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Table of Contents

Tuesday, June 18, 2013 - 18:30 - 19:30

Hémicycle - Conseil Régional Nord-Pas-de-Calais (Lille) : Opening Plenary (Chair: Irene Ring)

Institutions and Institutionalism: Crafting a Coherent Science of Environmental Policy, D. Bromley 1

Wednesday, June 19, 2013 - 09:00 - 10:30

Auditorium (MACC's Building) : Plenary Session 1: Environment-Society Relationships : Changing Behaviour or Changing Values ? (Chair: Begüm Özkaynak)

The emancipation and autonomy of humanity: Are they always liberating utopia?, M. Capron 2

Environmental policy-making and behaviour change: Financial incentives, 'nudge' or citizenship?, A. Dobson 3

Wednesday, June 19, 2013 - 11:00 - 12:30

Salle 4 (MACC's Building) : Session spéciale ESEE/RIODD : Le développement durable est-il soluble dans l'histoire? (Présidence: Béatrice Touchelay)

Le développement durable est il soluble dans l'histoire?, B. Touchelay 4

Prédation versus conservation : les paradoxes de l'industrialisation américaine, C. Druelle korn 5

L'exploitation houillère : un développement insoutenable ?, N. Care 7

La Compagnie du chemin de fer du Nord : entre prise de conscience environnementale et obligations légales, S. Dobrowolski 8

Salle 1 (MACC's Building) : Special session - Effectiveness of biodiversity conservation instruments in a policymix: comparing experiences from subnational settings in Europe and Latin America 1 (Chair: Rui F. Santos & Peter May)

Multi-scale approaches to the analysis of policymixes for biodiversity conservation, B. David n. [et al.] 9

Landowners perceptions and participation in agri-environmental schemes: lessons for instrument design in a conservation policymix, R. Santos [et al.] 10

Forest owner perceptions of institutions and legitimacy and their influence on voluntary contracting for forest biodiversity conservation, E. Primmer [et al.] 11

8 (SUP Building) : Special session - Heterodox Notions of Natural Value in Local Environmental Planning and Decision-Making (Chair: Roelof Plant)

'New Beliefs, New Values' ? Embedding a Heterodox Interpretation of the Ecosystem Services Concept in Local Environmental Planning and Decision-Making, R. Plant [et al.] 12

What knowledge needs for practical implementation of ecosystem services at the local level?, M. Snethlage [et al.] 15

Economic incentives and motivation crowding in biodiversity conservation, J. Rode [et al.] 17

Alternative Arguments for the Protection of Biodiversity, L. Braat [et al.] 19

Auditorium (MACC's Building) : Parallel paper session: Insights on climate change adaptation (Chair: Patrick Schembri)

Institutional (Climate) Change - Exploring climate adaptation through institutional analysis, M. Roggero [et al.] 21

VULNERABILITY AND ADAPTATION OF URBAN AREAS TO GLOBAL CHANGES: A SYSTEMIC INTERDISCIPLINARY APPROACH TO UNDERSTAND CITIES TRAJECTORIES TOWARDS RESILIENCE, B.

Quenault [et al.] 24
Climate governance in embedded cities: between mitigation and adaptation, C. Altenburg.... 25
Identifying Drivers of Household Coping Strategies to Multiple Climatic Hazards in Western Uganda: Implications for Adapting to Future Climate Change, R. Berman [et al.] 26

Salle 2 (MACC's Building) : Parallel paper session: Social Ecological Transition 1 (Chair: Marina Fischer-Kowalski)

Slow Management and Accounting for a Socio-Ecological Transition, R. Bobulescu [et al.] 27
Green economy: a regress in ecological economics?, V. Boisvert [et al.] 28
Green growth or low growth: Modelling the balanced transition to a sustainable economy, I. Cassiers [et al.] 29
Degrowth ?à la française? : A Lacano-marxist reading of Serge Latouche's proposals, O. Gun [et al.] 31

Salle 3 (MACC's Building) : Parallel paper session : New indicators of wealth and sustainability (Chair: Jacques Theys)

"Beyond GDP": Revealing Hidden Disparities of Stances to Make the Debate Possible, L. Sébastien [et al.] 32
Applying the Happy Planet Index to the household level ? a crossnational comparison on the relationship between energy consumption and life satisfaction in Munich and Bolzano, J. Schubert [et al.] 33
Are people that are living a more sustainable life more satisfied?, B. Bleys....35
Assessing Sustainability Indicators: The Need for a Criterion of "Performative Coherence", G. Thiry.... 36

301 (SUP Building) : Parallel paper session: Ecosystem Services: Foundations, Perceptions and Applications (Chair: Harold Levrel)

Can we better understand land-use conflicts by linking ecosystem services trade-offs with stakeholders and scales?, E. Kovács [et al.] 37
Conflicts on River Flows - Who Captures the Highest Share of the Ecosystem Services?, D. Jorda-capdevila [et al.] ... 40
Spatial dimensions of ecosystems and their services in Central European cultural landscapes: Challenges and options for governing common goods, C. Schleyer [et al.] 41
Stakeholders representions of biodiversity and eco-system services. A critical view., C. Merlin-brogniart [et al.] 43

211 (SUP Building) : Parallel paper session: Environmental Justice (Chair: Edwin Zaccai)

The Justice Dimension of Sustainability - A systematic and general conceptual framework, K. Stumpf [et al.] 44
Combining environmental justice and historical/institutional approaches to analyse big water projects in semi-arid regions : a case study in Northeastern Brazil., P. Roman....46
The relationship between intragenerational and intergenerational justice in the use of ecosystems and their services. An ecological-economic model., S. Sievers-glotzbach [et al.] 48
Fair and equitable governance? Procedural justice in the negotiations on the Nagoya Protocol, J. Pitseys [et al.] 50
Including justice in institutional analysis - How do frameworks for institutional analysis consider ideas of justice?, K. Stumpf [et al.] 51

208 (SUP Building) : Parallel paper session: Water Resources Management 1 (Chair: Iratxe Calvo-Mendieta)

Water No Get Enemy. How Could Water Security Shape Sustainable Water Governance?, T. Bolognesi [et al.] 54
Adding realism in river basin management planning ? a practical tool for costing diffuse phosphorus loading reduction in

Finnish catchments, T. Hjerppe [et al.] 56
A network perspective on agricultural watershed governance. The case of the Local Agri-Environmental Schemes (LAES) in France., A. Andriambelona [et al.] 58
Understanding policy-driven collective action to address challenges of European water management, A. Thiel [et al.] . 60

303 (SUP Building) : Parallel paper session: Environmental and Ecological Macroeconomics (Chair: Inge Røpke)

Macro-economic rebound estimation using Granger causality tests, B. Alcott [et al.] 63
Determinants of environmental institutions: The role of socio-economic models, L. Elie....65
The sovereign debt crisis : a new challenge in the socio ecological transition, N. Lancesseur [et al.] 66
What can we learn from the classical economists for the development of ecological macroeconomics?, E. Pirgmaier....68
Diversity of capitalism and sustainable development : institutional complementarity dynamics or radical change in the hierarchy of institutions ?, E. Magnin.... 69

Salle 3 (MACC's Building) : Parallel paper session: Ecological Economics: Theoretical and Epistemological Issues 1 (Chair: Arild Vatn)

A radical approach to sustainability economics, M. Remig [et al.] 70
New Foundations for Ecological Economics, C. Spash....71
Towards a common, evolutionary epistemology for ecological and institutional economics. Lessons from Veblen and Georgescu-Roegen., P. Van griethuysen....72
Ecological Economics and Degrowth, Nicholas Georgescu-Roegen's Controversial Legacies, A. Missemer....73
La valeur, le travail et la valeur de la nature : retour à la critique de l'économie politique, J. Harribey....74

302 (SUP Building) : Special session - Money and Degrowth (Chair: Kristofer Dittmer)

Local currencies for purposive degrowth? A quality check of some proposals for changing money-as-usual, K. Dittmer.... 75
Monetary and fiscal policies for a finite planet, J. Farley.... 77
Voluntary degrowth ? can we observe it empirically? A socio-economic and socio-cultural analysis of Bavarian low income municipalities., B. Gill [et al.] 79
Structure and Agency in the Dynamics of Growth: A monetary macroeconomic equilibrium perspective on growth imperatives and stagnation, C. Kimmich [et al.] 82

Wednesday, June 19, 2013 - 14:00 - 15:30

Salle 1 (MACC's Building) : Special session - Effectiveness of biodiversity conservation instruments in a policymix: comparing experiences from subnational settings in Europe and Latin America 2 (Chair: David N. Barton & Irene Ring)

PES in a policy mix: Spatial and temporal articulation in Mexico, D. Ezzine de blas [et al.] 83
What does it take to convince farmers to afforest? A comparative choice experiment from the Netherlands and Germany, N. Lienhoop [et al.] 84
The effectiveness of the ?Ecological ICMS? as a fiscal transfer for biodiversity conservation in Mato Grosso, Brazil, P. May [et al.] 85
Targeting AEM in human shaped ecosystems in south-eastern Portugal, R. Pinto [et al.] 87

Procedural and Distributive Justice in Afforestation Schemes: A Cross-Country Comparison, E. Papyrakis.....89

208 (SUP Building) : Session Spéciale ESEE/RIODD : L'économie de la fonctionnalité : sortir d'une vision strictement microéconomique (Présidence: Gérald Gaglio)

Towards a transportation system operated in accordance with the principles of functional economy, M. Drut.....91

La dimension institutionnelle de l'économie de la fonctionnalité, C. Du tertre.....92

L'économie de la fonctionnalité, une traduction possible ou rêvée de la RSE dans un nouveau modèle économique ?, T. Lamarche.....94

Salle 2 (MACC's Building) : Special session - The crisis of democracy in modern growth societies and the new cycle of protest (Chair: Barbara Muraca & Viviana Asara)

Does democracy need economic growth to its stabilization? Challenges and visions for a democratic transition to a post-growth-society, B. Muraca.....95

Growth and Domination. Shortcomings of the (De-)Growth Debate, U. Brand.....97

Degrowth, capitalism and democratic stability, D. Hausknost.....99

Words and story-lines in development dialogue. The role of economics in politics and institutional change processes, P. Söderbaum.....101

The indignados movement in Barcelona. Framing the crisis and democracy, V. Asara.....104

301 (SUP Building) : Parallel paper session: Payments for Environmental Services Schemes 1 (Chair: Jean-François Le Coq)

Is there any evidence of an ecosystem service curse?, J. Kronenberg.....107

Feasibility of a Payment for Ecosystem Services Scheme: Cost-benefit Distribution and Contracting Opportunities in Güisayote Biological Reserve, Honduras, O. Rendon.....108

SPATIAL ECOSYSTEM SERVICES OF MEXICAN FREE-TAILED BATS, R. Wiederholt.....109

8 (SUP Building) : Parallel paper session: Industrial ecology and Material Flows Analysis (Chair: Nicolas Buclet)

Industrial Ecology : Crossed Viewpoints from Economics and Biology, M. Maillefert [et al.].....110

How many materials does Austria globally use? A comparison of seven methods to calculate Raw Material Equivalents (RME), N. Eisenmenger [et al.].....112

The performativity of industrial ecology: towards cases of biomimicry in the sector of flooring, R. Debref [et al.].....113

Salle 3 (MACC's Building) : Parallel paper session : Commons, Common pool-resources, Common property 1 (Chair: Bina Agarwal)

Production of commons by means of commons, S. D'alessandro [et al.].....114

The ?Common-Pool Resources? approach of the Bloomington School : A Critical Analysis, C. Baron [et al.].....115

Not distant ?others' but close ?us': Why do individuals commit themselves to CPR management?, H. Ishihara [et al.] 116

The common good is a social construction: the merits and limits of Ostrom's approach to environmental governance, A. Douai [et al.].....117

302 (SUP Building) : Parallel paper session: Climate change governance (Chair: Matthias Ruth)

The Ostrich or the Phoenix? ... dissonance and creativity in a changing climate, K. Anderson 118
How change happens? The status quo bias in climate policy, S. Geisendorf.....119
Economics of climate change and intergenerational justice, A. Schaffer [et al.] 121
Unconventional Determinants of Greenhouse Gas Emissions: The Role of Trust, S. Carattini [et al.] 123

211 (SUP Building) : Parallel paper session: Agriculture and Sustainability 1 (Chair: Gaël Plumecocq)
Towards Sustainable Agriculture? The EU Framework and Local Adaptation in Sweden and Poland, E. Ohlund [et al.] ... 124
Sown Biodiverse Permanent Pastures Rich in Legumes: A Systematic Sustainability Analysis, T. Domingos [et al.] .. 125
Locked Into Continuous Insecticide Spraying in Rice. Developing an inte-grated ecological and socio-political DPSIR analysis, J. Spangenberg [et al.] 127
Analysing adaptive capacity of Russian agriculture to climate change from an institutional economics perspective, Y. Polishchuk.....129
?Good' Environmental governance in the context of agriculture and deforestation, S. Sedlacek [et al.] 133

303 (SUP Building) : Parallel paper session: Water Resources Management 2 (Chair: Arnaud Buchs)
On Counting Cows, Power and Institutional Change: Communal Water Management in the Kunene Region, North-Western Namibia, D. Menestrey schwieger.....135
Institutions, organizations and the characteristics of investment in aquatic ecosystems, a comparative analysis of four French case-studies, P. Scemama [et al.] 136
Decentralization and economic incentives to manage groundwater withdrawals for irrigation - From theory to practice, A. Figureau [et al.] 138
How make environmental restoration affordable: transform disproportionate costs into proportionate ones, M. Cordier..... 139

Salle 4 (MACC's Building) : Parallel paper session: Towards a Socio-Ecological Transition 1 (Chair: Markku Lehtonen)
Modelling the Great Transition, G. Bernardo [et al.] 141
Left Turn in Bolivia and Ecuador: Changes in environment and development policies, L. Pellegrini [et al.] 142
Addressing Sufficiency ? Including altruistic motives in behavioural models for sustainability transitions, F. Rauschmayer [et al.] 144
Adam Smith's Stationary State, and Sustainable or Steady-State Economies in the History of Economics, N. Bertaux 146

1 (SUP Building) : Parallel paper session: Ecological Economics: Theoretical and Epistemological Issues 2 (Chair: Géraldine Thiry)
Social Ecological Economics, C. Spash..... 147
Nonlinear versus linear accounting of Sustainable Economic Systems, (SES): the ecological economist's challenge to the neoclassical intergenerational, non-declining, welfare model., A. Friend.....149
Participatory Action Research for Ecological Economics, G. Pataki [et al.] 150
Structured methodological pluralism in sustainability science, P. Florin..... 152
Social-ecological system depends on model of the mind: Contrasting information-processing and embodied views of cognition in ecological economics, J. Hukkinen..... 154

Auditorium (MACC's Building) : Special session - Environmental conflicts and degrowth (Chair: Federico Demaria, Marta Conde, Joan Martínez-Alier)

Capital accumulation, degrowth and environmental conflicts, F. Demaria [et al.] 156
The relevance of life projects for understanding links between degrowth and environmental conflict in the ?First World', C. Zografos 159
Mining conflicts at the crossroads of the de-growth and environmental justice movements, B. özkaynak [et al.] 160

Wednesday, June 19, 2013 - 15:45 - 17:00

Hall (Sup Building) : Poster session (Chair: Charlotte Da Cunha)

Back from the future: Defining sustainable employment through backcasting, A. Köves [et al.] 161
Challenges of designing a PES-Scheme in south-western Madagascar, R. Neudert [et al.] 163
Corporate social responsability in Madagascar : tool of development and source of frustrations, J. Ballet [et al.] 164
Costs and benefits of creating stork villages in Poland, J. Kronenberg [et al.] 166
Ecosystem services trade-offs from a historical perspective, F. Veronika [et al.] 167
Evaluation des interactions entre les parties prenantes dans la gouvernance communautaire des ressources naturelles à Madagascar : cas d'Analamanga, A. Gaudieux 169
Exploring the links between agricultural biodiversity, ecosystem services and human well-being. Evidence from the Yucatán, Mexico., G. Blundo canto 170
External diseconomies, Neoclassical and Marxist analysis: a vision, G. Papalexiou [et al.] 171
Green is the Color of Money: The EU ETS failure as a model for the "green economy", R. Coelho [et al.] 173
Indigenous natural resources management and mobility in Arnhem Land, northern Australia, K. Zander 176
Modeling the Determinants of Organic Consumption Based on Sales Data: The Role of Nature Connectedness and Peers Influence, H. Cheval [et al.] 177
Neo-liberalisation of Water Resources Management: Its Implications in Turkey in the context of the recent Hydroelectric Power Plant (HPP) Development Projects, R. Sayan 178
One Globe: from talking with local indigenous communities to having global community voice heard via Internet ? what participatory processes offer today?, J. Spiric [et al.] 180
Outlining a sustainable future for the island of Samothraki (Greece) as a Biosphere Reserve, P. Petridis 182
Perceived impacts on ecosystem services and expected compensations in the context of marine renewable energy : A fuzzy cognitive mapping approach, C. Kermagoret [et al.] 184
Quand la financiarisation des économies touche les marchés des denrées alimentaires Alijani S., Karyotis C., S. Alijani [et al.] 185
Reducing consumption emissions: balancing technological change with consumption, R. Wood [et al.] 186
Seeking permanence as an alternative goal to maximizing profits in economic appraisal, A. Zabala 188
The difficult governance in a complex institutional context : the case of the grand boulevard in the Lille Metropolis, R. Plichon [et al.] 190
The EJOLT Mapping Platform of Environmental Justice: A European Perspective, T. Leah [et al.] 191
The impacts of energy technologies to enhance sustainable degrowth, P. Wächter 193
THE PARADOX OF AFFLUENCE AND ACTIVE COMMUTING IN NEW ZEALAND, L. Mckim [et al.] 195
The scientific influence of ecological economics. An exploratory bibliometric exercise, A. Teixeira 198
What Can We Learn from Combining Experimental Research with Post-experimental Group Discussions and Interviews?

Insights from Two Framed Field Experiments in Andhra Pradesh, India, J. Rommel [et al.] 199
What territorial distribution of cropping systems could limit quantitative water management crisis?, C. Murgue 201
Working with ecology: Using the Allee effect for invasive species (control) policy, S. Mcdermott [et al.] 203

Wednesday, June 19, 2013 - 17:00 - 18:30

Salle 1 (MACC's Building) : Special session - Shared, Plural and Cultural Values of Ecosystems (Chair: Jasper Kenter, Katherine Irvine)

What are shared and social values of ecosystems?, J. Kenter [et al.] 205
Shared and cultural values around ecosystems, health and renewable energy ? a literature review., L. O'brien [et al.] . 207
Managing land for multiple benefits in the Scottish uplands: the influence of values across regions and institutions, R. Bryce [et al.] 209
Eliciting shared values using deliberative valuation and participatory systems modelling ? a case study from the Solomon Islands, J. Kenter [et al.] 211

301 (SUP Building) : Parallel paper session : Land use and the dynamics of Sustainability (Chair: Ben Davies)

Transregional Land-Use Dynamics of Bioenergy Policies ? An Agent-Based Approach, C. Klassert [et al.] 212
Analysing historic land use in New Zealand: Tracing land use efficiency based on the Human Appropriation of Net Primary Production framework, T. Fetzel [et al.] 214
The effect of forest proximity on biological control of pasture in Northwest Mato Grosso, Brazil: a cost-benefit analysis for land use policy, P. Del arco zúñiga [et al.] 216
Land Use Conflicts in Protected Agro-ecosystems: Exploring and Interpreting the Dynamics of Actors and Factors, A. Kalóczkai [et al.] 218

302 (SUP Building) : Special session: Fragile governance (Chair: Tatiana Kluvankova-Oravska)

Fragile Governance: Environmental Governance Under the Complexity and Uncertainty., T. Kluvankova-oravska..... 220
Management of External Shocks in Polycentric Urban Systems, M. Finka [et al.] 221
Agri-environmental measures and sustainability? GIS based institutional analyses of agri-environmental measures for protected areas in Slovenia, A. Udovc [et al.] 222
Local or Global Commons? Application of Framework for Analysing SES for Soil Biodiversity at EU Level., T. Kluvankova-oravska [et al.] 223
Institutional Dynamics and Adaptive Governance towards maintaining Socio-Ecological Resilience (A case study from Shiretoko, Japan), M. Shioya 224

Auditorium (MACC's Building) : Special Session ESEE/RIODD: Common-Pool Resources and Social-Ecological Systems (in memory of Elinor Ostrom) (Chair: Roland Perez)

The land above, within, and below: the evolving complexity of landscapes and common pool resources?, E. Brondizio [et al.] 226
Role-playing games to assess the external validity of experimental economics, F. Bousquet [et al.] 227
Roundtable - A New Science of Governance for the New Age, J. Le moigne [et al.] 228

1 (SUP Building) : Special session - Capitalism, Green Growth and Degrowth (Chair: Igor Matutinovic)

Capitalism and sustainability, I. Matutinovic [et al.] 229

The Growth Paradigm: Its intellectual history and current travails, G. Dale 230
Criticism of economic growth as phenomenon, structure and ideology: A comparative analysis of contemporary degrowth classics, L. Haapanen [et al.] 232
Río +20 in Perspective: From the Limits to Growth to the Green Economy, E. Gómez-baggethun [et al.] 235

208 (SUP Building) : Parallel paper session: Payments for Environmental Services Schemes 2 (Chair: Renaud Lapeyre)

Intergovernmental fiscal transfers to support local conservation action in Europe, C. Schröter-schlaack [et al.] 237
International Payments for Ecosystem Services and agriculture-driven biodiversity loss in Central Kenya, M. Curran [et al.] 240
Institutional analysis of incentives for the provision of forest goods and services: an assessment of incentive schemes in Catalonia (North-East Spain), I. Prokofieva [et al.] 242
Evaluating Farmers' Participation in Potential Payment Schemes for Climate Regulation in the UK Farmlands: A Choice Experiment Approach, U. Aslam 243

Salle 4 (MACC's Building) : Parallel paper session: Technology and innovations (Chair: Abdelillah Hamdouch)

Environmental Innovations, Partnership strategies and Governance: A study case of Poitou-Charentes firms, M. Ferru [et al.] 245
Is innovation the key to a decarbonized economy? Myth and Reality of Environmental Innovation, G. Xavier..... 248
Innovation projects and the trajectory's irreversibility of the Aquitaine wood filière, M. Bélis-bergouignan..... 250
The role of advisory services in the dynamic of Agricultural Knowledge and Innovation Systems: locking in or locking out?, P. Labarthe [et al.] 251

Salle 3 (MACC's Building) : Parallel paper session : Critical analysis of markets for water, carbon and biodiversity (Chair: Franck-Dominique Vivien)

What is the carbon market for? Compliance transactions versus financial transactions, E. Gautherat [et al.] 253
The high cost of cost-efficiency: A critique of carbon trading, R. Coelho..... 254
Biodiversity mitigation policies and the market: A reassessment based on French case studies, V. Boisvert [et al.] 256
Water Banks and Drought Management in Andalusia (Spain), M. Beltrán [et al.] 257
Diffusion of ?Market based instruments? and ?biodiversity offsets? notions within European environmental policies: between international benchmarking and domestic dynamics, M. Hrabanski..... 258

303 (SUP Building) : Parallel paper session: Response to climate change adverse effects (Chair: Charlotte Da Cunha)

Climate change and socio-economic impacts of invasive alien species, M. Getzner [et al.] 259
Why do some countries have an approved climate change adaptation strategy and others don't? ? A qualitative comparative analysis of governance processes and outcomes in the Alpine space, S. Menzel [et al.] 261
How little or how much climate change? Facilitating stakeholder thinking on food system futures, S. Mander [et al.] 263
Responding to Climate Change: Field Experiments at Chilika Lagoon, India, A. Sharma..... 265
Crise de santé et environnement au Sahel, S. Callens [et al.] 266

Salle 2 (MACC's Building) : Parallel paper session: Biodiversity : instruments and policies (Chair: Sybille van den Hove)

How can institutional analysis contribute to the understanding of Marine Protected Areas challenges?, G. Weber de morais [et al.] 269

Ignorance, uncertainty and biodiversity conservation: decision-making by the European Court of Justice, V. Mauerhofer.. 272

Agri-Environmental Schemes and Grassland Biodiversity: Another Side of the Coin, A. Münch..... 274

What do conservationists really think about markets?, C. Sandbrook [et al.] 275

Learning process in adaptive governance for sustainable development: a critical perspective. Some issues from the French experience of effective implementation of the Green and Blue infrastructure., V. Angeon [et al.] 276

211 (SUP Building) : Parallel paper session: Agriculture and Sustainability 2 (Chair: Gilles Allaire)

A Transdisciplinary Research Framework for an Integrated Sustainability Assessment of Livestock Farming Systems, H. Ding [et al.] 277

The interactions between agricultural intensification and different aspects of governance: effects on agricultural expansions in tropical Latin America, M. Ceddia [et al.] 279

Individual Decisions or Institutional Dynamics? Reasons for the Intensive Use of Fertilizer in Eastern China, L. Berger [et al.] 281

ANALYZING FERTILIZER USE ON FARMLANDS WITH DIRECT EXPERIMENTATION, A. Saysel [et al.] 283

Assessment of eco-efficiency in agricultural sector in Japan: An application of System of Environmental and Economic Accounting and Sustainable Value, T. Hayashi [et al.] 285

8 (SUP Building) : Parallel paper session: Assessments, Indicators and Sustainability (Chair: Felix Rauschmayer)

Objective, Subjective and Phenomenological Environmental Effects, T. Johansen.....287

The Building Blocks of per capita Ecological Footprint Inequality: A Regression-Based Decomposition., J. Teixido-figueras [et al.] 296

Mobilizing ground and underground Knowledge and uncertainties in Urbanisation: Multi-stakeholders and multi-criteria evaluation processes in a deliberative perspective, J. Douguet..... 297

Geological disposal of radioactive waste as a ?megaproject?: challenges and approaches to the evaluation of socio-economic impacts, M. Lehtonen 298

Thursday, June 20, 2013 - 09:00 - 10:30

Auditorium (MACC's Building) : Plenary Session 2: Rethinking the Role of Science in Society (Chair: Sigrid Stagl)

Science, Innovation and Sustainability: Exploring Myths and Asymmetries, S. Van den hove.....301

Opening up Green Transitions: Acknowledging the Politics of Ecologies, Economies and Technologies, A. Stirling... 302

Thursday, June 20, 2013 - 11:00 - 12:30

Salle 3 (MACC's Building) : Special session: Biodiversity: valuation, conservation and policy 1 (Chair: Iulie Aslaksen)

MARKETS IN ENVIRONMENTAL GOVERNANCE. FROM THEORY TO PRACTICE, A. Vatn.....303

The UN System of Environmental-Economic Accounting (SEEA) ? Experimental Ecosystem Accounting. Implications for

biodiversity policy, P. Garnåsjordet [et al.] 304
Biodiversity and ecosystem services: The Nature Index for Norway, I. Aslaksen [et al.] 307
Path-dependent policyscapes: a theoretical approach to the evaluation of policymixes for biodiversity conservation, B. David n. 310

Salle 4 (MACC's Building) : Special Session ESEE/RIODD: Critical analysis of environmental management arrangements 1 (Chair: Eve Chiapello & Maya Leroy)
Genesis of environmental management arrangements in Amazonia. A comparison between France (French Guiana) and Brazil (Amapá)., S. Nicolle 312
The mechanisms for quantifying the costs incurred by asbestos removal projects., N. Berland 315
Experimenting with technique. How to make an agro-environmental management device?, D. Busca [et al.] 316

303 (SUP Building) : Special session: Distributed innovation/agency in sustainable energy transitions (Chair: Gill Seyfang & Jason Chilvers)
Community Energy in the UK: examining grassroots innovations for sustainable energy transitions, G. Seyfang [et al.] ... 318
Participation, politics and actor dynamics in sustainable energy transitions, J. Chilvers [et al.] 319
Who uses smart homes? Representations of users by the smart home industry, T. Hargreaves [et al.] 320

302 (SUP Building) : Special session - The Role of Civil Society Actors in Mainstreaming the Ecosystem Service Concept (Chair: Bettina Matzdorf, Claudia Sattler, Bernardo Aguilar-González)
Strengths and weaknesses of state initiated Payments for Ecosystem Services: Actors' roles and implementation performance, C. Meyer 321
Decision-making in payments for ecosystem services scheme design: Findings from case studies in Germany and the UK, K. Nicolaus 323
HOW TO ENABLE CIVIL SOCIETY INITITATIVES TO FACILITATE EFFICIENT AND EFFECTIVE PES IMPLEMENTATION? - AN ELABORATION OF THE ISSUE ON GERMAN LANDCARE ASSOCIATIONS -, S. Schomers 325
On the misuse of metaphors: are payments for environmental services instruments of commodification of the nature?, A. Karsenty 327
How do Civil Society Actors use the ES concept? A Case Study of Ecological Economic Valuation and Participatory Ecological Conflict Resolution in the Work of an Environmental NGO in Costa Rica, B. Aguilar-González 328

103 (SUP Building) : Session Spéciale ESEE/RIODD : PME et responsabilité sociétale (Présidence: Jean-Marie Courrent)
La RSE, une source de création de valeur partagée en PME ?, S. Berger-douce [et al.] 330
A Change management approach to sustainability in Small and Medium Enterprise, L. Uhlaner [et al.] 332
L'engagement responsable de dirigeants de petites entreprises, A. Paradas 334
Profil de l'entrepreneur et adhésion à la vision «business case» des politiques sociales et environnementales des PME, M. Spence [et al.] 335

Auditorium (MACC's Building) : Parallel paper session: Social metabolism (Chair: Sabine Barles)
The future of socioeconomic metabolism in a changing world: transition dynamics between saturated industrial and rapidly

growing emerging economies, M. Fischer-kowalski [et al.] 339
Okavango Delta: society in Transition. Social metabolism of a rural community in Ngamiland, Botswana., S. Domptail [et al.] 341
Rethinking the concepts of Virtual Water, Socioeconomic Metabolism and Water Metabolism. Towards a new paradigm: Integrated Water Metabolism, E. Velázquez [et al.] 343
The Global Metabolic Transition: Regional Patterns and Trends of Global Material and Energy Use, 1950-2010, A. Schaffartzik [et al.] 344

Salle 2 (MACC's Building) : Special session - Institutional analysis of Ecosystem Services in Developing countries 1 (Chair: Géraldine Froger)
Institutional dimensions of ES and their main application, PES: what sociology and political sciences can bring to economic approaches?, P. Méral [et al.] 346
The institutional foundations of the ecosystem services approach, R. Mongruel [et al.] 347
Payments for Ecosystem Services as Incentives for Collective Action, R. Muradian 348
Forest Use Rules in South Asia's Community Governed Forests: Does Gender Make a Difference?, B. Agarwal 349

8 (SUP Building) : Parallel paper session: Valuation of Ecosystem services 1 (Chair: Erik Gómez-Baggethun)
A comparative study on valuation methods and decision-aid tools: cases on ecological restoration, L. Carnoye [et al.] 350
Valuation of Ecosystem Services - An ex-post analysis of Marine Spatial Planning Processes in Europe, R. Lopes [et al.] 352
Talking money. How economic valuation can undermine the support for environmental protection, S. Neuteleers [et al.] . 354
The Deliberative Monetary Valuation (DMV) a powerful tool for arbitrated between two inter-related ecosystem services with negative jointure., N. Gallai [et al.] 357

1 (SUP Building) : Parallel paper session: Fisheries and Governance (Chair: Jean-Pierre Réveret)
Governance system of fisheries quota management: a bio-economic approach in the case of the sole fishery in the bay of Biscay, C. Macher [et al.] 361
Factors influencing adaptability of fish Producers Organizations: lessons from Portugal, V. Karadzic [et al.] 363
LOCAL KNOWLEDGE OF POND FISH-FARMING ECOSYSTEM SERVICES: IMPLICATIONS OF FISHFARMERS' PERCEPTIONS FOR MANAGEMENT IN THREE CONTEXTS (FRANCE, BRAZIL AND INDONESIA), S. Mathe [et al.] 364
Social learning among resource users: fish producers' organization experience, V. Karadzic [et al.] 367

208 (SUP Building) : Session parallèle ESEE/RIODD: Responsabilité sociale des entreprises et des consommateurs (Présidence: Florence Jany-Catrice)
La responsabilité économique du consommateur, déterminants et conséquences sur le fameux «Acheter Français» !, P. Folcher 368
La réalité sectorielle comme défi à la RSE pour les TPE, P. Callot 370
Economie de la réglementation des OGM. Une approche par la qualité., J. Milanesi 372

103 (SUP Building) : Special session - Sustainability Transitions, Doubly Green Chemistry and Biorefinery 1

(Chair: Martino Nieddu)
Revisiting the Sustainability Transitions in Doubly Green Chemistry, M. Nieddu [et al.] 373
From bioenergy to biorefinery: controversies in the Danish transition towards a fossil free society, M. Jørgensen [et al.] .. 375
Which analytical framework to analyse territorial anchorage of the productive activity based on forestry biomass?, C. Cazals [et al.] 377
The continental biorefineries: a civil privatization of the agro-industrial choices?, J. Gobert [et al.] 379

301 (SUP Building) : Parallel paper session: Sectoral approaches in fighting climate change (Chair: Nina Eisenmenger)
Adapting institutions for balancing environmental and economic needs in the electricity sector under climate change, K. Eisenack [et al.] 381
Exploring polycentric approaches to mitigate the contribution of maritime transport to climate change, M. Doudnikoff..... 382
The German energy transition as a regime shift, S. Strunz.....384
Social Impacts of CO2 Pipeline Installations, L. O'keefe [et al.] 386

211 (SUP Building) : Parallel paper session: Political and institutional aspects of agriculture and (un-) sustainability (Chair: Jean-Marc Douguet)
The Opportunity Costs of Conserving Pasture Resources for Mobile Pastoralists in the Greater Caucasus, R. Neudert [et al.] 387
Combining Institutional and Technical Innovation to improve the Acceptability of Agri-environmental Measures. The example of teritorialized agri-environmental measures in France., J. Del corso [et al.] 388
ANALYSING THE PROBLEM OF CULTIVATED PLANT GENETIC RESOURCES FROM THE VIEWPOINT OF CRITICAL INSTITUTIONAL ECONOMICS, G. Bela..... 390

Thursday, June 20, 2013 - 14:00 - 15:30

Salle 3 (MACC's Building) : Special session: Biodiversity: valuation, conservation and policy 2 (Chair: Per Arild Garnåsjordet)
Carbon storage in boreal forests ? economic and environmental policy approaches, B. Holtsmark [et al.] 392
Consequences of Uncoordinated Responses to Diffusing Invasive Alien Weed Stocks: a Dynamic Game Analysis, K. Grimsrud..... 395
Ethical and political considerations on the commodification of ecosystem services, E. Gómez-baggethun..... 398

Salle 4 (MACC's Building) : Special Session ESEE/RIODD: Critical analysis of environmental management arrangements 2 (Chair: Eve Chiapello & Maya Leroy)
Agri-environmental designs: failure of substantive efficiency appeals for procedural effectiveness, M. Barbier [et al.] 400
Differentiating Payment for Ecosystem Services arrangements as a necessary step to discussing their strengths and weaknesses, T. Leménager [et al.] 401
A management perspective on economic tools for biodiversity, L. Mermet..... 404
Evaluation of the FSC Forest Certification Scheme from an Environmental Effectiveness Perspective: Methodological Challenges and Proposals, S. Guéneau 406

Auditorium (MACC's Building) : Special Session ESEE/RIODD: Environmental externalities, social cost and theory of the firm (Chair: Corinne Gendron, Michel Capron)

Three conceptual tools for CSR - of which only one (externalities) is traditional - and inappropriate, O. Favereau..... 407
SOCIAL RESPONSABILITIES: FROM A STAKEHOLDER TO A MANAGERIAL THEORY OF THE FIRM, B. Segrestin 408
How Karl-William Kapp was received by economists, B. Girard.....409

303 (SUP Building) : Special session ESEE/RIODD - Finance and sustainability : financial debt vs ecological debt (Chair: Roland Perez)

Carbon Finance or the price-value myth caught in the act of ineffectiveness, E. Fimbel e., [et al.] 410
Neither Internal, Nor External: Understanding Corporate Governance Failures in the Financial Sector, W. Sun..... 411
The development of bio-agriculture in the Candidate Countries between challenges and opportunities. Results of a survey on the situation in Serbia, M. La torre [et al.] 412

302 (SUP Building) : Parallel paper session: Resilience, Vulnerability and Adaptation (Chair: Jérôme Ballet)

Integrating the role of participatory action research and governance into resilience and socio-ecological assessment, C. Da cunha [et al.] 413
Stakeholders' cognitive pathways and Decision Support System for resilience : case study of a FP7-Theseus's project., I. Kane..... 416
Portfolio of resilience options: Operating framework of application of resilience principles to the coastal risk management, case of study: the Gironde estuary, N. Touili.....417
The Pivotal Role of Exposure in Shaping the Vulnerability and Resilience of SMEs: Theoretical Linkages and Empirical Findings, P. Hernandez montes de oca.....419
Resilience and adaptation of urban systems to cope with and to respond to climate change adverse effects, B. Quenault.... 422

Salle 2 (MACC's Building) : Special session - Institutional analysis of Ecosystem Services in Developing countries 2 (Chair: Philippe Méral)

Costa Rican Payment for Environmental Services: Between international and national influence, a feedback analysis, D. Pesche [et al.] 423
Development of ecosystem-services-based policy tools in Cambodia, C. Chervier [et al.] 425
Can payments for environmental services be used to reduce local vulnerability?, G. Froger [et al.] 427
Environmental services and market coordination: the role of local intermediary organizations in the program of Payment for Environmental Services in Costa Rica, J. Le coq [et al.] 429

1 (SUP Building) : Special session: Sustainable land care (Chair: Brynhildur Davíðsdóttir)

Ecosystem Service Frameworks, Where Do Soils Fit In?, D. Robinson [et al.] 431
Indicators for soil sustainability, B. Davidsdottir [et al.] 432
An ecosystem services approach to the evaluation of soil conservation policy in New Zealand hill country pastures., E. Dominati [et al.] 433

8 (SUP Building) : Parallel paper session : Commons, Common pool-resources, Common property 2 (Chair: Simone D'alessandro)

Institutional dynamics in managing common pool resources: community-based shrimp aquaculture in the northwestern Sri Lanka, E. Galappaththi 435

Urban solid waste in southern countries: from a blurred object to common pool resources, J. Cavé 436

The prospects of using community land title deeds (CLTDs) to counteract land grabbing and to promote sustainable agriculture in Thailand, P. Chiengkul 437

The transmission of sustainable harvesting norms when agents are conditionally cooperative, A. Richter [et al.] 438

Salle 1 (MACC's Building) : Special session - Sustainability Transitions, Doubly Green Chemistry and Biorefinery 2 (Chair: Martino Nieddu)

Biorefinery concept and ecosystem services of a territory: an exploration within an agricultural region, N. Sirina 439

Do we need a unified appraisal framework to synthesize biofuel impacts?, A. Gasparatos [et al.] 440

What if Science follows Policies?, B. Chèze 443

Economic analyze integration to Life Cycle Assessment: agricultural case from Turkey, N. Mencet yelboga [et al.] ... 445

103 (SUP Building) : Parallel paper session : Science-policy interface (Chair: Andrew Stirling)

Act when the window of opportunity is open: Enhancing time-sensitive connectivity between research and policy-making in sustainable development, J. Hukkinen 446

Environmental policy implementation as a legal battlefield: The changing role of street-level bureaucrats in Europe, N. Kohlheb [et al.] 448

Viral Agency in Heterogenous Assemblages: An interdisciplinary reframing of the challenge to regulate endocrine disrupting chemicals in wastewater, J. Hukkinen [et al.] 451

Comparing the sustainability of the 27 European Countries. A robustness approach, T. Luzzati [et al.] 453

Addressing Agency in the Institutionalised Timescapes of Endocrine-Disrupting Chemicals Governance, J. Munck af rosenschöld [et al.] 454

211 (SUP Building) : Parallel paper session: Work and the (de)growth paradigms (Chair: Muriel Maillefert)

Avoiding unemployment under the growth dilemma: a short review of relevant economic literature, J. Bernardino 456

Sustainability and making a living - Ideals of Green Work, T. Schmidt [et al.] 457

Friday off - the case for reducing work hours in Europe, G. Kallis 458

Green jobs: what are they, and how many?, A. Mearman [et al.] 460

Useful work and Portuguese economic growth, 1856-2009, A. Cabrera serrenho [et al.] 461

301 (SUP Building) : Parallel paper session: Towards a Socio-Ecological Transition 2 (Chair: Andrew Dobson)

Grassroots innovations in context: lessons in transition governance from two Belgian case studies, A. Debourdeau [et al.] 463

Grow-your-own Green Money: Grassroots Currencies and Sustainable Development, G. Seyfang [et al.] 464

Do many small rivers can make a big river? or how local initiatives are contributing to the foundation of a new conventional regime, N. Buclet 465

Viable local societies enlightened by ecological economics., A. Ingulfsvann [et al.] 466

208 (SUP Building) : Special session - Exploring the role of habitual practices, social norms and peers in (un) sustainable consumption behaviours: theory, evidence and policy (Chair: Ali Douai, Nathalie Lazaric, Vanessa Oltra, Kevin Maréchal)

Social norms and consumer's green behaviour: theory and evidence from France, A. Douai [et al.] 468

?Habitual Practice' and household energy consumption: opening the black-box through discussing people's relationship with their homes, K. Marechal [et al.] 470

Initial Effects of a Community-Based Energy Saving Initiative: a Field Experiment, N. Bardsley [et al.] 472

Do community currencies enhance sustainable quality of life?, M. Mock [et al.] 474

Thursday, June 20, 2013 - 16:00 - 17:30

Salle 4 (MACC's Building) : Special Session ESEE/RIODD: Critical analysis of environmental management arrangements 3 (Chair: Eve Chiapello & Maya Leroy)

Quantitative analysis of French marine and coastal environmental policy performance: first step from a local scale, M. Duhalde [et al.] 477

The Moroccan Agdal as an archetype of Community Based Natural Resources Management system. Contributions and limits of a ?new institutionalist? perspective on environmental management., P. Aubert 479

Protected Areas in the Brazilian Amazon: from "Paper Parks" to Efficient Environmental Management Arrangements against Deforestation. The Case Study of the Terra do Meio (Pára State), R. Taravella 481

1 (SUP Building) : Parallel paper session: Energy transition, governance and policies (Chair: Janne Hukkinen)

CO2, energy and GDP per capita: a reassesment of the EKC, T. Luzzati [et al.] 483

Residential Energy Consumption across Europe: The Effect of Policy within a Dynamic Panel Approach, E. Aydin [et al.] 486

Sustainable bioenergy: UK drivers of innovation priorities, L. Levidow 487

Smart meters as an opportunity to motivate households for energy savings? Designing innovative policy instruments based on the coupling of smart meters and non-financial incentives, H. Joachain [et al.] 490

Debate over Renewable Energy in Rio+20 ? Role of Energy Sector in UN Negotiations on Sustainable Development, M. Laihonen [et al.] 491

Salle 2 (MACC's Building) : Special session - Institutional analysis of Ecosystem Services in Developing countries 3 (Chair: Roldan Muradian)

Fire risk and smallholders in the Brazilian Amazon: use of a role playing game to conceive incentives for forest conservation, E. Coudel [et al.] 494

Funding reforestation with Payments for Ecosystem Services in Indonesia: Does it trigger institutional innovation?, R. Lapeyre [et al.] 497

Fences and property: participation dynamics and institutional change in carbon forestry, C. Hendrickson [et al.] 499

Willingness of small farmers to make a transition out of deforestation and implications for REDD projects: insight from São Felix do Xingu (state of Pará, Brazil), C. Schneider [et al.] 500

8 (SUP Building) : Parallel paper session: Wetlands and governance (Chair: Valérie Deldrève)

Analysis of a national programme for wetland rehabilitation in South Africa: lessons for environment and development policies, A. Zabala [et al.] 502

Role of Institutions in Governance of Urban Wetlands in Kolkata, India, S. Bandyopadhyay 504

Reconciling livelihoods with ecosystem integrity in Ga-Mampa wetland, South Africa, S. Morardet [et al.] 505

Salle 1 (MACC's Building) : Special session - Sustainability Transitions, Doubly Green Chemistry and Biorefinery 3 (Chair: Martino Nieddu)

Biorefinery Techno-fixes for Resource Constraints?, L. Levidow..... 507

Green chemistry, its eco-concepts and its practices: A dialogue between science and philosophy, J. Llored.....508

Towards a dominant design for the sustainable chemistry? The analyze of the relationships between green chemistry and doubly green chemistry for academic research and industrial innovation, R. Debref [et al.] 510

How to build the filieres of the Doubly Green Chemistry? The variety of strategies of involved firms, B. Nicolas..... 511

Salle 3 (MACC's Building) : Special session ESEE/RIODD : Corporate Social Responsibility, Environmental Innovation and Firm Performances (Chair: Virgile Chassagnon)

ENVIRONMENTAL INNOVATION AND TECHNOLOGICAL LEADERSHIP: A FIRM-LEVEL EMPIRICAL ANALYSIS, V. Chassagnon.....513

Do socially responsible firms implement green innovations? An empirical study based on surveys, C. Le bas [et al.] .514

Policy design, eco-innovation and industrial dynamics in an agent-based model: an illustration with the REACH regulation, N. Arfaoui [et al.] 515

The intensity of the firm's eco-innovative performance, D. Galliano [et al.] 516

Consumer's perceptions on environmental and social communication: the case of organic and fair trade products., J. Martinez boysselle.....517

Friday, June 21, 2013 - 09:00 - 10:30

Auditorium (MACC's Building) : Plenary Session 3: Redefining Prosperity (Chair: Giorgos Kallis)

Redefining progress and prosperity: with which indicators?, F. Jany-catrice 520

Macroeconomic relationships within a green economy, T. Jackson..... 521

Friday, June 21, 2013 - 10:45 - 12:15

Salle 1 (MACC's Building) : Special session - Conceptualizing and operationalizing the policy mix for low carbon innovations (Chair: Kristin Reichardt & Karoline Rogge)

Towards a comprehensive conceptualization of the policy mix: the case of renewable power generation technologies, K. Reichardt [et al.] 522

The ?policy mix' for sustainable urban development: Lessons from the city district Hammarby Sjöstad in Stockholm, A. Mahzouni..... 525

Re-Thinking Consistency and Coherence in Policy Design: Intentionality and Non-Intentionality in the Creation of Policy Mixes, M. Howlett [et al.] 526

208 (SUP Building) : Special session - Macroeconomics of degrowth: indicators, scenarios and institutions (Chair: Filka Sekulova)

Sustainability transitions in the perspective of ecological macroeconomics, I. Røpke..... 528

Transition to sustainability: Scenarios towards a low-carbon economy, S. D'alessandro [et al.] 529

How close are countries to a socially sustainable steady-state economy? Results from the Degrowth Accounts, D. O'neill. 531

The implications of a multi-dimensional degrowth for happiness, F. Sekulova 533

Salle 3 (MACC's Building) : Special session - Transdisciplinary Research : Challenges and Opportunities for a Social-Ecological Biodiversity Research (Chair: Marion Mehring, Alexandra Lux)

The ecosystem services approach as an interdisciplinary research framework, L. Loft 535

Transdisciplinarity as a Research Practice to Approach Biodiversity - a Social-Ecological Perspective, A. Lux [et al.] 537

Integrated assessment of economic tools for conservation management: A transdisciplinary research approach?, J. Rode [et al.] 538

Reframing resources and public goods: an integrative approach to natural resources security at regional scale, I. Negrutiu [et al.] 540

103 (SUP Building) : Special session ESEE/RIODD - Corporate social responsability in the South : institutional dynamics and specificities (Chair: Bruno Boidin)

Is corporate social responsibility compatible with institutional designs of Southern countries ? The case of Senegal, B. Boidin 542

Sustainable corporate strategies: bridging the gap between the triple bottom line and value-based management, A. Caridade [et al.] 544

Can Corporate Social Responsibility smooth the transition of the labour regime in the Chinese industry?, C. Séhier 546

211 (SUP Building) : Parallel paper session: Sustainability and towns (Chair: Béatrice Quenault)

Sustainable long-term perspective of local development: Which drivers for small and medium-sized towns?, A. Hamdouch [et al.] 548

Socio-ecological trajectories: the urban dimension. Paris, 18th-20th centuries, S. Barles 549

Towards the Establishment of a Green Belt in the Region of Montreal, Quebec: a Look at the Area, its Actors and Tools of Implementation., J. Dupras [et al.] 551

Auditorium (MACC's Building) : Parallel paper session: Property regimes, resources and institutions (Chair: Daniel W. Bromley)

Property Rights Regimes in Complex Fishery Management Systems: A case of the Tonle Sap wetlands, Cambodia, Y. Kanchanaroek 554

Perceptions on Natural Resource Availability and Adaptations of Property Rights Institutions: Evidence from a Natural Experiment, K. Daedlow [et al.] 556

Quality regimes and property regimes: a framework for understanding/ assessing geographical indications sustainability implications, G. Allaire [et al.] 558

Defining cost-effective strategies for off-reserve conservation actions in human-dominated landscapes, N. Zafra calvo [et al.] 560

301 (SUP Building) : Parallel paper session: Social Ecological Transition 2 (Chair: Nuno Videira)

Pathways to Sustainable Living - Integrating individual and structural approaches for sustainability transitions, F. Rauschmayer [et al.] 562

Découplage entre croissance économique et impact environnemental: une analyse régulationniste, M. Camara 564

The use of technology within the context of degrowth ? enabling potentials of technologies, L. Nierling 566

Modern anthropology in a lock-in situation, F. Flipo 567

302 (SUP Building) : Parallel paper session: Valuation of Ecosystem services 2 (Chair: Valérie Boisvert)

Quantifying regulating ecosystem services provided by urban forests in Barcelona, Spain, F. Baró [et al.] 569

Income inequality and willingness to pay for ecosystem services, S. Baumgärtner [et al.] 572

Land use change as a determinant of the European agricultural vulnerability confronted with pollinator decline, N. Gallai [et al.] 574

Looking beyond academic applications of environmental valuation: What practical uses of economic valuation in decision-making processes? The case of marine environment., O. Marcone [et al.] 576

Salle 4 (MACC's Building) : Parallel paper session: Corporate Social Responsibility and institutions 1 (Chair: Corinne Gendron)

THE SYSTEMATIC INSTITUTIONAL APPROACH AS A NEW COGNITIVE FRAME IN THE STUDY OF THE CORPORATION, D. Pletnev 578

Extended Exporter's Responsibility for waste management of durable goods, M. Dubois 580

What is the rationality behind a mass certification process? The case of the Rainforest Alliance in the Ivorian cocoa sector, S. Lemeilleur [et al.] 583

?Into the wild?, pedagogical innovation for responsible management?, G. Nonet [et al.] 585

303 (SUP Building) : Special session - Market-based instruments, biodiversity values and institutional dynamics: How to compensate for the loss of nature? Lessons from theory to practical applications (Chair: Coralie Calvet, Harold Levrel, Claude Napoléone)

Market-based instruments for nature conservation: from the economic foundations to applications. Empirical results of the first experiments of French habitat banking., C. Calvet 586

Achieving no net loss? Biodiversity offsets and habitat banking in France, F. Quétier [et al.] 587

Environmental compensations and the problem of ?constitutive incommensurability?: a sociological analysis., L. Centemeri 589

Mitigation banking for permitted losses of aquatic ecosystems in Florida, USA. A Strategic and institutional analysis, A. Vaissière [et al.] 591

Markets or Payments? Towards a better discrimination between institutional arrangements for biodiversity compensation, R. Lapeyre 593

Salle 2 (MACC's Building) : Special session - Environmental Justice struggles at the commodity frontiers 1 (Chair: Beatriz Rodríguez-Labajos, Mariana Walter, Joan Martínez-Alier)

Advances in research for extended recognition in environmental justice conflicts, B. Rodríguez-labajos [et al.] 595

The Political Effects of a Depoliticizing Mission ? Hydropower and Environmental Conflict in Sikkim, Northeast India, A. Huber 597

1 (SUP Building) : Special session - Transborder Water Resources Governance and Riparian Areas: Theories, Methods and Applications (Chair: Olivier Petit)

International environmental regimes Critical analysis and avenues for future researches, B. Morehouse [et al.] 599

An International Water Regime? The case of the river Scheldt, C. Maganda [et al.] 600

Transboundary Ecosystem Services identification and assessment : Preliminary results of field studies on the Scheldt (France, Belgium, The Netherlands), M. Maillefert [et al.] 602
Addressing Trans-boundary Spatial Subsidies in Ecosystem Services: Mexico-U.S. Institutional Innovations for the Colorado River Delta, B. Colby [et al.] 604

Friday, June 21, 2013 - 13:15 - 14:45

Salle 1 (MACC's Building) : Special session - A Glace at the Epistemic Sharing of Ecological Economics: Bibliometric Analyses of the Scientific Publications (Chair: Gael Plumecocq)
Analysing the Patterns of collaboration in ?Ecological Economics? by Means of Social Network Analysis (SNA), L. Capari [et al.] 606
Ecological economics: transdisciplinarity in question. A social network analysis of co-publications, R. Levy [et al.] .. 607
Ecological economics and the role of participation within Ecological Economics ? a comparison via network analysis of keywords, U. Bechtold [et al.] 609
The second generation of Ecological Economics: how far has the apple fallen from the tree?, G. Plumecocq..... 610

Salle 2 (MACC's Building) : Special Session : Building coherent degrowth proposals (Chair: Filka Sekulova, Francois Schneider, Nuno Videira)
Exploring coherence between degrowth proposals: a systems thinking analysis, N. Videira [et al.] 612

Auditorium (MACC's Building) : Parallel paper session: Integrated Assessments, Multi-criteria Analysis and Post-Normal Science (Chair: Clive Spash)
Environmental conflicts management in the ?post-consensual' age: (re)visiting Participatory Multi-Criteria Approaches (PMCA) as agonistic platforms, A. Merino-saum 614
PARTICIPATORY MULTI-CRITERIA ASSESSMENT AS 'OPENING UP' VS. 'CLOSING DOWN' OF POLICY DISCOURSES: A CASE OF OLD-GROWTH FOREST CONFLICT IN FINNISH UPPER LAPLAND, H. Saarikoski [et al.] 615
Deliberating Beyond Evidence: Lessons from Integrated Assessment Modeling, E. Vecchione 618
Liberation Methodology: reflecting on performances of post-normal science, K. Farrell..... 619

211 (SUP Building) : Parallel paper session: Sustainable Consumption (Chair: Tom Bauler)
Sustainable Consumption in Capability Perspective: An Empirical Analysis, O. Lessmann [et al.] 621
Time-use survey data and new metrics of household consumption, M. Jalas [et al.] 622
Heterogeneity in the solar powered consumer electronics market: A discrete choice experiments study, S. Lizin [et al.] 624
A Poor Man's Version of Green Consumerism: Understanding Weak and Strong Ethical and Sustainable Consumer Behavior, K. Wilen [et al.] 625

Salle 3 (MACC's Building) : Special session : Biodiversity within the green economy (Chair: Alexandros Gasparatos)
Biodiversity within the green economy: Identifying current knowledge gaps, A. Gasparatos [et al.] 626
From bioprospecting to payment for ecosystem services: market and conservation in the economy of promises., J. Foyer [et al.] 629

Uncovering the hidden trade-offs of biodiversity in the Green Economy, C. Doll [et al.] 630
Entrepreneurial attitudes and organizational costs in the supply of biomasses energy, G. Martino [et al.] 632

Salle 4 (MACC's Building) : Parallel paper session: Corporate Social Responsibility and institutions 2 (Chair: Michel Capron)
Matter-dependent production functions for economic modelling of firms, D. Maes [et al.] 634
Synchronising the environmental management objectives of New Zealand's key export industries: A common pool resource approach, R. Singleton [et al.] 636
Professional ethos and environmental attitudes. A French survey on engineers' ecoskepticism, C. Didier [et al.] 638

1 (SUP Building) : Special session : Delivering sustainability transitions: Overcoming energy and resource constraints (Chair: Julia Steinberger & Timothy J. Foxon)
Energy and efficiency as sources for economic growth: a co-evolutionary perspective, T. Foxon [et al.] 640
Development and dematerialization: an analysis of time-series trends across countries, J. Steinberger [et al.] 642
Whole system perspectives of energy technologies: combining life-cycle analysis modelling with ecosystem service approaches, K. Scott [et al.] 644
Economic growth versus material use ? is there an actual decoupling? Re-estimating the global material intensity for 1900-2009, P. Kalimeris [et al.] 646
Assessing the critical material constraints on low carbon infrastructure transitions, K. Roelich [et al.] 649

8 (SUP Building) : Special session - Environmental Justice struggles at the commodity frontiers 2 (Chair: Beatriz Rodríguez-Labajos, Mariana Walter, Joan Martínez-Alier)
Towards a better understanding of environmental conflicts in Turkey: A mapping exercise, B. Ozkaynak [et al.] 651
Social metabolism and Resource extraction conflicts in Madagascar, V. Raharinirina [et al.] 652
Ecological debt through the eyes of social metabolism: the impact of a regional economy on the global environment, E. Garmendia [et al.] 653

208 (SUP Building) : Parallel paper session: Lifestyles, Capabilities and Sustainability (Chair: Ines Omann)
Inclusive Capital and Human Development: Integrating Human and Natural Capitals, R. Mihashi [et al.] 655
Capabilities and needs ? combining approaches to contribute to sustainability, F. Rauschmayer [et al.] 656
Understanding a nature-related conflict from a capability perspective, Y. Griewald [et al.] 658
Towards a Typology of Poverty-Environment Indicators, J. Ballet [et al.] 660

Friday, June 21, 2013 - 15:00 - 16:00

Auditorium (MACC's Building) : Plenary Session 4: Towards a Socio-Ecological Transition (Chair: Timothy J. Foxon)
The dynamics of energy and mobility demand, E. Shove 662

Institutions and Institutionalism: Crafting a Coherent Science of Environmental Policy

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There are many visions of a properly constituted and motivated ecological economics. Some wish for it to embrace a broad vision?open to multiple ways of knowing, and thereby able to advance competing accounts of the vexing problems of sustainability and feasible prospects for the future of humans in their fraught interactions with nature. A second vision is that ecological economics should be a radical movement dedicated to criticizing and changing social organizations and institutions that are responsible for the spread of false beliefs about economic, social, and what is called «environmental reality.» Regardless of which vision ultimately prevails? and there are other visions that fall between these two?it is obvious that the concept of «institutions » is instrumental to realization of the desired future. This is unfortunate for the simple reason that those who appeal to institutions have never bothered to develop a consistent and coherent idea of this allegedly important concept. They just invoke the word. Institutions cannot possibly matter if those who write about them have no idea what they are writing about. Here I will spell out the core meaning of two central ideas to the future of a coherent ecological economics? institutionalism, and institutions. I will show that a clear understanding of these two related ideas will liberate ecological economists from continued angst and debate about ontology, epistemology, and methodology?and some wished-for grand theory. I predict that this liberation will be much welcomed by ecological economists who merely wish to get on with doing good science.

The emancipation and autonomy of humanity: Are they always liberating utopia?

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Summary: In the great movement of emancipation and autonomy of humanity, the consumerism dream and the mirage of unlimited growth have not made people freer. Crises have shaken the socio-economic systems and reshaped social classifications. The working class, supposed to carry the hope of profound social change, has lost its Promethean vocation to fall back on the defense of its own survival.
More than ever people seem powerless to master their destiny in the face of economic internationalized and financialized powers which do not have any other motivation and other horizon but endless material accumulation. Bureaucratic economic organizations with gigantic size have distorted the spirit of entrepreneurship and individual and collective initiative that characterizes the human species.
But the advanced degradation of natural resources and the exacerbation of social inequalities on the planet for which economic activities are mainly responsible are not inevitable and uncontrollable phenomenon. Through a few current examples, the presentation will attempt to emphasize the stakes of the unification of social criticism on one hand and ecological criticism on the other as the matrix for the conception of a new liberating utopia.

Environmental policy-making and behaviour change: Financial incentives, 'nudge' or citizenship?

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Summary: Given their generalised commitment to ?sustainable development', governments around the world are looking for ways to change people's environment-related behaviour. In recent times, and in the context of the increasing delegitimisation of the state and the turn to privatised solutions to public policy problems, attention has turned from the way in which people's decision-making is structured by their macro-context to individual-level prompts that can influence behaviour. In the environmental context (and indeed in others) this has taken two forms. First, we have witnessed the creation of a suite of environmental incentives and disincentives (rewards and punishments) which are designed to alter people's behavioural patterns in line with the self-interested rational actor model of behaviour. Second, increasing attention has been paid to the potential of behavioural economics ? or what has been popularised as ? nudge', after the eponymous book by Cass Sunstein and Richard Thaler. This presentation will outline the nature of both these policy tools, offer examples of them, and discuss their advantages and disadvantages. I will then compare these ?value-lite' approaches with one which draws on the idea of environmental citizenship, rooted in a, ethical and practical commitment to justice.

Le développement durable est il soluble dans l'histoire?

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Chacune des trois communications qui composent la session, l'une abordant les chemins de fer du nord au XIXe siècle (Sébastien Dobrowolski), l'autre les premiers temps de l'exploration charbonnière à Anzin (Nicolas Caré) et la dernière ouvrant à une approche comparative entre la France et les Etats-Unis (Clotilde Druelle-Korn), éclaire à sa manière, avec plus ou moins d'expérience en matière de recherche (deux étudiants de master et deux enseignants chercheurs), les origines de la question du développement durable/ soutenable en les situant dans des configurations politiques et économiques et à des époques différentes. Les croisement des chronologies, les questions transversales posées par ces communications et leurs principaux enseignements feront l'objet d'une présentation synthétique.

Prédation versus conservation : les paradoxes de l'industrialisation américaine

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Le rapprochement entre l'histoire des entreprises et l'histoire de l'environnement est récent. Jusqu'à il y a peu, les deux champs s'ignoraient largement (Christine Meisner Rosen, Christopher C. Sellers, Business History Review 2000): le premier ne s'étant guère penché sur les impacts des activités productives des firmes sur l'environnement, le second restant éloigné des entrepreneurs et des logiques d'entreprise. L'histoire du recyclage et des déchets, par exemple, reste pour une bonne part à écrire. Des travaux novateurs, parmi lesquels il faut citer l'ouvrage de l'historien des sciences Jean-Baptiste Fressoz (L'Apocalypse joyeuse. Une histoire du risque technologique, 2012), tendent à reconsidérer le passage d'une « modernité industrielle » à « une modernité réflexive ». Ils montrent que les sociétés passées ont fait preuve de réflexion face aux risques et qu'elles se sont montrées inquiètes des conséquences environnementales et sanitaires de leurs innovations scientifiques et techniques. Le cas étatsunien met en évidence cette coexistence entre l'exploitation prédatrice des ressources naturelles par les intérêts privés, sa dénonciation et la mise en oeuvre de dispositifs de régulation privés et publics.
La phase d'industrialisation rapide que connaissent les États-Unis dans la seconde moitié du 19e s, associée à la disparition de la Frontier mise en évidence par Frederick Jackson Turner (1861-1932), est concomitante d'un débat entre la préservation, défendue par le célèbre naturaliste John Muir (1838-1914) et la conservation, prônée par Gifford Pinchot (1865-1946) ingénieur forestier engagé en politique. Le conservationnisme américain pose d'emblée la question de l'exploitation raisonnée des ressources et du caractère soutenable du développement économique, il s'ancre politiquement dans le mouvement progressiste auquel ont adhéré un certain nombre de businessmen et d'hommes politiques.
Dans le cadre de la session proposée, notre contribution porte sur les positions, les politiques défendues et mises en oeuvre par Herbert C. Hoover (1874-1964). Ingénieur géologue de formation, homme d'affaires à succès, Secrétaire au Commerce (1921-1928) puis président des États-Unis (1929-1933). Son implication en matière de gestion raisonnée des ressources naturelles ne s'est jamais démentie. L'étude s'appuie à la fois sur la littérature (Kendrick A. Clements, Conservation and Consumerism, Engineering te Good Life, 2000 et les archives Hoover auxquelles nous avons eux accès. Ces dernières sont conservées à la Herbert Hoover Presidential Library (West-Branch Iowa). Nous développerons en particulier son action pour la période 1921-1932.
La communication à venir s'articule en 3 parties :
I ? « Use without waste » Herbert Hoover, un ingénieur conservationniste des Administrations républicaines Harding et Coolidge (1921-1928).
Après avoir rappelé la portée du mouvement conservationniste partisan de compromis avec les industries forestières et minières entre autres (Olivier Delbard, « La politique du United States Forest Service », Transatlantica [En ligne], 1 | 2005, mis en ligne le 24 mars 2006,), on présentera Herbert Hoover. Ingénieur géologue de formation, il est au lendemain de la Grande Guerre le représentant par excellence des ingénieurs qui revendiquent une responsabilité sociale dans la société. Sous sa double qualité de dirigeant d'une des plus importantes organisations d'ingénieurs civils américains et de Secrétaire au Commerce, il dirige une vaste enquête sur la réduction des gaspillages dans l'industrie. Le terme de « waste » désigne ici tout autant l'économie des matières premières, la rationalisation de la production que la standardisation des modèles. Les préconisations sont mises en oeuvre par des dispositifs associant volontairement les organisations de producteurs et les sociétés d'ingénieurs sous l'égide du Commerce. Herbert Hoover incarne une vision du développement économique basé sur un essor de la consommation s'appuyant sur une utilisation raisonnée des ressources naturelles.
II ? Comment articuler les échelles de l'action en faveur d?un développement durable dans un État fédéral ? l'exemple de la qualité des eaux et de la préservation des espèces piscicoles.
La seconde partie sera consacrée aux acteurs publics et privés mobilisés par cette politique à

visée de développement durable. Les contraintes constitutionnelles des Etats fédérés et de l'État fédéral pèsent sensiblement sur toute nouvelle extension du champ de la régulation économique et sociale aux Etats-Unis. Les effets de la surexploitation des espèces piscicoles et de la pollution des eaux littorales et intérieures sont l'occasion pour le Bureau des Pêches dépendant du ministère du Commerce d'intervenir entre les parties et de proposer entre 1924 et 1926 des solutions innovantes : accords interétatiques côtiers (ie entre Etats fédérés des Etats-Unis) avec délégation à une agence indépendante de la gestion des pêches littorales, écloseries gérées par le Bureau fédéral des Pêches en liaison avec les sociétés de pêche récréative et sportive sur le bassin du Mississippi, intervention directe de l'État fédéral uniquement dans le cas du territoire de l'Alaska qui n'est pas encore un État de l'Union. En matière de pollution et de conservation des eaux d'autres acteurs privés à l'instar de la Audubon Society fondée en1905 ou des entrepreneurs rassemblés dans les Chambers of Commerce, participent au financement de politiques de conservation.

III ? Le développement soutenable à l'heure de la Grande Dépression 1929-1932

Devenu le 31ème Président des Etas-Unis, la présidence de Herbert Hoover est marquée par la Grande Dépression. A l'aune d'une situation économique qui se dégrade dramatiquement en quelques mois, puis d'un Congrès qui lui est hostile, l'ingénieur - homme politique ne parvient pas à articuler la crise économique ni la crise environnementale du début des années trente (sécheresse puis Dust Bowl) avec la philosophie conservationniste qui l'animait. Pire, il mesure avec douleur les limites des procédures qui avaient fait son succès dans les années Vingt : la décentralisation des actions par la coopération volontaires des Etats-fédérés et des acteurs organisés en groupes de pression, l'échelon fédéral n'intervenant que ponctuellement. Alors que l'action du Secrétaire au Commerce Hoover avait été décisive dans la mise en oeuvre du gigantesque projet de construction du barrage sur le Colorado conjuguant enjeux environnementaux et économiques, le Hoover Dam dont les travaux commencent sous sa présidence en 1931 est inauguré en 1935 par F. D. Roosevelt sous le nom de .... Boulder Dam avant quelques années plus tard de retrouver le nom de son promoteur.

L'exploitation houillère : un développement insoutenable ?

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Le concept de développement durable est-il pertinent dans l'étude des sociétés charbonnières passées ? Cette communication vise à apporter des éclairages à la question. Y sera interroger l'histoire de l'expression et du concept et dans quelle mesure, bien que le développement durable ne soit pas encore inventé, certaines de ses principales composantes pouvaient déjà être pensées dès le XVIIIe siècle en Europe du nord ouest.

La Compagnie du chemin de fer du Nord : entre prise de conscience environnementale et obligations légales

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L'industrialisation est au coeur de la Révolution industrielle. L'utilisation du charbon puis du pétrole comme la multiplication des établissements industriels de plus en plus polluants apportent des nuisances. Le décret impérial de 1810 imposant de classer les établissements industriels selon leur degré d'insalubrité et incitant à contrôler les plus insalubres est-il le signe de l'émergence d'une conscience environnementale et quels sont ses arguments ?
En marge de ce décret, les compagnies de chemin de fer subissent d'autres formes de contrôles comme en témoigne l'examen des archives de la Compagnie du chemin de fer du Nord déposées aux Archives nationales du monde du travail à Roubaix (France ? 59 Nord) Concédée le 10 septembre 1845 à Messieurs de Rothschild Frères, la Compagnie connait un développement rapide et plusieurs règlements tentent de limiter ses externalités. Proviennent-ils d'une prise de conscience environnementale ? D'où vient cette prise de conscience, si elle apparait, des Pouvoirs publics, des dirigeants ou sociétaires de la Compagnie, des fournisseurs ou des clients ? Quels seraient ses effets ? Plus largement, en quoi l'histoire de la Compagnie informe t'elle sur le passage de la lutte contre les nuisances industrielles à la prise de conscience environnementale ?

Multi-scale approaches to the analysis of policymixes for biodiversity conservation

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The paper summarises the approaches to policymix analysis in the special session. Methods can broadly speaking be divided into landscape level approaches using GIS and spatial modelling tools, and household-level approaches using survey and interview techniques. Multi-scale hybrid approaches combine spatially referenced survey data with GIS-based landscape analysis.

Landscape level approaches attempt to compare the current spatial allocation of instruments with the cost-effective spatial configurations taking into account conservation value, landuse change risk and opportunity costs. Methods include the use of GIS overlay analysis of conservation features, and spatial optimization methods that use spatial search algorithms to identify cost-effective conservation locations[1]. These so-called optimal reserve site selection methods are usually usedex anteto identify future cost-effective policy scenarios in the landscape as a function of conservation goals and conservation criteria priorities. We call these cost-effective scenarios ?policyscape benchmarks'. Few examples exist of comparing ?policyscape benchmarks' for spatial targeting of instruments with the ex-post policy locations that actually took place. Landscape level conservation analysis has started to consider complementary targeting of different management zones across landscapes with such tools as Marxan with Zones. However, these methods are limited in that they do not allocate or evaluate multiple instruments acting at and on particular locations.

Household level approaches enable evaluation of the combined incentive effects of formal rules of policy instruments and the informal norms concerning land use.Ex anteapproaches are experimental, including choice experiments in which respondents select to be participants or non-participants based on attributes of a property-level policy instrument such as PES. Choices are explained by respondent and household characteristics retrieved from the survey, and in some cases also landuse characteristics retrieved from GIS[2]. Ex post survey approaches sample existing ?treated' properties and non-participating properties, and evaluate policy impact during a time period for respondents with similar ?matched' characteristics. GIS is used to retrieve landuse characteristics of properties[3], and sometimes characteristics of neighbouring properties. Survey-based approaches offer an opportunity to evaluate landowner perceptions of the effects of combinations of instruments in force in particular parts of the landscape.

The synthesis paper ends with a discussion of opportunities to compare findings on the combined effectiveness of instruments using different methods (Figure 1), as well as through the integration of household level findings with landscape level analyses[4]. Multi-scale approaches that combine spatially referenced household/farm survey data and landscape analysis provide an opportunity to evaluate the combined incentive effects of different combinations of instruments on single properties. In particular, choice experiments and owner survey data may help to explain why we observe such large differences between properties that GIS approaches identify as « optimal» participants, and the properties that actually participate. Qualitative approaches with information on policy-making process can further help to explain the gap between ?policy benchmarks' , actual policy implementation and baseline scenarios without the policy. The paper finishes with a discussion of the opportunities and limitations of upscaling/downscaling findings from property/landscape level studies respectively to inform state and national level instrument design.

[1] Papers following this approach include Uezu et al.; Barton, et al; Andrade et al.;
[2] Papers following this approach include Santos et al. and Lienhoop and Brouwer
[3] Papers following this approach include Primmer et al.
[4] Ezzine-DeBlas et al. provides an example of such an approach.

Landowners perceptions and participation in agri-environmental schemes: lessons for instrument design in a conservation policymix

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Forest biodiversity in Portugal is mostly associated to human-shaped systems, such as traditional agro-pastoral system and extensive oak woodlands (montados). The ecological stability of these multifunctional systems is highly depended on human management, namely traditional practices. In this scenario it is essential to articulate conservation policies with activities such as agriculture, hunting or forestry.
Agri-environment measures (AEM) are financial incentives designed to encourage farmers to protect the environment on their farmland. This type of economic incentive recognizes the central role of landowners in conservation, and can help reconciling the local costs with global benefits of biodiversity conservation.
This paper aims to assess the implementation and environmental outcomes of the Portuguese agri-environment scheme in amontadolandscape, as well as to identify possibilities to improve its design. The analysis will be conducted taking into account the country conservationpolicymixand, therefore, the potential conflict/complementarity between AEM and other conservation instruments (both economic incentives and command and control approaches).
A study site located in the left bank of the Guadiana River, in the southeast of Portugal, was selected for this purpose. The area comprises a diversity of land-uses, including multifunctional landscapes, protected areas, Natura 2000 sites, agriculture and urban settlements.
Interviews with local stakeholders, public and private, are used to understand their perceptions, motivations and expectations regarding land use change and biodiversity conservation, as well as to assess the role of relevant institutions and the performance of current AEM. Opportunity costs for landowners and how do they relate with received compensations under the existing scheme are also assessed. A choice experiment is used to propose changes in the contract design of AEM in order to improve adhesion to the scheme and promote cost-effectiveness and policy legitimacy.
Finally, we discuss the role of AEM in the Portuguese conservation policymix, evaluating potential redundancies, complementarities or conflicts with other policy instruments, in particular with nature conservation regulations and ecological fiscal transfers.

Forest owner perceptions of institutions and legitimacy and their influence on voluntary contracting for forest biodiversity conservation

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Although the concepts of economics and institutions have been integrated in recent writings about payments for ecosystem services, their joint application in empirical analyses has been scarce. Typically, analyses of land-owner participation in voluntary contracts and the impacts of payments for ecosystem services place much emphasis on the private benefits and costs experienced by the contracting land-owners. Along with the growing interest in ecosystem service valuation, also the collectively experienced public benefits and societal costs have received increasing attention. At the same time, the analyses of hypothetical land-owner choices have improved the understanding of the contract terms that land-owners would agree to. However, the empirical analyses relying on assumptions of private utility and independent preferences communicate little with the institutional theories highlighting collective utility, rights and responsibilities, informal norms and legitimacy. Our analysis of Finnish non-industrial private forest owners' voluntary biodiversity conservation contracting seeks to take the institutional and legitimacy theories seriously and operationalise them in a context where real-world decisions about participating in conservation are made. We analyse survey responses from 86 contracted forest owners and 101 respondents who have a valuable site on their land but have not made a conservation contract. Our focus is on 1) the respondents' perceptions about the character of the ecosystem services they provide and their rights and responsibilities in this provision, and on 2) the respondents' perceptions of their rights and responsibilities in making the contract and the legitimacy of the contracting process. Our results demonstrate that most theoretical considerations of institutions apply to the forest-owner population that has the potential to take up voluntary conservation and that some of these importantly influence participation. xml:namespace prefix = o ns = "urn:schemas-microsoft-com:office:office" />

'New Beliefs, New Values' ? Embedding a Heterodox Interpretation of the Ecosystem Services Concept in Local Environmental Planning and Decision-Making

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Summary ? This paper explores the theoretical argument for embedding a ?heterodox' interpretation of the ecosystem services (ES) concept in environmental planning and decision-making at the local scale. The paper adopts as it key premise that the uncertainties and knowledge gaps that emerge when the ES concept is taken beyond its mainstream interpretation can motivate planners and their stakeholders to «think harder and deeper» about why they value their ecosystems. This invites actors to question their settled beliefs about how they live from, with and in their local environment ? now and in the future. Drawing from Peirce's theory of abduction and Ostrom's institutional theory, the paper develops a constructivist perspective on local environmental planning and decision-making. It also presents empirical findings from a first case study in the Thau lagoon, Southern France.

Abstract

The past 15 years, and especially the post-2005 period, have been characterized by increasing endeavours from the scientific community to convince policy makers to take action to conserve nature based on the «value» of biodiversity and ecosystems to humans, largely through the popular concept of «ecosystem services» (ES) ? the benefits people obtain from ecosystems (MEA, 2005). Although these endeavours may have raised actors' awareness of «natural capital», to date little on-the ground evidence has emerged to suggest that the condition of ecosystems and biodiversity worldwide is indeed improving. When we gauge the socio-political paradigm that currently dominates modern Western society, we can anticipate that ongoing positivistic attempts to «price » ecosystems and their goods and services pose risks of «commodification» (McCauley, 2006) and «compartmentalisation» (Ridder, 2008) of nature, with potentially adverse effects on the equity of local public access to ecosystems and ecosystem functioning itself. If we price only what we can price, to satisfy our wants right here and right now, we are likely to continue to erode the ecological basis upon which our very future and that of our children depends. Here emerges a need for an inquiry into the nature of «ES» that surpasses the current mainstream interpretation.

Much has been written about economic valuation of ES (e.g. Gómez-Baggethun and Ruiz-Pérez, 2011; Sagoff, 2011). Behind this valuation debate exists a rich literature critiquing mainstream economic approaches to biodiversity conservation (e.g. Nijkamp et al., 2008; Pannell, 2004; Spash and Hanley, 1995), and non-market valuation techniques in particular (e.g. Cooper et al., 2004; Sauer and Fischer, 2010). For our purposes, a promising critique of mainstream economics is that provided by Bromley (2006). Bromley sets up a robust theoretical context for collective action in the biodiversity conservation space. He does so by adopting a pragmatist perspective to frame the problem of knowing through a commitment to diagnostic strategies that offer explanations. Beliefs are rules for action, and so a pragmatist perspective asks actors to find and articulate reasons for holding particular beliefs. This approach fundamentally challenges the positivistic perspective which currently dominates ecosystem service valuation studies. Pragmatism teaches us that there is no one truth claim ? no one single answer - that can be ? calculated' a priori (using e.g. willingness-to-pay measures and associated cost-benefit ratios).

Bromley's work, which is grounded in the pragmatist maxim initially developed by Charles Sanders Peirce (1839 ? 1914) (InteLex Corporation, 1994, CP 5.2), builds on a scholarly tradition which has previously attempted to juxtapose mainstream economics and institutionalist economics in terms of their underpinning philosophical schools of thought (Mirowski, 1987). A related literature advocates the use of this very same pragmatist tradition in the context of adaptive ecosystem management (Norton, 1999, 2005) and deliberative democracy (Brooks, 2009; Williams, 2003).

However, neither of these literatures addressed above specifically focuses on ES. This points to

an opportunity to reconsider the ES concept from a pragmatist perspective. In the mainstream, inquiry into ES and its associated values is often based on Total Economic Value (TEV) (Plottu and Plottu, 2007), social interpretations of value (Raymond et al., 2009; Sherrouse et al., 2011), moral value perspectives (Maris and Bechet, 2010), or some combination of these. An alternative approach to inquiry can be conceived which omits, at least initially, any pre-existing typologies of value: that of abductive inference. Following Peirce,abductionis the process of forming an explanatory hypothesis. It is the only logical operation (inference) which introduces any new ideas: deduction proves that somethingmustbe; induction shows that something actuallyisoperative; abduction merely suggests that somethingmaybe. Abductive inference has significant potential to help frame inquiry into ES, inviting questions that may help actors to find explanations and reasons for their valuations of ecosystems. To put it in Peirce's words: «The action of thought is excited by the irritation of doubt, and ceases when belief is attained; so that the production of belief is the sole function of thought» (InteLex Corporation, 1994, CP 5.394). Framed this way, inquiry becomes «a struggle to attain a state of belief» (InteLex Corporation, 1994, CP 5.374).

This thinking can be grounded in real-world resource management situations by considering that actors' settled beliefs about biodiversity are always embedded in the institutions (norms, rules, shared strategies) that govern human behaviour (Ostrom, 2011). Understanding these beliefs, or ?held values' (rather than ?measuring preferences') and how they might affect institutions through the process of inquiry is therefore fundamental to policy reform. For example, reframing and trialling the ES concept as a cognitive tool which triggers the «irritation of doubt» may motivate actors to be more cooperative. Such processes may be assessed across diverse knowledge domains using Bayesian Belief Networks (Haines-Young, 2011).

To illustrate our approach, we present preliminary findings from employing the ES concept as a heuristic tool for participatory planning in the Thau lagoon in Southern France. Our case study employs semiotics (Maurel, 2012) to identify and select representations (e.g. land use maps, 3D models, pictures) of ES, whereas the stakeholder knowledge generated during the participatory process is captured using Bayesian Belief Networks software.

References

Bromley, D.W., 2006. Sufficient Reason: Volitional Pragmatism and the Meaning of Economic Institutions. Princeton University Press.

Brooks, T., 2009. A Critique of Pragmatism and Deliberative Democracy. Transactions of the Charles S Peirce Society 45, 50-54.

Cooper, P., Poe, G.L., Bateman, I.J., 2004. The structure of motivation for contingent values: a case study of lake water quality improvement. Ecological Economics 50, 69-82.

Gómez-Baggethun, E., Ruiz-Pérez, M., 2011. Economic Valuation and the Commodification of Ecosystem Services. Progress in Physical Geography 35, 613-628.

Haines-Young, R., 2011. Exploring ecosystem service issues across diverse knowledge domains using Bayesian Belief Networks. Progress in Physical Geography 35, 681-699.

InteLex Corporation, 1994. The Collected Papers of Charles Sanders Peirce. MS-DOS version, with an editorial introduction by John Deely [Reference to Peirce's papers designated CP followed by volume and paragraph number].

Maris, V., Bechet, A., 2010. From Adaptive Management to Adjustive Management: A Pragmatic Account of Biodiversity Values. Conservation Biology 24, 966-973.

Maurel, P., 2012. Signes, Données et Représentations Spatiales : Des éléments de sens dans l'élaboration d'un projet de territoire intercommunal. Application au territoire de Thau.

McCauley, D.J., 2006. Selling Out On Nature. Nature 443, 27-28.

MEA, 2005. Ecosystems and Human Well-being: Biodiversity Synthesis. (Millennium Ecosystem Assessment). Island Press.

Mirowski, P., 1987. The Philosophical Bases of Institutionalist Economics. Journal of Economic Issues 21, 1001-1038.

Nijkamp, P., Vindigni, G., Nunes, P.A.L.D., 2008. Economic valuation of biodiversity: A comparative study. Ecological Economics 67, 217-231.

Norton, B.G., 1999. Pragmatism, adaptive management, and sustainability. Environmental Values 8, 451-466.

Norton, B.G., 2005. Sustainability. A Philosophy of Adaptive Ecosystem Management. University of Chicago Press., Chicago.

Ostrom, E., 2011. Background on the Institutinal Analysis and Development Framework. The Policy Studies Journal 39, 7-27.

Pannell, D.J., 2004. "Heathens in the Chapel?" Applicaton of Economics to Biodiversity. Pacific Conservation Biology 10, 88-105.

Plottu, E., Plottu, B., 2007. The concept of Total Economic Value of environment: A

reconsideration within a hierarchical rationality. Ecological Economics 61, 52-61.
Raymond, C.M., Bryan, B.A., MacDonald, D.H., Cast, A., Strathearn, S., Grandgirard, A., Kalivas, T., 2009. Mapping Community Values for Natural Capital and Ecosystem Services. Ecological Economics 68, 1301-1315.
Ridder, B., 2008. Questioning the ecosystem services argument for biodiversity conservation. Biodiversity and Conservation 17, 781-790.
Sagoff, M., 2011. The quantification and valuation of ecosystem services. Ecological Economics 70, 497-502.
Sauer, U., Fischer, A., 2010. Willingness to pay, attitudes and fundamental values - On the cognitive context of public preferences for diversity in agricultural landscapes. Ecological Economics 70, 1-9.
Sherrouse, B.C., Clement, J.M., Semmens, D.J., 2011. A GIS application for assessing, mapping, and quantifying the social values of ecosystem services. Applied Geography 31, 748-760.
Spash, C.L., Hanley, N., 1995. Preferences, Information and Biodiversity Preservation. Ecological Economics 12, 191-208.
Williams, J., 2003. Natural and epistemological pragmatism: Democracy and environmental problems. Sociological Inquiry 73, 529-544.

What knowledge needs for practical implementation of ecosystem services at the local level?

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Continuing administrative decentralisation and the decreasing active role of governments across Europe is increasingly putting the onus on local and regional stakeholders when it comes to the implementation of the nature and biodiversity agenda. To foster practical action, international agreements and policies regarding the protection and sustainable use of natural resources need to be taken up by these and other local actors. To be effective, biodiversity strategies and action plans at all levels (including local and regional) need to mainstream biodiversity into a wide range of policy areas and sectoral activities. Even more than in the case of climate change, the science underpinning biodiversity is complex, hindered by ambiguous definitions and still has many unknowns. Due to their complex nature, biodiversity and the ecosystem services it underpins are therefore difficult to communicate.

Consensus building through stakeholder participation is a promising new trend that takes into account the interactive character of the communication process. There is a growing realisation that stakeholder participation has a significant role to play in the development and delivery of biodiversity and ecosystem services at the local level (Jones-Walters et al., 2009 & 2010). Developing a common knowledge base, understanding and valuation of biodiversity and ecosystem services is essential to inform such a consensual process. Experience and best practice from activities such as the designation and management of Natura 2000, Integrated Coastal Zone Management, the development of local biodiversity action plans and the integration of biodiversity in the local planning process, shows that problem solving is significantly enhanced through a participative process. The attribution of value to local biodiversity and ecosystem services requires access to best available knowledge. However, in many instances, especially in Central and South East Europe, information and data are still very scarce and thus recourse to local traditional knowledge often provides an important source of additional information to feed into the process of valuation and decision making. There is therefore the potential for a change to take place in the way that biodiversity policy is developed and implemented at the local level. This brings challenges to the biodiversity community in terms of developing new skills and processes and in engaging with new agendas and sectors.

Whilst nature conservation organisations have a tradition of using communication to achieve their aims, many of these activities fall into the categories of information and education; however, these one-way (instrumental) means of communication allow for little or no interaction between sender and receiver. They often completely bypass local traditional knowledge of natural resources. In many circumstances more interactive approaches to communication and information gathering are more effective. In several countries formal consultation of ?stakeholders' is therefore now part of the process of developing conservation policy and conservation action plans. However, even these formal consultation processes are not satisfying for anyone if the various stakeholders merely put forward their own views without the possibility of dialogue and a sense of ?feedback' from and ?ownership' of the process.

For example, Natura 2000 is a key policy instrument for ensuring the protection and long-term maintenance of biodiversity in Europe. The larger sites can have many people living and working within their boundaries. Their designation and subsequent management is likely to require co-operation and collaboration from owners and occupiers if nature conservation objectives are to be achieved. However, many Natura 2000 sites have been designated with little involvement of the people who live and work within them and who often rely on the ecosystem services that they provide for their livelihoods. They profess to feelings of being disenfranchised and alienated as a result of the legalistic and technical language and application of the process of site designation; generating feelings of fear, frustration and anger. The result has been widespread conflict between stakeholders and responsible authorities (Bouwmaet al.2010). The use of an incomplete scientific baseline (of often questionable accuracy) as the reference to designate sites and develop their

management plans also added to the pervasive feelings of distrust of some stakeholders having a far better tacit knowledge of the local biodiversity values and conditions.
Such conflicts can be avoided by trying to introduce more proactive and imaginative ways of thinking and a collaborative approach to problem solving and knowledge sharing. Consensus development through stakeholder participation is a promising trend that takes into account the interactive character of the communication process. In the past, in relation to environment in general and biodiversity in particular, these participative processes were given momentum by a number of key drivers.
The ecosystem approach is interdisciplinary and holistic, recognising the interconnections among ecosystem components. Because social and economic activities affect the environment as a whole, the ecosystem approach incorporates environmental, social and economic elements into its definition. It is made up of 12 complementary and interlinked principles.
Whilst many of them imply access to knowledge and information, Principle 11 is explicit in this respect. It states that: the ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices. Information from all sources is critical to arriving at effective ecosystem management strategies. A much better knowledge of ecosystem functions and the impact of human use is desirable. All relevant information from any concerned area should be shared with all stakeholders and actors, taking into account, inter alia, any decision to be taken under Article 8(j) of the Convention on Biological Diversity. Assumptions behind proposed management decisions should be made explicit and checked against available knowledge and views of stakeholders. (CBD, 2011). The principles of the ecosystem approach have successfully been integrated in «How to plan for nature», a training package for local planners in which the holistic approach to decision making based on best available evidence has been applied and tested in the field (Snethlage et al., 2012).
The greatest problem remains the ?top down' organisational paradigm which also applies to the valuation and knowledge transfer. Participation is a daunting prospect for those who are used to making policy based on official knowledge and mainstream information sources and then implementing it through legislation, regulation or the power that comes with owning land. They have difficulty in dealing with a range of people and organisations that may previously have been seen as the cause of the problem rather than the solution. But there is also the shift that needs to be made by the stakeholders themselves who are also accustomed to and often comfortable with a top-down approach and who may take considerable convincing before they agree to engage in the process.
There is clearly potential for biodiversity related initiatives to promote civil society and build its capacity through applying a participative approach to the delivery of projects and programmes; particularly when such enterprises are associated with training in relevant skills (many of which are highly transferable). In this respect, it should also be noted that project funding is increasingly being tied to the development of capacity in civil society (particularly in Eastern and South Eastern Europe). The results from the application of the training method «How to plan for nature » will provide practical evidence to feed into the debate.

References

Bouwma. I.M., van Apeldoorn, R.D. and Kamphorst, A. (2010). Current practices in solving multiple use issues of Natura 2000 sites: Conflict management strategies and participatory approaches. Alterra, Wageningen, the Netherlands. Available at: http://circa.europa.eu/Public/irc/env/natura_2000/library?l=/preparatory_2000/preparatory_32008&vm=detailed&sb=Title

Convention on Biological Diversity (Website accessed August 2011). Ecosystem Approach: http://www.cbd.int/ecosystem/; and Principles (12 principles of the ecosystem approach): http://www.cbd.int/ecosystem/principles.shtml
Jones-Walters, L., Snethlage, M., Civic, K., Cil, A. and Smit, I. (2009). Making the connection! Guidelines for involving stakeholders in the implementation of ecological networks; ECNC, Tilburg, the Netherlands. http://www.ecnc.org/publications/technicalreports/making-the-connection

Jones-Walters, L., Catchpole, R., Mladenovi?, A., Çil, A., Snethlage, M., ?ivi?, K., Schrauwen, A., Su?i?, S. and Soluji?, A.S. (2010). Local Biodiversity Action Planning for Southeastern Europe. ECNC, Tilburg, the Netherlands. http://www.ecnc.org/publications/technicalreports/local-biodiversity-action-planning

Snethlage, M.A., B. Delbaere, M. Elliott & L. Jones-Walters (2012) How to plan for nature ? Handbook. ECNC: Tilburg, The Netherlands Available at: www.biodiversityskills.eu

Economic incentives and motivation crowding in biodiversity conservation

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Catalyzed by the Millennium Ecosystem Assessment and the The Economics of Ecosystems and Biodiversity initiative, the ecosystem services approach and related market-based instruments, such as payments for ecosystem services (PES), have received growing attention in the international political arena, reaching out to actors in the economic and business domain.
While many regard these new approaches as an innovative and important impetus for biodiversity protection, critiques voice doubts on the general potential for halting biodiversity loss through economic reasoning and market-based instruments. A concern frequently raised is that economic valuation leads to an inappropriate commodification of ecosystem services. Furthermore, there is the hypothesis that a growing focus on economic incentives for conservation may undermine people's intrinsic motivations for biodiversity protection. In that case, introducing economic incentives could have unintended effects and their positive impacts on biodiversity and ecosystem services protection would be systematically overestimated.
Motivation crowding theory is based on the psychological notions of intrinsic vs. extrinsic motivation. It suggests that external motivators such as monetary incentives or punishments may undermine (or, under different conditions, strengthen) people's intrinsic motivation. The ? crowding-out' hypothesis is often traced back to Titmuss' (1970) argument that blood donors are typically motivated by moral concerns rather than money, and that monetary compensation for donating blood could hence decrease its supply. Intrinsic motivation refers to doing an activity for its inherent satisfaction, meaning that an individual is moved to act for the fun, challenge, or personal conviction. Extrinsic motivation, on the other hand, pertains whenever an activity is done for its instrumental value of attaining some separable outcome in form of products, pressures, or rewards. It is argued that the «crowing-out» effect may in some cases over-compensate the motivational effect of the extrinsic motivator, so that the introduction of monetary incentives would actually reduce the propensity to engage in the activity.
The crowding-out hypothesis has found increasing attention in «behavioral» economics and its effect has been documented for several contexts, including work motivation and compensation in labor market, willingness to host a nuclear energy facility, arriving on time for picking up one's children from the kindergarden, and voluntary fund-raising for humanitarian projects. In a recent survey, Bowles & Polonía-Reyes (2012) report on 50 experimental studies and classify different psychological mechanisms that underlie crowding-out effects. According to their analysis, extrinsic incentives for doing an activity may reduce motivation by (i) providing additional information about the person who implements the incentive, (ii) framing the decision situations as to suggest appropriate behavior, (iii) compromising a control averse individual's sense of autonomy, and (iv) affecting the process by which people develop new preferences. In psychological terminology, the latter point refers to the possibility of changing attitudes and values.
However, the literature also suggests that use of economic incentives may, in some contexts, have an opposite effect, i.e. in the biodiversity context enhance intrinsic motivation forconservation, a phenomenon that is referred to as motivation crowding-in. For example, according to previous research, this is likely to be the case if external incentives are perceived as supportive rewards, self-esteem is fostered, and self-determination is increased.
The aim of our research is to synthesize state-of-the-art knowledge on motivation crowding for the context of biodiversity conservation, based on a systematic review of existing theoretical and empirical contributions on the topic. Vatn (2010) acknowledges that the motivational aspect of PES schemes is «a very under-researched area of PES», and indeed only recently a number of empirical studies are addressing motivation crowding for specific settings. The following questions appear central: Which intrinsic motivations are relevant for biodiversity conservation and to which extent do they currently influence conservation behavior? Under which conditions

can motivational crowding effects be expected? Our paper reviews the arguments and the empirical evidence provided in the interdisciplinary literature and structures systematically how economic incentives may affect biodiversity conservation through motivational crowding effects. We conclude by synthesizing the evidence, identifying knowledge gaps, and identifying priority areas for the research agenda on motivational crowding effects in the context of biodiversity conservation.

Alternative Arguments for the Protection of Biodiversity

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Summary ? This paper will discuss the alternative ways ? beyond the orthodox interpretation of the popular concept of ?ecosystem services' in which concepts for the ?value of biodiversity' can be used to improve biodiversity policy making and governance at local, national and European to global scales. The paper will also present preliminary findings from European case studies carried out within the FP7 project BESAFE. Within these case studies the use and effectiveness of various types of arguments for biodiversity protection under varying circumstances is investigated and analysed.

Abstract - Demonstrating the value of biodiversity to humans by the economic value of the goods and benefits it brings them, clearly has the advantage that people, when properly incentivised, will be more willing to support the protection of something that adds to their well-being in easily understood terms (Fischer and Young, 2007; Buijs et al., 2009; Liu et al., 2010). Economic arguments can address many use values of biodiversity. Even future wellbeing can be addressed by so-called option value and, as many political and economic decisions are based on monetary arguments, it appears that monetary valuation of costs and benefits of ecosystem services is very powerful (Vatn, 2009). An additional advantage is that it shows the importance of protecting biodiversity outside protected areas and hot-spots, including non-threatened species (Haslett et al., 2010). The results of the Millennium Ecosystem Assessment (MA) strongly increased awareness of the value of biodiversity to humans but, as a consequence, also increased the demand for demonstrating this value, preferably in monetary terms, to legitimize investments in biodiversity protection. As a concrete follow-up from the MA, the economic value of biodiversity and ecosystem services have been demonstrated in the substantial effort under The Economics of Ecosystems and biodiversity study (TEEB, 2009, 2010), which also highlights the economic costs of biodiversity loss and ecosystem degradation.

However, there is also a possible downside to economic valuation. Policy makers are increasingly reluctant to take action for biodiversity protection when the valuecannot be expressed in clear monetary terms (Sathirathai and Barbier, 2001). Some European court cases, for example, have shown that the actual enforcement of protective measures increasingly depends on demonstrated value expressed in monetary and cash flow terms (Amigues et al., 2002; Christie et al. 2006; Ericsson and Bostedt, 2008). There is also growing concern that the current emphasis on monetary valuation ignores those parts of biodiversity that are not directly related to short term economic benefits made explicit in markets (Spash and Vatn, 2006). Moreover, a review of recent studies on ecosystem services indicates a lack of the explicit inclusion of a social dimension (i.e. peoples' social preferences and values (Menzel and Teng 2010)). The consequences are potentially grave because societal opposition or the absence of awareness can result in the failure of all forms of conservation initiatives. Scientists propose an ever increasing number of techniques to calculate the value of ecosystem services on a range of scales, but there is much less attention being paid to the impact of such approaches on awareness of, and discourses on, the role of biodiversity in human life, on goals for sustainable development and on implementation of protection measures in the field. Yet, as the increasing public awareness and valuation of environmental and climate change has shown, the long term effect of arguments and strategies is of extreme importance.

The value of an argument is accredited, and therefore determined by the context in which the argument is used. A specific stakeholder will attribute importance to the ecosystem services or values important to him, but neglect services that are valued by others due to their different views, understandings and needs. Increasing our knowledge on the relationship between biodiversity and benefits and the use of arguments for biodiversity protection in varying contexts will therefore improve our ability to use them effectively. In short: to improve protection we need to explore how much and why people value biodiversity and to what arguments they are sensitive in different situations.

The BESAFE (Biodiversity and Ecosystem Services: Arguments For our Future Environment) FP 7 project will thereto examine environmental policy decisions in 12 case studies spread over three governance levels; local, national and global. Once complete, we can then investigate if there are differences and commonalities in the use of specific arguments and in their effectiveness depending on the governance level. The alternative arguments and their efficacy are mainly identified through policy and discourse analysis. In this paper we will discuss results from the first project phase in which we reviewed literature for the use and effectiveness of different types of arguments, and present and discuss first results from the case studies.

BESAFE's results will help to improve environmental policy decisions and governance through two main channels. On the one hand, we aim to provide policy makers with better insight into why people think biodiversity deserves protection, and on the other, inform them of the most effective arguments for their specific situation.

The results from our studies will be analysed for general trends and then published in scientific and policy papers. The results will also be incorporated in a web toolkit and database, in which we hope to use the trends for the fundamental web-tool structure while using specific case study situations and arguments as examples. This database and toolkit will be developed in close cooperation with stakeholders to ensure we create a user-friendly product. The general idea is that the web toolkit should be able to ?profile' stakeholders and their particular conservation issue and then match it with the most effective arguments and examples from the database.

The main purpose of both the web tool and database will be to convincingly demonstrate the value of biodiversity to policy makers and provide them with guidance on the use and effectiveness of the various arguments in a range of situations. The tool will also demonstrate how the effectiveness of different argument types can vary between governance levels. A better understanding and awareness of these aspects may prove influential in conservation policy.

References

Buijs Arjen E., Birgit H.M. Elands, Fransje Langers 2009 No wilderness for immigrants: Cultural differences in images of nature and landscape preferences. Landscape and Urban Planning 91 (2009) 113?123.

Christie, M., Hanley, N; Warren, J., Murphy, K., Wright, R, Hyde, T. 2006. Valuing the diversity of biodiversity. Ecological Economics 58:304-317.

Ericsson, G. and G. Bostedt 2008. Wolves as a symbol of people's willingness to pay for large carnivore conservation. Society of Natural Resources 21:294-309.

Fischer, A., Young J.C. 2007. Understanding mental constructs of biodiversity: Implications for biodiversity management and conservation. Biological Conservation 136:271-282

Haslett JR, Berry PA, Bela G, Jongman RHG, Pataki G, Samways MJ, Zobel M. (2010) Changing conservation strategies in Europe: A framework integrating ecosystem services and dynamics. Biodiversity and Conservation19:2963-2977.

Menzel S., Teng, J. 2009. Ecosystem services as a stakeholder-driven concept for conservation sciences. Conservation Biology 24:907-909.

Sathirathai, S. and E. Barbier 2001. Valuing mangrove conservation in Southern Thailand. Contemporary Economic Policy 19 (2): 109-122.Schmidt, V. & C.M. Radaelli (2004): Policy Change and Discourse in Europe: Conceptual and Methodological Issues. West European Politics, 27(2), 183-210.

Spash, C.L., Vatn, A. 2006. Transferring environmental value estimates: Issues and alternatives. Ecological Economics60(2): 379-388.

TEEB 2009. The Economics of Ecosystems and Biodiversity -for National and International Policy Makers. Summary: Responding to the Value of Nature 2009.

Vatn, A. 2009. An institutional analysis of methods for environmental appraisalEcological Economics, Volume 68, Issues 8?9, 15 June 2009, Pages 2207?2215

Institutional (Climate) Change - Exploring climate adaptation through institutional analysis

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Summary (800 characters)

This paper aims to understand climate adaptation from the perspective of theories on institutional change. Particularly, Vatn (2005) and Bromley (2006) conceptualise individual choices as a product of social interaction, taking full account of the heterogeneity of human behaviour and of the process dimension of collective arrangements. So far, such theories have not been employed to climate adaptation questions.

We develop a multi-layered model of individual choice within social processes foreseeing actors that either adapt to new insights on future climate conditions within the established institutions or opt for a change of such institutions. We will apply the model to qualitative evidence on climate adaptation strategies in Germany.

Extended Abstract (1000 words)

Background
This paper is part of on-going research on the economics of climate adaptation within the econCCadapt project.

Problem description
A large amount of space in the climate adaptation literature is devoted to the identification and study of «barriers» to adaptation (Adger et al. 2009, Gawel et al. 2012). Logically, this implies that a given degree of climatic change has a corresponding degree of adaptation and that «barriers » prevent it from coming about. Inquiries thus focus on identifying and characterize such barriers from a technical, institutional, or cognitive point of view. Once barriers are identified, recommendations can be made concerning whether and how to «remove» them so as to achieve that «natural» (optimal, efficient, cost-effective) degree of adaptation expected but ultimately not observed.

Such a perspective fails in two respects. First, it fails to acknowledge the heterogeneity of human behaviour. Second, it fails to factor in the social dimension of decision making processes. This leads to the question: how shall we understand climate adaptation once we factor in such heterogeneity? What role does process play and what shape does it take? With this paper we attempt to frame adaptation choices through the underlying social process that determines how groups of individuals deal institutionally with the material underpinning of their interdependent economic activities ? this is the perspective of Institutional Economics.

Within the broader literature on economic institutions, we try to achieve a more nuanced understanding of adaptation by employing theories of Institutional Change after Bromley (2006) and Vatn (2005). Such theories focus on institutions as rules that structure processes by which plural individual perspectives are translated into shared norms and formal arrangements (institutions) that shape current and future use of natural resources. Once we apply a similar understanding of institutions and social interaction, does the currently observed slow pace of adaptation in Germany become self-evident, or do we still need to foster ad-hoc «exceptions » such as the many «barriers» to climate change adaption that the literature points at?

Literature covered
We approach this task by focusing on four strands of literature. We intend to provide:

1) An overview on current literature on climate adaptation from a strictly economic (Heuson et al. 2012) point of view and from a more interdisciplinary and governance-oriented perspective (Adger 2001, Adger at al. 2005, 2009).

2) A summary of the core dimensions of key policy documents (grey literature) on climate adaptation, such as the EU's White Paper on Climate Change Adaptation (EC 2009) and selected reports from selected research projects (Swart et al. 2009, Mirkwitz et al. 2009).

3) A review of literature on similar governance challenges, regardless of the link to adaptation, in particular Multi-level Governance (Bache and Flinders 2004, Marks and Hooghe 2002).

4) A discussion of scholarship on Institutional Economics and Institutional Change, encompassing Ostrom (2005), Vatn (2005), Bromley (2006), and Hagedorn (2002, 2008).

Theory development

We develop a theoretical framework conceptualizing Institutional Change with reference to the specific challenges of climate adaptation. Surprisingly, thorough applications of Institutional Economics to climate adaptation are still missing from the literature, forcing us produce an analytical framework that reflects them.

With this goal in mind, we propose a model of individual choice where actors face the question whether to adapt their current choices to the expected effects of Climate Change, or scale up and rediscuss those institutions shaping such choices. Such micro-model applies to a multi-layered structure of institutions foreseeing 1) institutions that shape resource use, 2) institutions that shape decisions about them, and 3) institutions shaping the distribution of decisional power across actors and communities.

Against this background, exogenous projections on future climate conditions lead actors at all levels to reassess their individual objectives and decide whether to adjust within the frame of the given institutions or whether, instead, conditions are such that new ways of organisation and interaction are needed. Our goal is to understand under which conditions change happens at the « second» level: when meeting the challenge of climate change adaptation requires new ways of organizing for collective decisions. This may or may not lead to new arrangements but may lead to changes in preferences and thus to different appraisals of the options at hand.

Empirics (Materials and Methods)

Our interest in the question of organizing for decision-making stems from the empirical materials that we intend to analyse through the framework developed herewith. We have carried out an assessment of climate adaptation strategies in Germany at different levels, qualitatively reviewing how selected municipalities approach climate change adaptation in terms of the actors involved, the institutions at play and the normative aspects implied. The 12 reviewed strategies hardly prescribe any concrete adaptation measures. Instead they call for a broad societal cooperation in tackling climate adaptation.

While being very similar to one another in framing adaptation as a task for the whole society and not for the state alone, strategies do vary greatly in the way they promote such broad cooperation, effectively allowing for very different preference formation processes among the actors involved. Choices of this kind are located at the «second» of the three levels shown above, as they pertain the use and possible alteration of those institutions shaping how actors actually interact so as to decide 1) whether to opt for adaptation to future climate conditions or other objectives; and 2) whether to rely on adaptation by some kind of collective or on individual initiative.

Expected results

The proposed paper will provide first qualitative evidence in support or rejection of the insights from the model. Specifically, benchmarking the properties of the framework against the reviewed adaptation strategies will allow us to verify whether the level and the typology of challenges to be met in each case represent necessary and/or sufficient conditions for actors to engage in substantially different ways of making decisions about managing problems related to climate change.

It is the aim of the model to show what is at stake for key actors that decide on how communities

should approach climate adaptation. This will in turn tell us under which conditions actors are left to their own devices or, instead, under which conditions scope exists to rethink the institutions that shape their economic behaviour in light of different climate conditions. As far as Germany is concerned, we expect to achieve an understanding of why adaptation has taken the slow pace that we observe, together with its process-oriented, consultation-driven and planning-focused approach.

VULNERABILITY AND ADAPTATION OF URBAN AREAS TO GLOBAL CHANGES: A SYSTEMIC INTERDISCIPLINARY APPROACH TO UNDERSTAND CITIES TRAJECTORIES TOWARDS RESILIENCE

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Abstract
The development of strategies to reduce vulnerability and increase adaptation to global changes has become a major challenge for sustainable urban development, but urban vulnerability and adaptation are not easy concepts to understand. The objective of this paper, which is essentially theoretical and conceptual in scope, is to review the dialectic relations between vulnerability and adaptation and to show how the translation of vulnerability perceptions to local urban management answers induces a chain of complex processes. The backwards loops which appear within this chain may explain that the willingness of cities to adapt to climate change can, far from the objective pursued that is reducing their vulnerability, create on the contrary the conditions of future catastrophic events. The challenge is to identify a way to break the infernal loop of the simultaneous evolution of urban and climatic problems in order to avoid the occurrence of future disasters.xml:namespace prefix = o ns = "urn:schemas-microsoft-com:office:office" />

Climate governance in embedded cities: between mitigation and adaptation

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Since about two decades, cities and towns have become important players in shaping and implementing policies concerning environmental issues, sustainable development and ? more recently ? climate change. As the primary producer of GHG emissions and the hub of economic and social activities, the local level represents both challenges and opportunities of climate change policies to reach a low carbon future.
The paper presents a qualitative comparison of two metropolitan agglomerations in the U.S. (Boston and Cambridge (MA)) and in Germany (Berlin and Potsdam) in view to their urban climate policies. By focusing on a small number of cities, which are quite similar regarding their climatic conditions, yet quite different in terms of their size, economic power and civil society, we analyze differences (and commonalities) in the way climate mitigation and adaptation policies are formulated and eventually implemented. Through the lens of a multi-level governance perspective special attention is paid to the influence of vertical governance settings which reflect differences in U.S. and German politics. Another focus is the role of local scientific institutions as the chosen case studies represent important centers of academic research within their countries. Key questions are e.g. which actors play a powerful role and how governance structures ? vertically as well as horizontally ? differ among the large and the mid-size cities. Questions of key institutions and financial resources play a role as well as salient domains in which a particular city might excel or not. In the last part of the qualitative assessment we analyze the links between mitigation and adaptation strategies and how they are played out in different policy networks and scales. The comparison of current practices will shed more light on how successful low carbon futures are brought about locally.

Identifying Drivers of Household Coping Strategies to Multiple Climatic Hazards in Western Uganda: Implications for Adapting to Future Climate Change

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Abstract:
We investigate how household coping strategies vary depending on the climatic hazard experienced in rural Uganda. Rural households in sub-Saharan Africa draw on various coping strategies to reduce the impact of climatic hazards on their livelihoods. Despite research to date, we still have limited understanding of how the coping strategy portfolio of households' changes depending on the climatic stress. Using empirical data from Uganda, we contribute to this gap by 1) exploring how household characteristics and livelihood activity relate to household coping strategy and 2) how these coping strategies vary depending on the hazard. We find that for households without market access, coping strategy is hazard specific: livelihood specific coping strategies are relied on during floods whilst during drought, social support and labour opportunities are utilised regardless of livelihood. However, households with increased market access rely on economic activities regardless of the hazard. We discuss how choice of coping strategy impacts on the longer term adaptive capacity. These results suggest there is a need for hazard-specific policies in order to support rural communities to cope with climate variability.

Slow Management and Accounting for a Socio-Ecological Transition

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Under the light of René Passet's three-sphere theory, a firm entity is formed as anecosystemin which the different stakeholders participate and express their commitments and expectations in terms of financial, social, and natural capital with in mind that the human, natural and social resources do exist but they are limited and some of them could not be auto-created or replaced. In our view, Slow Management is indeed the way to coordinate human actions in a collaborative environment, in order to build stable relationships with long term customers and suppliers. Slow Management involves and coordinates free small-scale organizations and it is based on values such as trust, cooperation, sustainability and respect for Humans and Nature, which induce an attitude of individual responsibility. The debate about what the company must make, how much, what kinds of jobs and salaries, and many other things, must be open up to all the stakeholders as these issues have common shared and social consequences.
We wish to bring novelty in the management field. Slow Management is a transverse concept to the other Slow movements. It is a concept of socioeconomic ecology, beyond the material well-being as synonymous of human comfort, pursuing the psychological well-being, the personal development by respecting human differences. We need to remember that the so-called « professional relationships» are first and foremost human relations. Slow Management thus fits within the broader Slow Life concept, where the word "Slow" evokes a profound paradigm shift, not just a speed shift.
In this perspective, one potential limit to the implementation of Slow Management is the firm's economic survival. Thus, our research question is: can we build an accounting model that promotes and sustains Slow management, in a broader degrowth perspective? Based upon a case study in organic agriculture, we show how accounting can be used as a forum for discussion between the members evolved in the ecosystem and how the double entry bookkeeping mechanism in accounting helps them in the search for an equilibrium between the ecosystem members' commitments and expectations and by the way translate the sustainability spirit that animates the ecosystem. This case study is an illustration that the double-entry bookkeeping can be used for other purpose that the one that generates growth and perpetrates the capitalist spirit in looking for perpetual surplus of the capital invested. We can say that the double-entry bookkeeping mechanism helps to promote sustainability and degrowth by helping people to control the equilibrium of the three spheres: economic, social and natural.

Green economy: a regress in ecological economics?

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Whereas the Rio Conference in 1992 had played a major role in the diffusion of sustainable development as a new paradigm or integrative framework to reflect on the relationship between economies and the environment, Rio + 20 Summit was meant to be a celebration of ?green economy'. The latter did not actually take place and the importance of green economy has been considerably downplayed in the Declaration, compared to the first drafts that were circulated prior to the Conference. Though the notion is (purposedly?) kept vague and did not meet with the success expected by its promoters, it still illustrates a new or further stage in the representation of the relationship between nature and societies.
In the 1970s, the environment was considered as a set of constraints, imposing various physical and ecological limitations on economic activity. The advent of sustainable development introduced changes in this representation: economic development or growth was considered as possibly compatible with environmental protection. In the green economy narrative, the environment and its protection or management are represented as the very drivers of economic growth. The inherent contradictions in capitalist accumulation that lead to dispossession and nature degradation are dismissed. A non-confrontational view of environmental policies based on win-win strategies is considered as plausible. The diverging views of the various actors and constituencies could be reconciled, at least in the future, thanks to technical innovations, social engineering, and the building of a shared and common future.
Green economy appears to a large extent as a self-fulfilling prophecy and our purpose in this paper is to describe and study it as such. We first analyse the green economy narratives, from the first proposals of a Green New Deal, following the 2007-2008 financial crisis to the final declaration of Rio+20 Summit through various reports of international organizations. Then we focus on the theoretical foundations of these discourses, the kind of institutional setting and arrangements they are promoting and the role and representation of technique they are building upon. Does green economy constitute a paradigmatic shift in ecological economics or a mere regress, leading to reconsider the relation between nature and societies as they were thought about in the 1980s?

Green growth or low growth: Modelling the balanced transition to a sustainable economy

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800 characters summary
We present a simple mathematical model to investigate how economic balanced paths are modified under public policies for transition to sustainability. From a numerical benchmark economy initialised with OECD and World Bank data, we first show the unsustainability of the current economic trend. We then build two scenarios for stabilizing the atmospheric CO2 concentration at the IPCC objective: "Green Growth" (GG) or "Low Growth" (LG). The simulation results show that, under the GG assumptions relying on massive technological innovation, sustainability is achieved after 60 years; under the LG option, a sectorial shift towards zero carbon emission activities allows to achieve the same objectives within the same time horizon.
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We present a simple mathematical model for the transition to a sustainable economy in the line proposed by Peter Victor [Victor and Rosenbluth, 2007] and Tim Jackson [Jackson, 2009]. The modelling approach is in the continuation of the «Limits to Growth» of [Meadows et al., 1972, 2004] which have emphasized the unsustainable character of the current economic trend and the necessity of a major change in the economic structure and the consumption behaviour. The « Limits to Growth» projections are confirmed by [Turner, 2008] in his recent comparison with empirical data.
Some authors (e.g. [Spash, 2012]) have expressed their doubts as to the possibility of correctly analysing the sustainable transition with the toolbox of mainstream economics and ask for the development of an epistemological questioning. Although we totally agree with the relevance of the epistemological issue, we believe that the current debate may be clarified by looking more closely into the potential and the limits of the neo-classical formalism for the understanding of the sustainability transition. In this paper we intend to set some preliminary basis for further critical discussion.
The model is build to assess public policies to attain sustainability. Our ultimate objective is to use the model to explore long-run evolution of an economy that achieves limitation of atmospheric greenhouse gas, environment protection and full recycling of material resources with high public investment. However in this communication, we restrict the focus on greenhouse gas limitations, and more precisely on carbon dioxide (CO2), which is the major contributor to greenhouse gas emissions. The issues of material resources and environment protection are addressed in a companion paper.
The model is a conceptual representation of a «decentralized economy» where the decisions of producers, consumers and government are distinguished. In order to address the objectives mentioned above, the model involves the main economic and environmental variables that are essential for analysing a sustainable economy. In addition to standard macroeconomic variables (such as production, consumption, investment, capital and labour), we therefore also consider environmental variables (such as CO2 emissions and atmospheric CO2 concentration). As it is usual in macroeconomic modelling, the model consists essentially of «flow balance equations » that combine aggregate stock variables and flow functions.
We restrict our attention to balanced economic paths. Our main concern is to investigate how balanced paths are modified under public policies for transition to sustainability. The reason for restricting to balanced paths is to have consistent models that are as simple and flexible as possible. Simple to be easily implemented, even by users who are not familiar with the use of optimal control methods in neo-classical economic theory. Flexible to easily include extensions like subregions, economic subsectors or explicit fiscal policies.
We define a fictional pseudo-world economy with two subregions that are endowed with the CO2 emissions of OECD and non-OECD countries respectively. Then, for the OECD subregion,

we examine two major options towards sustainability: the «Green Growth» option and the «Low Growth» option. In the green growth option, it is believed that the greenhouse gas emissions will be limited by developing public novel technical innovations without changing the final output nor the economic structure. In contrast, the low growth option aims at developing zero or low carbon emission activities without having to rely on major discoveries of new green technologies, which results in structural change and lower growth.

We proceed as follows. We first build a baseline system, which is a simple single-sector economy with a standard neo-classical production function in capital and labour. The system is supposed to follow a balanced trajectory along which the marginal product of capital and the output-capital ratio are constant. We then set up a benchmark numerical model which is initialized with orders of magnitude corresponding to the state of OECD economy during the period 1998-2008 and which is consistent with the empirical data. Besides we model the CO2 intensity and the quantitative estimation of the relative decoupling between GDP growth and CO2 emissions. We then proceed to three simulation experiments corresponding to «business as usual», «green growth » and «low growth». For the simulations, the model equations are solved with Matlab-Simulink. In the «business as usual» simulation, the economy continues to follow its current trend and makes the planet reaching unsupportable CO2 atmospheric concentrations at the end of the century. Next, the baseline system is extended with a sector producing green technical knowledge. The investment in this sector is assumed to increase proportionally to the excess of CO2 emissions. The simulation result shows how the investment policy in public green technologies stabilizes the atmospheric CO2 concentration at the value of 450 ppm (recommended by IPCC) within about sixty years, with a public cost in the range 2-8 % of GDP. Finally, we examine how the transition to sustainability may be achieved with a low-growth public policy that consists in fostering the development activities with low or zero carbon intensity, with the results of low productivity growth and structural change. For this purpose, we consider an economy with two sectors: a conventional sector endowed with the economic features of the baseline system and a transition sector of activities having zero carbon intensity and constant labour productivity. The simulation results show that it is possible to achieve the same sustainability objective, within the same time horizon, without blind faith in technologies, by systematically subsidising a transition to low carbon and low capital intensive activities, leading to a sectorial shift from the conventional sector (from 100% to 45% of GDP) to the transition sector (from 0% to 55% of GDP). Obviously, by running linear combinations of these two extremes, all intermediate trajectories are possible. The model, as it set up, represents a very narrow and limited perspective regarding the transition to sustainability. Many relevant aspects of the impact of global warming on the economy are ignored and the structure of the economy itself is extremely simplified. Important related issues such as social inequalities or international finance unreliability are not addressed. However, we hope that our parsimonious modelling contributes to highlight some of the fundamental challenges in terms of economic policy. Moreover, the model can be easily extended to include more subregions and economic subsectors or explicit fiscal policies.

[Jackson, 2009] Jackson, T. (2009). Prosperity without Growth - Economics for a Finite Planet. Earthscan.

[Meadows et al., 2004] Meadows, D., Randers, J., and Meadows, D. (2004). Limits to Growth: The 30-Year Update. Chelsea Green Publishing Company.

[Spash, 2012] Spash, C. (2012). New foundations for ecological economics. Ecological Economics, 77:36?47.

[Turner, 2008] Turner, G. (2008). A comparison of the limits to growth with thirty years of reality. Csiro working paper series 2008-2009, CSIRO (Australia).

[Victor and Rosenbluth, 2007] Victor, P. and Rosenbluth, G. (2007). Managing without growth. Ecological Economics, 61:492?504.

Degrowth ?à la française? : A Lacano-marxist reading of Serge Latouche's proposals

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The issue of sustainable development forces us to think social change. We are interested in how Serge Latouche - an author known today as one of the leading thinkers of degrowth «à la française » (Martinez-Alieret al., 2010) - captures this problem of social change. To do that, we propose an analysis that crosses Marxism and psychoanalysis. As a first step, we return to the idea of ?? the «invention of the economy» (Latouche, 2005), which according to Latouche, is always present in his work since his thesis writen in the middle 1960s to his most recent writings (Latouche, 2012). In these writings, "Economics" appears as an "imaginary" which is historically constructed and globally diffused, an imaginary we should leave today. In a second step, we propose an interpretation of the idea of "getting out of the economy", as prescribed Latouche in light of the model of the "talking cure", i.e. the presence and speech of the psychoanalyst that allow the analysed to hear what there is in his own language and ways of speaking, and thus ways to be. This is the meaning of the expression «mot-obus» ("word shell") - launched against one of the key word of economics - used by some authors to characterize degrowth «à la française» (Cheynet, 2008). Similarly, the "pedagogy of disasters" («pédagogie des catastrophes»), which also refered Latouche, must be understood in the perspective of an irruption of the "real" in the universe of the meaning, so that befall subjects and decide for themselves in full knowledge of datas and impasses of their desires. The idea and the way of "getting out of the economy", as they appear in Latouche's work, confront us with the unsustainability of our being in the world. They are then faced with constant phenomena of resistance, denial and repression, like the good example provided by the expression "sustainable development".

Cheynet V. (2008) Le choc de la décroissance, Paris, Le Seuil. Latouche S. (2005) L'invention de l'économie, Paris, Albin Michel. Latouche S. (2005) Décoloniser l'imaginaire, Lyon, Parangon/Vs. Latouche S. (2012) L'âge des limites, Paris, Mille et une nuits. Martinez-Alier J., Pascual U., Vivien F.-D., Zaccaï E. (2010) « Sustainable de-growth : Mapping the context, criticisms and future prospects of an emergent paradigm », Ecological Economics, vol. 69, n°9, pp. 1741-1886.

"Beyond GDP": Revealing Hidden Disparities of Stances to Make the Debate Possible

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What should we aim for as a society? How can we measure progress? Should we replace GDP or complement it? How can we assess the sustainability of our societies? These questions have risen up the agenda in Europe and across the world in recent years under the banner "Beyond GDP". Several high profile initiatives such as the OECD's Measuring Progress initiatives, the EU's GDP and Beyond, the French Commission on the Measurement of Economic Performance and Social Progress, the UK's Measuring National Well-Being and Bhutan's Gross National Happiness have all lit up the debates.
An increasing literature addresses the recent expansion of this "Beyond-GDP" phenomenon through various approaches, mainly focusing on the elaboration of indicators or on the role they are to play in governance systems. However, few studies have questioned the way the civil society, political and scientific actors integrate the "Beyond-GDP" agenda in their visions and actions. We tackle this issue in our European research project BRAINPOoL.
Our communication is structured as follows. We first present the variety of "Beyond-GDP" contexts within different European countries. The second part develops our methodology based on documents and discourses analyses (about 40 interviews performed and 40 documents studied). Our results, presented in a third part, draw a systematic outline of the disparity of actors' positions that need to be clarified. Indeed, the lack of transparency regarding the ? possibly conflicting ? positions vis-à-vis the "Beyond-GDP" agenda constitutes one of the main sources of its paralysis. We identify three main issues where disparity of stances appears as problematic: 1) lack of common conceptual grounds; 2) difficult combination of scales for implementing indicators; 3) gap between intentions and actions regarding the participative aspects of "Beyond-GDP" indicators. Fourth, we combine the three above-mentioned types of positions disparities within an analytical perspective. We suggest that the scattered state of the "Beyond-GDP" debates might reveal the inadequacy of the traditional decisional spheres to properly echo the actors' wills.

Applying the Happy Planet Index to the household level ? a crossnational comparison on the relationship between energy consumption and life satisfaction in Munich and Bolzano

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Abstract:
Using our survey data from Munich (Germany) and Bolzano (Italy), the Happy Planet Index is applied to the household level: First, to identify households which are coined by high degrees of life satisfaction in combination with comparable low energy consumption. Second, to learn more about the curve shapes of life satisfaction and energy consumption in different socio-structural contexts. Although it is generally assumed that each additional unit of environmental input results in diminishing returns of life satisfaction, significant differences between e.g. income- or age-groups are expected. Based on these results, regulatory instruments like taxes could be designed more specifically by restricting only that part of environmental consumption that increases life satisfaction only marginally.

Long Version:
The Happy Planet Index (HPI) can be described as an efficiency measure, quantifying the relationship between life expectancy, experienced well-being and ecological footprint. Analogously to simple input-output models, it is assumed that environmental resources (inputs) result in certain levels of life satisfaction (output). Depending on the ratio of input and output, the HPI «ranks countries on how many long and happy lives they produce per unit of environmental input» (nef 2012).
Using our survey data from Munich (Germany) with N= 1060 and a response rate of nearly 33% and Bolzano (Italy) with N=1088 and a response rate of nearly 17%, we modify the HPI to apply it to the household level. In doing so, we pursue two central questions: First, we want to identify households which are coined by high degrees of life satisfaction in combination with a comparably low degree of energy consumption. Second, and on this basis, we want to learn more about the curve shapes of life satisfaction and energy consumption in different socio-structural contexts. In general, it is assumed that each additional unit of environmental input results in diminishing returns of life satisfaction. Despite this general assumption, we expect significant differences in the relationship between life satisfaction and energy consumption between different income groups, age groups, nationalities, or types of household within Bolzano and Munich (and within each of these cities). In short, we are interested in the main driving forces of life satisfaction, energy consumption, their interaction, and how they vary between Munich and Bolzano.
This research question is approached in the following way: Life satisfaction was surveyed on a scale with eleven levels, ranging from absolutely dissatisfied to absolutely satisfied. Due to the fact that roughly 50% of our overall CO2-emissions can be traced back to private transport and housing, we decided to survey environmental input via energy expenditures. Using fuel-specific price indices and CO2-conversion factors, expenditures are translated into absolute amounts which ? in turn ? are converted in CO2-emissions. With regard to the main driving forces of CO2-emissions and life satisfaction, we know from our previous work and from the work of our colleagues, that CO2-emissions highly depend on fuel-type, building-type, living space, household size, and the number of cars in the household (Schubert et al. 2012), whereas life satisfaction primarily depends on the state of health and social integration (cf. Keuschnigg et al. 2010).
Now, and regarding the HPI, the crucial question is whether or not the driving forces of life satisfaction also determine CO2-emissions (and vice versa). With regard to the findings of Schubert et al (2012) and Keuschnigg et al (2010), the number of household members should improve life satisfaction and reduce CO2-emissions (per capita). In the case of living space, instead, it might be the other way round: Higher living space per capita is expected to result in increasing carbon emissions and increasing degrees of life satisfaction. As these examples

suggest, answering the question of whether or not the driving forces of life satisfaction also determine CO2-emissions (and vice versa) is an intricate endeavor. Due to the possible differences in the directions of effects (as illustrated for household size and living space), it is an empirical question how the driving forces of life satisfaction and carbon emissions may interact or counteract each other.

Provided that there is substantial evidence that each additional unit of energy consumption results in decreasing returns to life satisfaction, environmental and social politics might benefit from such results in the following way: Using the HPI and taking socio-structural difference between e.g. income- or age-groups into account, it should be possible to identify break points at which the ratio between environmental input and life satisfaction becomes more and more inefficient. It will be argued that inefficient resource consumption ? that is: resource consumption that does not significantly improve life satisfaction ? should be prevented by regulatory measures which more specifically account for properties of different social groups. Only those parts of environmental consumption should be restricted which increases life satisfaction only marginally. In contrast to the current measures of general energy price taxes ? which often hit the lower income groups more severely since they have to spend a higher proportion of their household income for energy ? such an approach should encounter less political resistance because it accounts for the tradeoffs between welfare politics and environmental protection.

Are people that are living a more sustainable life more satisfied?

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In this paper we explore the relation between living a sustainable life and self-reported life satisfaction based on a survey conducted in Flanders (n = 592). Respondents were asked to rate their current life satisfaction using a 10-point scale («All things considered, how do you rate your satisfaction with life?») and to assess the sustainability of their life style using a similar scale («To what extent would you rate your current lifestyle as sustainable?»). The survey also included several socio-economic characteristics as well as personality traits.
Self-reported life satisfaction and the subjective assessment of the sustainability of the lifestyle are positively correlated (r = 0.441). Respondents who rate their lifestyle as more sustainable tend to report higher levels of life satisfaction. This result holds when the subjective sustainability is included in a more general regression model for life satisfaction (R^2 = 0.326) in which the subjective assessment of sustainability is one of the most important variables (p = 0.000). Other significant variables in the model are age and age squared, personal income, being in a relationship, being a student, the number of doctor visits in the past 12 months and a number of personality traits (being extravert, worrying constantly, ...).
Looking at the subjective assessment of the sustainability of the lifestyle and a number of other socio-economic variables also leads to some interesting results. First, middle-aged respondents tend to rate the sustainability of their lifestyle higher than both younger and older respondents. Next, having a higher education leads to a higher level of self-reported sustainability.

*** NOTE ***
A new survey will be held in Spring 2013 in which respondents are also asked 11 questions that allow us to calculate their ecological footprint. As a result, we will be able to compare the subjective assessment with a more objective assessment (ecological footprint). It will also be interesting to explore what drives the eventual misjudgment of the respondents (lack of knowledge of the environmental problems, environmental concerns, ...). Preliminary results of this updated survey will be available by June 2013.

Assessing Sustainability Indicators: The Need for a Criterion of "Performative Coherence"

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Are beyond-GDP indicators the potential lever of a paradigmatic change? Or, on the contrary, are they the tool of legitimization of a status quo in the way societies are governed and organized? Given the political issues raised by the growing use of indicators in governance patterns, it appears crucial to distinguish, among the indicators discussed today to go beyond GDP, between those liable to bear a change in the orientation of societies and those which, in the way their are designed, encompass the roots of a system they elsewhere pretend to overcome. If sustainability indicators are adequately designed, they might be something else than the ineluctable vector of a general transposition of managerial norms to all the societal spheres.

However, most of the quantification options encountered in the current debates appear inadequate to quantify sustainability in a coherent way: we have systematically observed contradictions between, on the one hand, the normative signal launched by the accounting of a dimension (such as environment, for instance) in the indicator and, on the other, the performative implications of the methodology adopted to quantify this dimension (monetizing environment, for instance, which assumes substitutability between capitals and potentially jeopardizes specific capitals if this indicator is used to asses sustainability). These contradictions lead us to think about the methodological, theoretical and epistemological conditions needed to design more coherent indicators.

The objective of that communication is to propose a new evaluative criterion of sustainability indicators: the "performative coherence". This criterion results from the triple perspective we adopt to address sustainability indicators. The latter are conceived as tools of convention, as the cogs of a form of governance inscribed in the mutation of the State-Statistics relationship, and as technico-theoretical constructs with empirical and normative ends, therefore being performative.

We show that referring to this criterion is necessary to apprehend sustainability indicators in all their complexity. The search for the conditions of performatively coherent indicators leads us to discredit neoclassical economics and to investigate the contribution of ecological economics, by de facto shedding light on its adequacy to the complex issues of sustainability.

The presentation is structured as follows. After a terminological clarification on our use of the concept of "sustainability" (section 1), we draw a diagnostic of the debatable conceptual foundations of most of the indicators discussed today (section 2). We then develop the principle of performative coherence as a new evaluative criterion of sustainability indicators, liable to imply a change in the way sustainability issues are perceived and addressed through quantification (section 3). Section 4, addressing the theoretical and epistemological conditions of performative coherence, stresses the interest of a post-normal epistemological posture as a lever of paradigmatic change. Such a posture raises a question of legitimacy, which is treated in section 5. Section 6 concludes.

Can we better understand land-use conflicts by linking ecosystem services trade-offs with stakeholders and scales?

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Summary
Land-use changes induced by nature conservation regulation and management practices often result in trade-offs between ecosystem services (ESs). Exploring ESs related to land use practices before and after the change and linking ESs with stakeholders can help reveal the potential losers and winners. In contrast to expectations that trade-offs go hand in hand with conflicts, our study demonstrates that this is not always the case. ESs are enjoyed and perceived at different spatial and time scales, separating stakeholders with conflicting interests. In these cases stakeholders might not even get in direct contact and conflicts do not emerge. Three case studies from the Hungarian Great Plain are assessed and compared in a conceptual framework integrating the ESs concept, trade-offs, stakeholders and scale. Based on the assessment, different instruments can be recommended to handle ESs trade-offs and land-use conflicts.

Abstract
Ecosystem services (ESs) is a widely recognised concept, the importance of which is underlined in many policy documents and scientific studies (e.g. MA, 2005, Kumar, 2010). Trade-offs in ESs often emerge as a result of land-use changes initiated by nature conservation regulation and/ or bodies with the aim of promoting biodiversity conservation in that particular area.
Identifying the connection between certain ESs and certain stakeholders helps us better understand the complex relationship between ES trade-offs and land-use changes. Usually local land users benefit from the provisioning services, while cultural, regulating and supporting services are enjoyed and perceived by broader social groups, many times distant from the specific area both in time and space. Thus the importance of ESs and the perceptions of stakeholders about it are scale-dependent both spatially and temporally. Linking ESs with stakeholders at different scales can reveal who are the «winners» and the «losers» of particular land-use changes. In these cases however, it is not certain whether actual conflicts arise or not. We assume that scale is an important factor in explaining the emergence and the nature of conflicts.
In the current literature on ESs, trade-offs between ESs are often recognised (e.g. Rodrígez et al., 2006; Bennett et al., 2009, Kumar, 2010). There are empirical studies aiming to measure or map ES trade-offs (e.g. Butler et al., 2011; Haines-Young et al., 2012) and studies investigating stakeholder perception of ESs (e.g. Lamarque et al., 2011, Castro et al., 2011). Many studies focusing on land-use conflicts in protected areas (e.g. Stoll-Kleemann, 2001, Pavón et al., 2003;) do not link conflicts to ES trade-offs. Few researches attempt to connect stakeholder preferences of ESs with trade-offs between ESs (Martín-López et al., 2012), or link stakeholders to ESs along different spatial and temporal scales (Butler et al., 2011), or even to conflicts (de Groot, 2006). However, such complex research have been relatively rare, therefore the need for researches connecting these concepts are often emphasised (Carpenter et al., 2006, 2009).
In the light of the above mentioned considerations, we argue that linking the trade-offs between ESs with stakeholders at different spatial and temporal scales has a potential to become a powerful tool to analyse land-use changes and related conflicts. We use this approach as a conceptual and methodological framework in a comparative analysis of three empirical case studies from the Hungarian Great Plain in order to see its validity and operative value in addressing land-use

conflict issues. The three empirical case studies carried out between 2007 and 2011 applied qualitative data collection methods (interviews and focus groups) to identify ESs perceived as important by different stakeholder groups. The history of land-use changes and related ecosystem services were assessed using archival data and documentary analysis.

In all three areas land-use changes occurred in the 1990s, due to nature conservation restrictions and land acquisition by the national park directorates. Intensive agricultural activities were replaced by more extensive forms of agriculture. The range of ES provision has been broadened, but some trade-offs between ESs appeared. Provisioning services (crop and fodder) beneficial mostly to local farmers and consumers from local to national scales were dominant before the land-use change. Due to land-use change, new provisioning services became apparent while formally important provisioning services lost their significance. Regulating services (e.g. flood protection, habitats for rare species, biodiversity), and cultural services (tourism, scientific inquiry, environmental education) also gained more importance, increasing both in types and in quantity. Regulating services and cultural services are beneficial to a much wider audience from local to regional and in some cases to national or even global scales.

In sum local farmers have been the main losers of the land-use change, while there are many winners both at different spatial (from local to global) and temporal (from present to future) scales. In all three areas there are conflicts between local farmers and the national park directorates, but no conflicts between farmers and other beneficiaries of the new ecosystem services. Due to scale mismatch, local farmers might not be aware of the other stakeholders, and vice versa, so there is no direct connection and confrontation between them.

Building on the results of the assessment, policy and other instruments can be advised to handle the scale mismatches and the conflicts (e.g. wider information provision and stakeholder dialogue about ESs, conflict resolution methods and identification of research needs related to ESs). Finally, some limitations of this research exercise can also be formulated (e.g. shortcomings of the qualitative evaluation of ESs, difficulties of assigning stakeholders to certain ESs, or the need to investigate other reasons behind the conflict situations).

References

Bennett, E.M., Peterson, G.D. Gordon, L.J. 2009. Understanding relationships among multiple ecosystem services. Ecology Letters 12, 1?11.

Butler, J.R.A., Wong, G.Y., Metcalfe, D.J., Honzák, M., Pert P.L., Rao, N., van Grieken, M.E., Lawson, T., Bruce, C., Kroon, F.J., Brodie J.E. 2011. An analysis of trade-offs between multiple ecosystem services and stakeholders linked to land use and water quality management in the Great Barrier Reef, Australia. Agriculture, Ecosystems & Environment, In Press, Corrected Proof, Available online 6 October 2011

Carpenter, S.R., DeFries, R., Dietz, T., Mooney, H.A., Polasky, S., Reid, W.V., Scholes, R.J., 2006. Millennium Ecosystem Assessment: research needs. Science 314, 257?258

Carpenter, S.R., Mooney, H.A., Agard, J., Capistrano, D., DeFriese, R.S., Díaz, S., Dietz, T., Duraiappah, A.K., Oteng-Yeboah, A., Pereira, H.M., Perrings, C., Reid, W.V., Sarukhan, J., Scholes, R.J., Whyte, A., 2009. Science for managing ecosystem services: beyond the millennium ecosystem assessment. Proceedings of the National Academy of Sciences U.S.A. 106, 1305?1312.

Castro A.J., Martín-López B, García-LLorente M., Aguilera P.A., López E., Cabello J. 2011. Social preferences regarding the delivery of ecosystem services in a semiarid Mediterranean region. Journal of Arid Environments 75: 1201?1208.

de Groot, R., 2006. Function-analysis and valuation as a tool to assess land use conflicts in planning for sustainable, multi-functional landscapes. Landscape and Urban Planning 75, 175-186.

Haines-Young, R., Potschin, M., Kienast, F. 2012. Indicators of ecosystem service potential at European scales: Mapping marginal changes in trade-offs. Ecological Indicators 21, 39-53.

Kumar, P., (Ed.) 2010. The Economics of Ecosystems and Biodiversity: Ecological and economic foundations. Earthscan, Oxford, United Kingdom, 456 pp.

Lamarque P, Tappeiner U, Turner C, Steinbacher M, Bardgett R.D, Szukics, U. Schermer, M.,. Lavorel, S. 2011. Stakeholder perceptions of grassland ecosystem services in relation to knowledge on soil fertility and biodiversity. Regional Environmental Change 11, 791?804.

López, M. B, Iniesta-Arandia, I., García-Llorente, M., Palomo I., Casado-Arzuaga I. Del Amo, D.G., Gómez-Baggethun, E. Oteros-Rozas, E. Palacios-Agundez, I., Willaarts, B., González, J. A., Santos-Martín, F, Onaindia, M., López-Santiago, C. , Montes, C. 2012 Uncovering Ecosystem Service Bundles through Social Preferences. PLoS ONE 7(6), 1-11.

MA 2005. Millennium Ecosystem Assessment. Ecosystems and Human Well-being: Synthesis.

World Resource Institute, Washington DC
Pavón, D., Ventura, M., Ribas, A., Serra P., Saurí, D., Breton, F. 2003. Land use change and socio-environmental conflict in the Alt Emporda` county (Catalonia, Spain). Journal of Arid Environments 54, 543?552.
Rodriguez, J.P., Beard, T.D., Bennett, E.M., Cumming, G.S., Cork, S.J., Agard, J., Dobson, A. P., Peterson, G.D., 2006. Trade-offs across space, time and ecosystem services. Ecology and Society 11, 28.
Stoll-Kleemann, S. 2001. Reconciling Opposition to Protected Areas Management in Europe: The German Experience, Environment 43(5), 32-44.

Conflicts on River Flows - Who Captures the Highest Share of the Ecosystem Services?

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Lack of instream flows at different scales is often related to social conflict. To what extent this is due to an unequal distribution of benefits in terms of ecosystem service provision? Claims for a global action agenda addressing the need of protecting environmental flows are increasing. However, alternative instream-flow policies may result in very different outcomes that can be used by a high number of beneficiaries, or being captured by specific groups of interest. We use an ecosystem services framework to disentangle the relationships among water policies, river ecosystems functioning, and the delivery of ecosystem services (and ensuing benefits for human well-being). Our empirical evidence relies on the Ter River case (NE Catalonia). Dozens of weirs in the upper part divert water for hydropower thus the river flow becomes discontinuous. Meanwhile, in the middle course, the bulk of water flow is transferred to the metropolitan Barcelona, generating water scarcity in the lower Ter. Our results point out that 1) the ES framework enhances communication between stakeholders and scientists; 2) ground-up exercises are essential for the characterisation of river benefits at local scale; 3) managing stream flows to deliver multiple ES is a complex issue, difficult to deal with a reductionist approach; and 4) there are potential tradeoffs between river uses, which should be recognised in order to disentangle this complexity and understand how conflicts on river flows are produced.

Spatial dimensions of ecosystems and their services in Central European cultural landscapes: Challenges and options for governing common goods

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We investigate the impact and the interdependence of regulatory and incentive-based policies for the spatial configuration of ecosystem services provided by two ecosystems in Saxony (Germany): 1) farm trees (e.g. hedgerows, scattered fruit tree meadows), and 2) open fish ponds (aquaculture systems where freshwater fish is produced). While their management is determined by distinct social, legal, and political settings at various levels, they have in common that they provide ecosystem services which are intimately linked with their spatial configuration and which show features of public goods. Based on semi-structured interviews with stakeholders and other experts, we assess existing collaborative approaches and reflect on the potential and limits of policies fostering collaboration. Central European cultural landscapes usually comprise different ecosystems, such as forests, grassland, arable land and open waters, which differ ? among others ? with respect to their spatial features (e.g., number, size, agglomeration) and other biophysical characteristics. They have been shaped and sustained by various forms of land use, and provide biodiversity and multiple ecosystem services which operate at different scales ranging from the local and regional to the landscape and national level and even beyond. Those ecosystem services often show features of public goods or common-pool resources where exclusion of actors is difficult and some form of collective action and coordination between resource users within a particular landscape is necessary to ensure the provision of appropriate levels of these ecosystem services. At the same time, land use decisions affecting the provision of ecosystem services in landscapes are influenced by a multitude of regulatory and incentive-based policies formulated and implemented at different political and administrative levels ranging from the local over the national and EU level to the global level.In this paper, we look at two different types of ecosystems which are prominent features of the Upper Lusatia Pond and Heath Landscape in the German federal state of Saxony: 1) farm trees, such as hedgerows and scattered fruit tree meadows, and 2) open fish ponds, which are an important part of aquaculture systems where freshwater fish is produced. While their management is largely determined by rather distinct social, legal, and political settings at the supranational, national, and regional level, they have in common that they provide ecosystem services which are intimately linked with their spatial configuration and which show features of public goods. Hedgerows, for example, which form linear structures in agricultural landscapes, provide many jointly produced ecosystem services, such as buffering groundwater pollution, controlling surface runoff and soil erosion, and offering cultural services like aesthetics and sense of place. Open fish ponds, in turn, consist of networks of shallow ponds of varying size that are connected with each other as well as with other open waters, such as lakes, rivers, and drainage ditches. Apart from private provisioning goods, e.g., fresh water fish grown in the ponds, they are also habitat for a multitude of ? partly endangered ? plants, offer spaces for breeding, resting, and feeding for birds and amphibians, have important functions for the stabilization of the regional landscape water regime, and are also important for the aesthetics of the landscape and provide recreational services.Using Elinor Ostrom's SES framework as conceptual basis, we investigate the impact and the interdependence of existing regulatory and incentive-based policies for the spatial configuration of the different ecosystem services provided by the two types of ecosystems. Further, we explore and assess existing collaborative approaches and coordination activities in the context of the provision of the ecosystem services under scrutiny.

Based on this analysis, we reflect on the need for and the potential of fostering collaboration and coordination among resource users, and discuss the limits of such collaborative approaches and constraints for their effective implementation. Finally, we reflect on the challenges and options for the vertical and horizontal integration of such collaborative policies in a multi-level governance context.The paper is based empirically on semi-structured interviews with relevant stakeholders and other experts in the research region and at the federal state level as well as on the assessment of policy and legal documents and regional statistics. Both ecosystems ? which are characteristic landscape features in the research region ? are investigated in the same landscape in order to keep the general regulatory, administrative, and political context similar.

Stakeholders representions of biodiversity and eco-system services. A critical view.

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L'idée selon laquelle les écosystèmes fournissent des services contribuant au bien-être humain, a notamment été diffusée par le rapport du MEA et du TEEB. Cette référence à la notion de « service» dans le champ de la biodiversité véhicule de nombreux présupposés. L'objectif de cette communication est d'apprécier, par l'intermédiaire du discours des acteurs-clés praticiens de la biodiversité, la pertinence et les conséquences notamment sur la gestion de la biodiversité et l'aménagement du territoire de la notion de «services rendus par la biodiversité». Nous utiliserons la grille d'analyse des économies de la Grandeur pour tenter de mettre en évidence les univers d'actions de ces acteurs. Nous analyserons les mots «signifiants» à l'origine des registres de justifications des acteurs à partir d'entretiens réalisés auprès des parties prenantes, ainsi que dans les documents utilisés par les structures auxquelles elles appartiennent.

The Justice Dimension of Sustainability - A systematic and general conceptual framework

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Summary
We argue that the normative dimension of sustainability can be captured in terms of justice. We (i) identify the core meaning of sustainability, (ii) discuss ontological and epistemological assumptions underlying sustainability conceptions, (iii) introduce a general «conceptual structure of justice» for the analysis and comparison of different specific conceptions of justice, (iv) determine the specific characteristics and challenges of justice in the context of sustainability along this «conceptual structure». We demonstrate that the modern sustainability concept entails a core of ontological and epistemological assumptions, which raise specific and partly new challenges of justice in regard to the community of justice, the judicandum, the metric and the instruments of justice.

Extended Abstract

The modern sustainability concept obviously has a normative dimension which is of key importance for sustainability research (Becker 2012, Christen and Schmidt 2012) and, more specifically, for ecological economics (e.g. Baumgärtner et al. 2008, Daly 1977). In this paper, we discuss whether and how this normative dimension can be interpreted in terms ofjustice. We ask, what are the characteristics and challenges of justice in the context of sustainability?

We proceed in several steps. First, we discuss the concept of sustainability. Despite the huge variety of sustainability conceptions, we can identify a core meaning (Becker 2012) with three elements: Sustainability (1) is about a threefold relationship with contemporaries, future persons, and nature; (2) is about continuance, and (3) seeks to give normative orientation.

Second, we discuss the concept of justice and present a formal «conceptual structure » (Baumgärtner et al. 2012) of elements of every conception of justice, comprising the community of justice (claim holders and their claims as well as claim addressees), the judicandum (that which is to be judged as just or unjust, Pogge 2006), the metric (informational base and principles of the justice assessment, e.g. Sen 1979) and the instruments of justice.

Third, we use the conceptual structure of justice to ask, how can we specify a conception of sustainability justice as regards the community of justice, the judicandum, the metric and the instruments of justice?

Conceptions of both sustainability and justice are always and necessarily based on a certain set of basic assumptions, on a certain basic construction of the world (Baumgärtner et al. 2008). The diversity of these conceptions derives partly from their diverging underlying assumptions. We focus onontologicalassumptions, referring to issues as the understanding of the human being, of nature, and of the society-nature-relationship, and onepistemological assumptions, referring to questions such as: What can we know, especially about the future? How can we learn? Where do we encounter systemic ignorance? In this paper, we aim to show exemplarily how different conceptions of sustainability and justice rely on different ontological and epistemological assumptions and what this means for a conception of sustainability justice.

Our analysis proceeds at two levels of specificity. On anabstract, conceptual level, we develop a formal framework for the concepts of sustainability and justice, respectively, and for how they could be combined to yield different conceptions of sustainability justice. On thespecific level, particular conceptions of justice and of sustainability are discussed. These particular conceptions not only serve as examples to illustrate a particular point, e.g. a particular element of justice, but are also meant to back up and reinforce the abstract argumentation in a more synthetic way: By showing that several important conceptions of justice, include that certain element, we can show that this element is indeed an important component of the concept of justice.

We demonstrate that the modern sustainability concept entails specific and partly new challenges of justice in regard to the community of justice, the judicandum, the metric and the instruments of justice, and that this requires some modifications of established theories of justice in order to adequately analyse issues of justice in the context of sustainability. We identify a number of

cogent conclusions for some elements of the syntax, and possible ranges of answers (depending on the underlying ontological and epistemological assumptions) for other elements.
First, we find that the community of justice needs to be substantially extended to cover the current generation on a global scale, future generations and potentially non-human beings as claim holders. One needs to properly define the claims of all members in the community of justice depending on assumptions about what matters to the claim holders, e.g. with regard to a decent life and security. Second, today's humans as claim addressees are simultaneously confronted with claims by contemporaries, future humans, and nature. As the three kinds of claims and corresponding duties possibly conflict, a conception of sustainability justice needs to address these conflicts. Third, most relationships between claim holders and claim addressees are asymmetric in terms of power and abilities, and are mediated by mechanisms such as the global economy or the environment. Fourth, uncertainty and ignorance call for a dynamic understanding of claim addressees as well as for duties of the current generation not to increase risk and uncertainty.
We further argue that judicanda (that which is to be judged as just or unjust) should include persons, actions, and ? most importantly ? institutions (or meta-structures). In terms of the metric, the definition of the right «informational base» for the justice assessment depends on the specification of the different claims of justice attributed to the different claim holders. The informational base for different kinds of justices might need to be different. Because of the asymmetries involved in the sustainability relations, principles of proportionality (e.g. according to ability to act) and priority might be more appropriate than principles of equality.
We consider different instruments of justice such as individual education (learning) and the reform of meta-structures (and with this, societal institutions, systems, and organizations). In more detail, one could think about (i) education for sustainability by different means and by different institutions, (ii) organizational reforms e.g. by ethical instruments such as CSR (iii) societal reforms by political instruments. Sustainability justice might also require (iv) the reduction of complexity of certain systems, and the foregoing of technologies that could cause further uncertainties.
Each specific conception of sustainability justice is based on certain understandings of sustainability and of justice and, indirectly, on their underlying ontological and epistemological assumptions. Many of the proposals put forward in the literature, however, are not explicit about their underlying assumptions (Spash 2012). We argue that these sets of assumptions should be consistent across the different elements and advocate the more explicit discussion of the basic constructions of the world that underlie different understandings of justice and sustainability.
Our approach of interpreting sustainability as justice at the conceptual level helps to systematically understand the different possibilities for specifications of the normative content of sustainability, depending on the set of underlying basic ontological and epistemological assumptions. For example, a specification of claims, claim holders and claim addressees allows to clarify goals and responsibilities for sustainability policies. Another example is that considering certain forms of uncertainty and ignorance leads to different forms of instruments for sustainability justice than adopted when assuming certainty. Concluding, the systematic and general conceptual framework proposed here could be useful both for research programs and for policy programs aiming to contribute to sustainability.
References
Baumgärtner, S., C. Becker, K. Frank, B. Müller and M. Quaas (2008): Relating the Philosophy and Practice of Ecological Economics.Ecological Economics67: 384-393.
Baumgärtner, S., S. Glotzbach and K.H. Stumpf (2012):What is Justice?Lecture Notes (in German), Univ. of Lüneburg.
Becker, C. (2012):Sustainability Ethics and Sustainability Research. Dordrecht: Springer.
Christen, M. and S. Schmidt (2012): A Formal Framework for Conceptions of Sustainability - a Theoretical Contribution to the Discourse in Sustainable Development.Sustainable Development20(6): 400-410.
Daly, H. (1977):Steady-State Economics, San Francisco: W.H. Freeman.
Pogge, T. W. (2006): Justice. In: D. M. Borchert (ed),Encyclopedia of Philosophy. USA: Macmillan.
Sen, A.K. (1979):Equality of What?In: The Tanner Lecture on Human Values, vol. I, Cambridge: Cambridge University Press, 197-220.
Spash, Clive L. (2012): New foundations for ecological economics.Ecological Economics77, 36?47.

Combining environmental justice and historical/ institutional approaches to analyse big water projects in semi-arid regions : a case study in Northeastern Brazil.

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The project to divert part of the waters of the São Francisco River to the semi-arid region of northeast Brazil ("Projeto de Integração do Rio São Francisco com Bacias Hidrográficas do Nordeste Setentrional") has been one of the biggest socio-environmental conflicts in Brazil's history. The alleged purpose of this ?megaproject' is to ease the economic development of a water-short region, to bring freshwater to poor households of the ?semi-árido', and to democratise access to water by a broad spatial redistribution (MIN 2004). Despite unambiguous pro-poor narratives and packaging by the Federal Government, the project is viewed by many as a source of wealth concentration and an ecological and social nonsense (Suassuna 2011, Said 2009, WWF 2007, Ribeiro 2007). Indeed, the great bulk of diverted water will benefit thirsty urban areas and industries, and export-oriented agriculture controlled by big landowners. Such a patent injustice explains why a powerful grassroots movement has been fighting against the project during several years, pursuing social and environmental justice (Bouzada 2011, Andrade 2006, Martínez-Alier 2003).
Adequately describing the full swing of issues entailed by such a project and its inscription in a specific historical and institutional context, it is necessary to understand how water scarcity was constructed and what are the specific institutional arrangements governing water access and management in the concerned region. Although the region presents some genuine peculiarities (Bursztyn 2008, Tavares 1998, Castro 1992), particularly as far as power relations are concerned, the water issue is in some respects similar to that of other semi-arid regions, be it in developing countries or in developed ones. The same problematic of water scarcity construction and mega water-transfers occurs for instance in Spain (Clarimont 2010, Buchs 2012). We can therefore build upon some existing work on water diversion issues in semi-arid regions to propose a relevant analysis framework for our case.
In order to build a theoretical approach well suited for the analysis of big water projects in emerging countries, we propose to complement the institutional framework proposed by Buchs (2012) and to articulate three distinct theoretical approaches : historical/classical institutionalism (, justification theory (Boltanski and Thevenot 1992) and environmental justice (Schlosberg , Martinez-Alier 2003).
While the first is well suited for analysing the roots of the conflict and the social construction of scarcity in the Northeast region, the second permits us to understand the meta-ethical drivers of the diverging views in the conflict, and the third sheds light on some original movements/claims These three approaches are complementary, but they have hardly been mixed in ecological economics or institutionalist works ; articulating them in a historical/institutional framework allows us to reach a better understanding of distributional issues in their institutional context. The proposed framework may apply to other cases and help to better understand typical issues related to massive water diversion projects in semi-arid areas.

Aguilera-Klink, F., E. Pérez-Moriana and J. Sánchez-García, (2000) The social construction of scarcity. The case of water in Tenerife (Canary Islands),Ecological Economics,Vol. 34, pp. pp. 233-245.

Andrade, R. M. T. d. (2006). The Third Bank of the Lower São Francisco River: Culture, Nature and Power in the Northeast Brazil 1853-2003. Energy and Resources, University of California, Berkeley. Vol. PhD Thesis.

Boltanski, L. and L. Thévenot (1991). De la justification. Les économies de la grandeur., Gallimard

Bouzada, F. V. L.(2011). Entre o Abstrato e o Concreto: Legados do Embate sobre o Projeto de Integração do São Francisco ou da Transposição. Departamento de Pos-Graduação em Ciência Politica. Brasilia, Universidade de Brasilia. Vol. Dissertação de Mestrado p. 200.

Buchs, A., (2010) La construction sociale de la pénurie en eau à Almeria (Andalousie) ou l'échec de la normalisation "hydrauliciste",Cahier de recherche du LEPII,Vol. 36.

Buchs, A., (2012), Observer, caractériser et comprendre la pénurie en eau. Une approche institutionnaliste de l'évolution du mode d'usage de l'eau en Espagne et au Maroc. Thèse de Doctorat, Université de Grenoble.

Bursztyn, M. (2008). O poder dos donos: planejamento e clientelismo no Nordeste. Rio de Janeiro, Garamond

Castro, I. E. d. (1992). O Mito da Necessidade. Discurso e Prática do Regionalismo Nordestino. Rio de Janeiro, Bertrand Brasil

Clarimont, S., (2010) Le transfert d'eau: radioscopie de la contestation du projet de connexion Èbre-Llobregat (Espagne), in Graciela Schneier-Madanes ed.,L'eau mondialisée. La gouvernance en question., (Paris, 2010), pp. pp. 255-273.

Martínez-Alier, J. (2003). The Environmentalism of the Poor: A Study of Ecological Conflicts and Valuation, Edward Elgar Publishing.328

MIN (2004). Relatorio de Impacto Ambiental - RIMA. Projeto de Integração do Rio São Francisco com Bacias Hidrograficas do Nordeste Setentrional, Governo Federal, p. 136.

Said, M. (2009). Transposição do Rio São Francisco ? a outra margem da história. Fortaleza

Schlosberg, D., (2004) Reconceiving Environmental Justice: Global Movements And Political Theories,Environmental Politics,Vol. 13, pp. pp. 517-540.

Suassuna, J. (2011). Transposição do Rio São Fancisco na perspectiva do Brasil real, Porto de Ideias Editora.237 p.

Tavares, M. d. C. (1998). Seca e poder: entrevista com Celso Furtado, São Paulo, Fundação Perseu Abramo

WWF (2007). Pipedreams? Interbasin water transfers and water shortages, WWF, p. 49 p.

The relationship between intragenerational and intergenerational justice in the use of ecosystems and their services. An ecological-economic model.

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Summary:
Conflicts between intragenerational and intergenerational justice in the use of ecosystems and their services may arise in the design and implementation of sustainability policy. We present a model that depicts the relationship between intragenerational and intergenerational justice (? justice-relationship') against the backdrop of given ecological, economic and societal circumstances. These system determinants include the quality and quantity of ecosystem services, population development, substitutability of ecosystem services, technological progress, institutions, and political restrictions on redistribution. With this model, we numerically simulate how different assignments of resource utilization rights to potential ecosystem users impact on the justice-relationship depending on system determinants.

Abstract:

Realizing a sustainable use and conservation of ecosystems and their services is a major challenge for human society (MEA 2005, TEEB 2010a, UN/DESA 1992, UNEP 2012). Its implementation in global, national and local sustainability policy demands to account for the variety of ecosystem services: They can be provisioning, regulating, cultural or supporting services; substitutable and non-substitutable by human-made goods and services; excludable or non-excludable from use; consumptive or non-consumptive; rival or non-rival in consumption. Intragenerational trade-offs in the provision of different ecosystem services by one renewable resource stock (e.g. between wood provision and recreational services provided by a forest), as well as intergenerational trade-offs between the consumption of ecosystem services by today's persons and the conservation of renewable resource stocks for future persons (e.g. between present provision of agricultural goods and the maintenance of fertile soils for future agricultural production) may occur (cf. TEEB 2010b: 81ff.). These potential trade-offs ask for careful recognition of the underlying linkages between renewable resource stocks and ecosystem services. The societal objective of sustainability in the use of ecosystem services refers to two different justices of equal normative rank: intragenerational justice and intergenerational justice. In the design and implementation of sustainability policy, these two justices potentially conflict. Generally, three relationships in the attainment of the two justices (?justice-relationships') occur in real-world contexts: independency, facilitation and rivalry (Glotzbach and Baumgärtner 2012).

Although considerable research has studied problems of intergenerational justice in renewable resource use (specifically under the maximin-criterion in the spirit of Rawls' second principle of justice, e.g. Cairns and Tian 2010, Martinet 2007), rather less attention has been paid to simultaneous investigation of intragenerational and intergenerational problems in renewable resource use (cf. e.g. Roemer and Veneziani 2007). In this paper, we aim for a systematic investigation of the ?justice-relationship' against the backdrop of given societal circumstances,. focusing on environmental justice ? that is, justice in the distribution of access rights to ecosystem services (Glotzbach, forthcoming).

In the two-period model, individuals maximize their utility from a manufactured consumption good and two ecosystem services delivered by a renewable resource stock, a consumptive and a non-consumptive ecosystem service. The policy instrument (instrument of justice) is the assignment of first- and second-generation utilization rights to the renewable resource stock by a social planner. The given societal circumstances are depicted by certain system determinants: the quantity of ecosystem services (i.e. the total endowment with the renewable resource stock

and its intrinsic growth rate), the quality of ecosystem services (consumptivity, rivalry in consumption and excludability from consumption), population development, substitutability of ecosystem services (both between manufactured-good consumption and aggregate ecosystem-service consumption, and between a consumptive and a non-consumptive ecosystem service), technological progress (in the manufacturing sector and in resource harvesting), and political restrictions on the assignment of resource utilization rights. The degree of intragenerational (resp.: intergenerational) justice in ecosystem-service use is measured in terms of the Rawlsian Difference Principle regarding the individual utilities attained by the first-generation individuals (resp.: the first- and second-generation individuals). We define efficiency in the assignment of utilization rights regarding the two objectives of intragenerational and intergenerational justice (Baumgärtner et al. 2012).

With this model, we numerically simulate how different assignments of resource utilization rights to potential ecosystem users give rise to different combinations in the degree of attainment of intra- and intergenerational justice (?justice opportunity set'). We identify efficient and inefficient assignments of resource utilization rights for given system determinants, and illustrate how (in) efficiency is related to rivalry, independency and facilitation in the justice-relationship.

The contribution of this paper is twofold: First, it systematically represents the main elements of the ?justice-relationship' and their interactions in an ecological-economic model ? including the societal circumstances of the ?justice-relationship' and a differentiated description of ecosystem services (i.e. regarding mode of production, substitutability, excludability from use, consumptivity and rivalry in consumption). Second, this model provides a tool to systematically analyze the interdependencies between the objectives of intragenerational and intergenerational justice in ecosystem use.

Baumgärtner, S., S. Glotzbach, N. Hoberg, M.F. Quaas and K.H. Stumpf 2012. Economic analysis of trade-offs between justices. Intergenerational Justice Review, 1/2012, 4?9.

Cairns, R. D. and H. Tian 2010. Sustained development of a society with a renewable resource. Journal of Economic Dynamics and Control 34 (6), 1048?1061.

Glotzbach, S., forthcoming. Ecosystem services and distributive justice. Considering access rights to ecosystem services in theories of distributive justice. Ethics, Policy & Environment.

Glotzbach, S. and S. Baumgärtner 2012. The relationship between intragenerational and intergenerational ecological Justice. Environmental Values 21(3), 331?355.

Martinet, V. 2007. A step beside the maximin path: Can we sustain the economy by following Hartwick's investment rule? Ecological Economics 64 (1), 103-108.

MEA ? Millennium Ecosystem Assessment 2005. Ecosystems and Human Well-being. Washington D. C.: World Resources Institute.

Roemer, J. and R. Veneziani 2007. Intergenerational justice, international relations and sustainability. In: Intergenerational Equity and Sustainability. Edited by J. Roemer and K. Suzumura. Basingstoke, Hampshire u.a.: Palgrave Macmillan.

TEEB 2010a. The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: Synthesis of the Approach, Conclusions and Recommendations of TEEB.

TEEB 2010b. The Economics of Ecosystems and Biodiversity. Ecological and Economic Foundations. Edited by P. Kumar. London, Washington D. C.: Earthscan, Chapter 2.

UN/DESA ? United Nations Department of Economic and Social Affairs, Division for Sustainable Development 1992. Agenda 21: Earth Summit ? The United Nations Program of Action from Rio. New York.

UNEP ? United Nations Environment Programme 2012. Global Environment Outlook 5: Environment for the Future We Want. UNEP, Nairobi, Kenya.

Fair and equitable governance? Procedural justice in the negotiations on the Nagoya Protocol

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A fair international agreement on genetic resources benefit-sharing will be better approached by a fair and equitable decision-making process. The Nagoya Protocol is not perceived as fair, despite the formal equality of the participants and the relative success of the agenda-setting strategy of the Least Developed Countries. This paper envisages the possible sources of the alleged unfairness of the decision-making process. Aside the conditions of formal (right to vote) and background equality (financial resources) of the participants, it envisages to what extent the autonomy and the margin of action of the participants can also be affected by the way they fit to the conditions ofparticipatory justice. The paper tries finally to envisage to what extent the conditions of participatory justice are legitimate.

Including justice in institutional analysis - How do frameworks for institutional analysis consider ideas of justice?

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Summary
We propose to include dimensions of justice more explicitly into institutional and policy analysis of environmental governance. Therefore, we investigate how alternative frameworks for the analysis of environmental institutions (Ostrom 2005; Vatn 2011; Young 2008) address concerns of justice. More specifically, we ask: (1) Which dimensions and elements of justice are relevant for institutional analysis and design? (2) Do these dimensions appear in existing frameworks for institutional analysis? And (3) if not, can these frameworks be adapted to include core elements of justice? We develop a check-list of different dimensions and aspects of justice and find that the investigated frameworks, although not explicitly excluding questions of justice, do not fully exploit their potential to consider different dimensions and categories of justice.

Extended Abstract

Questions of justice, fairness and equity are at the heart of democratic and legitimate environmental governance and law (Franck 1995). While notions such as environmental justice and climate justice receive increasing attention in public and political discourses, there is little discussion of the structure, outcomes and impacts of policies and institutions related to justice. Nevertheless, «justice is unavoidable» (Shue 1992) and is treated as a key variable for legitimate and acceptable policies (Sunshine and Tyler 2003, Young 1999). Researchers have thought about the ideal solutions both for procedural and distributive justice in environmental policies; most recently with an emphasis on global climate governance (e.g. Gardiner 2004, 2010, Okereke 2008). Yet, institutional and policy analysis seem to provide no, or only a limited account of justice implications. This gap has been highlighted, for example, in the Earth System Governance Science Plan, which outlines a broad research agenda for the global social science community (Biermann et al. 2009).

In this paper, we investigate how alternative frameworks for the analysis of institutions- the IAD framework by Elinor Ostrom, the Environmental Governance framework by Arild Vatn, and the Diagnostic Approach by Oran Young - address different elements of justice. More specifically, we ask: (1) Which elements of justice are relevant for institutional analysis and design? (2) Do these dimensions appear in existing frameworks for institutional analysis? And (3) if not, can these frameworks be adapted to include core elements of justice?

As a background to our analysis, we examine the justice literature coming out of political philosophy, the global climate justice discourse and local issues in the context of the environmental justice movement. Based on this combination of philosophical theory and practical discourses, we identify a set of dimensions and elements of justice as a «checklist» to analyze different institutional analysis frameworks. The checklist addresses questions such as the following:

-What units of analysis that are relevant to justice are addressed in the framework? Which judicanda (that which is to be judged as just or unjust) can be addressed (e.g. individual or collective actors, actions and omissions, institutions or states of the world, Pogge 2006)?

-How explicit does the framework make norms and values (or even particular ethical theories) underlying it or addressed in it?
-Can the different domains of justice such as procedural justice, distributive justice, corrective justice, retributive justice, justice-in-exchange and political / structural justice be investigated within the framework? Can power structures be made visible?
-Does the framework include particular principles of justice, such as the Precautionary principle, the No-harm principle, Equality, Historical and causal responsibility, Ability to pay, NIABY (Not in anybody's backyard), etc.?
-Are issues of scale included, such as different impacts of policies on different spatial levels?
-Does the framework provide a «metric» of justice? Does the framework consider different performance standards? Does the framework include tools to measure the distribution of impacts? Does the framework generate data on income, utility, capabilities or other informational bases?
-Does the framework allow to address questions of trade-offs between different justice goals, or between justice and other goals (such as regime effectiveness or efficiency)?
-Does the framework allow to identify claim holders and duty-bearers of justice claims?
- Does the framework identify «instruments» of justice? Does it make suggestions of how to make processes, outcomes, impacts more just?
We show that although none of the three frameworks was explicitly designed to address aspects of justice, they all offer entry points for the analysis of justice. In the IAD framework by Ostrom, the clearest link to justice is in the evaluative criteria. In the Diagnostic Approach by Young, justice enters both as a condition of successful regime formation and as a performance criterion. In Vatn's Environmental Governance framework, the clearest link to justice regards the rules of access and interaction.
Rules / institutions and their outcomes and impacts qualify as units of analysis or judicanda in all three frameworks. All three frameworks account for different social norms, practices and rationales that could include norms of justice. In all of them, it is also possible to find entry points for consideration of procedural justice (in terms of the inclusion and exclusion of actors) and distributive justice concerns (in terms of evaluative / performance criteria (Ostrom, Young) or linked to rules of access (Vatn)). All frameworks are applicable at different scales.
Links to other aspects of justice (such as power, political justice, trade-offs and principles of justice) are less evident or entirely missing in one or two of them. All three frameworks are too broadly designed and abstract to include metrics or instruments of justice, or details on claim holders and duty bearers of justice claims. Such specific aspects can only be addressed in combination with particular theories of justice.
We find that all three investigated frameworks do not fully exploit the potential to include matters of justice. Some general conclusions for including justice in institutional analysis can be drawn. One important aspect is to include reference to power relations into an institutional analysis of justice. Furthermore, for any substantive assessment of justice, the institutional analyst has to be explicit and transparent about the ethical background and the principles of justice the analysis builds on.
Additionally drawing on some of the limited examples of applied studies which examined justice as part of an institutional analysis, we provide further ways to improve the analysis of justice in institutional analysis frameworks.
References
Biermann, F., Betsill, M.M., Gupta, J., Kanie, N., Lebel, L., Liverman, D., Schroeder, H. and B. Siebenhüner 2009.Earth System Governance: People, Places and the Planet.Science and Implementation Plan of the Earth System Governance Project. Earth System Governance Report 1, IHDP Report 20. Bonn, IHDP: The Earth System Governance Project.
Franck, T. 1995.Fairness in international law and institutions.Oxford: Clarendon Press.
Gardiner, S.M. 2004. Ethics and global climate change.Ethics, 114 (3), 555?600.
Gardiner, S.M. 2010. Ethics and climate change: an introduction.Wiley Interdisciplinary Reviews: Climate Change, 1 (1), 54?66.
Okereke, C. 2008. Equity Norms in Global Environmental Governance.Global Environmental Politics8 (3), 25?50.
Ostrom, E., 2005.Understanding institutional diversity. Princeton University Press.
Pogge, T.W. 2006. Justice. In: Borchert, D.M., ed.Encyclopedia of philosophy. 2nd edition, Detroit: Macmillan Reference USA, 862?870.
Shue, H. 1992. The unavoidability of justice. In: Hurrell, A. and B. Kingsbury, eds.The International politics of the environment, actors, interests, and institutions. Oxford: Clarendon Press, 373?397.
Sunshine, J. and T.R. Tyler 2003.The Role of Procedural Justice and Legitimacy in Shaping Public Support for Policing.Law & Society Review, 37 (3), 513?548.

Vatn, A. 2011. Environmental Governance ? A Conceptualization. In Kjosavik, D. and P. Vedeld, eds.The Political Economy of Environment and Development in a Globalized World. Exploring the Frontiers.Trondheim: Tapir Academic Press, 131?152.
Young, O.R. 1999. Fairness matters. The role of equity in international regime formation. In: Low, N. ed.Global Ethics and Environment. London: Routledge, 247?263.
Young, O.R. 2008. Building Regimes for Socioecological Systems: Institutional Diagnostics. In: Young, O.R., King, L.A. and H. Schroeder, eds.Institutions and Environmental Change. Cambridge: MIT Press, 115?144.

Water No Get Enemy. How Could Water Security Shape Sustainable Water Governance?

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Summary
This paper discusses the architecture of a framework aiming at consolidating the concept of water security particularly thanks to the contribution of socio-ecological economics. At first this paper takes for granted that water security offers an innovative and relevant perspective to address the issue of the sustainability of the society/resources nexus. However its lack of substance and its protean nature are obvious. In order to exploit its full reformative potential, we propose an analysis based on social-ecosystemic interdependencies and, finally, on the co-production of a robust adaptive regime. The sustainability of water governance is considered from a multi-scalar perspective, taking into account territories, agents and institutions.
Keywords: Water security; governance; institutions; socio-ecological systems; sustainability.
Abstract
This research postulates the theoretical and the empirical requirement of using the embryonic notion of water security; validating the plea launched by Bogardi et al. (2012): «water security in the 21st century will require better linkage of science and policy, as well as innovative and cross-sectoral initiatives, adaptive management and polycentric governance models that involve all stackholders». As such the closing speech of the 6th World Water Forum (in March 2012) given by Loïc Fauchon (World Water Council President) sounds like an imperative: water security must participate in defining a framework guiding water policies. These statements of principle are straightforward. Nevertheless in order to overcome its current state of «nirvana concept » (Molle, 2008) we should first give substance to the concept of water security and, secondly, we need to grasp its genesis and rise from a critical perspective. A clear-cut characterization of the notional field built on this concept (proponents' identity and weight, nature of their interactions) and a robust analysis of the issue enable us to specify the nature of its contribution to the literature (be it analytical, ontological, theoretical, etc.).
The canonical definition of water security was provided by the Global Water Partnership in 2000: «water security at any level from the household to the global means that every person has access to enough safe water at affordable cost to lead a clean, healthy and productive life, while ensuring that the natural environment is protected and enhanced». As shown by van Hofwegen (2009), this definition remains focused on individual water use in an environmental context (anthropocentric approach): it does not take into account productive uses and it prioritizes social and environmental imperatives. This is why, from a more comprehensive and sustainability-oriented perspective, Cook and Bakker (2012) suggest crossing both imperatives of ecosystem health and human health and redefining the arrangements shaping water governance.
This double orientation constitutes the starting point of our research whose general objective is to strengthen the concept of water security via the theoretical corpus of socio ecological economics (Norgaard, 1994; Spash, 2012) to grasp the concept as an ecological and societal issue. It is particularly relevant to question the kind of governance associated with this concept. Indeed water security seems to be operational to address the diverse challenges of water governance. Nevertheless operational and technical choices traditionally induced by water security stumble over two hurdles: they ignore the complexity of the local situations to be regulated and avoid the determination of «collective choice rules» (Ostrom, 2005).
More fundamentally we consider that the emphasis put on water security in recent years reveals a shift of research on the adaptation of socio-ecosystems, leading to an increasing assertion of the primacy of «command and control» governance regimes. In response to the attempt to « divide» (Hodson & Marvin, 1997) the issue of resource securitization, we propose an analysis based on socio-ecosystem dependencies and, finally, on the co-production of a robust adaptive

regime.
In sum, we show that water security implies a socio-ecological co-evolutionary process that links environment, values, organizations, knowledge and technology (Swaney, 1987; Kallis & Norgaard, 2010) involving an iterative, participatory and polycentric governance of social-ecological systems (Ostrom & Janssen, 2004). In an adaptive regime characterized by a multitude of decentralized learning processes, the appropriation of the political construction of a common future becomes the central issue.
Institutionalist approaches in terms of «reflexive governance» (Brousseau et al., 2012), «adaptive management» (Pahl-Wostl et al., 2010) or «democratic experimentalism» (Cohen & Sabel, 1997) appear to be useful. Firstly this kind of approach relies on the self-regulation capacities of systems of agents at the local level (mutual learning from successes and failures). Secondly these approaches help in understanding the whole system's capacity, in terms of institutional monitoring safeguards, to mitigate the vulnerability generated by decentralized solutions. Thus regulatory power plays a new essential role, which departs from the traditional functions assumed in a « command and control» regime: it must ensure the coupling of decentralized organizational learning and institutional dynamics.
In order to build an analytical framework to address the issue of water security in a sustainability-oriented perspective, we will proceed in three stages. At first this paper attempts to analyze the different meanings of water security. We show that its polysemy generates a lack of substance and operability (Norman et al., 2010). The two following stages are more theoretical. The second stage proposes to test the potential of a theoretical approach that crosses institutionalist and ecological economics. Finally the third stage concludes this research by identifying black spots that remain with the application of the theoretical framework to this concept. This step aims at guiding future research on this issue.
Indicative bibliography
Bogardi J.J. et al., 2012. «Water Security for a Planet under Pressure: Interconnected Challenges of a Changing World Call for Sustainable Solutions», Environmental Sustainability, n° 4, pp. 35-43.
Brousseau E. et al. (eds.), 2012. Reflexive Governance for Global Public Goods, MIT Press, Cambridge.
Cohen J. & Sabel C.F., 1997. «Directly-Deliberative Polyarchy», European Law Journal, n° 3-4, pp. 313-342.
Cook C. & Bakker K., 2012. «Water Security : Debating an Emerging Paradigm», Global Environmental Change, n° 22, pp. 94-102.
Global Water Partnership, 2000. Towards Water Security: A Framework for Action, Global Water Partnership, Stockholm.
Hodson M. & Marvin S., 2007. «Urban Ecological Security: A New Urban Paradigm?», International Journal of Urban and Regional Research, vol. 33, n° 1, pp. 193?215.
Hofwegen P. van, 2009. «Capacity Challenges on the Path towards Water Security», In Alaert G.J. & Dickinson N.L. (eds.), Water for a Changing World ? Developing Local Knowledge and Capacity, UNESCO-IHE, Delft, pp. 201-213.
Kallis G. & Norgaard R.B., 2010. «Coevolutionary Ecological Economics», Ecological Economics, n° 69, pp. 690-699.
Molle F., 2008. «Nirvana Concepts, Narratives and Policy Models: Insights from the Water Sector », Water Alternatives, vol. 1, n° 1, pp. 131-156.
Norgaard R.B., 1994. Development Betrayed: the End of Progress and a Coevolutionary Revisioning in the Future, Routledge, London.
Norman E. et al., 2010. Water Security: A Primer Program on Water Governance, UBC, Vancouver.
Ostrom E., 2005. Understanding Institutional Diversity, Princeton Press, Princeton.
Ostrom E. & Janssen M., 2004. «Multi-level Governance and Resilience of Socio-ecological Systems» In Spoor M. (ed.), Globalisation, Poverty and Conflict, Kluwer Academic Publishers, Kluwer, pp. 239-259.
Pahl-Wostl C. et al., 2010. «Analyzing Complex water Governance Regimes: The Management and Transition Framework», Environmental Science & Policy, vol. 13, n° 7, pp. 571-581.
Spasch C., 2012. «New Foundations for Ecological Economics», Ecological Economics, n° 77, pp. 36-47.
Swaney J.A., 1987. «Elements of a neoinstitutional environmental economics», Journal of Economic Issues, vol. 31, n°4, pp. 1739-1779.

Adding realism in river basin management planning ? a practical tool for costing diffuse phosphorus loading reduction in Finnish catchments

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Summary:

European Union's Water Framework Directive requires that in principle all water bodies should achieve good ecological status at latest within year 2027. A spreadsheet tool was developed to identify the cost-effective solutions at a catchment scale in Finland. The tool is designed to meet the needs of the regional river basin management planning in Finland. It can be used to compare single measures by their cost-effectiveness or by their achievable phosphorus reduction rate. In addition combinations of measures can be built and compared by their costs and reductions. Uncertainty analysis of the tool is carried out with Monte Carlo ?simulation. The tool has been piloted in 7 different Finnish river basins during 2011-2012. The case studies have shown that the tool can be used to allocate the financial resources better and that the tool adds realism in river basin management planning.

Abstract:

European Union's Water Framework Directive (WFD) requires that in principle all water bodies should achieve good ecological status at latest within year 2027 using cost-effective combinations of measures. For the implementation of WFD including the cost-effectiveness analysis new kind of tools for river basin management planning are needed.

A practical spreadsheet tool, named KUTOVA, was developed to identify the cost-effective solutions at a catchment scale in Finland. The tool is designed to meet the needs of the regional river basin management planning in Finland. The aim was to build a tool that can be actually used independently by the experts working with the regional river basin management planning. At the moment, the KUTOVA-tool contains 19 different measures for reducing phosphorus loading from agriculture, forestry, scattered settlement and peat mining.

The KUTOVA-tool combines and utilizes existing loading models like the hydrological water quality model (WSFS-VEMALA), a land use based loading model for Finnish catchments (VEPS) and the tool for allocation of measures to control erosion and nutrient loading from Finnish agricultural catchments (VIHMA). The maximum extents of the measures are defined using available geographical information data and VIHMA tool. Reduction rates for the measures to reduce loading from agriculture are also calculated using VIHMA tool. For the other measures reduction rates have been determined using the literature. The costs for the measures are defined in national groups of experts of different sectors of diffuse loading (agriculture, forestry, scattered settlement).

The cost-effectiveness of a measure (i) is stated as a price tag for reduced phosphorus kilograms (?/P kg). The cost-effectiveness (CEi) is calculated using following formula:

$CEi = Ci/Ei = CUiAi/RiLi$ (1)

where Ci is the cost of the measure in euros when the measure is applied in its maximum extent. It is calculated by multiplying the maximum extent or area of the measure (Ai) in the catchment with the cost per unit of the measure (CUi). Ei is the achievable phosphorus reduction of the measure in kilograms when the measure is applied in its maximum extent in the catchment. This is calculated by multiplying the phosphorus loading reduction percentage of the measure (Ri) with the input loading of phosphorus in kilograms (Li) to the area of the measure when it is applied in its maximum extent to the catchment.

The KUTOVA-tool can be used to compare single measures by their cost-effectiveness or by the share of phosphorus reduction that can be achieved when the measure is applied in its maximum extent.

The KUTOVA-tool also enables to build combinations of measures and analyze the most cost effective solution of these combinations. As a starting point a certain phosphorus rate or maximum budget can be used. When a measure is added to this combination, its effect on the input loading of the other measures is taken into account. The most cost-effective combination of measures

can be achieved by applying the measures at their maximum extent in the order of their cost-effectiveness, starting from the most cost-effective measure [Figure 1]. It is possible anyhow to choose another, more realistic, extent of the measure and compare different kind of combinations. The total costs and effects on the loading are calculated for selected the combination of measures.
Figure 1. The principle of selecting the most cost-effective combination of measures
Uncertainties related to the variables of the KUTOVA-tool have been recognized and therefore ranges of the input values used in the calculations have been determined. Uncertainty analysis of the tool is carried out with Monte Carlo ?simulation changing all the variables randomly between defined minimum and maximum values.
The KUTOVA-tool has been piloted in seven catchments in seven different Finnish river basins durin 2011-2012. These catchments have been divided into sub catchments and the tool has been applied to these sub catchments as well. The catchments differ in soil, land use, slope and lake percent. These characteristics have effect on the cost-effectiveness of the measures. Thus different catchments have different outcomes for the most cost-effective measures. The case studies have shown that the tool that the tool adds realism in river basin management planning by giving estimates of the achievable phosphorus loading reductions at certain costs. To support the policy making of river basin management these costs or achievable reduction rates can be compared to the reductions needed in phosphorus loading in order to achieve the goal of the good ecological status in surface waters. The tool can be used to allocate the financial resources better. In addition the tool has proved to be a useful tool to support discussion with stakeholders.
The KUTOVA-tool has been piloted and will be introduced to the 2nd river basin management planning period of the WFD in Finland. Further development needs for the tool have been identified. For example the calculation of the effect of the selected measures to the nitrogen loading will be included to the model in the future.

A network perspective on agricultural watershed governance. The case of the Local Agri-Environmental Schemes (LAES) in France.

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The EU Water Framework Directive sets the objective of achieving good water status for all surface waters and groundwater by 2015. A more integrated approach by defining the river basin as the basis for water management is promoted and the participation among all concerned parties encouraged (European Union, 2000).Watershed governance typically relies on inter-organizational networks whose structure is likely to influence the success of cooperation. An emerging body of literature seeks to analyze the role of networks in natural resource management (Carlsson and Sandström, 2008; Bodin and Crona, 2009). This paper aims at developing a research frame to assess the effects of the structure of inter-organizational networks on the outcomes of watershed governance. We focus on a specific type of watershed partnership implemented in France in the frame of European agri-environmental policy with the aim of limiting agricultural nonpoint source pollution: the Local Agri-Environmental Schemes (LAES).

In a first section, the paper reviews the literature adopting a network perspective on natural resource governance. Second, the LAES and some first empirical evidence about the role of networks in their implementation are presented. Finally, the insights provided by the literature are used to formulate assumptions to be tested in future work. A strategy for data collection is also presented.

Networks and Natural Resource Governance (NRG)

The literature adopting a network perspective on NRG deals more particularly with collaborative management as an alternative to hierarchical coordination mechanisms characterizing centralized management. In the field of water management, collaborative arrangements take the form of formal or informal partnerships at the basin level and rely on personal or inter-organizational networks. These networks are believed to be better suited for addressing the collective action dilemmas involved in NRG (Carlsson and Sandström, 2008; Schneider et al., 2003).

However, scholars stress that not only the existence of collaborative networks but also their structure matters for the NRG outcomes (Bodin et al., 2006, Bodin and Crona, 2009). The relational configurations underlying watershed partnerships may affect the level of transaction costs through the development of trust and shared norms of cooperation and the mobilization of the resources needed to sustain cooperation.

The literature focusing on the influence of the structure of networks on NRG developed around the concept of social capital and most studies use Social Network Analysis methods (Knoke and Yang, 2008).

Burt (2000) identified two network mechanisms through which social capital affects the performance of individuals or groups. The "network closure" argument relies on the assumption that networks with many and strong connections will favour the development of trust and norms of reciprocity and thus performance. The "structural hole" argument is based on the advantage for individuals or groups to access new information or resources by being connected to other actors not previously linked within the network.

Carlsson and Sandström (2008) argue that well-performing co-management systems combine the two properties of closure and bridging across structural holes. On the one hand, network closure is assumed to reduce the transaction costs of collective action, i.e. decision-making costs and monitoring and enforcement costs of agreements. On the other hand, the existence of cross-scale linkages allows for the access and exchange of resources to support collective action.

Empirical studies support a positive effect of network closure on the success of collective action for the management of natural resources as well as the positive impact of bridging ties among various stakeholders on resource governance outcomes (Bodin and Cröna, 2009). The role played by the broader institutional environment in affecting the development of networks favouring cooperation is also highlighted (Schneider et al., 2003; Mandarano, 2009).

A case of agricultural watershed management: The Local Agri-Environmental Schemes

In France, the implementation of agri-environmental measures aiming at limiting non-point

source pollution in the period 2000-2006 was evaluated as having very limited effects on farmers' practices and water quality. First, farmers mostly chose to contract the less constraining measures, also those having less environmental impact. Second, the participation rate of farmers to agri-environmental schemes in a given area was often too low to induce a significant effect on water quality (AND International, 2008).

In order to support the achievement of the objectives set by the Water Framework Directive, a new type of agri-environmental scheme was initiated in 2007: the Local Agri-Environmental Schemes (LAES). These new schemes differ from the previous agri-environmental programs targeting water pollution (Gassiatet al., 2010). First, implementation areas are chosen to match the environmentally relevant scale, such as watersheds or drinking water catchments. Second, while agri-environmental schemes were previously managed jointly by state agencies and agricultural organizations, the formal coordination of LAES projects is open to other local stakeholders such as environmental associations, local governments or drinking water suppliers. Some first empirical evidence shows that the partnerships established by coordinators matter for the success of the LAES projects, suggesting a crucial role of the underlying networks. Defining and implementing an agri-environmental project implies for the local coordination to access information and resources from a variety of organizations, locally and at higher scales (Harreau, 2009). Further, the adoption by farmers of agri-environmental measures may depend on the information diffused by the local coordinator and by the trust developed with farmers (Louis and Rousset, 2010).

Research design

We assume that the structure of the inter-organizational networks underlying the governance of LAES projects affects their success. More precisely, we assume that:

(i) The level of network closure has a positive effect on the success of the LAES projects by lowering transaction costs linked to collective action.

(ii) The existence of bridging links among a variety of stakeholders at local, water-basin and regional scales affects positively the success of the LAES projects by facilitating the mobilization of necessary resources at the different implementation phases.

Further, the structure of networks is assumed to be affected by the institutional environment. Institutions are defined here as the formal and informal rules that prevail in a given context (North, 1990).The objective is to determine how institutional features can explain the observed network structures.

Methodologically, a two-step approach is considered. First, in-depth case studies of LAES projects will be realized in two French regions in order to refine the assumptions made. A comparative inter-regional approach will be carried out in order to take into account the effect of the different formal rules framing the implementation of LAES at this level. Interviews will be conducted with the LAES coordinators and other stakeholders involved in the implementation of LAES.

Second, the hypotheses will be tested econometrically on the basis of a larger scale database. Following Berardo (2009) and Scholz et al. (2010), we seek to identify the impact of network structure on the "performance" of agri-environmental projects. Two variables may capture the « performance»: the project selection at the regional level and the rate of participation of farmers to the schemes. Independent variables will include network structural properties and institutional factors (formal rules of implementation, norms of cooperation....).

It is expected that the approach combining institutional economics and social network analysis will shed light on water local governance, by highlighting the role of network structure and institutions in these processes.

Understanding policy-driven collective action to address challenges of European water management

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Community management of water resources in the EU is largely influenced by European, national or sub-national policies. The Common-Pool Resources (CPR) literature stresses the importance of governments in recognizing the right of direct users to manage local resources, but there is still a research gap on the drivers and implications of state intervention on local collective action. This paper addresses how state policies interact with collective action for water quality/quantity management in European rural areas.
The paper starts with a review of the literature addressing the different tools through which the state can exert an influence on cooperation at local levels. Using game theory, we model the incentive structure of different action situations underlying water management issues to specify how the state may intervene to promote collective action. The applicability of this analytical framework is then illustrated by means of five European empirical cases covering diverse action situations. A preliminary analysis of the results shows that, in the cases studied, the potential use of coercive power by the state is a constant, while being combined with different measures to lower transaction costs of collective action.

State intervention and collective action: a review
The State can be defined by its role in maintaining order on the basis of its monopoly right to coercion, in representing the overarching common interest and general will on behalf of its territorially delineated constituents and in overcoming freeriding on public goods through its taxing authority (North, 1988; Jessop, 1990).
In the CPR literature, self-regulation by users is seen as an alternative to direct coercion by the state and to market management, both options presenting limits. However, the role of the state in facilitating collective action is not limited to coercion but can take a variety of forms (see the review of Ostrom (1990) by Anthony and Campbell, 2011).
The state can exert an influence on cooperation through a perceived threat of intervention. In a variety of industries, firms have chosen to organize themselves into associations to set quality and safety standards in the advent of state regulation (Anthony and Campbell, 2011; Lyon and Maxwell, 2008). States can also provide tangible resources to facilitate the emergence of collective action. Recent examples in the field of irrigation management show that the use of incentives and investments in infrastructure can enhance the performance of irrigation organizations, particularly if farmers have been able to develop their own management system (Lam, 2001; Ostrom and Lam, 2010; Anthony and Campbell, 2011). States can confer legitimacy to bottom-up cooperative processes. One of Ostrom's (1990) design principles states that cooperating users groups are to enjoy a minimal recognition of rights to devise their own institutions. Finally, states can try «to transform perceptions of the costs, benefits and therefore interests of private actors in ways that either lead to or prevent cooperative behavior in the first place» (Anthony and Campbell, 2011, 290). This can be illustrated by the development of participatory tools for the design and implementation of policies and voluntary approaches to regulation (Alberini and Segerson, 2002).
While a number of studies have described the different roles the state can play in promoting cooperation for natural resource management, how specific state interventions relate to collective action situations and cooperation outcomes remains unclear.

Modeling collective action situations
Making the assumption that the specific policy intervention applied by the state depends on the characteristics of the collective action setting, we distinguish between three types of situations, using game theory.
Coordination games (e.g. assurance, chicken, battle of the sexes games) reflect situations where actors that share a natural resource are not assured of the strategy others will adopt. However, once additional knowledge on the strategy of one actor provides a focal point, collective action may ensue. The information provided does not change the relative payoffs of actors. In these situations, the state can promote communication or information exchange between

interdependent users to lower transaction costs, which may otherwise be prohibitive for coordinated action.
In a prisoner's dilemma type of situation, individual rationality leads to suboptimal outcomes. Perceptions about present and future pay-offs of individuals have to be changed in a long-lasting way. The state can make commitment of actors credible by penalizing defection or threaten with regulatory action where collective action does not succeed. Alternatively, the state can change the cost-benefit calculus by providing monetary or in-kind subsidies, in relation to favored coordinated strategies (Bowles, 2004).
In a third type of collective action situation, the gains from cooperation only become apparent at larger spatial scales or in different arenas. In zero-sum games, win-win situations between interdependent actors do not exist. By endorsing a compromise, the state may alter the political costs of different negotiation outcomes. The existence of spill-overs of benefits from coordination may be another important justification for the state to promote collective action. This can include positive externalities to other agents than those involved in the cooperation problem, or include an intertemporal dimension.

State intervention and collective action: insights fromcase studies in water management in agriculture

We apply our conceptual framework to five cases of collective action for water management in agriculture in Europe. Two cases correspond to cooperation for water management operations: the case of a drainage farmer association in Germany and the case of farmer associations for the reduction of nitrate pollution in France. One case is a consensus building in dam conflict in Aragon, Spain. The two last cases correspond to participatory water planning processes in the Balearic Islands, Spain and the Volos Metropolitan Area, Greece.
The table below presents the characteristics of the collective action situations underlying the empirical cases, the identified state interventions and outcomes of cooperation.

France
Germany
Balearic Islands, Spain
Aragon, Spain
Volos, Greece
Collective action situation
a) required focal point
b) prisoner's dilemma
c) zero sum game
a) required focal point
[evidence on further constellations missing]
a) required focal point
b) prisoner's dilemma
c) zero sum game
Zero sum game
a) required focal point
b) prisoner's dilemma
c) zero sum game
Spill-overs/externalities
Downstream
State level
Political arena
Political arena
Local population and political arena
State interventions
a) lowering transaction costs
b) regulatory threat
Lowering transaction costs
a) lowering transaction costs
b) regulatory threat
a) lowering transaction costs
b) regulatory threat
a) lowering transaction costs
b) regulatory threat
Collective action outcomes
a) information exchange

b) coordination in operation
a) information exchange
b) coordination in operation
c) operational rule making

a) information exchange
b) collective choice rule making

a) information exchange
b) coordination in operation
a) information exchange
b) coordination in operation
c) collective choice rule making

In all empirical cases, spill-overs are at stake from collective action to the political arena or to the public that local, regional or national state actors represent.
Further, in all cases, the state played an important role in lowering transaction costs of collective action. Regulatory threat or formal state endorsement also played a role, except for the case in Germany. Thus, despite being combined with different measures to lower transaction costs (provision of information and resources), the potential use of coercive power by the state is a constant in all the cases studied.
Given the diversity of settings identified, in-depth analysis is necessary in order to tease out what kind of action situation is at stake and what type of collective action results (including its sustainability). A further step towards the understanding of the interactions between state policy and collective action could be to analyze case studies selected by holding one or several of the attributes we proposed constant.

Macro-economic rebound estimation using Granger causality tests

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by Blake Alcott and Tyler James Marangi.
[Themes: ?Resources and environment' AND ?Governance, policies and institutions'
Natural-resource conservation is a primary goal of ecological economics pursued by sustainability strategies including the resource-efficiency strategy. When due to business-as-usual cost savings or prescriptive policies a resource gets used more productively, the amount of the resource thatcould besaved with no loss of utility (ie when output remains unchanged) is calledengineering savings. If there is any increase in output, not all of this this theoretical quantity is saved: there isreboundresource consumption measured as apercentage ofengineering savings. If the resource consumption remains unchanged over against the trend ? if, that is, the whole amount of the resource lying temporarily fallow after the efficiency increase gets used up for further output ? then rebound = 100%. As rebound approaches 100% the environmental energy-efficiency strategy becomes cost-ineffective and, finally, ineffective.
Since 1980 (Khazzoom, 1980) micro-economic methods have been utilised to measure rebound: What is theefficiency elasticity of priceof (1) goods and services throughout the economy and (2) the more-efficiently-used resource itself? What are theprice elasticities of demandfor (1) goods and services and (2) the resource? What role does the substitutability (or lack thereof) of production-factor inputs play in the amount of demand for the resource? If an economy's fleet of motor vehicles becomes on average 10% more efficient, how many more tonne-kilometres are therefore driven (?direct' rebound), and what other economic activities are undertaken by consumers to raise their utility by consuming the resource (?indirect' rebound or ?societal income effect')? Sector production and sales statistics, interviews for example with the owners of newly-insulated houses, and models involving economic sectors, production functions and production possibilities frontiers have all been employed in semi-empirical studies that nevertheless rely heavily on theory.
Far from resulting in even a broad consensus on rebound's magnitude, such studies estimate total or ?economy-wide' (direct + indirect) rebound between 15 and 350%. (Dimitropoulos, 2007; Sorrell, 2009; Madlener & Alcott, 2011) In this context, and because computation of total rebound from this mixture of theory and micro-economic data is extremely complex, we have by contrast chosen a macro-economic approach, using world data and ignoring economic sectors and shifts of demand between them. The global scale of the research also enables us to avoid the issue of embodied resources in imports, i.e. how to compute a country's energy consumption when attribution can be based either on point-of-resource-consumption or point-of-output-consumption. (Peters, 2008)
Our time series consists of the 38 years from 1971 to 2009. Our dependent variable orexplicandumis that which is of environmental interest, namely Total Primary Energy Supply TPES. Our independent or hypothesised causal variable is energy efficiency expressed as Gross World Product (the sum of the GDPs of our 134 countries) divided by TPES: GWP/TPES. We are testing for the energy-efficiency elasticity of energy consumption, aka rebound.
Data comes from the International Energy Agency and the World Bank. We build on work by Polimeni (2009), Luzzati & Orsini (2009), Krausmann et al. (2009), and Steinberger et al. (2010). Problems with the TPES metric include its inclusion of nuclear and renewable energy production and its exclusion of human and other-animal metabolism. The main problem with GWP is that it underestimates output by excluding barter and unpaid work. We discuss these problems and suggest adjustments of the variables for future regression analyses.
Our independent variable is a ratio or intensive number from which an absolute or extensive number such as our dependent variable cannot be directly deduced. Our analysis is thus intended to shed light on a further middle term expressable as an absolute quantity, namely change in GWP. With only two variables, we are employing uni-variate regression analysis using Granger causality tests which presuppose (1) stationarity, requiring detrending; (2) specification of time lag between the hypothesised causal event and change in input consumption; (3) absence of unit

roots; and (4) little or no autocorrelation. We find danger of autocorrelation but regard this as insufficient to warrant abandoning the Granger-causality method.
The results, with an F-statistic of 5.1, speak for causality, while separate tests indicate high correlation, with R2 > 0.95. Indicating very high rebound, these results shift the burden of proof onto the low-rebound hypothesis. Approaches to date have assumed that less input per unit of output must result in less input consumption ? even if not proportional to the percentage technological-efficiency increase ? have meant the default question is ?Where is the rebound?' With equal legitimacy one can ask ?Where are the savings?'
If the environmental goal is to reduce depletion and pollution there is a simple, direct institutional change or policy tool that is sufficient, i.e. necessarily effective: caps on the resource in question. (Daly, 1974) These can be prescribed directly or worked towards indirectly by removing subsidies and introducing resource taxes. To achieve the environmental goal, the study of efficiency change and rebound is superfluous. Greater efficiency is merely something that would follow automatically and decentrally, without specific policies, once caps were legislated. Efficiency serves utility or affluence goals, not environmental ones, and resulting possible problems of increased poverty should be solved by institutional changes in social policy, perhaps income support, job guarantees and land reform.

References

Daly, Herman E., 1974. The economics of the steady state.American Economic Review64 (2): 15-21.
Dimitropoulos, John, 2007. Energy productivity improvements and the rebound effect: An overview of the state of knowledge.Energy Policy35: 6354-6363.
Khazzoom, Daniel, 1980. Economic implications of mandated efficiency standards for household appliances.Energy Journal1 (4): 21-40.
Krausmann, Fridolin, S. Gingrich, N. Eisenmenger, K.H. Erb, & M. Fischer-Kowalski, 2009. Growth in global materials use, GDP and population during the 20th century.Ecological Economics68: 2696-2705.
Luzzati, Tomasso, & Marco Orsini, 2009. Investigating the energy-environmental Kuznets curve. Energy34: 291-300.
Madlener, Reinhard, & Blake Alcott, 2011. Herausforderungen für eine technisch-ökonomische Entkopplung von Naturverbrauch und Wirtschaftswachstum, unter besonderer Berücksichtigung der Systematiserung von Rebound-Effekten und Problemvershiebungen.Enquete-Kommission des deutschen Bundestages.http://www.bundestag.de/bundestag/gremien/enquete/wachstum/datenaustausch/Kommissionsmaterialie/M_13_Madlener_Alcott_Reboundstudie_111208.pdf
Peters, Glen P., 2008. From production-based to consumption-based national emission inventories.Ecological Economics65 (1): 13-23.
Polimeni, John, [2008] 2009. Empirical evidence for the Jevons Paradox. In:The Myth of Resource Efficiency: The Jevons Paradox,eds. John Polimeni, Kozo Mayumi, Mario Giampietro & Blake Alcott.Earthscan, London.
Sorrell, Steve, 2009. Jevons' Paradox revisited: The evidence for backfire from improved energy efficiency.Energy Policy37: 1456-1469.
Steinberger, Julia K., Fridolin Krausmann & Nina Eisenmenger, 2010. Global patterns of material use: A socioeconomic and geophysical analysis.Ecological Economics69: 1148-1158.

Summary

In contrast to micro-economic approaches, after exogenous energy-efficiency increases total rebound can be estimated using world data regressing Total Primary Energy Supply (TPES) on Gross World Product divided by TPES using Granger causality tests as well as ordinary correlation tests. Rebound is very high, probably 100%. This renders the environmental efficiency strategy most likely insufficient for reducing depletion and pollution. The analysis shifts the burden of proof onto low-rebound theory. The efficiency strategy is unnecessary as well because society can cap resource use then deal with the social consequences with social policies. Ironically, this renders rebound estimation, from the environmental point of view, scientifically superfluous.

Determinants of environmental institutions: The role of socio-economic models

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The purpose of this empirical paper is to explain the differences between 18 OECD countries' processes of taking on environmental norms. In particular, we want to test the role of socio-economic models in this adoption process.
This study develops econometric models of the relationship of a metric of environmental policies adoption and the country's belonging to a socio-economic model, while controlling other factors that may influence this adoption.
The study found significant, positive and robust correlation between social democratic model and the metric of policies adoption, and put in highlight the role of economic inequality, income per capita (with a reverse U-shape relationship) and environmental pressures in this adoption process.

The sovereign debt crisis : a new challenge in the socio ecological transition

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The aim of this article is to study the macroeconomic and environmental evolutions without political intervention in Europe in the framework of a new socio ecological transition (SET) and the current public debt crisis. First, it is important to clarify some points so as to understand the full implications and the inevitability of this transition. The concept of «socio ecological regime », developed by the Institute of Social Ecology, defines the relationship between a human society and its environment. The main features of this relationship are the sources and the dominant conversion technologies of energy used by the society to satisfy its needs (Fischer-Kowalski and Haberl [2007]). The first example of socio ecological transition is the transition from the «Hunting and gathering» regime, characterized by passive solar energy utilization, to the agrarian regime characterized on the contrary by active solar energy utilization, since human activities like agriculture or livestock farming implies the transformation of ecosystems. Then, the industrial revolution led to a regime based mainly upon fossil fuels and corresponding technologies that deliver power to the system of production.
Now, we are going through a transition to a new regime since the depletion of the fossil fuels stocks and the climate change make the current industrial regime no longer sustainable. In fact, the symbolic end of fossil fuels called « peak oil » might have already happened (in 2008 according to Alekett et al. [2010]) or will happen before 2035 (EIA [2010], UKERC [2009], etc.) Besides, the transformation of the earth system caused by current human activities (global warming being the best example) could have catastrophic consequences on the organization of human societies (IPCC assessments [1990],[1995],[2001] and [2007], Stern [2006], etc.)
The sustainability of the regime is a worldwide challenge but developed countries, hence Europe, should be in the forefront of the new transition. First, they have the best technical abilities to find new sources and new technologies for energy. Moreover, their structural economic situation requires a radical adaptation. Indeed, the rapid catching-up of emerging economies puts additional pressure on the stock of resources and, given the high degree of openness of contemporary economies, deeply modifies the sectoral composition of employment. The ageing of developed economies' populations is an important feature of the new SET as well, especially in Europe, insofar as it questions the balance of social systems implemented after the Second World War.
The crucial point is the role of public authority in this ongoing transition. Should it intervene in order to both reduce the negative environmental externalities and improve job creations? Or should we consider that market forces will be efficient? This is a major policy concern widely studied by scientific community (cf. the NEUJOBS project financed by European Commission or the substantial literature on environmental fiscality)
In this study, the quantification of the macroeconomic and environmental evolutions at the European level is conducted using the macroeconometric model NEMESIS which is estimated for each European country with a coverage of thirty sectors. Two versions of the reference scenario, «Friendly» and «Tough» (i.e. two levels of difficulty for the adaption of Europe to the SET) enable the identification of the challenges and the opportunities for the European countries in the framework of the new SET without political intervention.
Stagnation and ageing of the population and high fossil fuel prices are the main quantified characteristics of the new SET in Europe. Furthermore, the ageing rate, the energy prices, the interest rates and the EUR/$ exchange rate, are higher and the population is slightly declining in the «Tough» case.

In the « Friendly » case, the sectoral employment share evolution benefits to the construction sector, the public and private services at the expense of agriculture and industries (the energy intensive ones and the others). The European unemployment rate falls to 5.5% in 2030 compared to almost 10% in 2010. On the one hand the current rate is unusually high due to the economic crisis; on the other hand demographic fundamentals imply a labor force decrease until 2030 which automatically reduces the unemployment rate. Besides, the GHG emissions decline by 25% in 2030. This last result does not comply with the milestone of 40% in 2030 defined by the European roadmap to 2050.

In the « Tough » version of the reference scenario, the fossil fuel prices are even higher so the decline of the employment in the energy intensive industries is stronger. In addition, the share of investment goods sectors in the total employment decreases owing to the higher interest rate. Furthermore, the GHG emissions are logically lower than in the « Friendly » case because the economic growth is lower. Nevertheless, the emissions intensity (GHG emissions/GDP unit) is higher due to the lack of investment in energy efficiency.

GHG emissions reduction of 40% in 2030 (milestone of the European roadmap) is far from being reached in both scenarios. Besides, the unemployment rate remains high even in the «Friendly » case. In particular the important increase in high-skilled labour force supply cannot be fully absorbed by labour demand, leading to a «bottleneck» effect. The main difference in the economic results of the «Friendly» and the «Tough» scenario lies in the different impacts of the debt sustainability rule imposed in both scenarios. The unfavourable demographic and natural conditions in the «Tough» case imply that the budgetary efforts penalise employment and the economic growth during the whole period 2010 - 2030. In these conditions, most of the European countries do not have the financial leeway to make the investments necessary for the socio-ecological transition.

Finally, we discuss about the relevance of implementing a green fiscal reform in all the European countries (higher tax level on fossil energies). The tax revenues would be reallocated to labor cost or capital cost abatement depending on the country. In fact, countries with high technology level will give priority to a decrease of the labor cost (in particular of low skilled workers) to foster employment, when countries like Romania or Bulgaria should prefer a decrease of the capital cost to foster investment (in particular investment in energy efficiency). Given the fact that the macroeconomic and environmental evolutions are not satisfying without political intervention, a green fiscal reform should be then a useful tool to enhance the new socio ecological transition in Europe by fostering employment and lowering the GHG emissions. Furthermore, the quantification of the two scenarios highlights the importance of the debt burden in the European economic path in the next twenty years. The budgetary neutrality of the reform is then a strong argument for its use.

What can we learn from the classical economists for the development of ecological macroeconomics?

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This paper explores ideas and threads of reasoning from the classical economists and tries to establish ties to the current debate on developing ecological macroeconomics. A range of 18th and 19th century authors such as Adam Smith, Robert Malthus, John Stuart Mill, David Ricardo or Stanley Jevons discuss topics that are relevant for the current debate on ecological macroeconomics such as a steady-state economy, non-renewable energy dependence, resource scarcities, and population and poverty. In ecological economics, only limited forays have yet been made into such a historical context. The basis for this paper is a literature study that explores the writings of selected classical economists with the aim of better grasping how they understood environment-economy interactions as the basis for economic theories. The general concern is to throw light on neglected past works and to explore old ways of thinking about the relationship between the environment and the economy with the aim of inspiring further work on ecological macroeconomics.

Diversity of capitalism and sustainable development : institutional complementarity dynamics or radical change in the hierarchy of institutions ?

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Within the theoretical framework of the comparative analysis of capitalism, in both the Varieties of capitalism (Hall & Soskice, 2001) and the (Régulationist) diversity of capitalism approaches (Amable, 2003), the issue of sustainable development is generally missing.
We propose to consider two ways of reintegrating this issue, which rest on different meanings of sustainability, a limited versus a radical sense. Each variant of sustainability is also related to a scenario for the future of capitalism in the after-crisis perspective. The first one is the limited sustainability scenario, ?business as usual', in which the aspiration for a ?greener' economy does not really change the pre-crisis growth regime. Each family of capitalism, for example the Anglo-Saxon capitalism or the social-democratic model, makes a shift towards a ?greener' economy without altering its specific configuration of complementary institutions. At the micro level, the limited evolution of the institutional framework does not lead to major changes in firms' business models. In the ?green' industrial firm, profitability is still dependent on the increase in the volume of sales of material goods. In that case, the rebound effect impedes any attempt from shifting to a more sustainable growth regime.
The second scenario, the radical sustainability one, is much more unlikely even if it rests on the widely shared observation that the developed countries consumption and production model is no longer sustainable, as global warming, depletion of natural resources and biodiversity erosion remind us. Therefore a more radical change of growth regime is required. It means a reversal in the institutional hierarchy, which currently characterizes capitalist models. Finance would leave its place at the top of the hierarchy for a new environment-oriented world governance. As a result, state intervention would find a new role in managing the transition towards a new sustainable development model. At the micro level, institutional constraints and opportunities would encourage firms to experiment alternative business models such as the ?functionality' model based on services and not on material goods delivery. The diversity of capitalism would still appear in the diversity of national transformation trajectories to a sustainable economy.
Many experts are now sharing the view that a change in the growth regime to a ?greener' economy could be a way of escaping the present crisis, by starting a new schumpeterian economic dynamics.

A radical approach to sustainability economics

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Recently, a new conceptualization of «sustainability economics» (se) has been put forward by Baumgärtner and Quaas (2010) and triggered a vivid debate in the journal Ecological Economics. The current debate about the principles of se is more about harmonizing parts of thinking in neoclassical environmental and resource economics on one side and ecological economics on the other side. This is only possible if the basic importance of a large part concerning the debates of ecological economics is considered irrelevant for such a foundation of se.
Ecological economics has been up to now the relevant scientific school for treating sustainability from the perspective of economic sciences. Sustainability has been a facet of such a problem-orientated trans-discipline like ecological economics, which brought together diverse problem facets (instead of a canonical world view) and diverse methods (instead of a methodological monism). The special feature of such a conceptual approach to sustainability was the attempt to integrate neoclassical allocation-economics as one rather minor part of an encompassing conceptual construction, which focused additionally on the assurance of an ecological compatible scale of activities and ? given this ? a just distribution of the inter-andintragenerational use of ecological resources.
The above-mentioned propositions for the development of a canonical conception of sustainability economics represent a backwards movement against the disparate conceptual assembly of ecological economics. The propositions formulate that the core of se is the long-term consideration of the relationship of humans towards nature under the constraint of predominantly intergenerational criteria of justice on the one hand, and efficiency considerations on the other. Apparently the motivation is to reconcile the aims formulated by neoclassical equilibrium-economics, i.e. maximizing human utility (or formulated differently, the satisfaction of human needs), with inter- and intra-generational justice considerations. The formulated ontology of sustainability economics (?What is the human being? What is nature? What is the economy?«) as well as its research questions are oriented along these lines towards a-historic constants (as formulated by neoclassical equilibrium-economics) and less towards the specific patterns of modern, capitalist market-economies.
The argument for a more radical approach to sustainability economics will be developed along the following lines:
(1) General features of the debate so far
(2) Se only as a link between justice and efficiency?
(3) Getting away from shortcomings in terms of economic foundation
(4) Interacting complex adaptive systems as a conceptual background for se
(5) Tasks of se
In tackling with the internal economic dynamics, the systemic interaction between technological, consumption related and financial dynamics is at the core of the challenge for a new economic policy related to sustainability.
The normative orientation of sustainability economics not only includes the formulation of concrete development desiderata (for the ecological, the economic and the social sphere), but also the critical reflection on the feasibility of the thus required institutional and behavioural change. Non-intended long-term effects have to be made explicit. Such a more radical approach to sustainability economics, therefore understands sustainability as a procedural norm of rationality («regulative idea») for our living within the living systems.

New Foundations for Ecological Economics

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Ecological economics has been repeatedly described as transdiciplinary and open to including everything from positivism to relativism. I argue for a revision and rejection of this position in favour of realism and reasoned critique. Looking into the ontological presuppositions and considering an epistemology appropriate for ecological economics to meaningfully exist requires rejecting the form of methodological pluralism which has been advocated since the start of this journal. This means being clear about the differences in our worldview (or paradigm) from others and being aware of the substantive failures of orthodox economics in addressing reality. This paper argues for a fundamental review of the basis upon which ecological economics has been founded and in so doing seeks improved clarity as to the competing and complementary epistemologies and methodologies. In part this requires establishing serious interdisciplinary research to replace superficial transdisciplinary rhetoric. The argument places the future of ecological economics firmly amongst heterodox economic schools of thought and in ideological opposition to those supporting the existing institutional structures perpetuating a false reality of the world's social, environmental and economic systems and their operation.

Towards a common, evolutionary epistemology for ecological and institutional economics. Lessons from Veblen and Georgescu-Roegen.

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This paper will review, compare and contrast the epistemological arguments stated by Thorstein Veblen and Nicholas Georgescu-Roegen both on the limitations of the mechanistic analogy and on the required paradigm shift toward an evolutionary paradigm. Differences and similarities will be identified in an effort to distinguish between common denominators and potential gaps. Building on those findings, the paper further proposes some elements towards the elaboration of a theoretical corpus that could serve as a conceptual framework for the non-reductionist integration of critical institutional economics and ecological economics. This proposal relies on recourse to metaphysics of process, a two-level methodology and a conceptual articulation of heterodox approaches as partial, local disciplines that address ontologically different realities with different theoretical and methodological instruments while being commonly anchored into an evolutionary epistemology.

Ecological Economics and Degrowth, Nicholas Georgescu-Roegen's Controversial Legacies

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As an original economist of the 20th century, Nicholas Georgescu-Roegen left his footprint in different fields of knowledge, from philosophy of sciences to economics. Built upon the book The Entropy Law and the Economic Process (1971), his bioe- conomic paradigm aroused contrasting interests among scholars, but it undeniably gave birth to different schools of thought that claimed to be representative of the roegenian legacy. Although the bioeconomic revolution did not happen within main- stream economics, it was adopted by several groups of scholars, in particular around the idea of ecological economics or, in French-speaking countries, around the idea of degrowth. Those two legacies of Georgescu-Roegen's work share a common diag- nosis on the state of the current economic system, which must be reinvented faced with natural and physical constraints. However, the ways these scholars think about their bioeconomic legacy, and the solutions they propose to solve the ecological cri- sis, substantially differ. Moreover, during the end of the 1980s, ecological economists had to face a kind of denial from Georgescu-Roegen himself. In contrast, the advo- cators of degrowth sometimes laid their legacy on controversial bases. This paper aims at examining those legacies to measure their legitimacy in Georgescu-Roegen's initial work. It concludes that ecological economics is much closer to the bioeco- nomic paradigm than the degrowth theories, opposing the frequently held view in the French language literature.

La valeur, le travail et la valeur de la nature : retour à la critique de l'économie politique

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La crise du capitalisme contemporain est double. Elle est sociale, à la fois comme cause et conséquence : cause parce que la dévalorisation de la condition salariale affaiblit les conditions de réalisation de la valeur pour le capital, conséquence parce celui-ci tente de rétablir sa rentabilité en poussant plus loin encore la dégradation salariale. La crise est aussi écologique, d'abord comme conséquence puis comme cause : conséquence du productivisme échevelé du système économique, et cause de l'impossibilité pour le capitalisme de concevoir une accumulation infinie. Crise de production et de réalisation de la valeur et interrogations sur la valeur de la nature sont désormais au centre de discussions théoriques renouvelées. Notre proposition est d'examiner ces questions à la lumière d'un retour à la critique de l'économie politique. La théorie de la valeur-travail en tant que théorie critique des rapports sociaux est capable d'intégrer la prise en compte de la nature, puisque la raréfaction de certaines ressources se traduit par le renchérissement des coûts de production, qui doit lui-même être considéré comme un indicateur d'alerte.

Local currencies for purposive degrowth? A quality check of some proposals for changing money-as-usual

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This article provides a quality check of the degrowth movement's proposal of local currencies as tools for advancing socially equitable and ecologically sustainable degrowth. The article draws comprehensively upon mainly English-language academic research about four widespread local currency types ? LETS, time banks, HOUR currencies, and convertible local currencies (CLCs) ? to assess their performance with respect to four criteria, which reflect some of the most common motivations for setting up and participating in local currency systems: community-building, advancement of alternative values in economic exchange, facilitation of alternative livelihoods, and eco-localization. These criteria are also closely related to the degrowth project. Community-building resonates with the degrowth vision of a shift from material to relational goods, such as friendship and neighbourliness. The use of local currencies to advance alternative values in exchange (i.e. challenging mainstream values regarding race, class, gender, and nature) mirrors the degrowthist call for ?re-evaluation', and the facilitation of alternative livelihoods with local currencies can be viewed as a degrowthist strategy of voluntary simplicity. Finally, many degrowth advocates consider eco-localization to be an important strategic means of degrowth. In more general terms, local currencies are usually the kind of grassroots initiative that degrowth advocates prefer to government policy-making, given the broad failure to implement effective environmental policies during the sustainable development epoch.

This review does not find any clear success stories of local currencies as drivers of degrowth. Existing research suggests thatLETSsupport alternative livelihoods under quite uncommon conditions, and contribute indirectly to eco-localization by moderately facilitating informal resale, repair, and sharing of commercially produced goods, although their burdensome management and confinement to small memberships limit their usefulness.Time bankshelp expand social networks, and are best at reaching the socially excluded. However, they are confined to unskilled personal services and dependent on grant funding.HOUR currenciesdo not stand out with regard to any criteria, but may have a minor capacity to promote local purchasing.CLCsare best at attracting local businesses, but no significant evidence of their said capacity to localize supply chains has surfaced as yet, and their business-friendly design works to the detriment of other criteria. In sum, existing research provides a very weak basis for advocating local currencies as tools for purposive degrowth.

Local currencies are here categorized as two utopian socialist approaches: thebehind-society's-backvariety of LETS and HOUR currencies, and theappeal-to-elitesvariety of time banks and CLCs. Marx and Engels's critiques of these approaches remain valid; successful monetary systems require resources that are not available behind society's back, notably the power to levy taxes and designate by which means they can be paid. The state's imposition of a tax liability, when burdensome enough to discharge, has been characterized as a sufficient (although not a necessary) condition for triggering general acceptance, as money, of the thing that the state announces that it will accept in payment of the tax. This taxes-drive-money argument, the long intellectual history of which is only recently being uncovered, is supported by historical studies of the monetization of pre-capitalist and colonial societies. Local currencies that appeal for elite support ? without mass popular backing ? have shaken off most radical connotations, perhaps condemning them to irrelevance to degrowth from the very beginning. Future research would have to tell whether recent local government-endorsed currencies, such as the Bristol Pound, retain any capacity to resist assimilation into conventional local growth agendas, and contribute instead to (zero-sum) import substitution. Furthermore, opportunistic exploitation of existing policy agendas can lead to catastrophic failure as funding is withdrawn subsequent to agenda changes or negative assessments of the currency system's capacity to deliver on policy expectations.

In so far as the existing monetary system is biased against social justice and ecological sustainability, the degrowth movement's advocacy of alternatives to money-as-usual is coherent with its objectives. However, the historical conditions for the establishment of strong local currency systems do not seem to materialize, and perhaps never will, since the successful creation of stable monetary spaces has so far virtually always been the work of states. Given the present historical conjuncture of popular outrage against the banking sector, this paper argues that the degrowth movement would improve its chances of contributing to purposive degrowth by prioritizing government-centred ecological reform of the monetary system over local currencies. The strong development of Modern Money Theory (MMT) by Post-Keynesian economists in recent times has advanced a powerful understanding of the monetary system, providing a theoretical basis for monetary and fiscal policies that are potentially compatible with intentional degrowth. In the present historical conjuncture, such reforms appear less utopian (in the sense of unrealistic), i.e. more likely to succeed in generating enduring advances towards socio-ecological transition, than withdrawals into autonomist local currency schemes or appeals for elite support of innovations that lack mass popular backing.

Monetary and fiscal policies for a finite planet

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There are two primary sources of money creation in the modern economy. The first is known as vertical money. Modern monetary systems are based on fiat currencies, which are created when governments spend them into existence. Fiat currencies are backed by the productive capacity of whoever accepts them, and all citizens must accept these currencies for the goods and services they produce in order to pay taxes. Vertical money is destroyed when government revenues exceed new government expenditures.

The second, which makes up the vast majority of money in circulation, is known as horizontal money. One theory of horizontal money creation is that recipients of vertical money deposit it in banks for safekeeping. Governments stipulate that a fraction of this can be loaned out, but those loans are then deposited again in banks, enabling more loans. If banks must hold a 5% reserve, they can lend out nineteen times as much as the vertical money that was deposited. A second theory is that banks simply loan money into existence and that money is then deposited back into banks. In other words, loans precede deposits. In either case, the loans create horizontal money, which is destroyed when the loans are repaid.

Most loans are issued to businesses that use the money to pay households for factors of production. Households use their income to purchase goods and services produced by firms. Firms however seek to earn a profit and must pay back loans with interest, which means that firms demand more money from households than they initially paid to them. Profits and interest payments are only possible if the banks continually issue new loans in excess of repayments, which will only happen in a growing economy, or if the government continually issues new vertical money, which generally stimulates economic growth. Furthermore, horizontal money is pro-cyclical. Banks are willing to lend out more money when the economy is growing and they are confident of repayment. Banks cease to make new loans when the economy is contracting, which reduces the money supply and forces debtors into default, initiating a recessionary spiral that generates unemployment, poverty and misery, which is what the public therefore associates with degrowth. As a result of this dynamic, banks can make any loan they believe will be profitable, regardless of reserve requirements. The Central Bank is forced to loan them money to bring bank reserves to the required level, or risk inadequate money supply to meet existing debt obligations, resulting in economic collapse. The horizontal money system must collapse in the absence of growth.

Degrowth is therefore incompatible with the debt-based, interest bearing creation of money. The solution is for governments to increase reserve requirements to 100%, which can be done gradually or all to once. The role of banks would be to serve as intermediaries between savers and borrowers. Savers lose access to their deposits while they are loaned out, and fully accept the risk of non-payment, which eliminates any systemic risk from loan defaults. Banks would also safeguard money in checking accounts for a fee.

100% fractional reserves would destroy the bulk of a nation's money supply. In order to avoid an uncontrollable recessionary spiral, the government would be required to replace horizontal money with vertical money. There are a number of ways to create vertical money. Some authors have proposed issuing money directly to citizens to pay off their outstanding debt, or opening time deposits in banks equivalent to outstanding loans, thus backing all outstanding bank loans with vertical money. Degrowth at the scale necessary for a sustainable economy however requires major investments in public goods ranging from ecological restoration to open source green technologies, and also expenditures directly targeted toward alleviating the unemployment, poverty and misery currently associated with degrowth. Horizontal money is not invested in such activities because they do not generate the profits required to pay back the loan. Debt free government investment in these activities in contrast increases the money supply without increasing the demand for interest payments or profits, thus facilitating repayment of existing debt.

Vertical money creation could be decentralized by requiring the central bank to purchase interest free state and municipal bonds to finance expenditures at the local level. The money thus created would be destroyed when state and local taxes are levied to redeem the bonds.

A degrowth economy will likely require a decreasing money supply, which turn will require government revenue in excess of spending. Sources of revenue should include green taxes and

government auctions of environmental allowances to manage throughput, highly progressive taxes to reduce inequality, and confiscatory taxes on rent (unearned income) to eliminate the incentives for speculation and to ensure a more just distribution of wealth, income and resources. Only by replacing interest bearing, debt-based horizontal money with debt-free vertical money will society be able to eliminate the need for growth, and achieve the controlled contraction required to bring the economy in line with planetary boundaries.

Voluntary degrowth ? can we observe it empirically? A socio-economic and socio-cultural analysis of Bavarian low income municipalities.

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Abstract
Most citizens and scholars can imagine degrowth only as either ecologically desirable but politically unfeasible, or as something which is imposed exogenously as some form of economic crisis. In contrast, we propose to reinterpret degrowth as a viable life form which is practiced already now by many persons in modern affluent societies. Seen from this ankle, we get the advantage that degrowth may be observed and analyzed empirically: What are the socio-economic and cultural conditions of degrowth as a desirable way of life? We will analyze this question on the base of a data set of all 2056 Bavarian municipalities, comprising of six metropolitan regions. Taking population growth as an indicator for consent to living conditions, we identify 339 municipalities with an average income below the median, which shall be further investigated as "happy degrowth" communities.

Long version

Most citizens and scholars can imagine degrowth only as either ecologically desirable but politically unfeasible, or as something which is imposed exogenously as some form of economic crisis. What we propose here as a different and fresh perspective is to reinterpret degrowth ? or the acceptance of lower income ? as a viable way of life which is practiced by many people in the poorer regions of modern affluent societies. Seen from this ankle, we get the advantage that degrowth may be observed and investigated empirically: What are the socio-economic and cultural conditions of degrowth as a desirable way of life?

So let us start first with the conceptual reinterpretation: Of course everybody knows that there are a lot of people that accept lower incomes ? be it in the southern hemisphere of the world, be it in remote rural areas, or be it in segregated (sub)urban districts of the own nation state or region. In Bavaria, for example, people who live in one of the 194 municipalities which are officially classified as "very peripherical" have an average income which is 40 percent below the income of those who live in the "very central" communities. But what reasons have "we", "the urban rich", to imply that "the poor" feel unhappy? To be sure, most people would prefer to have more money if we would ask them in a survey, abstracting from the costs they would be willing to undergo for having that extra money.

But literature from authors such as Emile Durkheim (1933), Marshall Sahlins (1972), and Ernst Friedrich Schumacher (2010) indicate that there are several direct socio-psychological advantages of economically low development and of subsistence production: no alienation from the products and the means of production, no social hierarchy, and closer relationship between body, sensations, emotions and thoughts in mindful activities. These advantages exist already from the start of economic development ? thus since the neolithic revolution. Other authors such as Richard Easterlin et al. (2010) and Tim Jackson (2009) imply that the advantages of economic development, i.e. better protection against hunger and nature's roughness, are worthwhile up to a certain point of saturation. When this point is reached, the genuine motivation for economic growth ? and its byproduct: environmental destruction ? ceases, but the quest for economic growth still continues since capitalist societies are trapped in an "iron cage of overconsumption".

So our question arises whether there may exist larger groups which voluntarily accept lower incomes in current modern societies ? besides a hand full outspoken "deep ecologists". Within our proposed contribution we will study a data base of the 2056 Bavarian communities which we have composed to investigate energy consumption and CO2 emissions in Alpine regions. The data include a broad range of socio-economic, demographic and cultural indicators which we have build from official statistical accounts of all 2056 Bavarian municipalities and which we combine with survey data from the German Socio-economic panel (SOEP) to extrapolate per capita environmental consumption. Our first finding suggest that households in the small and

dispersed communities have larger CO2 emissions from heating, household electricity and transport than households in the more compact cities with its opportunities for district heating, better surface/volume-ratios and shorter transport distances (Schubert et al. 2012). On the other hand, however, the much lower incomes in the spatial periphery result in a much stronger saving effect with respect to residual consumption (that is: consumption beyond the scope of household- and transport energy) ? surmounting the saving effect of physical compact (but rich) cities by far. But are people in the periphery contend with their lower incomes? Based on official statistics, our data set cannot answer this question in the conventionally form of a survey (cf. Easterlin et al. 2010, Inglehart 1997). Instead, and as a "vote by feet", we take migration surplus ratios and counts of births per capita as indicators for consent with low income ways of life. Taken on average, these indicators show a certain decline of the rural lifestyle with birth rates a bit and immigration rates a lot higher in more central and more affluent municipalities. But as the scatter plot below shows, the correlation between higher incomes and population growth is not so straightforward (R2=0.23 in linear bivariate regression). If we take the medians of average income and population growth as discriminators we get a contingency scheme with four quadrants: Above the horizontal red line two sectors with population growth ("happiness"), below the median line the sectors with zero growth or population decrease; on the left side of the vertical line the two sectors with incomes below the median ("degrowth"), on the right side the communities with higher than average incomes. Our "happy degrowth" quadrant thus contains 339 municipalities, with 288 of them ? comprising about 825.000 people ? situated in the spatial "periphery" or "outer periphery", and 51 of them ? with about 582.000 heads ? in the spatial "center" or "inner center", according to the classification by the German official institute for spatial planning (BBSR).
=> for the scatter plot of the relationship between average income and population growth in 2056 Bavarian municipalities, see the attached file (shown below)
So our next step will be to analyze this subgroup of Bavarian municipalities which comprises about 11 percent of the Bavarian population and contrast it with the other subgroups and subpopulation. Qualitative experiences and our first quantitative findings propose that the "happy degrowth" communities in the spatial periphery are upheld by a strong value conservative counter culture in favor of traditional rural ways of life. Whereas the "happy degrowth" communities in the center are probably inhabited more by immigrants with lower incomes and traditional backgrounds from abroad. But since our data set contains many socio-economic and socio-cultural variables we hope to present at the ESEE conference in Lille a richer, more refined and more robust picture. We also want to answer the question there how stable the "happy degrowth" milieus are, or whether they may probably dissolve with the younger generations.
In sum, our contribution will analyze the spatial distribution of environmental impact (in the sense of York et al. 2003), show the contribution of lower incomes to reduce that impact, and analyze conditions in which voluntary degrowth ? in the sense of acceptance of lower incomes ? already happens: not on the base of "deep ecology" commitments, but unintentionally, as byproduct of traditional ways of life. To learn more about the socio-economic conditions and mentalities of the really existing degrowth people may become thus an inspiring ? and at times certainly irritating ? endeavour for ecological economists which, on average, are city based and urbanly educated.

Literature

Durkheim, É. (1933).¬The division of labor in society;New York?; London?; s.l.: Collier Macmillan.
Easterlin, R. A., McVey, L. A., Switek, M., Sawangfa, O., & Zweig, J. S. (2010). The happiness? income paradox revisited.Proceedings of the National Academy of Sciences. doi:10.1073/pnas.1015962107
Inglehart, R. (1997).Human values and beliefs; a cross-cultural sourcebook?; political, religious, sexual, and economic norms in 43 societies?; findings from the 1990 - 1993 world values survey. Ann Arbor: Univ. of Michigan Press.
Jackson, T. (2009).Prosperity without growth; economics for a finite planet(1. publ., repr.). London [u.a.]: Earthscan.
Sahlins, M. D. (1972).Stone Age Economics. Transaction Publishers.
Schubert, J., Wolbring, T., & Gill, B. (2012). Settlement Structures and Carbon Emissions in Germany: The Effects of Social and Physical Concentration on Carbon Emissions in Rural and Urban Residential Areas.Environmental Policy and Governance. doi:10.1002/eet.1600
Schumacher, E. F. (2010).Small is beautiful; economics as if people mattered(1. Harper Perennial ed.). New York, N.Y.: Harper Perennial.
York, R., Rosa, E. A., & Dietz, T. (2003). STIRPAT, IPAT and ImPACT: analytic tools for

unpacking the driving forces of environmental impacts.Ecological Economics,46(3), 351?365. doi:10.1016/S0921-8009(03)00188-5

Structure and Agency in the Dynamics of Growth: A monetary macroeconomic equilibrium perspective on growth imperatives and stagnation

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We consider explanations for the persistence of growth by exploring a system-inherent growth imperative. Our analysis of the credit economy detects two axioms (liquidity preference, marginal propensity to save) and two key principles (investments create savings, maturity transformation) of a functioning credit economy. We choose a structure?agency perspective explaining growth dynamics as the interplay of microeconomic behaviour and aggregate system characteristics. We find that developed economies tend to stagnate at underemployment equilibrium. This implies a growth imperative in order to overcome stagnation. We conclude that microeconomic analyses need to account for macroeconomic structure. Further, we point to possibilities and limitations of different actors to mitigate and overcome the growth imperative.

PES in a policy mix: Spatial and temporal articulation in Mexico

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Government based PES have been criticized for being less targeted towards environmental effectiveness objectives, while prioritizing a wide range of side-objectives. In Mexico, Munoz-Pina and al. (2008) and Rolon Sanchez and al. (2011) have showed how the eligibility criteria have evolved throughout the different phase of the implementation of the government-based hydrological PES.
In the present paper we analyze how the changes in priority criteria have reallocated the PSA-H spatially and therefore their interactions with other policy instruments. First, based on a national sample of 325 ejidos, we identify what types of policy-mixes predominate including H-PES, with regard to a proxy measuring the deforestation risk. We afterwards downscale to state level in Yucatan and Chiapas in order to understand the causality links between the type of policy-mix and the deforestation threat. In these two states we develop a stakeholder analysis of the rationale behind the spatial targeting of H-PES eligible areas based on government officials' interviews. We then derive its spatial and temporal implications regarding its changing association with different environmental and agricultural development instruments. This allows us to discuss the environmental effectiveness of such scheme in terms of apolicy-scape.

What does it take to convince farmers to afforest? A comparative choice experiment from the Netherlands and Germany

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Many European members states aim to increase their forest cover in order to expand timber production, sequester CO2, provide more opportunities for recreation and create mosaic landscapes. Funding opportunities exist to support afforestation on private and public land, but the interest in these schemes is limited in a number of countries, including the Netherlands and Germany. The objective of this study is to identify the institutional and economic conditions of funding schemes that encourage farmers to afforest on their land. Using choice experiments, we estimate farmers' demand for varying contractual funding designs. Identical choice experiments were conducted in the Netherlands and Germany. The findings give an insight into the differences in the two countries with respect to the attitudinal, economic, institutional and ecological factors that influence farmers' willingness to participate in a funding contract for afforestation.

The effectiveness of the ?Ecological ICMS? as a fiscal transfer for biodiversity conservation in Mato Grosso, Brazil

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The main purpose of this research is to appraise the role of the Ecological ICMS (ICMS-E) for biodiversity conservation in Mato Grosso. Our principal hypothesis is that ICMS-E resources can generate different conservation outcomes, depending on how they are distributed both within and among municipalities. The case study focused on Northwest Mato Grosso, a region of Amazonia which is under great deforestation pressure. We selected three municipalities to evaluate the environmental effectiveness of this instrument and potential variants to its resource allocation formula. A prior secondary data analysis showed a restricted role for ICMS-E in promoting protected area creation. We now seek to investigate the reasons for this, the potential institutional innovations to improve the instrument and to understand the role of ICMS-E in Mato Grosso in the existing policymix with respect to its environmental and economic effectiveness. Our research questions include: (a) Is the ICMS-E a cost-effective instrument for conservation?; (b) What are the criteria for promoting fairness in intra-municipal allocation of ICMS-E? (c) What legal and institutional arrangements including flexibility in intra-municipal benefits distribution could allow an improvement in the effectiveness and equity effects of the ICMS-E implementation?

The ICMS-E is a form of Environmental Fiscal Transfer, created in Brazil in the early 1990s, when it was introduced in the state of Paraná. Since then, 12 states have enacted the instrument, which allocates revenues from the state Value Added (ICMS) taxes to municipalities based in part on formulae adopted by the individual states. ICMS-E was implemented in Mato Grosso in 2001 and included as criteria in its resource allocation formula the existence within municipal territories of both Protected Areas and Indigenous lands. From 2002 onward, five percent of the share of ICMS which is devolved to the municipalities has been distributed according to these criteria. Although the initial purpose of this instrument, when it was first implemented in Paraná, was to compensate the municipalities for the Protected Areas they could not use economically, it later began to be viewed as an incentive to promote conservation. In previous research we showed that the enactment of the ICMS-E in Mato Grosso had stimulated some local responses to promote greater conservation, but these actions were restricted to the years immediately following the instrument's establishment, and did not reach municipalities of the Amazon basin. In order to analyze the use of these additional resources with regard to conservation outcomes, we have assessed how the municipalities that benefit from the instrument distribute these resources within them. We found that municipalities rarely have institutional arrangements in place in Mato Grosso to specify the use of the revenues from the ICMS-E. In fact, some local government authorities in the state are not even aware of the existence of such revenue, since the rationale for the ICMS allocation is not specified when the funds arrive in local government accounts. Thus, it is to be expected that the amount corresponding to environmental criteria may well be spent for purposes other than those that might be considered environmentally friendly, and indeed may even have harmful repercussions.

In the municipality of Juína, however, the current mayor allocates about ten percent of the local ICMS-E revenue to the two Indian tribes whose lands cover more than half of its total area. Nevertheless, this transfer is not determined by law and can terminate at any moment, as is expected with the incoming mayor elected in 2012, who represents timber interests. On the other hand, in nearby Cotriguaçu there is no transfer of resources from ICMS-E to the managers of Protected Areas which generate the additional revenue, although proposals have been put to the Municipal Environmental Council that would redress this situation. Cotriguaçu has already created a Municipal Environmental Fund, which gathers resources to be applied in activities related to environmental protection, and the ICMS-E is a possible source of such revenue. Additionally, a public prosecutor has recently determined that environmental fines in a neighboring municipality, Colniza, must be deposited to such a fund.

Economic analyses we conducted jointly with this study are first concerned with identifying the impact of the instrument on the allocation of revenues among municipalities in the state over the

past ten years, to show which municipalities experienced revenue enhancement related to ICMS-E and which had lost. Second, it is possible that the ICMS-E revenues which would be generated if more Protected Areas were created would be higher than the revenues from the use of these areas for conventional economic activities. Such a belief stems from the fact that the lands in the region are most likely to be used for cattle ranching, which has a low value added. This would be an incentive for the municipalities to create new Protected Areas. The third analysis concerns the use of qualitative criteria to allocate the ICMS-E. The State Secretariat of Environment has recently tried to introduce a criterion associated with fire point sightings within Protected Areas, as grounds to cut municipal revenue allocations under the ICMS-E. However, this proposal would have led to a major change in allocation of such revenues, which caused some mayors to complain. It was then decided instead to introduce such criteria gradually. We thereby seek to analyze how introduction of qualitative criteria will affect municipalities. Finally, we aim to investigate whether the resources from the ICMS-E could be used in restoring private areas registered to the Rural Environmental Cadastre ? CAR. This instrument facilitates monitoring of legally required forest reserves and protected areas on private lands, according to the national Forest Code. The state government is providing economic incentives for those who register their properties to the CAR. However, the primary cost is related to restoration and the resources from the ICMS-E would be an additional incentive to promote the CAR.

In summary, therefore, our research suggests that innovative revenue sharing instruments can have positive results for conservation effectiveness, but their improvement for these purposes requires both local commitment to environmental governance and efforts at the state level to promote inter-municipal equity.

Targeting AEM in human shaped ecosystems in south-eastern Portugal

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Over the last few years, economic instruments for biodiversity conservation have been gradually implemented in the Portuguese conservation policy in order to address the degradation of ecosystems in targeted areas. Agri-environment measures (AEM) are one of the economic instruments implemented specifically directed to private actorsto help halting biodiversity loss as it can involve a high number of farmers and cover large areas.
The Portuguese agri-environment scheme is designed to include measures at the national level, focusing on the inclusion of the greatest possible number of farmers («broad and shallow»), and at the regional/local level, adapted to particular farming systems and specific local environmental questions («deep and narrow»). While «broad and shallow» measures cover a vast area and promote conservation at the landscape level, «deep and narrow» measures focus on priority areas. Integrated Territorial Interventions (ITI) are «deep and narrow» measures designed to promote management of agricultural and forestry systems suitable for conserving rural landscapes and biodiversity in areas of special interest (i.e. areas comprising agriculture and forest systems relevant for conserving identified natural values). As ITI operate on a limited budget, we propose to maximize their cost-effectiveness by selecting the best set of areas to receive the payments, within a selected case study area.
The case study area is located in the southeast of Portugal, in the left margin of the Guadiana River. The total area of 2 860 km2 is a human shaped multifunctional landscape that encompasses agricultural lans, forest areas, urban settlements, national protected areas and Natura 2000 sites (a Site of Community Interest and a Birds Special Protection Area). The biodiversity richness found in this region is highly depended on the landscape mosaic formed by traditional agro-pastoral systems and extensive oak woods (montados), which have been threatened by agricultural intensification, infrastructure expansion, poor agriculture practices, and increasing land abandonment.
Amongst the available agri-environmental measures in the case study area, the analysis will focus on two types of environmental payments addressed in the ITI: (1) agro-environmental supports, addressing the extensification of agri-pastoral systems of high conservation value (e.g. cereal steeps); and (2) silvo-environmental supports, that address extensive oak woods (montados), aiming at their maintenance and regeneration.
The optimal distribution of the aforementioned environmental supports will be determined using the freely available software Marxan with Zones v1.0.1 (www.uq.edu.au/Marxan). This tool provides decision support to a variety of conservation planning problems, such as designing new reserve systems, and developing multiple-use zoning plans for natural resource management. It makes use of an optimization algorithm to find a good network configuration through simulate annealing, whereby different sets of potential conservation areas are compared with pre-determined conservation targets and costs, resulting on the set of areas that most efficiently achieve the conservation objectives.
Based on the distribution of conservation features (e.g. habitats, species), as well as on the opportunity costs for the different types of land use found in the region, Marxan with Zones will provide the best set of areas to apply the agri- and silvo-environmental supports, maximizing their cost-effectiveness.
The Portuguese agri-environmental program, to be reviewed in 2014, can be improved in several aspects (e.g. instrument design or stakeholder participation), but one of the top priorities is to maximize the cost-effectiveness of the provided subsidies, as the funds available on following Programs will be increasingly lower. Methodologies and tools such as Marxan with Zones can be useful for decision makers to prioritize or rank fund allocation according to their ecological

effectiveness on different properties. If available to all stakeholders, Marxan results can also guide landowners in deciding which measures can be more suitable to their properties.

Procedural and Distributive Justice in Afforestation Schemes: A Cross-Country Comparison

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Abstract
In this study we compare the importance given to issues of procedural and distributive justice based on data collected across farmers in four different countries (the Netherlands, Germany, Finland, Portugal). We explore whether their willingness to participate in certain afforestation schemes depends on how the design of such schemes takes into account issues related to fairness and equity with respect to the distribution of costs and benefits of participation. Distributive justice relates to whether the effort and benefits of participation are equally shared across participants. Procedural justice relates to whether all farmers face equal barriers (financial, regulatory, informational) prior to their participation, as well as whether they tend to have equal opportunities to help shape the inherent procedures. Many farmers find the existence of procedural and distributive justice an important precondition for their participation, although the relative importance varies across countries.

SUMMARY
The effectiveness of conservation schemes is likely to be closely linked to how participants perceive that such schemes address issues pertinent to distributive and procedural justice. Interventions are likely to be more successful and characterized by broad participation when individuals sense that they are designed in a manner that prevents injustice either in terms of the distribution of project-specific costs and benefits, or the barriers faced prior to participation. In that respect, participation may be dependent not only on the anticipate benefits and cost at the personal level, but also on the perceived legitimacy of the intervention based on whether participation is fair.
In this paper we have compiled a large dataset based on responses from farmers in four European countries (the Netherlands, Germany, Finland, Portugal). The farmers have been asked a series of questions related to their willingness to participate in afforestation schemes and the ideal design they would prefer in terms of scheme features. Some of these preconditions for participation naturally relate to more egotistical aspects (e.g. investments costs are fully compensated or that any funding is as lucrative as other land use options). Some preconditions are directly related to more society-specific issues linked to fairness and justice (e.g. whether other farmers also participate or whether everyone benefits equally).
Distributive justice relates to the social distribution of both the costs and benefits of participation the afforestation scheme, as well as the accrued environmental benefits. Economic gains and losses may be unequally distributed across farmers and it is of importance whether this not only discourages participation but also further aggravates income inequality across farmers. Similarly, any environmental benefits as part of successful afforestation schemes should be distributed to everyone on the vicinity of the intervention.
Procedural justice relates more whether all farmers face equal barriers (financial, regulatory, informational) prior to their participation. Another integral element of procedural justice links to the ability of farmers to be actively involved in decision-making and able to help shape the design of certain procedures. Initial transaction costs for participation, for instance, may disproportionately burden farmers of low income. Similarly, not all farmers may have equal to access to information related to the design of the scheme. Being able to contribute to the design of the scheme and decision-making once the scheme initiates is also an important element of procedural justice.
Making use of our extensive dataset we assess the role of justice (distribute/procedural) in influencing farmers to participate in afforestation in comparison with other factors that are perceived to me more individual (egotistical) orientated (such as the level of personal compensation). The dataset allows to examine whether certain groups (by gender, income group, size of plot) feel disadvantaged by current afforestation procedures. Furthermore, the

questionnaires have been designed in a comparable way that allows us to discern any differential patterns across the four different geographical areas of our survey. Our spatial econometric analysis estimates the relative role of justice-related factors in influencing participation, amongst other driving factors.

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Towards a transportation system operated in accordance with the principles of functional economy

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Short Abstract (130 words)
The Functional Economy (FE) consists in selling a use function instead of a product. The potential for application of this socio-ecological transition could have significant implications, particularly as regards sustainable development (emission reduction, slowdown of resource depletion). While the FE is usually discussed in management sciences, we choose in this paper to tackle the FE through an economic approach, and to apply this concept to the transportation issue.
After we identify the origin and definition of the concept of FE, along with its characteristics and objectives, we use an example of bike sharing system (Vélib' in Paris) to analyze the major issues and advantages associated with such a model, as well as barriers and limits to the FE. Through this concept, we highlight a considerable potential for sustainable urban passenger transportation systems.

For a longer abstract (1200 words), see the document attached.

La dimension institutionnelle de l'économie de la fonctionnalité

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Les entreprises qui se réfèrent à l'économie de la fonctionnalité dans leur recherche de nouveaux modèles économiques associés au développement durable, s'engagent dans deux directions :
- une offre de solutions fondées sur l'association de biens et de services dont les effets conduisent à transformer tant les conditions dans lesquelles la production est réalisée, que celles dans lesquelles les usages des biens et des services s'opèrent. Dans le cas d'activités relevant des relations interentreprises (b to b), l'usage concerne le travail des salariés qu'ils soient en situation d'exécution ou d'encadrement ; dans le cas des solutions destinées aux ménages (b to c), l'usage concerne les modes de vie. L'offre de « solutions associées » relève d'une dynamique servicielle transformant les normes de production et les normes de consommation dans une perspective qui permet de prendre en charge certaines externalités négatives environnementales et sociales, et qui se traduit par un découplage du développement économique du volume de matières mobilisés. En d'autres termes, la croissance de la valeur servicelle s'accompagne d'une diminution de la quantité de matière et d'énergie utilisées ;
- une offre de solutions fondées sur l'intégration de biens et de services au regard d'un nouveau périmètre d'activités qui permette de répondre à des attentes exprimées sur un plan territorial au regard de « sphères d'activité » (ou sphères fonctionnelles) : attentes en matière de mobilité, de santé, d'habitat, d'alimentation, de production et diffusion de connaissances... Les solutions sont, alors, adossées à des performances relevant de ces « sphères d'activité ». Dans cette deuxième perspective, la dimension territoriale des solutions est consubstantielle à leur élaboration et au périmètre d'acteurs concernés par leur réalisation et leur évaluation.

Dans les deux directions, plusieurs enjeux apparaissent qui renvoient à l'émergence de nouveaux dispositifs institutionnels :
- la coproduction des solutions conduit à progresser dans la coopération entre acteurs au sein de l'entreprise, entre partenaires, comme entre prestataires et bénéficiaires. Deux types de dispositifs institutionnels sont en train d'émerger : les premiers concernent les retours d'expériences en mettant en avant les difficultés et les réussites rencontrées dans le travail ; les seconds, concernent la forme que prend l'évaluation qui ne peut pas se réduire à des indicateurs et à des mesures ;
- les deux dynamiques relevant de l'économie de la fonctionnalité conduisent également à reconsidérer les formes que prend l'innovation. Les dispositifs institutionnels issus de l'ère industrielle ne sont plus pertinents ayant tendance à enfermer l'innovation dans la technologie et dans l'espace des secteurs d'activité ou des filières industrielles. C'est pourquoi se mettent en place des « milieux innovateurs serviciels » agissant de manière transverse aux secteurs d'activité et aux professions, mobilisant les territoires locaux et mobilisant la recherche en sciences sociales. Ces logiques transverses font émerger de nouveaux acteurs d'intermédiation et de nouveaux dispositifs institués favorisant leur reconnaissance et le renforcement de leur professionnalisme. De plus, les rapports de la recherche en sciences sociales au réel n'étant pas les mêmes que ceux des sciences dites dures ou des sciences de l'ingénieur, la place de la recherche dans ces activités d'intermédiation devient centrale. De nouveaux rapports se mettent en place à la recherche d'un cheminement original à leur institutionnalisation ;
- les changements de modèles économiques associant modes de production et modes de vie transforment les « formes de conscience » et les « formes de pensée » des acteurs économiques, sociaux et institutionnels. De nouveaux référents implicites ou explicites émergent agissant comme des doctrines. Ces doctrines ont besoin de s'institutionnaliser pour être reconnues et faire référence.

L'ensemble de ces enjeux conduit à prendre en compte le fait que les modèles de l'économie de la fonctionnalité sont en lien direct avec les dynamiques d'institutionnalisation. Un semi-fonctionnalisme / semi-institutionnalisme est en marche. Il s'agit de l'analyser et de comprendre

sa portée sociale, économique et politique.

L'économie de la fonctionnalité, une traduction possible ou rêvée de la RSE dans un nouveau modèle économique ?

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La contribution vise à interpeller l'économie de la fonctionnalité dans sa dimension normative et stratégique, en particulier dans son acception anglo saxonne à partir d'une mise en perspective de la dynamique de RSE.
La RSE, s'apparente au « volet entreprises » du développement durable (Capron Petit, 2011), elle a pour objet de répondre à des questions écologiques / environnementale et sociétales (droits humains, discrimination, effet sur les communautés locales) à partir de l'échelle de la firme. Ces questions sont regroupées sous le vocale de critères ESG (environnement, social, gouvernance) elles ne peuvent faire l'économie d'une réflexion sur les transformations de l'entreprise, dans un contexte marqué par les défaillances de la gouvernance actionnariale (Lamarche et Rubinstein, 2012).
La critique écologique semble contribuer à faire évoluer la régulation du capitalisme, notamment par un déplacement du compromis institutionnalisé depuis une dimension sociale vers une dimension sociétale, plus vaste et plus floue. En l'occurrence, ce sont les entreprises qui mettent en avant des valeurs auparavant mobilisées pour critiquer ce système économique. La RSE est ainsi l'instrument privilégié d'un mouvement de légitimation de l'entreprise dans la société. Et conjointement, elle prévient l'édiction de règles contraignantes. La RSE telle qu'elle est portée par les entreprises pionnières en la matière est orientée vers le volontariat, elle suppose la bonne volonté et la bonne foi des dirigeants d'entreprises. Cette dimension de volontariat est cependant moins vérifiée sur le volet environnemental que sur le volet sociétal. L'environnement est régi par de nombreuses lois tandis que le volet social connaît la dynamique inverse en étant porté par un mouvement de libéralisation. Ce faisant, la publicité faite au concept de RSE conduit les entreprises à élargir le champ de leurs prérogatives en endossant une responsabilité environnementale qui s'ajoute à leur « responsabilité » vis-à-vis de leurs actionnaires, selon la définition canonique de Friedman (1970).
En nous référant aux deux approches de l'économie de la fonctionnalité (qui sont au coeur des contributions de le session et que nous ne développons pas ici) nous ferons sortir deux points saillants :
les approches microéconomiques de l'économie de la fonctionnalité restent marquées par la place du déclaratif et la maintien de pratiques de domination des clients et de lutte contre les concurrents. Autant de pratiques qui sont intégrées dans les structures. Les approches mésoéconomiques restent largement en devenir et impose l'identification des tensions entre approches normatives et positives.
Pour nourrir cette mise en perspective on se demande alors si et comment la RSE peut elle entrer au sein du système productif en participant à la fondation d'un nouveau modèle (et à quelle échelle) ?

La dimension communicationnelle, non opposable et volontariste de la RSE nous donne à voir des pratiques d'entreprises qui modifient très peu les logiques de la production et ne fait pas évoluer la prise en compte des coûts sociaux (travail, souffrance) et environnementaux (externalités négatives). La RSE de part sa construction paraît peut favorable à la l'émergence d'une économie de la fonctionnalité mésoéconomique. Le maintien de pratiques asymétriques produites par la puissances des structures de la concurrence et de la finance joue en effet contre les pratiques coopératives.

Does democracy need economic growth to its stabilization? Challenges and visions for a democratic transition to a post-growth-society

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1. Summary (Overview Paper of the session)
Modern democracy has established itself as an overlap of different traditions, social struggles, and systemic favorable conditions. This paper will give an overview of the complex historical allegiance between growth and democracy and will problematize the current crisis of this very allegiance due to immanent contradictions of the growth regime as well as to the undeniable ecological, economic, and social limits to growth. The improvement of the material and overall conditions of the majority of the people has been an important condition for democratic participation. Moreover, the modern welfare state (which reduced inequality, improved public education, general health care, and social security) relied so far on economic growth for its stabilization and legitimization. The contemporary multiple crisis is threatening this wicked allegiance by exacerbating the orientation towards growth as the sole goal and thus subordinating political processes to economic interests.
In the first part of the paper the ‚wicked marriage? between degrowth and democracy is analyzed along three ideal-typical paths: indifference; degrowth as a danger to democracy; degrowth as an ally to democracy. In the last part some main challenges for a democratic path towards a degrowth or post-growth-society are considered. The paper concludes by pointing out at some albeit attractive traps and possible opportunities paths embedded in the ‚wicked marriage? between degrowth and democracy.

2. Degrowth and democracy: a wicked marriage
In the current debate on degrowth & democracy we can classify following ideal-typical positions:
2.1.Indifference:
- Degrowth is considered by different proponents a) as an inevitable path and a challenge to modern societies (either we let it happen in form of a catastrophic recession or we start designing degrowth) or as a normative goal for saving the earth.
- Whatever is the case, one might consider that democracy is not the issue at stake in the face of a dramatic danger for the planet and the future of humanity. We do not have time to wait for a democratic process that will enact the change we urgently need.
- Changing political structures & institution is not held to be the main field of action for a real change. We have to start at the individual level and embody new models of living and understanding ourselves in relation to nature. Everybody can start by changing her habits towards voluntary simplicity, and by enhancing other forms of neighborhood solidarity, cooperation, and exchange on a regional basis. Sufficiency and subsistence economy in food-sovereign regions is the way to go.
The risk along this path is a strong depoliticization of the degrowth debate and a focus on individual or small-group-scale paths of change.
2.2 Degrowth is a danger for modern democracies
- Modern democracies have arisen and stabilized themselves by means of economic growth. The improvement of the material and overall conditions of the majority of the people has rendered their participation in democratic processes possible (see gender equality and emancipation struggles). The modern welfare state (which reduced to a certain extent inequality, improved public education, general health care, and social security for all members of society) relies on economic growth its stabilization (low social conflicts, high tax revenues) and legitimization (unemployment, perspective of improvement for oneself & one?s own children, independence from family bindings, individual freedom). How can a welfare state in a degrowth society be envisioned?
- One can find in the analysis of future scenarios for a post-growth-society following equation: degrowth = less tax revenues = shrinking of welfare state = reallocation of services to family & the private sector (care, education) = less materialistic-based path to happiness & more family relations, spiritual and community values. Against such conservative drifts, advocates of an emancipatory perspective recall the danger for gender equality and the issue of domination and

discrimination relations in the family and the community. According to the critics, degrowth proposals are antidemocratic and serve the logic of the dominating system (pacification through voluntary simplicity instead of struggles for the redistribution of wealth and the access to participation). Rather, they focus on non-naive sustainable growth paths. The problem is not growth, but the capitalistic accumulation and the unjust distribution of wealth and power.
- Degrowth proposals in terms of re-localization & bioregionalism, which seem to do away with the institutional coordination function of a central democratic government, lack adequate models for inclusive democracy and for interventions for the protection of the disabled, the excluded, and the foreigner. Bioregionalism relies on an ecological asset of the carrying capacity of "bioregions«, according to which the population size allowed to inhabit bioregions is fixed and strictly controlled. Everybody would have their specific role in the community, according to an harmonious and holistic understanding of society. Emancipatory and domination-sensitive approaches reject bioregionalism as a conservative & eco-fascist model.

2.3. Degrowth as a crucial ally to save and enhance democracy.

- Even if growth has been a crucial factor of stabilization for democracies and a condition of possibility for its development, this does not work anymore. Accordingly, we are now facing the inescapable alternative between recession under the current system conditions of capitalism or degrowth by design. While the first option might lead to a fascist reaction to protect society from destabilization or let a surface of formal democracy survive, the second option is considered as the only path to save and enhance democracy.
- According to advocates of degrowth, democracy has been highjacked by the dominating growth/ capitalistic paradigm: what we call representative democracy is in reality the organized defense of the privileges of the fews. The compulsive growth paradigm has worked as a kind of natural law above the citizens' heads and has hindered real democratic decisions towards alternative paths of social development. Liberation from the pervasive growth-diktat is necessary for a truly democratic path, in which the people decide about how they want to live together. Degrowth can be a path to re-invent & strengthen democracy by re-embedding the economy back into the social & the political.
- The enhancement of democracy under a degrowth regime would help the development of democracies all over the world, by reducing or suspending the pressure of globalization & the neo-colonial struggle for resources and sinks.

3. Conclusions: Challenges for a democratic degrowth path

Degrowth and democracy is not an obvious link, but a link which has to be constructed, defended, and continuously questioned. One has to keep in mind the vision of a degrowth society and the transition path towards it.

- Can a democratic degrowth society remain within the systemic structures of modern societies (other regulations regimes, changed behavior)? If not, what has to/ would change (market, capitalism, representative democracy)?
- Which democracy? Are there any mixed paths of binding back representative democracy to the direct control and participation of the people?
- Which institutions in a wider sense are required and envisioned? How does social coordination and integration works? How can social, formal, and juridical justice be guaranteed to all citizens independently from their being embedded in social networks? How are work and labour designed? What is the basis for social recognition and participation?
- How do we deal with the challenge of open-endedness of direct democratic processes, which might very well lead to paths contrary to degrowth? What is the role of ,experts? if any?
- How does the path towards deeper or direct democracy work on a global scale? How do the different scales (local, regional, international) interconnect?

Growth and Domination. Shortcomings of the (De-) Growth Debate

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Questions around economic growth and prosperity are currently subject of intense debate. This is due largely to the current economic crisis and decreasing rates of economic growth as well as to a re-politicisation of the ecological crisis. The latter has mainly to do with the obvious fact that international environmental politics largely failed and that environmental destruction is in many areas accelerating (UNEP, 2012). The widely recognised study published by Rockström et al. (2009) shows that in many respects the «planetary boundaries» are already or almost reached; in addition to biodiversity loss and the nitrogen cycle, climate change is the most severe problem. Additionally, estimates about peak oil and peak everything push the debate whether and how to rethink economic growth (IEA, 2011; Murray and King, 2012). The common denominator is that the classical orientation at the annual growth of the production and consumption of market-mediated goods and services is not any longer considered as adequate.

In the following, I condense quickly the motives behind the increasing criticism of the strong quest economic growth and discuss prominent proposals which argue for a different approach to growth.

Many open questions of this vivid and important debate remain. For instance, Steuerer (2010) argues that the growth debate is full of problematic assumptions because extrapolations of actual trends remain uncertain. Discussions in and between the disciplines of environmental economics and ecological economics, environmental governance, social and political ecology center around qualitative or degrowth. Here, questions emerge about implicit assumptions of the role substitution of «natural capital», of technology, prices and the possibilities of the internalisation of externalised costs, the rebound effect and, in sum, the effects of relative decoupling and absolute reduction. The relationship between monetary and physical factors and their growth or use, respectively, is not clear and requires more research. One criticism of the proposals towards a de-growing economy is its weak macroeconomic foundation and their consequences (Victor 2008, Jackson/Victor 2011). However, some important aspects are formulated like the necessary reduction of the work time of wage-labour and the redistribution of work as the basis to maintain productivity growth without economic growth.

Whereas claims for qualitative growth propose changes largely within the existing institutional settings (of state, market and civil society), the consensus within the de-growth debate ? I include here the recent plea for a-growth pragmatically - is that there is a need for in-depth social change or social-ecological transformation in order to address social and ecological problems. The orientation towards economic growth is mainly seen as part of the problem, not as the solution. Prosperity without growth is conceivable, feasible, and moreover it is essential.

Against the background of this short overview over the current state of the art - I refer to the English and German-speaking debate - I develop my main argument: The debates which refer critically to the traditional orientation towards quantitative growth usually forget a crucial dimension: The question how economic growth as a social relation is linked to societal domination and, hence, reproduces social structures. Contributions developed from a perspective of critical theory ? especially feminist and Marxist ones - insist on the domination-shaped character of economic growth as integral part of capitalist societalisation (Vergesellschaftung). Societal domination, I argue in the tradition of the «older» Frankfurt School, is also the basis for domination-shaped societal nature relations and should be considered as a main driver of actual socio-ecological problems and a major obstacle for the development of alternatives.

Domination is understood as a complex political, economic and cultural mode of the reproduction of societal structures along class, gender, ethnical, generational or international lines. Domination can be exercised by open violence but more often it is reproduced in a form that the dominated think that the will of the dominators is their own will. Such a relational understanding of domination stands in the tradition of Max Weber.

I refer here more to a structural understanding, i.e. to domination-shaped structures and processes that produce and are reproduced by an active or at least passive consent among the dominated

(Antonio Gramsci, 1991, vol. 1: 101-2, Thomas 2009). Hegemony is not just explicit agreement with certain relations and methods, but a comprehensive practice which involves «the day-to-day action of many individuals and social groups in which their acceptance of domination is manifested as active self-subjection to the shared customs of a large collective» (Demirovi? 1997: 257, translation U.B.). Consent in a Gramscian sense is not just conviction or false consciousness but a lived practice. And it has a «material core», especially with respect to the material reproduction of everyday lives of people. It is broadly accepted and deeply inscribed into economic, political and cultural practices and norms. And under the existing conditions this material core is not at all sustainable.

A Gramscian perspective has an agential or relational dimension as well: The ruling class(es) that organize(s) other forces in a hegemonic power bloc manages to «assert itself, to extend itself throughout the whole of society. In so doing, it creates uniformity not just of economic and political objectives, it also creates intellectual and ethical unity; all the issues over which struggles rage are elevated by it to the ?universal' level, that is, beyond the merely corporatist level. Thus the hegemony of one of the basic groups of society over a number of subordinate groups is established.» (Gramsci, 1996, vol. 7: 1561, translation U.B.) Finally, domination has a lot to do with the dominant and marginal forms of the societal appropriation of nature or, more precisely, societal nature relations.This paper is organised as follows. In section 2, I summarise major issues of the debate. In section 3, my own argument on economic growth and societal domination is outlined, referring to the feminist and neo-Marxist debate and enhanced from a perspective of political ecology towards domination-shaped society nature relations. The question of democracy is introduced in section 4 and linked to some aspects of the recent debate about social-ecological transformation. Some conclusions are drawn in the last section.

Degrowth, capitalism and democratic stability

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Summary
This paper investigates the conditions of possibility of democratic regime stability in a ?degrowth' society. While such societies might offer more vivid, inclusive and comprehensive forms of democratic citizenship due to their co-operative normative structure, the question remains as to the expected stability of such ?degrowth democracies': how can political conflict over resource distribution, workloads, failed cooperation and issues of economic planning be handled without overburdening the political structures of the polity? Which centrifugal mechanisms and forces are to be expected in a degrowth democracy and which centripetal forces could be institutionalised to balance them? An innovative analytical framework will be presented within which these crucial questions can be addressed.

Degrowth, the paradox of democracy and the problem of political stability
Regime stability in a degrowth democracy does not immediately appear problematic when democracy is conceived solely as a normative framework. Ideals of democratic citizenship, political participation and equality are arguably more closely related to the ideals of a degrowth society based on a more co-operative and solidary economy, than to a capitalist society based on competition, individualism and the forces of the market. The problem of regime stability comes to the fore, however, as soon as we leave the normative terrain and analyse democracy as an essentially paradoxical relation. Political modernity, one might say, is defined by the fact that politics have become a matter of pure ?immanence', in which God's Divine Will has ceased to organise the social order. Humans, as a result, are left to their own devices, and are forced to organise themselves on their own accord. This liberty, as Rousseau knew very well, constitutes the very core of the modern paradox of politics, that Bonnie Honig (2007: 9) neatly described as ?the people's relation to itself as both ruler and ruled'. One and the same instance, the ?people', is thus placed at both ends of a hierarchical relation, which inaugurates a ?chicken-and-egg circle' (cf. Honig 2007: 2) in search for legitimate rule. This undecidable quest for the power to execute democratic sovereignty between the ?people ruling' and the ?people ruled' has led to the often violent failure of many democratic experiments in history, including the French Revolution. The political paradox indeed haunts all democratic endeavours that involve the mechanism ofrepresentation, that is, all instances when someone starts speaking ?for the people' (Cowans 2001), thus claiming a position of authority over others (Saward 2006). Representation, however, is a necessary mechanism for all practical purposes in any polity that exceeds the size of a small town. We have to assume that mechanisms of representation of some sort will remain indispensable for any relevant model of democracy, also under conditions of economic degrowth and a new socio-economic order.
So, if democracy is paradoxical and democratic representation inherently unstable, how come that the historical formation that we have come to call ?liberal democracy' and that has dominated much of the capitalist world during the past hundred years has been such a story of success in terms of regime stability?
The answer I propose here is that liberal democracy has been relatively successful not because of itsnormativelegitimacy (which is inhabited by the political paradox) but because of a form of legitimacy I have elsewhere called ?epistemic' (Hausknost 2011; 2012). This form of legitimacy refers to thesocial constructionand collectiveperceptionof societal reality. The idea behind it is the following: under conditions of immanent politics (i.e. without a transcendental source of authority) the only way to resolve the undecidable hierarchy between the people and the state is by introducing athird termin relation to which both can organise their precarious relation. This third term must have the power to structure reality in a way similar to the pre-modern transcendental force, so that state and people share the same epistemic vantage point at thereceivingend of a reality that is createdoutsidetheir own relationship. This is the only way in which the explosive hierarchy between them can be turned into a horizontal relationship on the basis of which political representation can work smoothly. Thus, Claude Lefort's (1988) famous

definition of modern democracy as a regime in which ?the locus of power is empty' only works insofar as the power to decide about the basic contents of societal reality is placedoutsidethe representative relationship, that is, into the (invisible) hands of thatthird termthat generates ourcommonly acceptedreality. The moreopaqueand autonomous the sources of our shared social reality appear, the lighter the burden of its justification. Put differently, the more social reality appears as ?externally given', the easier it is to stabilise a democratic system of representation that merely ?administrates' this given reality.
Historically speaking, this decisivethird termemerged in the form of the capitalist market economy. What we today call modern (or liberal) democracy is the result of a gradual and reluctant democratisation of a liberal state that was built on mechanisms of representation (of the propertied classes) that reach back to the middle ages (Pitkin 2004). The resulting ?uneasy alliance' (Macpherson 1973) of liberalism and democracy relies on the capacity of the capitalist market economy to generate the substantial ingredients of social reality (e.g. jobs, incomes, commodities and prices) in an epistemically opaque manner (thus Smith's Invisible Hand and the Austrian School's ?Epistemic Liberalism'). State and people are thus united in their epistemic position as receivers of an essentially ?given' reality that needs to be ?managed' and ?administrated' (which has been the generic purpose ofliberalparliamentarianism). Political tension is then structurally reduced to questions of the right way of reacting to market data, economic problems and opportunities, and matters of social distribution. These are conflictual enough issues for a democratic polity, but the undecidable and most antagonistic questions about the idealstructureandpurposeof society and its ultimatetelosare all but eclipsed from the system of representation. Hence, the stability of liberal democracy is based on a mechanism that suspends the political paradox essentially by suspending the sovereignty to decide about the basic contours of society. Growth-based liberal democracy, this view suggests, can draw on a psychological advantage a degrowth democracy would have to forgo: it relies on the market economy as an autonomous source of reality (a quasideus ex machina) to which the representative order can refer as acommon matrix of reference. Conversely, a truly ?sovereign' degrowth democracy would not have such an ?external' source of reality at its disposal and would need to deal with social reality in an essentially ?immanent' and therefore precarious way.

This understanding of modern democracy should be alarming for normative theorists of an egalitarian, democratic degrowth perspective. For if modern democracy could only be stabilised with the help of an ultimately unsustainable growth-based market economy, the urgent question arises as to how democracy can be re-invented under post-growth conditions without falling prey to the constitutive political paradox that rests at its core. Do we need another ?opaque source of reality' to suspend the paradox? Or do we need a substantive normative core that is strong enough to sustain a society without closing it in a totalitarian way? Or is it possible to invent new democratic institutions and mechanisms that help us suspend or at least control the political paradox effectively? These are the central questions a democratic theory of degrowth has to address in my view. The proposed analytical framework could help making progress in this direction.

Words and story-lines in development dialogue. The role of economics in politics and institutional change processes

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Contribution to Special session »The crisis of democracy in modern growth societies and the new cycle of protest» as part of ESEE conference in Lille, France, 18-21, June 2013
Words and story-lines in development dialogue. The role of economics in politics and institutional change processes
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Abstract:
In response to the present multi-facetted crisis there are protests and social movements. Also economists and other scientists respond in one way or other to what they perceive. Economists are not neutral observers of various phenomena but actors as part of society. «Values are always with us» (Myrdal 1978) as researchers and educators. I will look upon individuals (whether identifying themselves as economists or not) as political economic persons guided by their ideological orientations. Normal imperatives of democracy are relevant also for universities and departments of economics. A movement away from technocracy towards democracy implying pluralism rather than neoclassical monopoly in economics and an open discussion of paradigms and ideological orientations is needed.
Against this background I will discuss the role of various story-lines (such as de-growth) and institutional change processes and how they can be understood. I will also point to some of the options for institutional arrangements at various levels from the local to the global.
Introduction
Public debate about the future draws inspiration from many sources. It is argued here that the conceptual framework of economics, with connected story-lines, is such a source. Economics plays a role for many establishment actors, be they politicians, business leaders or civil servants. Even actors in social movements are influenced by ideas stemming from economics.
The focus in this paper is on the role of economics. If story-lines focusing on economic growth in GDP-terms continue to dominate as implying the solution (or at least a way of dealing with) all kinds of problems then we have reasons to seriously reconsider research and education in economics. As part of a multi-facetted crisis situation there is a crisis also in economics, perhaps even in ecological economics.
In the case of business corporations, more precisely joint stock companies, there is a limited liability doctrine. The liability of shareholders is limited to their financial contributions in terms of shares. These days, however, Corporate Social Responsibility (CSR) is discussed as a kind of extended responsibility. Do we have reasons now to also discuss University Social Responsibility (USR) or do we believe that universities and actors within universities, for example scholars at departments of economics, always behave in a responsible way? I suggest that positivism as a theory of science may play a role as a limited liability doctrine with its emphasis on objectivity, standing outside, even «value neutrality» is such a candidate. Positivism is based on the belief that science and politics can be separated.
A way of being more responsible as actor within universities is to accept that «values are always with us» in economics research and education (Myrdal 1978). Or to put things in a somewhat different language: economics is science in some sense but at the same time ideology. We need to discuss the ideology of mainstream neoclassical theory and of different non-neoclassical schools of thought that represent alternatives. Also specific contributions to ecological economics need to be scrutinized in this way.
My argument here is then that all actors in a democratic society are expected to behave in a responsible manner. Considering the role played by economic thinking in public debate there are reasons to focus on this discipline. Rather than looking at actor categories outside universities I think that it is wise to focus on our own category. My «hypothesis» is that research and education in economics has failed in many ways to guide establishment actors in solving the financial and ecological crises of the past and the present. If that is the case we may need to consider more

than one story line or discourse in our attempts to prepare the way for sustainable development. In questioning simplistic ideas of welfare in terms of ?growth', ?de-growth' as a key word will play a role but my belief is that we also need to open up the conceptual framework of mainstream neoclassical economics more generally. How realistic is the de-growth discourse if it is assumed that the present political economic system will essentially remain intact? How can economics move away from its technocratic tendencies to become more compatible with democracy? Is it meaningful to rely on Economic Man assumptions when approaching issues of ?de-growth' or do we need a different idea of human beings?

In what follows I will move in the direction of democracy and an open political economics. As economists we can consider alternative views of individuals, organizations, markets, decision-making, institutions etc. to make them more compatible with democracy. Against this background I will discuss how institutional change can be understood and some of the main barriers and opportunities for such change.

Political economic person and Political economic organization assumptions

In my writings I have repeatedly pointed to the need to discuss alternatives to Economic Man assumptions. I may be wrong but with few exceptions my observations suggest that there is little interest in discussing such alternatives even in the ecological economics community. For me, our view of human beings is where everything begins. If we want to get away from neoclassical theory this is where we should start. And when some alternative model is suggested this does not exclude other options.

The individual will be understood as a political economic person (PEP) and actor guided by an ? ideological orientation'. An organization will similarly be understood as political economic organization and actor guided by an ideological orientation or ?mission'. Individuals as well as organizations are regarded as responsible in the local, national and global societies in which they live. Ideology here stands for a means-ends relationship. It can be understood as a kind of compass and is about where you are (present position), where you want to go (future positions) and how to get there (strategy). An ideological orientation is seldom something to be optimized. It is rather fragmentary, uncertain and is made up of quantitative as well as qualitative and visual elements. But it is still used for decision-making and to value specific developments or alternatives.

Why this reference to ideology and to political aspects? For me it appears clear that a specific interpretation of sustainable development exemplifies an ideological orientation. Actors may interpret sustainable development in different ways. Such interpretation is something to be investigated in each case rather than taken for given. Some actors think in terms of narrow « business-as-usual» terms, others are ready to broaden their views.

Why this reference to ideology and ideological orientation? Ideology has been used mainly at the collective level for example the ideology of as specific political party. But if political parties connect their identities with specific ideological orientations when trying to increase the number of votes for example, then also citizens who are expected to respond to their arguments and story-lines may think in similar terms. It should also be noted at the outset that some terms, or even discourses, which are increasingly used these days such as Corporate Social Responsibility (CSR) or ?fair trade' become meaningful as part of a language in terms of PEPs and PEOs. Actually, our ambition may be to socially construct a language that facilitates participation in society rather than further strengthening the technocratic tendencies of mainstream economists.

Institutional change

Against the above background institutional change processes will be approached. Again things start with individuals interpreting or understanding specific phenomena in similar ways. Members of an organization may realize that its performance can be measured in non-monetary terms in addition to financial control of the usual kind. Environmental Management Systems (EMS) such as ISO 14001 came about in this way. The organization may be certified implying that the common interpretation is manifested in organizational changes (perhaps an environmental coordinator and the choice of an auditing organization) and of course in measurement of performance when compared with previous years. When an ?institution' is increasingly accepted it becomes more legitimate.

The concept of institution may be used in a broad sense. The European Society for Ecological Economics can be looked upon as an institution. Perhaps even the ?de-growth' story-line or discourse has become an institution among other institutions.

But dealing with present crisis situations probably requires more than incremental institutional change. We have to deal with broad schemes of interpretation such as theories of science (for example the role of science in relation to politics), paradigms in economics and ideology or ideological orientations. Mainstream perspectives in these respects largely explain the institutional arrangements or political economic system that exists. Dominance at the level of perspectives may thus explain dominance in terms of institutional arrangements. Alternative

perspectives may on the other hand open the door for new institutional arrangements.

References:

Jackson, Ross,2012. Occupy World Street. A global road-map for radical economic and political reform. Chelsia Green Publishing. White River Junction.

Myrdal, Gunnar, 1978. Institutional Economics,Journal of Economic Issues, Vol. 12,No. 4, pp.771-783.

Söderbaum, Peter, 2008. Understanding sustainability economics. Towards pluralism in economics. Earthscan/Routledge, London.

Söderbaum, Peter och Judy Brown, 2010. Democratizing economics. Pluralism as a path toward sustainability.Annals of the New York Academy of Sciences1185,Ecological Economics Reviews, pp. 179-195. New York Academy of Sciences, New York.

The indignados movement in Barcelona. Framing the crisis and democracy

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Summary

2011 has witnessed a «new cycle of protest» (Tarrow, 1997). After the so-called «Arab spring», citizens movements have swept Western countries, starting from the demonstrations of the « Generaçao a Rasca» in Portugal in March, then taking a much wider scope in May in Spanish squares, and resonating in other European cities under the «indignados» and «Occupy» umbrella terms. This paper aims at shedding light on how the indignados movement in Spain frames its perception of the crisis and the potential solutions to it in order to change a situation seen as unjust, and how this articulation relates to conceptions of ?real democracy« by the movement. In order to identify frames, participant observation of the movement in Barcelona is complemented with thematic analysis of transcripts of 35 in-depth interviews and 5 focus groups (Johnston, 2002; Ryan and Bernard, 2003; Ritchie et al., 2003), and of documents produced by the movement.

Extended abstract

The meta-political critique of social movements (Offe, 1985) has been powerfully resurging under the 2011 «new cycle of protest» (Tarrow, 1997) following the global economic crisis. After «Iceland peaceful revolution» and the emergence of the so-called Arab spring, citizens movements have swept Western countries, starting from the demonstrations of the «Generaçao a Rasca» in Portugal in March, then taking a much wider scope in May in Spanish squares, and resonating in other European squares under the «indignados» and «Occupy» umbrella terms. The indignados movement has featured the largest occupations of Spanish squares since the transition to democracy in the 70s, while assuring a support from the wider population of over 70% (Metroscopia, 2011). Through its appeal to being «outraged», it seems to have involved a re-politicization of some sectors of the population that were not familiar to political activism (Anthentas and Vivas, 2012; Arellano Yanguas, 2012), by substituting the logic of temporary and relatively closed counter-summits typical of the global justice movement with permanent political discussion processes, the square.

According to Offe (1985), what particularly characterize the «new social movements» starting with 1968 student, feminist and ecological waves, as compared to movements of the industrial society is their fundamental meta-political critique of the social order and of representative democracy, challenging institutional assumptions regarding conventional ways of doing politics, in the name of a radical democracy. In this article it is argued that the meta-political critique, has been powerfully resurging under the wave of the 2007-2008 global economic crisis, assuming new important shades.

This paper aims at shedding light on how the 15-M frames its perception of the crisis and the potential solutions to it in order to change a situation seen as unjust, and how this articulation relates to conceptions of ?real democracy« by the movement. It also purports to investigate how its collective identity has changed through time, and how it differs from the social justice movement.

Frames have been identified as schemata of interpretation that enable individuals to «locate, perceive, identify and label occurrences within their life space and the world at large» (Snow et al., 1986). Framing theory inserts itself into the core problematic of movement analysis, why people participate, and by proposing that signifying processes have a central role in this (Westby, 2002). Frame analysis allows to capture the process of attribution of meaning which lies behind the explosion of any conflict. There are three stages in the activation of mobilization, the « diagnostic, prognostic, and motivational» dimensions of framing (Snow and Benford, 1988). « Master frames» have been originally conceptualized as collective action frames conveying broad interpretations of reality, and they characterize and contrain the orientation and activities within cycles of protest. This concept is especially relevant to recent large-scale mobilizations and protest events constituted by an alliance or coalition of a multitude of heterogenous groups (Della Porta and Diani, 2006).

In order to identify frames, participant observation is complemented with thematic analysis of transcripts of 35 in-depth interviews and 5 focus groups (Johnston, 2002; Ryan and Bernard, 2003; Ritchie et al., 2003), and documents of «minimal demands, «declarations of principles», flyers etc. produced by the movement. This diversification of sources allows to consider the dynamic evolution of collective identity and frame formulation.

The indignados movement has been depicted as having been ignited as a response to the global economic crisis and the approaches taken by the European Union and the Spanish government to handle it, the structural adjustment measures promised by the government to the so-called Troika (the International Monetary Fund, the European Commission and the European Central Bank) and involving massive cuts to educational, social and cultural programmes in a context of high unemployment. But their contention seem therefore to go beyond the protest against the economic crisis and the retreat of welfare state provisions. The metapolitical critique is intrinsically linked with the identification of a «multi-dimensional crisis», involving not just an economic, but a political, social and environmental dimensions (Fraser, 2012; Fernández Buey, 2009; Morin, 2011; Fotopoulos, 2005; Castoriadis, 1997). Neoliberal societies have entered since many years a phase of important economic-political turbulence and social malaise. Global capitalism has in fact broken the longstanding historical alliance among capitalism, the welfare state and democracy (Crouch, 2004).

While prompted by the crisis, the 15M is not simply issue driven. It develops a critique of the overall society. The multi-dimensional crisis is part of the master frame of the indignados movement, and is conducive to advancing the need for deep structural society changes, involving the core of its symbolic production, values. Not only the dominance of markets over politics is perceived as one of the important points of the diagnosis, especially in the movement's inception and explosion phase, but also economism and competition in nowadays' societies are criticized. Solidarity, cooperativism, self-management, mutual support, and frugality are seen as values in contrapposition to nowadays' societies.

It is revealed that, although deeply connected to its closest «cousin» - the social justice movement - the indignados movement is characterized by new different master frames, which disclose in certain respects a generational conflict between the two movements.

The movement is post-modernist in that it focuses not only or not principally on the political system, but on the wider cultural dimension, involving and affecting everyday habits and patterns of thought (Rattila and Rinne, 2012). In this sense, a special emphasis is put on consumption, while morality claims assume a preponderant role. Not only one important frame has moral connotations ? the social justice frame (Gamson, 1995) ? but Occupiers have also embraced and articulated the sharing and caring morality (Langman, 2012) as a core feature of their prognostic frames. Thus, not only they demand more fairness, but also express the need for a profound change in lifestyles, identities and values.

The collective identity of the 15M has gradually shifted through time from a relatively less politicized and more heterogenous collectivity to a more radical, politicized one, with less diversity in terms of positions. Also, the movement has evolved into being cognizant and sympathetic to degrowth positions, whose conceptualization seems to reflect and accommodate the radical need and demands for deep societal changes.

Representative democracy is delegitimized and perceived as «outdated», while different conceptions of participatory democracy and direct democracy form a central part of the prognosis envisioned, supported by economic democracy. Within this line, assemblearian processes acquire a heightened importance, but horizontality sometimes hinders the capacities for a true coherent and unitary action and programme, while the movements may result as fragmented, and sometimes even paralyzed in its willingness to avoid conflicts, for its dominance of the consensus frame.

Is there any evidence of an ecosystem service curse?

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This paper explores existing evidence for an ecosystem service curse, whereby countries rich in ecosystem services would receive payments significant enough to distort their economies, or at least to distort local economies where ecosystem services originate (Kronenberg and Hubacek, 2012). Although there are potential opportunities to create jobs with the use of PES, such as in tree-planting, tourism or silvopastoral practices, as well as potential positive externalities for agriculture (from forest and water conservation), and further economic opportunities may emerge with new capital available to poor communities; all of these depend on how PES are designed. These opportunities may be undermined by rent seeking, unequal bargaining power and volatility of payments; problems that may affect the development opportunities of ecosystem-rich countries.

Several case studies available from the literature will be examined to study the origin of the socio-economic problems that were observed in regions and communities which benefited from ecosystem-services-related payments. The main focus will be on agri-environmental programmes and on payments made within the REDD and REDD+ initiatives. In both cases various authors have already observed the emergence of strategic behaviour leading to rent seeking, and negative consequences of volatility of payments or ecosystem service prices.

In conclusion, suggestions will be made on how to design institutions that would withstand the above problems and help avoid the risk of a potential ecosystem service curse.

Reference

Kronenberg, Jakub and Klaus Hubacek (2013), ?Could Payments for Ecosystem Services Create an «Ecosystem Service Curse»?', Ecology and Society, 18(1): 10.

Feasibility of a Payment for Ecosystem Services Scheme: Cost-benefit Distribution and Contracting Opportunities in Güisayote Biological Reserve, Honduras

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Currently, there is a large challenge in ecosystem-based management to understand the distribution of costs and benefits among and within different groups in society (Tallis and Polasky 2009) in order to create economic incentives for conservation and improve equity locally. This study determined Willingness to Pay for potable drinking water and the required compensation for upstream landowners to take land out of production in order to improve water quality in three watersheds of the Güisayote Biological Reserve in the west of Honduras. Furthermore, the cost-benefit distribution and local context was studied to understand contracting opportunities. The study found a very low willingness to pay by beneficiaries but a payment for ecosystem services scheme in the study site could still be feasible through a NGO-based scheme with external support or a bundled-scheme. Furthermore, an efficiently targeted approach needs to be employed, aiming at more equitable payments for beneficiaries and providers. Such a scheme could secure water conservation but it needs to compliment a wider set of policy measures as it doesn't substitute the need for improved protected area management and control. A more holistic and creative approach needs to be taken combining both governance and incentive-based policies.

SPATIAL ECOSYSTEM SERVICES OF MEXICAN FREE-TAILED BATS

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We present a theoretical approach for quantifying spatial ecosystem subsidies for a migratory bat species, the Mexican free-tailed bat (Tadarida brasilliensis mexicana). Spatial mismatches can occur between locations that most support the viability of migratory populations and the locations where they provide the most ecosystem services. Consequently, certain locations may end up subsidizing the delivery of ecosystem services in other parts of the species' range. Mexican free-tailed bats overwinter in Southern Mexican and migrate to summer breeding sites in Northern Mexico and the Southwestern U.S.; they provide important pest control services for agricultural crops and are a source for ecotourism. Conservation efforts are needed as bat populations are facing threats from numerous sources and the Mexican free-tailed bat population may be declining. This approach can also be used quantify spatial subsidies and provide conservation frameworks for other migratory species.

We used a migratory network model for the Mexican free-tailed bat to simulate migration between winter sites and summer maternity sites. This modeling approach assessed the migratory linkages and estimated the relative contribution of different regions to the maintenance of migratory bat populations. Then, we calculated the value of two ecosystem services provided by Mexican free-tailed bats: ecotourism and pest control provided to cotton farmers through reduced crop damage and avoided pesticide costs. Finally, we estimated the spatial subsidy values between Mexico and the U.S.

We found that Northern Mexico and Texas were important regions for maintaining the viability of the migratory bat population, and received the largest flows of migrants. Further, Mexican free-tailed bats generate considerable tourism value, and provide substantial pest control services for cotton farmers in the southwestern U.S. over the growing season. Our subsidy calculations indicated the overwintering habitats in southern Mexico are providing subsidies mainly to Texas and New Mexico. Thus, we recommend that conservation efforts be focused on these influential areas for bat populations, and that efforts be made to harmonize management and conservation strategies across the U.S. - Mexico border. Finally, we suggest this approach for estimating spatial ecosystem subsides be applied to other migratory species in order to facilitate transboundary conservation.

Industrial Ecology : Crossed Viewpoints from Economics and Biology

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Industrial ecology (IE) is a new research field, mainly developed by engineers, which aims at saving materials and energy. Based on the analysis of industrial metabolism, it promotes symbiotic relations between actors (industries) on different territories.
Originally designed to optimize flows of productive activities (on business parks for example), it has been extended to other situations in different contexts (i.e. urban heating networks). Different experiments such as the Kalundborg symbiosis are now well documented.
Though very heterogeneous, all these experiments share a common methodology which lays on the study of the industrial metabolism. The approach of IE is based on the idea that the natural metabolism (the biological systems) can be reproduced on the scale of human activities. Graedel (1996) has thus proposed a representation of a completely symbiotic system in which the only external energy is solar.
From the perspective of social sciences, this representation can be described as eco-centric. Different models are under discussion. Debates have emerged with the assessment of different experiments and failures were explained by the non inclusion of the «human factor» (Mirata, 2005) into the experiments. More explicitly, two different perspectives about IE emerged from the debate between Allenby (2006) and Ehrenfeld (2007). Allenby, pictures IE as a spontaneous process, based on opportunities and market based exchanges, whereas Ehrenfeld defends a vision of IE as a socially constructed process, where transactions are embedded in the social sphere - using the terminology of Granovetter (1985). In the first case, and even if not explicitly mentioned, human exchanges are compared to natural exchanges (natural systems) and environmental constraints are, at best, taken into account by imitating natural systems. It therefore appears appropriate to speak about an eco-centric vision (Hess, 2010). The second approach focuses instead on the social dimension, but fails to explicit the links with the natural environment. This explains why Hess (2010) considers the reference to ecosystems is metaphoric in this approach, and goes along with an anthropocentric point of view.
This paper aims to reconsider the debate between the two conceptions of IE. That is, firstly, to clarify the different epistemological positions. And secondly, we aim to go beyond the traditional debate in order to promote a real interdisciplinary perspective, notably between economics and social sciences on the one hand, and more (so called) applied sciences (ecology, genetics), on the other.
To do so, we start by reviewing each position. We can contrast two ways of representing relationships between disciplines, which reflects two implicit epistemological positions. This first is a strategy ofjuxtapositionwhich consists in accepting the results of each other without questioning the status of the research object. Each side mobilizes its own tools, that is to say, its own principles of action and regulation (ie rationality and the market on the one hand, evolution and natural selection of the other). As a consequence, opposed or irreconcilable epistemological point of views can coexist easily, without apparent contradictions. Another way consists in embedding the two opposed positions into a wider theoretical corpus. When doing so, the opposed positions becomes a special case of this general corpus. Again, two positions can be identified.

The first, named thebusiness model position, aims at reducing human action to a general objective : profitability. Survival (literally) therefore requires cost saving and synergies are instruments associated with cost saving. Natural systems are subordinated to human goals, nature is to serve productive purposes. In contrast, the other vision is completely at the opposite. This model is based on the assumption of subsidiarity of human actions which are under laws that manage biological systems. As a result, the real (true) survival model in the medium / long run imposes that human activity must be managed within this framework.
However, natural systems are generally regarded as having no purpose other than their survival and reproduction, whereas human systems are reflexive and therefore able to design goals, criteria and modalities of action. One crucial points of this debate, lays on the question ofintentionalitywhich distinguishes natural systems from human systems.
This communication aims to evaluate each model by showing its assumptions, characteristics and mechanisms, to highlight their normativity. We show that the so called vision supported by biologists and geneticists, is more complex and mobilizes mechanisms that are more subtle than those proposed by critics. The functioning of biological systems, with operates at different levels of complexity is difficult to grasp. Thus, the mechanisms of natural selection are often assimilated to the survival of the fittest (strongest), which does not seem to give room to chance. This leads to the development of different strategies from the same starting point. Meanwhile, the market metaphor itself is normative, and has its own weak points, perhaps better known by the social sciences community. There are very restrictive assumptions about the actors' behavior. Regulation encounters market failures, inefficiencies and problems of fairness. There are also difficulties in integrating environment and externalities.
Finally, the communication will attempt to propose criteria to be discussed in order to build common properties, to qualify action and systems (objectives, criteria for action, context). A middle option might be to change the basis for discussion, namely to turn towards the notion ofeco-situationrather than the notion ofeco-centrism. The criteria of complexity as a departing point is preferred to the criteria of opposed conceptions. Human systems are under various constraints, conservation, functional redundancy, diversity, they have to cope with disturbances, inefficiencies in the functioning of organizations ... Much can be learn for evolution principles of ecosystems and some can be applied to human sustainability (or sustainable development) maybe reconciling apparently irreconcilable approaches.

Allenby B.R., 1994, « Understanding Industrial Ecology from a Biological Systems Perspective », Total Quality Environmental Management, Spring, 343:354.Allenby B.R., 2006, « The ontologies of industrial ecology ? », Progress in Industrial Ecology ? An international Journal, vol. 3, n° 1-2, 28: 40.Beaurain C., Varlet D., 2012, Une lecture pragmatiste de l'écologie industrielle ? Quelques pistes de réflexion à partir de l'exemple de l'agglomération dunkerquoise. Colloque « Sociologie des approches critiques du développement et de la ville durables», Paris, 1er et 2 février 2012.Erhenfeld J.R., 2007, « Would industrial ecology exist without sustainability in the background », Journal of Industrial Ecology, vol. 11, n° 1, 73:83.Graedel T.E., 1996, « On the concept of industrial ecology ». Annual Review Energy Environment, 21, 69:98.Granovetter M., 1985. « Economic Action and Social Structure: The Problem of Embeddedness», American Journal of Sociology, 91(November): 481-510.Hess G., 2010, « The Ecosystem: Model or Metaphor? Epistemological Difficulties in Industrial Ecology », Journal of Industrial Ecology, vol 14, 2, 270:285.Journal of Cleaner Production, 2004, Applications of Industrial Ecology vol 12, N°s 8-10.Mirata M., 2005, Industrial Symbiosis: a tool for more sustainable regions. PhD Thesis, Lund University, The International Institute for Industrial Environmental, Lund, Sweden.

How many materials does Austria globally use? A comparison of seven methods to calculate Raw Material Equivalents (RME)

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Summary
The increasing integration of economies into a globalized world gives rise to the need for new indicators of material use within the material flow accounting (MFA) framework. Raw Material Equivalents (RME) of traded goods include all upstream material requirements and allow for calculating all resources used for final consumption of a country. For Austria, material consumption increases from 25 t/cap (measures as DMC) to 32 t/cap (representing RMC).
Currently a number of different methods to calculate RME exist, i.e. single-region- or multi-region input-output approaches, coefficients approaches, and finally hybrid methods. In an application to Austria for 2007, we used six different methods to calculate RME; and found very different results. In the presentation we will first show the results and will then discuss possible factors within the different approaches that lead to the observed differences.

Abstract
The increasing integration of economies and commodities into the globalized system of international trade gives rise to the need for new indicators of material use within the material flow accounting (MFA) framework. Domestic material consumption (DMC = domestic extraction + imports ? exports) no longer suffices to reflect an economy's true share in global resource use. The raw material equivalents (RME) of trade are calculated to include the upstream material inputs into the production of traded goods within material flow accounts. For Austria, for example, the RME of imports were about 3.5 times as high as the imports themselves in 2007 indicating that significant amounts of material were mobilized in other economies in order to produce these goods. At the same time, however, the RME of Austria's exports was about 3.4 times as high as the exports themselves because a relevant share of the economy's material imports was used in the production of exports. Thus, material consumption increases from 25 t/cap (measures as DMC) to 32 t/cap (representing RMC which includes RME of imports and exports).
Although indispensable to our understanding of international resource use, the calculation of RME is not yet part of standard material flow accounts and currently a number of different methodological approaches exist. These range from single-region input-output (SRIO) to multi-region input-output (MRIO) approaches and from coefficient to hybrid methods, incorporating both input-output data and coefficients (most commonly derived from life cycle analysis). We will present an overview of examples of these approaches, applying each one to Austria (2007) as a case study. More precisely, we use 7 different calculation methods: (1) a single-region IO approach, (2) a hybrid IO-LCA approach, (3) an application of the Eurostat RME coefficients, (4) a combined approach using Austrian IO and Eurostat coefficients, and finally three MRIOs: (5) GTAP, (6) WIOD, and (7) EORA.
These 7 different methods result in very different results: RMC ranges between 21 t/cap (which is even lower than DMC) and 33 t/cap. In the presentation we will discuss the differences in the results, highlighting how they relate to the assumptions behind the respective method of calculation and discussing the analytical consequences of each approach. With these findings, we hope to make a contribution to the current debate on RME methodology in order to understand RMC results and move towards a harmonization of approaches and international applicability.

The performativity of industrial ecology: towards cases of biomimicry in the sector of flooring

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Twenty years after the Earth Summit in Rio de Janeiro , the concept of green chemistry has led various sectors to go for more reflexibility on their practices and design methods for a transition to a sustainable socio-technical regime. Industrial sectors are directly confronted to environmental issues, and some of these sectors are not well known in the literature despite the fact they affect the quality of our lifestyles and households. This the case of the European sector of the resilient floorings. This sector is currently self-organizing around a paradigm relating the technosphere with the biosphere. As a result, the concept of biomimicry has emerged as a solution to mimic natural processes. Today, it is crystallized by the development of a certification «cradle to cradle » that aims to transform waste into nutrients or recoverable waste by developing close-loops systems.
We argue that this kind of biomimicry can be considered as a focal point making the representations and practices in the industry of resilient flooring converge. This paper highlights the mechanisms responsible for the rise of biomimicry, and explains the convergence of representations. In our opinion, this convergence is original since interests and perceptions of stakeholder communities, both scientists and industries, and environmental issues were initially heterogeneous in the wake of the 1990s. We argue that this phenomenon can be explained by the performative role played by the field of industrial ecology. More precisely, we assume that the scientific results and propositions produced by this scientific field disseminate through mechanisms of performativity into the European sector of resilient floorings. We show that this dissemination materialized into the researchers' representations and the practices of industries. We particularly emphasize the role of more or less formalized institutional compromises like the European Resilient Flooring Manufacturer's Institute and the project Vynil 2010.
This article is at the crossroads of various scientific fields such as science studies and institutional economics. Our methodology is inspired by the evaluation of the performativity of the scientific discourses that has been well-studied in the case of financial markets. We propose to apply the same theoretical and conceptual framework. Our contributions is mainly based on empirical insights thanks to around 20 interviews with various communities of actors in Europe. Moreover, we aim to restitute and explain some stylized facts in this peculiar sector while suggesting that they may generalize to other sectors/fields.

References

Allenby, B. & Cooper, W.., 1994. Understanding industrial ecology from a biological systems perspective. Environmental Quality Management, 3(3).
Anastas, P.T. & Lankey, R.L., 2000. Life cycle assessment and green chemistry: the yin and yang of industrial ecology. Green Chem., 2(6), p.289?295.
Benyus, J.M., 2002. Biomimicry: innovation inspired by nature, Perennial.
Braungart, M. & McDonough, W., 2002. Cradle to Cradle: Remaking the Way We Make Things 1st éd., North Point Press.
Geels, F.W., 2011. The multi-level perspective on sustainability transitions: Responses to seven criticisms. Environmental Innovation and Societal Transitions, 1(1), p.24?40.
Godard, O., 1993. Stratégies industrielles et conventions d'environnement?: de l'univers stabilisé aux univers controversés. Environnement, économie, 39-40(Actes du Colloque des 15 et 16 février 1993), p. 145?174.
Gowdy, J.M., 1994. Coevolutionary economics: the economy, society, and the environment, Springer.
Pluijmert, T. et al., 2008. Industry approach to life cycle assessment. Plastics, Rubber and Composites, 37(9-10), p.406?410.

Production of commons by means of commons

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The traditional characterization of goods based on the rivalry and excludability criteria is a static definition, which does not consider the dynamic of economic growth. Market expansion and the commodification process based on technological and/or institutional changes results in a continuous increase of the possibility for exclusion. Thus, market can substitute communities (and state) in the management of such resources since the ?problem of non-excludability' is solved. On the contrary, the growth paradigm neglects completely the consequence of such a process, which very often causes deprivation of communities and depletion of natural resources. By contrast, we argue that the commons should not only be considered as a peculiar feature of a resource, but a managing procedure - ?commoning' - which can be considered as a proper production process where communities generate institutions (rules and norms) and technology able to manage and to reenhance the benefits and the services provided by common pool resources. In this paper, we discuss alternative classifications of the commons, which may disentangle the shortcomings implied in the traditional economic approach. Moreover, we describe how ?commoning' may induce a shift in the trajectory of economic development. In particular, we found that the re-emergence of ?commoning' can induce a downscale in production, a reduction in consumption and labour supply, but an increase in relational goods and social networks that provide substitutes to market goods and services.

The ?Common-Pool Resources? approach of the Bloomington School : A Critical Analysis

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The Common-Pool Resources current (CPR) originally developed around Elinor Ostrom and the methodological framework elaborated by researchers in the Bloomington School at the Workshop in Political Theory and Policy Analysis in the University of Indiana. Interestingly, the enthusiastic reactions which greeted the approach, both within the academic community and amongst international institutions and donors, have largely gone unchallenged. Yet, from our point of view, and without belittling the important contributions which explain the success of the CPR current, a critical analysis of the theoretical influences, the epistemological underpinnings and the empirical limits of the application of the analytical framework developed by Elinor Ostrom seem to be in order.

However, the theoretical and methodological foundations on which the approach of the Bloomington School were build are often either considered relatively unimportant or are quite simply unknown by researchers referring to Elinor Ostrom's work. Furthermore, many academics neglect to take into account a number of limitations that Ostrom herself has underlined. The objective of our paper is to review the aspects of Ostrom's thought that we regard as ambiguous and to identify a number of limitations to the application of the principles that she defends. In order to do so, we have used information gathered for field studies of collective management approaches applied to natural resources and water services in emerging countries.

We will attempt to characterize CPR from a historical and epistemological point of view in order to gain a better understanding of the theories influencing the emergence and development of the current (Section 1). We will then present a review of its strengths and weaknesses (Section 2) before offering a number of critiques based on field studies undertaken in Morocco (Section 3) and Burkina Faso (Section 4).

Not distant ?others' but close ?us': Why do individuals commit themselves to CPR management?

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This paper argues that some historically long standing Common Pool Resource (CPR) institutions are deeply embedded within communities and strongly related to the communal identities. Despite the attention to ?embeddedness' of CPR institution, the current CPR literature still lacks theoretical framework to understand the relationship between CPR institution, community and communal identity. This is partly because studies on CPR have shifted its focus from community to CPR institution. From the 1990s, many researchers criticized the notion of community as small space with ?homogenous' population sharing same norms and interests. While communities are generally neither ?homogenous' nor ?harmonious', there are CPR institutions, which are deeply embedded inside the community. In these cases, the CPR institutions are interlinked with other institutions, such as religious institutions, kinships and neighbourhood associations. Due to the interlinked nature of CPR institution, in some cases it is difficult to analyse CPR institution as isolated system for natural resource management at organizational and cognitive level. At the organizational level, various communal institutions bear the cost and reap the benefits from CPRs. At a cognitive level, the members of the community recognized CPR management as part of ?obligation as community member' not as an activity to reap benefit from CPR institution. To this end, we argue that the CPR institutions contributes to the creation of communal identity, which we term as ?we-ness', through providing a notion of ?obligation as community member'. The individuals who participate in CPR management do not always perceive others as distant ?others', but as part of ?we', which one belongs and feel committed. In this paper we go one step further by providing a theoretical framework which connects the CPR institution, the community and the individual identity using the concept of ?institutional leakage' developed by Douglas. The framework allows the possibility that CPR institutions lead to the creation of a ?deontological rationality' which is based on the notion of ?obligation as community member'. This type of rationality is fundamentally different from instrumental rationality which is presupposed by many game theorists and political scientists. The paper aims to integrate the interdisciplinary understanding of the CPR institution and provide a more realistic understanding of human behaviour in relation to CPRs.

The common good is a social construction: the merits and limits of Ostrom's approach to environmental governance

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This paper highlights the merits and limits of Ostrom's approach to environmental governance for the purpose of building a conceptual framework which would provide the political conditions required for managing what does not (or should not) belong to the market sphere.

We first argue that the emergence of the «common good» issue, which began with the writings of Ostrom, is not a simple repetition of the 1950-60s discussions in terms of «public» or «collective goods» in neoclassical theory. We show that the protest of Ostrom against the Hardin's model of the «tradegy of the commons» has allowed the former to overcome the main theoretical failure of Samuelson's neoclassical conception. Indeed, in opposition to the latter, criteria of definition of the goods are not related anymore to the goods themselves ? i.e. they do not have intrinsically specific characteristics: in Ostrom's neo-institutionalist approach, the «commons» refer to the systems of collective rules, and not only to the objects to which these rules are applied, or to the alleged intrinsic properties of these objects. In other words, we argue that an important contribution of Ostrom to the renewal of these issues is the standpoint that what belongs to the « collective» and/or the «public» and/or the «common» always arise from a political decision, whatever the scale at which it is taken.

However, we aver that Ostrom's theory of the forms of self-governance and self-organization suffers from an important shortcoming if one wants to understand most of institutional changes in the environmental area: his theory is based on the belief that systems of rules emerge from deliberations between equal actors within a community. In the numerous monographs provided by Ostrom, the existing social relationships are not explicitly taken into consideration to understand how the systems of collective rules are instituted. Instead of seeing the common goods only as resources, Ostrom have considered them as a specific type of property which cannot be separated from a permanent collective deliberation. But a paradox is that she has neglected the social relationships in which communities' experiences are embedded. If the issue of the «common»/«public»/«collective» goods is opposed to the «enclosure model», it is not because the nature of the goods would have suddenly changed; it is because a change in the force relations between social groups has occurred, with as a result the abolition of old rules and the adoption of new ones.

We finally provide a methodology for a better understanding of the frontiers and overlaps between the domains of the «collective», the «public» and the «common», which takes explicitly account of the existing socio-economic dynamics.

The Ostrich or the Phoenix? ... dissonance and creativity in a changing climate

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In 2009 the international community agreed a threshold of temperature increase that delineated dangerous from acceptable climate change ? and as such finally quantified the 1992 commitment to stabilise greenhouse gas concentrations in the atmosphere «at a level that would prevent dangerous anthropogenic interference with the climate system." The Copenhagen Accord (and subsequent COP agreements), calls on its signatories to «hold the increase in global temperature below 2 degrees Celsius, and take action to meet this objective consistent with science and on the basis of equity».
Translating the language of the Accord into quantitative probabilities enables cumulative emissions budgets to be derived; with the greater the chance of remaining below 2°C the smaller the quantity of emissions (carbon budget) that can be released. However, just two years on from Copenhagen, and despite an economic recession and upheaval for many industrialised nations, global carbon dioxide emissions rose by 3.2% on the 2010 figure, which itself was up almost 6% on 2009. Against such a backdrop of significant and escalating emissions growth ? alongside a much clearer framing of the carbon budgets accompanying 2°C - it could be expected that the science and policy community would be openly revisiting the appropriateness of the 2°C threshold.
By contrast, many scientists and policy-makers continue to claim it is possible to contain the global increase in mean surface temperature at or below 2°C through green growth and win-win opportunities. However and notwithstanding the increasingly vociferous rhetoric around ? transitioning to a low carbon economy', current emissions growth is much more aligned with temperature rises of 4°C or higher, and possibly within just a few decades. Disturbingly, in 2012, and with meaningful mitigation still little more than rhetorical façade, even a 4°C future now demands significant levels of mitigation.
This framing of climate change represents a radical departure from the more incremental mitigation proposed by many policy makers and scientific reports. Whilst orthodox expertise maintains «2°C is not only possible but achievable without sacrificing the benefits of economic growth and rising prosperity», this paper argues «it is difficult to envisage anything other than a planned economic recession being compatible with 2°C, 3°C and increasingly 4°C futures».
Consequently, whether in terms of mitigation or adaptation, we face a profound paradigm shift, triggered by climate change, but with repercussions across all facets of contemporary society.

Such a fundamental transition leaves society with three clear choices. To continue the delusion that climate change can be addressed adequately through rhetoric, financial fine-tuning and ad hoc incrementalism; to interpret such conclusions as a message of despair and futility; or to acknowledge that «at every level the greatest obstacle to transforming the world is that we lack the clarity and imagination to conceive that it could be different», and that through immediate harnessing of human will and ingenuity we can yet deliver relatively low-carbon and climate-resilient communities.

Putting some flesh on the bones of a new paradigm, this presentation will reject the orthodox mindset, whereby a steady state (no-growth) future can only ever be a land of torpor and desolation ? and instead embrace a more enlightened and creative outlook that could yet see a low carbon Phoenix emerge from fossil-fuelled flames.

How change happens? The status quo bias in climate policy

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Short Abstract
When discussing the potential of different climate change measures the human factor is largely neglected. Standard economic models assume instant adaptation and macroeconomic climate-economy models à la Nordhaus (1994, 2008) or Stern (2007) are abstract optimization models, resulting in a cost-minimizing climate policy. While it is obvious that people in the real world do not behave as optimization models assume, the reasons for these deviations and possible actions to overcome them are rarely investigated. One such reason is likely to be a status quo bias (Wüstenhagen 2012) resulting from a strong path dependency of behavior and technologies (Arthur 1984). The paper investigates its implications for the inertia of climate policy and gives examples to illustrate the idea. It also explores how the same mechanism might be useful to enhance climate protection.

Paper content
Business economists would argue that a sensible decision should be based on an informed perception of risks and returns of a decision. Climate change is a risk associated with certain damage costs resulting from extreme weather conditions as well as from changes in regional weather. Climate protection is also a form of risk because we would have to invest large sums without knowing for sure if we actually need to do so in order to prevent some probable higher damage. In order to decide how much climate protection should be done, the risk of losses due to a wrong decision should be weighed against the return in case of the decision being right. In other words ? and this is what the macroeconomic not really decision based climate economic models have been doing for a long time ? damage costs have to be weighed against mitigation costs to find an optimal level of climate protection.
Both ways to look at this crucial decision ? the business as well as the economic one ? neglect to have a closer look on human behavior. Behavior has a strong path dependency (Arthur 1984). This is not only true for established technologies but as well for ideas and behavioral patterns. The resulting status quo bias (Wüstenhagen 2012) imbalances people's perception of risks and thus of adequate measures to prevent unwanted events. And again, this is not only true for established technologies but probably as well for the perception of the dangers and costs of climate change and for different kinds of behavior which are climate damaging or not. The paper investigates how important these influences can be for climate policy decisions as well as for some exemplary individual decisions impacting on CO2 emissions.
However, on the other hand the same status quo bias might be used to overcome some behavioral inertia when used sensibly. This idea is related to the «default option» for a given choice which may have a larger impact on actual behavior than we are aware off. Let´s look at an example, given by Wüstenhagen (2012). In 2010 only 10% of electricity customers in the city of St. Gallen used «green» electricity. In 2012 it have been 90%. What happened within only two years? The utility simply switched the default option from the traditional largely fossil based energy mix to the green electricity option. In both cases customers could change the default and opt for green electricity in 2010 or now the fossile fuel mix. But due to an enormous status quo bias they rarely do.
This tells us two things. First, behavior tends to be rather inflexible. But second, we have to analyze closer for what reasons and referring to what status quo. Taking the above example we could misinterpret that people are not willing to switch from fossil fuel electricity to the green variant because they are used to consume «traditional» energy or they are not flexible enough to believe in climate change and thus see no need for a switch. However, as the example showed, the real reason seemed to have rather been a quite high un-motivation to make an active switch ? regardless from which default option the utility gave them that choice.
The work in this paper builds on previous work of the author in which a climate economic model has been linked to a multi-agent system (Geisendorf 2009, based on a model by Janssen 1996, Janssen/deVries 1998). In this «battle of perspectives» model individual behavior has also been

taken into account in the form of different perceptions of the relevance of climate change resulting in different intensities of prevention measures. But this former model does not account for the specific form of behavioral inertia represented by the status quo bias.
Judging from the above sketched idea, a careful analysis of actual backgrounds of beliefs and behavior that are relevant for climate policy and protection might offer helpful insights into unreasonably high inertia. At the same time it may hint at possible ways to overcome it.

References

Arthur, W. Brian (1994),Increasing Returns and Path Dependence in the Economy, Ann Arbor, Michigan: University of Michigan Press.
Geisendorf, S., 2009, Do we believe in climate change? A multi-agent climate-economic model. Papers on agent-based economics, No. 8, Section environmental and innovation economics, University of Kassel
Janssen, M.A., 1996, Meeting Targets: Tools to Support Integrated Assessment Modelling of Global Change. PhD Thesis ISBN 90-9009908-5, University of Maastricht, the Netherlands.
Janssen, M. B. de Vries, 1998, The battle of perspectives: a multi-agent model with adaptive responses to climate change. Ecological Economics, 26: 43-65
Wüstenhagen (2012)
Nordhaus, W.D., 1994, Managing the Global Commons: The Economics of Climate Change. Cambridge, MA: MIT Press
Nordhaus, W.D., 2008, A Question of Balance Weighing the Options on Global Warming Policies, Yale University Press New Haven & London
Stern, N., 2007, The Economics of Climate Change: The Stern Review. Cambridge, Cambridge University Press.

Economics of climate change and intergenerational justice

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Summary. Long-lasting impacts of global climate change demands for economic models that account for present and future generations' interests. In general, issues of intergenerational justice find their way into the models via the time preference rate in the utilitarian welfare function. Due to the long time horizon, small differences in the time preference and subsequently discount rate yield large differences in model outputs and policy implications. Following a concept of intergenerational equality, the presented study seeks to partly circumvent problematic time-based discounting by minimizing the difference of the generations' proportional climate cost rather than maximizing utility.

Abstract. Complex economic models have become popular instruments to quantify the cost of climate change and to identify the benefits of diverse mitigation and adaptation strategies. Among a large number of sophisticated tools, the integrated RICE and DICE models developed by Nordhaus and the PAGE2002 integrated assessment model designed by Hope and applied within theStern Review on the Economics of Climate Changecan be considered the most prominent models.

Both, the Nordhaus and the Hope/Stern model follow an integrated approach that accounts for diverse feedbacks between the climate and the socioeconomic system and thus allows for the identification of the optimal mitigation path. The object of optimization is the social welfare, which is set up in a utilitarian frame in both models.

Despite the similar setup of the models, which seem to produce similar outputs in terms of the physical impacts of global climate change, Nordhaus and Stern draw conflicting conclusions concerning the optimal mitigation path. Nordhaus suggests a climate policy ramp with a continuously increasing rate of emissions over time (Nordhaus 1994, 2007). At the same time Stern proposes strong and early mitigation, whose benefits would by far outweigh the cost (Stern 2006, Executive Summary, p. ii).

The contrarious policy recommendations can to a large extend be explained by the differing discounting approaches. While Stern opts for a normative approach with apure time discount rateclose to zero, the corresponding rate in the Nordhaus model is based on observed time preferences (long term interest rates). As a consequence the Hope/Stern model assigns higher weights to the avoidance offuturedamages compared to the DICE model.

The strong differences in the two model outcomes (due to the high sensitivity of choosing the time discount rate) complicates rather than eases the political decision making process. Furthermore, a major assumption of the utilitarian welfare concept, which proposes that winners would (or at least could) compensate losers, hardly holds for such a long time. Even if today's generation would establish a climate fund for future generations, the next generation could decide to use the money to fight a severe crises (apart from climate change) rather than feeding the fund.

The presented study seeks to identify a mitigation path, if social welfare is setup in a non-utilitarian way. Instead the study follows the concept ofIntergenerational Equality, which proposes that the proportion of climate cost relative to total income should be equal for any generation. As a consequence the approach, which at least to some extent circumvents the problematic time discounting, seeks to minimize the distance of the generations' proportional climate cost rather

than to maximize utility. Total climate cost are defined as the sum of mitigation and adaptation cost and each generation is assumed to have no preference in bearing either mitigation or adaptation cost (or both).
Apart form the welfare function, the model set up follows closely the DICE model in System Dynamics notation. This, in turn allows for a comparative analysis. The main results are twofold. On the one hand, the mitigation path looks more like the immediate action plan proposed by Stern. However, the motivation is different - the strong action is mainly driven by modest adaptation costs of current generations (which therefore need to mitigate in order to balance the proportional cost assigned to climate change). In terms of emission concentration, the process would stabilize at lower level compared to the original Nordhaus model. On the other hand, the lower concentration level is achieved at the cost of per-capita income, which is also lower compared to the original Nordhaus model.

Unconventional Determinants of Greenhouse Gas Emissions: The Role of Trust

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Social norms have been included in the theory of collective action to overcome difficulties in explaining why commons may perform better when self-regulated. The role of trust has been identified in several contexts of local social dilemma, but only recently has been extended to global commons, based on large descriptive evidence collected by Elinor Ostrom. However, no quantitative evidence was available until now. Using a dataset of 29 European countries over the period 1990-2007, we provide empirical evidence in favor of the role of trust in global dilemma. We end up with a negative impact of trust on greenhouse gas emissions, whose extrapolation to Spain would imply a reduction in emissions of 12.5% if Spaniards would trust each other as Swedish people do.

Towards Sustainable Agriculture? The EU Framework and Local Adaptation in Sweden and Poland

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This paper assesses how two EU Member States, Sweden and Poland, apply the EU Common Agricultural Policy (CAP) in relation to sustainable agriculture. The main findings are that even though the overarching objective of the CAP is to create a common market for farmers in all Member States, the actual room for maneuver in implementing the CAP has been significantly different in Sweden and Poland due to the countries' different times of EU accession. Although a comparably small share of the Polish agricultural land is targeted by agri-environmental payments, it could be argued that the direct payments also can have a large importance for sustainability in the Polish agricultural sector by enabling more farmers to continue cultivating their land. Parts of the CAP seem to counteract each other: Support is provided e.g. to extensive agriculture with high value for biodiversity and social communities, simultaneously as other programs contribute to further intensification of already intensively cultivated regions.

Sown Biodiverse Permanent Pastures Rich in Legumes: A Systematic Sustainability Analysis

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SUMMARY
Sown biodiverse permanent pastures rich in legumes (SBPPRL) were introduced in Portugal as a strategy to increase grassland productivity, by sowing mixes of up to 20 species/cultivars of legumes and grasses. Here we present evidence that, compared to natural pastures, this system provides higher yields of better quality pasture, significantly increasing sustainable stocking rates, with environmental co-benefits: (1) soil organic matter pools are replenished and soil structure reposed; (2) surface water runoff decreases and pirophyte shrub vegetation is eliminated or much reduced; (3) nitrogen accumulates in stable forms in the soil after being fixed by Rhizobium/legume symbiotic associations; (4) the high increase in stable soil organic matter acts as a carbon sink, making the system ian optimum tool for climate change mitigation.

ABSTRACT

The MediterraneanBasin, encompassing the South of Europe, Northern Africa and some small areas in the Middle East, is a human-shaped, rich and diverse mosaic of landscapes and an important biodiversity hotspot (Bugalho et al., 2011). Grazing has shaped Mediterranean ecosystems for millennia. Fire, clearing of shrubs and reducing forest density have been employed to maintain or reverse the process of vegetation succession (Bugalho et al., 2011). One of the human-engineered landscapes that resulted was themontado/dehesa, a savanna-like forest dominated by cork and/or holm oaks, and associated to grasslands (Pereira et al., 2009). In the 20th century, these Mediterranean ecosystems occupy vast areas where soils are shallow, stony, sloped, and low in organic matter and nutrients, namely phosphorous. For instance, 57% of Portuguese soils have low or very low soil organic matter (SOM) concentrations (0.5-2.0%) (Van-Camp, 2004). The annual soil erosion risk by water in Europe is highest in the MediterraneanBasin, reaching 10 tons of soil per hectare per year (Van-Camp, 2004).

Within this context, sown biodiverse permanent pastures rich in legumes (SBPPRL) started being developed in Portugal as an economically rational strategy to increase grassland productivity. SBPPRL consist of diverse mixes of up to twenty different species or varieties of seeds, and are rich in legumes. In general SBPPRL are more productive than natural grasslands, and are also richer in number of species. There are fewer gaps in plant cover throughout the plots, since species variability ensures that the species more suited for each spatial condition will thrive. There are many studies on the role of biodiversity in productivity but SBPPRL are what may be called the only widespread large-scale application of «biodiversity engineering».

The seed mix is designed specifically for each location after soil analysis. Species in the mix is adapted to soil physical and chemical characteristics, as well as to local climate conditions, and therefore there is no single representative mix. The higher plant productivity of SBPPRL implies increased atmospheric carbon capture through photosynthesis. Part of the biomass produced is stored in soils due to the high density of yearly-renewed roots.

If the pastures are well managed, there is no need for shrub control. However, that is not the case with the common natural pastures, fertilized or not. In these cases, there is the need to control, and the most used technique is tillage. This technique causes enormous losses of soil organic carbon and N pools as greenhouse gases to the atmosphere (Blanco-Caqui and Lal, 2008). Tillage also decreases soil quality and increases erosion.

When compared to natural pastures, the resulting semi-natural system provides higher yields of better quality pasture, significantly increasing sustainable stocking rates, with environmental co-benefits. Evidence shows this SBPPRL system is an economic and ecological win-win solution that answers many of the causes for degradation in Mediterranean ecosystems. Soil organic matter pools are replenished and soil structure reposed. Surface water runoff decreases and pirophyte shrub vegetation is eliminated or much reduced. Nitrogen accumulates in stable forms in the soil after being fixed byRhizobium/legume symbiotic associations. The high increase in stable soil organic matter acts as a carbon sink, turning the system into an optimum tool for climate change mitigation and adaptation.

The carbon sink associated with the transition from natural grasslands to SBPPRL is an ecosystem

service that can and should be accounted for. This work was done by Teixeira et al. (2010). In this work data was obtained from rainfed pastures in eight farms in Portugal from 2001 to 2005. Plot areas ranged from 5 to 15 ha. Each plot's soil and landscape type was approximately homogeneous, in terms of soil and previous use. Samples were collected both from SBPPRL and natural grasslands (fertilized or not). The carbon sink occurs due to a soil organic matter increase and this last was modelled considering a simple mass balance, according to which the mass percent balance of SOM is the difference between input and mineralization. To determine the grassland system in which the increases in SOM was highest, the SOM increase was calculated in all systems starting from the same initial SOM (Teixeira et al., 2011). A 10 years model allows an increase in SOM of about 0.21 pp.yr-1, equivalent to 1.78 tCha-1.yr-1 and to the sequestration of 6.5 tons of CO2 per hectare per year. This increase is higher than for natural grasslands, 0.08 pp.yr-1, equivalent to 0.71 tCha-1.yr-1 and to the sequestration of 2.6 tons of CO2 (Teixeira et al., 2011).

This has been used in the context of Kyoto Protocol. Portugal has voluntarily committed to reporting the CO2 emissions and removals resulting from grassland management under Kyoto Protocol Article 3.4. There are strict stipulations in the Kyoto Protocol (KP) as to how a country's emissions inventory is made, namely regarding what to account. However, there are some items that remain as an option for each signatory country. These options relate to the agro-forestry sector and are the so-called Land Use, Land Use Change and Forestry activities, now renamed Agriculture, Forestry and Other Land Uses (AFOLU), within the framework of Article 3.4 of the KP. While most sectors are net polluters, where all that can be done is to minimize CO2 emissions, AFOLU activities are responsible for CO2 sequestration in soils and living biomass. Therefore, AFOLU activities do not promote a decrease in emissions, but rather the sequestration of CO2.

Portugal plays a leading role regarding AFOLU account in the KP, since it has decided to elect, in the framework of these voluntary AFOLU activities under Article 3.4 of the KP, the activities: « Grassland Management», «Cropland Management» and «Forest Management».

This commitment, together with the fact that a significant proportion of grasslands in Portugal are of low productivity and are located in the regions with higher risk of desertification, brought the context and motivation to further promote the expansion of permanent sown biodiverse rich in legumes. Nowadays, this type of pasture represents more than 85 000 ha in Portugal, from which a significant percentage has been supported by the Portuguese Carbon Fund as a way of funding farmers for the provision of an environmental service.

REFERENCES

Bugalho, M.N., Caldeira, M.C., Pereira, J.S., Caldeira, M.C., Aronson, J. and Pausas, J.G., 2011. Mediterranean cork oak savannas require human use to sustain biodiversity and ecosystem services.Frontiers in Ecology and the Environment9, 110310094015068.

Pereira, H.M., Domingos, T., Vicente, L. (Eds)., 2004.Portuguese Millennium Ecosystem Assessment: State of the Assessment Report. Centro de Biologia Ambiental, Faculdade de Ciências da Universidade de Lisboa, Lisbon. Available from: http://ecossistemas.org.

Van-Camp. L., Bujarrabal, B., Gentile, A-R., Jones, R.J.A., Montanarella, L., Olazabal, C. and Selvaradjou, S-K., 2004.Reports of the Technical Working Groups Established under the Thematic Strategy for Soil Protection.EUR 21319 EN/3, 872 pp. Office for Official Publications of the European Communities, Luxembourg.

Blanco-Canqui H., Lal R., 2008. No-tillage and soil profile carbon sequestration: An on-farm assessment.Soil Sci. Soc. Am. J., (72), 3, 693-701.

Teixeira R., Domingos T., Costa A., Oliveira R., Farropas L., Calouro F., Barradas A., Carneiro J.,. Soil organic matter dynamics in Portuguese natural and sown rainfed grasslands.Ecological Modelling, 222, 993 - 1001.

Locked Into Continuous Insecticide Spraying in Rice. Developing an inte-grated ecological and socio-political DPSIR analysis

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Throughout South-East Asia, every year significant losses of rice harvest occur due to infestations by planthoppers (in the past, the Brown Planthopper (BPH;Nilaparvata lugens) and the White-Backed Planthopper (WBPH;Sogatella furcifera). Most planthoppers (and all those which are regarded as pests) are described by ecologists as r-strategists (rapidly reproducing organisms, short generations ? i.e. fast development and high number of offspring), of which many (especially the BPH) are monophagous (feeding exclusively on one plant species), and are adapted to be successful in ephemeral (i.e. only short-term existing) environments that undergo perturbations (Heong 2009). Insecticide spraying often increases the rice crop's vulnerability to such pests, as they indiscriminately destroy natural enemies and the ecosystem services they provide. In planthopper destroyed crops the patterns of damage often coincide with the patterns of insect spraying in the early crop stages.

The usual reaction to hopper infestation is ? in particular in intensive wet rice agriculture such as in central Thailand, Vietnam and parts of China ? to intensify insecticide spraying to combat the hoppers. However, this strategy does not reliably work in the case of infestation, nor does it prevent future damages, resulting from direct feeding and infections by virus diseases the hoppers carry. However, although the method of choice seems to be of limited effectiveness, so far rather an intensification of spraying than testing alternative means of reducing hopper-induced losses has been observed. Insecticide spraying has become a behavioural routine, applied prophylactically, and if not effective, frequency and dosage are increased; the next escalation step is mixing several insecticides into one spray.

An alternative offered by ecological engineering (Gurr et al. 2012) includes withholding insecticide applications in the first 40 days after sowing to avoid disturbances of the available biocontrol potential, and actively supporting it by planting suitable, nectar-rich plants on the paddy dykes to serve as shelter and food for biocontrol agents such as egg parasitoids of the genusAnagrus, the mired egg predator (Cyrtorhinus lividipennis) and the water predatory bug (Microvelia douglasi atrolineata). The ecological engineering approach has been shown to be effective, in experimental fields in China, Thailand and Vietnam,demonstrating the applicability of the management concept in day-to-day practice. Besides reducing harvest losses it is effectively reducing input costs (especially insecticides) and it helps save time for other purposes such as husbandry. Add to this the reduction of health risks for both producers and consumers, and the ecological engineering management approach should be expected to spread like wild fire ? which it doesn't.

Obviously there is a problem with the feedback mechanism, preventing effective learning processes. This paper analyses the impact-to-reaction mechanisms causing this lock-in situation, i.e. the habit of answering to infestation with increasing doses of insecticide spraying as routine behaviour. It does so by using the Driving Forces ? Pressures ? State ? Impact ? Response DPSIR model developed to communicate the need for Response action arising from different impacts and their causes.

For instance in the case of planthopper infestations, when the State is characterised by increases in pest outbreaks, chemical pollution and insecticide resistance, and the Impact includes farmers' income loss, rising debt (and even suicides), national loss in export earning, health problems and unstable production, the need to counteract these trends to restore biodiversity and ecosystem resilience to reduce these threats is easily recognised. In this case, adaptation measures could include financial or physical support, and health and financial services for the severely affected farmers, while mitigation measures against the pressures of unnecessary insecticide use, misuse/ overuse and wrong insecticide choice could be a ban on insecticides and training in integrated

pest management IPM. However, this would not address the root causes, the Driving Forces of inadequate pesticide marketing caused by missing, inadequate or unenforced regulations, and misguiding advice from untrained retailers or from extension workers who are supported by the insecticide industry. Prevention would thus require revising pesticide marketing regulations, licensing of retailers based on proven skills and overall a transition from chemical pest regulation to biological approaches (Gurr et al 2012).

Furthermore, as the social and the environmental systems are interacting, it is advisable to take a closer look at the different hierarchical structures when analysing the processes structured by applying the DPSIR scheme. Regarding the social system, one way of structuring its description is by the three levels of institutions: organisations (the agents), mechanisms (the rules of decision making), and orientations (beliefs, ideologies, values, meaning) (North 1990; Spangenberg et al. 2002). All three play different roles in generating Pressures, and thus have to be addressed specifically in problem solving strategies. The Pressures are of special importance as they constitute the interface between the social and the environmental system, the biosphere and the anthroposphere.

An «environmental problem» can then originate from the relationships between stakeholders (power balance), from the inefficiency of institutional arrangements in implementing an established regulation, from social inequality (dumping waste in poor areas may be cheap), or from the inadequacy of policy actions for a given social context.

On the other hand, for instance the Millennium Ecosystem Assessment (MA) proposes that Drivers can be both anthropogenic and natural factors«that directly or indirectly cause a change in an ecosystem»(MA 2003, p. 85). According to this definition, precipitation change, invasive species or natural disasters qualify as Driving Forces.

In conclusion, depending on the objectives of the research, very different descriptions of systems and of the inter-relationships between the environmental and the human systems can be developed. The DPSIR scheme can be «turned on its head» (analysing either the impacts of the socio-economic system on the environment, or vice versa). In that case, different meanings need to be attached to the concept of Driving Force and subsequently to P, S, I and R, once the perception of «where» the cause of a problem lies is changed (human and/or natural systems), and the level of the chosen system at which one assumes the problem to originate is decided.

As a one-sided, seemingly ?causal' description of environmental problems inevitably downplays the multiple dimensions of causality inherent in complex environmental and socio-economic systems, only the combined perspective can provide effective solutions (being aware of its inherent simplifications and the unavoidable uncertainty). Consequently, the paper complements and reframes the standard ?DPSIR' scheme, suggesting a «Double DPSIR» or »Double Belly » structure.

Being mainly a communication tool, the Double Belly DPSIR may ? although somehow more complex than the initial version ? still be effective (as its conceptual ancestors are) to convey the message to decision makers if properly used in science-policy interfaces and knowledge brokerage processes.

Any successful strategy to overcome this lock-in, leading from insecticide use to planthopper damage, and on towards more insecticide use and more damage, needs to address the different institutional levels of orientations, mechanisms and organisations. To break up the lock-in, it will be necessary to employ knowledge brokerage strategies and science-policy interfaces to achieve a discursive opening, but also public education to make stakeholders aware of their epistemic fallacy: what they considered a true representation of reality was just an epistemology, a view based on a limited knowledge about reality. The Double-DPSIR scheme is suggested as a heuristic device for structuring information, and as a communication tool for conveying the message in a simplified but meaningful way.

Analysing adaptive capacity of Russian agriculture to climate change from an institutional economics perspective

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Summary
With its vast territory, Russia will experience diverse effects of climate change in its various regions. While scientists frequently give positive forecasts for the impacts of climatic change on Russian agriculture, other, more elaborated analyses are alarming. This paper aims to examine the adaptation potential of Russia's agriculture to climate change from a new institutional economics perspective. To access this potential, it is argued, it is not enough to examine which of the adaptation measures suggested in the literature suit the climatic conditions of the country' regions and how they can be introduced. Rather, the institutional dimension of the adaptive capacity of the agricultural system needs to be thoroughly analysed, taking into account the institutions and governance structures shaped by the major post-USSR transformation process.

Abstract
«Agriculture is the one human endeavour likely to be most affected by changes in climate.» (UN 2012)
Significant transformations in the political, economic and social life in Russia after the fall of the USSR have had tremendous repercussions on the agricultural sector. Plummeting state support and a concomitant collapse of agricultural production in the 1990s were accompanied by major changes in the land regulation and restructuring of state farms. To a range of country-specific transformations currently add global-scale challenges such as environmental problems related to land use change and climate change. Triggered by the latter, food production shortfalls can double in the major Russian crop growing regions by the 2020s and triple by the 2070s, and such shortfalls are expected to increasingly occur in a number of regions simultaneously, decreasing the compensation potential between them (Alcamo et al., 2007). Hence, «significant adaptive measures in the agricultural system» (ibid.: 442) will be required to ensure the security of Russia's food supply and water resources. However, other fundamental issues such as low productivity, underinvestment, poor infrastructure and underdeveloped market mechanisms (e.g., FAO/EBRD, 2009; Liefert and Liefert, 2012) completely overshadow climate change concerns in the country. The Climate Doctrine of Russia, issued in 2009 (Presidential Decree, 2009), recognizes the unprecedented speed of global warming and the necessity to take adaptation measures, while the Implementation Plan (Governmental Order, 2011) foresees that a set of adaptation measures in agriculture are to be developed and implemented in the period from 2011 till 2020. However, especially given the size of the country, the context-specificity of climate change effects requires that action be taken on the regional and local level. So far, though, barely any region has adopted an own strategy or programme on climate change (see, e.g., UNDP Russia, 2009, for an exception), not to mention actual adaptation action.
At the same time, to assess how well the Russian agricultural sector will be able to adapt to climate change impacts in the long term, it will not suffice to check which of the potential adaptive measures suggested in the literature (e.g., Smit and Skinner, 2002) can be applied to the specific geographical and climatic conditions. To assess the adaptive capacity[1] of agriculture in the long run, one has to account for the institutions and governance structures characterising the agricultural sector (e.g., Berman et al., 2012), shaped by the diverse political, economic and social developments of the past decades. In this light, the proposed paper aims to provide some insights for analysing the institutional dimension of climate change adaptation in Russia.
So far the literature has not been able to offer the required insights on the institutional dimension of climate change adaptation in Russia, remaining somewhat bifurcated. On the one hand, the scientific community increasingly addresses the implications of environmental change on the Russian agriculture, notably addressing the potential effects of climate change (e.g., Alcamo et al., 2007; Fischer et al., 2005). Here, the idea of necessity of adaptive measures comes as an important message (Alcamo et al., 2007; Kracauer Hartig et al., 1997). However, there are virtually no contributions addressing the ability of the Russian agricultural sector to adapt to

changes against the background of the institutional specificities of the agricultural sector and the transformation process. On the other hand, however, a growing number of contributions explore the recent developments in the Russian agriculture and its characteristic features from an economic perspective (e.g., Liefert and Liefert, 2012; Franks and Davydova, 2005; Lerman and Shagaida, 2007). In particular, scholarly work on the so-called new agricultural operators, or agroholdings, as a characteristic feature of Russian agricultural development is especially gaining impetus (e.g., Hockmann et al., 2005; Hockmann et al., 2009; Koester, 2005; Rylko et al., 2005). This literature vividly depicts the peculiarities of the agricultural sector in Russia, especially the dominance of large agricultural organisations as opposed to small private farms, also addressing the institutional dimension of such developments (e.g., Koester, 2005). However, this literature neither touches upon the environmental side of agricultural activities nor tackles the issues of adaptive capacity or robustness of the agricultural system in the light of current environmental challenges. In this light, it appears critical to bridge these two strands of literature to understand the implications of the current institutional setting in agriculture for the environmental performance and adaptive capacity of agriculture as a social-ecological system.

The proposed contribution is embedded in the framework of new institutional economics, subscribing to the ideas that «institutions do matter» and «the determinants of institutions are susceptible to analysis by the tools of economic theory» (Matthews, 1986: 903, cited in: Williamson, 2000: 595). A distinct feature of institutional analysis in the field of agriculture is that it has to take into account the specificities pertaining to it as a «nature-related sector » (Hagedorn, 2008). The three central properties of transactions examined in new institutional economics are asset specificity, uncertainty, and frequency (Williamson, 2005). According to the discriminative alignment principle (ibid.), institutions and governance structures are to be aligned with the properties of transactions. However, in agriculture transactions also have specific properties due to the social-ecological character of agricultural activities. Hagedorn (2008) argues that «the properties of the transactions are strongly influenced by attributes that are typical of natural systems», further inferring that «this requires the design of special institutions and governance structures suitable for regularising the interdependence between actors» (Hagedorn, 2008: 358). In line with this, Vatn (2002) speaks of jointness, complementarity and competition as features pertaining to agricultural transactions, and these features have strong implications for the institutional dimension.[2] Hagedorn (2008) further suggests that such properties of transactions are relevant as coherence and complexity, limited standardisability and calculability, time and scale, predictability and irreversibility, adaptability and observability, etc.

In this light, the Institutions of Sustainability (IoS) framework (Hagedorn et al., 2002) will be applied to identify and analyse the key factors determining the adaptive capacity of the agricultural sector and the interactions between them. The four groups of factors under examination are the actors and their characteristics, properties of nature-related transactions, institutions and governance structures. The examined action arena is represented by crop production practices and the relevant policies in the Russian agriculture.

As a focus area, the West-Siberian region of Tyumen will be examined, where a potential shift of the Russian grain belt northwards (Pilifosova et al., 1997) is expected to have implications both for the agricultural sector itself and for non-agricultural (and, in part, almost intact) ecosystems. This choice is also aimed to shed light on the area outside of the European south of Russia, which has been the most frequently studied area of Russia with respect to agricultural development (e.g., FAO/EBRD, 2009).

References

Alcamo, J., Dronin, N., Endejan, M., Golubev, G. and Kirilenko, A. (2007). A new assessment of climate change impacts on food production shortfalls and water availability in Russia. Global Environmental Change 17: 429-444.

Berman, R., Quinn, C. and Paavola, J. (2012). The role of institutions in the transformation of coping capacity to sustainable adaptive capacity. Environmental Development 2: 86-100.

Eriksen, S. and Selboe, E. (2012). The social organisation of adaptation to climate variability and global change: The case of a mountain farming community in Norway. Applied Geography 33: 159-167.

FAO/EBRD (2009). Russian Federation: Analysis of the Agribusiness Sector in Southern Russia. FAO Investment Centre / EBRD Coopertaion Programme. Report series No. 13.

Fischer, G., Shah, M., Tubiello, F.N. and van Velhuizen, H. (2005). Socio-economic and climate change impacts on agriculture: an integrated assessment, 1990-2080. Philosophical Transactions of the Royal Society of Biological Sciences 360: 2067-2083.

Franks, J.R. and Davydova, I. (2005). Reforming the farming sector in Russia: New options for

old problems. Outlook on Agriculture. Vol 34, No 2, pp 97?103
Governmental Order (2011). Order of the Government of the Russian Federation from 25.04.2011 No. 730-r (version of 30.07.2012) «On the Complex Plan of the Implementation of the Climate Doctrine of the Russian Federation for the period till 2020».
Hagedorn, K. (2008). Particular requirements for institutional analysis in nature-related areas. European Review of Agricultural Economics 35(3): 357-384.
Hagedorn, K., Arzt, K. and Peters, U. (2002).Institutional arrangements for environmental co-operatives: a conceptual framework. Hagedorn, K. (ed.). In: Environmental Cooperation and Institutional Change: Theories and Policies for European Agriculture. Elgar: Cheltenham; 3?25.
Hockmann, H., Bokusheva, R. and Bezlepkina. I. (2009). Agroholding membership: does that make a difference in performance? Quarterly Journal of International Agriculture 48(1): 25-46.
Hockmann, H., Wandel, J. and Nedoborovskyy, A. (2005). Agroholdings in Russia: Breaking the Vicious Circle? Paper prepared for presentation at the 94th EAAE Seminar ?From households to firms with independent legal status: the spectrum of institutional units in the development of European agriculture', Ashford (UK), 9-10 April 2005.
Koester, U. (2005). A revival of large farms in Eastern Europe ? how important are institutions? University of Kiel.
Kracauer Hartig, E., Grozev, O. and Rosenzweig, C. (1997). Climate change, agriculture and wetlands in Eastern Europe: vulnerability, adaptation and policy. Climatic Change 36: 107-121.
Lerman, Z. and Shagaida, N. (2007). Land policies and agricultural land markets in Russia. Land Use Policy 24: 14?23.
Liefert, W.M. and Liefert, O. (2012). Russian agriculture during transition: Performance, global impact, and outlook. Applied Economic Perspectives and Policy 34(1): 37?75.
Matthews, R.C.O. 1986. «The Economics of Institutions and the Sources Of Economic Growth,» Economic Journal 96(4): 903?18.
Moser, S.C. and Ekstrom, J.A. (2010). A framework to diagnose barriers to climate change adaptation. PNAS ? Proceedings of the National Academy of Sciences of the USA 107(51): 22026-31.
Pilifosova, O., Eserkepova, I. and Dolgih, S. (1997) Regional climate change scenarios under global warming in Kazakhstan. Climatic Change 36: 23-40.
Presidential Decree (2009). Decree of the President of the Russian Federation from 17.12.2009 No. 861-rp «On the Climate Doctrine of the Russian Federation».
Rodima-Taylor, D., Olwig, M.F., and Chhetri, N. (2012). Adaptation as innovation, innovation as adaptation: An institutional approach to climate change. Applied Geography 33: 107-111.
Rylko, D.N., Robert W. Jolly, R.W., Mosolkova, M.A. (2005). Organizational innovation in Russian agriculture: The emergence of "new agricultural operators" and its consequences. Paper prepared for presentation at the 94th EAAE Seminar ?From households to firms with independent legal status: the spectrum of institutional units in the development of European agriculture ', Ashford (UK), 9-10 April 2005.
Smit, B. and Skinner, M.W. (2002). Adaptation options in agriculture to climate change: a typology. Mitigation and Adaptation Strategies for Global Change 7: 85-114.
Smit, B. and Pilifosova, O. (2001). Adaptation to climate change in the context of sustainable development and equity. Climate change 2001: Impacts, adaptation and vulnerability: Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change, pp. 877-12, In: McCarthy, J., Canziani, P., Leary, N., Dokken, D., and White, K. Cambridge: Cambridge University Press.
UN (2012). Agriculture development and food security. Report of the Secretary-General. A/67/294. General Assembly, United Nations.
UNDP Russia (2009). Integrated Climate Change Strategies for Sustainable Development of Russia's Arctic Regions (Case Study for Murmansk oblast). Summary ? Moscow: UN Development Programme in Russia, Russian Regional Environmental Centre.
Williamson, O.E. (2000). The New Institutional Economics: Taking Stock, Looking Ahead. Journal of Economic Literature. XXXVIII: 595?613.
[1] In the recent years, adaptation to climate change has increasingly been viewed as a complex social process, «involving changing relations, institutions and practices» (Eriksen and Selboe, 2012). In line with this, attention has shifted from purely «climatic stimuli» (Smit and Skinner, 2000, Smit and Pilifosova, 2001) to the «changes in social-ecological systems in response to actual and expected impacts of climate change in the context of interacting nonclimatic changes » (Moser and Ekstrom, 2010). While much of the adaptation literature focuses on actual adaptation measures,adaptive capacityis increasingly gaining attention, referring to «the broader ability of a system [...] to cope with climate related risks and opportunities» (Smit and Skinner, 2002: 108).
[2] Jointness refers to the inability to assign the inputs to specific outputs in the case when there

are several outputs. Complementarity emerges when the production of one good creates an input for another good. Competition takes place in cases when the goods compete with each other for inputs (Vatn, 2002).

?Good' Environmental governance in the context of agriculture and deforestation

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Summary
The paper focuses on the role of ?good' environmental governance for managing tropical forests sustainably. The main argument is that good governance practices have to be implemented at three different levels (global, national, and local/regional) in a coordinated way. Therefore we will develop a conceptual framework of environmental governance with a specific focus on the above discussed three different spatial levels. The goal is to address conflicting aspects of the three governance levels. We will investigate different approaches of environmental governance and mirror them with concrete needs in tropical and subtropical moist broadleaf forests zone in 6 Southern American countries (Bolivia, Brazil, Colombia, Paraguay, Peru and Venezuela). We will focus on cases in the six countries and will present a status-quo analysis of the major threats based on secondary material, including published documents and material.

Abstract

The world is facing a number of growing global problems with environmental challenges closely linked with agriculture. Two severe problems are climate change and biodiversity loss as consequences of deforestation especially of tropical forests with their sink capacity for carbon. Tropical deforestation is caused by a number of factors being related to economic development and population growth. As a consequence a growing human population is demanding more food which consequently leads to unsustainable agricultural practices. Coupled with economic growth and technological change agricultural expansion leads to growing environmental challenges.

Therefore the risk of natural resource depletion and environmental degradation is growing tremendously. The solution to these problems is complex and requires a systemic approach to identify the interlinkages and interdependences of the coupled ecological-economic system. There is a clear need to improve agricultural practices but also to improve the overall food supply mechanisms including poverty reduction measures as well as governance practices.

Good governance practices including the rule of law, transparency, accountability, effective management of resources, control of corruption, and citizen participation have to be implemented at three different spatial levels in order to be effective. At the global level, good governance refers to substantive policies which support the poor and protect the environment with procedures which are transparent and participatory. This is specifically important for managing ecosystems as reported in the Millennium Ecosystem Assessment. At the national level, governments are challenged to provide an environment supportive for ecosystem protection including stakeholder participation which would help to integrate the Millennium Ecosystem Assessment into proposed national development plans. From a governance point of view inter-governmental cooperation could help to close the gap between the national and global level. At the regional and local level participatory elements would need to be implemented in forms of networks and partnerships which help to transfer global and national goals into practice.

In many countries located in the tropical and subtropical moist broadleaf forests zone deforestation as a consequence of converting forest into agricultural land is very sensitive. In the developing tropical countries deforestation is mainly caused by clearing as a consequence of farmers' poverty, subsistence agriculture, cash cropping, ranching and logging. On top of this we are facing the problem that the needs of indigenous people in these countries are overlooked and often disregarded. In order to find proper solutions for these problems coordinated governance mechanisms at the different levels are required. Besides national policies considering the Millennium Development Goals and taking them to the local level, a proper forest management would be needed in order to consider forest conservation aspects. In developing countries sustainable forest management practices are less promoted than in developed countries. Only a

minor proportion of the forests are covered under formal forest management plans. From an environmental governance point of view it would be extremely important to integrate top-down oriented national policies with bottom-up conservation management practices. Since many vulnerable tropical and subtropical moist broadleaf forests span in cross-border regions inter-governmental governance has to be integrated. In many cases NGO driven governance networks become active in managing these vulnerable conservation areas (e.g. certification initiatives). The effectiveness of these initiatives heavily depends on how these networks are organized and whether they involve local stakeholders. Putting forests under the control of indigenous people and give them the opportunity to use it collectively is an important step towards sustainable forest management.

The purpose of the paper is to outline the role of good environmental governance in the cause-effect chain of deforestation. It is an explorative study dealing on the one hand with the different approaches of environmental governance and on the other hand on concrete needs in one type of biome. Although the paper will be organized along two parts the first part which is providing an overview of the existing literature dealing with environmental governance will be the dominant part. The literature review helps to categorize the different governance approaches and tries to detect overlaps of co-existing approaches. At the end of this part we will develop a conceptual framework of environmental governance with a specific focus on the above discussed three different spatial levels (global, national, regional/local). The framework will focus on the three levels separately but will aim to integrate top-down and bottom-up governance mechanism. Since the paper builds on previous research and is linked to another paper were we combine data from the FAO and the World Bank and the World Database on Protected Areas for 6 Southern American countries (Bolivia, Brazil, Colombia, Paraguay, Peru and Venezuela) to construct panel data, and study the major determinants of agricultural land expansion over the period 1970-2006 the framework will be applied at a limited scale to this set of countries. We will focus on cases of particular tropical and subtropical moist broadleaf forests in the six countries and will present a status-quo analysis of the major threats based on secondary material, including published documents and material. This includes an overview about the governance indicators in the respective countries based on the World Bank data as well as the «WWF Global Ecoregion » classification.

On Counting Cows, Power and Institutional Change: Communal Water Management in the Kunene Region, North-Western Namibia

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The role of power in the development of institutions governing the use of common pool resources has been given little emphasis in the leading theories in this field. A case study from North-western Namibia illustrates how power and bargaining strategies shape institutional development in the realm of communal water management. The example shows how policy reforms based on theories focusing on successful institutions for sustainable resource management clash with local dynamics of power asymmetries and social interdependencies. Institutional development therefore becomes a bargaining game, in which regulations are not the result of a motivation to achieve collective benefits, but are rather the by-products of conflicts over social outcomes. These circumstances prompt a reassessment of concepts of ?institutional failure' in which only environmental factors are implicated, while social ones are ignored.

Institutions, organizations and the characteristics of investment in aquatic ecosystems, a comparative analysis of four French case-studies

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Investment in aquatic ecosystems, through actions of protection, restoration or creation of wetlands, appears today as an important tool for the spatial planning. In most cases, these investments are set up to meet a regulatory application. This is particularly the case for programs of wetland restoration aimed at achieving the objective of good ecological status set by the Water Framework Directive or else the case of compensatory measures implemented to offset the impacts of development projects. These actions can also be seen as opportunities for voluntary investment in the perspective of a future commercial valorization of the ecosystem services produced or in case of the revitalization of a territory.
The implementation of these investments requires for policy makers to have accurate information on future income generated by these investments, but also on their cost. For this communication, we focused on the study of the costs of restoration and creation of aquatic ecosystems by building on an analysis of the scientific literature and grey literature. It appeared that the information - very patchy today - on the costs of ecological restoration activities were very heterogeneous as dependent on the type of actions implemented, of targeted ecosystems, of ecological and institutional context, etc. Furthermore information on the costs report the significant part of transaction costs in project's total cost (cost of coordination and contracting around the process of land acquisition, cost of project administration, cost of monitoring, etc.).
To move forward on this issue, it is first important to contextualize the actions of restoration or creation of aquatic ecosystems under specific institutional frameworks, heavily influencing investment objectives. We will rely on the theoretical framework of the new institutional economics to analyze the role played by institutions in the various forms of investment in aquatic ecosystems but also to assess organizational effectiveness in terms of the criterion of minimizing transaction cost (Williamson 1985 ; North 1991). According to this theory, organizational arrangements that surround a transaction is in fact the result of a search for minimizing of transaction cost. However, the tradeoff between the arrangements is made from the characteristics of the transactions which are the source of transaction costs: asset specificity, uncertainty and frequency of transactions. Organizational effectiveness plays such a key role in the regulation of transactional relationships that involve highly specific investments and surrounded by uncertainty which is the case of actions of restoration or creation of aquatic ecosystems.
In a second step, we will present the results of a comparative study of the processes that led to the establishment of investment in aquatic ecosystems on four sites:
- The first relates to an action of restoration of the Vurpillères river in the nature reserve of Remoray (Doubs, Franche-Comté). This action was taken in a nature reserve which has a very strong environmental protection (access denied or partial). The objective was the remeandering of a stream that had been rectified.
- The second concerns an action of establishment of a wetland at the outlet of a sewage treatment plant in Saint-Just (Hérault, Languedoc Roussillon). The aquatic ecosystem was set up with the aim of creating a new market around the production of ecosystem services.
- The third site is the marshes of Kervigen located at the land / sea interface, which has been rehabilitated to take advantage of its capabilities of purification for the abatement of nitrate discharged into the sea (Finistère, Bretagne). The restoration of this marsh is included in the local dynamic against the proliferation of green algae.
- Finally, our fourth case study focuses on the environmental measures implemented in the context of the construction of the extension Port 2000 of the Great Harbour of Le Havre, at the Seine estuary (Seine Maritime, Haute Normandie). This site includes several actions: creation of two meanders on the north bank of the Seine estuary, creation of a resting place for birds and creation of an artificial island. The objective here was twofold: to comply with the obligations of compensation of impacts and to create conditions for local acceptance of the project, especially

for environmental actors.
The study of these sites allows us to put into perspective these three points:
- The weight of the institutional context on the definition of environmental objectives of the actions ;
- The weight of institutional context on the characteristics of ecosystems that are traded and thus on the transaction costs associated and the choice of the most effective organizational arrangement;
- The process of institutional change that led to the implementation of these actions, starting from contexts in which they were historically perceived as an obstacle to economic development.
Our site survey will allow us to confront institutional frameworks, institutional arrangements and the different characteristics of four actions of restoration and creation of wetland area. This analysis allows us to finally offer opportunities to build different business models around investment in aquatic ecosystems.

Decentralization and economic incentives to manage groundwater withdrawals for irrigation - From theory to practice

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Summary
In France, the creation of local organisms for the management of irrigation withdrawals is a first step towards water management decentralization. This raises an original principal-agent relationship between local organisms and farmers. We search for economic instruments that can give farmers the incentive to comply with the authorized volume. The first contribution of the paper is to propose a theoretical representation of a decentralized resource management that allows us to craft three original economics tools. The second contribution consists in investigating the operational feasibility of these tools through a field approach in five concrete case studies in France. The first results identify economic, institutional, technical, and ethical locks that reduce the tools' operationality.
Full abstract has been upload as an additional file.

How make environmental restoration affordable: transform disproportionate costs into proportionate ones

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The European guidelines for the implementation of the Water Framework Directive recommend the use of cost?benefit analysis (CBA) to identify water bodies in which environmental measures present disproportionate costs (European communities, 2009). For water bodies where costs exceed benefits disproportionately, decision makers can ask the European Commission to postpone environmental targets or make them less stringent. If we take the case of the sub-basin Seine aval in the Seine estuary (North-West France), 51% of it surface water bodies (lakes, littoral and rivers) have seen their environmental targets postponed from 2015 to 2021 and even to 2027 for some of them. The Water Framework Directive allows environmental targets to be postponed in order to avoid that some polluters have to bear excessive costs without sufficient financial resources to bear them. The impacts of excessive costs would not only be financial ones for economic sectors responsible for pollution but also economic ones since it could impact employments in the whole sub-basin. However, one can question the way the cost-benefit analysis was carried out. If the cost-benefit analysis had not been based on the conventional polluter pay principle but on an extended one instead, would costs of environmental measures still have been disproportionately excessive for half of the superficial water bodies of the sub-basin? This is the question answered in this paper.
In this paper, we test three polluter pay principles:
1) Conventional polluter pay principle: costs of environmental measures are allocated to economic sectors in proportion of their direct contribution to the total degradation of fish nursery areas (first order responsibility).
2) Extended polluter pay principle: not only sectors with direct responsibilities (first order) are included in the allocation rule but also those with indirect responsibilities of second order (covers sectors that use goods produced by sectors of first order).
3) Largely extended polluter pay principle: identical to extended polluter pay principle but included also economic sectors with indirect responsibilities of third order (covers sectors that use goods produced by sectors of second order).
The extended polluter pay principle (2) can be considered as more fair to polluting sectors than the conventional polluter pay principle (1) because not only producers that are directly responsible for degradations (first order responsibility) have to repair. The extended polluter pay principle makes that economic sectors of second order responsibility have also to repair. This includes economic sectors that consume goods and services produced by first order companies and profit from the fact that degraded environmental assets are free of market prices.
But the third principle listed above is an even fairer. We named it «the largely extended polluter pay principle» (2). It enlarges the responsibility of degradation to sectors of third order, i.e. those that consume goods and services from the second order responsible sectors. This principle is fairer because all responsible sectors are involved in reparation of degradation caused to the ecosystem and not only the direct and indirect responsible ones. Another reason why the largely extended polluter pay principle is fair to polluting companies is that it allows costs to be shared between a larger number of sectors. That makes costs borne by each sector much lower and reduces the risk to face a situation where some sectors might not have sufficient financial means to support the costs of environmental measures (this is the case of disproportionate costs).
These three principles are tested with the help of an environmentalised input-output model: the model ECO (Cordier et al., 2011; Cordier, 2011, 2012). The model is applied to the case of scenarios of restoration of estuarine fish nurseries, a marine natural habitat located in the Seine estuary, north-west France. The aim is to see if the largely extended polluter pay principle can lead to a fair allocation of restoration costs to economic sectors responsible for degradations caused to fish nursery.

Nurseries are made of estuarine mud- and sand-flats and provide a supporting ecosystem service in the form of habitats which ensure the life of several fish species. In spite of the fact that they provide an important ecosystem service, nursery habitats have been continually destroyed since 1850 by the construction of dykes and harbour extensions for the purpose of maritime transport (Rochette et al., 2010; Cuvilliez et al., 2009). The resulting growth in the maritime transport sector has contributed to the important development in the regional industrial production. However, this development has particularly harmed the natural habitat of seven commercial fish species whose juveniles need nurseries for feeding: Common sole, Bass, flounder, plaice, pouting, poor cod, and whiting[1] (Ifremer, 1999).

It has resulted in a decrease in the provisioning ecosystem service of fish resources found in the Seine estuary for final consumption and for intermediate consumption (the fishing sector and other sectors that consume fish as an intermediate input). An increase in the surface and quality of estuarine nursery areas might partly reduce decreases in fish stock, which threaten at least three of the seven commercial species mentioned above: plaice, whiting and sole (ICES, 2008). Due to the high level of uncertainty and lack of data on the state of most fish stocks in Europe and given the unsustainable harvest of the remaining stocks, measures applied to fish habitats on the basis of the precautionary principle might acquire greater political acceptability in the future. Out of a total of 44 fish stocks in European fishing zones, there is 57% of the stock whose state is unknown or undefined, only 4% of the stock is sustainably harvested, and the remaining 32% (including sole) is overfished, i.e. their capacity to regenerate for the future is endangered (ICES, 2008). In response to these figures, this paper intents to answer the following question: what would be the ecological and economic impact of precautionary measures applied to fish habitats while still respecting the principles that environmental damage should be rectified at the source and that the polluter should pay? These three principles are stated in the Marine Strategy Framework Directive (European Parliament and Council, 2008) and the environmental measure considered in this paper is based on them. The environmental measure consists in restoring 25% of the areas of sandy subtidal nurseries with high fish density that have been the most heavily destroyed between 1834 and 2004, i.e. 24,38 km2. The expected impact is a growth in fish stocks, which should increase the resilience of fish populations to fishing activities and their capacity to regenerate for the future.

Our results show that enlarging responsibilities of nursery degradation to second and third order transform disproportionate costs into proportionate ones. Indeed, the total cost of nursery restoration is allocated to more sectors and some of them with sufficient benefits to absorb the cost without being significantly impacted in their competitiveness. For instance, tertiary sectors are an important responsible of third order in nursery degradation. They consume an important share of goods transported by water by petroleum refineries (responsible of second order) : gasoline for transportation. The link with nursery destruction is made through harbours. Due to consumption by tertiary sectors in petroleum products, harbours (responsible of first order) develop their infrastructures on nursery areas. This causes direct destruction of nursery areas through colonisation of human infrastructure on natural areas but also indirect ones through modification of hydro-sedimentary dynamics.

If the largely extended polluter pay principle was applied instead of the conventional polluter pay principle, it is likely that less environmental targets would be postponed or made less stringent when member state of the European Union apply environmental legislations.

[1]Solea solea,Dicentrarchus labrax,Platichthys flesus,Pleuronectes platessa,Trisopterus luscus, Trisopterus minutus, andMerlangius merlangus.

Modelling the Great Transition

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The purpose of this paper is to introduce the modeling work being developed at the New Economics Foundation as part of the Great Transition Initiative, a wider effort of research aimed at envisioning a new economic system ? more sustainable, fair and stable ? and seeking the appropriate policies to manage the transition.
The multiple crises that currently affect the economic system (financial instability, environmental emergency, stagnation of wellbeing levels, rise in inequality) have led many ? in governments, universities and civil society ? to seek for alternative economic strategies and for new tools for analysis. We want to contribute to this debate by building a sound and reliable macroeconomic to be used as policy-analysis tool in the pursuit of a new economic system, characterized by high levels of prosperity and wellbeing, a just distribution of resources and a low impact on our environment.
Our model consists of: 1. An aggregate macroeconomic framework where production, demand and employment dynamics are modeled; 2. Sectoral accounts of different economic agents (currently: households, non-financial firms, banks, central bank and government). Each sectoral account is built using a double-entry book keeping representation in order to ensure the dynamic consistency of the model.
The model is being developed using system dynamics methodology, which is particularly apt to grasp the functioning of the multiple connections and feedbacks that exist between different sectors of the economic system, allowing for a larger analytical power than most of the widespread macroeconomic theories and methods.
In particular, we have developed an original modeling of banks and the process of credit creation. We feel these are fundamental (although rather unexplored) variables in the analysis of the transition to a low-carbon economy. We here present the theoretical framework that has been developed and offer some numerical simulations, showing how private debt has crucial implications for the wider macroeconomic framework. We also show that economic growth can only take place with a positive net change in debt (that is, an expansion of the broad money supply).
We intend to concentrate the future modeling work on three main topics:
Environmental limits. One of the main purposes of the complete model is to analyze the functioning of a market economy when considered as inserted in a bigger framework constituted by the surrounding environment. We sketch the interactions between the economic systems and the environment by concentrating the analysis on energy (energy consumption and energy prices, energetic efficiency and the diffusion of renewable sources of energy) and climate (adopting a framework similar to Integrated Assessment Models)Well-being and non-monetised outputs. The underlying goal of the model is to demonstrate how a transition can be made to a low-carbon economy that respects environmental limits but maintains high levels of wellbeing. Given the macroeconomic framework that we use, we build an index of societal wellbeing, capable of capturing a set of variables which we consider important for good social functioning (e.g. income level, employment, amount of polluting emissions, an index of inequality, etc.)Social policies. The model is intended to be used to analyze some important socio-economic variables. In particular, it is our intention to include: a) distributional issues; and b) changes in work hours.
We will aim, in a finished version of the model, to present it interactively, providing a user-friendly interface through which the users can simulate different policy choices, impose potential shocks and test different assumptions on calibrated parameters. In this sense, the model is likely to serve educational purposes for the less experienced public and to stimulate alternative thinking in trained economists.

Left Turn in Bolivia and Ecuador: Changes in environment and development policies

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Several Latin American nations have been undergoing major political and economic changes during the past decade that have significantly altered their development politics and policies. Taken together, these transformations have been referred to as the emergence of a ?New Left', the ?Left Turn' and the ?Pink Tide'. At its outset, the clearest demonstration of this phenomenon came with the election of Hugo Chavez as the president of Venezuela, though another but less pronounced manifestation could also be found in Brazil under the presidency of Lula. This resurgence of left-leaning, and to their critics populist, leaders continued and strengthened with the election of Rafael Correa in Ecuador, Evo Morales in Bolivia. The latest example came from Peru, where Humala beat the Fujimori, who promised to continue with her father's brand of neoliberal developmentalism, with a campaign that used many of the themes articulated by his like-minded counterparts in Venezuela, Bolivia, and Ecuador. Taken together, the election of these leaders has ushered in a new era in Latin American politics that is already having significant impact to the development trajectories in these nations. It is now possible to speak of a Latin America- wide shift in development politics and policy that is comparable to previous, similarly broad and influential turns such as the dependency era of the 1960s-1970s and the neoliberal era of the 1990s-early 2000s.

As a broad characterization, two main trends can be observed in the development policies of these nations. On the one hand, they have made poverty alleviation and delivery of basic social protection to the marginalized communities a central plank in national development planning. On the other hand, to achieve this goal, they have aspired to make the state and the office of the president significantly stronger with the stated aim of shielding domestic political and economic structures from the detrimental influence of neoliberal policies dominating at the global level. In so doing, these leaders have borrowed from both the ?old left' of ?actually existing' European socialism and the dependency school of Latin American development planning of the 1970s. Simultaneously affirming the core principles of these approaches, particularly the centrality of emancipatory development, socioeconomic equity and justice, and regional alliance of like-minded nations, and critiquing their mistakes by calling for a more participatory and human-centered approach to development, several of these leaders have articulated their project as on that sought to build the ?Socialism of the 21st century'. It has quickly become clear that the term ?Socialism of the 21st century', which has been explicated mainly by the Mexico-based German sociologist Dietrich has mainly served as a dramatic and appealing campaign slogan with little substantive content. Even as a slogan, it has since diminished in significance in recent years with leaders such as Correa making ?Revolucion Ciudadana' a more prominent discursive identifier for his political economic project. This is not to say, however, the central messages that with the articulation of the ?Socialism of the 21st century' have been completely lost. A closer look at the Plan National de Buen Vivir of Ecuador and National Development plan of Bolivia, for example, reveals many of its central strands woven into the ambitious development strategies articulated in these documents. Two particular policy proposals emerge from these documents: the centrality of a new way of conceptualizing societal development in terms of the concept of buen vivir/ vivier bien (living well) and nationalization of key economic sectors, particularly the extractives sector.

Taken together, these two approaches put nature in general and environmental policies and natural resources in particular, at the heart of the development strategies articulated by the ?New Left'. Building squarely upon various indigenous cosmologies that are predicated upon a harmonious and co-dependent relationship between human communities and natural processes, buen vivir emphasizes the indispensability of preserving the sanctity of ?Pacha Mama' (mother earth) to attempts to create a just, healthy and egalitarian model of human development. Nationalization, on the other hand, seeks to render national states significantly more powerful in not only deciding the way in which the rich national natural resources contained in these countries are developed but also giving them a much greater share in economic returns, which are expected to play a central role in implementing the redistributionary social policies embodied in national development strategies. Whereas the shift towards nationalization can be characterized as a way

to reformhowdevelopment would be achieved, the intensifying debates onbuen vivirreflect a potential sea-change inwhatdevelopment would look like and deliver.

Building on this observation, this paper critically interrogates the policies implemented under the Presidency of Morales in Bolivia and Correa in Ecuador in terms of environment and natural resources. In so doing, it provides a broad overview of the ways in which alternative development models championed by these leaders have (or have not) translated into actual policies and practices. Such an inquiry is not only important given the fundamental importance of preserving Latin America's rich natural landscapes including the Amazon basin but could also pave the way towards constructing a sober assessment of the changes that have accompanies the emergence of the new left in Latin America, which, while attracting much scholarly interest, has not had sufficient empirically grounded analyses.

Addressing Sufficiency ? Including altruistic motives in behavioural models for sustainability transitions

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Abstract
The main motivation for sustainable development, as defined in the Brundtland report, is to care for other humans ? for the world's poor and for unborn people. Traditional economic models use the motivation to increase one's own well-being as the main motivation for action. Efficiency-improvements, as the main focus of the economics-based models have largely shown to be ineffective, due to rebound effects etc. We assume that efficiency or consistency improvements can only be effective when accompanied by a more fundamental value shift. A shift including altruistic motivations for behaviour, as they are part of sufficiency strategies for sustainable development. Models that reduce motivations for actions to self-centred ones cannot account for such change. The Capability Approach as an alternative to neo-classical approaches, distinguishes between interests in own well-being and other-regarding interests. Yet it has seldom been applied to address the latter. Tested psychological models that encompass both motivations, on the other hand, have no scope for analysing wider societal effects of policies. This paper therefore integrates psychological knowledge in a capability framework, to be used as a basis for empirical analyses. The developed model should allow the design and assessment of efficiency, consistency, and sufficiency strategies for sustainability transitions.

Introduction
The most common definition of sustainable development (SD) is the one from the Brundtland Commission. Central terms in the Brundtland definition of SD are ?needs' and ?limitations'. Reinterpreting the fulfilment ofneeds, the idea of a decent quality of life has been seen as a central goal of sustainable development . To reach this goal, SD policies aim at maintaining or even expanding thelimitedspace for a high quality of life, e.g. by solving (global) environmental problems and social inequalities/ inequities. Core strategies follow the principles of efficiency, consistency, and sufficiency. Many contemporaneous scholars postulate a claim for intra- and intergenerational justice as the main idea behind the Brundtland conception of SD. The claim for inter- and intragenerational justice is addressed to governments, business, and individuals alike ?all of which may contribute to efficiency, consistency or sufficiency attempts to SD. In this paper, we will focus on the latter, the individuals, the consumption of which has substantial social and ecological impact.
It is unclear, though, whether individuals are called upon to check their own everyday (consumption) behaviour to be in line with the value of SD or whether it is in their role as citizens to push policy towards SD. In both roles, individual behaviour can be termed sustainable behaviour when it contributes to SD. And in both roles, individuals may act being motivated by their own interest or by altruistic considerations. To further understand how individual behaviour can contribute to SD, it might be helpful to differentiate between three different understandings of sustainable behaviour:
Substantially, one could consider behaviour sustainable that allows the world's poor and future generations to meet their needs, i.e. to realize a decent quality of life (specified in one way or another, e.g. by critical natural, social and economic capital).Normatively, one could consider only such behaviour sustainable that is motivated by the wish to allow the world's poor and future generations to meet their needs and to realize a decent quality of life.Procedurally, one could consider a behaviour, or a set of connected behaviours, sustainable, if the way the behaviour itself is carried out is in line with principles of sustainability (e.g. if the voting procedure on an environmentally relevant infrastructure decision is consistent with principles of inter- and intragenerational justice).
We argue that it is useful to link the first and the second understanding of SD to analyse the different SD strategies: While efficiency strategies focus on the substantial definition, sufficiency arguments, such as those prominent in the degrowth debate, draw on substantial and normative

definitions. Efficiency strategies try to motivate substantial sustainable behaviour only by interest in personal well-being, not necessarily questioning current and consumption-oriented definitions of well-being. This omission of the normative dimension of SD might be one possible reason for rebound effects occurring in the implementation of efficiency strategies. Various barriers impede the adoption of sufficiency lifestyles, like e.g. conventions, feared loss of convenience, or conflicts with common consumerist lifestyles. Increasing the willingness to take responsibility and to bear the cost related to adopting a suffiency lifestyle seems to be require a fundamental value shift, so that individuals can increase individual well-being through pro-social behaviour. Ways to overcome the barriers need to be assessed and evaluated to show their effectiveness. Therefore psychological considerations on individual motivations to behave sustainably become crucial. Those models of individual (citizen or consumer) behaviour should account for altruistic motivations for SD, if one wants to assess efficiency, consistency, and sufficiency strategies for making behaviour more sustainable.

It has been shown that SD policies based on efficiency or consistency are only very limited in their success: limited in the spatio-political, resource or time scale. To integrate sufficiency strategies coherently into policy design and assessment, different models of human behaviour are required. While policies based on efficiency or consistency strategies can be analysed and evaluated by using mainstream behavioural models based on well-being or utility maximisation, the evaluation of sufficiency strategies is hampered by the lack of appropriate models. There is ample evidence, though, that non-consumptive behaviour and the well-being of others are important for one's own quality of life. We suggest that a behavioural model is needed that includes altruistic motives and can be therefore a basis for a more holistic policy design and assessment. This implies that such models have to include self-centred and other-centred motivations as well as different impacts of changed behaviour at a societal level. Most current psychological models don't fulfil this last requirement in that they don't link behavioural analysis with assessments of achievements at a societal level, such as quality of life.

It is the main aim of this paper to develop and discuss such a model that combines societal and psychological elements to make it suitable for discussions on sustainability transitions. In search for new models of sustainable behaviour allowing for policy analysis, we therefore link psychological models of sustainable behaviour with the capability approach. Capability as the freedom to live a life one values or has reason to value has become prominent in the discussion on human development, i.e. in the discussion on global intragenerational justice. Understanding such freedom as the basic quality of life, the capability approach offers a structure to better understand what individuals require in order to have this freedom. In the following, we will suggest that the image of human behind the Capability Approach, as developed by A. Sen, M. Nussbaum and others, can account for the difference between self-interested and pro-social behaviour. At the same time, it can be extended by results from psychological research to explain differences in behaviour when shifting to sufficiency. On this basis, policy recommendations for sustainability policies can be drawn that are based on a model of individuals richer than most of current economic research and more oriented to public policy than most of psychological research. In this paper, we develop and discuss such model, so that SD policies can be designed and assessed on a better basis. First, we elaborate the differences between efficiency, consistency, and sufficiency strategies for SD. We then introduce the concept of capabilities in the context of SD. Third, we link this concept to psychological research on environmental behaviour. Fourth, we sketch a model based on these links, before discussing perspectives and limitations of this approach.

Adam Smith's Stationary State, and Sustainable or Steady-State Economies in the History of Economics

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The earliest modern political economists (whom Karl Marx later dubbed "the classicals") paid a great deal of attention to the overall level of income and production, as well as to the dynamics or patterns of changes in the level of income and production. Indeed, Adam Smith (1723-1790) was an early user of the term "stationary state," and scholars generally conclude that he took a dim view of the potential vitality of such a state. In this paper, I consider the impact of teaching Smith's views on the stationary state in some detail, as seen in hisWealth of Nations, to undergraduate students, and I explore the ways in which these views could constitute the historical roots of contemporary models of a steady-state or sustainable economy (as described by Herman Daly and other ecological economists who hold that growth for its own sake is misguided and ultimately dangerous for the economy). The essay will contrast this approach (in both teaching and scholarly research) to the more usual focus on the ways in which Smith's conception of the « dull» stationary state in fact contradicts these modern ideas of a desirable, sustainable economy, based on qualitative development without reliance on quantitative growth.
Classical economists following Smith took both grim (David Ricardo, 1772-1823; Malthus, 1766-1834) and more optimistic (John Stuart Mill, 1806-1873) views of the livability of a stationary state. Karl Marx (1818-1883), the classical economist who predicted the inevitable collapse of capitalism, emphasized the way in which the growing market economy would revolutionize social relationships and empower the oppressed majority to transform the system. Whether the ultimate classless society he envisioned was a form of optimistic stationary state is an interesting and open question. Thus, taken as a whole, classical political economy cannot be said to present a solidly negative stance on the stationary state, although it is usually presented as such. This paper will reflect on how the interdisciplinary field of the history of economics can contribute to broadening the impact of ecological economics on undergraduate education and scholarly research.

Social Ecological Economics

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Ecological Economics has developed as a modern movement since the late 1980s (see Spash, 1999). This movement has gathered together a variety of perspectives and interests concerned to address the modern environmental crisis. A crisis because environmental degradation?species loss, long range transport of air pollutants, contamination of soil and water, introduction of synthetic chemicals, desertification, deforestation?has only belatedly been recognised as integrally linked to the way the economy is run.

In economics, the appearance of environmental problems has for long been minimal and attention largely left to sub-disciplinary specialists (e.g. agricultural, resource and environmental economists) easily sidelined and disregarded by both mainstream micro and macro economists. In micro economics, core theoretical ideas have set the stage in terms of price theory for over a century (see Lee, 2009: 2-3), providing a restricted orthodox worldview. In macro economics, the type of subjects which dominate (e.g., money supply, unemployment and inflation) have seemed divorced from environmental problems. This has meant economists working on the environment could easily be dismissed as having consigned themselves to irrelevance. Even amongst heterodox schools, where a voice might have been more readily expected to be heard, there has been relatively little (e.g. critical institutionalists, neo-Marxists) or basically no sustained attention (e.g., post-Keynesians). Economists of all schools have generally been able to ignore the evidence of environmental problems as having anything to do with their work. Yet in more recent times this seems to have been changing.

Since the early 1990s a range of Nobel economic prize winners (e.g., Arrow, Kahneman, Ostrom, Sen, Solow, Stiglitz) have been found imparting their wisdom on environmental matters, and some have even associated with ecological economists (e.g., Arrow, Ostrom, Sen). This appears to indicate a new engagement by economists with environmental issues and a new found respect for the field of research. Thus, the magazine The Economist has moved from relegating occasional environmental articles to its science section to running regular features and leaders. An economist may now apparently study and publish on environmental topics while maintaining some collegiate standing. Indeed, specialists in the area appear, in neoclassical economic terms, as rather cunning speculators who foresaw the potential personal returns of an early investment.

That the environment is now a headline economic issue goes hand-in-hand with the fact that controlling pollution is big business. The high political profile given to human induced climate change and neo-liberal support for multi-billion dollar carbon trading markets have made this very clear. For example, the European emissions trading scheme had an estimated worth of $US51 billion in 2007 (European Commission, 2008: 21) and $US80 billion in 2008 (Kantner, 2008). The market in carbon offsets is also a growth industry (European Commission, 2008). As potentially the largest commodity market ever created, carbon trading has stimulated considerable interest in the financial markets and amongst banks and corporations (Spash, 2010). All this provides an incentive for the new found environmental interest within the economic establishment.

However, what can be observed is eminent figures in the economic establishment talk the new rhetoric of environmental concern without substance. Indeed, there is a continued neglect of the environment as anything to do with the core of economics as a subject. This can be explained by considering two alternative ways in which economists address environmental issues. First, is the treatment of environmental problems as special cases of more general theoretical constructs in mainstream economics. This allows (both mainstream and heterodox) economists who are embedded in an establishment discourse to maintain their own preoccupations without needing to pay much attention to the specifics raised by environmental problems (e.g. transforming to a low carbon economy becomes green jobs which are just an aspect of macroeconomic employment policy). This has been the preferred approach for most economists. Second, is the recognition that serious attention to environmental reality leads to the need for a totally new way of thinking based in political economy and interdisciplinary learning. As will be shown, this is the raison d'être of Ecological Economics. Thus, work by ISEE Presidents Bina Agrawal (2001), Joan Martinez-Alier (2002), Richard Norgaard (1994) and John Gowdy (1994) has addressed the social and political as much as the economic, while emphasising the need to learn from interactions

with ecosystems. A perhaps inevitable struggle has then been on-going between this Social Ecological Economics approach and those engaged in legitimising economics as an objective technical means for engineering society, where the environment is something external to the economy.

This presentation explores that struggle and some of the resulting confusion it has created for understanding the meaning and content of Ecological Economics. The central contention is that the institutionalized power of mainstream theory has played an important role in delimiting the field of environmental research. As Lee (2009: 7) states: "The mainstream explanation focuses on how asocial, ahistorical individuals choose among scarce resources to meet competing ends given unlimited wants and explains it using fictitious concepts and a deductivist, closed-system methodology." Adopting that approach, in part or whole, then has serious implications for the conduct and relevance of Ecological Economics.

Understanding the discourse surrounding the work which has been appearing as Ecological Economics involves more than merely focussing on the academic technical debates. This requires historical analysis, exploration of conflicts and probing of the ideological and methodological differences. The overarching objective, of the project of which this presentation is a part, is to enable a better classification of relevant work and indeed explain why some is inappropriately classified while other, dispersed across a range of fields, could easily be included within the bounds of relevance.

The presentation will provide a historical exploration of the community of scholars grouped around Ecological Economics which probes their motives and interests in order to start clarifying areas of ideological and methodological unity and division. The next section looks at the rise of environmental concern leading to the development of economic thinking in the area. This sketches the claim to deep historical roots for Ecological Economics, but clearly identifies the modern movement as arising from late 20th Century environmentalism. Environmental economics is then seen as an earlier failed attempt to create a community challenging mainstream economic thinking. This background shows how Ecological Economics was born into a divided and contested world. Specific divisions and conflict in the recent history of Ecological Economics are employed to explain how the movement became partially entrapped by an orthodox economic dialogue. This historical analysis emphasises the role of individuals in developing and propagating ideas amongst a community of scholars and other interested people. Rather than denying the relevance of divisions the aim is to clarify their role in creating the current community. The ideas to be discussed are part of the needed on-going discussion as to the appropriate intellectual pursuits of Ecological Economics. The overall aim is to reveal the "interwoven, interdependent narrative of ideas and community", as Lee (2009: 11) puts it. The conclusion presented is that if this movement is to make a substantive difference then it must pursue Social Ecological Economics as an heterodox interdisciplinary movement in political economy (Spash, 2011).

References Cited

Agarwal, B., 2001. Participatory exclusions, community forestry, and gender: An analysis for South Asia and a conceptual framework. World Development 29, 1623-1648.

European Commission, 2008. EU Action Against Climate Change: EU Emissions Trading. European Commission.

Gowdy, J.M., 1994. Coevolutionary Economics: The Economy, Society and the Environment. Kluwer Academic Publishers, Dordrecht.

Kantner, J., 2008. Clean carbon copy not enough for US. Australian Financial Review 12th December.

Lee, F., 2009. A Histroy of Heterodox Economics: Challenging the Mainstream in the Twentieth Century. Routledge, London.

Martinez-Alier, J., 2002. The Environmentalism of the Poor: A Study of Ecological Conflicts and Valuation. Edward Elgar, Cheltenham.

Norgaard, R.B., 1994. Development Betrayed: The End of Progress and a Coevolutionary Revisioning of the Future. Routledge, London.

Spash, C.L., 1999. The development of environmental thinking in economics. Environ. Values 8, 413-435.

Spash, C.L., 2010. The brave new world of carbon trading. New Political Economy 15, forthcoming.

Spash, C.L., 2011. Social ecological economics: Understanding the past to see the future. American Journal of Economics and Sociology 70, 340-375.

Nonlinear versus linear accounting of Sustainable Economic Systems, (SES): the ecological economist's challenge to the neoclassical intergenerational, non-declining, welfare model.

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The paper is in the form of a dialectic which lays out two positions on Sustainable Development: the holistic approach with the code word ?nonlinear,' and the reductionist approach with the code word ?linear.' The latter roughly follows the neoclassical economic argument where SES assumes a net-product value just sufficient to maintain some well-defined, time-discounted, non-declining human-welfare function, (Solow, 1992). The argument requires substitution (weak sustainability) among three distinct forms of capital, manufactured, human and natural, (Dasgupta, 2011). The former assumes that the SES is a function, (i.e., set of objects whose values are conserved-in-exchange) embedded in the larger scale social wellbeing function, (i.e., set of objects whose values are conserved-in-use), which, in turn, is a subset of the all embracing ecosystem function, (i.e., set of objects whose values are conserved-in-themselves, or intrinsic to the SES), (Friend, 2012). This approach reduces the economy into a singular entropic process described by the G-R Flow-Fund Model, (Georgescu-Roegen,1971). The argument introduces powerful logics of pluralism, adaptation, and Bayesian statistical methods to develop algorithms necessary to map theEconosphere ?Sociosphere?Ecosphere, (Friend and Friend, 2009). The paper's object is to explore the differences between the neoclassical and the ecological economists in framing the question, including the influence of the theoretical roots, for environment-economy integration, (Friend, 2000). The argument starts by the (1992) RIO Declaration on Sustainable Development and its effective institutional response to the development of SES accounts, (UN,CSD, 2012). This will be contrasted with the scientific, intellectual, response concerning uncertainty, complexity and the Jevons Paradox, (Funtowicz and Ravetz, 1991, Polimeniet al, 2008). The paper concludes with a research programme of nonlinear accounting methods, the object of which is to bridge the gap between the institutional and academic conceptual frameworks of SES under the rubric of ?beyond GDP.'

Reference:

Dasgupta, P. 2011, «Inclusive National Accounts: Introduction.» Paper prepared for the Expert Group for Green National Accounting for India, (Manuscript.)

Friend, A.M. 2000. «Roots of Green Accounting in the Classical and Neoclassical Schools,» in Greening the Accounts, eds. Simon, Proops, Cheltenham, UK, Edward Elgar

Friend, A.M., Friend, M. 2009 Non-linear Accounting Methods and Adaptive Logic: An Exploration of the Meta-language of the Georgescu-Roegen Flow-Fund Model, Presented at the European. Society for Ecological Economics Conference, Ljubljana, Slovenia, 30 July - 2 August 2009

Friend, A.M. 2012. «System of Accounts for Global Entropy Production (SAGE-P): The Accounting in the Topological Domain Space (TDS) of the Econosphere, Sociosphere and Ecosphere», in Sustainability Analysis, An Interdisciplinary Approach, eds Shmelev. S, Shmelve. I., UK, Palgrave-Mamillan.

Funtowicz, S.O., Ravetz, J.R.(1991) Uncertainty and Quality in Science Policy, Dordrecht, Kluwer Academic Publishers

Georgescu-Roegen, N. 1971. The Entropy Law and the Economic Process. Boston, Harvard University Press

Polimeni, J., Mayumi, K., Giampeetro, M., and Alcott, B. 2008. Jevon's Paradox and the Myth of Resource Efficiency Improvements, Earthscan Publications

Solow, R., 1992. An Almost Practical Step Towards Sustainability. Washington, Resources for the Future

UN Commission on Sustainable Development, RIO 2012, Issues Briefs # 6.

Participatory Action Research for Ecological Economics

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Ecological economics identifies itself as a trans-disciplinary, post-normal science that focuses upon the historically situated interactions between complex ecological and human systems; applies a co-evolutionary framework of thought and is committed to the political ideal of deliberative democracy (Gowdy, 1994; Costanza et al., 1997; Prugh et al., 2000). Epistemologically, ecological economics favours empirical inquiries based upon a cross-disciplinary dialogue and evaluated by an extended peer community. It also implies an awareness of historical specificities, situatedness and temporalities involved in conducting research.
The application of participatory action research (PAR) methods implies that the research should be conceptualised as a process of mutual learning as well as co-construction. On the one hand, the researchers had to be aware that they are part of the system they are trying to understand (Norgaard, 1994). On the other hand, scientifically trained researchers and local people both are knowledgeable, self-reflective and creative subjects and should have an equal standing in the research process. Moreover, this self-critical epistemological awareness (Chambers, 2000) embodied in doing participatory research should be extended to power relations both within the local communities in question and between researchers representing academic institutes and local lay people.
Participatory approaches emphasise the importance of experiential knowing. The research component of PAR is a tool for action, not an end in itself. For knowledge generation, participatory processes are required to involve and evolve stakeholders' perceptions and values through learning. The PAR approach puts an emphasis on the systematic testing of theories in live-action contexts and contributes to the development of deliberative institutional arrangements; therefore it may offer valuable methodological tools and theoretical insights for ecological economics. Epistemologically, the PAR approach is in line with an hermeneutic, constructivist research process proposed by Tacconi (1998) for ecological economics.
The paper is based upon the experience of two PAR research projects: one conducted with a rural community living in a socially and economically disadvantageous but high nature value region, the other with a segregated Roma community in an urban setting. The PAR approach, on the one hand, proved to be useful in understanding human-nature relationship in the first setting and contributed to the co-construction of a sustainable rural development strategy. On the other hand, it demonstrated its applicability, in the second setting, to raising issues of local human rights and advancing the access to education and other opportunities for Roma people. In both case, the PAR process contributed to opening a democratic communicative space where free discussions on public issues with high importance to disadvantageous communities could be carried out.
The PAR process highlighted issues of primary importance for ecological economics such as: (i) Whose questions are addressed by the research process? (ii) Whom sustainability researchers conduct research for? (iii) Who can participate legitimately in the knowledge creation process involved in any research activities? (iv) Who are to judge the usefulness of the research process? and (v) What are the main implications for how science is (and should be) institutionalised in our societies? If ecological economics aims for being a science of/for sustainability these (and probably other) issues should not only be raised but critically discussed generally as well as in designing any particular research in sustainability. Ecological economics if it aspires to become useful in designing, implementing, and supporting sustainability transitions may need an ?action turn' in theory and practice.
References
Chambers, R: 2000. Us and them: finding a new paradigm for professionals in sustainable development. In: Warburton, D. (Ed.) Community and Sustainable Development. Earthscan, London 116?147.
Costanza, R., Cumberland, J., Daly, H., Goodland, R., Norgaard, R. 1997. An Introduction to

Ecological Economics. St. Lucie Press, Boca Raton, Florida
Gowdy, J.M. 1994. Coevolutionary Economics: The Economy, Society and the Environment. Kuwer, Boston
Norgaard, R.B. 1994. Development Betrayed. Routledge, London
Prugh, T., Costanza, R., Daly, H. 2000. The Local Politics of Global Sustainability. Island Press, Washington, D.C. and Covelo, Calif.
Reason, P., Bradbury, H. 2001. (Eds.) Handbook of Action Research. Participatory Inquiry & Practice. Sage, London,
Tacconi, L. 1998. Scientific methodology for ecological economics. Ecological Economics, 27, 91?105.

Structured methodological pluralism in sustainability science

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Sustainability problems are often characterized by a plurality of decision-makers, pervasive uncertainties, spatial and intertemporal externalities, interplay between humans and nature, and an evolving understanding of the policy objectives (Boulanger and Brechet 2005). Therefore, finding solutions to complex sustainability issues requires a reconsideration of the way scientific knowledge is produced and validated. This reconsideration engages the way sustainability problems areframed, but also themethodological, organizational and social features of research. Sustainability science can make an important contribution to this process, given its transdisciplinary and holistic approach and its focus on how knowledge is structured (Komiyama & Takeuchi 2006).

At present, many of the proposed theoretical innovations in sustainability science have a limited visibility and impact on the organization of science or on the science-policy interface. Apart from the challenge of getting natural and social scientists together and making institutions more open to interdisciplinarity, there is a more fundamental problem that has to do with the way knowledge is produced and validated. Distinct methodologies are rooted not only in deeper epistemological divides concerning the choice of independent variables and the role of normative and methodological assumptions, but also in the way scientific results are validated and integrated in policy making and governance. A reconsideration of the underlying epistemological and organizational framework of interdisciplinary research on sustainability is needed.

Sustainability research progressed from acomplex systems approach(focusing on the interactions between the natural and social components of various social-ecological systems) towards atransformative approach, based on acknowledging the solution-oriented and normative dimensions of research. In this transition, the focus shifts towards problem framing and the plurality of variables influencing the organization of research, which underlie and justify methodological choices (Becker 2011, Lang et al. 2012, Dow 2007).

In this proposal, we argue for the need to take this progression in the conceptualization of sustainability problems further, from a transformative perspective towards acritical-reflexive approach. This progression implies a gradual acknowledgement of social and normative variables which intervene not only in the delimitation of the research object, but also in the way research is structured and organized (methodological assumptions, interdisciplinary collaboration, institutional rules etc.). A critical-reflexive perspective is needed in order to capture a broader range of variables characterizing complex sustainability problems. Thereflexiveandcriticaldimensions are interconnected in the overall normative and epistemological analysis; while the first one implies acknowledging the values, presuppositions and social context of research, the second one adds a critical normative analysis informed by public debate. The values, assumptions and social, institutional and technological constraints that shape research not only inform and guide methodological choices in sustainability research; they also help in ensuring that resulting knowledge is relevant and applicable. By making them explicit and acknowledging their role in problem framing and the organization of research, sustainability science can move towards a stronger model of knowledge validation that brings together requirements of credibility, salience and legitimacy (Cash et al. 2003).

The progression towards a critical-reflexive approach can be equally seen as a progression in the understanding ofmethodological pluralism. Earlier developments in sustainability research were generally characterized by attempts to justify pluralism globally andin abstracto. They took, for instance, the form of claiming that «traditional scienti?c approaches (usually quantitative, often experimental) and their alternatives (e.g., qualitative, narrative, post-modern) all have their place and are all to be valued», and therefore «it is more productive to follow a strategy of ?tting the method to the research question.» (Barker and Pistrang 2005, p. 202). Pluralism was thus understood as a methodological principle justified by the intrinsic complexity of phenomena and the need to deal with theoretical shortcomings. The result of applying distinct methodological lenses to the research object is «not at all purely subjective or arbitrary; but none of them singly can encompass the whole system. Looking at the process as a whole, we may ask whether an

awareness of their limitations is built into their personal systematic understanding, or whether it is excluded.» (Funtowicz et al. 1999, p. 6). These perspectives are not ?competing' in any way for exclusive validity, because they refer to distinct (although connected) levels of description.
Following Spash (2012), we can group these earlier developments under the label of ?unstructured pluralism'. It isunstructuredinsofar as it takes pluralism for granted given the complexity of analyzed systems, but without considering the role of the broader social-institutional and normative context. But openness to everything (or ?anything goes') «is antithetical to the building up of knowledge» (Dow 2007, p. 448). Pluralism needs to be itself justified in terms of its contribution to generally-shared epistemic values, and this contribution cannot be assumed to be the same across different disciplinary fields and research problems. We claim that the progression towards a critical-reflexive approach to sustainability science implies at the same time a progression towards a morestructuredpluralism.
Through a critical analysis of the way sustainability problems are framed in regards to theresearch object(features of the phenomena being investigated) and theorganization of research(including values, assumptions and socio-technological constraints), informed decisions can be made regarding the use of multi-method approaches. The suitability of methodological pluralism (be it interdisciplinary or not) is thus not presupposed or taken for granted; different sustainability problems may require different multi-method approaches. For instance, in environmental valuation applying the cost-benefit analysis (CBA) exclusively and indiscriminately to all valuation contexts may result in gross misrepresentations of the preference-building and valuation process (Spash 2006). Where commensurability of values and utilities can no longer bea prioriassumed (although partial commensurability can nevertheless be accepted ex post), multi criteria analysis (MCA) can usefully complement the dominant approaches based on quantitative scales. MCA usually requires «setting out project or policy options, determining specific performance criteria, and evaluating each option relative to the criteria» (Spash and Vatn 2006, p. 386). Therefore different criteria such as economic utility, environmental damage or distributional impacts are weighted by importance and integrated into the overall valuation process, with no prior requirement of value commensurability. Moreover, participatory approaches (citizen juries, focus groups or consensus conferences) and methods (such as mediated modeling, scenario analysis and social multi-criteria evaluation) can be integrated into a pluralist methodology in order to facilitate consensus on how sustainability problems are to be framed, how results are to be interpreted or how policy measures should use these results. They can also help in mitigating conflicts and solving decisional bottlenecks (ibid).
Such an understanding integrates the cognitive and socio-normative variables which intervene in defining the research object, but also the values, assumptions and socio-institutional constraints shaping the organization of research. Structured methodological pluralism is not a global solution to be applied indiscriminately to entire categories of problems, but an individualized answer to a specific sustainability problem, which takes into account the underlying cognitive and socio-normative variables affecting the organization of research. By reflecting on its own conditions of possibility and its underlying values and assumptions, sustainability research on socio-ecological systems can develop a critical awareness of its own methodology and of the suitability of multi-method or interdisciplinary approaches for a specific research problem.

Social-ecological system depends on model of the mind: Contrasting information-processing and embodied views of cognition in ecological economics

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Model of the mind, or the way we think about the way we think (Bermudéz 2010; Clark 2011; Dennett 1991; Lakoff and Johnson 1999), is a crucial but overlooked component of ecological economics and environmental policy. Environmental policy is based on a mental model of human-environmental interactions. The mental model is in turn based on a model of the mind, i.e., particular categorizations and relationships that we assume to describe how human beings operate in the world and that determine what we can do about our relationship with the environment. The mental model structures the knowledge that we obtain from the environment to maintain and recursively revise the mental model. Like all communities of biological organisms, human societies are in this way autopoietic systems: they have the capacity to renew themselves and regulate this process in a way that maintains the integrity of their structure (Hofstadter 1979; Jantsch 1980; Maturana 2002; Polski 2009; Varela et al. 1991). The model of the mind specifies the process by which the self-renewal takes place and in doing so increases or decreases human adaptive capacity to a particular social-ecological system (SES). In this paper, I contrast two models of the mind, the information-processing and the embodied model, in how they conceptualize SESs and what implications this has for environmental policy.

An example of an explicitly autopoietic system is Elinor Ostrom's seminal conceptualization of a nested, multitier framework for analyzing SESs. One of the variables in the system is resource users' Knowledge of SES/mental models (Ostrom 2007: 15183, Table 1). With their mental models of the SES they are part of, resource users endow the SES with a capacity to renew and regulate itself to maintain its integrity. This feature of the SES framework is potentially emancipatory but requires hard work, because «to develop cumulative capacities to diagnose the problems and potentialities of linked SESs requires serious study of complex, multivariable, nonlinear, cross-scale, and changing systems» (Ostrom 2007: 15181).

While comprehensive and adaptable, Ostrom's conceptualization of SESs is biased toward the so-called information-processing model of human cognition, which sees the human mind as an entity separate from its social and material environment. According to the information-processing model, informational input from the environment is transformed via sensory systems into symbolic representation (i.e., the SES variables) on which computations are performed in the mind. Computational results are then transformed into output as human action upon the environment. In contrast, the embodied model of human cognition sees the human mind as being constituted by the socio-material environment and extending functionally into that environment. Abstractions of the mind are not symbolic representations but rather neurally grounded in concrete sensorimotor experience (Clark 2011; Lakoff and Johnson 1999; Shapiro 2011).

The embodied perspective suggests fundamental qualifications to the information-processing view of SESs, both in terms of how human-environmental interaction is conceptualized and what environmental policies stem from such conceptualization. An environmental policy measure that from the information-processing perspective looks like an emancipatory adjustment of an SES control variable may from the embodied perspective disrupt a tightly interconnected structure of social-ecological action. Since the embodied perspective on human cognition has recently attracted considerable analytical attention?for some as an alternative (Fauconnier and Turner 2002; Lakoff and Johnson 1999; Varela et al. 1991), for others as a complement (Clark 2011; Gallagher 2005; Shapiro 2011; Slingerland 2008) to the predominant information-processing model of cognition?it is worthwhile to explore its implications for SES analysis. My aims are to (1) highlight the fundamental differences between the information-processing and embodied view of SESs with an illustrative comparative analysis of reindeer calf marking, (2) point out areas in need of revision in current view of SESs on the basis of the comparison, and (3) argue for the benefits of developing a hybrid view of SESs grounded in an integrated model of the

human mind.

The analysis reveals three qualifiers for the information-processing SES framework. First, to ensure the accumulation of SES knowledge, we need more research on embodied models of SESs that provide a framework for characterizing the generic structure of embodied social-ecological interdependencies. In particular, a typology of the embodied idiosyncracies of specific SESs is needed, including clarification of the relations between types of functional embodiment and types of variable in the information-processing SES framework. Second, and related to the first point, improved knowledge of embodied social-ecological interdependencies should be used in designing experiments in SESs that are sensitive to the functional couplings that remain hidden in the information-processing perspective. Finally, we need to understand the emergence of embodied SESs by analyzing their genealogies, that is, specifying how the socially and materially grounded activities evolve over time.

How we theorize about the mind matters a great deal also for the politics of knowledge in ecological economics and environmental policy. An information-processing SES framework easily becomes the mental comfort zone for the officials and planners at the higher tiers of the social-ecological decision making hierarchy, precisely because it is a representational abstraction reducible to computational algorithms with inputs and outputs. In contrast, the embodied perspective on SESs requires familiarity with the management practices of a particular SES, knowledge that is only available for the practitioners with embodied involvement in the livelihood. Hybrid knowledge of SESs demands active collaboration between scientists and practitioners.

References

Bermúdez, J.L. 2010. Cognitive Science: An Introduction to the Science of the Mind. Cambridge University Press, Cambridge.

Clark A (2011) Supersizing the Mind: Embodiment, Action, and Cognitive Extension (Oxford Univ Press, Oxford).

Dennett DC (1991) Consciousness Explained (Little Brown, Boston, MA).

Fauconnier G, Turner M (2002) The Way We Think: Conceptual Blending and the Mind's Hidden Complexities (Basic Books, New York, NY).

Gallagher S (2005) How the Body Shapes the Mind (Oxford Univ Press, Oxford).

Hofstadter DR (1979) Gödel, Escher, Bach: An Eternal Golden Braid (Vintage, New York, NY).

Jantsch E (1980) The Self-Organizing Universe: Scientific and Human Implications of the Emerging Paradigm of Evolution (Pergamon Press, Oxford).

Lakoff G, Johnson M (1999) Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought (Basic Books, New York, NY).

Maturana HR (2002) Autopoiesis, Structural Coupling and Cognition: A history of these and other notions in the biology of cognition. Cybernetics & Human Knowing 9(3-4): 5-34.

Ostrom E (2007) A diagnostic approach for going beyond panaceas. PNAS 104 (39): 15181-15187.

Polski MM (2009) Wired for Survival (FT Press, Upper Saddle River, NJ).

Shapiro L (2011) Embodied Cognition (Routledge, London and New York).

Slingerland E (2008) What Science Offers the Humanities (Cambridge Univ Press, Cambridge, MA).

Varela FJ, Thompson E, Rosch E (1991) The Embodied Mind: Cognitive Science and Human Experience (The MIT Press, Cambridge, MA).

Capital accumulation, degrowth and environmental conflicts

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Abstract
The entry of degrowth into the academic arena since 2008 has attracted a considerable interest, but has also been widely criticized. In particular, marxists have questioned the fact that the most well-known degrowth proponents, such as Latouche, have not sufficiently discussed and questioned capitalism (Saed, 2012). It has been highlighted the lack of a discussion on the relations between degrowth and both the capitalist mode of production (Foster, 2010) and the process of capital accumulation (Altvater, 2011). Even if Latouche (2012) outlined the anti-capitalist root of the degrowth paradigm, we agree with the above criticism that this dimension has to be further analytically explored. This article tries to move a step forward in this line. First, it intends to discuss the relations between capital accumulation, economic growth and social metabolism. Second, it argues that capital accumulates expanding social metabolism and capitalist markets through dispossession (Harvey, 2003) and contamination (Demaria and D'Alisa forthcoming). Third, it argues that both dispossession and contamination result into environmental injustices which lead to conflicts where different actors emerge reacting to capital accumulation. Therefore, the article proposes that in fact degrowth necessarily calls into question capital accumulation and that environmental conflicts represent a political arena where this is already happening. Two case studies about waste-related environmental conflicts are discussed. First the building of an incinerator in Naples (Italy) is introduced,where contamination is the main strategy of the capital accumulation. Second the case of New Delhi (India) is discussed, where the two described processes of dispossession and contamination take place simultaneously: waste is diverted (see expropriated) from wastepickers to incinerators built with Clean Development Mechanism (CDM) investments from Kyoto Protocol, which pollutes the locals and the environment.

Introduction

Looking at socio-ecological processes, we have seen that the changes and expansion of social metabolism can lead to socio-environmental conflicts, from the extraction of resources to the disposal of waste (Martinez-Alier, 2002; Martinez-Alier et all., 2010). More efforts can be devoted at the theorisation of this phenomenon, in particular in clarifying its driving forces and the correspondent typologies of conflicts.

The multidimensional crisis that our societies are facing shows the instability and the crisis tendencies of capitalism. It offers the possibility to revitalize the theory of over-accumulation, meaning that the economic crisis is due to a lack for capital of opportunities for profitable investments. Potential solutions can be found in the search for lower costs of inputs (i.e. land, raw materials, labour,...) and widening of markets (i.e. trade with non-capitalist social formations). Capitalist development appears in need of something 'outside of itself' and for this reason continuously opening up 'territories' (Harvey, 2003). The question of interest here is how this process interacts with social metabolism and which are the social and environmental consequences.

Theoretical framework

In this article we intend to apply this framework of analysis to one particular sector: waste management. The complexity of the waste sector and its social, economic, and political implications make it the quintessential for ecological economics (Barata 2002, pag. 117, Bisson K., Proops J. 2002). A system of waste management could be said to be integrated and sustainable. However this should not only refer to the sense of perfectly matched technical options of waste treatment (Nelles et al. 2010) but to acommon badimplying a wide range of environmental, economic, social and political factors (Barata 2002). Therefore waste management should be

addressed more as a social and political process rather then as a pure technical matter (K. Bisson, J. Proops 2002, Winiwarter V. 2002).
The complexity reached by the sector of waste management seems to be translated into profitability opportunities, meaning a very tempting market for the over-accumulated capital in search of profitable businesses. Our hypothesis is that that the appropriation ofbad commonssuch as waste is one of the several strategies for expanding the scale and scope of capital accumulation as Prudham (2007) explain properly in the case of biotechnology. These socio-ecological processes are justified and legitimized by a narrative of progress and (sustainable) development that turn out to be challenged when socio-environmental conflicts emerge.
Therefore this paper attempts to link two lines of thoughts, ecological economics and political ecology, to show how capitalism appropriates nature and labour force to expand his dominion via dispossession (expropriation of rights) and contamination (cost-shifting). We intend to argue that the neo-liberal project is about the release of assets (both inputs and outputs of the social metabolism) at a very low cost.
In the case of dispossession, something that was pre-existing outside the capitalist system is brought inside (i.e. privatization of the public assets or commons). Normally a specific social group is dispossessed by another one to obtain profit.
In the case of contamination an appropriation of de-facto property rights takes place resulting is the shifting of costs and risks (i.e. exploiting the sinks over their sustainable assimilative capacity). The consequences most likely fall upon the most vulnerable social groups, but the society as a whole can be affected. Such unequal distribution can be intra-generational and/or inter-generational.

Case studies

Three case studies are discussed. First we look in Naples (Italy) at the contamination of an extended population group via massive incineration. Second we discuss a combination of the two dynamics of accumulation with a case in Delhi (India) where the wastepickers are dispossessed of the waste that has to be burned into the incinerators. The intention is to explore the explicative ability of the two concepts: accumulation by dispossession (Harvey 2003) and accumulation by contamination.

Discussion and Conclusions

Socio-environmental conflicts have emerged in the three cases. In the first case animated by wastepickers, in the second by local people and in the third a combination of both.
Socio-environmental conflicts can be seen as a reaction to the expansion of capitalist accumulation that deteriorates the social and environmental conditions. In the case of dispossession people complain about the expropriation of their means of production, while in the case of contamination people complain about the costs shifted to the detriment of their environment and health.

Bibliography

Barata E. 2002. Muicipal Waste, pp. 117-142, in Bisson K., Proops J. (Edited by), 2002. Waste in Ecological Economics. Edwar Elgar Publishing.
Bisson K., Proops J. (Edited by), 2002. Waste in Ecological Economics. Edwar Elgar Publishing.
Chen X. , Geng Y. , Fujita T, 2010. An overview of municipal solid waste management in China. Waste Management 30, 716?724
Bumpus, A.G. and Liverman, D.M. (2008) Accumulation by Decarbonization and the Governance of Carbon Offsets, Economic Geography84 (2), p. 127-155.
D'Alisa, G., Burgalassi, D., Healy, H., Walter, M., 2010. Conflict in Campania: Waste emergency or crisis of democracy. Ecological Economics 70, p. 239-249.
De Jong P., Wolsink M., 1997. The structure of the Dutch waste sector and impediment for waste reduction. Waste Management & Research, 15, 641-658
De Angelis, M., 1999. Marx's theory of primitive accumulation: a suggested reinterpretation. Manuscript, University of East London (available at http://homepages.uel.ac.uk/M.DeAngelis/PRIMACCA.htm).
Glassman, Jim, 2006. Primitive accumulation, accumulation by dispossession, accumulation by 'extra-economic' means. Progress in Human Geography 30, 608.
Harvey, D. 2003. The New Imperialism, Oxford: Oxford University Press.
Martinez-Alier, J. et all., 2010. Ecological distribution conflicts (Special Issue). Ecological Economics 70.
Martínez-Alier, J. 2002. The environmentalism of the poor: a study of ecological conflicts and valuation. Cheltenham: Edward Elgar.
Nelles M., Arena U. Bilitewski B. 2010. Thermal waste treatment ? An essential component of a sustainable waste treatment system. Editorial. Waste management 30. 1159?1160.

Prudham, S., 2007. The fictions of autonomous invention: accumulation by dispossession, commodification, and life patents in Canada, Antipode 39(3): 406-429.
Winiwarter, V. (2002) «History of waste» in Bisson, K., Proops, J. (Edited by), (2002). «Waste in Ecological Economics». Edwar Elgar Publishing.

The relevance of life projects for understanding links between degrowth and environmental conflict in the ?First World'

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Ecological economics has produced a convincing case as regards links between environmental conflicts and the expanding social metabolism of capitalism globally. In this narrative, the drive to growth that fuels a seemingly unceasing expansion of social metabolism produces cost-shifts that create environmental and socio-economic ?backwaters', peripheral spaces that suffer the social and environmental costs of capitalist wealth-creation in the ?centre'. Relevantly, a mostly Marxist-based political ecology literature has typically conceptualised opposition to environmentally-degrading projects in such ?peripheries' as attempts to redress such inequitable cost-benefit effects of capitalist expansion. Nevertheless, such explanations of the politics of environmental change and governance regularly overlook the micro-politics of environmental change and harm, i.e. the everyday and heterogeneous practices, thoughts and routines of those who engage with environmental harm and conflict both at the producing and receiving ends. In doing so, those explanations controversially obfuscate the motivations for engaging in environmental conflict by basing their analysis upon narrow models of human action, such as ?rational', own-seeking benefit behaviour, which they themselves criticise.
Building on an emerging literature of ?First World' political ecology, this presentation will link environmental conflict to degrowth by looking at the relevance of life projects, i.e. efforts to sustain a meaningful and purposeful life (Blaser, 2004). To do this, it will bring evidence from two case studies of conflicts and controversies related to climate change policy (mitigation and adaptation) in Southern Catalonia. It will demonstrate how life projects, far from being ?lifestyle' activities of ?post-material' subjects, are deeply political engagements of people concerned with and attempting to maintain viable alternative futures. It will show how these efforts are rooted in arguments critical of growth, its outcomes and implications and thus comprise active attempts to derail the growth project and imaginary. Finally, the presentation will reflect on the significance, potential and limitations of life project political action for understanding how power can be challenged in order to create alternative degrowth imaginaries and futures.

References

Blaser M, 2004, «Life projects: indigenous peoples' agency and development», inIn the way of development: indigenous peoples, life projects and globalisationEds M Blaser, HA Feit (Zed Books, London) pp 26-44

Mining conflicts at the crossroads of the de-growth and environmental justice movements

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The mining sector enjoys a prominent role in our current global economic order. The growth in consumption and production has escalated the need for energy and raw materials, with resource use reaching exceptionally high levels worldwide. Between 1970 and 2004, the global extraction of major metals grew by over 75 percent, industrial minerals by 53 percent, and construction materials by 106 percent, while world population increased by about 72 percent. Contrary to beliefs that the economy will decouple from natural resources and environmental impacts, the mining extraction frontier continues to expand. Total consumption and extraction increased for practically all mineral resources, driven up by the raising per capita consumption of high demand countries like China, the European Union (EU) and the United States (Rogich and Matos, 2008). In fact, increasing exchange of energy and materials with the environment?the so-called increasing global social metabolism (Fischer-Kowalski, 1997; Fischer-Kowalski and Haberl, 2007)?triggers new conflicts around extractive industries. Given the appetite of the growing world economy and population for regions and/or a range of inputs that have yet to be penetrated by or incorporated into the market system (Martinez-Alier et al., 2010), there has been increasing pressure and expansion in particular at «commodity frontiers» (Moore, 2000). In this context, Bebbington et al. (2008) point to the dramatic increase in mining activities in many developing countries during and after the 1990s, following the adoption of neoliberal economic reforms with the promise of more economic growth throughout the world. These projects developed and conducted mostly by the multinational companies often generate the main domestic extraction of the respective commodity, while the materials (and/or the monetary benefits from this extraction) do not remain within the national borders. In several of the projects, the total production is shipped and exported to the global North or China (e.g. copper in Tía María and Los Pelambres; zinc and lead in San Cristóbal; uranium in Brazil, Niger and Namibia).
Against this background, this paper aims at exploring contemporary mining conflicts at the crossroads of degrowth and environmental justice movements. This is done based on 24 real case studies from 18 different countries (Argentina, Bolivia, Brazil, Bulgaria, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, India, Mexico, Namibia, Niger, Peru, Slovenia, and Turkey) which are described by local activists and scholars taking part in EJOLT. While 17 of the reported cases focus on conflicts related to metal mining (e.g. gold, silver, copper, zinc, and lead), four address uranium mining and one refers to coal mining. As an example of a new frontier in the industry, a sand mining conflict from India is also reported. The analysis helps us to better understand the link between mining conflicts and the quest for growth in the North and the metabolism of economies as well as the role that ecologically unequal exchanges play in this context.

Back from the future: Defining sustainable employment through backcasting

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Ecological economics is about leaving the realms of current paradigms underlying current economic thinking. Sustainability is defined in the stricter sense of the word by ecological economics delineating a world where strong sustainability is the norm. Yet, how far have these normative theories penetrated our everyday thinking? When people are given the chance to leave the path dependencies of today behind and imagine a sustainable future ? like in a future search experiment as backcasting ?, what elements of «radical change» occur in their normative vision? Or what are those underlying principles of our current ways of thinking that are so embedded in our world that they remain unquestioned and still seem to direct our plans for the future? These are the questions this paper attempts to find answers to building upon the experience of a backcasting workshop on sustainable employment conducted in Hungary in April 2012. The paper consists of three main parts. The first one provides the background of the backcasting experiment itself; the second gives a short overview of the relevant literature on sustainable employment both from the perspective of the current dominant paradigm and radical change paradigms, while the third one examines how these theories were represented in the backcasting process and its co-created scenario.

Backcasting is one of the approaches in future studies which attempts to elaborate prospects for different levels of social organisation such as companies, cities and societies. Backcasting is part of a larger category of methods called normative scenarios that stand for the idea that when one attempts to create a vision of the future, there should be certain values and basic normative assumptions determining what a desirable future would look like. Therefore, instead of attempting to forecast from a large pool of data what the most likely future scenario will be, normative scenario-building moves along a different path identifying acceptable and desirable futures instead. The distinguishing feature of backcasting is that it starts with a normative future vision and attempts to create links between these desirable conditions of the future and the present. Consequently, it works backwards by strategising and planning the necessary steps to achieve the given set of goals embedded in this future vision.

Employment is not often the topic of backcasting exercises. When the opportunity arose that the National Council for Sustainability Development of Hungary is ready to finance such an experiment, the topic of employment was suggested for a number of reasons. Partly because employment policy is a highly pressing and contested issue in the Hungarian socio-economic context, and partly due to the fact that the issue of employment is considered a cornerstone of sustainability and yet it seems to be underrepresented in sustainability research. Therefore, even though the normative vision may cover Hungary in the 2050s, some of the experiences gained can be more of a general significance.

The backcasting experiment applied a stakeholder involvement approach. Hence, the 16 participants who took part in the two-day workshop were all professionally related to employment issues but came from varied backgrounds and different sectors (representing academia, business, civil society organisations, and public administration).

The term «sustainable employment» as such rarely occurs in scientific discussions. However, in policy discussions and documents the two concepts often meet in the discourse on a green economy providing green jobs. The notion of the green economy promises «quick fixes» to economic recession and employment problems while reducing carbon emissions and other environmentally harmful economic activities without initiating major changes either in our ways of thinking or in our way of living. It remains well within the currently reigning paradigm and attempts to achieve weak sustainability through improving eco-efficiency. The logic of the argument is that as new technologies arise and the state encourages investment into these developments through grants and ecological tax systems, a new market for environmentally conscious goods and services appears. In theory, these trends not only lead the economy towards

reduced pollution and waste levels but at the same time also create employment.
On the other hand, the radical change paradigm disposes of the concepts of the free market economy and believes that new »great transformations» are unavoidable, whereby values must change just as much as institutions. Representatives of the radical change paradigm go beyond the boundaries of neoclassical economics and refuse to accept its definition of welfare solely in terms of levels of consumption; its characterisation of work as purely paid labour and its seemingly problematic attachment to the ideal of full-employment. On this basis, work is not purely a way of providing basic subsistence or a compulsion to reach new levels of consumption but also part of human well-being. Following such a re-definition, the same levels of well-being can be maintained even with decreasing consumption levels. These new meanings of work would make way for changes and open opportunities in community work, or social enterprises, as they would no longer be just a haven for those crowded out of the labour market. They would also enable work time reduction schemes as means of enhancing well-being. The radical change paradigm also includes schools of thoughts like eco-localism or bio-regionalism that support environmental sustainability and social cohesion through local production and consumption networks.
During the backcasting experiment these theories presented themselves in a highly disentangled manner as participants envisioned scenarios that are by no means free from internal inconsistencies. However, these inconsistencies provide us with valuable insight as to what elements are those in our current economic system that are most ingrained in our ways of thinking and which are those assumptions that have been «overthrown» even by people who do not deliberate on alternative paradigms in their everyday lives. It has also become clear that the underlying theories are not clear cut at all. In the mind of the participants, eco-localisation can happen without questioning globalisation; for-profit companies will start resembling to socially and environmentally devoted non-profit organisations without shedding doubt on the underlying principles of our current market economy; and ecological sustainability will be achieved without any reservations on where technology with its current impetus is heading us.
It is also interesting how the idea of «green growth» has not yet taken root. Even though this issue is so frequent in the political rhetoric and the mainstream media tends to cover sustainable employment almost solely from this perspective, it comes somewhat to a surprise that the participants of the backcasting used a much wider conceptual framework and the terms «green economy» or «green jobs» hardly occurred in the discussions. On the other hand, the slogan of the «knowledge-based social market economy» that is currently the flagship model of the European Union described in the EU2020 document as the «Strategy of smart, sustainable, and inclusive growth» has infiltrated current ways of thinking so much that at large this is the scenario participants described with slight modifications.
On the other hand, just like in the radical change paradigm, the redefinition of needs, welfare, and work played the most central role in the discussions as well as in the scenario itself. The shift from material consumption to satisfying other types of needs is well reflected in the output of the workshop. The majority of the policy tools were aimed at achieving this change in our ways of thinking. Even though globalisation was treated as deterministically as technological development, the role of the local community, local economy and production played a significant role in the vision. Other radical change notions such as the introduction of more deliberative governance systems also occurred in the backcasting discussions.
In summary, analysing the normative vision of this backcasting experiment gives us a chance to re-evaluate what alternative theories can take root in everyday thinking more easily and what are those that may take longer to adopt. It also provides an overview of competing theories that somehow manage to co-exist in the minds of the participants.

Challenges of designing a PES-Scheme in south-western Madagascar

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The poster presents our approach for designing a Payment for ecosystem services (PES) within the Project «Sustainable land management in south-western Madagascar» (SuLaMa). The study region, Mahafaly Plateau in south-western Madagascar is characterized by low and variable precipitation, dry spiny forest ecosystems with a high percentage of endemic species, and increasingly vulnerable livelihoods of the local rural population due to population growth and diminishing precipitation resulting from climate change. Some types of land use conducted by the local population, e.g. slash and burn agriculture or charcoal making, have especially negative effects on ecosystem services supply and biodiversity. Economic development and the provision of ecosystem services could go hand in hand if local users were adequately rewarded for practices providing ecosystem services. One aim of SuLaMa is to design a locally accepted and cost-effective PES scheme for the Mahafaly region. We propose two PES Schemes for the Mahafaly area and describe our steps in the PES design process. Although there are already experiences with the implementation of PES and PES-like schemes in Madagascar (Ferguson 2009; Ferguson 2009; Baldauf et al. 2010; Sommerville et al. 2010a; Sommerville et al. 2010b; Bidaud et al. 2011; Cahen-Fourot and Meral 2011; Brimont 2012), the remoteness, poverty of the local population and the prevalence of strong community rules pose challenges as well as chances for the design of a PES Scheme in this region. xml:namespace prefix = o ns = "urn:schemas-microsoft-com:office:office" />

Corporate social responsability in Madagascar : tool of development and source of frustrations

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Madagascar est classé au 151ème rang sur 181 en termes d'Indice de développement humain (PNUD, 2010), ce qui le classe parmi les pays à faible niveau de développement humain. Le taux de pauvreté y est de 76,5%. La région Anosy, région de notre analyse, connaît un taux de pauvreté supérieur à la moyenne nationale, soit 83,5%, avec une différence entre le milieu urbain (55,1%) et le milieu rural (87,6%) (INSTAT, 2010). Dans ce contexte, les projets de développement sont particulièrement scrutés en termes d'impact. Les entreprises qui participent à ces projets ont de ce fait une responsabilité forte liée aux attentes de la population et du gouvernement.

Cette responsabilité est d'autant plus prégnante que le gouvernement malgache mise largement sur les investissements directs étrangers pour favoriser son processus de développement (Cocks, 2005). Comme l'a bien souligné Sarrasin (2006), le gouvernement malgache, dès la fin des années 1990, s'est engagé dans une perspective de réduction de la pauvreté via l'augmentation de la croissance, suivant en cela les préconisations de xml:namespace prefix = st1 ns = "urn:schemas-microsoft-com:office:smarttags" />la Banque mondiale[1]. Dans ce cadre de lutte contre la pauvreté, les investissements directs étrangers constituent la pierre angulaire du dispositif.

Or, comme la dégradation de l'environnement est attribuée aux populations locales, en particulier en raison de la faible productivité agricole qui les pousserait à mettre systématiquement en culture de nouvelles terres, empiétant de fait sur les zones forestières (Cleaver et Schreiber, 1998)[2], l'investissement direct étranger est aussi perçu comme un moyen de sortir les populations locales de cette spirale pauvreté-dégradation des ressources-pauvreté, en permettant par l'investissement direct étranger l'emploi de ces populations comme salariés sur les projets d'envergure. Cette perspective est évidemment largement relayée par les entreprises désirant investir (voir dans notre cas d'analyse le rapport de QIT Madagascar Minerals SA., 2001) et est devenue le cadre général de la politique de développement dans de nombreux pays en développement, dont Madagascar (Sarrasin, 2006).

La responsabilité sociale des entreprises étrangères prend alors tout son sens puisque leur activité sur le territoire national permettrait simultanément de réduire la pauvreté et de préserver les ressources naturelles. Les partenariats public-privé, largement mis en valeur par le Global compact, ont ainsi pris toute leur place.

A Madagascar, ce cadre de développement via la responsabilité des entreprises s'est appuyé sur le secteur minier. La Banque mondiale, avec l'assentiment des autorités nationales, a en effet fait du secteur minier à Madagascar un Pôle intégré de croissance (Mission Economique de Tananarive, 2007). Bien que le secteur minier ne représente qu'une faible part de la création de richesse nationale, notamment en raison d'une structuration essentiellement dominée par l'extraction artisanale (notamment pour les pierres précieuses-semi-précieuses et l'or), le secteur est visé comme un moteur du développement avec de grands projets dans le cadre des partenariats public-privé (Pelon, sans date). Les deux plus grands projets sont actuellement le projet QMM de Tolagnaro, objet de notre analyse, et celui de l'entreprise Sherrit dans la zone est de Madagascar (l'axe Tamatave-Ambatovy plus précisément)[3]. En 2003, la Banque mondiale prévoyait ainsi que le secteur minier pouvait voir sa production multiplier par 20 et les exportations multipliées par 30 à l'horizon 2010 (Banque mondiale, 2003).

Afin d'attirer des investissements étrangers dans ce secteur, la législation malgache a connu de nettes évolutions visant d'une part à favoriser l'implantation des firmes multinationales, d'autre part à marquer le désengagement de l'Etat dans les opérations de production (Sarrasin, 2006). L'aboutissement de ce processus, visant à la mise en oeuvre d'une bonne gouvernance[4], est l'admission de Madagascar, en février 2008, dans le processus de l'Initiative pour la transparence des industries extractives[5].

Dans cet article, nous voulons souligner le rôle majeur dévolu aux entreprises d'extraction minière

à Madagascar en matière de développement durable et les frustrations et tensions qu'un tel rôle génère à l'égard des populations. Bien que la dimension environnementale soit souvent essentielle dans l'appréciation qui est faite de ce secteur d'activité, nous révèlerons surtout les frustrations et tensions sociales. Ces dernières ne sont d'ailleurs pas dénuées de relations avec les privations d'accès aux ressources naturelles que subissent les populations à la suite des projets d'extraction. Pour cela nous nous appuierons sur le cas du projet de QIT Madagascar Minerals SA (QMM) dans la région Anosy au sud-est de Madagascar, plus précisément à Tolagnaro (Fort-Dauphin). Ce projet est en effet un des premiers grands projets d'extraction minière à Madagascar et est désormais proche de la phase finale où l'exportation de minerai va démarrer.
Nous exposons d'abord le contexte malgache et le rôle attendu par ce type de projet dans le pays. Ensuite, nous présentons le développement du projet et son cadrage par rapport aux contraintes légales du pays. Puis nous soulignerons les réalisations en parallèle des frustrations et tensions que le projet a créées. Nous concluons alors sur le rôle que ce type de projet peut jouer en matière de développement mais aussi sur ses limites.

[1] Rappelons que cette relation entre croissance et réduction de la pauvreté est largement sujette à débat. Les travaux de Dollar et Kraay (2002) ont défendu cette vision, mais elle a été largement nuancée. Voir notamment Bourguignon (2003). xml:namespace prefix = o ns = "urn:schemas-microsoft-com:office:office" />
[2] Il va de soi qu'il s'agit là d'une hypothèse extrêmement contestable. Depuis les travaux de Boserup (1965), l'hypothèse de la relation entre croissance démographique et dégradation des ressources naturelles a été largement invalidée.
[3] Sur cet autre projet voir par exemple Ballet et al. (2011a, b).
[4] Au sens donné à ce terme par la Banque mondiale, visant essentiellement à la transparence sur les revenus tirés des activités. Pour une critique de cette conception de la gouvernance voir par exemple Cartier-Bresson (2000).
[5] Notons toutefois que la société civile a exercée des pressions pour que le gouvernement malgache fasse sa demande d'entrée dans le processus (L'Express de Madagascar, http://www.lexpressmada.com/index.php?p=display&id=22238). Les détails de cette initiative internationale sont disponibles sur www.eitransparency.org. Des informations sont aussi disponibles sur le site spécifique à Madagascar dispose aussi d'un site : www.mines.gouv.mg/eiti.

Costs and benefits of creating stork villages in Poland

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Several villages in Poland which have white stork (Ciconia ciconia) nesting colonies have been branded as ?stork villages'. Even in Poland, a country where 25% of world population of this bird breeds, such villages attract tourists and provide an opportunity for ecological education. Most of them are organized by conservation NGOs which use these villages to protect storks and to attract people to nature conservation.
Based on two best-known examples of such villages (Zywkowo in North-East Poland and Klopot in the west of the country) we attempt to assess the economic effectiveness of creating and running such villages. Although stork colonies occur there naturally (unlike in some stork villages in Western Europe), for such a village to keep being attractive for storks and to attract tourists, significant costs have to borne, related to nature conservation and the development of tourist infrastructure.
Our analysis involves both private and public costs and benefits. As a first step we estimated public benefits related to recreational use of these villages, using the travel cost method. The next step was to identify various categories of costs and benefits, such as costs related to the development of public infrastructure and private tourist infrastructure, costs of acquiring or renting the premises on which tourist infrastructure was created, costs of maintenance of this infrastructure, costs of nature conservation activities related to maintaining stork-friendly habitats, costs related to marketing and educational activities, and private benefits from tourist activities. These costs and benefits have been calculated and compared, based on data obtained from NGOs which run these two stork villages.

Ecosystem services trade-offs from a historical perspective

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Ecosystem services trade-offs from a historical perspective
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Summary

Ecosystem services trade-offs in a historical perpective illustrate the concequences of a decision made in a particular historical context about land use. Six periods were differentiated in the history of ecosystem services trade-offs in the Hevesi Plain. During the different periods the importance of different ecosystem services for human communities changed, as human perceptions and value judgements about nature altered according to the different social contexts.
Abstract
Decisions made on land use will, consequently, determine the quality and the quantity of ecosystem services (ESs) provided by a landscape (Rodríguez et al. 2006). When human communities decide to enhance the use of a particular ecosystem service to fulfill their needs, this often happens at another ES's expense. As the services interact with each other in several ways, there are not only synergies but clear ?trade-offs» between them (Pereira et al. 2005). ESs are often not equally important for humans, provisioning services are the most directly visible, therefore decisions tend to focus primarily upon them. Often relatively less significance is attributed to regulating, cultural and supporting services in decision making (Pereira et al. 2005). One can detect this kind of order of importance in the land colonization process (De Fries et al. 2004). In the initial stage, when small-scale agriculture sustains a small population, provisioning services are of great importance. Later, when human land use becomes more intensive (water management, purification, and fertilization all occur), regulating services gain prominence. Eventually, human societies decide to protect parts of the landscape and rehabilitate regulating and supporting ecosystem services (Rodríguez et al. 2006).
Our study site, the Hevesi Plain is a diverse, patchy habitat with grasslands, moorlands, situated on the northern periphery of the Great Hungarian Plain. Agriculture here is based on arable farming, although soil fertility is quite low. Cattle grazing is marginal, there are only a few herds in the area. Socially, unemployment and out-migration of the local population are the main problems hitting the region.
Our research interest was in the historical perspectives of the ecosystem services trade-offs in the area. The methodology comprised two stages, archival and desk research was performed to study landscape history and, then, semi-structured interviews were conducted with nature conservationists, farmers, and other residents to study their perceptions about ecosystem services. A slightly modified version of MEA's ecosystem services typology was applied.
Six periods were differentiated in the history of ecosystem services trade-offs in the Hevesi Plain. Duringthe first period(from the first human colonization to the 19th century) small-scale agriculture was dominant. Arable farming, cattle grazing and fishing were the main sources of livelihood (Petrecsák & Veres 2005). Arable land expanded gradually in this period at the expense of grasslands and forests (Sz?cs 2008). Therefore provisioning services (cereal) were in trade-off with other provisioning services (wood and fiber), regulating (erosion regulation, habitat for wildlife) and supporting services (soil formation). The second period started with thecapitalist

economic transitionand the born of civil society in Hungary in the 19th century. Small-scale agriculture started to be transformed into a market-oriented one, grassland degradation and fragmentation continued, more arable lands were created (Petrecsák & Veres 2005). Like in the previous period, some regulating services and supporting services dissapeared. To expand more the arable lands and pastures, water management measures were introduced, the regulation of rivers and streams started in this period (Petrecsák & Veres 2005). The salination of grasslands was a side effect of this intervention (Sz?cs 2008). Trade-offs between provisioning and regulating (water purification, flood regulation, habitat for wildlife) services occured. There was a particular ?trade-off» between provisioning services and cultural services that was manifested in a very long timescale. Due to salinization of the soil, a very unique habitat was occured in the area. The next (3rd) period isindustralisation. The livelihoods primarily based on agriculture lost importance. In the beggining of the 20th century, agriculture began to use fertilizers, pesticides and machines to enhance the effectiveness of arable farming. The intesification of cattle grazing caused the decrease of the proportion of meadows and pastures (Petrecsák & Veres 2005). As the more provisioning services (cereal, meat) emerged in the area, the less regulating and supporting services were present. The forth period was the so-calledcommunist era, where industrialisation was strengthened and conversion of private agriculture into state-owned, collective farming started. The intensification of agriculture continued and increased. Provisioning services were the most significant, supporting and regulating services (e.g. habitat for wildlife) were continued to decrease. During thedemocratic transition(the fifth period) the main influencing factors become free market and private property. As both the industry and the cattle grazing sector lost its weight in the area after the transition, unemployment and out-migration became serious problems. Due to these processes, provisioning services (meat) and regulating services (habitat for wild life: succession of grasslands) were decreased simultaneously. Arable farming intensification decreased, as fertilizers and pesticides prices became too high. In 1993, a new protected area was designated in the area to conserve salty garsslands, remaining other grasslands, moorlands and several animal species (birds, e.g. Otis tarda). This resulted in a trade-off between regulating services (habitat for wildlife) and provisioning services (restrictions in arable farming and cattle grazing). The last period is theEU accession, when further protected areas were designated (Natura 2000 and High Nature Value Areas). Both conservation programmes offer compensation to farmers for diminishing provisioning services (Natura 2000 compensation hasn't been put in action yet for every kind of land use). The decreasing of cattle garzing (provisoning service) is still a problem, causing biodiversity loss at the same time. Due to EU funding, some habitat restoration projects (freshwater habitats and grasslands) were carried out, whereby regulating (water purification) and supporting (soil formation) services were restored. One could observe that the significance of different ESs for humans changed during the six periods, as human perceptions and value judgements about nature altered according to the different social contexts.

References

DeFries, R. S., J. A. Foley and G. P. Asner. 2004. Land-use choices: balancing human needs andecosystem function. Frontiers in Ecology and the Environment 2:249?257.

Millennium Ecosystem Assessment. 2003. Ecosystems and human well-being. A framework for assessment. Island Press, Washington, D.C.

Pereira, H. M., B. Reyers, M. Watanabe, E.,Bohensky, S. Foale, C. Palm, M. V. Espaldon, D. Armenteras, M. Tapia, A. Rincón, M. J. Lee, A., Patwardhan, and I. Gomes. 2005. Condition and trends of ecosystem services and biodiversity. Pages 171?203 in D. Capistrano, C. Samper, M. J. Lee, and C. Raudsepp-Hearne, editors. Ecosystems and human well-being: multi scale assessments, Volume 4. Findings of the Sub-global Assessments Working Group of the Millennium Ecosystem Assessment.Island Press, Washington, D.C., USA.

Petrecsák Tivadar és Veres Gábor (szerk.) (2005): Heves megye népm?vészete. Eger

Rodriguez, J. P., T. D. Beard Jr, E. M. Bennett, G. S. Cumming, S. Cork, J. Agard, A. P. Dobson, and G. D. Peterson.Trade-offs across space, time, and ecosystem services. Ecology and Society 11, 28 2006. Sümegi Zsófia Eszter (2010): A szalakóta él?helyválasztása a Hevesi- Borsodi síkon. Szakdolgozat. Gödöll?

Sz?cs Márta (2008): A Hevesi-sík ÉTT célprogramjainak hatása a vizsgálati terület földhasználatára. Szakdolgozat. Gödöll?

http://bnpi.hu/oldal/hevesi-fuves-pusztak-tk-55.html

Evaluation des interactions entre les parties prenantes dans la gouvernance communautaire des ressources naturelles à Madagascar : cas d'Analamanga

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Résumé de la communication
Les prémisses de la gouvernance communautaire[1] des ressources naturelles Malgaches émergent dès le IX ème siècle. L'année 1864 marque un réel tournant en gouvernance de l'environnement Malgache avec l'apparition de l'ère coloniale française (1864-1960). Fort de cet héritage, après son indépendance, les instances malgaches s'inspirent d'une juridiction traditionnelle et hétéroclite de la gouvernance des ressources, axée tant sur les paradigmes du droit international de l'environnement, que sur les préceptes économiques pour moderniser le système. La gouvernance environnementale devient plus axée sur les parties prenantes avec les principes participatifs durant décennie 1990 (Froger, 2001). Ainsi, face à la pression environnementale, l'idée de créer une nouvelle politique environnementale[2] sur la gouvernance des ressources apparaît avec la Charte de l'environnement en 1990 (loi 90-033) et notamment avec l'apparition des lois en faveur de la sauvegarde des biens communs. La loi Gélose[3] du 30 Septembre 1996 et le décret relatif à la Gestion Contractualisée des forêts[4] (GCF) du 14 février 2001 marquent l'émergence d'une réelle réglementation pour la gouvernance communautaire des ressources de l'écosystème à Madagascar. Bien qu'étant le premier pays en développement à avoir un système de gouvernance environnementale aussi innovant, les dichotomies et les conflits entre les intérêts des parties prenantes entravent l'efficacité de la gouvernance communautaire dans un contexte d'urgence écologique[5]. Cette étude propose de mettre en lumière, la prise en compte de l'efficacité de la gouvernance exercée par les parties prenantes et ses limites dans le cadre de la gouvernance communautaire de ressources naturelles à Analamanga (via une analyse socio-économique crée à cet effet).

[1]Selon Bates (1981, 1992, 2006), la gouvernance communautaire des ressources naturelles désigne l'application efficiente des principes et stratégies de développement durable aux ressources naturelles. Elle assure le maintien des principes de la bonne gouvernance et une gestion efficace des biens communs. Bates D.G. (2010), « Human Ecology : contempory resarch and pratice », ed. Srpinger.
[2]S'agissant de la législation Malgache, elle relève principalement des traditions du peuple malgache. Le droit coutumier occupe une place prépondérante dans la vie du peuple Malgache. Les us et coutumes dictent les gestes de la vie courante dans chaque région depuis des siècles. Avec une population à 85 % rurale, le droit informel et le droit traditionnel ont tendance à prendre le pas sur le droit formel. La gestion communautaire est un moyen de développer les connections entre le droit positif et traditionnel et les innovations. A l'exemple du Dina (règlement) qui règlemente les relations au sein de la communauté de base en fonction de ses propres règles coutumières. Selon la loi 96-025, si deux ou plusieurs communautés de base gèrent conjointement un espace naturel et / ou forestier, chaque règle coutumière propre à chaque communauté de base nécessitera la mise en conformité du Dina à ses spécificités. Le Dina reste, cependant, inférieur à la loi étatique et il doit être en conformité avec la droit constitutionnel, législatif, réglementaire et aux coutumes de la communauté de base.
[3]La loi N°96-025 est relative à la gestion locale des ressources naturelles renouvelables.
[4]La GCF (Décret n° 2001/122) simplifie le transfert de gestion du contrat Gélose, mais il ne concerne que les forêts. De 1999 à 2010, Madagascar réalise plus de 2000 contrats de Transferts de gestion.
[5]A Madagascar l'urgence écologique doit être conjuguée avec l'urgence socio-économique en vue de parvenir au développement. En effet, en vertu de la déclaration des droits des peuples autochtones (13 Septembre 2007), Madagascar assure le respect des droits autochtones à travers la valorisation et la protection des ressources, en assurant un partage équitable et la participation des populations autochtones aux décisions.

Exploring the links between agricultural biodiversity, ecosystem services and human well-being. Evidence from the Yucatán, Mexico.

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This study hypothesis is that the application of an integrated and multidimensional human well-being - ecosystem approach can improve our understanding of agricultural biodiversity and the ecosystem services it provides in terms that are meaningful to the people that depend on them, allowing us to draw relevant public policy implications. We adopt and test the Capability-Ecosystem Approach (Duraiappah, 2004) by assessing strengths and weaknesses of its empirical application and ultimately contributing to its operationalization. Specifically, we tailor this approach to analyse the relationship between agricultural biodiversity, ecosystem services and human well-being in the Yucatán rural areas, Mexico, where farmers are among the poorest inhabitants of the total Mexican population. These area is of particular interest as Mayan farmers use and depend from a wide variety of natural resources, mostly agrobiodiversity, which represents a fundamental element of their culture and traditional knowledge.

External diseconomies, Neoclassical and Marxist analysis: a vision

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Encoding the basic theoretical aspects of the Neoclassical Economic Theory of the external diseconomies (negative externalities), it can be noted that the Neoclassical Theory (or Orthodox Economics) recognizes the market inability to internalize the external costs in the polluter prices. Moreover, the Neoclassical Economic Theory of Natural Resources (or Environmental Economics) does not take into account the specific capitalist (class) context of the environmental problem. Simultaneously, the Neoclassical Economics of Natural Resources recognizes that the theoretical framework of an optimal level of pollution implies accumulated or residual pollution. Considering these observations as starting points of a Marxist critique in Mainstream Economics of Environmental Externalities, there is an attempt to establish a Marxist approach about to the relationship between nature and capitalist economy. xml:namespace prefix = o ns = "urn:schemas-microsoft-com:office:office" />

There are external diseconomies generated by producers or by consumers. External diseconomies of production are caused when the enterprise output increases the costs of another enterprise. As a result the compensation of the latter through the market is not feasible. It is evident that market fails to enclose the entire costs ? that is the social and the private costs ? in the commodity price. Consequently, prices comprise only the producer private costs. This market weakness has resulted in the declination between private and social costs, so that private costs are less than the total social costs. The external diseconomies of production may lead to the decrease of the profits or to the increase of the prices of the affected firm. In other words, polluting enterprise profitability is carried out at the expense of other enterprises (Stiglitz 2000).

In addition, even if achieving the «optimization» of pollution, the polluter profitability takes place at the expense of other industry/business profitability. In that way, the polluter profitability contributes to a further environmental degradation.

A solution to the problem of external diseconomies without resorting to state intervention (and outside of any market mechanism) is, according to the Neoclassical economists, the « internalization» of external diseconomies through direct negotiations between the concerned parties in order that the production and the environment pollution are reduced at the socially optimal level (Coase 1960). However, in the case of environmental negotiations, the neoclassical perspective ignores the polluter and polluted socioeconomic power. Therefore, the negotiations cannot ensure an optimal social level of pollution or adequate environmental protection.

Apart from environmental negotiations, the government intervention is essential to limit environmental deterioration. According to the Economic Theory, for a given technology, a socially optimal level of production can be achieved if the government imposes taxes, which are equal to the marginal external costs per unit of product. Another measure is the direct quantitative control of production. However, this «optimization», which is determined by the equilibrium between social marginal cost and marginal revenue, does not result in externality elimination. Moreover, the government intervention is based on the assumption of a pluralistic understanding of socioeconomic power distribution, whereby in society the state power represents all individual and group interests that have equal political power. In addition, the state intervention is assumed to be «neutral» as long as social groups and classes competition is ignored.

The «optimization», with accumulated or residual pollution, enforces the argument that Neoclassical Economics tends to ignore natural limits and the scarcity of natural resources. Given the fact that Environmental Economics suggests the substitution of a certain natural resource, usually, by the available technology, the environmental degradation is not only limited but also increased.

On the bases of a critical reading of the neoclassical theory of external environmental diseconomies, some aspects of a Marxist vision about nature and the relationship between nature and capitalist economy have been composed as follows:

1. The Marxian analysis highlights the multiplicity of the interdependence between nature - technology and capital (see Marx 1991). In this way, it is in contrast to the naturalistic-ecological approaches which suggest a rigid character of natural conditions and limits (Benton 1989) and the «voluntarist promethean» approaches of the unobstructed transformation of nature (Grundmann 1991) and production of a «second nature» (Castree 2000),.
2. Consequently, environmental diseconomies cannot be bypassed by a «second nature».
3. Through the Marxian theory, the specific consistency between the domination of the capitalist mode of production and the creation of crisis condition, and the environmental degradation under capitalism can be better understood (see also Liodakis 2001).
4. In the short or the long run, the environmental pollution may increase the total capital's profitability ? finally strengthening the historical tendency of undermining the conditions of capitalistic reproduction.
5. If the rising capital profitability is smaller than the diminution of profitably caused by pollution the state intervention becomes a necessity.
6. However, even in the case of state intervention, residual pollution expressing the accumulative ecological repercussions of capitalist production on the ecosystem will exist.
7. Environmental diseconomies cannot be examined only in relation to the competing capitalists, ignoring the non-capitalist traditional petty bourgeoisie. The non-capitalist production constitutes a potential field of surplus product abstraction in favor of (polluting) capital, in the form of environmental deterioration of its terms of production (external diseconomies). Such an abstraction, simultaneously, is concealed by the market prices mechanism. Whether or not such an abstraction occurs depends on the class correlation of power in a social formation field.

References

Benton, T. (1989), «Marxism and Natural Limits», inNew Left Review178: 51?81.
Castree, N. (2000), «Marxism and the Production of Nature»,Capital & Class, Autumn, vol. 24, no. 3: 5-36.
Coase R. H. (1960), «The Problem of Social Cost»,Journal of Law & Economics3: pp. 1-44.
Grundmann R. (1991),Marxism and Ecology,Oxford University Press
Liodakis, G. (2001), «The People-Nature Relation and the Historical Significance of the Labour Theory of Value», Capital & ClassSpring, vol. 25, no. 1: 113-140.
Marx, K. (1991),Capital, Vol. 3, London: Penguin Books.
Stiglitz, E. J. (2000),Economics of the Public Sector, New York: W.W. Norton & Co.

Green is the Color of Money: The EU ETS failure as a model for the "green economy"

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The European Union Emissions Trading System (EU ETS) is the cornerstone of European climate policy. Here, we present a critical review, aiming to show that is has failed to achieve its own objectives.
Emissions reductions in the EU ETS covered sectors have been modest. Carbon prices have been low and decreasing. Yet, windfall profits for major polluters have been significant.
Now that the second phase of the EU ETS is reaching its end, the EC is preparing several changes in the system. Yet, none of these changes address the fundamental issues that the system raises. The most pressing problems of carbon trading cannot be designed away, as they relate to how it gives an incentive to end-of-pipe solutions in detriment of a fair transition away from fossil fuel dependence.

The European Union Emissions Trading System (EU ETS) is a major undertaking. Covering 30 countries, about 12,000 industrial installations and about half of the EU's CO2 accounted emissions, the EU ETS has gone beyond the primary trade market of permits and credits, entering into a broad range of financial products. This report presents an overview of the first seven years of the system, aiming to show that is has failed to achieve its own objectives.
While emissions reductions in the EU ETS covered sources have been modest, the same cannot be said about the windfall profits. The first two phases of the EU ETS (2005-2007, 2008-2012) allocated free permits according to historical emissions; a practice known as ?grandfathering' that has acted as a de facto subsidy for the biggest polluters. On the one hand, energy-intensive industries were given an excess of permits, mainly in the case of the steel and cement sectors, which have been sold for a profit in the first two phases of the EU ETS and can also be banked for future use from the second phase to the third (Elsworth et al, 2011). Research by CE Delft (Bruyn etal, 2010) estimates that windfall profits from passing through the "opportunity costs" to consumers in steel, iron and refineries sectors reached ?14 billion between 2005 and 2008. On the other hand, electricity producers, which face relatively tighter caps, are free to pass on to the consumers the full ?opportunity cost' of the permits and can profit anywhere between ?23 to ?71 billion in the second phase of the EU ETS (Point Carbon and WWF, 2008).
Prices for emissions permits and credits have been consistently decreasing, reflecting the systematic over-allocation, aggravated by the drop in emissions following the 2008-12 economic crisis. This is, again, a sign that the EU ETS is failing by its own standards. The whole purpose of carbon trading, in theory, is giving a clear price signal to induce emissions reductions.
A historical analysis of the drivers of emissions shows that other factors not related to carbon trading are much more relevant than the existence of a carbon price. Emissions reductions in the 1990s can be attributed to the "dash for gas"and the deindustrialization of the former German Democratic Republic. The large emissions reductions registered after 2008 can be attributed mostly to the economic crisis. Finally, the delocalization of industrial production to China and other countries in the global South led to a transfer of emissions, as the Kyoto Protocol accounts for emissions from production, not consumption. Estimates from the European Commission on the proportion of emissions reductions registered in the second phase of the EU ETS that can be attributed to carbon trading are not available, further bringing into question the validity of the scheme.
The European carbon market has also been impacted by several frauds. VAT frauds cost the European taxpayers more than ?5 billion (Europol, 2010). Phishing frauds have cost millions to affected companies. This has led to increased regulatory pressure on the market but has also implied its temporary shutdown.

Now that the second phase of the EU ETS is reaching its end and the third phase (2013-2020) will start, the EC is preparing several changes in the system. First, aviation has been included. Despite major opposition from airlines and other countries, though, an impact assessment carried out for the EC estimated the emissions reductions from this measure at a mere 2.8 per cent by 2020, which is about equivalent to one year's growth in emissions in a «business as usual» scenario (Comission of the European Communities , 2006). Moreover, airlines will join the «polluter gets paid» system, since most permits will be given for free and they can pass on the «opportunity cost» to consumers.

Second, «grandfathering» will be replaced by benchmarking and auctioning as the method of allocation. Yet, only the power producers will have to pay for all of their permits, and the performance-based benchmarks for industries have been set following polluters' wants and not the best available scientific evidence. As a result, industrial sectors can still get ?7 billion annually in windfall profits (Martinet al, 2010). And, on top of that, subsidies accruing to 85 per cent of the eligible costs will be given to industrial sectors deemed to be exposed to international competition.

Third, worries about low prices in the EU ETS led to the emergence of proposals by EU institutions to ?set-aside' a part of the permits, thus reducing the excess supply that exists in the market, estimated by Sandbag at about 1.7 billion permits (Morris, 2011). So far, the EC is merely considering a postponement of auctioning, so that less permits are auctioned in the coming years and more are auctioned near 2020. How many permits will be set aside is unclear.

Fourth, offset credits rules will be changed. Clean Development Mechanism projects that eliminate HFCs or N2O will be excluded from April 2013, following accusations of lack of environmental integrity. More importantly, only offset credits from Least Developed Countries will be accepted for compliance, while the EU plans to implement bilateral or multilateral agreements with other contries in the South to generate credits from sectoral market mechanisms. Still, the supply of offset credits in the third phase of the EU ETS will still be high and the average limit to their use for compliance will actually increase.

None of these changes address the fundamental issues that the EU ETS raises: its lack of environmental effectiveness, its connections with industrial lobbying its dependance on the uncertain outcomes of speculative moves in financial markets. Nevertheless, this system has been used as a blueprint for the creation of other carbon trading systems in the world, namely in South Korea and Australia. Furthermore, carbon trading was presented at the Rio+20 Conference by the EU as a model for the commodification and financialization of nature, through schemes like biodiversity offsets and Reducing Emissions from Deforestation and Forest Degradation (REDD+) .

The most pressing problems of carbon trading cannot be designed away, as they relate to how it gives an incentive to end-of-pipe solutions in detriment of more ambitious and socially just policies that would facilitate the transition away from fossil fuel dependence. By focusing on abstract data of emissions or volume of trading as criteria for success, carbon trading legitimizes the continued use of fossil fuels, the over-production and consumption model, and actually makes the climate and environmental crisis worse.

Dropping the EU ETS would not imply giving up on policies to address the climate crisis. On the contrary, it would leave the field open to effective, just and democratic climate policies, which are now being blocked by the existence of the EU ETS. Insisting on trying to ?fix' a system that is broken from the start deviates attention and resources away from such policies. Insisting on exporting the EU ETS failure to other countries, under the cover of ?leadership', hinders cooperation with the rest of the world.

References:

Bruyn, Sander de et al. (2010) «Does the energy intensive industry obtain windfall profits through the EU ETS?» Delft: CE Delft [http://www.ce.nl/publicatie/does_the_energy_intensive_industry_obtain_windfall_profits_through_the_eu_ ets/1038].

Comission of the European Communities (2006) «Impact Assessment of the inclusion of aviation activities in the scheme for greenhouse gas emission allowance trading within the Community », COM(2006) 818 final, p.26.

Elsworth, Rob et al. (2011) «Carbon Fat Cats 2011: The companies profiting from the EU Emissions Trading Scheme» London: Sandbag, p.5, [http://www.sandbag.org.uk/site_media/pdfs/reports/Sandbag_2011-06_fatcats.pdf].

Europol (2010) «Carbon Credit fraud causes more than 5 billion euros damage for European Taxpayer» [https://www.europol.europa.eu/content/press/carbon-credit-fraud-causes-more- 5-billion-euros-damage-european-taxpayer-1265].

Martin, Ralf et al. (2010) «Still time to reclaim the European Union Emissions Trading System for the European tax payer», Policy Brief, Centre for Economic Performance, London School of

Economics, p.4, [http://cep.lse.ac.uk/pubs/ download/pa010.pdf].
Morris, Damien (2011) «Buckle Up! Tighten the cap and avoid the carbon crash», London: Sandbag, [http://www.sandbag.org.uk/site_ media/pdfs/reports/Sandbag_2011-07_buckleup.pdf].
Point Carbon, WWF (2008) «EU ETS Phase II ? The potential and scale of windfall profits in the power sector» [http://wwf.panda.org/index. cfm?uNewsID=129881].

Indigenous natural resources management and mobility in Arnhem Land, northern Australia

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Migration and increasing mobility are two of the most important processes at the nexus between ecology and society. While most migration is motivated by economic and social factors such as the pursuit of better jobs and lifestyles, migration is increasingly a response to environmental degradation and climate change. While research on environment driven migration and on the impacts of migration driven population pressure on the environment is increasing, there is almost no research on the link between natural resource management (NRM) and migration or its consequences. This gap is particularly relevant to societies that strongly depend on natural resources, such as Indigenous people in remote northern Australia. For many Indigenous people culture, nature and land are inextricably intertwined and a healthy country is essential for their health and well-being. Many government programmes formally engage Australian Indigenous people in natural resource management (NRM) to provide environmental services. There are also many Indigenous people who ?look after country' without rewards/payment because of cultural obligations. xml:namespace prefix = o ns = "urn:schemas-microsoft-com:office:office" />

We investigated how Indigenous peoples' mobility in and around two communities (Maningrida and Ngukurr) is affected by their formal or informal engagement in NRM. Understanding factors that influence peoples' mobility is important if essential services are to be provided to communities efficiently. We found a significantly lower level of mobility among those providing environmental services in a formalised setting (as ?rangers') than among those ?looking after country' for nothing as a cultural obligation. Rewarding Indigenous people to engage with markets for NRM (carbon farming, payment for environmental services schemes) may alter traditional activities and reduce mobility, particularly seasonal movements away from the community that extend the time spent on country. This could have both environmental and social consequences.

Modeling the Determinants of Organic Consumption Based on Sales Data: The Role of Nature Connectedness and Peers Influence

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Agro-food systems need to be adapted from the production to the distribution. Among all the stakeholders involved, the consumer is a key driver and support for transition to sustainability. Nevertheless, consumption habits are particularly delicate to change as it comes from routine and cultural behavior. Therefore understanding the factors that entail greener consumption is essential for developing alternative agro-food systems. Socio-demographic factors, psychological ones and price premium effects have largely been investigated. Despite their importance, macro-level factors like the environment people are living in or cultural differences have been poorly studied. Moreover, peers influence and social norms are often proposed as a major driver for pro-environmental behaviors, but long term and macro-level analysis are lacking. Analyzing the last eight years-geographically located retail data from one of the French hypermarket leaders (more than 500 stores in France), we first analyzed the spatial variability of organic consumption. In addition to socio-demographic and price factors, we found a significant positive effect of the rural versus urban context. We specified our result by studying the effect of different natural environment: types of relations to wild nature and types of agriculture. In a second step, we tested the assumption of peers influence by modeling the spatiotemporal diffusion of organic consumption. We combined diffusion through contagion in the neighborhood and hierarchy models. We conclude by comparing our results to previous studies on pro-environmental behaviors and diffusion of innovations.

Neo-liberalisation of Water Resources Management: Its Implications in Turkey in the context of the recent Hydroelectric Power Plant (HPP) Development Projects

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http://www.dundee.ac.uk/water/

Hydropower development projects have been historically prioritised as a development strategy. These projects are considered controversial mainly due to their trans-boundary impacts and their implications in terms of environmental quality, and there is no consensus on whether the overall impacts of hydropower development projects are positive or negative. The history of water resources management can be tracked under three phases. Firstly, early civilisations mainly constructed canals for irrigation and their hydraulic solutions included local and small-scale projects. Secondly, in the 20th century, the developed world initiated a transition in water resources management, sometimes described as the hydraulic mission, resulting in the construction of large-scale dams to command water resources to meet the demands of growing populations, industry, changing lifestyles and the increasing need of irrigated agriculture. This pattern has been followed by developing countries since the 1960s, and the number of dams has been globally quadrupled as a result of this engagement. Thirdly, Integrated Water Resources Management (IWRM) has become the dominant paradigm in water resources management as a response to the problems faced during the hydraulic mission process. IWRM`s main principles can be listed along with the Dublin Principles (1992), which recognises water as a vulnerable resource, the necessity of a participatory approach in water resources management, the role of gender issues and the concept of economic good. Accordingly, free market mechanisms have been begun to be integrated into water resources management, which has accelerated the process of neo-liberalisation of water resources management at the global level.xml:namespace prefix = o ns = "urn:schemas-microsoft-com:office:office" />

Since the 1980s, with the domination of neo-liberal ideology in the global political economy, water resources management has begun to be neo-liberalised, commodified and externalised through governmental regulations, using market-driven economic tools to manage water resources. In other words, socio-ecological practices including water resources management have begun to be regulated by free market tools such as privatisation. The structural adjustment process led by the IMF and World Bank has stipulated that one of the conditions for developing countries to apply to the loans of these institutions requires them to regulate their domestic structures (including water resources management). They need to comply with the notions of neo-liberal global economy. Furthermore, Clean Development Mechanism, under the Kyoto Protocol, has encouraged developed countries to invest in renewable projects in developing world, including hydropower, in order to compensate their excessive carbon quotas. These global developments are implemented at national level through policies, market mechanisms and law assisted by national governments, and it generally creates social and environmental problems at the local level in developing countries. As a result of the implementation of these policies, water has started to lose its cultural, social and ecological value since its economic value is emphasised more, and profit maximisation has become the main aim of water resources management in practice.

Within this scope, since the 1980s, Turkey has introduced a series of policies to comply with the global economy, and neo-liberal transitions in water resources management have been accomplished. The recent HPP development projects in Turkey can be seen as the continuation of the trends started in the 1980s. Turkey, as a country traditionally prioritising the hydropower, and using it as the main source of energy generation, has recently issued legislation changes related to the HPP development projects, which have enabled private initiatives to take the control of water resources to construct the HPPs in order to meet the excessive energy demand of the country to comply with its fast-growing economy. Accordingly, Turkey plans to build around 2000 new small-scale HPPs all around the country, generally in the rural parts. However, these projects have been mostly confronted by the local people since they threaten their social, cultural

and economic activities during the construction process. Therefore, these recent legislation changes can be analysed in the light of the global process of the neo-liberalisation of water resources management.

This paper uses the main theoretical framework of Urban Political Ecology (UPE) to explain the relation between neo-liberalisation of water resources management and the recent HPP development projects in Turkey. In other words, the literature of UPE, which is prominently focused on neo-liberalisation of water resources management, is fruitful for this paper. Therefore, since UPE takes society and nature as tangled into each other; explains the relation between nature and society as shaped by/within the capitalist global economy, which is currently neo-liberal, and social power relations inherited by neo-liberal economic system; sees the social and ecological inequalities as the by-product of this dominant system; and encourages analysts to conduct a multi-level analysis of the event, this paper is framed within this theoretical approach.

In lines with this brief introduction, this article aims to shed light on the process of recent HPP development projects in Turkey. This article, in other words, intends to relate the impacts of this global wave of neo-liberalisation of water resources management on the recent Hydroelectric Power Plant (HPP) development projects in Turkey. After the introduction, the global trends on water resources management are enunciated followed by its reflections in Turkish context with the specific reference to the recent HPP development projects.

This paper applies qualitative methods. Desktop study from secondary sources constitutes the theoretical framework of UPE and neo-liberalisation of water resources management. Primary sources such as organisational papers and legislations are used to explain the implications of the neo-liberalisation of water resources management in Turkey in addition to secondary sources. Furthermore, structured and in-depth interviews are utilised to explain the implications of this system in Turkey. Finally, this paper uses case study technique (Turkey) to narrow down the scope of the research.

One Globe: from talking with local indigenous communities to having global community voice heard via Internet ? what participatory processes offer today?

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A need for the active community inclusion into environmental policy has been recognised as important for improving legitimacy of policy-making process, adding to its acceptability and effectiveness. We use term community participation to describe «the active, voluntary engagement of individuals and groups to change problematic conditions and to influence policies and programs that affect the quality of their lives or the lives of others» (Gamble and Weil, 1995). We define community as a group of individuals, representing general public from the local to the global scale, including urban and rural communities. Although varieties of participatory procedures have been developed, many environmental policy processes still suffer from inadequate participation. In this article we focus on two types of community participation that are presently taking place in parallel at various scales and under different circumstances and conditions: traditional participation ?tParticipation based on various types of face-to-face contacts, and online ? eParticipation that is a set of technology-facilitated participatory processes that enable interaction between the civil society and the formal politics and administration sphere (Sæbø et al., 2008).
This article explores similarities and differences between tParticipation and eParticipation by comparing them against a set of criteria. As an example of tParticipation we take communities engagement in designing national REDD+ mechanism, and of eParticipation, online involvement of community in the climate changes decision-making process.
The traditional participation includes interviews, workshops, meetings and roundtables, and other participatory appraisal methods, while eParticipation is organised through online awareness raising campaigns, online surveying, voting, and decision-support. Participation does not just ? happen', it is ?initiated' (Rahman, 2005). tParticipation is mainly initiated by local and international civil society organisations (CSO), private organisations, governments or community itself. In the case of eParticipation initiating actors may include governments (eGovernment and eGovernance), scientists, CSOs or community members. Initiators hold the authority and manage the process by deciding how much or how little control is allocated to other participants, therefore impacting its legitimacy (Thomson et al., 2011).
Legitimacy of environmental decision-making concerns the recognition of actors, the acknowledgement of their needs and the distribution of decision-making power (Paavola, 2003). The lack of recognition could be intimately linked to political and institutional hierarchies and the social characteristics such as class, economic status, ethnicity or gender (Young and Fraser, 2003). An example is a lack of recognition of landless people in carbon forestry projects (Corbera, 2005). Then again, the major barrier to eParticipation is a lack of Internet access or digital divide and the language barrier, as blogging on climate change is mainly in English (O'Neill and Boykoff, 2010), with exception of multilingual online platforms (Bojovic et al., 2012).
Based on type of information flow and amount of power given to participants, we determine various levels of participation, from passive participation to self-mobilisation (Pretty, 1995). In passive participation people are just informed what is happening. Participation by giving information is presented in online sphere by awareness raising campaigns, or information sharing through the social media, while community opinion is not consider in the decision-making. tParticipation mainly happens though participation by consultation, where people are consulted on the predefined problems, while initiators hold right to decide whether their views will be taken into account or not. eParticipation is convenient for the systematic collection and initial understanding of public opinion on less explored policy issues facilitating new policy preparation (Phang and Kankanhalli, 2008). In interactive participation people take control over local decisions through building action plans, forming new local groups or strengthening old ones, such as community forest management organisations, or in the case of eParticipation-online forums. In the case of tParticipation the ultimate level of participation is self-mobilisation, when

people take initiatives and decisions independently of external actors, e.g. REDDeldia movement consisting of 100 community organizations united against REDD+ in Mexico. However, the ultimate goal of eParticipation may be decision-support, a meaningful participatory process. Self-mobilisation often presents a very first stage of eParticipation and dominates online activism. For example, Avaaz, an online global CSO, collects voices and positions of the global community on the issues of importance to the society, including climate change.

Generally, common for both types of participation is that by having impact on the decision-making process, people tend to support and comply with the new rules and norms, which is shown through higher level of trust and policy acceptability (Vatn, 2011). The level of trust also depends on process transparency and accountability. Transparency of the process should assure an open communication among all actors, including decisions and the reasoning behind them being well documented, easily accessible and understandable by all stakeholders (Jarvis and Sovacool, 2011). In tParticipation this means communicating in a way culturally appropriate for each local or indigenous community (idem.). In the online sphere transparency is reflected in the visibility of activities - citizens can see how other participate and how government responses, namely «naming and shaming» offenders could go on instantaneously through the Web (Meijer et al., 2009). Accountability refers to a clear assignment of authority and responsibility to all stakeholders involved in process for their decisions and actions (Jarvis and Sovacool, 2011). Keeping the actors accountable assures that no stakeholder group dominates the process (Beisheim and Dingwerth, 2008). This is easily achieved in online spaces that enable different actors to openly contribute to the framings of the problem (O'Neill and Boykoff, 2010) and collective action.

Time, monetary and human resources allocated to a participatory process determine its efficiency. The recent studies on local forestry projects document reduction of consultations period and centralization of decision-making by initiators in order to cut the costs of participation (Lovbrand et al., 2009). eParticipation could be characterized as an efficient process, as it is not resource demanding and it overcomes the physical constraints of time and space, allowing people to participate anytime and anywhere (Phang and Kankanhalli, 2008). For example, a campaign launched by Avaaz and 350.org collected though Internet more than 1 million signatures in 15 days. However, in eParticipation participants' identity may be difficult to check, putting in question reliability of collected information.

This paper compares two different participatory processes that do not exclude one another, but rather should be combined in communities with the internet access, to improve efficiency and effectiveness of the process. Combing the two approaches could help eParticipation improving the reliability and tractability of the results and shifting this process from passive and consultative to a more meaningful one, reflected in decision-support. Conversely, in this matched approach, tParticipation efficiency can be improved by reaching high absolute numbers of participants in a short time. This way would assure the transparency of the process and enable all involved groups the equal rights, while adding to knowledge sharing through interactive communication. An example, however still in its infancy, is REDD+ Mexico online platform dedicated to REDD+ related information exchange among the stakeholders. This kind of open system of online media is where we see that scientists can easily get included in online public discussions, and more actively deliver their messages to community (Nature, 2012). The recent large-scale empirical study confirmed that online mobilisation has a positive effect on the off-line world (Bond et al., 2012). This justifies growing use of eParticipation and supports further development of this new research area, while combining it with the experience and body of knowledge in tParticipation.

Outlining a sustainable future for the island of Samothraki (Greece) as a Biosphere Reserve

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Summary
The process of establishing a UNESCO biosphere reserve (BR) on the Greek island of Samothraki is conceptualized as a case study of transdisciplinarity. The point of departure has been the wish to preserve an island with unique natural and cultural heritage from potentially destructive pathways and to come up with an alternative development model. This has generated a unique opportunity to pre-structure, observe and reflect on a process of evolving decision-making and management towards a sustainability transformation of an island. After several years of research and communication efforts, the mayor of Samothraki, with the unanimous support of the municipal council and the Greek National MAB Committee, submitted an application to UNESCO for Samothraki to be included in the World Network of Biosphere Reserves.

Abstract

Using the island of Samothraki in NE Aegean (Greece) as a case study, this poster will discuss the potential of UNESCO's Man and Biosphere (MAB) programme, as a driver triggering a transition towards a more sustainable future. Point of departure is the wish to preserve an island with unique natural and cultural heritage from potential destructive pathways of being transformed into just another Greek beach tourism destination and come up with an alternative development model. In this respect, the MAB concept seems to point into the right direction. Biosphere Reserves (BR) are «areas of terrestrial and coastal ecosystems promoting solutions to reconcile the conservation of biodiversity with its sustainable use» (UNESCO, MAB Programme) and have three main functions, namely (a) nature conservation, (b) socio-culturally and ecologically sustainable development and (c) research/education. Our initial aim has been to explore the potential of a Biosphere Reserve, in securing a sustainable future for the island of Samothraki. Could this be feasible? How could we find out about it?

A Biosphere Reserve is feasible, if (a) a particular ecological (and possibly cultural heritage) value of the area can be established, and biodiversity is maintained there, (b) there are scientific facilities for monitoring the state of the environment and the human activities pertaining to the environment and (c) inhabitants and local authorities are interested and share a vision of sustainable regional development. Therefore, a feasibility study was performed in order to establish the natural endowment and fragility, establish pressures on the environment by existing uses of resources and ecosystem services and identify the main stakeholder groups and evaluate whose interests are served by those pressures, who benefits and who suffers. This included an extensive survey of visitors, their behaviour and preferences, the outline of economic models for tourism and a comprehensive consultation with stakeholders. The results showed an overwhelming support for the BR perspective, something that was also reflected in the unanimously positive decision of the community council to endorse the application to UNESCO for Samothraki to become part of the World Network of Biosphere Reserves. The application was submitted by the Greek National MAB committee and is currently under review by UNESCO. Current aims include the development of a management plan and monitoring standards for the proposed BR, as well as the elaboration of some projects towards sustainability, in particular relating to the economy (such as tourism, agriculture, fishing), energy self-reliance, waste management, and sustainable infrastructure, leading to first steps in implementation in collaboration with the local administration, NGOs, and civil society networks. We aim to collect equally well-developed observations and indicators on the nature conservation aspects, and on the socio-economic uses of the study area, their impact on conservation goals, and opportunities for improvement. The main orientation while addressing these challenges would be to maintain the level of service/benefit at reduced rates of resource use. A key concept for this is the idea that an environmental goal can bring about collateral socio-economic benefits, in the form of green jobs (esp. for the young educated local people), improvement of the production/value chains of agriculture, income security, natural resource security and community savings. Main challenges that need to be tackled are social obstacles and local hostilities.

Samothraki holds a great potential to serve as a model site for promoting sustainable development.

There has been a long history of involvement of Samothraki in national and international projects in the direction of sustainability and the inclusion of Samothraki in the World Network of Biosphere Reserves would be an opportunity to place all efforts into a broader framework by promoting cooperation and information transfer. A Biosphere Reserve would be a good solution for Samothraki, because it combines the concern for the environment with the concern of sustainable livelihoods of the community and a promising future for the young. It is an open framework that invites participation, ideas and resources from all sides. It will be filled with life to the degree the inhabitants and visitors of Samothraki invest their expectations and enthusiasm into this endeavour.

References

Fischer-Kowalski, M., Xenidis, L., Singh, S.J. and Pallua, I. (2011). Transforming the Greek Island of Samothraki into a Man and Biosphere reserve: A feasibility study.Gaia, 20(3), 181-190.

Petridis, P. (2012). Perceptions, attitudes and involvement of local residents in the establishment of a Samothraki Biosphere Reserve, Greece.Journal on Protected Mountain Areas Research, 4 (1), 59-63.

Perceived impacts on ecosystem services and expected compensations in the context of marine renewable energy : A fuzzy cognitive mapping approach

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Although the renewable marine energies are widely deployed in the Northern Europe, France is still at a planning and design stage. Four proposed offshore wind farm are now underway along the French Atlantic coast. Even if the goal of the French marine renewable energy program is to have a sustainable strategy regarding the energy provisioning, it is also a major source of changes for marine habitats, for human uses and it can be perceived as a source of negative impact by local stakeholders. Physical disturbances created by these technologies such as noise or electromagnetic impact on coastal biodiversity are reported in different studies (Gill, 2005; Inger et al., 2009). Offshore wind farms can also be considered as a threat for the natural beauty of a sight by local stakeholders who would be ready to pay higher costs per kWh in order to keep away a wind farm from the coast (Ladenburg and Dubgaard, 2007; Devine-Wright and Howes, 2010). Thus, these environmental modifications could be a source of conflicts for local stakeholders who can see their interests threatened. In this context, compensations seem to be the key instrument to overcome environmental concerns and social conflicts and to improve acceptability of the offshore wind farm projects (Ellis, 2007). Resulting partly of a regulatory framework, compensation must reach a no-net-loss goal and can be assessed through the concept of Ecosystem Services (ES) provided by marine biodiversity. Compensation assessment addresses the issue of the ES valuation which refers to different standards of value that are specific for each stakeholder and each ES. Taking into account these stakeholder perceptions should allow us to understand better these values.
The poster presents the results of a study on stakeholder perceptions regarding an offshore wind farm project in the bay of Saint-Brieuc, conducted among communities of practices. This study is based on semi-structured interviews, using a fuzzy cognitive mapping approach. Targeted stakeholders are tourists, naturalist NGO's, local resident organizations, recreational users and commercial fishers. During these interviews, participants are invited to draw cognitive maps representing the positive and negative influences of the offshore wind farm project on the different environmental components. Required compensations are also described. Aggregations of these individual cognitive maps provide a semi-formal framework for organizing stakeholder perceptions at a local scale and give information about the origin of the diversity of opinions regarding the offshore wind farm project. We assume that this method is an interesting tool for revealing stakeholders knowledge and perceptions, for understanding complex relationships between ecosystems and society, for facilitating negotiations around the deployment of offshore wind farms.

Quand la financiarisation des économies touche les marchés des denrées alimentaires Alijani S., Karyotis C.

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Les marchés dérivés sont nés au dix-neuvième siècle pour permettre aux négociants en grains de se couvrir contre les variations des cours des céréales. S'ils sont indispensables à la gestion des risques, leur liquidité et leur fonctionnement ne sont assurés que grâce à des spéculateurs qui font les anticipations inverses de ceux qui cherchent unhedging.
La crise née en 2007, et toujours actuelle, a provoqué une chute des marchés financiers qui a induit à un déplacement des investisseurs ou spéculateurs sur d'autres marchés au nom de l'adage « flight to quality ». Ces marchés furent ceux descommoditiesen général, et des denrées alimentaires en particulier. Entre janvier 2007 et juin 2008, le prix de ces denrées alimentaires a augmenté de 56%, amenant à des émeutes de la faim dans 25 pays.
Alors y a-t-il davantage de spéculations sur les denrées alimentaires depuis la financiarisation à outrance des économies ?
«Almost nothing is taboo on the trading menu : leveraged bets on corporate debt repayments (credit default swaps), life expectancy (mortality bonds and of course ? the price of food. Largely insulated from failure, today's institutional mega-traders can manoeuvre from one «hot sector » to another, with zero regard to ethical considerations» (Berg 2011).
Certains auteurs estiment que la hausse des prix des denrées agricoles ne s'explique pas uniquement par les soucis de récoltes parce que la volatilité s'accroît de plus en plus. Consciente de ces problèmes, dès septembre 2008, la CFTC a décidé d'encadrer la spéculation sur les matières premières par une loi (Stop Excessive Energy Speculation Bill) en imposant des plafonds.
Diallo et Al. (2012) ont étudié les relations entre les activités financières et les cours de matières premières sur la période 1986 ? 2010 en prenant l'indice SPX duChicago Board Options Exchangeet l'indice de prix des céréales sur le marché des matières premières. S'ils ne peuvent pas démontrer une réelle corrélation, ils constatent une hausse régulière des spéculateurs. Hormis Irwin et Sanders, plusieurs auteurs (Unctad 2009, Baffes & Haniotis 2010...) concluent à un impact amplificateur des spéculateurs sur la volatilité des prix.
Selon des études deUnited Nations Conference on Trade and Development,les marchés des produits dérivés représenteraient entre 20 et 30 fois la production physique, à l'instar de ce qui se passe sur les autres marchés decommodities, tels le pétrole.
Et depuis 2011, on retrouve une très forte volatilité sur ces marchés, qui peut certes s'expliquer par des raisons climatiques mais pas uniquement. «According to Brown [president of the Earth policy research centre in Washington], we are seeing the start of a food supply breakdown with a dash by speculators to "grab" millions of square miles of cheap farmland, the doubling of international food prices in a decade, and the dramatic rundown of countries' food reserves»(Vidal 2012).
Selon une étude le rapport Foodwatch (2011), la part des spéculateurs dans les négociations sur les contratsfutureblé au CBOT serait passée de 29,5% à 42,3% entre 1998 et 2008.
Dans cette contribution, nous nous proposons d'étudier l'évolution des marchés physiques du blé et du riz d'une part, et des marchés dérivés sur ces céréales d'autre part, depuis une décennie afin d'étudier le rôle de la spéculation sur les marchés des denrées alimentaires.

Reducing consumption emissions: balancing technological change with consumption

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Existing global negotiations focus on avoiding more than a 2oC global temperature increase. As global greenhouse gas emissions (GHG) continue to rise the urgency of identifying and delivering successful mitigation options consistent with this objective increases. In general, global commitments to reduce GHG emissions are translated at a smaller geographical scale into national or regional carbon targets and budgets. To inform the development of GHG mitigation policy, decision makers require an understanding of the relative contribution of both sources of GHG and policies or measures that can reduce them. Scenario analysis is one method that can inform this area. To date most scenario analyses developed to inform mitigation policy focus on the reduction of territorial or production based emissions. However, these approaches omit the emissions embodied in imported goods, thus limiting both the scope of mitigation policies considered and potentially underestimating the efforts required for a country to deliver GHG reductions based on the emissions it could be deemed responsible for. This paper presents a series of scenarios developed to assess the role of technology pathways and future consumption profiles on consumption based emissions in the UK. To develop the scenarios we have used a scenario tool that enables users to explore the impacts of mitigation options aimed at both production and consumption, providing an insight into the relative efficacy of alternative options and an indication of the scale of change required to deliver a stated emission reduction objective.

Global greenhouse gas emissions are rising, and despite some success in the UK to deliver territorial based emission reductions since 1990, consumption based emissions have continued to increase [1]. This pattern is also observed in other developed countries [2]. In the UK there is growing political interest in consumption based emissions accounting exemplified by the recent initiative by the UK Government Department of Environment, Food and Rural Affairs (Defra) to publish annually the UK's consumption based emissions and an inquiry by the House of Commons Energy and Climate Change Select Committee into consumption based emissions reporting [1, 3]. Reporting and monitoring consumption based emissions, albeit a challenge in itself is only the first step, the next is to understand how consumption based emissions can be reduced.

Methods

To date a range of scenario analyses have been published detailing how the UK could deliver territorial emission reductions see for example [4 & 5]. Reducing territorial emissions is evidently a key part of mitigation policy, and will undoubtedly contribute to reducing consumption based emissions too, the question is, by how much? The paper presents the results from the use of a new modelling framework designed to complement existing territorial emission focused scenario tools by soft-linking an environmentally extended input-output model [6] to a) a nationally focused energy scenario tool ?ASK' [7 & 8] and b) a nationally focussed consumption tool in order to explore future consumption emission scenarios. In doing so the framework facilitates the examination of dependencies between UK population, consumption, the greenhouse gas (GHG) intensity of national and global production and the UK's GHG consumption emissions. Furthermore, increasing the detail and understanding the importance of both an energy system transition, and changing patterns of consumption, through this framework, extends the applications of input-output analysis for scenario development. The scenarios presented have been generated by a combination of participatory scenario development and by interpreting

existing UK decarbonisation pathways into a format suitable for the scenario tool.

Results

The UK consumption emissions associated with a series of scenarios demonstrate the percentage of consumption based emission reductions that can be achieved through territorial mitigation policies alone and the relative contribution that could be made through additional actions to a) shape the profile of consumption in the UK and b) improve the emission standards of imported goods and services. The scenarios provide an insight into the trade off between efforts focussing on technological solutions to mitigate emissions from production and the size of consumption that can be supported while remaining within a user defined carbon reduction objective.

Conclusions

Scenario analyses using a combination of an environmentally extended input output model and energy scenario tool indicates that despite significant territorial emission reduction efforts, the UK's consumption emissions remain significant unless coordinated action is taken to a) deliver commensurate territorial emission reductions in key trading partners and b) reduce and / or reshape the consumption profiles of UK residents. The results give an indication of the emissions intensity that could be achieved from technologically optimistic emission reduction efforts and highlight the gap between this level and the size of emission reduction required for the avoidance of more than 2oC global surface temperature increase. Furthermore the results support arguments in the existing literature that question the ability of mitigation efforts focussed at avoiding 2oC to be delivered while consumption continues to grow [e.g. 9].

[1] Defra (2012) Defra official statistics release: UK's Carbon Footprint 1990 ? 2009, Department for Environment, Food and Rural Affairs

[2] Peters, G.P., Minx, J. C., Weber, C.L., Edenhofer, O., (2011) Growth in emissions transfers via international trade from 1990 to 2008. Proceedings of the National Academy of Science 108 21 8903-8908.

[3] House of Commons (2012) ?Government should be open aboud outsourced emissions according to committee;
http://www.parliament.uk/business/committees/committees-a-z/commons-select/energy-and-climate-change-committee/news/consumption-published/
Accessed: 14.12.12

[4] UKERC (2010) Low carbon futures for the UK. UK Energy Research Centre.

[5] Anderson, K., Mander, S., Bows, A., Shackley, S., Agnolucci, P., and Ekins, P., (2008) The Tyndall Decarbonisation Scenarios ? Part II: scenarios for a 60% CO2 reduction in the UK, Energy Policy, 36, 3764-3773

[6] Dawkins, E., Roelich, K., Owen, A., (2010) A consumption approach for emissions accounting ? the REAP Tool and REAP data for 2006. Stockholm Environment Institute.

[7] Anderson, K. and Bows, A., (2008) Decarbonising the UK: a backcasting approach, Scenario definition, quantification and modelling, UKERC Annual Energy Modelling Conference, Oxford, 30-31 January, 2008.

[8] Agnolucci, P., Ekins, P., Lacopini, G., Anderson, K., Bows, A., Mander, S., Shackley, S. (2009) Different scenarios for achieving radical reduction in carbon emissions: A decomposition analysis. Ecological Economics 68 1652-1666.

[9] Victor, P. Growth, degrowth and climate change. Ecological Economics in press.

Seeking permanence as an alternative goal to maximizing profits in economic appraisal

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SUMMARY. This paper approaches the dilemma of how to meaningfully introduce environmental elements into economic equations by looking at the other side of the spectrum: exploring the mismatch between the theory behind these equations and the reality they represent. The use of cost benefit analysis is based on profit maximizing strategies. Thus, it explores the idea of replacing the profit maximization criteria by other goals in economic appraisal. The paper critically reviews the origins of the assumption of profit maximization in economic theory and compares it with permanence as an alternative goal. It then explores the feasibility of operationalizing permanence in economic appraisal and it opens the door to consider other human motivations as alternative goals, based on social psychology and behavioural economic theories.

ABSTRACT. A major cause of environmental harm is attributable to projects which economic appraisal is positive in terms of discounted costs and benefits, but which accountancy of environmental and long term social costs is ambiguous or non-existent. Accounting for these latter costs is a long standing issue in theoretical debates and among practitioners. The complexity of ecosystems and the limited knowledge about the impact of the introduction of human induced large scale disturbances is one main reason for a flawed accounting of the environment in economic valuation. Acquiring sufficient ecological and economic knowledge to translate the long term impacts in ecosystems into monetary terms is, the least, a monumental task with a very short term deadline.

This paper approaches the dilemma of how to meaningfully introduce environmental elements into economic equations by looking at the other side of the spectrum: exploring the mismatch between the theory behind these equations and the reality they represent. The use of cost benefit analysis is based on profit maximizing strategies, which seek to maximize the difference between benefits and costs. Thus, it explores the idea of replacing the profit maximization criteria by other goals in economic appraisal. It argues that alternative goals may be as legitimate and valid as profit maximization. For that purpose, it discusses the following hypotheses, based on a thorough literature review: (a) profit maximization is not the only goal of human behaviour, and using it as the only goal in economic activity is an oversimplification which limitations need to be acknowledged; (b) this simplification is useful within a limited framework, but because economic activity has a direct and increasing impact on ecosystems, it falls short to represent reality and it causes environmental harm; (c) using alternative goals for economic appraisal have the potential to facilitate sustainable activity while keeping the functions of a company as a provider of livelihood and welfare.

In ecological economics many basic assumptions of neoclassical economics are questioned and alternatives are posed, such as discount rates as representations of time frames or the GDP as a representation of human well-being. These concepts were originally formulated as simplifications which application required to acknowledge their limitations, yet they became widespread in economic practice, to the extent that their conceptual limitations to represent reality are omitted. In the same way, profit maximization is a principle that dominates the niche for goals of behaviour in economics. Still, economics is not the science of how to maximize profits, but rather of how to allocate scarce resources (Robbins, 1932) and the goal to be fulfilled when allocating these scarce resources is, in principle, of normative concern.

The dominant goal of economic activity according to mainstream theory is maximizing utility, a concept that applied to firms is translated into profit maximization. Hence maximizing profits is considered the dominant goal of firms. Profits have the advantage that they can be easily counted and transformed into investment or into benefits to distribute among shareholders. This assumption and its simplification into monetary profits is currently accepted almost as an axiom. Most recent textbooks assume profit maximizing behaviour without major justification (Samuelson, 2009, 19th ed.). Older textbooks purport this concept more clearly as an assumption, acknowledging its weaknesses and explicitly stating the purpose of this simplification (Stonier

& Hague, 1972).
While this assumption remains the underlying principle that measures the success of a firm, other concepts aiming at softening the negative impacts of their activities have been introduced, such as processes of corporate social responsibility, triple bottom lines and the like. However, as long as profits remain the ultimate goal of a firm, softening measures may incontestably have lower preference and therefore trade-off situations between softening measures and actual profits may be detrimental to the former. Therefore these softening measures do not address the issue at its root.
Profit maximization is certainly not an accurate portrayal of human behaviour and it incompletely matches human values and drivers for action. As other social sciences have largely shown, the goal of human beings is not just maximizing profits and in addition to it, there are other goals which motivate human behaviour. This inherently brings the question of whether profit maximization should still be the main goal to use in economics. Far from being an unrealistic idea, replacing the dominant goal of profits in a firm is the basis of the already popular concept of social business. Looking beyond the idea of profit maximizing as the unique goal is clearly insufficient and falls short to comprehend the wide range of human goals for action. This oversimplification of human goals driving economic activity is arguably a major cause leading to the unprecedented scale and severity of environmental degradation nowadays.
Potential alternative goals can be maximizing employment, maximizing profit distribution, or satisfying a profit threshold. Beyond economic activity, other disciplines provide background to define what can be alternative goals motivating human behaviour. Goals can be broadly grouped into self-interested (self-centred) goals and collective-interest goals. The pyramid of human needs formulated by Maslow sheds light on alternative goals motivating human behaviour which could be interpreted as utilities to fulfil. Some of them, particularly those at the bottom of the pyramid are easier to transform into monetary units, such as physiological needs, whereas some others are not, e.g. self-actualization. Still all them motivate human behaviour. Ecology shows that the survival of species drives biological behaviour, both at the individual level and also at the collective level, as long as the individual identifies himself as belonging to the group which is aimed to survive.
Often used as a synonym with sustainability, the concept of permanence has a narrower meaning, referring to the existence of something throughout time. In economics, Kumarappa (1945) and Schumacher (1973) developed on this concept, yet it has not have much further application. Other disciplines do find it instrumental. The concept of permanence has become increasingly mentioned in species population modelling literature, especially with prey-predator models based on Lotka-Volterra. It is also sparingly mentioned in psychology literature referred to the permanence of childhood interests or of learning. Most recently it has become popular in carbon emission reduction and sequestration literature, which defines it as «the longevity of a carbon pool and the stability of its stocks» (IPCC 2000, Appendix III Glossary). Here a broader meaning of permanence is used, not only applied to carbon sinks, but to economic and ecological variables in general.
The paper critically reviews the origins of the assumption of profit maximization in economic theory and compares it with permanence as an alternative goal. It then explores the feasibility of operationalizing permanence in economic appraisal and it opens the door to consider other human motivations as alternative goals, based on social psychology and behavioural economic theories. It concludes by ellaborating how can permanence be defined as a specific, realistic and measurable goal to be operationalized.

The difficult governance in a complex institutional context : the case of the grand boulevard in the Lille Metropolis

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Le Grand Boulevard, artère structurelle de la métropôle lilloise connait un paradoxe particulier. Artère capitale au riche patrimoine, son aménagement à l'aune des grandes restructurations pensées durablement reste totalement inenvisagé actuellement. Face a cet immobilisme de l'action publique tendant à être expliqué par deux biais majeurs que sont la complexité instinutionnelle et les désaccords politiques, une forme innovante de participation citoyenne au projet d'aménagement est observée. Au delà de représenter une contribution participative par l'intermédiaire d'un concours d'idée, l'innovation de la démarche ici analysée consiste dans le fait que se sont les citoyens et non la puissance publique qui est à l'initiative de ce processus.

The EJOLT Mapping Platform of Environmental Justice: A European Perspective

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This paper presents the online platform of the EJOLT map of Environmental Justice, a global inventory of ecological conflicts, focusing specifically in the presentation on the conflicts that European corporations are involved in. This paper will present the methodology and the database structure of the mapping project, explaining the approach and possible applications. The map will be launched in Spring 2013 online.

The EJOLT Map of Environmental Justice aims to investigate, understand and disseminate the causes and consequences of conflicts generated by the exploitation of natural resources, the generation of wastes and the degradation and commodification/privatization of environmental goods. It consists of an online unique database of socio-environmental conflicts, geographically referenced (mapped with GIS), and linked with social metabolism and socio- environmental indicators.

The inventory has been elaborated drawing on the activist knowledge of Environmental Justice Organizations (EJOS), both partners of the EJOLT project and other collaborators, and aims to increase the visibility of environmental conflicts, to serve as a networking and knowledge-sharing platform and to enhance research and understanding of the drivers of these conflicts through geo-spatial and statistical analysis.

Along the entire global chain of production, from extraction, to processing, to disposal, the impacts of pollution are distributed unequally among populations. Those most heavily impacted are marginalized sectors of the population including poor people, women, minorities and particularly indigenous peoples, who depend most directly on natural resources for their livelihood. The impacts occur far from the point of consumption of the resources, and are thus often invisible to consumers in the importing countries.

EJOLT defines ecological conflicts as those arising from structural inequalities of income and power that lead to impacts on the health and environment of specific populations, whereby persons engage in place-based struggles, making visible claims for their physical environment and likely impacts (e.g. on their health, social or economic status). The communities make claims over rights related to the burdens of pollution (distribution), access to environmental resources and to a healthy environment (participation) and a voice in decision-making over the environment (recognition). Their action repertoire may include formal claim-making, petitions, meetings, demonstrations, boycotts, strikes, legal actions, civil disobedience, collective violence, and other action forms. In the act of claiming redistributions, these conflicts are often part of, or lead to larger gender, class, caste and ethnic struggles.

The EJOLT Map is designed along a commodity perspective that tracks the flows of resources and specific commodities through the metabolism of the world economy. The commodity chains perspective reveals much about the structure of production in the global economy and the identification of the actors, processes and impacts that are associated with products that are brought to market.

The European Context

With almost 3 tonnes per capita per year, Europe is the continent with the highest net-imports of resources. The EU imports an estimated 80% of the raw materials used by its manufacturing companies. Similarly, around 70 per cent of imports into the EU are not finished consumer products but raw or intermediate goods heading for the transformation industries.

Despite economic contraction due to the crisis, and increasing resource efficiency, Europe's deep dependence on imported raw materials mean that European trade strategy remains centered on ensuring resource supply. In 2008 the European Commission published the Raw Materials Initiative (RMI). Its aim was to secure access to vital non-energy and non-agricultural raw materials for the benefit of the EU's manufacturing industry. This includes minerals (e.g. fluorite, silicia), metals (e.g. copper, aluminium) and high-tech metals (e.g. lithium, cobalt, rare earths), as well as wood, hides and other commodities. But rather than focusing on reducing consumption, the priority of the initiative was on guaranteeing supply by forcing countries to abandon any trade and investment policy instruments that limited access to raw materials, exploitation or

extraction.
For example, the RMI is against export restrictions, despite being aware that environmental protection is one of the most frequently cited policy objectives of these. Mining and other extractive industries are often highly energy consuming or polluting, and export taxes are sometimes applied to reduce production. For example, In 2010, in a context of major increases in the export of logs leading to deforestation, the Mozambique parliament passed a bill imposing a 20 per cent export tax on unprocessed wood in order to increase wood processing and to use the revenue from the export tax for reforestation and improved inspection.
The RMI furthermore aims to limit countries ability to regulate investment in raw materials and to limit strict social and environmental obligations for EU companies investing abroad. By leaving environmental and human rights standards aside, the RMI will inevitably exacerbate existing environmental, social and health problems related to resource extraction caused by European multi-nationals.
By visibilising these conflicts, the map highlights the need for a shift in European trade policy, away from ensuring a «sustainable» supply of raw materials and towards the promotion of sustainable extraction methods, a low-resource society and equitable distribution of resources.
The Environmental Justice Organisations, Liabilities and Trade is an FP7 project supported by the European Commission that will run from 2011-2015. The project supports the work of Environmental Justice Organisations, uniting scientists, activist organisations, think-tanks, policy-makers from the fields of environmental law, environmental health, political ecology, ecological economics, to talk about issues related to Ecological Distribution. Central concepts are Ecological Debts (or Environmental Liabilities) and Ecologically Unequal Exchange. Read more about the Mapping project and the database form structure here: http://www.ejolt.org/maps/

The impacts of energy technologies to enhance sustainable degrowth

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Past and present energy demands are one of the main drivers for increasing GHG emissions causing climate change. The transition urgently needed consists not only of replacing non-renewable energy sources by renewable ones but of a break with the current energy system. Since current structures do not favour a sustainable energy generation and use a fundamental change of the structures, energy technologies, policy framework and also a normative change of values and attitudes of all stakeholders involved is necessary to deal with the challenges. Although it seems that technophobes dominate the discourse within degrowth also tendencies can be observed that more technophile positions emerge emphasizing the importance of some technologies for degrowth.

Technology plays a crucial role in regard to the environment: On the hand, technology facilitates the extraction and exhaustion of natural, mainly fossil, resources needed for energy production and are decisive for the unsustainable ways energy is used. On the other hand, technology can also contribute to a more efficient energy use and provide new forms how energy can be produced in a less harmful way for the environment. Although efficient technologies have the potential of less resource use a number of problems occur: Firstly, gains in energy efficiency are offset by the rebound effect leading to even more energy consumption. Secondly, technologies for using renewable energy sources such as solar panels are crucial because rare materials are needed for their construction. Thirdly, the use of biomass enables the production of biofuels where large amounts of land are required for it which is in competition with land needs for food production. In spite of all these critical issues, efficient and sustainable energy technologies play an important part when exploring the transition to a less resource-consuming society. Therefore, the paper wants to explore how and which energy technologies can be used that they constitute an enhancement to sustainable degrowth.

To make use of energy daily needed such as electricity large infrastructure systems are built to provide the supply. Power plants provide the electricity which has to be transported over sometimes large distances to reach the consumers. Thermal power plants using fossil sources to produce electricity can easily respond to people's demand. When electricity is peaking in the mornings and evenings more electricity can be produced immediately. When renewable energy sources are used they cannot be regulated in the same way because these sources are not always available when demanded, e.g. the sun is not always shining and wind not always blowing. To gain a better use of these decentralized electricity production one solution are smart grids where electricity production, storage and consumption are net and therefore the use of these three parts can be regulated and controlled according to the specific electricity demand. While this is favourable from an environmental stand of view, it can cause problems because of privacy aspects and because of hierarchical power relations regarding grids. If to these problems attention is paid from the beginning and solutions can be found smart grids have the potential to make a contribution to degrowth. Nonetheless, the aim is an optimized use of renewable energy sources which can only take place by adopting large infrastructure systems.

Various energy technologies have the potential to contribute to an enhanced citizen's engagement and to strengthen DIY approaches. By the self-construction of energy technologies such as small windmills or solar panels the democratisation of energy production is enforced. Citizens are asked to organize themselves from bottom-up and are enforced to learn also on a mutual basis. Learning in this sense helps to evolve mechanical skills on the one hand and on the other to evolve a deeper technical understanding how and how much energy can be produced with which technical advices and which energy needs can be satisfied. The collective work on energy technologies can be a starting point for other activities within a community. Last but not least, the importance for degrowth lies also in the independence from energy providers and their grids. Therefore, these energy technologies make a contribution to energy security in the sense that

people do not depend on their financial possibilities to afford their energy consumption. This point will be even stronger if energy prices rise as predicted. Self-constructed energy technologies can be regarded as a valuable contribution to enhance sustainable degrowth.

Current energy demands are feasible neither with renewable energy nor with technically induced energy efficiency. Seeing this as an irrevocable fact the conclusion to be drawn is that energy demand has to decrease substantially to come to sustainable levels. Energy technologies can support the transition to degrowth by rebuilding large infrastructure systems and by enhancing the self-construction of energy technologies. Nonetheless, innovative environmentally less harmful technologies are urgently needed.

THE PARADOX OF AFFLUENCE AND ACTIVE COMMUTING IN NEW ZEALAND

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Summary (800 characters)
Economic growth and associated affluence have resulted in high rates of car ownership and low rates of walking and cycling in contemporary New Zealand. Will even greater affluence continue to reduce the use of active transport in favour of the convenience of cars?
This paper explores the relationship between income and the use of active modes of transport for commuting in New Zealand. While historically the car has replaced walking and cycling as wage rates have risen, in cross section the relationship between income and active commuting looks quite different. While higher incomes do allow people to purchase motorised transport, they also allow workers to purchase shorter commutes and to integrate active and public transport modes. Consequently, the probability of active commuting rises with income. As such, promoting compact urban form can help stem some of the negative environmental and health effects of rising affluence.

Abstract (1200 words)
Over successive decades in New Zealand, car ownership has increased in parallel with increases in GDP per person. It is now among the countries with the highest rate of car ownership in the world, with 718 motor vehicles per 1000 population (The World Bank, 2012). As such, on a per capita basis New Zealand contributes disproportionately to global climate change, cardiovascular disease and obesity.
As affluence and car ownership have risen, there has been a corresponding decrease in the use of active modes of transport in general, and in active commuting (walking and cycling to work) in particular. The percentage of commutes which mainly involved walking fell by almost half over the thirty-year period from 1976-2006, and the prevalence of cycling to work has diminished to the point where cycle commutes now make up just 2% of all work commutes.
However, while the historical pattern has been for active commuting to decline with income overall, cross-sectional evidence suggests that active commuting actually rises with income in most cases. The resolution of the paradox of active commuting rising with income at the individual level while decreasing in the aggregate lies in exploring the spatial context within which commuting choices are made. The relationship between active commuting and income in New Zealand is significantly modified by the characteristics of the urban environment and the geographical relationship between work and home is modified by income.
The decision to choose active transport therefore is not simply one of economics, but of economic geography. Making the picture even more complex are a myriad of other facets, among them culture, habit, autonomy and control, and relative preferences for physical health. All of this means there are two ways of looking at the choices involved in the use of active transport. The first is the standard modal choice framework, which is about the daily choice on what transport mode to use to get to and from work. This is the classic modal choice problem.
The second set of choices are the prior long term ones, but they may be just as crucial in framing the daily commute mode decision. Those decisions made some time ago effectively set the wider context in which the daily transport decision is made: the decision on the type of household, life style, region of residence, type of settlement and location within large settlements. In other words, the whole gamut of past choices lead to the socio-economic and geographic context that frame the daily choice of commuting mode. These earlier choices, on where to live in relation to work, between urban centres and within large centres have a major constraining influence on the relative costs that feature as constraints in the typical model of modal choice.
Therefore, modal choice models as such do not capture the embedded nature of the commuting decision. Because modal choices are made in the context of a broader set of prior situational factors, they often result in habitual choices, which may not adjust for new information. Also, the endogenous nature of underlying residential self-selection processes can make it tricky to evaluate causation among locational, temporal and individual elements, and associated outcomes (Mokhtarian and Cao, 2008). Assertions regarding such causal mechanisms will always be questionable unless data is available that maps both the residentialandcommute mode choices

of the same individuals over time. Typically, this type of longitudinal data is not available and certainly not in New Zealand. Whether a negative relationship between active commuting and income applies to individuals over the course of their own working lives is not easily discernable from the literature, which paints a complex and contradictory picture.

What is of immediate interest in this paper is the degree to which the available cross-sectional evidence from the New Zealand Household Travel Survey (2003-08) is consistent with a conceptual position that argues for a negative relationship between active commuting and income. In addition to the geographical considerations that can alter the way active commuting might relate to income, there are several other possibilities. For example, active transport may rise with income because of the impact of education. To the extent that higher incomes are associated with higher levels of education (about, for instance, the health benefits of active transport), healthy options can be expected to play an increasingly important role in people's decisions about life style as their incomes rise. In this respect, one might also want to add a social consciousness and concern for environmental sustainability, both of which might be expected to rise, at least with the education component of rising income.

There is some support for this line of thought in the literature, though the role of affluence in explaining socially and environmentally-motivated actions is quite contentious. According to the affluence hypothesis, environmental quality is a luxury good that becomes of concern only when basic needs have been met (Duroy, 2008). It is thus assumed that income is the most important determinant and that affluent nations are more likely to display greater demand for environmental quality than developing nations (Meyer and Liebe, 2010). This argument is reminiscent of Maslow'shierarchy of needs theory(1954), and also Inglehart'sTheory of Post-Materialist Values(1990, 1997), which postulates that, with growing prosperity in post-industrialized nations, people are freed from burdensome economic concerns and able to pursue other goals such as improved health and environmental sustainability (Duroy, 2008; Meyer and Liebe, 2010).

But the view that rising social and environmental concern are the result of economic affluence is rejected by many authors (e.g. Martinez-Alier, 1995; Shiva and Jafri, 1998; Escobar, 2006), who have noted that, while concern for global issues such as climate change is higher in developed nations, grassroots movements and action at the local and community level are negatively correlated with GNP per capita - i.e. stronger in poorer countries (Dunlap and Mertig, 1995; Duroy, 2008).

Add to this the argument that affluence, which necessitates greater levels of production and consumption, is itself a major cause of environmental degradation. This could provide an explanation for why environmental concern might increase along with it. By this rationale, an increase in environmentally-friendly behaviours, such as the use of non-motorised transport modes, among better-educated individuals could be expected. According to this argument active commuting will decline with income up to a point (as car ownership becomes possible), after which it will begin to increase, as people become better educated and more socially and environmentally-responsible.

But the main interest in income stems from its link to economic growth, whose primary purpose is to raise incomes. If raising incomes also lowers the propensity to use active transport for the daily commute then it would suggest that the neoclassical growth model is not sustainable, either in terms of public health or environmental impact. Given that economic growth is the main objective of most governments around the world, including New Zealand's, it is important to question what effect increasing affluence might have on the propensity to get physically active on the daily commute. From this perspective, the empirical relationship between active commuting and income becomes quite central.

References

Dunlap, R. E., & Mertig, A. G. (1995). Global concern for the environment: Is affluence a prerequisite?Journal of Social Issues, 51, 121?137.

Duroy, Q. M. H. (2008). Testing the Affluence Hypothesis: A cross-cultural analysis of the determinants of environmental action.The Social Science Journal, 45, 419-439.

Escobar, A. (2006). An ecology of difference: Equality and conflict in a globalized world.Focaal? European Journal of Anthropology, 120?137.

Inglehart, R. (1990).Culture shift in advanced industrial society.Princeton, NJ: Princeton University Press.

Inglehart, R. (1997).Modernization and postmodernization: Culture, economic, and political change in 43 societies.. Princeton, NJ: Princeton University Press.

Martinez-Alier, J. (1995). The environment as a luxury good or ?too poor to be green?Economie Appliquée, 48, 215?230.

Maslow, A. (1954).Motivation and Personality.New York: Harper.

Meyer, R., Liebe, U. (2010). Are the affluent prepared to pay for the planet? Explaining willingness to pay for public and quasi-private environmental goods in Switzerland.Population and Environment, 32(1), 42-65.
Mokhtarian, P. L., & Cao, X. (2008). Examining the impacts of residential self-selection on travel behavior: A focus on methodologies.Transportation Research Part B: Methodological, 42(3), 204-228. doi: 10.1016/j.trb.2007.07.006
Shiva, V., & Jafri, A. (1998). Stronger than steel: Indian people's movement against the Gopalpur steel plant.Ecologist, 26, 349?353.
The World Bank. (2012). Data - Motor vehicles (per 1,000 people). Retrieved 29 November 2012, from http://data.worldbank.org/indicator/IS.VEH.NVEH.P3

The scientific influence of ecological economics. An exploratory bibliometric exercise

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Resorting to the studies that cited the articles published in the relational scientific backbone of ecological economics (which comprises 7 main journals, American Journal of Agricultural Economics, Ecological Economics, Environment and Development Economics, Environmental and Resources Economics, Land Economics, Land Use Policy, and Journal of Environmental Economics and Management), we analyze the scientific areas as well as the geographical patterns of influence of ecological economics.xml:namespace prefix = o ns = "urn:schemas-microsoft-com:office:office" />

What Can We Learn from Combining Experimental Research with Post-experimental Group Discussions and Interviews? Insights from Two Framed Field Experiments in Andhra Pradesh, India

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Ultimatum Bargaining or Social Dilemma experiments have challenged the key assumption of Neo-classical Economics (Güth, Schmittberger, & Schwarze, 1982; Isaac & Walker, 1988). It has also been shown that by introducing «cheap talk» (Sally, 1995) or punishment (Gürerk, Irlenbusch, & Rockenbach, 2006) into iterated social dilemma experiments, cooperation can be sustained over long periods of time in the lab. These findings have triggered the development of new theoretical models such as «inequity aversion» or «other-regarding preferences» (Bolton & Ockenfels, 2000; Fehr & Schmidt, 1999) which are now integrated into the dominant paradigm of Economics.

Pioneered by Elinor Ostrom and her colleagues, experimentalists, by testing relatively simple hypotheses, have also asked which factors are important in explaining successful management of common pool resources in social-ecological systems (Ostrom, Gardner, & Walker, 1994). In this process researchers have left the lab and have conducted so-called «framed field experiments » (Harrison & List, 2004), which are by today widely applied (Viceisza, 2012). These studies struggle with the apparent need to reduce complexity in instructions and design (Friedman & Sunder, 1994) which is of particular importance in the context of developing countries (Viceisza, 2012). At the same time the complexity of social-ecological systems in those settings has to be acknowledged. To pay due respect to this complexity, it has become now common to complement experiments with case study research and survey methods (e.g. Vollan, 2008; Werthmann, 2011). To extend and validate insights generated from experiments, some scholars have also used debriefing and post-experimental group discussions (Cárdenas, 2000) or have combined experiments with participatory methods (Lopez, 2008; Lopez, Maya, & Cárdenas, no date). Beside these attempts, systematic approaches focusing on the resulting methodological trade-offs and challenges are still rare.

The empirical background of the planned paper is provided by two experiments which will be conducted in the Indian state of Andhra Pradesh in January and February 2013.The first experiment addresses the question of collectively maintained toilets in the slums of Hyderabad and will be conducted with about 100 female slum dwellers. Two factors ? leadership and inequality in endowments ?, which have been identified in an explorative field phase as being particularly important for successful collective action in this context, will be varied in a voluntary contributions mechanism public good game (see Levati, Sutter, & van der Heijden, 2007 for a lab version of a related experiment).

The second experiment draws on about 50 farmers as a subject pool and is conducted in four villages in Vemulavada district, about 150 km away from the state capital of Hyderabad. Farmers receive electricity for irrigation at a subsidized flat-rate tariff and have, thus, no incentive to save energy. This has resulted in an overuse of electricity and deteriorating service quality, namely high voltage fluctuation and the rationing of electrical power. Fluctuations lead to frequent motor burn-outs in irrigation pumps and transformer burn-outs create additional costs (Kimmich, 2012). Farmers can improve grid quality by installing capacitors. However, it is only individually rational to invest within a certain range of the overall capacitors installed at a transformer to which usually about 20 farmers are connected. An s-shaped production curve of voltage fluctuations leads to a situation where farmers can not benefit individually when either too few or too many other farmers install capacitors (Kimmich, 2012). The underlying coordination problem will be addressed experimentally in a coordination game. Group size and technology adoption of «lead farmers» have been identified as important factors and will be varied in experimental treatments.

Against the background of the recent mixed-method debate (Poteete, Janssen, & Ostrom, 2010), the planned paper seeks to compare different methods of post-experimental debriefing with qualitative research. More specifically, post-experimental group discussions are contrasted with

individual interviews. To structure the questions asked and to organize the data, the study will employ the framework developed by Cárdenas & Ostrom (2004). In doing so, the paper seeks to identify trade-offs faced in the choice of these methods. Anonymity between subjects may, for example, be more easily maintained with face-to-face interviews. Also, group conflicts may emerge from discussions among community members. On the other hand, group discussions allow a better investigation of dynamics and group behavior. Further, it is planned to conduct group discussions and individual interviews without a prior experiment. This way we will be able to identify the effect experimental research may have on the dynamics and content of the qualitative research method. We expect, that conducting experiments prior to group discussions and interviews lead to a less open, more structured and more narrowly focused coverage of the topic. Depending on the particular case at hand, this may be desirable or not. The results of our research may be helpful to create more awareness for the respective trade-offs involved when choosing a particular combination of qualitative research and experiments.

Reference List

Bolton, G. E., & Ockenfels, A. (2000). ERC: A Theory of Equity, Reciprocity, and Competition. American Economic Review, 90(1), 166?193.

Cárdenas, J.-C. (2000). How Do Groups Solve Local Commons Dilemmas? Lessons from Experimental Economics in the Field.Environment, Development and Sustainability, 2(3/4), 305?322.

Cárdenas, J.-C., & Ostrom, E. (2004). What do people bring into the game? Experiments in the field about cooperation in the commons.Agricultural Systems, 82(3), 307?326.

Fehr, E., & Schmidt, K. M. (1999). A Theory of Fairness, Competition, and Cooperation.The Quarterly Journal of Economics, 114(3), 817?868.

Friedman, D., & Sunder, S. (1994).Experimental methods: A primer for economists.Cambridge (England); New York: Cambridge University Press.

Gürerk, Ö., Irlenbusch, B., & Rockenbach, B. (2006). The Competitive Advantage of Sanctioning Institutions.Science, 312(5770), 108?111.

Güth, W., Schmittberger, R., & Schwarze, B. (1982). An experimental analysis of ultimatum bargaining.Journal of Economic Behavior & Organization, 3(4), 367?388.

Harrison, G. W., & List, J. A. (2004). Field Experiments.Journal of Economic Literature, 42(4), 1009?1055.

Isaac, R. M., & Walker, J. M. (1988). Group Size Effects in Public Goods Provision: The Voluntary Contributions Mechanism.The Quarterly Journal of Economics, 103(1), 179?199.

Kimmich, C. (2012).Networks of Coordination and Conflict: Governing Electricity Transactions for Irrigation in South India.Dissertation, Humboldt-Universität zu Berlin, Berlin.

Levati, M. V., Sutter, M., & van der Heijden, E. (2007). Leading by Example in a Public Goods Experiment with Heterogeneity and Incomplete Information.Journal of Conflict Resolution, 51 (5), 793?818.

Lopez, M.-C. (2008).Combining Experiments and participatory rural appraisal tools in the field: Exploring new techniques to preserve the Commons in Colombia. Paper Presented at the 12th Biennial Conference of the IASC, July 14?18, 2008, Cheltenham, UK.

Lopez, M.-C., Maya, D., & Cárdenas, J.-C. (no date).Experimental Economics and Participative Methodologies: Looking for Theoretical and Methodological Bridges to Analyse Collective Action in Common-Use Resources Management.

Ostrom, E., Gardner, R., & Walker, J. M. (1994).Rules, games, and common-pool resources.Ann Arbor, Mich.: Univ. of Michigan Press.

Poteete, A. R., Janssen, M. A., & Ostrom, E. (2010).Working together: Collective action, the commons, and multiple methods in practice.Princeton, NJ: Princeton Univ. Press.

Sally, D. (1995). Conversation and Cooperation in Social Dilemmas: A Meta-Analysis of Experiments from 1958 to 1992.Rationality and Society, 7(1), 58?92.

Viceisza, A. C. (2012).Treating the Field as a Lab: A Basic Guide to Conducting Economics Experiments for Policymaking(Food Security in Practice Technical Guide Series No. 7). International Food Policy Research Institute.

Vollan, B. (2008). Socio-ecological explanations for crowding-out effects from economic field experiments in southern Africa.Ecological Economics, 67(4), 560?573.

Werthmann, C. (2011).Understanding Institutional Arrangements for Community-Based Natural Resource Management in the Mekong Delta of Cambodia and Vietnam: A mixed methods approach.Dissertation, Philipps-Universität Marburg, Marburg.

What territorial distribution of cropping systems could limit quantitative water management crisis?

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In the Adour Garonne watershed, the structural deficit between available water resources and needs led to question irrigated agriculture and set institutional reforms. Because water storage potential is now limited, the debate around land utilization and changes in farming practices as a mean to manage quantitative water issues is emerging. We present a participatory modeling process, aiming at simulating interactions between spatial distribution of cropping systems and flow levels in rivers, at the scale of large territories. This methodological procedure articulates hybridizing information sources to build a spatially explicit representation of the irrigated territory structure and dynamics, co-building alternative territorial cropping system distributions, and simulating those alternatives to evaluate their performance in terms of sustainability and robustness against changing climate variability.

1. Problems in Adour-Garonne quantitative water management

The Adour-Garonne watershed features the main challenges of quantitative water management: structural deficit, large irrigated areas, conflicts between water uses, and institutional reforms. The monitored flows are regularly found to be below the legal low flows targets indices (DOE) in many sub basins. These situations are institutionally defined as quantitative water management crisis. Depending on how bad the situation is, local authorities can intervene on water withdrawals by means of restrictions. Being fourth priority in the law, after sanitation, ecological and industrial needs, restrictions are usually put on irrigated agriculture uses. The LEMA of 2006, French law on water and water environments inspired by the European water framework directive, induced a reconsideration of the agricultural water withdrawals authorizations process. Authorities have defined available volumes for agriculture, calledabstractable volumes(VP). They were calculated on the basis of the actual availability of the resource, at the scale of elementary hydrological units (UHE). These were calculated in order to ensure a ?normal' quantitative water management situation 8 years out of 10 (i.e. crisis situations will occur only in statistically extreme climatic events). In some UHE, where the VPs are much below historical withdrawals levels, implementing this reform is socially and economically challenging, as it requires a change in current irrigation practices. This re-launched a debate around the need to integrate land use planning into water management issues (MEDDTL, 2011). This policy approach is referred to asspatial management of waterby Narcy and Mermet (2003), and raises important difficulties in terms of communication, coordination and antagonisms between water and land management stakeholders.

2. Building irrigation territorial alternatives to manage water

This work aims at answering the question:What territorial distribution of cropping systems could limit the occurrence of quantitative water management crisis?

The main goal is to study the links between spatial distributions of cropping systems and water extractions dynamics in time and space, and decision making of water managers during crisis time. This study takes place in a tense context between those who manage and those who use water, mainly because of disagreements on criteria and values retained for water management (VP, DOE). Our goal is to create and unfold a trans-disciplinary methodology to accompany actors of a large irrigated territory (more than 500 km²) in the conception and evaluation of alternative cropping system distributions to tackle water crisis issues. We not only try to capture the diversity of actors' point of views on the topic of tackling water crisis through cropping system distribution, but also aim at evaluating the proposed solutions in terms of sustainability and their robustness regarding climatic variability.

We propose an approach based on participatory modeling (Barreteau et al. 2010 ; Jakku & Thorburn, 2010) as a tool for prospective research (Godet, 1992; Alcamo, 2008; Houet et al. 2008) which can simulate the irrigated territory in order to run an multi criteria evaluation (Garmendia & Gamboa, 2012; Gomiero & Giampietro, 2005; Jakeman & Letcher, 2003). Models serve (1) as boundary objects to facilitate interaction between science and society (Barreteau, 2010), (2) to simulate interactions between biophysical (crop growth) and hydrological processes

(river flows), and the adaptive decisions of farmers (cropping practices) and water managers (restrictions); (3) to evaluate sustainability indicators.
Our work is in the field of landscape agronomy (Lardon, 2007) as it looks at the irrigated territory as a socio-agro-hydrological complex system and studies the links between agricultural structure and environmental dynamics at various organizational levels. Our objectives are close to those of spatially explicit prospective works (Houet, 2008), but we differ in the way we deal with future: we do not simulate trajectories of change, but we only represent and evaluate stakeholders views on preferable spatial organizations of cropping activities in the territory (backcastingin Alcamo, 2008);visioningin Salter, 2010).
This work should (i) nourish the reflection on the potential of land agricultural use and cropping practices to regulate water needs, (ii) question the sustainability of alternative agricultural systems at the scale of the irrigated territory, (iii) elaborate on the nature of planning tools to assist quantitative water managers.
The final approach articulates around 4 specific objectives:
Hybridizing data and knowledge to build a shared representation of the current spatial distribution of cropping systems (crop successions and associated practices) and its links to irrigation water sources (rivers, dams, underground water) Co-defining a set of criteria/indices to judge the sustainability of the irrigated territory (water management, and socio-economic and environmental sustainability) Building a model to simulate water withdrawals dynamics, responses of water managers, and the consequences on the developed indices. Co-constructing alternative spatial distributions of cropping systems that tackle quantitative water management issues and territorial sustainability; Evaluating these alternatives on the criteria, and simulating the answer of the systems to climatic variations (robustness) over 10 years, as to compare them.

3. Conclusion

This works tackles quantitative water management through cropping management and land use planning at sub-basin scale in a trans-disciplinary, participatory approach based on modeling the irrigated territory for dynamic simulation and integrated evaluation. We look at the influence of local practices on environmental dynamics and institutional decision making. This way, we nourish the debate on the potential of agricultural land use and cropping practices regulation to tackle quantitative water management issues. We believe that such an approach looks into management options which could reconcile the development of agricultural activities with the sustainability of water environments.

4. References

Alcamo, J. (2008). Environmental futures: the Practice of Environmental Scenario Analysis. (Elsevier., p. 224). Amsterdam.
Barreteau, O., Bots, P. W. G., & Daniell, K. A. (2010). A Framework for Clarifying « Participation » in Participatory Research to. Ecology And Society, 15(2).
Houet, T., Hubert-Moy, L., & Tissot, C. (2008). Modélisation prospective spatialisée à l'échelle locale?: approche méthodologique. Policy, 18(3), 345?373.
Lardon, S., Caron, P., & Benoît, M. (2007). De la géo-agronomie à l'agronomie des territoires?: un parcours, des étapes-clés et des prolongements.
Lardon, S., & Pivetot, V. (2012). Méthodologie de diagnostic pour le projet de territoire?: une approche par les modèles spatiaux. Géocarrefour, 80(2005), 75?90.
Pahl-wostl, C., Schlumpf, C., Büssenschütt, M., Schönborn, A., & Burse, J. (2001). Models at the interface between science and society?: impacts and options. Most, 267?280.
Salter, J., Robinson, J., & Wiek, A. (2010). Participatory methods of integrated assessment-a review. Wiley Interdisciplinary Reviews: Climate Change, 1(5), 697?717. doi:10.1002/wcc.73

Working with ecology: Using the Allee effect for invasive species (control) policy

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The Allee effect could be useful in managing invasive species because they have a difficult time becoming established below certain population densities. However, the Allee effect is often neglected in invasive species policy. We use the emerald ash borer (EAB) as an example to illustrate the importance of incorporating the Allee effect into policy. Our paper models the interdependent relationship of the EAB with the native environment and economic activity in Ohio. We show that the movement of the EAB, due to ash resource-dependent economic activity, degrades ash trees at a higher rate than when economic activity is excluded from the model. We also argue that understanding the Allee effect can assist policymakers to reduce the establishment and spread of the EAB.America's economy travels on its roadways. Over three trillion miles are driven each year for trade and recreation (U.S. Department of Transportation, 2012) . However, this movement of people and goods can shelter unwanted hitchhikers, such as non-native species that disrupt local ecosystem services and goods. For example, gypsy moths, which were first introduced into the U.S. to be mated with the native silkworm, have continued to spread through wood materials and have contributed to the destruction of millions of oak trees throughout North America (Mayo et al., 2003; Schultz Baldwin, 1982). Another example is Japanese stiltgrass. This exotic plant, introduced from Asia in the early 1900s, is found mainly along roadways. It crowds out native species resulting in significant reductions in native plant productivity and diversity in over twenty states (Flory Clay, 2009).When a trade-introduced invasive species appears to be permanently established, the most effective action could be to use control techniques to prevent their spread or to lessen their effect. Examples of control techniques include local eradication, population suppression, and movement limitation. However, for certain invasive species, populations may be considered too widespread for effective control measures. As a result, a key challenge in policymaking is determining how much attention should be given to controlling trade-introduced invasive species. Understanding the ecological implications of an invasive species will influence how much attention is paid to the control policies. However, current invasive species control policy recommendations reveal a common avoidance of ecological realities (NISIC, 2012), which ultimately misleads policy decisions. Examples abound, but the most common assumption is that the success rate of the invasive species is constant. Inherent within this approach is the supposition that population density does not impact the growth rate of the species. But low population density exhibits genetic inbreeding, resulting in decreased fitness and a reduction in cooperative interactions, such as mating. This well-established ecological phenomenon is known as the «Allee effect», which is impacted by the repeated introduction of invasive species from economic activity. As a result, invasive species are an environmental externality that operates through interdependent ecological-economic relationships. In this paper, we demonstrate the importance of the Allee effect and the economic-ecological interdependencies in invasive species policy. Specifically, we may be able to keep the invasive population below the threshold of population explosion by reducing the number of economically-introduced invasive species. The emerald ash borer (EAB) provides a pertinent example, where movement in and around EAB-infested areas has accelerated the rate of spread of the EAB population (Bendor et al., 2006). Most scientists hypothesize that the EAB, originally from Asia, entered Michigan in 2002 through the solid wood packing materials transported in cargo ships and planes. The EAB larvae feed on the inner bark of ash trees and destroy the trees' ability to translocate water and nutrients. Human activity leads to hundreds of new EAB introduction points, which are the likely cause for the blanket of infestation now seen in southeastern Michigan. For instance, EABs, on their own, can move an average of 9.84 km/year; however, they are currently moving over 20 km/year. The human-accelerated spread of EAB continues through economic activity including driving, leisure activities (such as camping), firewood gathering, and gardening with infested nursery trees. The EAB is now found as far east as Connecticut and as far north as Ontario, Canada, causing the death of more than 30 million ash trees in Michigan alone (USDA Forest Service, 2009). As there has been little resistance to

the spread of EAB, it is obvious that the current EAB control policy of quarantining an infested county (prohibiting the movement of ash outside of a confirmed EAB-infested area) has not been effective. In fact, quarantines have intensified the long-run dispersal of EAB because it is legal to move infested EAB ash within and between adjacent quarantined areas. In September 2010, Ohio officially announced that the entire state was under quarantine. This quarantine included 88 counties, of which only 69 were under quarantine prior to September, and 53 were positive for EAB infestations. In response to the quarantine, Dan Herms (an entomologist with the Ohio Agricultural Research and Development Center) wrote that: «It's inevitable that all of the ash trees in Ohio are going to die» (Kovac, 2010)We argue that all ash trees do not have to die. We maintain that the Allee effect has important policy implications for slowing the spread of EAB, which has been neglected by both Dan Herms and other authors. In our EAB application, the Allee effect is due to mate limitations in low population densities. Sexual reproduction requires contact between male and female gametes. Basically, they cannot find each other. As a result, slowing the introduction from economic activity may keep the population below the threshold where invasive species behaviors, such as breeding, become more efficient due to larger social groups. This will have the effect of reducing reproductive success. Our paper models the invasive EAB within the native environment of Ohio and assesses the interdependent relationship and implications between ecological and economic activity. A system of differential equations is used to model the predator-prey relationship of ash and the EAB while accounting for Allee effects due to mating limitations. The empirical model estimates the time paths of the ecosystem for different policies concerning EAB-spreading economic activity. This economic-ecological interdependent relationship illustrates that the movement of EABs due to ash resource-dependent economic activity degrades ash stocks at a higher rate than when economic activity is excluded from the model. While previous literature suggests a complete loss of ash stock (Poland Mccullough, 2005; Sydnor et al., 2007), we find that the population of the EAB remains below endemic levels under reduced economic introduction policies. The key reason for this result is the Allee effect?a low invasive species population level makes it difficult to locate mates. Our model accounts for key population variables and adaption within the ecological system when determining invasive species control policy. We find that reducing the economic activity that contributes to EAB spread could prevent a complete loss of ash because we can influence long-run introductions and prevent reaching the Allee threshold. Works CitedBendor, T., Metcalf, S., Fontenot, L., Sangunett, B., Hannon, B. (2006). Modeling the spread of the Emerald Ash Borer. Ecological Modelling, 197(1-2), 221?236. doi:10.1016/j.ecolmodel.2006.03.003Flory, S. L., Clay, K. (2009). Non-native grass invasion alters native plant composition in experimental communities. Biological Invasions, 12(5), 1285?1294. doi:10.1007/s10530-009-9546-9Kovac, M. (2010, September 9). Emerald Ash Borer Quarantine Extended to Cover Entire State. The Daily Record.Mayo, J. H., Straka, T. J., Leonard, D. S. (2003). The cost of slowing the spread of the gypsy moth (Lepidoptera: Lymantriidae). Journal of economic entomology, 96(5), 1448?54. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/14650517National Invasive Species Information Center (NISIC). Retrieved October 30, 2012, from http://www.invasivespeciesinfo.govSchultz, J. C., Baldwin, I. T. (1982). Oak Leaf Quality Declines in Response to Defoliation by Gypsy Moth Larvae. Science, 217(4555), 149?151.Sydnor, T. D., Bumgardner, M., Todd, A. (2007). The Potential Economic Impacts of Emerald Ash Borer (Agrilus planipennis) on Ohio , U . S ., Communities. Society, 33(1), 48?54.Transportation, U. S. D. of. (2012). U.S. Highway Statistics: U.S. Department of Transportation. Retrieved from http://www.fhwa.dot.gov/policyinformation/statistics.cfm

What are shared and social values of ecosystems?

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SUMMARY
Theoretical and methodological plurality is needed to account for the full value of ecosystems to human wellbeing. In recent valuation frameworks, shared (social) values are now included as a distinguishable value category. However, these concepts have neither been clearly established theoretically, nor is there much empirical evidence to establish their significance. We develop a typology of shared and social values across five dimensions: the type of values; the value provider; the intention of value; its scale; and the process used to elicit values. We then discuss shared social values in relation to individual values, notions of legitimacy, deliberation and social learning. We conclude by discussing a research agenda to progress with understanding and capturing shared values of nature.

ABSTRACT
Theoretical and methodological plurality is needed to understand and account for the full value of biodiversity and ecosystem services to human wellbeing (UK National Ecosystem Assessment 2011; Fishet al.2011). Conventional approaches to valuing non-market benefits of the environment (such as contingent valuation), and the welfare economic theory on which these methods are based, understand value in relation to the individual. The social value of the benefits provided by ecosystems is typically considered through aggregation of individual utility. However, such methods may not be able to fully capture collective meanings and significance ascribed to natural environments, potentially missing out on these important, shared dimensions of social value. In recent frameworks for ecosystem valuation, such as that of the UK National Ecosystem Assessment, ?shared values' or ?shared social values' are now being included as a distinguishable value category. However, these concepts have neither been clearly established theoretically in relation to valuing nature, nor is there much empirical evidence to establish their significance.
Understanding these values is crucial for decision-makers to better handle conflicts over natural resources, assess risks and develop effective environmental management strategies (White 2002), and there is increasing academic and government interest in quantifying them (Fujiwara & Campbell 2011; Fishet al.2011). Nonetheless, the terms shared and shared social values, and related terms such as plural values, are used to refer to a wide range of overlapping concepts in the literature.
Within the fields of ecosystem assessment and environmental valuation, the terms shared values, social values, and shared social values have been used to indicate a wide variety of different constructs, including: the sum of individual values or aggregated willingness-to-pay; values that

individuals hold but pick up through environmental conditioning and the social and cultural contexts of society; values created by group processes and values that are illustrated through democratic debate at the societal level; values that individuals only hold in social situations; altruistic values; and ?meta-values' about how values should be treated, such as fairness norms. Though shared and social values are sometimes used interchangeably, there are differences of emphasis.

?Shared values' often refer to deeper held guiding principles and normative values that are shared by groups or communities, or to cultural values more generally, but they can also refer to the contextual values or preferences of groups and the values that arise as the result of a shared social process. ?Social values' may also refer to the values of groups or to the values and norms of society at large. However, the term is also used to refer to: values derived through a social process; the public interest; values for public goods; ?altruistic' values and feigned altruistic values; the values that people hold in social situations; contribution to welfare or wellbeing; the willingness to pay of a group; and the aggregated willingness to pay of individuals. The amalgam ?shared social values' can be used to refer to subsets or combinations of these concepts. For example, ?social' can be used to refer to societal context while the ?shared' adjective can indicate group values.

Thinking about ?shared values' inevitably leads to questions about the relationship between general values (in the sense of guiding principles), and more contextual values (in the sense of worth or importance), which can be reflected in people's revealed or stated preferences or assessed by other valuation methods. This literature also raises questions about: how such preferences are shaped; whether there is an identifiable category of values that are shared socially and are not simply the aggregation of individual values; whether or when such values should be elicited as shared values in a deliberative group setting; and when it is sufficient to aggregate individual values to capture a collective sense of significance. This then leads to questions about whether or when, shared values can be sufficiently accounted for by adapting and improving valuation methods based on neoclassical assumptions, or whether new or additional approaches are needed to capture the full contribution that ecosystems make to human wellbeing.

We start by developing a typology of different types of shared, social and shared social values, seeking to distinguish them from various other value adjectives. The typology distinguishes along five dimensions: the type of values; the value provider; the intention of value; its scale; and the process used to elicit values. We identify an array of current terms used within the literature, and use these five dimensions of shared and social values to identify terms that can be used to disambiguate.

We then consider how shared values relate to individual values, and contrast neoclassical, non-deliberative approaches with deliberative approaches to economic valuation that attempt to incorporate shared and social values. Here we touch briefly upon issues relating to valuation and legitimacy and valuation amidst complexity and uncertainty. We also consider how deliberative approaches influence social learning and vice-versa, and how social learning relates to shared and social values. We conclude with a discussion of what might be fruitful research avenues to better understand and capture shared values of nature.

While this paper frames issues around social values within the field of valuing the environment, shared values are of course relevant to a much wider range of policy decisions, and the discussion here will be relevant to all areas where there is a desire to better incorporate social impacts and wellbeing into policy decisions.

References

Fish, R., Burgess, J., Church, A. & Turner, K. (2011) Shared Values for the Contributions Ecosystem Services Make to Human Well-being.UK National Ecosystem Assessment: Technical ReportUNEP-WCMC, Cambridge.

Fujiwara, D. & Campbell, R. (2011)Valuation Techniques for Social Cost-Benefit Analysis - Stated Preference, Revealed Preference and Subjective Well-Being Approaches, a Discussion of the Current Issues. HM Treasury, London.

UK National Ecosystem Assessment. (2011) Synthesis.The UK National Ecosystem AssessmentUNEP-WCMC, Cambridge.

White, M.V. (2002) Doctoring Adam Smith: The Fable of the Diamonds and Water Paradox. History of Political Economy, 34, 659?683.

Shared and cultural values around ecosystems, health and renewable energy ? a literature review.

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When it was published in 2011, the UK National Ecosystem Assessment (UK NEA, 2011) provided a state of the art overview of the different ecosystem services ? supporting, regulating, provisioning, cultural - in the xml:namespace prefix = st1 ns = "urn:schemas-microsoft-com: office:smarttags" />UK. Providing a general framework within which to consider the importance of the natural environment for societal wellbeing, the work outlined that a complete ecosystem assessment requires a consideration of shared values. The argument posits that the ways in which ecosystem services contribute to human well-being cannot be based on individual preferences alone. Many of these services, and in particular the cultural services described by the UK NEA as ?environmental settings' (i.e. the places people interact with the environment such as gardens, parks, the wider countryside), may have collective cultural meanings as well as significance. In the UK NEA, shared values were conceptualised both as the values people hold for ecosystem services as citizens rather than as individuals and as the values that groups of people, or society as a whole, hold. This conceptualisation thus includes an ethical dimension that guides societal concern for nature.
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While the UK NEA developed a basic foundation for the concept of shared values in ecosystem service assessment, a follow-on research project was funded with the overarching focus of evaluating the extent to which shared, plural and cultural values of the environment (hereafter collectively referred to as shared values) differ from individual values and how they can be elicited. The specific aim is to establish a clearer understanding of shared values in the context of valuing nature and provide a means to assess these for decision-making at multiple scales.

A foundational component of this new shared values research project is a literature review (presented here), being undertaken for completion in May 2013. In this review we are specifically looking at:

How are shared values conceptualised within the literature? How are these values captured within the different disciplines, particularly in terms of methodology for identification/elicitation of values? How have these values been utilised, if at all, by policy makers in decision-making processes?

This follow-on shared values research project builds on a funded one-year interdisciplinary network-development project, BRIDGE (Bridging the gap between supply of and demand for valuation evidence), which aimed to investigate how ecosystem service values obtained from natural, social and economic sciences could best be integrated into governance to improve decision-making and implementation. Key outputs from BRIDGE are a set of scientific papers (forthcoming) one of which is a conceptual piece examining shared and social values of ecosystems (Kenter et al. in prep). The new project's literature review will build on the concepts identified and questions illustrated in Kenter et al to focus more explicitly on how shared values are being conceptualised in the literature across a range of different areas such as ecosystems, health and renewable energy.

Our literature review involves a broad interdisciplinary team from disciplines including psychology, sociology, economics, health, philosophy, ecology, geography and media studies. This broad interdisciplinary base allows the team to address a critical aspect of the work which is to examine the literature for both explicit and implicit reference to social values. Published literature (primarily peer-reviewed but also drawing on relevant grey literature such as

government reports) will be reviewed to identify articles where the terms ?shared', ?cultural' and ?plural' values are specifically used but also to identify articles where the concept of shared values is tacitly present. The latter approach is central to the literature searches; it will specifically draw on the expertise and knowledge of the interdisciplinary team members in order to ensure the review covers a broad range of disciplines where the concept of shared values may be being debated but the terminology used may be quite diverse and wide ranging. Precisely because of the need to identify implicit discussion of the concept of shared values, the approach taken will be a modified systematic review. While comprehensiveness is an aim and some search terms, inclusion/exclusion criteria (e.g. articles from at least the last ten years), have been specified, expert judgment will refine searches within provided guidelines (see e.g. Centre for Reviews and Dissemination 2008; Government Social Research Service; Popay et al. 2006).

Conceptually, shared values at the societal and cultural level are promoted, imparted, transmitted, changed and maintained in a variety of ways, for example, through exposure to formal and informal customs, laws, norms, cultural traditions and societal institutions (Bourdieu 1972; Markua and Kitayama 1994). Individual values are thus a product of shared social values yet are also interpreted through each person's own individual experience. We will discuss the formation of values at the societal and cultural level and the orientation of values at the individual, group and societal level. We posit that context is critical in the elicitation of values and will use ?real world' situations that illustrate how values are elicited through a variety of approaches. Epistemological understandings often differ between different disciplines both in terms of what shared values are and how they can be elicited i.e. by asking individuals and aggregating their preferences, or through communication processes such as deliberation. Deliberative theories and social theories suggest that shared values should be constructed through dialogue and communication and that through this process people listen to arguments and use reasoned judgment to reach an agreement (Niemeyer, 2004). In this conception, deliberation can bring rational outcomes in opposition to the vote aggregation methods of private preferences (Niemeyer and Spash, 2001).

We will outline a conceptual model for valuation processes identified in the BRIDGE paper on shared values and a typology that differentiates between different types of shared, social and cultural values. We will present the findings of the shared values literature review clarifying some of the ambiguity that currently exists in defining shared values. We will present findings on how shared values are conceptualised by different disciplines and illustrate the differing epistemological understandings this raises. Finally we will outline how shared values are currently used in decision making and provide insights for taking a more holistic approach to understanding how these values can be taken into account through processes such as multi-criteria analysis.

References

Bourdieu, P. (1972). Outline of a theory of practice.Cambridge: Cambridge University Prcss.
Centre for Reviews and Dissemination (CRD) (2008).Systematic Reviews: CRD's guidance for undertaking reviews in health care(Vol. 3). York: CRD, University of York.
Government Social Research Service. (undated) Rapid Evidence Assessment Toolkit xml: namespace prefix = st2 ns = "isiresearchsoft-com/cwyw" />[Accessed 28 November 2012; Available from www.civilservice.gov.uk/networks/gsr/resources-and-guidance/rapid-evidence-assessment]
Kenter, J.O., O'Brien, Christie, M, Church, A, Fazey, I, Hockley, N, Irvine, K, Ravenscroft, N, Reed, M. Shared and social values of ecosystems. (Submitted to ESEE 2013).
Markua. H.. & Kitayania. S. (1991). Culture and self Implications for cognition, emotion and motivation. Psychological Bulletin, 102: 72-90
Niemeyer, S. & Spash, C.L. (2001) Environmental valuation analysis, public deliberation, and their pragmatic syntheses: a critical appraisal. Environment and Planning C-Government and Policy, 19, 567-585.
Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., et al. (2006).Guidance on the Conduct of Narrative Synthesis in Systematic ReviewsESRC.
Ravenscroft, N, Reed, M. (in press) What are shared and social values of ecosystems?
UK National Ecosystem Assessment. (2011). The UK National Ecosystem Assessment: Synthesis of the Key Findings. UNEP-WCMC, Cambridge

Managing land for multiple benefits in the Scottish uplands: the influence of values across regions and institutions

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An ecosystem approach is being promoted as a means of achieving more integrative and sustainable natural resource management that also contributes to social and economic needs. To achieve this it is necessary to understand the values and motivations underlying decision making by land managers so that these can be aligned with policy development. We explored the use of participatory Multi-Criteria Decision Analysis to evaluate the environmental, social, cultural and economic values and priorities of regional land managers and National level stakeholders and assess how well they are delivered by current management in upland Scotland. This transparent and systematic method allowed stakeholder values to be accounted for alongside definitive management objectives in the identification of synergies and trade-offs when managing land for multiple benefits.

Managing land in such a way as to integrate sustainable social and economic goals with the conservation of habitats, species and biodiversity is a globally recognised ideal known as the ecosystem approach. While frameworks for analysing socio-ecological systems and valuing their contributions to ecosystem sustainability are well-established in policy-making, practical tools for making advances on the ground are lacking. Tools that incorporate and help communicate social, economic and environmental goals and values between policy and managers are essential for development and implementation of an integrated, ecosystem approach to management and must be capable of translating information between multiple institutional levels and over a range of geographic scales.

The provision of ecosystem services such as food, water and the right to use land for recreational purposes is considered of prime importance to wider society. However as competing demands for resources increase, conflicts over how land should be managed have intensified. Discussions about the value of ecosystem services have emphasised wider public benefits. The priorities of communities and land managers may reflect local and practical perspectives as well as underlying values. While there may be overlap in overarching ideals for what land should deliver, the language used and decision-making and implementation processes can bring managers and communities into conflict with policy makers.

The Scottish uplands provide an ideal backdrop to an investigation of the influence of competing interests for natural resources due to increasing pressure on these areas to provide multiple benefits. Scottish uplands and peat-lands cover 38% of Scotland's land area and are the source of a range of public good such as drinking water, livestock farming, recreational opportunities and host species and habitats of international conservation concern. A complex mosaic of land ownership characterises the uplands with a large proportion in private ownership alongside public, NGO and community ownership. Maintaining a sporting industry is the focus for many private managers and owners. Deer stalking, grouse shooting and fishing have great historical and cultural significance and a considerable role in supporting rural economies

There are many potential conflicts that may arise between private management interests and the delivery of public benefits due to the asymmetric distribution of costs and benefits such as local management costs against gains for wider beneficiaries and the challenges of devising systems of compensation for the provision of wider ecosystem services.

Participatory multi-criteria decision analysis (MCDA) is a useful decision-support tool for recognising a range of interests and identifying trade-offs and compatibilities through structured deliberation. It has been used to tackle a variety of natural resource management problems. In this paper we apply and evaluate MCDA as a structured process for representing differing interests and identifying where synergies and trade-offs exist in the current delivery of multiple benefits

in the management of the Scottish uplands. Understanding the motivations and values underlying management decisions across regional and institutional scales is an important step towards predicting how policy strategy grounded in an ecosystem approach will translate into the practical delivery of priorities.

We used participatory MCDA in three workshops to identify priorities, including environmental, economic and social values, and assess potential implications of policy shift for land managers with the aims of enhancing compliance, reducing conflict, identifying synergies and tradeoffs and increasing communication between stakeholder groups. We investigated regional differences in values and priorities between two groups of land managers from areas of Scotland with high and low intensity upland management and also compared regional managers to National level stakeholders.

MCDA was applied as a deliberative process with workshop participants to assess what environmental, social and economic priorities and values are delivered by a range of current management types. Priorities and values were defined through group consensus and then ranked by participants alongside priorities extracted from current policy strategy. Each participant then scored how well they considered different local management practices fulfilled each priority/ value.

Participant-defined values and priorities reflected the attitude and approaches taken by the different groups to management. The National group tended to promote broader strategic processes while the regional groups focused more on practical measures. Participants emphasised the importance of including broader management values such as sustainable and resilient management in addition to definitive outcomes such as income generation and species management. Enabling factors for management such as collaboration, reducing bureaucracy, training and public education were also important priorities for stakeholders and are considered lacking in current policy strategy.

Overall, management for deer stalking was considered to best deliver the broadest range of current management priorities, including economic, social, cultural and environmental values. A broader range of benefits were delivered in the low intensity management region where activities such as native woodland regeneration and renewable energy schemes provide attractive incentives to compensate for lower productivity and the higher costs associated with livestock and game production. On land intensively managed for game, there were more tradeoffs associated with delivering a broader range of benefits.

MCDA proved a valuable method in three respects; Firstly it allowed us to assess how different types of management perform under current conditions, where they are compatible and where compromise is required, we were secondly able to evaluate stakeholders' values and motivations in management decision making and therefore understand potential conflicts and finally the transparent and systematic nature of the method contributes to effective communication of the complexities of the ecosystem approach incorporating both quantitative and qualitative information.

This methodological approach provides an improved understanding of and capacity to deal with conflict over multifunctional land-uses by representing the range of values and priorities held by different stakeholders and their assessment of the capacity of different land-uses to deliver economic, social and environmental benefits, and so contribute to the development of more integrative policy instruments for ecosystem management and conflict resolution.

Eliciting shared values using deliberative valuation and participatory systems modelling ? a case study from the Solomon Islands

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SUMMARY
There is increasing interest in establishingsharedvalues of ecosystems and biodiversity: the collective meanings and significance ascribed by groups of people to their natural surrounds. This has particular significance to transitional economy settings in the least developed countries, where cultures are less individualised and decision-making structures and property rights are often group-based. This case study in the Solomon Islands combined a deliberative monetary valuation approach with participatory systems modelling, storytelling, and novel ?participatory psychometrics' to assess changes in values through deliberation (illustrative video material to be presented). Results indicate clear increases in a sense of personal environmental responsibility and normative changes in favour of conservation action. Intensive participatory approaches combining valuation with simple system dynamics tools and moral debate anchored on social-psychological theory can be an effective and appropriate way to assess shared values of ecosystems in developing countries.

ABSTRACT
See attached file.

Transregional Land-Use Dynamics of Bioenergy Policies ? An Agent-Based Approach

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Summary
Bioenergy promotion policies, such as such as the EU Renewable Energy Directive (RED) and US Renewable Fuels Standard 2 (RFS2), aim at promoting the diffusion of bioenergy as a low-carbon alternative to fossil energy sources. Negative land-use change effects in the countries promoting bioenergy or other countries might require bioenergy policies to be combined in a policy mix with climate or land-use governance instruments. Current models used to analyze the effects of these policy mixes only have a limited ability to represent producer heterogeneity, spatial interactions, and some relevant policy objectives. To analyze these aspects in more detail, we use an agent-based computational laboratory to simulate the land-use dynamics between two production regions under different policy mixes.

1. Background

Bioenergy promotion policies, such as the EU Renewable Energy Directive (RED) and US Renewable Fuels Standard 2 (RFS2), aim at promoting the use of bioenergy as a low-carbon alternative to fossil energy sources. The positive effects of bioenergy promotion might, however, be offset by land-use changes (LUC) they cause, which have been found to create conflicts with ecological, social and food security interests (Fargione et al. (2010), German et al. (2011a), Babcock (2011)). Further promotion of bioenergy might increase these land-use conflicts, as it is expected to lead to further significant LUCs in the future (OECD/IEA (2011), pp. 25 et seq.). One way to mitigate the negative LUC effects of bioenergy promotion policies is to combine them in a policy mix with instruments for climate or land-use governance. An assessment of whether this strategy is likely to be successful or whether bioenergy promotion should be reduced requires an understanding of the overall effects of the possible policy mixes. The analysis of these overall effects is, however, complicated by the fact that LUCs do not only occur in the country, which promotes bioenergy, but also in other regions in the world, and that carbon leakage and indirect land use change (iLUC) can occur (see, e. g., Searchinger et al. (2008)).

2. The Need for Further Research

Consequently, the models mainly used to analyze the potential effects of bioenergy, climate, and land-use policies, computable general equilibrium (CGE), partial equilibrium (PE) models, and integrated assessment models, are especially suited to simulate their transregional effects (Edwards et al. (2010), Witzke et al. (2009), Wise et al. (2009)). In order to do so, these models simulate policy effects at a high level of aggregation. Therefore, they only have a limited ability to represent dynamics resulting from producer heterogeneity and spatial interactions, and to analyze their ecological, economic and social effects in detail.
This leads to a need for further research. Firstly, the limited representation of producer heterogeneity and spatial interactions might lead to systematic biases in the assessment of different policy instruments. Case studies in the context of bioenergy production highlight that it might be important to differentiate between the reactions of smallholders and large-scale farms to policies and to take their interactions into account (German et al. (2011a)). Secondly, the analysis of conflicting policy objectives in the context of bioenergy policy requires a detailed assessment the ecological, economic, and social effects of various policy mixes. Thirdly, some policy issues, such as the integration of smallholders into bioenergy production chains, can only be analyzed, if producer heterogeneity is explicitly represented in a model.

3. Modeling Approach

These research needs raise the challenge of creating a model, which can simulate the transregional land-use effects of bioenergy policies, while also allowing for an analysis of the dynamics resulting from the spatial interactions of heterogeneous producers and their ecological, economic

and social effects. To deal with this challenge, we have made use of the approach of agent-based computational economics, which is especially suited to evaluate the «robustness of standard economic theories to relaxations of their assumptions» (Tesfatsion (2006)).
We have created an agent-based computational laboratory, which enables us to systematically analyze the effects of various policy mixes under a baseline scenario, with assumptions similar to those underlying CGE and PE models, and compare them to scenarios which deviate from these assumptions. To model transregional land-use effects, our computational laboratory consists of two production regions, which are connected via markets for generic food and bioenergy crops. Each of these regions is populated with agents representing agricultural producers. A landscape generator assigns a number of land cells on a cell grid to each these producers and determines whether the cells contain carbon stocks. These producers make land-use decisions by optimizing production functions with three inputs, land, labor, and capital, for each of the crops, which are then implemented on the cell grid and on the product markets.

4. Analysis

To analyze policy mixes in the baseline scenario we first let the model run into an equilibrium in the food market. Then we introduce bioenergy demand in combination with different climate and land use governance instruments, leading to production and land-use changes. Evaluation functions record the resulting changes in welfare, climate balance, and agricultural sector structure in each of the regions. This allows for detailed analyses of (1) the land-use effects on the second region, if an instrument combination is used, which optimally pursues different policy objectives in the first region, and (2) potential approaches to mitigate these effects through individual or coordinated approaches in the two regions.
Subsequently, we plan to compare the results from the baseline scenario to scenarios with heterogeneous producers and with an explicitly modeled land market. By testing for systematic differences between the outcomes under these scenarios, we hope to provide a better understanding of the reliability of the policy impact assessments of models currently used in the bioenergy context.

REFERENCES

Babcock, B. A. (2011).The Impact of US Biofuel Policies on Agricultural Price Levels and Volatility. International Centre for Trade and Sustainable Development (ICTSD), Issue Paper No. 35 (June 2011)
Edwards, R., Mulligan, D., and Marelli, L. (2010).Indirect land use change from increased biofuels demand ? Comparison of models and results for marginal biofuels production from different feedstocks.JRC Scientific and Technical Reports, European Commission Joint Research Centre Institute for Energy, Brussels 2010.
Fargione, J. E., Plevin, R. J., und Hill, J. D. (2010).The Ecological Impact of Biofuels,Annu. Rev. Ecol. Evol. Syst. 2010. 41: 351?77.
German, L., Schoneveld, G. C., and Pacheco, P. (2011a).Local Social and Environmental Impacts of Biofuels: Global Comparative Assessment and Implications for Governance,Ecology and Society 16 (4): 29.
OECD/IEA (2011).Technology Roadmap ? Biofuels for Transport,OECD/IEA 2011.
Searchinger, T., Heimlich, R., Houghton, R. A., Dong, F., Elobeid, A., Fabiosa, J., Tokgoz, S., Hayes, D., und Yu, T.-H. (2008).Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land-Use Change,Science 319: 1238?1240.
Tesfatsion, L., 2006.Agent-Based Computational Economics: A Constructive Approach to Economic Theory (Chapter: 16). In: Tesfatsion, L., Judd, K.L. (Eds.), Handbook of Computational Economics, Volume 2: Agent-Based Computational Economics, Handbooks in Economics. North-Holland, Oxford.
Wise, M., Calvin, K., Thomson, A., Clarke, L., Bond-Lamberty, B., Sands, R., Smith, S. J., Janetos, A., and Edmonds, J. (2009).Implications of Limiting CO2 Concentrations for Land Use and Energy.Science 324: 1183.
Witzke, P., Banse, M., Gömann, H., Heckelei, T., Breuer, T., Mann, S., Kempen, M., Adenäuer, M., and Zintl, A. (2009).Modelling of Energy-Crops in Agricultural Sector Models ? A Review of Existing Methodologies.JRC Scientific and Technical Reports, European Commission Joint Research Centre Institute for Energy, Brussels.

Analysing historic land use in New Zealand: Tracing land use efficiency based on the Human Appropriation of Net Primary Production framework

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The natural vegetation in New Zealand underwent fundamental changes in its short history of human presence. Since the arrival of Europeans land use change accelerated, driven by a complex and interwoven set of socio-economic dynamics which triggered fundamental changes in land cover. Land-use change (i.e. deforestation, expansion of agricultural land) and intensification resulted in environmental problems such as soil erosion or water pollution through nitrate leaching. We here analyse the effects of these dynamics on the energy flows in New Zealand's ecosystems. For this we calculate the ?Human appropriation of Net Primary Production' (HANPP), an indicator framework that allows analysing the human impact on ecosystems by linking natural with socio-economic processes. It relates the extraction of biomass to the annual Net Primary Production (NPP) of green plants (i.e. the amount of biomass produced by plants through photosynthesis) and the potential NPP of ?hypothetically prevailing- ecosystems. The HANPP indicator captures (1) harvested biomass and (2) land use induced productivity change. The first includes all harvested products (cereals, wood, biomass harvested by grazing animals), parts of plants destroyed during harvest and biomass destroyed during human induced fires. The second part accounts for changes in productivity through land use change (i.e. the conversion of forest land into pasture or cropland results in a reduced annual Net Primary Production; NPP) by comparing the actual NPP in a year with the potential NPP. Using the potential NPP (i.e. the NPP that would prevail in a natural ecosystem without human interaction) as a baseline for the HANPP indicator enables to thoroughly quantify human impacts on ecosystems (i.e. the alteration of trophic energy flows) despite natural, site-specific differences resulting from e.g. different climate conditions. In addition, by looking at the ratio of harvested biomass and productivity changes, the indicator provides a stringent indicator on land use efficiency/harvest efficiency.
We here present an integrated socio-ecological analysis of land use trajectories in New Zealand for the time between 1860 and 2005 based on the HANPP framework. In overall terms, HANPP levels in New Zealand are comparably high in international comparisons, and characterized by low land use efficiency, in particular in the more distant past. The HANPP analysis allows discerning four distinct phases of land-use change in New Zealand.
In the first observed period between 1860 and 1920 HANPP rose substantially from 35% to 53% of the potential Net Primary Production (NPP0). The main drivers lying behind this dramatic increase were the widespread deforestation process and the parallel expansion of agricultural land. Besides regional and global aspects such as trade relationships to Australia and Britain, the exploitation of kauri gum, and market prices for wool influenced these trajectories. Particularly the advent of refrigerated shipment in 1882 and the associated improvement in transport resulted in an acceleration of land conversion by enabling the long distance transport of frozen meat and dairy products. The widespread conversion of forest land into other land uses resulted in an increasing HANPP trajectory coupled to a high share of productivity losses and low land use efficiency. At the end of this period the deforestation process stagnated and came to an end following substantial reforestation measures after the introduction of the fourth Forests Act in 1921. The effect of this process is clearly visible in the trajectories of HANPP which dropped from its previous maximum of 53% to 31% of the potential NPP. This remained fairly constant until around 1950, however, being accompanied by a steadily increasing efficiency of land use. After 1950 New Zealand's land use system experienced a new phase of agricultural land expansion, in particular of artificial grassland, that continued until the early 1980's which caused HANPP to increase in this period from around 31% to 41.5% of NPP0 in 1981. Increasing governmental subsidies played an important role in order to protect New Zealand's economy from a number of external factors such as fluctuating prices, changes in target markets, or the energy crisis in the 1970's. The HANPP trajectories show a decreasing share of productivity

losses on total HANPP and increasing land use efficiency until the late 1960's. Interestingly thereafter both, the improvement of land use efficiency and reduction of productivity losses show a stagnating trend until the early 1980's hinting to the fact that further productivity gains could have been partly hampered by the high subsidization level. Since the mid 1980's, HANPP decreases, as a result of the increase in yields in agriculture.

In this paper, we discuss the land-use history of New Zealand by analyzing the interrelation between socio-economic dynamics and HANPP. Furthermore, we elaborate on the added value of the HANPP framework to analyze interrelations between socio-economic and political developments and the land use system.

The effect of forest proximity on biological control of pasture in Northwest Mato Grosso, Brazil: a cost-benefit analysis for land use policy

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ABSTRACT- This research aims to generate information for landowners and policymakers, to motivate them to take into account the value of the forest in agro ecosystems management in Northwest Mato Grosso. Pest control of pasture is analysed, as an important ecosystem service (ES) provided by the forest for a key economic activity in the municipality of Cotriguaçú. The value of biological control, and the criteria for maximizing it, will be assessed by the correlation between forest proximity and spittlebug (Homoptera: Cercopidae) infestation level on pastures, and its estimated economic loss. Different scenarios in terms of conservation strategies and better cost-efficiency will be generated from the estimated value of this ES with the opportunity cost of conserving the remaining forest.

As supporting and regulation ecosystem services are widely dependent on biological factors, agro ecosystems resilience depends on their biological integrity and diversity. In this way, agroecosystem and production stability could be augmented by increasing functional biodiversity (ALTIERI, 1999), and connectivity between forest fragments.
In the present context of weakening in environmental law at a national level in Brazil, due to revisions in the country's Forest Code, this research provides information for landowners and policymakers that may lead them to consider the value of the standing forest in agroecosystems management. In this way, this research could help in the impasse associated with local vs. global benefits of forest conservation, since farmers are not interested in conserving forest if it means loss of productive area, but if it can be shown they can gain from forest proximity to pasture, they may buy-in to a solution of global and local benefit.
In this sense, the study documents the local economic benefits associated with pest control provided to pastures by the forest. This is a key issue in Northwest Mato Grosso, since cattle ranching is a key economic activity in the region.
Spittlebugs (Homoptera, Cercopidae) are the primary pest affecting grasses in Tropical America. Their damage is caused by the suction of sap and the injection of salivary secretions in plant tissues by nymphs and, mainly, adults (VALERIO, 2009). As a result, there is a dramatic fall in pasture production and quality, so the grass loses support capacity. Degraded grasses are attacked more, especially when this degradation is related to degraded soils and water deficits (Ibid, 2009).
In this sense, the importance of Ecosystem Services provided by the forest to agriculture and cattle ranching is clear ? microclimatic and hydrologic regulation, nutrients cycling, erosion control, and other factors. Yet, farmers do not clearly perceive these benefits, and tend to seek chemical treatment or try burning pastures to rid themselves of the pest and to enhance productivity.
The large scale of damage caused by spittlebugs in Northwest Mato Grosso, the tendency of this damage to grow, related by local farmers and technicians, and the failure to control this pest ? by fire, pesticides, or fungus -, have generated a local demand for alternative control methods. That can be interpreted as the need for a guarantee of sustainable grass production.
Rather than finding ways to «kill more spittlebugs», or to develop spittlebug-resistant pastures,

it may be possible both to ensure healthy pastures, and to maintain spittlebug populations balanced in a food chain, which regulates their number through biological control (DRIESCHE, 2007). To make this possible, it is necessary to demonstrate to landowners and policymakers the value of ecosystem services provided by the forest to agroecosystems.

The value of biological control is assessed by the level of spittlebuginfestationachieved and estimated damage caused annually and the relationship of forest proximity to these variables. For this, we measured spittlebug nymphs´ and adults´ infestation level, on a set of five sample plots of one hectare -100 m x 100 m- in cattle ranching properties with different arrangements of forest or forest fragments andBrachiaria brizanthapastures. Each sample plot has 25 sample points, regularly established in a 25 x 25 meters web. Samplings were taken once a week for three weeks, during the wet season.

The nymphs´ infestation level was measured using a 25 cm x 25 cm wire square. It was fixed randomly on the floor, near each sample point, and the number of spittles ?where spittlebugs remain in groups during their nymph phases to avoid natural enemies and desiccation- was counted.The adults´ infestation level was measured using a sweeping net, doing 10 sweeping movements near each sample point (VALÉRIO, 2002).

The value of this ES is determined by relating the pasture infestation level data recorded in each plot - three of them with forest fragments inside or around the plot, and two without - to subsequent weight loss in meat production (derived from the literature), and then obtaining their associated economic losses.The economic analysis will consist of partial budgets of pasture management using conventional pesticides and biological control (forest proximity) to compare the relative net returns, incorporating opportunity costs and productivity benefits.

The possible correlation between forest proximity and pest infestation level will determine the criteria for maximizing biological pest control, which could generate a valuable tool for decision-making on landscape planning using tools such as MARXAN. Mosaic effect on infestation reduction could be multiplied across the landscape at a municipal or regional level to motivate broader land use management strategies, including forest fragment connectivity. In this sense, different scenarios, in terms of conservation strategies and better cost-efficiency, will be generated from the estimated value of ES using the opportunity cost of conserving the remaining forest.

This research aims to generate two kinds of effects: a more integrated, efficient, and ecologically balanced landscape planning, through training technicians and policymakers, and promoting a change in owner´s incentives to deforest. Instruments that could be brought to bear include extension and agro-environmental measures. Additional incentives could be derived through PES or REDD+ measures. The final result of this work is achievement of greater compatibility of ranching with biodiversity conservation within the productive landscape in one of the most threatened regions of the Amazon basin.

REFERENCES

ALTIERI, M.A., 1999. The ecological role of biodiversity in agroecosystems. Agriculture, Ecosystems and Environment 74. 19?31.

DRIESCHE, R.G.V., 2007. Control de plagas y malezas por enemigos naturales. The Forest Health Technology Enterprise Team (FHTET-USDA).

VALÉRIO, J.R., 2002. Monitoramento de espécies e de níveis populacionais de cigarrinhas-das-pastagens na região centro-norte do país. Embrapa Gado de Corte.

VALÉRIO, J.R., 2009. Cigarrinhas das pastagens. Campo Grande, MS. Embrapa Gado de Corte. Documentos/179.

Land Use Conflicts in Protected Agro-ecosystems: Exploring and Interpreting the Dynamics of Actors and Factors

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Summary
This paper emphasises that different land use conflicts can have the same consequences but their importance might be distinct and underlines that it is necessary to examine local economic, social and natural factors in order to understand the fundamental roots of problems. In the paper we argue that some of the factors and actors are more important than others depending on the context. Therefore this study tries to approach conflict cases from a different point of view to find answers related to the following: What are the factors of land use conflicts? Who are the key stakeholders? What is the socio-ecological dynamics of land use conflicts? This paper presents the findings of four case study areas that will illustrate how local constituencies for nature conservation in different protected agro-ecosystems in Hungary are trapped in conflicts.

Abstract

Exploring and understanding the causes of land use conflicts is a complicated undertaking. This is not only because nature is characterised by an intricate set of relationships with unknown effects, but human factors such as culture, social dynamics or economic circumstances make it difficult to pinpoint the causes of these conflicts (White et al, 2009). Nonetheless, many research studies seek to study conservation related land use conflicts and widen the knowledge related to this topic (Stoll-Kleemann, 2001 a, b; Young et al, 2007; Henle et al, 2008, Bergseng and Vatn, 2009).

Several factors (not only conservation and environmental-related conflicts) contribute to these land use conflicts. Our paper emphasises that different land use conflicts can have the same consequences but their importance might be distinct and underlines that, it is necessary to examine local economic, social and natural factors in order to understand the fundamental roots of problems. In the paper we argue that some of the factors and actors are more important than others depending on the context. Therefore this study tries to approach conflict cases from a different point of view to find answers for the following questions: What are the main factors of land use conflicts? Who are the key stakeholders behind the complex socio-ecological dynamics of land use conflicts? Why do some factors cause conflicts in one area and not cause problems in another one? How structural conditions of the agricultural governance, low level of trust of rural actors, and conservation interests contribute to land use conflicts?

Four case study areas will illustrate how local constituencies for nature conservation in different protected agro-ecosystems in Hungary create conflicts: two of them are National Parks and the other two are part of the landscape protection areas and High Nature Value areas (HNVA). However, nature protection has a notable status in all study areas and agricultural activities are significant as the income and subsistence of local communities are based on agriculture.

The same methodological steps were taken in all cases. First, desk research was performed to ground the study. Historical, ethnographic and landscape history was studied in order to get information about the cultural background and changes to landscape and agricultural practices. Second, semi-structured interviews were made with nature conservationists, farmers, mayors, agricultural experts and other locals to study their perceptions about nature, ecosystem services and land use conflicts. The interviews were analysed using text analysing software (NVivo). Third, in some cases other qualitative methods such as focus groups and quantitative methods such as questionnaires were applied to gain a deeper understanding of the local context. The analysis was focused on the roots of the ensuing conflicts in order to be able to compare the results of the four case studies.

According to the comparative analysis of the case study documentation, six factors emerged that

can cause or have the potential to cause conflicts. These are: (1) the perceivedconservation importance of the areawas important, as higher assumed conservation importance resulted in potentially higher levels of conflict related to the use of the land. Our empirical experiences showed that in the case of the two national park study areas, ?rség and Peszéradacs meadow, the situation related to the use of the forests/pastures is tense. In the other case studies the National Park Directorates pay less attention to these areas. (2)The quality and quantity of relationshipsbetween National Park Directorates and farmers and locals appears to determine the appearance of conflicts. It can be assumed that higher importance of a particular area for the National Park Directorate leads to closer and stronger, therefore better relationship between the Directorate and local stakeholders. Nonetheless, it was found that even everyday connections (that is usual in the areas of high conservation importance) are not necessarily enough for a good relationship. To create and maintain an appropriate relationship with farmers and land users, the personality of the rangers who are the representatives of the Directorates is a fundamental factor. Almost every conflict has (3)causes related to interests. Despite this fact, we found that in some cases different interests did not cause conflicts because areas with conflicting interests do not overlap geographically (Szatmár-Bereg), or the conflicting interests are settled through payment schemes such as agri-environmental subsidies (Hevesi Plain). However, there are some cases when agri-environmental subsidies are still not enough to decrease the tension between farmers and nature conservationists (Peszéradacs meadow). This can be traced back to the (4)agricultural opportunity costof the area. Our research shows that, despite the agri-environmental subsidies, conflicts appear more frequently in areas that have greater agricultural potential (Peszéradacs meadow) and therefore higher opportunity costs (Hevesi Plain). It can also be claimed that tensions amongst locals and the nature conservation body is strongly influenced by the (5)spatial and temporal utilisation of farmers livelihood. Our experiences showed that in the case of Kiskunság, the conflict is strengthened by the high profitability potential of the more intensive agricultural activity, which is restricteded by conservation rules. On the other hand, in the case of ?rség, where the primaríy aim of small-scale forest use is not to make profit but to sustain a particular culture of forestry practice, forest conservation regulations taken by the National Park Directorate do not cause conflicts with local small-scale foresters. Hence, this highlights that land use conflicts are also determined by (6)the sociological characteristics of the land usersthat relate to the culture and history of the community as well as economic or other social factors.

References:

Bergseng, B. , Vatn , A. 2009. Why protection of biodiversity creates conflict ? Some evidence from the Nordic countriesJournal of Forest Economics,Volume 15, Issue 3,147-165

Stoll-Kleemann, S. 2001a: Barriers to nature conservation in Germany: a model explaining opposition to protected areas. Journal of Environmental Psyshology 21.

Henle, K., Didier Alard, Jeremy Clitherow, Paul Cobb, Les Firbank, Tiiu Kull, Davy McCracken, Robin F.A. Moritz, Jari Niemelä, Michael Rebane, Dirk Wascher, Allan Watt, Juliette Young., 2008. Identifying and managing the conflicts between agriculture and biodiversity conservation in Europe?A review,Agriculture, Ecosystems & Environment,124 (1?2),60-71

Stoll-Kleemann, S. 2001a: Barriers to nature conservation in Germany: a model explaining opposition to protected areas. Journal of Environmental Psyshology 21. 1-17.

Stoll-Kleemann, S. 2001b., Reconciling Opposition to Protected Areas Management in Europe: The German Experience, Environment 43(5), 32-44.

White, R. M. Anke Fischer, Keith Marshall, Justin M.J. Travis, Thomas J. Webb, Salvatore di Falco, Steve M. Redpath, René van der Wal 2009. Developing an integrated conceptual framework to understand biodiversity conflicts. Land Use Policy 26, 242?253

Young, J., Caspian Richards, Anke Fischer, Lubos Halada, Tiiu Kull, Antoni Kuzniar, Urmas Tartes, Yordan Uzunov and Allan Watt 2007. Conflicts between Biodiversity Conservation and Human Activities in the Central and Eastern European Countries, Ambio 36 (7,) 2007, 545-550

Fragile Governance: Environmental Governance Under the Complexity and Uncertainty.

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Fragile Governanceis understood as novel interdisciplinary approach to addresses decision making under the complexity of governing processes and the uncertainty of external factors. We argue that multiple method approach methodology (Pottete, Janssen, Ostrom, 2010) is novel and suitable methodology for analysing and predicting behavioural changes under complexity and uncertainty and will demonstrate them on selected cases from European environmental governance varying from agro-enviro EU policies and local practices, to biodiversity protection and forest management to urban planning. Paper will address (i)complexity and institutional diversity, (ii)complexity, uncertainty and socio-ecological dynamics, (iii) complexity and new governance mechanisms. Presentation is introductory to the session Fragile Governance.

Management of External Shocks in Polycentric Urban Systems

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The concept of polycentricism and territorial governance has been broadly discussed in spatial planning as well as governance communities. Polycentric urban development in the EU brought high concentration of economic activities and population in urban spaces, efficient division of functions among the settlements, relatively territorially homogenous accessibility of services and working places for the population, but in the same time strong interdependences in urban systems. This led to the growing vulnerability of urban systems to external shocks (natural or human-made) often appearing locally but affecting the whole system. The combination of the concept of spatial-structural polycentricism and of the concept of multi-level polycentric governance seems to have high potential to offer proper solutions for the problems connecting with the management of external shocks providing flexible, adaptive and robust framework for efficient responses to external shocks and achievement of development sustainability of urban systems.

Agri-environmental measures and sustainability? GIS based institutional analyses of agri-environmental measures for protected areas in Slovenia

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The agri-environmental measures are in Slovenia considered to be a good tool for countryside stewardship in protected areas. For this purpose the Slovenian agri-environmental programme comprehends a separate group of measures, which are designed specifically for farmers farming within protected areas. In our research we wanted to test how efficient are there measures and how widely have the farmers adopted them. We analysed with use of GIS tools and data from Slovenian paying agency the situation in three protected areas located in different parts of the county. We analysed the five years development in agricultural land use according to the actual land use database of Ministry of Agriculture, the detailed land use of those farms that are officially registered in the register of agricultural holdings and are receiving financial support or any other agricultural measures. The results show that the agricultural holdings are considered small, cultivating the area up to 20 ha, divided in many small plots. The analysis of agricultural plant species cultivated showed that farmers mainly produce permanent grassland, followed by production of corn for animal feed. Within the possible measures, various sub-measures are being implemented, among which Sustainable rearing of domestic animals is the most common. The main reason for this is that the majority of farms in the Park area are oriented in livestock production. The analysis revealed that the following sub-measures are: Organic farming, Preservation of special grassland habitats, Greening of arable land, Extensive grassland maintenance, Preservation of crop rotation, Bird conservation in humid extensive meadows in Natura 2000 sites and Preservation of litter meadows. More than one sub-measure can be implemented in one agricultural land. xml:namespace prefix = o ns = "urn:schemas-microsoft-com:office:office" />
As the observed time span includes the programme change between the measures for the period 2004-2006 and the current period 2007-2013, we could also observe how the farmers reacted to the institutional changes. One of the most obvious was that individually they were trying to maximize their individual profits, by improving the possible use of their plots (i.e. turning meadows into arable fields), or re-cultivating the abandoned plots into wet meadows. On the other side also the process of extensification can be observed in cases where less intensive use brings the same or even additional payments as more intensive (i.e. turning fertilised meadows into wet meadows). These results suggest that designing agricultural policy and the protection of nature in the future, requires sector-oriented approach in order to encourage farmers to continue with environmentally appropriate farming practices and thus significantly contribute to the preservation of traditional cultural landscapes and biodiversity.
In the paper we plane further to discuss the institutional framework of designing the agri-environmental measures to support the nature protection in protected areas.

Local or Global Commons? Application of Framework for Analysing SES for Soil Biodiversity at EU Level.

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The key challenge of soil protection is to identify the most appropriate land management strategy in the face of agriculture driven land-use change. Traditionally soil socio-ecological systems (SES) such as pastures, forest land, conventional but also alternative crop systems represents local systems that have persisted for a long time adapting their rules in use to natural and social disturbances as well as to the broader economic, political and social systems in which they where embedded.
Globalisation however introduces a dimension of scale which affects the vulnerability of traditional SES systems to external disturbances. In particular traditional (long lasting) institutions are challenged by global market actors and global policies, and their institutions that are not embedded in local institutional arenas. In general, the market increases the vulnerability of SES as it demands the intense exploration of soil biodiversity ecosystem services. The probability that markets affect a new area is influenced by institutional structure, in particular the degree of compatibility between current and new rules, such as traditional local institutions of crop rotation and new national or supranational agriculture regulations and measures to support internal markets. In this paper we applied SES framework as novel tool to address long term sustainability of SES, in particularly when dealing with large scale governance systems and their interconnections within nested multilevel governance structures (Ostrom, 2009) and have been empirically confirmed as the tool to be able to identify potential variables of sustainability policies in numerous local studies (Ostrom, 2009).
Main findings are that national or international policy interventions into the traditional small-scale resource systems can increase adaptability to the global market, improve the economic situation of states, sectors and local actors in the short term, but often reduces the capacity of the traditional system to self organize and maintain economic and governance performance when subjected to internal and external disturbances such as economic crises as well as climate change.

Bache, I. and Flinders, M. 2004. Multi-level governance: conclusions and implications. In Multi-Level Governance, edited by Bache I, Flinders, M. 195?206. New York: Oxford University Press. Biermann, F., Abbott, K., Andresen, S.. Bäckstrand, K., Bernstein, S., Betsill, M. M., Bulkeley, H., Cashore, B., Clapp, J., Folke, C., Gupta, A., Gupta, J., Haas, P. M., Jordan, A., Kanie, N., Kluvánková-Oravská, T., Lebel, L., Liverman, D., Meadowcroft, J., Mitchell, R. B., Newell, P., Oberthür, S., Olsson, L., Pattberg, P., Sánchez-Rodríguez, R., Schroeder, H., Underdal, A., Camargo Vieira, S., Vogel, C., Young, O. R., Brock, A., and Zondervan, R.. 2012. Navigating the Anthropocene: Improving Earth System Governance. SCIENCE 16. VOL 335, 1306-1307, 10.1126/science.1217255. Janssen, M.A. and Ostrom, E. 2006 Empirically based, agent-based models. Ecology and Society 25.OSTROM, E., 2009. A General Framework for Analyzing Sustainability of Social-Ecological, Science 325, 419 (2009); DOI: 10.1126/ science.1172133Poteete, A. R., Janssen, M. A. and Ostrom, E. 2010. Working Together: Collective Action, the Commons, and Multiple Methods in Practice. Princeton, NJ: Princeton University Press.

Institutional Dynamics and Adaptive Governance towards maintaining Socio-Ecological Resilience (A case study from Shiretoko, Japan)

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Introduction

Conservation is now an issue of international concern. This is partly due to the development of a worldwide 'global commons' ethic, and because conservation is increasingly linked to international trade - either due to the growth in world-wide tourism or because rare biological and cultural commodities have an international market (Adger 2003, Pelling 2004). There are various environmental problems related to human activities, and the creation of protected areas such as national parks (NPs) is one solution for the conservation of nature and endangered species, or other aspects of human heritage. Many of these sites have links to tourism, as this is often seen as a mechanism to offset the costs of administering a site, as well as providing education.
Resilience is currently defined in the literature as the capacity of a system to absorb disturbance and re-organize while undergoing change so as to still retain essentially the same function, structure, identity and feedbacks (Walkeret al., 2004). Various works on resilience have focused on the capacity to absorb shocks and still maintain function (Berkes and Folke 1998, Berkeset al., 2003, Paavola and Adger, 2005; Hodgson, 2004, Anderieset al. 2006, Smit and Wandel, 2006, Galazet al., 2008). Applying this theory to tourism management practice could give a better solution to environmental problems caused by human impact. In recent years, community-based tourism concept as a tool for both conservation and development has been increasingly recognized (Jain and Triraganon 2003), in the context of development assistance. The emergence of community-based tourism can be placed in terms of two developments: first, recent worldwide activities promoting sustainable and responsible forms of tourism; and second, the emergence of alternative approaches to protected area management and conservation efforts that link biodiversity conservation with local community development.

The socio-ecological system (SES) include societal (human) and ecological (biophysical) subsystems in mutual interactions (Gallopin, 1991). SES concept places humans within nature and focuses on the way in which interconnections between people and their biophysical contexts produce complex adaptive systems. Complex adaptive systems are nonlinear, meaning that a given cause ? often resulting from a complex chain of biophysical and human interactions ? can produce a disproportionate effect. The nonlinearity of complex system processes makes predicting the outcomes of reorganization difficult from both scientific and decision-making points of view. (Carpenteret al. 2001).

This study is based on the theory of Socio-Ecological Resilience with ambitions to contribute to the modern protection of biodiversity, particularly social aspects and governance. Case study from Japan as a highly economic developed country, though with problems in natural tourism management.

Aims and Objectives

The general aim of the dissertation thesis is to employ the theory of socio-ecological resilience to explore socio-ecological dynamics, in particular to suggest institutional changes to make existing governance system of protected area adaptive to the societal challenges such as tourism.
The specific aim of the research includes:
1. Building on the theory of socio-ecological resilience and evaluating and suggesting mechanisms for managing the potential environmental and economic conflicts between ecosystem and tourism;
2. Suggesting ultimately possible governance strategies on natural resource management that can improve the present situation in the provided case study in Japan.
3. Assessing the extent of participation of multi-level actors including local and indigenous people.

The specific objective of the research was to:
(i) determine how resilience/adaptive capacity is promoted in particular Shiretoko region

through increased rural tourism after the accessing National Park to World Heritage Site, (ii) contribute to the understanding the participation process and its strategy for a wider framework.

Based on these assumptions of the study, we will analyze how accession from National Park to World Heritage Site influenced the economical, societal environmental change in this area and whether there was a communication and linkage between different level of actors to promote sustainable rural tourism.

Methodology

The study has been done with a case study approach based on a combination of secondary and primary data. First, the theoretical foundations of human nature relationships and socio-ecological resilience, adaptive governance on protected areas and tourism will be presented through the study of related literature. To assess the impact on the SES interview work was done in Shiretoko National Park which was also designated a World Heritage Site (WHS) in 2005. A semi-structured interview guideline was used to interview multi-level actors who are related to park management. In summer 2010, the interview work was conducted at the central government in Tokyo, local governmental office in Sapporo and in the new World Heritage Site, Shiretoko, to assess the impact on the SES after the area was designated as a National Park and later as a World Heritage Site. The total number of interview respondents was twenty five including employees at central government, municipalities, local park authorities, local fishermen/tourism association, and indigenous people in the Shiretoko Area.

The land above, within, and below: the evolving complexity of landscapes and common pool resources?

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The last two decades continued to witness environmental change at unsustainable rates. National governments (and public policy) have faced the challenge of ensuring ways to use natural resources consistent with mitigation of climate change and preservation of biodiversity and simultaneously promote economic growth through globalization of resource chains. Although local populations are often threatened by the expansion of economic interests, they have also claimed for political recognition through global environmental agendas. As a consequence, a myriad of new types of institutional arrangements related to common pool resources have been put in place involving indigenous and conservation territories, carbon storage contracts such as REDD+, and concessions of land and resource use to expanding agropastoral and mining industries. New forms of property systems, in some cases particular to different components of natural resources, are being created in ways that overlap contrasting economic and social interests. Using examples from the Brazilian Amazon, including historical mapping of overlapping institutional arrangements, we show how these processes are leading to a complex social-territorial matrix whereas land and common pool resources represent at the same time symbols of local cultural identity and territorial rights, global agendas of conservation and climate change mitigation, and the economic frontier of global resource chains. To represent these evolving matrix of institutional, economic, and symbolic intersections, we use the metaphor of the ?land above, within, and below'. We discuss the implications of these processes for long-term management of common pool resource and for research on institutions and environment. This includes paying more attention to the role of human values and views of the environment, the increasing sensitivity of identity politics, and the limitation of segmented institutional arrangements to deal with cross-scale problems associated with common pool resources.

Role-playing games to assess the external validity of experimental economics

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During the last decade, field experiments regarding the study of common pool resource governance have been
performed that replicated earlier findings of laboratory experiments. One of the questions is how the
decisions made by participants in rural communities are influenced by their experience. This paper presents
the results of field experiments in Colombia and Thailand on fishery, forestry and water resources. The main question is the question of external validity. Is the behaviour of players during the experiments related to their decisions in relaity? To explore this question we have conducted role-playing games with the stakeholders. They modified the settings of the experiments to make it closer to reality. We discuss the results of this test done at the different places. The role-playing games give indications on the external validity of experimental economics.

Roundtable - A New Science of Governance for the New Age

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Roundtable in the context of the ESEE/RIODD Special Session "Common-Pool Resources and Social-Ecological Systems (in memory of Elinor Ostrom)".

Capitalism and sustainability

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We live in the period of global insecurity and uncertainty that is probably unprecedented in human history: the feeling of economic insecurity brought by globalization, political insecurity as a consequence of international terrorism, and uncertainty about the potential consequences of global warming as well as depletion of natural resources and conventional oil reserves. All these challenges lead both the academic community and the general public to question the capacity of capitalist societies to successfully deal with them. xml:namespace prefix = o ns = "urn:schemas-microsoft-com:office:office" />

We address the theme of the future of capitalism from the viewpoint of systems science, bringing together notions and concepts from the natural and social sciences, in particular the subsumptive hierarchy (Salthe 1993) and the naturalist developmental framework. The most probable future is constrained by the accumulation of historical constraints and, therefore, it is based on the extant variety of capitalist societies. We look at the key institutional traits of the capitalist society: ownership of the means of production, freedom of enterprise, markets, and profit and discuss how far these may change in the future. Next, we look at energy use and economic growth in the context of critical natural constraints that impinge on the capitalist development process. According to Maximum Entropy Production Principle, we conjecture that among different variants of capitalist societies, the one will most likely prevail which will be able to dissipate solar energy at the highest rate. Because of the energetic and ecological limits of the earth, unbounded economic growth is impossible and the capitalist system is likely to follow the developmental stages of other complex natural systems: immaturity, maturity and senescence.

A theoretical road map for desirable changes during the developmental stages of capitalism beyond growth can be drawn in broad lines and for different time scales. In the short term, which deals with socioeconomic aspects only, Chang (2012) presented an open and constructive critique of the current state of capitalism and proposed a set of policies which should make it socially more just and economically more rational than it presently is. His institutional reforms may allow global capitalism to adjust to the early mature phase without large-scale social upheavals. In the medium term perspective, referring to the entire mature phase of capitalist development, there are institutional reforms which aim to deal with energy and environmental adaptations including global warming, ecological restoration, population stabilization, and poverty as proposed by Victor (2008), Jackson (2009) and Brown (2011). In the long term, for the senescent phase of capitalist development, which concerns its material and energetic shrinking, Odum and Odum (2001) devised a systemic set of principles and polices that should prevent «hard landing». Finally, a distant future that concerns reorganization of the capitalist system and, afterwards, a new phase of growth and development, invokes the evolutionary perspective and is thus inherently unpredictable.

We conjecture that countries that industrialized first have already entered the mature stage based on stagnating or even declining per capita energy use. We emphasize local provisory improvements and «evolutionary tinkering» in the gradual process of institutional transformation of capitalist societies in its mature and senescent stages.

The Growth Paradigm: Its intellectual history and current travails

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ABSTRACT

This paper belongs to line of research in which I am currently engaged, the focus of which is upon the evolution and nature of the ?growth paradigm.' By growth paradigm I refer to the proposition that economic growth is good, imperative, essentially limitless, and the principal remedy for a range of economic and social problems. The project is being supported by a British Academy Mid-Career Fellowship, under the title «Economic growth as ideology: The origins, evolution and current travails of the ?growth paradigm.'»

The paper begins with a brief survey of pre-modern theorisations of economic growth, highlighting the work of Ibn Khaldun. It next discusses the simultaneity of what Nicholas Xenos calls «the invention of scarcity» in late eighteenth century Western Europe and the process of redefining human needs and desire that formed the backdrop for the ?take-off' of the growth paradigm in the works of the classical political economists.

The middle section of the paper discusses the ideological character of the growth paradigm. Growth, I argue, ranks alongside nationalism as a means of ideological mystification, whereby particular interests are presented as the general interest, and subaltern classes are incorporated within the hegemonic project of capital. While much attention has been devoted to the ideological effects and functioning of nationalism, however, the ideological role of growth has been neglected. Although space does not permit a substantial discussion of this, the paper will advance some central contentions. Firstly, growth serves as an idealised refiguration of capitalist social relations. It serves to naturalise and justify the prevailing social order. Even its vocabulary is in this respect revealing. Discussion of the economic by way of biological analogy implies continuity (gradual change), and unity (it is the «social whole» that grows). When represented through the discourse of growth, the interests of capital come to be identified with the common good, because the profitability of capital?given the monopolisation of the means of production by the capitalist class?appears as a necessary condition for the satisfaction of all other interests. Without profitable enterprises there will be no investment, no employment, no taxation, and no money for workers to pursue their goals. When growth accelerates, therefore, the changes ramify throughout society: consumers look to growth because it means more goods and services available in markets; workers see growing job opportunities and rising incomes; public agencies receive more money from increased sales and income tax revenue to pay for police, schools, and roads; nonprofits receive more donations and grants from rising incomes; bank loans are repaid; and, most importantly, investors' profits are realised. Conversely, when growth turns to contraction, trepidation is felt by all. If profits cannot be made, capital refuses to employ additional workers and fiercely resists wage rises; the public are therefore motivated to support political parties and actors that promise to increase growth, in the hope of achieving higher remuneration?the material compensation for labour and symbol of social recognition. In this way the growth paradigm?the idea that continuous economic growth is society's central and overriding goal?provides ideological cover for what is the central goal of capitalist production: the self-expansion of capital. In this way, the growth fetish operates as commodity fetishism at one remove. Economic growth, although the result of social relations between people, assumes the appearance of an objective necessity and imperative injunction. It is assumed to be essential, the lifeblood of our society. It comes to stand for what our society is and does.

In its final section, the paper turns to contemporary implications and debates, taking South Korea's «Green Growth» strategy as a case study of the attempt to «square the circle»?to reconcile the environmental critique of growth with the growth paradigm. The concept ?Green Growth'

gained prominence in 2005 when the United Nations Ministerial Conference on Environment and Development in Asia and the Pacific was held in Seoul under the auspices of the UN Economic and Social Commission for Asia and the Pacific (ESCAP). At this juncture, the government of South Korea picked green growth as its national development paradigm and has since, under the presidency of Lee Myung-bak, pioneered the global spread of the idea. South Korea's response to the global financial crisis of 2008 was a fiscal stimulus, 80% of which was dedicated to «green growth» projects. The paper briefly discusses what this has entailed: principally, a ramping up of nuclear energy, and the reinvention of unpopular «Pan Korea Grand Waterway» as the «Four Major Rivers Restoration Project.» The Four Rivers Project centres on the concretisation of waterways for purposes of flood control and drought prevention?ostensibly as an adaptation to climate change. Also deserving of mention is the «high-carbon» construction of so-called «green cities» such as Songdo.

My previous research in the field of ecological economic theory has borne fruit in the form of three journal articles:
(1) ?Adam Smith's Green Thumb and Malthus' Three Horsemen: Cautionary tales from classical political economy,' Journal of Economic Issues, Vol.46 No.4, 2012, pp.859-879.
(2) ?Critiques of growth in classical political economy: John Stuart Mill's stationary state and a Marxian response,' New Political Economy, Vol. 18, Issue 4, September 2013 (online version available from 2012).
(3) ?The Growth Paradigm: A Critique,' International Socialism, Issue 134, 2012, pp.55-88.

It has also resulted in invited lectures on the political economy of climate change (to Members of the European Parliament GUE-NGL grouping); on South Korea's ?green growth' strategy (Institute of Asia Pacific Studies, University of Nottingham), on the ?growth paradigm' (Korea University, Seoul; New Economics Foundation, London; Res Publica, Oslo; Tallinn University of Technology; Katholieke Universiteit Leuven; University of Sheffield), on Karl Polanyi's political economy of nature (European University Institute, Florence; Université catholique de Louvain), as well as a conference paper on John Stuart Mill's ?stationary state' (at the joint conference of WAPE, AESA, and IIPPE, Paris).

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Criticism of economic growth as phenomenon, structure and ideology: A comparative analysis of contemporary degrowth classics

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The degrowth concept has powerfully fuelled the renaissance of the criticism of un-checked economic growth. Earlier debates on the volume of material production and consumption in the economy are rather well-established. As the pro-and-con Malthus discussion was focused on the discrepancy of the growth rates of population and food production and theLimits to Growthdebate was focused on resource scarcity, the current wave of the degrowth debate is more grounded on emissions affecting climate change as well as the difference between economic and overall well-being.

The purpose of this paper is to analyze the thematics of the contemporary classics of the expanding degrowth literature. What kind of themes can be distilled from the central publications? How is economic growth perceived and in which ways is economic growth criticized? Three highly discussed books are compared through a qualitative conceptual analysis: Peter Victor's ? Managing without growth: Slower by design, not disaster', Serge Latouche's 'Farewell to Growth' and Tim Jackson's'Prosperity without growth: Economics for a finite planet'.

The conceptual analysis reveals three central themes in the criticism of economic growth: 1) Growth as a phenomenon, which focuses on the forms and impacts of growth and degrowth; 2) Growth as structure, which focuses on the institutional dependence on growth and required institutional change for degrowth; 3)Growth as ideology, which focuses on economic growth as an overwhelming political goal above other goals and the need to emancipation.

Growth as phenomenon

Although economic growth is criticized in the three books, they surprisingly little deal with economic growth itself. Rather, all authors focus on the prerequisites and consequencies of economic growth. Latouche discusses environmental problems on a general level, using a comprehensive term ?environmental crisis'. Jackson and Victor emphasize climate change and climate policy and use a set of indicators to prove their case. They both refer to absolute decoupling as a myth, an unattainable technological dream in the light of past improvement rates in eco-efficiency. They consider eco-efficiency alone to be an insufficient solution to environmental problems. Victor also discusses whether some good performance in ecological indicators is more apparent than real, as production and environmental problems are externalised from Europe to the xml:namespace prefix = st1 ns = "urn:schemas-microsoft-com:office:smarttags" />Third World.

Jackson and Victor also focus on the social effects of economic growth. They come to the conclusion that economic growth has long since stopped from increasing the wellbeing and happiness of western people. However, they believe that non-western countries would still benefit from economic growth. Latouche, instead, encourages the people in the Third World to create and strive for their own visions of success and wellbeing, whether or not these visions are growth related.

None of the three authors condemn all growth. They support the idea of downsizing areas of economic activity that are negative for the wellbeing of humans and nature while sustaining or

even growing the positive ones. Thus, they promote the principle of selectivity. Unfortunately this alternative is not described very clearly. Which activity is good and which is bad? What will happen when the bad ones will be reduced? Are the good ones actually functional substitutes for the bad ones?

Growth as structure

All three authors state that modern societies are filled with institutions based on economic growth ? either requiring or boosting growth. They describe this dynamics as «a vicious cycle », «a treadmill» and «an iron cage». Especially Jackson's book deals with the basic macroeconomic relation between technical development and employment. Victor adds a third piece to this puzzle: public welfare services. Increasing productivity due to technical development requires economic growth in order to prevent a further rise in unemployment and to gain funding for public welfare and salary raises. As workers need to work harder and longer, increased salaries are perhaps not worth the effort anymore in situations where the employees are already well-off. Leisure time becomes an increasingly scarce resource and could be much more valuable than a salary raise.

A simple solution could be shorter working hours in order to decrease unemployment. This would decrease salaries but increase leisure time. According to Victor, this could result in withdrawing international investments and trade from a country using such a strategy.

Latouche and Jackson bring the same structure to the private firm and consumer level ? if consumers get loans for consumption easily, they are hooked to work more in order to pay back in the future. The vicious circle in growth generation is ready. Jackson also describes the social logic of consumption: a whole set of cultural practices that sustain economic growth.

Growth as ideology

The authors also describe economic growth as an unquestioned ideology canonised in various discourses guiding daily practices. Economic growth has transformed from a means into an end. They use terms as ?growth thinking', ?growth logic', growth as ?fundamental value', ?growth mania' and ?growth fetish' when describing growth as ideology. This is not only mainstream thinking but an overwhelming hegemony that unites political parties from left to right, as Latouche notes. Economic sustainability is almost universally defined as economic growth. According to Jackson, degrowth activists receive only marginal attention and are usually labelled as ?grazy, idealistic and revolutionary' people.

The authors aim to show that economic growth is just as crazy and idealistic, and in that way attempt to undermine its hegemonic position. We think that the first part of proving growth religion as an ideology is much easier than the latter part of weakening its power. After all, the three books succeed better in describing the growth logic, even if in an unfavourable light, than in building a tangible alternative for it.

Summary and discussion

All three books deal with all three themes, but growth as phenomenon is the strongest theme in Victor's book, whereas growth as structure is the strongest theme in Jackson's book and growth as ideology in Latouche's book.

The question of pro-growth or degrowth is not only about facts but also the interpretation of the facts of the past. Envisioning a sustainable future is even more interpretative task and therefore discussion of growth as phenomenon is never just about getting the facts right. Its is not about the facts but the relation of the facts. The same facts and even the same values may lead to different strategies if the theory of the function of the society is different. To our understanding both growth promoters and growth critics should more clearly describe the alleged mechanisms in which economic growth or degrowth actually does affect the quality of the environment.

Instead of striving for overall economic growth, all three books make a case for more precisely defined social and ecological goals. The authors argue that if these goals are met, it should not

matter whether the size of the economy grows or diminishes. So, in the light of these books degrowth is actually not about continually downsizing the economy. It stands for ignoring the size of the economy. Ironically or tragically, it is unclear whether this message is heard, since the main focus of the books is on economic growth.

Río +20 in Perspective: From the Limits to Growth to the Green Economy

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According to recent scientific reports, more than 60% of ecosystem services are declining worldwide, biodiversity loss remains unabated, and human pressure on the ecological limits has reached a scale where large-sacle global environmental disruption can no longer be excluded. That planetary health keeps worsening half a century since the emergence of modern environmentalism and after four decades of global environmental governance, suggests that something is failing at the very core of international environmental policy. The recent celebration of the 2012 United Nations Conference on the Environment (known as Río +20) offers a timely occasion for such a reflection. In this light, the aim of this paper is to draw on the experience of four decades of global environmental governance to make an inquiry into the ultimate causes underlying a major environmental paradox of our time, namely, the persistence of declining trends in global ecological health in an era where the ?green', the ?ecological', and the ?sustainable' have become ubiquitous notions in social, cultural, and economic life. Our analysis is based on a chronological review of the major global environmental policy events in the last four decades, from the Stockholm 1972 Conference and the publication of Club of Rome'sLimits to growth, to the celebration of Rio+20 and the emergence of thegreen economy(UNEP, 2011) as new leading concept for global sustainability policy.

The publication of the Club of Rome report Limits to growth (Meadows, 1971) challenged widespread assumptions in mainstream economic thinking regarding the possibility of perpetual economic growth as the environmental problems from the clash with biophysical limits became more apparent. The report alerted of the inposibility of perpetual growth in population and production in a finit planet. Cumulative growth in population and economic size, the report stated, would only be feasible during a transitory period. The philosophy ofLimmits to growthand the calls for a structural change in the mode of production of industrial societies was picked up in the Stockholm Declaration, which synthesized the conclusions from the summit held in 1972, in order to address the major problems associated to global ecological crises.

In 1987, the United Nations' World Commission on Development and the Environment presented the reportOur common future, more widely known as theBruntland report, coining the official definition of the concept sustainable development. Five years later, the concept was launched at the Rio 1992 summit, spreading it beyond academic and specialized circles to the broader public arena. The release of sustainable development as new guiding notion for environmental policy and governance was accompanied by a reframing of the culprits underlying the global ecological crises. According to the Bruntland report, the core of the problem did not lie in the opulence of developed countries, but in the poverty that plaged many countries of the world. In line with Inglehart's ?post materialist' thesis, poverty was seen as a major obstacle for the development of an environmentalist consciousness and lack of growth prevented those countries from investing in green technologies. In this manner, the notion of sustainable development displaced the focus of the sustinability problem to the poverty that prevailed in so-called underdeveloped countries. Economic growth was freed of the stigma that had plagued during the previous decade and was now reframed as necessary step towards the solution to environmental problems. There was no necessarily a trade-off between economic growth and environmental sustainability. The pro-growth approach of the Bruntland Report was ratified some years later in the Río declaration (principle 12), which claimed for the need of ?an open international system that promoted economic growth and sustainable development in all countries'.

The change in scope and tone in environmental policy was ratified in the summits of Río 1992, Istanbul 1996 and specially Johannesbourg 2002, after which the lack of political support for any serious attempt to reconvert the economic metabolism of the industrial society became evident. Whereas in Stockholm 1972 environmental decline was explicitly linked to resource extraction and existing relations of economic exploitation ? thereby including political demands explicitly-, the declaration of Río 1992 shifted the focus towards the need to preserve environmental quality through legislation and market instruments; whereas in 1972 a detailed

enumeration was provided of the biotic and physical resources that should be preserved, in 1992 the focus shifted to the more abstract notion of ?sustainable development'; and, most importantly, whereas in 1972 the need to address the ecological crises was presented as araisson d'Etat, presenting governments as the main actors with the responsibility to guarantee the required economic transformation to achieve environmental sustainability using all means for territorial and resource planning, the 1992 declaration shifts the focus towards environmental impact assessments and economic instruments, highlighting the role of the private initiative (corporations and NGOs) in the navigation towards sustainable development. The role of the state is pushed to the background and to the last of the administration levels ?the municipalities- through the Agenda 21.

In June 2012, the United Nations Conference for Sustainable Development, more widely known as Río+20. Although it finally played a more secondary role than had been expected, the notion of green economy was supposed to play a central role as a guiding framework of the multilateral discussions of the summit. With this purpose, prior to the summit UNEP prepared a document entitled ?Towards a green economy: Pathways for sustainable development and eradication of poverty'. The working definition provided in the UNEP report defines a green economy ?as one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities'. As in sustainable development, the logic of growth remains unchallenged in the green economy and no conflict between growth and environmental conservation is acknowledged: «the key aim for a transition to a green economy is to eliminate the trade-offs between economic growth and investment and gains in environmental quality and social inclusiveness» (UNEP, 2011). Natural capital is conceptualized as a ?critical economic asset' and the document offers practical information for decision makers about the reforms required to liberate all its potential for production and labor creation in a green economy. In consonance with the pro-growth approach of sustainable development, the report states that ? there is a generalized myth in relation to an alleged unavoidable conflict between environmental sustainability and economic progress' (UNEP, 2011: 16).

In the Rio+20 final declaration, advocacy for economic growth and free trade is reaffirmed. Article 4 states ?We also reaffirm the need to achieve sustainable development by: promoting sustained, inclusive and equitable economic growth'. The need for sustained economic growth is then recalled in 22 other articles of the declaration. Article 281 states ?We reaffirm that international trade is an engine for development and sustained economic growth, and also reaffirm the critical role that [...] meaningful trade liberalization, can play in stimulating economic growth and development worldwide. Meanwhile the «economic roots of ecological decline» are still enjoying good health.

Intergovernmental fiscal transfers to support local conservation action in Europe

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Against the backdrop of an alarming rate of biodiversity loss and ecosystem degradation, the CBD strategic plan for biodiversity 2011-2020 calls for further development of positive incentives for biodiversity conservation and the mobilization of financial resources for effectively implementing biodiversity targets. One of the focal areas of further conservation action is the local level. However, the strategic plan also acknowledges the fiscal needs of sub-national governments, cities and other local authorities accompanied with further conservation action (CBD, 2010).

In Europe, Natura 2000, a network of nature protection areas established under the Habitats Directive, is the centrepiece of nature protection and biodiversity policy. The aim of the network is to assure the long-term survival of Europe's most valuable and threatened species and habitats. Decisions about where conservation areas are to be sited are frequently taken at higher levels of government, even though the costs of losing those areas for other social and income-generating developments are borne by the local governments and communities. Hence, there is an emerging rationale for ecological fiscal transfers as an innovative instrument to provide incentives for local governments to support and maintain the quality of water and nature conservation areas within their territories but also to provide wider ecological benefits beyond municipal boundaries.

Under fiscal transfer schemes, public revenue is redistributed through transfers from national and sub-national governments to local governments. Ecological fiscal transfers are allocated on the basis of ecological or conservation-based indicators, such as protected areas (see e.g. Ring et al., 2011). Transfers may be either lump-sum or in the form of specific-purpose transfers. The latter earmarked transfers have been used more commonly in intergovernmental fiscal relations in many countries, especially for end-of-the-pipe and infrastructure-related ecological public functions such as sewage and waste disposal.

In developing and transition countries, about 60% of sub-national public expenditure is financed by intergovernmental fiscal transfer schemes, in non-Nordic Europe and Nordic OECD countries they still account for 46% and 29%, respectively (Shah, 2007). Ecological fiscal reform and ? getting the prices right' as important corner stones of a green economy and sustainable development also require appropriate conservation indicators, next to the traditionally used economic and social indicators, for redistributing tax monies to lower levels of government.

More than twenty years ago, Brazil was the first country to introduce ecological fiscal transfers (ICMS Ecológico) in a number of states to compensate municipalities for land-use restrictions imposed by protected areas (see May et al., 2002; Ring, 2008b). Although the instrument was designed to compensate municipalities for opportunity cost encountered with existing protected areas, it developed into an incentive to engage in the management of existing protected areas and to designate or support new ones. This exemplifies the fact that a combination of regulation and economic instruments capable of offsetting the costs associated with protected areas is required; such linking creates synergies and enables spillover benefits generated to be internalised. Since ecological fiscal transfers explicitly address public actors, i.e. governments at different governmental levels and related public authorities, they complement programmes and schemes that primarily address land users and thus, private actors in their conservation costs, through e.g., payments for ecosystem services (PES).

More recently, Portugal has introduced protected areas (Natura 2000 and nationally protected areas) as an indicator to redistribute tax revenues from the national to the local level as part of a new Local Finances Law as of January 2007 (Santos et al., 2012). France considered introducing

a similar scheme about a decade ago, but then opted to just compensate municipalities lying within national parks, a protected area category with considerable land-use restrictions.
Ecological fiscal transfers offer a wide range of options to take account of global pressures on biodiversity while considering distributive equity and empowering local communities with the financial resources needed to address conservation challenges. In most schemes, just the protected area coverage as a quantitative indicator is used. In Brazil, the different categories of protected areas are further multiplied by a conservation factor or weight, reflecting the varying land-use restrictions associated with, for example, strictly protected or sustainable use areas (Ring et al., 2011). Some Brazilian states, such as Paraná and Minas Gerais, have additionally introduced a quality indicator into relevant legislation, but only Paraná has thus far rigorously implemented this quality indicator. In Portugal, transfers per hectare protected area are higher, if protected area coverage in relation to municipal area is beyond 70 % (Santos et al., 2012).
The choice of indicators will also impact on the costs of policy implementation. The total costs of conservation policies may be divided into production costs for actual conservation measures and transactions costs. Transaction costs may again be subdivided into implementation costs and decision-making costs (see Birner and Wittmer, 2004). Productions costs do not apply to ecological fiscal transfers, if the aim of the instrument is to compensate for opportunity costs only. Transaction costs of ecological fiscal transfers are comparatively low, because they do not require new institutions or a new bureaucracy as it builds on existing administrative procedures. This is not true for the implementation of qualitative indicators, which requires field validation of protected area management quality and relevance to local sustainable development. However, the effectiveness of ecological fiscal transfers is far greater with implementation of these quality parameters.
In Europe to date only Portugal and France (to some extent) have implemented fiscal transfers as a mean for encouraging local biodiversity conservation. In a number of other European countries, e.g. Germany and Switzerland, such transfers have been proposed, and potential consequences partly modelled (see Köllner et al., 2002; Ring, 2002, 2008a). In other European member states, such as Poland, municipalities are faced with new responsibilities regarding Natura 2000 implementation and management while lacking the relevant financial resources. In the latter case, ecological fiscal transfers would represent a suitable instrument to account for the financial needs of localities. We classify the approaches on a gradient covering the dimensions of 1) the existing fiscal transfers system, 2) indicators used or proposed and 3) the stage of these schemes in the policy cycle. Based on this gradient and the experiences gathered so far, a step-wise approach is developed to derive recommendations on how to successfully design and implement ecological indicators into existing fiscal transfer schemes.

Literature

Birner, R., Wittmer, H., 2004. On the "efficient boundaries of the state": The contribution of transaction-costs economics to the analysis of decentralization and devolution in natural resource management. Environment and Planning C: Government and Policy 22, 667-685.
CBD, 2010. Decision adopted by the Conference of the parties to the Convention on Biological Diversity at its tenth meeting: X/22. Plan of Action on Subnational Governments, Cities and Other Local Authorities for Biodiversity.
Köllner, T., Schelske, O., Seidl, I., 2002. Integrating biodiversity into intergovernmental fiscal transfers based on cantonal benchmarking: a Swiss case study. Basic and Applied Ecology 3, 381-391.
May, P.H., Veiga Neto, F., Denardin, V., Loureiro, W., 2002. Using fiscal instruments to encourage conservation: Municipal responses to the ?ecological' value-added tax in Paraná and Minas Gerais, Brazil, in: Pagiola, S., Bishop, J., Landell-Mills, N. (Eds.), Selling Forest Environmental Services: Market-based Mechanisms for Conservation and Development. Earthscan, London, pp. 173-199.
Ring, I., 2002. Ecological public functions and fiscal equalisation at the local level in Germany. Ecological Economics 42, 415-427.
Ring, I., 2008a. Compensating Municipalities for Protected Areas: Fiscal Transfers for Biodiversity Conservation in Saxony, Germany. GAIA - Ecological Perspectives for Science and Society 17, 143-151.
Ring, I., 2008b. Integrating local ecological services into intergovernmental fiscal transfers: The case of the ecological ICMS in Brazil. Land Use Policy 25, 485-497.
Ring, I., May, P.H., Loureiro, W., Santos, R., Antunes, P., Clemente, P., 2011. Ecological Fiscal Transfers, in: Ring, I., Schröter-Schlaack, C. (Eds.), Instrument Mixes for Biodiversity Policies. POLICYMIX Report Issue No. 2/2011. Helmholtz Centre for Environmental Research - UFZ, Leipzig, pp. 98-118.

Santos, R., Ring, I., Antunes, P., Clemente, P., 2012. Fiscal transfers for biodiversity conservation: The Portuguese Local Finances Law. Land Use Policy 29, 261-273.

Shah, A., 2007. A Practitioner's Guide to Intergovernmental fiscal transfers, in: Boadway, R., Shah, A. (Eds.), Intergovernmental Fiscal Transfers: Principles and Practices. The World Bank, Washington, DC, pp. 1-53.

International Payments for Ecosystem Services and agriculture-driven biodiversity loss in Central Kenya

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Summary
Land use change due to agricultural production represents a major drivers of global biodiversity loss. This study investigates the potential of levying compensation payments on agricultural commodities to internalize the cost of biodiversity protection into product prices. The method links landscape level conservation costs (e.g. through PES) with compensation payments on agricultural products. A case study of agricultural production in central Kenya is presented, with biodiversity data on plants, birds and mammals combined with economic cost data to prioritize sites for conservation. Costs are then levied on agricultural land based on intensity of use and area share in the region. The paper discusses the potential for application in the context of both domestic and international consumption (i.e. International Payments for Ecosystem Services).

Abstract
The environmental externalities framework posits that markets may fail because they do not adequately price impacts to society and the environment, such as the loss of biodiversity and ecosystem services driven by land and water use in agriculture. Global patterns of agricultural production, consumption, and biodiversity are skewed. Richer, northern countries ? of low relative biodiversity value ? predominantly consume, while poorer, southern nations ? of high relative biodiversity value ? predominantly produce. Life Cycle Assessments of agricultural products show that the majority of biodiversity impacts occur during the production phase due to land use change and intensification. Because international trade displaces the point of production from the point of consumption, external costs are often levied upon poor, producing nations with the lowest capacity to afford them. This study investigates the potential of environmental taxes or product premiums on agricultural commodities for internalizing such costs.

The paper presents a methodology developed through a case study of conservation and land use in Central Kenya, a major exporter of globally traded agricultural commodities including flowers, tea and coffee. The case study region encompasses the Aberdares Range and Mount Kenya, two of the countries most biodiversity mountain ecosystems and sources of freshwater. This region is also one of the most intensively populated and farmed in the country, resulting in an intense conflict between biodiversity protection and land availability for agriculture. We use data on the plants, mammals and birds to map patterns of species richness and compositional turnover in the case study region. Plant biodiversity is modelled and mapped using a dataset of almost 2000 réleves (study plots) scattered across the study region with associated species inventory information. Bird data is derived from Birdlife International range maps combined with expert interviews on habitat suitability for species of conservation concern. A recent mammal species distribution database (IUCN Global Mammal Assessment) is used to map patterns of mammal diversity in the case study region. Biodiversity data is combined to highlight regions of exceptional diversity, threat and poor/absent protection status, and conservation targets are set based on regional interviews and literature accounts on a species-by-species level or a community based assessment (for plants).

This biodiversity data is complemented by economic costs data comprising opportunity costs derived from literature accounts and interviews of over 300 households in the region, conducted in January 2012. Management costs and ecotourism benefits are derived from literature data and interviews with regional conservation organizations, with land prices derived from the literature. Biodiversity benefits and conservation costs are combined using the Zonation conservation prioritization software. Zonation is a GIS based software that ranks cells across a landscape according to their marginal importance for conserving biodiversity combined with a number of co-considerations such as economic cost, or ecological integrity.

Different conservation scenarios are developed using Zonation to illustrate different conservation

strategies (e.g. landscape level PES, land purchase and management, ecotourism) and their associated costs in meeting defined conservation targets. Scenarios are assessed based on economic criteria (efficiency, co-benefits of other PES) and social criteria (poverty alleviation, equity). The total costs required to meet defined landscape level conservation targets are then calculated, with a relevant share allocated to one of the main drivers of biodiversity loss: land occupation and transformation for agriculture. This is achieved through a land use impact assessment of different agricultural production systems in terms of their relative impact on biodiversity (i.e. less-intensive systems, such as agroforestry, receive a lower share of the costs) and their proportional area share in the case study region (i.e. land use systems occupying a higher area share in the region are penalized, receiving a higher share of the costs).

We present a final breakdown of costs allocated to each land use system, and discuss implications for agricultural trade and displaced consumption. The results are presented on a per hectare basis, with extrapolation to product level where possible (i.e. compensation costs per tonne of produced commodity). The implications of such a compensation scheme applied at the point of production (e.g. national tax) or at the point of consumption (e.g. import tarif) are discussed with particular reference to International Payments for Ecosystem Services (IPES), for which such a methodology represents a potential quantification method for scaling such payments to potential ecological impacts.

Institutional analysis of incentives for the provision of forest goods and services: an assessment of incentive schemes in Catalonia (North-East Spain)

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Payments for ecosystem services (PES) have recently attracted attention as a means for aligning the interests of landowners and society by remunerating forest owners for the goods and services their forests produce. As PES schemes are being extensively adopted around the world, questions related to their institutional dimensions, as well as the role of different actors and contextual factors in PES initiation, design and implementation, arise.
This paper seeks to gain an understanding of these issues by analysing three voluntary incentive schemes currently implemented in Catalonia: land stewardship ? a predominantly private PES scheme aimed at enhancing biodiversity, mature forest reserves ? a predominantly public scheme for protecting old-growth forest stands, and a hybrid public-private initiative for forest fire protection ? forest defence groups.
We develop a framework for the institutional analysis of PES extending earlier work on this subject, and we focus on actor and institutional interactions and outcomes that are likely to result from schemes implementation to draw conclusions regarding the factors that influence the success and the durability of these schemes.

Evaluating Farmers' Participation in Potential Payment Schemes for Climate Regulation in the UK Farmlands: A Choice Experiment Approach

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Evaluating Farmers' Participation in Potential Payment Schemes for Climate Regulation in the UK Farmlands: A Choice Experiment Approach

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Agri-environmental agreements are being used globally to enhance the efficiency of supply of ecosystem services associated with agriculture (Sauer and Wossink, 2010) and are an important component of the EU agricultural policies in the UK. Payments for ecosystem services (PES) are used as policy instruments for improving ecosystem services as they can help to establish both improvements in the environment and in welfare gains of ecosystem managers by linking the beneficiaries of the services to those who deliver them (Defra, 2010). Policies, such as the Agri-environmental measures (AEM), are designed to provide incentives to farmers in return for providing, maintaining and improving environmental/ecosystem services (European Comission, 2005). Such green agreements (or schemes) have attracted increasing global attention as a policy innovation that transformed ecosystem services into financial incentives for local land managers (Engel et al., 2008a) by compensating them for any income loss caused by reductions in outputs or increase in costs for the part they play in providing the environmental goods. The voluntary nature of these schemes means that the farmers' decision to participate is of utmost importance to achieve the policy objectives of the schemes. The basic idea towards the supply of ecosystem services by farm households is the willingness to accept a profit loss, which is due to the reduction in the productivity and the loss incurred due to the restrictions imposed on some agricultural activities. Hence, much of the recent studies looking into the participation of farmers in PES schemes have used the minimum Willingness to Accept (WTA) approach. This approach provides an estimate of the lowest level of compensation land owners expect from implementing management changes according to agri-environmental scheme designs. WTA values allow to estimate how farmers' would trade off different levels of attributes against per hectare payments (Espinosa-Goded et al., 2009). Thus, analysing farmers' behaviour can help to inform payment scheme policy designs. Different approaches have been used to assess the potential participation of the land owners' in PES schemes (Huber et al., 2011;Paulrud and Laitila;Thacher et al., 1996;Vanslembrouck et al., 2002;Vignola et al., 2010) and address improvements in PES scheme designs (Broch and Vedel, 2012;Espinosa-Goded et al., 2010; Ferrini and Scarpa, 2007;Jack et al., 2008;Ruto and Garrod, 2009;Tesfaye and Brouwer, 2012). Only a few of these studies have used Choice Experiments (CE) technique focusing on improving agri-environment scheme designs for European case studies (Broch and Vedel, 2012;Espinosa-Goded et al., 2009;Ruto and Garrod, 2009).

The research presented provides a national scale study in the UK, using CE technique, to assess the design of a payment scheme specifically addressing climate regulation. In this paper we examine the potential use of payments provided to farmers as incentives to adjust their agricultural land management practices in order to reduce greenhouse gas emissions. A CE approach was used to investigate farmers' preferences for different design attributes of potential payment schemes. Modelling farmers' choices allowed estimating how they would trade-off different levels of scheme attributes against per hectare payments. This study was conducted on a national scale in the UK the agricultural landscapes and all the farm management activities were taken into consideration before designing a potential payment scheme.

A policy scheme was designed which required farmers to develop an anaerobic digestion plant for the treatment of livestock manure for capturing methane gas emissions. Six attributes were defined for this policy scheme, the selection of which was based on how well they described the

payment scheme policy option and their contribution towards the investigation of farmers' preferences. The attributes investigated were; ?generator capacity anaerobic plant', ?distance of plant from the farm', ?availability of technical assistance', ?compensation methods[1]', ?length of agreement', and ?payment per hectare'. The choice sets followed an orthogonal fractional factorial design. Three alternatives were listed on each choice card, the first two describing varying levels of attributes and the third was ?do not want to participate' alternative. The CE survey was conducted from 329 respondents at different locations in England and Scotland. Along with choice experiment responses, data including the socio economic characteristics such as age, gender, education, household size, income sources and farm-specific information such as farm location, farm size, tenure management, type of farming, livestock and land management activities, was also collected from the respondents.

Conditional Logit (CL), Random Parameter Logit (RPL), and Latent Class (LCM) models were used to analyse the data. The RPL and LCM were estimated to provide a more flexible method for explaining preference variation and heterogeneity. The results reveal that farmers show preference to most of the attributes except the generator capacity attribute. The basic CL and CL with socioeconomic results show that farmers prefer the schemes options with shorter contract lengths, provision of technical assistance and self managed plants. The results indicate that farmers show a heterogeneous preference behaviour, the sources of which are found to be the age of farmers, farm income, farm size, and livestock units size. The RPL model results show that all the attributes except ?payment per hectare' have significant standard deviation and reveals that the mean estimate for distance, technical assistance and compensation method for the entire sample are significantly different from zero but their high standard deviations show that there is large variation within the preferences and some respondents might prefer lower levels of these. The preferred 3 segment LCM estimates with class probabilities also revealed discrete heterogeneity. The LCM results suggest that the farmers' age, livestock unit size and household size were the main variables for the heterogeneous behaviour.

The study implicates that farmers can be encouraged to voluntarily participate or adopt environmentally friendly management activities if the PES schemes are designed according to their preferences. The farmers show a strong preference for maintaining their current management activities; however, sufficient amounts of compensation can change this behaviour. The study also revealed that the mitigation plants preferable for the farmers were conditional on the combination of shorter contract lengths, provision of technical assistance and self management. Predictably, the model also showed that farmers with larger farm incomes and livestock units show more flexibility towards the design attributes. For policy implications understanding farmers' behaviour towards potential mitigation scheme design and the sources of heterogeneity can play an important role to reach environmental goals by developing and designing future payment schemes which are likely to be taken up by farmers.

[1] Compensation method attribute is defined as ?the suitable method of getting benefits from the plant' either by managing the plant by themselves or by a power company.

Environmental Innovations, Partnership strategies and Governance: A study case of Poitou-Charentes firms

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In the recent years, corporations used to consider sustainable development as a new competitive advantage (Porter and van der Linde, 1995; Beise and Rennings, 2005; Schot and Geels, 2008; Nidumoluet al., 2009). Indeed, a larger number of customers pays attention to the products durability (Bonini and Oppenheim, 2008) and promote new consumption and production behaviors (Depret, 2012). Simultaneously in the specifics fields of environment, energy, construction and post-carbon activities, the number of financial investments, patents, innovations commercialized and companies created increased significantly (UNEPet al., 2010; UNEP and Bloomberg New Energy Finance, 2011; Breitzman and Thomas, 2011; OCDE, 2011a). Green clusters also upsurge all around the world (Cooke, 2010; Hamdouch and Depret, 2012a). At the same time, international organizations and governments consider these activities as a cradle for growth and employment which could make up for the loss of jobs induced by other declining industrial sectors (WWF and Roland Berger Strategy Consultants, 2009; UNEP and Bloomberg New Energy Finance, 2011; Hamdouch and Depret, 2012a; OCDE, 2012). According to some authors, this phenomenon is a first step within a transition towards a new paradigm for a more sustainable, fairer and more compatible way of economic development (Smithet al., 2005; Kempet al., 2007; Nikvist and Whitmarsch, 2008; Jackson, 2010; OCDE, 2012). Even though these decisions are led by strategic consideration or by corporate social responsibility, the companies adopting sustainable development strategies are more and more numerous (Porter and Kramer, 2006 ; Jenkins, 2009 ; Inghamet al., 2011).

To implement this strategy, companies must adopt new business models and they generally focus on the environmental aspects and develop eco-innovations. They must therefore get the needed competencies, strategic resources (financial, managerial and human ones). They also have to integrate the structuring networks (green clusters) developing around the world (Depret and Hamdouch, 2012). That is why networks and proximity behaviors seem to be the core of environmental innovation dynamics (Jänicke, 2005; Cooke, 2010; Madsen and Andersen, 2010). In order to completely integrate these environmental innovations, companies need complementary skills and the participation of all the stakeholders is required (employees, customers, subcontractors, shareholders, etc.). As for any innovation (Chesbrough, 2003; Gassmannet al., 2010, Huizingh, 2011; Ferru, 2009), the collective dimension of the eco-innovation process appears as crucial. Even if these collective aspects appear to be necessary, they have not been studied deeply until now. That is why, in this paper, we aim at checking the existence of a collaboration/networking process and precise the influence of governance (i.e. participation of the stakeholders) in the implementation of the environmental innovations.

Among the new approaches of environmental economics, The «French School of Proximity» has get a growing influence since the beginning of the 2000's (Torre and Zuindeau, 2009). Thanks to the conceptualization of the term of proximity, studies are able to prove the negative externalities of spatial proximity. By generating conflicts between actors ? especially between actors arguing about environmental issues ? we can easily understand the negative impacts (Torre and Caron, 2005). On the other hand, the distinction between spatial and social proximities allows us to show the positive aspects of the institutional proximity as a way to solve these conflicts (Rivaud, 2010). The contribution of the School of Proximity to analyze environmental economics seems to be indisputable. However, the problematic has not been treated completely: the mobilization of the proximity concept to understand environmental strategies of firms remains a tack to be done. The analytic framework of the proximity has been mainly used to understand the companies' dynamics, helping us to analyze the innovation process whatsoever. This framework could be mobilized again to determine the importance of proximities in the collective process of environmental innovations (modification in terms of governance and the logic of partnership). In particular, we will use the proximity decomposition suggested by Bouba-Olga and Grossetti (2008) which distinguishes geographical and socio-economic proximities.

To fulfill these objectives, we use individual data collected through semi-structured interviews with around 30 managers of companies located in the Poitou-Charentes region. From a methodological standpoint, our empirical work combines qualitative and quantitative analysis (i.e.mixed-method). We will determine the existence of unique or different environmental strategy/strategies in the company: do firms require the participation of all the stakeholders to integrate eco-innovation? If yes, how is it possible? Do firms need necessarily to collaborate or integrate networks? We will identify the role of each type of proximities in this collective process of environmental innovation. We will also take into account the type of environmental innovations (preventivevs. curatives approaches) and their incentives; this could be at the basis of divergent strategies (cf. Alonsa-Ugaglia, Ferru and Guimond, 2012).

Alonso-Ugaglia A., Ferru M., Guimond B., 2012, "Moteurs et dynamiques des innovations environnementales des firmes. Le cas du Poitou-Charentes", Document de travail CRIEF.
Baron R., Quinet A, Janci D., Gollier C., Bureau D., de Perthuis C., Solier B., Crifo P., Lamotte H., Guillerminet M.L., Ollivier T., Bonnet X., Crassous R., Rosier P. (Eds.),Le financement de la croissance verte, Conseil Economique pour le Développement Durable, Paris.
Beise M. et Rennings K. (2005), « Lead Markets and Regulation: A Framework for Analyzing the International Diffusion of Environmental Innovations »,Ecological Economics, 52 (1), pp. 5-17.
Bonini S.M.J., Oppenheim J.M. (2008) «Helping ?Green' Products Grow»,The McKinsey Quarterly, October.
Bouba-Olga O. et Grossetti M., 2008, «Socio-économie de proximité»,Revue d'Economie Régionale et Urbaine, n°3.
Breitzman A., Thomas P. (2011) «Analysis of Small Business Innovation in Green Technologies »,Small Business Research Summary, SBA Office of Advocacy, 389.
Chesbrough h. (2003), Open innovation: The new imperative for creating and profiting from technology, Boston: Harvard Business School Press.
Cooke P. (2010) «Jacobian Cluster Emergence: Wider Insights from ?Green Innovation' Convergence on a Schumpeterian ?Failure'», In: Fornahl D., Henn S., Menzel M.-P. (Eds.), Emerging Clusters: Theoretical, Empirical and Political Perspectives on the Initial Stage of Cluster Evolution, Cheltenham, Edward Elgar, 17-42.
Crifo P., Crassous-Doerfler R., Flam M. (2010)L'économie verte et le rôle de l'industrie dans la croissance verte, Paris, Cercle de l'Industrie.
del Rio P., Unruh G. (2007) «Overcoming the Lock-Out of Renewable Energy Technologies in Spain: The Cases of Wind and Solar Electricity»,Renewable and Sustainable Energy Review, 11, 1498-1513.
Depret M.-H. (2012) « Que nous réservent les éco-industries du futur en matière d'innovations vertes ? »,Journée « Eco-vert : Innovation, entrepreneuriat, territoires verts », Dunkerque, 15 mars.
Depret M.-H., Hamdouch A. (2012) « Quand le "local" rencontre le "global" : Proximité, réseaux, clusters et entrepreneuriat dans le green business », Septièmes Journées de la Proximité : « Créativité, innovation et proximité », HEC Montréal (Canada), 21-23 mai.
EIO (2011) The Eco-Innovation Challenge: Pathways to a Resource-efficient Europe ? Annual Report 2011, Eco-Innovation Observatory, Brussels.
Ferru M. (2009), La géographie des collaborations pour l'innovation : le rôle des contraintes de ressources et de mise en relation, Thèse de doctorat en sciences économiques, soutenue à l'Université de Poitiers, le 18 novembre.
Gassmann O., Enkel E., Chesbrough H. (2010), The future of open innovation,R&D Management, 40 (3), 213-221.
Hamdouch A., Depret M.-H. (2012a) «Green Business and Entrepreneurship», In: Carayannis E.G., Dubina I.N., Seel N., Campbell D.F.J., Uzunidis D. (eds.), Encyclopedia on Creativity, Invention and Entrepreneurship, Springer, New York, forthcoming.
Hamdouch A., Depret M.-H. (2012b) «Sustainable Development Policies and the Geographical Landscape of the Green Economy: Actors, Scales and Strategies»,Finisterra- Revista Portuguesa de Geografia, XLVII (94), forthcoming.
Huizingh, E. (2011), Open innovation: State of the art and future perspectives,Technovation, 31, 2-9
Ingham M., Depret M.-H., Hamdouch A. (2011) « L'innovation responsable comme opportunité stratégique : Problématisation et illustration dans le cas de PME de la domotique », In : Hamdouch A., Reboud S., Tanguy C. (eds.),PME, dynamiques entrepreneuriales et innovation, Peter Lang, Bruxelles, pp. 381-404.
Jänicke M. (2005) «Trend-Setters in Environmental Policy: The Character and Role of Pioneer Countries»,European Environmental, Vol. 15, n° 2, p. 129-142.

Jenkins H. (2009), « A ?Business Opportunity': Model of Corporate Social Responsibility for Small-andMedium-Sized Enterprises »,Business Ethics: A European Review, 18 (1), pp. 21-36.
Jackson T. (2010)Prospérité sans croissance : La transition vers une économie durable, De Boeck, Bruxelles.
Kemp R., Totmans J., Loorbach D. (2007) «Assessing the Dutch Energy Transition Policy: How Does it Deal with Dilemmas of Managing Transitions?»,Journal of Environmental Policy and Planning, 9(3), 315-331.
Madsen A.N.; Andersen P.D. (2010) «Innovative Regions and Industrial Clusters in Hydrogen and Fuel Cell Technology»,Energy Policy, Vol. 38, n° 10, p. 5372-5381.
Maréchal K., Lazaric N. (2010) «Overcoming Inertia: Insights from Evolutionary Economics into Improved Energy and Climate Policies»,Climate Policy, 10, 103-119.
Nidumolu R., Prahalad C. K., Rangaswami M. R. (2009), « Why Sustainability is Now the Key Driver for Innovation »,Harvard Business Review, September, pp. 56-64.
Nikvist B., Whitmarsch L. (2008) «A Multi-level Analysis of Sustainable Mobility Transitions: Niche Development in the UK and Sweden»,Technological Forecasting and Social Change, 75 (9), 1373-1387.
OCDE (2011)Panorama de l'entrepreneuriat 2011, OCDE Publications, Paris.
OCDE (2012)Une croissance verte inclusive : Pour l'avenir que nous voulons ? Travaux de l'OCDE en rapport avec Rio+20, OCDE Publications, Paris.
Porter M.E., Kramer M.R. (2006) «Strategy and Society: The Link between Competitive Advantage and Corporate Social Responsibility»,Harvard Business Review, December, 78-92.
Porter M.E., van der Linde C. (1995) « Towards a New Conception of the Environment-Competitiveness Relationship »,Journal of Economic Perspectives, 9 (4), pp. 97-118.
Rivaud A., 2010, « Coordination autour d'une ressource commune et logiques d'acteurs. Une analyse au travers des usages agricoles et ostréicoles de l'eau dans le bassin versant de la Charente », Thèse de doctorat, Université de Poitiers
Schot J. et Geels F. W. (2008), « Strategic Niche Management and Sustainable Innovation Journeys: Theory, Findings, Research Agenda, and Policy », Technology Analysis & Strategic Management, 20 (5), pp. 537-554.
Smith A., Stirling A., Berkhout F. (2005) «The Governance of Sustainable Socio-technical Transitions»,Research Policy, 34(10), 1491-1510.
Torre A. et Caron A., 2005, Réflexions sur les dimensions négatives de la proximité : le cas des conflits d'usage et de voisinage,Economie et Institutions, 6 & 7, 183-220.
Torre A., Rallet A. (2005) «Proximity and Localization»,Regional Studies, 39(1), 47-60.
Torre A. et Zuindeau B., 2009, «Proximity economics and environment: assessment and prospects »,Journal of Environmental Planning and Management, vol. 52, n°1, 1-24
UNEP, Bloomberg New Energy Finance (2011) Global Trends in Sustainable Energy Investment 2011: Analysis of Trends and Issues in the Financing of Renewable Energy, UNEP Collaborating Centre for Climate & Sustainable Energy Finance Frankfurt School of Finance & Management, Frankfurt.
UNEP, EPO, ICTSD (2010) Patents and Clean Energy: Bridging the Gap between Evidence and Policy: Final Report, United Nations Environment Programme, European Patent Office and International Centre for Trade and Sustainable Development Report, Munich.
WWF, Roland Berger Strategy Consultants (2009)Clean Economy, Living Planet: Building Strong Clean Energy Technology Industries, Amsterdam.

Is innovation the key to a decarbonized economy? Myth and Reality of Environmental Innovation

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This paper will assess the problem of the effect of innovation, both environmental and non environmental, on the way to a more decarbonized economy, on the different channels this innovation necessary to promote this innovation, and on the different policy tools used to encourage it.

I Is the green innovation machine working?
Environmental innovation, measured either on R&D spending or on patents, enjoyed recently an impressive development. It is moreover important to point out that environmental innovation field is larger than the innovation of eco-industries, according to the EOCD Report «Measuring Environmental Innovation» (2007) «Eco-innovation is the production, assimilation or exploitation of a product, production process, service, or a managerial tool that is new to the organization that develops or adopts, and which leads, at throughout its lifecycle, to reducing environmental risks, pollution and other negative impacts of resource use (including energy) compared to other relevant alternatives" (Arundel and Kemp, 1998, Kemp and Pearson, 2007). Though measured in a few studies in report, environmental innovation accounts for more or less half of the overall innovations of firms, as a pioneering paper of R. Veugelers proved it (Veugelers, 2012).

II Environmental Innovation, Rebound Effect and Decoupling the economy
Nevertheless, till a recent time the surge of environmental innovation didn't entail a significant decrease in the pressure on environmental resources: as the rise in resource efficiency has a feed back effect on its use, global use of non renewable resources continue to rise, according to the « rebound effect ». This effect has been assessed in various environmental field ?energy consumption, water and land use, space heating and lighting. It is a challenge for environmental policy to try to shift it, on a national but also on an international level. From a more general point of view, innovation tends to increase environmental pressure through planned obsolescence, mainly in Information and Telecommunication Technologies (ITC) that are not environment friendly. Not only their production, but also their use requires high use of energy and materials, which are increasing with their development. So another challenge should be to «green» the innovation process, especially in the field of ITC, and it is far from be realized.

III Which channel to promote Environmental Innovation and «green growth»?
So decoupling economic growth and environmental pressure is a rather difficult task to achieve, at a national and international level. While innovation is necessary to achieve this goal, it appears not to be sufficient. It should be accompanied by change in use and habits, which will be self-enforcing in a demand-pulled and technology push process. A typology of Innovation helps to understand this issue, which classifies each environmental Innovation on these two dimensions, user and institutional practices, and change in technologies. It ranks these innovations in four categories: Incremental innovation, social innovations, techno-fixes innovation, and transformative innovations (Arundel, Kanerva, Kemp, (2011).
Energy transition requires using the widest range of technology choice according to this typology, but in some case the implementation of some of these technologies can drive to contradictory results. While some technologies will help to decrease directly environmental pressure and green house gas emissions, others, like the techno-fixes innovations, can lead to rebound effects mainly through the support they give to sustain existing practices. Shale Gas production technologies are a startling example of this kind of energy innovations which will help to continue the use of fossil fuels at a high environmental cost. Carbon Capture and Storage (CCS) technologies are another examples of theses techno-fixes innovations. Their massive deployment in developed as in developing countries is expected by the International Energy Agency «Blue Map» to reach

its goal of a stabilization of earth warming of 2° in 2050, but it will help to continue the use of fossil fuels.
Another issue that have to be addressed in the field of environmental innovation is the question of the timing of the deployment of these technologies: while some are already available without a financial public support, most of them are far from be competitive with the current energy sources. Technological forecasts are expecting that learning curves and technological change will help to shorten this time, but a wide range of uncertainty still remains in this field.

IV Which Policy Tool to encourage Green Growth?
The last question to be addressed in this paper is related to the Policy tools that are available to promote environmental innovation. They can be ranked in three main categories, regulation, tax and subsidies, and cap and trade systems. They can support either technology push or market pull technologies at a global or a technology specific level. From a normative point of view, endogeneous Growth models have proved that the technological trajectory of an economy could be shift from «dirty» to clean technologies without reducing its growth, by using an optimal mix of a carbon tax and a subsidy to the clean technologies (Acemoglue, Aghion, Burstyn and Hemous, 20012).
Results are quite different when considering the current working of environmental policies, which are used jointly these tools at different geographic levels, national, regional, and international levels. If this joint use is necessary to achieve the targets of environmental policies, their combination leads to large disparities in the carbon avoided price. These disparities exist between developing countries and developed countries, between developed countries, and between technologies themselves, and they lead to large disparities in energy efficiency and ecological footprint between countries.
As economic theory proved it, the efficiency of environmental policy depends largely on the uniqueness of avoided carbon price, which is far from be reached on each level of environmental technology implementation. Too large disparities mean that some technologies are financed at a far high cost, which may lead to a waste of money that will not be sustainable if the technologies wouldn't prove to be available at a commercial level in the future. On the other hand the reference to a unique price of avoided carbon can be understood as a normative benchmark that will help to monitor the policy choices. It remains that curving the road of innovation to a more environment friendly growth is a necessity for both environmental and innovation policies.

References

Acemoglu , Aghion, Burstyn, Hemous, (2012), «The environment and directed technological change »,American Economic Review, 102(1), February, pp. 131-66.

Arrundel A., Kanerva M., Kemp R. (2011),Integrated Innovation Policy for an integrated Problem : Addressing Cilmate Change, Resource Scarcity and Demographic Change to 2030, Pro Inno Group Report, Brussel European CommIssion, Bruxelles, DG Entreprise and Industry. Mars 2011.

Kemp R. and Arundel A. (1998) : «Survey Indicators for Environmental Innovation»,IDEA Paper Series, IDEA Paper No. 8,NIFU-STEP, STEP Group, available online : http://survey.nifu.no/step/old/Projectarea/IDEA/Idea8.pdf
Kemp R. and Pearson P.(2007) : «Final report MEI project about measuring eco-innovation», FP6 project No. 044513,Measuring eco-innovation (MEI),available online: http://www.oecd.org/dataoecd/54/19/43960830.pdf
Veugeleurs R. (2011), « Activating the private clean innovation machine », KUL Paper, KUL Leuven, 2011

Innovation projects and the trajectory's irreversibility of the Aquitaine wood filière

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The present article discusses the way innovation projects impact existing industrial trajectories. Admittedly, industries in their current trajectories develop some irreversibility. In particular, it focuses on the question of whether or not those innovation projets result in a trajectory's bifurcation. The article questions the way innovation projects might help in overcoming irreversibility and then tries to draw some conclusions about policy implications. The used data were collected through a specific survey of the 95 innovation projects of the ?competitiveness cluster'Xylofutur. A wide range of documents from different sources has also been synthetized, some of them highlighting the historical trajectory of thefilière.Have also been interviewed experts of thefilièreinvolved in some of those innovation projects and experts from regional or national organisms in charge of the financing or the implementation of norms in the wood industries. xml:namespace prefix = o ns = "urn:schemas-microsoft-com:office:office" />

The role of advisory services in the dynamic of Agricultural Knowledge and Innovation Systems: locking in or locking out?

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Summary
This papers deals with the institutional dimension of technological lock-in in agriculture. The analysis is focused on the role played by the back office investments of private firms of advisory services within Agricultural Knowledge and Innovation Systems (AKIS). It is based on the case of the reduction of pesticides use in the potato sector in France and England. We test the effects of new forms of public-private partnerships within AKIS on the modalities of production of evidence supporting pesticide use reduction. Two main results can be noted: i) the back office investments of private suppliers of advisory services related to health issues are restricted, and this limits in return the availability of reliable and relevant evidence supporting pesticide use reduction; ii) public-private partnerships induces inertia within the potato AKIS and prevents from testing alternative technologies to pesticides.

Abstract
The aim of this paper is to test the effects of new public-private partnerships in the back-office of farm advisory services on the risk of lock-in regarding the use of pesticides in the potato sector.
There are many researches trying to understand how patterns of sectoral systems of innovation may promote transitions toward the adoption of technologies that respect the environment, or, may in the contrary, lead to situations of lock-in. In the case of agriculture, one aim was to understand why, in some situations, farmers do not adopt production systems that consume less pesticides (such as Integrated Pest Management ?IPM), even when the choice of such alternative practices is more efficient both from ecological and economical points of view (Cowan and Gunby, 1996). These authors have identified three dimensions of lock-in mechanisms that prevent from transition towards IPM : i) the equipment of the farms (the adoption of IPM implies investments in new machinery for farmers who may have already invested a lot of capital for the acquisition of material for chemical control of pest); ii) the cost for acquiring new knowledge about IPM (for example about the life cycle of the pest, its spreading out, its population density and movement, the ecology of natural enemies, etc.); iii) the uncertainty about the effectiveness of IPM while many evidence have been accumulated about the effectiveness of pesticides. The combination of these three elements induces snowballing effects between farmers; therefore restricts the ability to move from one practice to another.
These studies highlight the importance of cognitive resources in technological lock-in mechanisms. One solution could be, for the State, to develop learning procedures that would help farmers to switch progressively from one technology to another, for instance by supporting agricultural advisory programs oriented toward the promotion of IPM. But such a suggestion may appear inconsistent with the actual trend of privatisation of agricultural advisory that is observed in most European countries. Some recent researches have shown that the disengagement of the State could lead to a disconnection between research and practice (Leeuwis, 2000). These researches emphasize the importance of intermediary actors ("knowledge brokers") to reconstruct the connections between the different actors of AKIS (Klerkx and Leeuwis, 2007). This suggests the integration of the description of locking mechanisms and transition of innovation systems (Geels, 2005) in an institutional analysis (Labarthe, 2010).
The originality of our approach is to focus such an institutional analysis on the transformation of back office activities of farm advisory services. Back-office stands for the R&D activities of advisory services. These activities, complementary from the front office ones that consist in the direct interactions between advisers and farmers, are those that are carried out of the presence of the beneficiary. They are a way of producing and standardising the knowledge. They can be considered as the support of the agricultural advisory services. Among those activities, the most important are: i) the updating of the competences that advisors use in front office (through training, etc.); ii) the continuous review of the scientific literature on agronomic issues; iii) the accumulation of data through controlled observation (about weather forecast, field contamination

by pest...); iv) the implementation of scientific experiments which help to provide evidence on the effectiveness of technologies or of new agronomic practices; v) the access and participation to various networks for peer-to-peer exchanges of knowledge between advisors.
Our hypothesis is that the evolution of these activities aiming at producing and updating the knowledge available to advisors, is indicative of the transformation of the innovation systems. The question is to understand whether new forms of partnership between public and private actors allow or not producing and updating relevant and reliable knowledge to support farm practices that protect human health and the environment, like practices allowing the reduction of pesticides use.
Our work is based on a comparative case study: the reduction of pesticide use in the potato production in France and England. This sector is under strong European regulations due to economic losses and phytosanitary risks cause by a pest, called the potato cyst nematode (PCN) that is considered by the EU as a quarantine disease. If the PCN is detected in a plot, it should be placed in quarantine for six years and there should be a decontamination of agricultural equipment and the destruction of the harvest that comes from the plot. Furthermore, if the control is still positive after six year, the potato production in the plot is prohibited. Even though the potato industry is an important sector in terms both of volume of production and number of producers in both countries, these countries have two different trajectories regarding the respective roles of private and public actors in the provision of research and services for potato growers. We conducted interviews with the main actors of AKIS to understand the consequences of the institutional settings of these systems on their ability to support pesticide reduction.
The results show that:
i) the investments of private actors (cooperatives, independents consultants, farmers' circle, upstream and downstream industries) in back office activities on health issue are limited and/or dependant from the upstream industry. Thus, these activities do not allow producing and updating robust evidence about pesticide use reduction.
ii) The public private partnership seems in this case to lock the innovation system of the sector and limit the possibilities of testing effective methods for fighting against PCN and consuming less pesticide The validation of the efficiency of such methods would require experiments of plots identified as contaminated. But, regarding the risks, a large number of private actors refuse to provide the lists of these plots, making impossible any experiment. This is also due to the fact that a key function within AKIS, which consist in coordinating observations about infested plots by the PCN, were also transferred from the State to private actors. There are thus less and less independent observations of the evolution of the diffusion of the disease and also less and less independent experimental trials about solutions using less pesticide.
iii) The results also emphasize the fact that the «life-cycle» of networks matters: «old» networks with few turn-over of participants and strong relations between industry, advisers and researchers (as in France) may have a more limited ability to tackle new challenges that are not in the direct line of the interest of industries.
Some public private partnerships within AKIS may give less opportunity to the state to influence the innovation system of the potato sector toward R&D approaches that combined productivity, health issues and environment.

What is the carbon market for? Compliance transactions versus financial transactions

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As a financial market, the EU ETS can obviously serve a different purpose than his official environmental one, i.e. helping installations to fulfil compliance and emissions caps. The constantly growing number of exchanged quotas is largely greater than the sources' compliance needs. Besides, the development of derivatives and options reveals that transactions are more and more sophisticated. Since no relevant and rigorous data are still available, we want to estimate the relative parts of compliance transactions and financial or speculative transactions. In others words, using several indicators ? all imperfect but all providing further information, we answer the question: who is trading and what for, or to whom the carbon market is actually of use.

The high cost of cost-efficiency: A critique of carbon trading

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Since its inception, carbon trading has been presented as a cost-effective regulatory instrument. The concomitant commensuration of carbon emissions is seen as unproblematic, given that a ton of carbon has the same climatic effect regardless of time and date. But the argument ignores the differences in social and environmental effects among carbon emissions. As these differences are significant, so are the social costs of cost-efficiency.
This paper presents a critique to carbon trading based on what carbon emissions commensuration turns invisible and the consequent social costs of cost-efficiency. It is argued that a purely quantitative approach to climate change cannot deliver a just, democratic and effective transition to a climate-friendly path of development.

In the late 1960's, Crocker (1966) and Dales (2002) suggested that pollutant emissions could be regulated by a market for emissions rights, following the example of existing markets for fishing or broadcasting rights. The basic setup of «cap-and-trade» is achieved through the fixation of a maximum level of emissions during a limited time frame (the «cap») and the allocation of emissions rights to sources, which can then trade rights among themselves (the «trade»). The allocation can be made by auctioning or by giving allowances for free according to some standard of performance or historical emissions. The resulting market for emissions rights is open to the participation of the public, so individuals and NGOs can buy these rights to retire them, thus buying their way into a better environment, and traders can speculate with the price variability for a profit.
Following the standard neo-classical framework, Montgomery (1972) made the case for the cost-efficiency of emissions trading. This is because, while an emissions or technology standard imposes the same rules for all affected sources, no matter what their abatement cost is, emissions trading allows sources to choose their level of emissions and abatement technologies according to their cost structure. Sources with high abatement cost, for which reducing emissions is costly, can buy allowances in the market, while sources with low abatement cost can reduce emissions beyond the mandated level and sell the excess allowances for a profit.
This framework, still followed today in Environmental Economics, rests on a narrow and ill-defined notion of cost-efficiency. A deeper analysis of the process of constructing a new commodities (emissions permits and credits) and new financial markets to trade these commodities reveals the concomitant social costs, which are neglected by the orthodoxy. This will be illustrated through the case-study of the Kyoto carbon markets.
To create carbon markets, it is necessary to frame the problem of climate change as an excess of CO2 in the atmosphere. The solution for the problem will then be to reduce emissions. The level of emissions reductions can be decided in the political arena, and quotas for countries and industries can be derived from this. Finally, a market of emissions permits and credits can be created.
Inherent to this creation we find processes of commensuration of carbon emissions, through which equivalences are defined and emissions are decontextualized and abstracted. These processes involve the mobilization of actors like governments, businesses, scientific institutions and quantifiers (accountants and consultants) in multiple technical operations through which value is created. More importantly, these processes are radical for what they turn invisible (Espeland and Stevens, 1998; Levin and Espeland 2002).
Following this contention, I present four sets of criticisms to the commensuration of carbon present in carbon trading which are categorized according to the ideals invoked. First, carbon commensuration implies a degree of accuracy in measurement of greenhouse gas emissions and sinks and in the conversion of different greenhouse gases to one common metric that scientific knowledge cannot currently provide. Second, abstracting carbon emissions from their context can lead to a worsening of inequalities and injustices, as it implies neglecting differences between

subsistence and luxury emissions and can direct investment in emissions reductions to projects that violate human rights as these are among the less expensive ones. Third, as climate change is a result of a historical process of carbon lock-in, reducing the problem to an excess of CO2 in the atmosphere and the solution to reducing abstract carbon emissions leads to a disregard of the necessary social changes that are imperative to overcome the societal dependency from carbon-intensive infrastructures. Fourth, putting the fate of climate policies in the hands of speculative markets dealing with permits of abstract carbon implies a disempowerment of citizens in favor of polluters and traders and of democratic institutions in favor of stock exchanges.

These criticisms illustrate how carbon trading generates important social costs. In some cases it can be possible to address some of these costs through design changes but this must always come at the expense of introducing restrictions to trading that will increase the cost of compliance for regulated industries. As cost-efficiency was the main reason given to introduce carbon trading, it is unlikely that such design changes can be implemented in the future.

More fundamentally, these criticisms are not reducible to design issues as what is at stake is how the purely quantitative approach to climate change present in carbon markets cannot deliver a just, democratic and effective transition away from a model of constant growth based on intensive use of fossil fuel energy.

Crocker, Thomas D. 1966. The Structuring of Atmospheric Pollution Control Systems. In The Economics of Air Pollution, ed. Harold Wolozin, 61-86. New York: W.W. Norton & Company.

Dales, John Harkness (2002), Pollution, property & prices: an essay in policy-making and economics. Cheltenham: Edward Elgar Publishing.

Espeland, Wendy Nelson; Stevens, Mitchell (1998), «Commensuration as a Social Process», Annual Review of Sociology, 24(1), 313-343.

Levin, Peter; Espeland, Wendy Nelson (2002), «Pollution futures: commensuration commodification and the market for air», in A. J. Hoffman and M. J. Ventresca (eds.), Organizations, policy, and the natural environment: Institutional and strategic perspectives. Stanford: Stanford University Press, 119-147.

Montgomery, David (1972), «Markets in licenses and efficient pollution control programs», Journal of Economic Theory, 5, 395-418.

Biodiversity mitigation policies and the market: A reassessment based on French case studies

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Over the last decade, the success of payments for ecosystem services and generally speaking of market-based instruments for biodiversity and ecosystem services has led to reconsider the existing mitigation policies. They tend to be described ? and praised or denigrated ? as market-oriented and based on a redirection of incentives towards conservation. However, the scope of biodiversity commodification and of the market turn experimented in some countries in this context is probably grossly overstated. A more balanced view of these mechanisms should be adopted as we illustrate it with French case studies on biodiversity offsets associated with the building of high-speed lines.

In spite of their description as market-based instruments, in most countries, the payment of fees and the offsetting of damages caused to biodiversity, when they occur, are still most of the time done to comply with legal obligations, e.g. the 1973Endangered Species Actin the United States or the 1976Loi relative à la protection de la naturein France. In most cases, land developersmust take appropriate measures according to the ?mitigation hierarchy': they should do their best to avoid adverse impacts on biodiversity, and if it is not feasible, they should minimize damages through on-site rehabilitation measures, and eventually compensate the significant residual impacts. They can provide their own biodiversity offset,i.e. a conservation or restoration project, on a land of their own or enter an arrangement with a third party that will offset the damages they have caused on their behalf. In few countries and for a limited number of endangered species or habitats, they can also purchase the number and type of ?biodiversity credits' required to offset the damages they caused. If they destroy a given acreage of the habitat of a particular species, they must contribute through their payment to the maintenance or restoration of a comparable area of the same species habitat. The whole difficulty is of course to define this area, in quantitative as well as in qualitative terms. This is the ?no-net loss' principle brought to the fore in the context of wetland mitigation in the United States.

The latter option is the only one that could be characterized as market-like, and in a metaphorical rather than literal sense. It is in practice limited to few countries and only to listed endangered species for which so-called conservation banks have been created. In addition, it has to be only a last resort. In France, even if some attempts have been made to develop market-like arrangements with the creation of CDC-biodiversité, their success has been limited so far. Only one natural assets reserve has been created to generate biodiversity credits likely to be recognized as offsetting measures of land development projects. The developers rather organize their strategies and their compliance with offsetting obligations on their own terms and set up institutional arrangements that could hardly be described as markets. After a description based on case studies of the actual organization of these offsetting strategies, we will discuss the changing perceptions of these arrangements due to their presentation as market-based instruments and try to explore their effect and the rationale behind them.

Water Banks and Drought Management in Andalusia (Spain)

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The traditional hydraulic paradigm that has governed the water policy in Spain during the last century suffers a crisis that has motivated new shifts in resource management, leaving behind only policies focused on increasing water supply. In this sense, both Andalusian and Spanish water laws open up the possibility of new adaptation strategies to the shortage, through the reallocation of concessional rights. Thus, recently, the Andalusian Regional Government has completed the draft of the Decree that established the constitution of Public Water Banks in the river basin districts of the Internal Basins of Andalusia. It is important to highlight that the Water Law of Andalusia does not restrict the creation of this mechanism to situations of drought, as reflected in the Spanish Law. For that reason, it might be considered that the Public Water Banks are a tool of demand-side management which allows managing this hydrological risk in times not traditionally considered as drought.
The starting point for this research is the reflection on the water markets and the analysis of the Andalusian and Spanish legislation related. This analysis is complemented with the update of the debate of the drought, at both European, and at national and regional level, in relation to the new cycle of hydrologic planning. The purpose of this study is to present an approach to the key elements that can facilitate or complicate the success of the legal reform that will be the Royal Decree of Public Water Banks in Andalusia in the framework of the debate of drought management in this region. Thus, the Public Water Banks are a reallocation mechanism for spatial and temporal rights that can contribute to carry out an integrated management of droughts, going forward the traditional contingency plans.

Diffusion of ?Market based instruments? and ? biodiversity offsets? notions within European environmental policies: between international benchmarking and domestic dynamics

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Since the 1990s, the international environmental community has been increasingly interested in market-based instruments (MBIs) as mechanisms for environmental progress. Developed to respond to the issues surrounding energy, transportation and water, they have grown since the negotiations of Kyoto (1997) to become a key tool of climate policy alongside the placement of carbon quotas (for greenhouse gas). In the biodiversity sector, the development of MBIs has been later, but the advancement of the concept of ecosystem services by the Millennium Ecosystem Assessment en 2005 placed new light and emphasis on the economic value of biodiversity and helped legitimized the MBI model. Publications from The Economics of Ecosystems and Biodiversity(TEEB, 2008, 2010)the World Bank, the Organization for Economic Co-operation and Development (OECD), and the Conference of Parties (COP) to the Convention of Biological Diversity (CBD) confirm a pronounced interest in the financial and economic evaluations of biodiversity in general and in the use of biodiversity economic instruments, such as PES and biodiversity offsets. The paper deals with the mechanisms of dissemination of the concepts of Market based instrument (MBI) in biodiversity and «biodiversity offset» at the European level which has been promoted, among others, across the EU. In Europe, we suppose that the dynamic in favor of market based instruments in biodiversity promoted in the same time the renovation of some old instruments such as compensation which were used in the different countries in Europe. Compensation mechanisms have undergone a «renovation» on both the international and national environmental policy scenes that is to say that we have used the term, renovation, to represent the active modification and adaptation of existing mechanisms to facilitate their implementation in different contexts. This renovation can be explained by the convergence between old national dynamics that concentrated on the original definition of compensation mechanisms and more recent transnational dynamics that follow the 1990s appearance of dialogue centered on the concept of MBIs. Our first hypothesis suggests that at the interface of these flows of thought, European compensation mechanisms evolved through this process of renovation and emerged as either MBIs, or regulatory mechanisms, or as some type of hybrid. In this paper, we identified the policy entrepreneurs, who are «public entrepreneurs who, from outside the formal government, introduce, translate and help implement new ideas into public practice» and we analysed how the biodiversity offsets mechanisms are diffused and hybridized in European political scene

Climate change and socio-economic impacts of invasive alien species

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The spread of invasive alien species (IAS) is endangering biodiversity, the provision of ecosystem services and also impacts on economic development and human well-being. According to a recent estimate costs caused by IAS in Europe amount to roughly ?12,5 billion per year. Global exchange of goods and people are a key factor in this process as it entails an unparalleled movement of organisms across the world. In addition, climate change is very likely to further exacerbate these developments as it may alter the habitat conditions significantly. In particular, climate change might encourage the spread of IAS to hitherto unaffected areas as their current spatial distribution is thought to be limited by climatic conditions. In addition, climate change is contributing to enhanced plant growth and will thereby reinforce negative impacts.
Against this background, the paper addresses the potential socio-economic impacts that three selected alien species - giant ragweed (Ambrosia trifida), annual wormwood (Artemisia annua) and marshelder (Iva xanthiifolia) - might have under different climate change scenarios. Given the current status of known impacts of the three species the paper is limited to the health and agriculture impacts of the respective species. The overall aim is to provide estimates on the costs and benefits of controlling the proliferation of the three species in Austria.
The methodological approach consists of a cost-benefit analysis (CBA) which evaluates the different outcomes over a period of four decades. The simulation model behind the scenarios takes the current distribution of plants and links them to various environmental and climate variables to predict future developments of the species distribution.
The paper is structured in the following way. The second section discusses the socio-economic impacts of IAS in general and provides a literature overview on the known impacts for the three species in particular. The third section introduces the model and its main assumptions while the fourth describes the main results of the CBA. The last section concludes.

Socio-Economic Impacts

As for the socio-economic impacts of the three IAS that are at the center of this paper they have been examined to different degrees. The impact on human health results from pollen induced allergies that can manifest themselves as rhinitis, conjunctivitis, asthma and contact dermatitis which are well documented forAmbrosiaandArtemisiaspecies. In addition to direct health costs (i.e. medical treatments), pollen allergic individuals suffer from reduced quality of life due to negative physical and psychological impacts as well as from reduced productivity at work. As most patients tend to be poly-sensitized it is difficult to link costs to one specific allergy source. We therefore rely on average pollen allergy costs. With regard to the agriculture impactAmbrosiaspecies andIva xanthiifoliaare qualifying as competitive agriculture weeds. Ambrosia trifidais an important weed in many field crops, being most prevalent in maize and soybeans in the United States, Canada and China.Iva xanthiifoliais a competitive weed in North America mainly in sunflower and soybean in the Midwestern States. In CEE, the plant occurs as a weed in several countries, mainly in sunflower, maize, soybean and sugar beets. As for the environmental impact thus far, no major influence has been documented in the literature for the three species.

Model

The CBA draws on inputs from a simulation model. In a first step the locational information of the findings is mapped to the quadrants of the Floristic Mapping project of Austria (FMA). Based on the current distribution the simulation model links various environmental and climate variables, including on land cover (from the CORINE land cover program), infrastructure (from the OpenStreetmap Project) and General Circulation Models of climate, to predict future developments of the species distribution.
The simulation model provides us with four baseline scenarios that are centered on two key variables: (i) climate change that is either assumed as «mild» or «severe» (ii) spread of the respective species that can be «limited» or «maximum». The two maximum spread scenarios

serve as background scenarios indicating of what could theoretically happen if all suitable habitats would be infested. The main focus is, hence, put on the two limited-spread scenarios to estimate the climate change impacts. For each of those four scenarios the model further distinguishes between control options that can either take the value «full eradication» or «no intervention».
Hence, for the CBA the model provides us with eight different outcomes regarding pollen load data as well as plant distribution per quadrant and time period for each of the three species. While the pollen load data is used in the CBA to estimate the health impact the tables on quadrants affected feed into the agriculture part of the CBA.
Based on these outcomes we estimate management costs consisting of variable and fixed costs. Fixed costs are primarily related to the establishment of a monitoring/prevention system while variable costs depend on the spread and the level of intervention chosen.
For estimating the health benefits arising from avoided allergies we compare the outcomes of the projected pollen-induced allergy pattern of the «eradication» option with the «no intervention » option. The potentially affected population per quadrant in Austria is elaborated from Census data and population forecasts. We then set two scenarios for allergies induced byAmbrosia trifidaandArtemisia annuapollen: (i) a conservative one assuming a modest increase of and a limited impact on allergic persons; (ii) a worst-case scenario with a strong rise of allergies as well as health costs per patient. In each of those scenarios we use the pollen load data provided by the simulation model as weighing factor to estimate the health impact of the respective species.
With regard to agriculture impacts we first construct the potentially concerned arable land by field crop for each quadrant by intersecting data on arable land with the quadrants from FMA. Similar to estimating health benefits we use a conservative (1% yield loss) and a worst-case (5% yield loss) scenario to assess the impacts on selected field crops. Based on the relative affectedness of each quadrant (input from the simulation model) as well as on average values on producers prices and yields we estimate the potential benefits.

Results
Based on the CBA several observations can be made. First, for all variants (conservative vs. worst-case assumptions, different discount rates) of our four baseline scenarios we arrive at overall net benefits. Second, the major share of the net benefits is derived from avoiding pollen-induced allergies. Third, an isolated look at each of the three plants reveals that the biggest impact is associated with limiting the pollen allergy potential ofArtemisia annua. In contrast, impacts associated withAmbrosia trifidaandIva xanthiifoliatend to be smaller, although under some specific scenarios they can also become substantial.Fourth, even an isolated perspective - comparing the management costs for all plants and the benefits for each plant - suggests that a timely intervention would yield positive net benefits, except for one specific case ofAmbrosia trifida.
Hence, our study suggests that the socio-economic benefits that can be captured by a concerted effort of public authorities to fight IAS are substantial. It is therefore highly advisable to act preventively to contain the spread ofAmbrosia trifida,Artemisia annuaandIva xanthiifoliain Austria.

Why do some countries have an approved climate change adaptation strategy and others don't? ? A qualitative comparative analysis of governance processes and outcomes in the Alpine space

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The Alps are already confronted with impacts from climate change and some of the alpine countries and regions have developed climate change adaptation (CCA) strategies. However, not all countries have achieved to draft and politically approve such a policy document; and the same is true for administrative bodies at the subnational level such as Cantons, Bundesländer or Provinces. In other words, different countries and regions show distinct governance performances in CCA policy making. Not having such a document with the objective to coordinate CCA activities and to mainstream CCA might result in no efforts to reduce impacts from climate change. Or, if adaptation measures are implemented, this might be done in a little coordinated way. With this paper we aim to explain why some countries and regions do have and others don't have achieved the governance outcome of approved CCA strategies.
Earlier research on the issue of CCA governance has identified several crucial factors explaining the occurrence of planned adaptation measures (Westerhoff et al., 2011): existence of political will, public support, relevant media portrayal of climate change, adequate financial resources, the ability to produce or access climate and other information, and the extent of stakeholder involvement in the design and application of adaptation measures as crucial (Westerhoff et al., 2011). For ten OECD countries Bauer et al. (Bauer et al., 2012) identified the three critical governance challenges for the development of national CCA strategies: horizontal as well as vertical integration, knowledge integration and non-state stakeholder involvement. We tie our research on CCA policy making to these earlier results and investigate the identified and above listed concepts (e.g., political will, adequate financial resources, ability to access knowledge) as potentially explaining factors for the development of approved national and regional adaptation strategies. Additionally, we investigate the role of a political focus on climate mitigation as a potential hindering factor for a country or a region to develop a CCA strategy. We also scrutinise whether country or region specific circumstances explain differences in stages or whether general patterns can be identified that support and hinder CCA policy formation processes.

We did our empirical research within the context of a knowledge-transfer project called C3-Alps «Capitalising Climate Change Knowledge for Adaptation in the Alpine Space», which is part of the EU Transnational Cooperation Alpine Space Programme. The partnership of C3-Alps consists of 17 partners from seven Alpine countries; the countries and regions participating in the presented study are: Austria, Bavaria (Germany), Baden-Württemberg (Germany), Italy, Rhône-Alpes Region (France), Lichtenstein, Piedmont (Italy), Slovenia, South-Tyrol (Italy) and Switzerland. We developed three instruments to gather data on policy documents and policy development processes as well as their impacts. These instruments were: a manual for a policy document analysis, an interview guide to perform interviews with experts on CCA in the partner countries and an online survey. The available data allows us to investigate the policy process from different angles (triangulation) based on mixed methods. Data were gathered in ten regions between August and October 2012. For each region two to five interviews were conducted. For this paper we analysed 37 of the total of 57 interviews. As we have many interviews for some countries (e.g. Lichtenstein, n=18) and we did not want the data density to drive our results we sampled the to-be-analysed interviews from the total amount of interviews; in doing so we performed stratified sampling taking country or region and gender of the interviewee into account. In contrast to earlier research we follow a rather formal methodological approach in the analysis of the data, namely, we perform a qualitative comparative analysis (QCA). To obtain data suitable for this analysis we first coded the interview responses. We started with a draft version of a coding

scheme containing basic concepts such as ?hindering factors', ?strength' and ?weaknesses' of the policy formation/drafting process or ?reasons for not having a policy document yet'. We further refined the coding scheme in the coding process (as suggested, e.g., in Grounded Theory). In a next step we created variables that correspond to the explanatory concepts listed above, such as, available financial resources, level of horizontal integration or focus on policy of mitigation. For each variable we then assessed corresponding values on the basis of each interview. In a last data preparation step we integrated the values of different interviewees for the same region/country to have only one value for each variable and region/country. With these values we created a truth table in order to perform a fuzzy QCA. Preliminary data analysis (status: December 2012) highlights two critical issues for the development of a CCA strategy document that receives political approval: a) the role of vertical coordinating activities, and b) science translating individuals or organisations (e.g., ProClim, the Swiss Forum for Climate and Global Change in the Swiss Academy of Sciences, which serves as an interface and enhances communication between science, public administration, politics, economy and the public).

Based on our results we are going identify challenges to be overcome in different policy development phases in the following steps of data analysis. Based on these identified challenges we are going to derive policy recommendations regarding advisable or key activities in these phases. Our results are supposed to be useful for the development of regional adaptation strategies, which are seen as an enabling step to initiate and support coordinated adaptation action, i.e., the implementation of adaptation measures on the local level.

References

Bauer, A., Feichtinger, J., Steurer, R., 2012. The Governance of Climate Change Adaptation in 10 OECD Countries: Challenges and Approaches. Journal of Environmental Policy and Planning 14, 279-304.

Westerhoff, L., Keskitalo, E.C.H., Juhola, S., 2011. Capacities across scales: local to national adaptation policy in four European countries. Climate Policy 11, 1071-1085.

How little or how much climate change? Facilitating stakeholder thinking on food system futures

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This paper focuses upon the methodological challenges of deepening understanding of how agricultural and food sectors can mitigate greenhouse gas emissions, whilst at the same time adapting to the impacts of climate change. Agriculture and food systems are inherently complex, and exploring uncertainty in this context requires an approach that presents the reality of an uncertain future in a manner that does not paralyse, but rather facilitates strategic planning. A participatory scenario process is presented which developed quantitative and qualitative food system scenarios, articulating pathways to 2°C and 4°C futures framed within a cumulative emissions budget, accounting for emissions along the supply chain from production to consumption. The process addresses four key challenges, namely: the need to re-frame policy discourse away from end-point targets and towards cumulative emissions budgets; the need to consider adaptation to higher levels of climate change than is currently considered; the importance of supply chain emissions; and how to work with stakeholders to consider the level of change implicit within this policy re-framing.

Whilst mitigation policies reducing emissions from the agricultural sector are commonly framed by end-point targets, mitigation efforts need to be placed within the context of wider emissions of greenhouse gases and consider cumulative emissions of greenhouse gases. Under a cumulative emissions approach, for certain levels of climate change, a limited amount of greenhouse gases can be emitted [1], thus global temperatures rise as cumulative emissions rise. For the same climate impact, if emissions are not cut sufficiently in the early years, more rapid rates of reduction are needed in later years to remain in budget, also affecting long-term targets [1]. For instance, the UK's 2050 target of reducing emissions by 80% from 1990 levels (70% for agriculture) will need to be strengthened if emissions are not cut sufficiently early on. The profile of agricultural emissions differs vastly to that of other sectors, dominated by emissions of methane (CH4) and harder to reduce emissions of nitrous oxide (N2O); the cumulative emissions framing in this context points to the importance of mitigation measures which can be deployed within a short timeframe such as changes to consumption and away from technological solutions.

Mitigation efforts also continue to be framed in terms of avoiding ?dangerous' climate change [2], yet the reality is that in the absence of meaningful reductions to date, and uncertainty over a future global agreement to cap greenhouse gas emissions, it is increasingly unlikely that global mean temperatures will remain below the 2°C threshold associated with ?dangerous' climate change. Even at this level of global warming there is a high likelihood of increased risks of extreme weather events, increased water stress, wildfire frequency and floods [3]. A more extreme, but still not a worst-case outcome of rising greenhouse gas emissions, would be a 4°C temperature rise over a similar timescale (by 2100) [4]. Studies suggest that with 4°C as a global average, impacts include temperature increases of 6 to 10°C compared with the current hottest days within cities such as Rome or Chicago. Examples of other impacts include drought events occurring twice as frequently across southern Africa and the Mediterranean basin; a 40% reduction in the maize and wheat yields in low latitudes and a 30% decrease in rice yields in India, China and South East Asia [5]. Thus, nowhere will the impacts of climate change be more keenly felt than in the agricultural sector where depending on the level of future climate impacts, important food producing regions may no longer be able to sustain production. Responses to more difficult growing conditions include increasing agricultural inputs, such as fertilizers, or protecting growing environments from extreme weather, measures which potentially increase greenhouse gas emissions exacerbating the risk of more severe climate change [6].

The third challenge when thinking about food system futures is the highly globalised food supply system; 40% of food consumed in the UK is sourced from outside the UK [7], accounting for emissions on a territorial (or production) basis excludes emissions associated with the overseas

production, processing and transportation of food. Supply chain emissions can be more readily considered using a consumption approach to emission's accounting; supply chain emissions from UK food supply chains are 11% of total consumption based emissions [8]. When developing scenarios along a whole supply chain, with mitigation efforts required across many different sectors such as agricultural production, retailers and processors, the benefits of involving stakeholders in the research are clear. Although a project team may bring together appropriate expertise, scenarios can be made richer and more plausible through the inclusion of many different forms of knowledge and experience.

Taking these points together, the challenge is to approach mitigation in tandem with adaptation to higher levels of climate change than have previously been considered. Clearly the potentially highly damaging impacts require that radical futures are explored, but within a process that emphasises solution focused scenarios avoiding alarmist messages in favour of identifying opportunities and exploring alternative pathways. The process must also break planning for the longer term into shorter time frames consistent both with typical short term planning horizons, but also consistent with the need for near-term measures consistent with the cumulative emissions framing.

These challenges were addressed through the development of a participative, backcasting scenario process which developed quantitative and qualitative food system scenarios and articulating pathways to 2°C and 4°C futures framed within a cumulative emissions budget, accounting for emissions along the supply chain from production to consumption. The paper focuses upon how the methodology issues thrown up by each of the identified challenges were overcome.

[1] Anderson, K. and Bows, A. (2008) Reframing the climate change challenge in light of post-2000 emission trends. Philosophical Transactions A. 366(1882): p. 3863-3882.
[2] Department of Energy and Climate Change (2010),2050 Pathways Analysis, The Department of Energy and Climate Change, Editor. London.
[3] IPCC, Climate Change (2007): the physical science basis, in Report of Working Group 1 to the Fourth Assessment report of the Intergovernmental Panel on Climate Change 2007.
[4] Betts, R.A., et al., (2011). When could global warming reach 4°C? Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences. 369(1934): p. 67-84.
[5]Lewis, K., (2009). Impacts of 'high-end' climate change, Met Office and Foreign and Commonwealth Office, Editors. Crown Copyright: http://www.metoffice.gov.uk/climate-change/guide/impacts/high-end.
[6] Roeder, M., et al. (2012). The sustainability of climate change adaptation and mitigation strategies for wheat. Forthcoming.
[7] Defra (2012),Food statistics pocketbook 2011. 2012.
[8] Bows A. et al, (2012). What's Cooking? Adaptation and Mitigation in the UK food system. UK: Sustainable Consumption Institute - University of Manchester.

Responding to Climate Change: Field Experiments at Chilika Lagoon, India

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Adverse weather conditions induced by global warming make certain occupations economically vulnerable. The possibility of loss of income is particularly profound for those in agriculture, forestry, mining, fishing and other activities that form the primary sector of an economy. As a result, developing countries are perilously susceptible due to their dependence on the primary sector of their economies. There is uncertainty not only about the specific threats posed, but also about the timing, duration and intensity of adverse weather events. This makes individual and community-based adaptation choices exercises in risk analysis.
In a series of field experiments conducted at Chilika Lagoon, India, we examine fishers' (fishermen) attitude towards risk (measurable risk as well as uncertainty) and explore the implications of such attitudes in fishers' willingness to adapt to climate change through the purchase of income insurance protecting against climate change induced losses. We further examine whether economies of scope can induce increased insurance coverage. Finally, we look at whether social interactions in the ethnically fragmented community can overall insurance coverage levels.
Our results indicate lower levels of risk and uncertainty aversion among Chilika fishers than typically found in studies in other cultures. We also find that economies of scope result in moderate increase in total insurance coverage. Lastly, we were encouraged to see that social interactions have an important role in increasing community-wide coverage in the ethnically fragmented region.

Crise de santé et environnement au Sahel

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CRISIS IN THE SAHEL , HEALTH AND ENVIRONMENT

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Crise de santé et environnement au Sahel

La zone du sahel est touchée par une série de crises liées entre elles à savoir : alimentaire, sécuritaire, économique, sociale, santé, environnement. Dans ce présent article, nous mettrons l'accent sur la crise au niveau de la santé et de l'environnement.

Au plan de la santé, de nombreuses études présentes une situation alarmante de l'état de santé de cette population. Aucune catégorie : enfant, femme et homme n'est épargnée. Ainsi, Selon les Nations Unis, 18 millions de personnes souffrent de faim dans certaines zones du sahel comme : le Mali, le Tchad, la Mauritanie et le Niger. De plus, 50 millions de la population vivant au sahel peuvent être confrontée à une infestation de grande ampleur. La faim qui est devenue le quotidien de ces populations à travers les crises alimentaires répétitives (1973-1974, 1984-1985, 2004-2005, 2008, 2010, 2012) engendre plusieurs pathologies dont la malnutrition. Celle-ci génère d'autres pathologies en l'occurrence, l'anémie, rend même aveugle, et facilite la contraction des maladies infectieuses et laisse surtout ces victimes avec des séquelles à vie.

Elle provoque même la mort prématurée de plusieurs millions d'enfants. Or le sahel, est la zone de la planète la plus touchée par cette pathologie. Au Sahel « le nombre de personnes mal nourries est passée de 90 millions en 1970 à 225 millions en 2008, avec une augmentation prévue de 100 millions d'ici 2015 ». [1][1]

Par ailleurs, Les populations sont également atteintes de maladies de peau comme la xérodermie et la kératodermie provoquée par le rayonnement solaire et la sécheresse de l'aire.[1][2] A cela s'ajoute le choléra qui constitue une menace récurrente dans la zone du sahel. En 2011, par exemple 67 000 cas de choléra décelés dans le bassin du lac Tchad (Tchad, Cameroun, Nigeria) entraînant 2153 décès. Cette année de nombreux cas de cette maladie sont identifiés dans les pays comme le Niger et le mali. De plus l'instabilité politique au Mali, contribue à la propagation de cette maladie puisqu'elle suscite le déplacement massif des populations.

En outre, le paludisme continu de faire des victimes dans cette région et la zone la plus touchée est le Mali.

Les multiples interventions des humanitaires auprès des autorités de cette zone interpellent sur l'urgence qui prévaut en matière de santé et la nécessité de trouver des solutions durables. Cependant, ces actions relèvent d'un véritable défi permanent face à la dégradation climatique de cette zone qui est à l'origine de ces pathologies.

Le Sahel est généralement caractérisé par la désertification, la sécheresse et une forte irrégularité des pluies. La saison sèche au sahel s'étend de 6 à 8 mois. A titre d'illustration, ces dix dernières années, cette zone a été confrontée à sa troisième sécheresse. Malheureusement, le bois demeure la principale source d'énergie. Ainsi selon, « Catinot, 1984 », au Sahel la consommation en bois-énergie va être multipliée par trois fois alors que la superficie forestière va être réduite de 50% d'ici l'an 2030. Tout cela réduit la couverture végétale du sol rare dans cette partie du monde. La

croissance rapide de la population (3% par an) contribue également à la dégradation de l'environnement. En effet, cette population pratique en générale l'agriculture ou l'élevage pour survivre et surexploitent ces ressources. De plus, certaines zones du sahel sont confrontées à des inondations (le sud du Burkina Faso, l'Ouest du Niger, et le Nord du Nigeria) qui dégradent encore les ressources naturelles déjà fragilisées par la désertification.

A la suite de ce bref aperçu des indicateurs de la crise de la santé et environnementale au sahel il est important de se poser certaines questions :

Quelles stratégies durable mettre en place pour relever les défis de la crise de la santé et environnementale dans un contexte de développement durable ?

Quelles sont les solutions innovantes et durables qui permettront d'impliquer les populations sahéliennes à l'égard de la crise de la santé et environnementale ?

Problématique : rôle des stratégies de coping devant l'instabilité climatique

La situation de la malnutrition au Sahel présente cependant un caractère récurrent. Les enquêtes faites régulièrement au Mali depuis 1987 indiquent une stabilité de l'incidence de la malnutrition. Les interventions humanitaires sont dans la période devenues plus efficaces faisant chuter de façon spectaculaire la mortalité induite par la malnutrition.

Les facteurs structurels de la malnutrition sont connus et pour une bonne partie d'entr'eux font l'objet d'un monitoring international, par exemple à travers le dispositif FEWS de la FAO et d'USAID. Il s'agit de stratégie d'adaptation collective basée sur des principes de gestion des risques majeurs (épidémie, feu de forêt), comme celui d'alerte précoce. La collectivité internationale s'est donné les moyens d'être alertée et d'être réactive devant une dégradation locale de la disponibilité alimentaire.

Les expériences de développement, les compétences des ONGs impliquées existent. La structure même de l'action humanitaire en santé s'est modifiée : la mise en réseau d'acteurs locaux de santé est privilégiée, et des formes de coordination pour l'espace saharo-sahélien ont été mises en place.

L'interprétation des relevés empiriques de situations de crise demande de faire appel à la temporalité construite des agents. Par exemple, le pic de malnutrition est situé au Mali, de façon assez paradoxale, dans l'extrême sud du pays (région de Sikasso, 56% d'enfants malnutris), alors que les indicateurs construits de menace sur les disponibilités alimentaires localise le risque maximum bien plus au Nord (au Centre du Mali, selon une ligne qui part de la région de Kayes et passe au Sud de Tombouctou). Ces indicateurs conjoncturels recoupent bien une zone où l'impact de l'instabilité climatique est maximale ; cependant les acteurs de l'humanitaire interviennent au Sénégal, Mali, Burkina Faso, Tchad en urgence dans des centres de soins présentant ce décalage spatial (plus au Sud)par rapport à la zone maximale d'instabilité climatique.

Les modes de vie sont à prendre en compte, et chacun d'entr'eux introduit des stratégies de coping face à une instabilité climatique.

Une stratégie de Développement doit tenir compte des stratégies de coping des agents.

[1][1]http://www.prb.org , la lutte contre la malnutrition infantile en Afrique subsaharienne :

des progrès mitigés selon les enquêtes

[1][2] Pierre VOLPOET, Jean-Henri RICOSSE, Jean DELMONT, Jean-Paul ALBERT, Gérard REMY, cahiers d'études africains, année 1982, environnement et maladies dans le sahel (Afrique de l'ouest). Un -entre ?deux- mondes, volume 22 numéro 85-86

[1][3] Crise humanitaire au sahel vue d'ensemble régionale ?besoins financiers, www.unocha.org

How can institutional analysis contribute to the understanding of Marine Protected Areas challenges?

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Summary
The Convention on Biological Diversity (CBD) has set the target of conserving 10% of all coastal and marine areas by 2020. However, as of 2010, Marine Protected Areas (MPAs), considered one of the main management tools to help achieve CBD's goals, cover only 1.17% of the total marine areas. In addition to it, among the existing MPAs, several face shortcomings that prevent them from achieving their conservation goals or even worse several are still only paper parks. That being said, we aim at exploring how institutional analysis can contribute to the understanding of MPAs challenges. We believe that institutional theory can provide a framework which could help identify: institutions in place and possible path dependencies; how they affect the actors involved; and signals of institutional change in course that could lead towards more effective MPAs. By doing so, we hope to contribute to the ongoing debate of governance aspects of MPAs.
Keywords: Marine Protected Areas; governance; institutions, institutional change; path dependencies.

Abstract

In spite of the growing work on Marine Protected Areas (MPAs) in the last 40 years, until recently most studies have dealt mainly with MPAs' biological aspects rather than with their human dimensions (Thorpe, Bavinck, & Coulthard, 2011). Being aware of countries' efforts to help achieve CBD's goal of expanding coastal and marine conservation areas from currently 1.7% (Toropova, Meliane, Laffoley, Matthews, & Spalding, 2010) to 10% by 2020 (Secretariat of the Convention on Biological Diversity, 2012a), this study aims at employing elements from institutional analysis to understand MPAs challenges.

By using the theoretical lenses of institutional analysis we intent to identify the institutions in place and possible path dependencies that might be preventing MPAs progress. We also want to understand how these formal and informal rules affect the actors involved and to observe whether there are indications of institutional change in course that could lead towards more effective MPAs. Our focus lies on MPAs from developing countries where it seems that a model copied from MPAs from developed countries (Wilkinson & Salvat, 2012) might be one of the reasons for the difficulties faced. We will select topics from institutional theory which fit our purpose and use them as a guiding framework to review the literature on MPAs governance aspects. In the following paragraphs we present some insights which will serve as an initial basis for this work.

The importance of proper institutions for environmental governance has been widely discussed in the last three decades (Agrawal, 2001). Several of these studies explore examples from marine resources (e.g. Berkes, 2006; Jentoft, 2004; Pinkerton & John, 2008; Wilson, 2002). But when it comes to Marine Protected Areas more specifically, there are still fewer studies that examine their institutional aspects (e.g. Brown, 2003; Jentoft, van Son, & Bjorkan, 2007; Rudd, Tupper, Folmer, & Van Kooten, 2003). Nonetheless, it has been suggested that in expanding MPAs' coverage special attention will need to be given to institutions as formal and informal rules play a crucial in MPAs performance (Fox et al., 2012; Jentoft et al., 2007; Pollnac et al., 2010).

Most MPAs face both environmental and social challenges. From a social perspective, usually they impose new resource use restrictions which might impact the distribution of access and income among user-groups (Jentoft et al., 2007). From a conservation perspective many MPAs have been performing poorly or even worse have been labeled as paper parks (The World Bank, 2006). But is there a way in which the formal and informal rules shaping MPAs in developing

countries could work better both for conversation and the people living in its surrounding areas? As it has been said, one of the possible reasons why MPAs in developing countries are facing such challenges is because the conservation model inspiring their design comes mainly from developed countries. The experience of these countries are usually of large MPAs with no take areas relying on enforcement and a top down approach, whereas the yet few successful experiences in developing countries are of smaller MPAs using a bottom up approach (Wilkinson & Salvat, 2012). Even though some argue that the top down approach is falling into disuse (The World Bank, 2006), this is a clear barrier from the past preventing further progress of MPAs. Another constraint is posed by the fact that several principles guiding MPAs management come from inland protection where the boundaries, just to mention one characteristic, are completely different (Agardy, 1994, 2000). In the same way, the former conservation narrative that nature is better off without people seems to still persist in some places (Brown, 2003; L. M. Campbell, Gray, Hazen, & Shackeroff, 2009).

Limitations like these are understood as path dependencies ? constraints from the past imposing limits on current choices (North, 1990). In our literature review of MPAs, we aim to learn about the institutions ? formally sanctioned, norms and conventions (Vatn, 2005) in place to understand whether there are path dependencies such as the ones just mentioned above that could be hindering MPAs advances. Also, we want to learn how these constraints are affecting the actors involved, especially the local communities which several times carry most costs of conservation by being displaced or losing their traditional ways of live and livelihoods (Pomeroy, Mascia, & Pollnac, 2007).

Finally, in part due to CBD goals and the increasing attention that marine resources have been receiving internationally (Secretariat of the Convention on Biological Diversity, 2012b) some countries such as Costa Rica are going through changes to consolidate their MPAs (Costa Rica Forever, n.d.). Our first question regarding these changes is whether they characterize a process of institutional change in which old institutions fall into disuse and give rise to new ones (Scott, 2008). Also, we want to learn whether these new formal and informal rules will be able to unlock these countries from the path dependencies preventing MPAs further development. Or conversely, whether they will only deal with issues such as financing conservation and end up not touching more fundamental questions related to the way MPAs are conceived. If we conclude that the changes are not addressing properly the path dependencies mentioned then we ask: what could be possible ways to do so?

We believe that cooperation between local communities and the government though cannot solve all MPAs problems could be a possible pathway. This proposition is based on the premise that the mobilization to work together per se could open up possibilities for new self-motivate solutions (Vatn, 2007). These solutions and the new institutions shaping them could be the first step to unlock MPAs from their current path dependencies and ultimately reduce the gap between formal rules stating how MPAs should look like and how they work in practice.[1] One of the first steps to achieve cooperation seems to be fostering social capital ? «the norms and networks that enable people to act collectively» (Woolcock and Narayan 2000 cited by Adger, 2003). Social capital could help in two ways: give members within a community and among different communities a sense of a common purpose; and facilitate communication between these communities and government (Rudd et al. 2007), thus helping to build trust between.

We acknowledge that building cooperation between government and communities towards more well-functioning MPAs is not an easy task. But we also think that the institutional framework surrounding the MPA governance, if better designed, could help create a basis to deal with their problems in a more coordinated way. We are not proposing anything new under the sun. Authors have already used arguments from institutional theory to indicate the conditions under which environmental institutions have more changes to be successful (Dietz, Ostrom, & Stern, 2003; Paavola & Adger, 2005). Our proposal is that these arguments could be applied more frequently and thoroughly to advance debate of MPAs governance in developing countries.

References

Adger, W. N. (2003). Social Capital, Collective Action, and Adaptation to Climate Change. Economic Geography, 79(4), 387-404. doi: 10.1111/j.1944-8287.2003.tb00220.x

Agardy, T. (1994). Advances in marine conservation: the role of marine protected areas.Trends in Ecology & Evolution, 9(7), 267-270. doi: http://dx.doi.org/10.1016/0169-5347(94)90297-6

Agardy, T. (2000). Information needs for marine protected areas: scientific and societal.Bulletin of Marine Science, 66(3), 875-888.

Agrawal, A. (2001). Common property institutions and sustainable governance of resources. World Development, 29(10), 1649-1672. doi: Doi 10.1016/S0305-750x(01)00063-8

Berkes, F. (2006). From community-based resource management to complex systems: The scale issue and marine commons.Ecology and Society, 11(1).

Brown, K. (2003). Three challenges for a real people-centred conservation.Global Ecology and Biogeography, 12(2), 89-92. doi: DOI 10.1046/j.1466-822X.2003.00327.x
Campbell, J. L. (2004).Institutional Change and Globalization. Princeton, New Jersey: Princeton University Press
Campbell, L. M., Gray, N. J., Hazen, E. L., & Shackeroff, J. M. (2009). Beyond Baselines: Rethinking Priorities for Ocean Conservation.Ecology and Society, 14(1).
Costa Rica Forever. (n.d.). What is Forever Costa Rica? Retrieved 15.12.2012, from http://www.costaricaporsiempre.org/index_en.aspx
Dietz, T., Ostrom, E., & Stern, P. C. (2003). The Struggle to Govern the Commons.Science, 302 (5652), 1907-1912. doi: 10.1126/science.1091015
Fox, H. E., Mascia, M. B., Basurto, X., Costa, A., Glew, L., Heinemann, D., . . . White, A. T. (2012). Reexamining the science of marine protected areas: linking knowledge to action. Conservation Letters, 5(1), 1-10. doi: 10.1111/j.1755-263X.2011.00207.x
Jentoft, S. (2004). Institutions in fisheries: what they are, what they do, and how they change. Marine Policy, 28(2), 137-149. doi: Doi 10.1016/S0308-597x(03)00085-X
Jentoft, S., van Son, T. C., & Bjorkan, M. (2007). Marine protected areas: A governance system analysis.Human Ecology, 35(5), 611-622. doi: DOI 10.1007/s10745-007-9125-6
North, D. (1990).Institutions, Institutional Change and Economic Performance. Cambridge, UK: Cambridge University Press.
Paavola, J., & Adger, W. N. (2005). Institutional ecological economics.Ecological Economics, 53(3), 353-368. doi: DOI 10.1016/j.ecolecon.2004.09.017
Pinkerton, E., & John, L. (2008). Creating local management legitimacy.Marine Policy, 32(4), 680-691. doi: DOI 10.1016/j.marpol.2007.12.005
Pollnac, R., Christie, P., Cinner, J. E., Dalton, T., Daw, T. M., Forrester, G. E., . . . McClanahan, T. R. (2010). Marine reserves as linked social?ecological systems.Proceedings of the National Academy of Sciences, 107(43), 18262-18265. doi: 10.1073/pnas.0908266107
Pomeroy, R. S., Mascia, M. B., & Pollnac, R. B. (2007). Marine Protected Areas: the social dimensionExpert Workshop on Marine Protected Areas and Fisheries: review of issues and considerations(pp. 149-175). Rome.
Rudd, M. A., Tupper, M. H., Folmer, H., & Van Kooten, G. C. (2003). Policy analysis for tropical marine reserves: challenges and directions.Fish and Fisheries, 4(1), 65-85. doi: 10.1046/j.1467-2979.2003.00110.x
Scott, W. R. (2008).Institutions and Organizations: Ideas and Interests(3rd ed.). Thousand Oaks, US: SAGE Publications.
Secretariat of the Convention on Biological Diversity. (2012a). National Action for Protected Areas: Key messages for achieving Aichi Biodiversity Target 11 (pp. 60). Montreal, Canada.
Secretariat of the Convention on Biological Diversity. (2012b). Press release: at United Nations Biodiversity Conference, countries agree to double resources for biodiversity protection by 2015 Retrieved 10.11.2012, from http://www.cbd.int/doc/press/2012/pr-2012-10-20-cop-11-en.pdf
The World Bank. (2006). Scaling Up Marine Management - The Role of Marine Protected Areas (pp. 100). Washington, DC.
Thorpe, A., Bavinck, M., & Coulthard, S. (2011). Tracking the Debate Around Marine Protected Areas: Key Issues and the BEG Framework.Environmental Management, 47(4), 546-563. doi: DOI 10.1007/s00267-011-9632-5
Toropova, C., Meliane, I., Laffoley, D., Matthews, E., & Spalding, M. (2010). Global Ocean Protection: Present Status and Future Possibilities. (pp. 96). Gland, Switzerland.
Vatn, A. (2005).Institutions and the Environment. Cheltenham, UK: Edward Elgar Publishing Ltd
Vatn, A. (2007). Resource regimes and cooperation.Land Use Policy, 24(4), 624-632. doi: http://dx.doi.org/10.1016/j.landusepol.2006.06.002
Wilkinson, C., & Salvat, B. (2012). Coastal resource degradation in the tropics: Does the tragedy of the commons apply for coral reefs, mangrove forests and seagrass beds.Marine Pollution Bulletin, 64(6), 1096-1105. doi: DOI 10.1016/j.marpolbul.2012.01.041
Wilson, J. (2002). Scientific uncertainty, complex systems and the design of common pool institutions. In E. Ostrom, T. Dietz, N. Dolsak & P. C. Stern (Eds.),The drama of the commons (pp. 327-359). Washington DC: National Academy Press.
[1] This concept is derived from Campbell (2004) who suggest that one way to reduce the tension between formal and informal rules, would be to bring the formal rules closer to informal rules.

Ignorance, uncertainty and biodiversity conservation: decision-making by the European Court of Justice

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Summary (800 characters including blank space)
Conflicts in biodiversity conservation often include aspects of ignorance and uncertainty. This paper concentrates on conservation conflicts dealing with at least one of these aspects and occurring in connection with the Birds Directive and the Fauna-Flora-Habitat-Directive of the European Union. Situations in and outside of reserves are covered. The methodology applied is an in-depth analysis of more than hundred judgments as binding institutions created by the Court of Justice of the European Union and released since 1984.The paper provides pattern of practical solution examples of such conflicts regarding species conservation as well as habitat conservation based on numerous judgments of the Court and concludes that the Court mainly applies the Precautionary Principle in and outside of reserves.

Abstract (1,200 worlds)
Conflicts in conservation often include aspects of ignorance and uncertainty (Faber et al 1996). This paper concentrates on conservation conflicts dealing with at least one of these aspects in and outside of reserves and occurring in connection with the Birds Directive and the Fauna-Flora-Habitat-Directive of the European Union (EU). It provides pattern for practical solutions of such conflicts regarding species conservation as well as habitat conservation based on the jurisdiction institutionalized by the Court of Justice of the EU (Cushman 2006, Mauerhofer 2010 Ioja et al 2010).

The methodology applied is an in-depth analysis of more than one hundred judgments of the Court of Justice of the EU released since 1984. The judgments are in particular assessed with regard to situations where the Court had to decide based on a total lack of information about future developments as well as on with-standing opinions on technical matters.

The analysis, regarding ignorance in habitat conservation, shows that the Court applied the precautionary principle on conflicts inside and even outside of protected areas in order to prevent any deterioration of the species and their biotopes. Concerning ignorance in species conservation no such application could be found yet.

Regarding uncertainty, the Court applied in habitat as well as species conservation the instrument of the distribution of the burden of proof while - by doing so - it also widely refers to the Precautionary Principle. The Court uses existing formal rules as well as ? if there are no such rules available ? creates innovative new rules in order to distribute the burden of proof and its extent among conflicting parties. This is done based on criteria such as the narrow interpretation of exemptions, the general availability of scientific proof concerning the asserted theme, the effectiveness of conservation and the absolute lack of any possibility to prevent damage.

Concerning uncertainty in selecting sites the ECJ does not even refrain from entering into the ? battlefield of scientific facts' when different proof was brought forward by the parties of the case concerning the uncertainty about the extent of occurrence for the species for with the sites should be designated as reserves.

In cases of uncertainty about changing boundaries of designated sites the Court decided that a Member State does not have the same discretion such as during selection. Thus, a State has to proof that suitability for conservation fall away and/or site was not suitable from the very beginning.

The Court took a similar position - supporting the Precautionary Principle - regarding uncertainty about whether an Appropriate Assessment of a future plan or project has to be implemented at all as well as for the potentially following question whether the project can be permitted in case uncertainties remain after the implementation of such an Assessment (Mauerhofer 2008a,b; Opdam et al 2009).

The Court emphasized also approaches in line with the Precautionary Principle in most of the cases dealing with uncertainty about the effective implementation of strict conservation systems of wild species in or outside of reserves. In this connection the Court highlighted concerning uncertainty about the existence of a legally requested strict species conservation system that a Member State has to proof the adoption of coherent and coordinated measures of a preventive

nature.

While the Court regularly decided in cases wherein the European Commission did not bring forward more than assumption against the defending Member State in favor of the Defendant. Thus, it is up to the Commission to prove that the obligation has not been fulfilled, or in cases where deliberativeness of a capture or killing act has to be proofed, that the author of such an act at the very least accepted the possibility of such a capture or killing of wild species.

Regarding the cases about uncertainty on deliberativeness in species disturbance the Court considered a proof to be sufficient when the Commission brought evidence forward on the presence of activities that usually have a disturbing effect or are capable of deteriorating or destruct specific sites.

A slightly different position was taken by the Court for derogations from species protection and the burden of proof. Therein, the Court did not follow the wording of the Habitats Directive which excludes any further derogation in cases of no existing favorable conservation status of the species envisaged. But the Court decided that a Member State has in this situation in general to proof that the grants of such derogations are not such as to worsen the unfavorable conservation status of those populations or to prevent their restoration at a favorable conservation status. Furthermore, the court additionally requested the proof for the effectiveness of the derogation as such with regard to its goal.

In cases dealing with uncertainty on numbers of derogations from species conservation the Court also put the burden of proof mainly on the shoulders of the Member States. Thus, the Member States have the burden of proof to change the - as such not legislatively created - definitions brought forward by the so-called ORNIS Committee regarding limitations on numbers of derogations from species conservation.

These results of the paper summarize for the first time based on several practical examples main problems and solutions related to ignorance and uncertainty within conflicts related to species and habitat conservation in the case law of the EU. The approaches applied in these judgments by the Court of the EU can widely serve as a pattern for parties and decision makers during similar conflicts in other world regions as well as for legislative bodies there providing the legislative basis of such decisions.

The main conclusion is that the Court of Justice of the European Union applies - regarding biodiversity conservation - in the judgments as its normative institutions «ignorance» and "uncertainty" in and outside of reserves mostly in the sense of the Precautionary Principle (De Sadeleer 2007, Mauerhofer 2008a), that briefly means «in dubio pro natura» (when in doubt, favor nature).

References:

Cashman, L., 2006. Commission Compliance Promotion and Enforcement in the Field of Environment. Journal for European Environmental and Planning Law 5, 385?394.

De Sadeleer N., 2007. Origin, Status and Effects of Precautionary Principle. In. Sadeleer N., Implementing the Precautionary Principle, Approaches from the Nordic Countries, the EU and USA. London, Sterling. VA, Earthscan, pp. 396.

Faber, M., Manstetten, R., and Proops, J.,, 1996. Humankind and the Environment: An Anatomy of surprise and ignorance. In: Faber, M., Proops, J. (Eds.), Ecological Economics: Concepts and Methods. Edward Elgar, Cheltenham, UK, pp. 205-230.

Ioja, C. I. Patroescu, M. Rozylowicz, L. Popescu, V. D. Verghelet, M. Zotta, M. I. Felciuc, M., 2010. The Efficacy of Romania's Protected Areas Network in Conserving Biodiversity. Biological Conservation. 143 (11) 2468-2476

Mauerhofer, V., 2008a. 3-D Sustainability: an approach for priority setting in situation of conflicting interests towards a sustainable development. Ecological Economics 65, 496?506.

Mauerhofer, V., 2008b. Conservation of Wildlife in the European Union with a focus on Austria. In: Panjwani, R. (Ed.), Wildlife Law: A Global Perspective. American Bar Association (ABA) Publishing, Chicago, pp. 1?55.

Mauerhofer, V., 2010. Missing links: how individual's can contribute to reserve policy enforcement on the example of the European Union. Biodiversity and Conservation 19, 601?618.

Opdam, P.F.M., Broekmeyer, M.E.A., Kistenkas, F.H., 2009. Identifying uncertainties in judging the significance of human impacts on Natura 2000 sites. Environmental Science & Policy 12, 912?921.

Agri-Environmental Schemes and Grassland Biodiversity: Another Side of the Coin

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In this paper, the Agri-Environmental Schemes (AES) of the European Union are evaluated on the basis of county-level data, the purpose being to disentangle the effects of AES on land-management practice from its effects on biodiversity. One of the major arguments in favour of AES subsidies is that they will promote environmental-friendly land-use, which, in turn, will lead to biodiversity conservation. However, the results of this paper reveal that AES subsidies are more focused on ecological land-use rather than extensive agricultural practice in the first place and, furthermore, the subsidies are predominantly allocated to already biodiversity-rich counties. Moreover, even if these subsidies were directed to biodiversity-poor countries, no clear evidence is found that land-use practices in situ improve the biodiversity status per-se.

What do conservationists really think about markets?

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The recent history of biodiversity conservation practice has been characterised by the increasing use of Market-Based Instruments. An emerging body of critical social science research seeks to understand this development. This literature tends to characterise conservationists as being ideologically in favour of markets in conservation. An alternative possibility is that conservationists pursue market solutions as a pragmatic response to prevailing political and economic circumstances. In this paper we seek to establish empirically what conservation professionals really think about markets in conservation. We used Q-methodology, a tool for analysing structure and form within respondents' subjective positions. The results suggest that conservationists are circumspect about the growing use of markets in conservation. We identify two dominant discourses that we label ?outcome focused enthusiasm and ?ideological scepticism'. Neither of these perspectives indicates strong, or uncritical, support for market approaches, and the views of our respondents appear to recognise the limitations of markets both in theory and practice. While there is some difference in views between the two dominant discourses that we document in this paper, there is considerable convergence towards a position that we label ? cautious pragmatism'. We conclude that those studying conservation need to be cautious about over-generalising the perspectives and values held by conservation professionals, as there appears to be far less consensus about the adoption of market-led approaches in this sector than has been suggested. Further research could investigate the drivers of pro-market behaviour at the organisational level given the evident personal scepticism of many conservationists.

Learning process in adaptive governance for sustainable development: a critical perspective. Some issues from the French experience of effective implementation of the Green and Blue infrastructure.

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The Green and Blue infrastructure (Trame verte et bleue ?TVB) is a new conservation policy tool based on the notions of ecological network and corridor. The TVB's implementation process establishes the connection of multi and nested decisional and action levels and needs permanent adjustment to change that is analyzed as adaptive governance mechanisms. The implementation of an adaptive governance is described as an mean to overpass those failures. The literature on adaptive governance gives learning process a central place as it permits to systematically improve policies and practices for an effective preservation of the environment. The aim of this article is to provide a critical perspective on learning processes in adaptive governance. We aim at reintroducing two blind spots. First, knowledge theory frequently forget to consider the strategic issue of knowledge. Second, knowledge theory implicitly recognizes that an actor acts but, it is often true that an actor can «be acted».

A Transdisciplinary Research Framework for an Integrated Sustainability Assessment of Livestock Farming Systems

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The modernization and intensification of agriculture through the increased use of chemical inputs and concentrates and high animal stocking rates have generated long-term and far-reaching environmental impacts. However, due to the multi-functionality (e.g. landscape, biodiversity, cultural heritage, rural development, etc) of many farming systems (Groot et al., 2012; Pacini et al., 2004), the increasing animal productivity does not always allow to satisfy the broader range of social and welfare objectives of the farming systems. Therefore, to achieve long-term sustainability goals for the development of farming systems in Europe, it implies the needs of seeking the trade-offs and synergies of the conflicting objectives (Gibon, 2005), and incorporating the dynamic analysis into the interactions between agricultural practices and ecological progresses over time (Bernués et al., 2011). These, in turn, provokes the need of developing systematic assessment tools to evaluate all three sustainability aspects for the design of effective on-farm management practices to cope with present and/or future global changes.

Since the 1960s, various complex simulation models have been developed and greatly advanced in agricultural research to assess the farming systems in terms of their economic, environmental and social performances, and to design and support superior management practices in livestock farming systems (McCown, 2001). By then, the «system» concept has been integrated into the mathematical models that simulated physical and physiological processes of the whole farm system, however its application for intervention in farming practices has not been prevailed until the late 1990s (McCown, 2001). In practice, farmer's management decisions were often modelled based on economic optimisation theory and the use of static production function. In particular, the farming system models are generally constructed in three ways: (1) by incorporating the multiple objectives in the objective function, (2) by optimising one objective while using the other objectives as constraints, or (3) by optimising farm profits, while taking the other objectives as externalities of the maximization of profit (Janssen and van Ittersum, 2007). However, Woodward et al. (2008) argue that the problem with «optimal» solutions might be inappropriate due to the complexity arising from multi-stakeholder reviews, multi-criteria, non-linearity and the dynamic nature of farming system problem. In fact, this is often criticised as a constraint for the simulation models to have any practical impact on farming (Woodward et al. 2008), which has triggered the development of dynamic simulation models as a replacement for production function (Dent and Anderson, 1971).

Although much effort has been made to develop various modelling tools to evaluate the whole farm sustainability, most of the sustainability evaluation tools are often designed for one or two types of farming systems or for a given farm in a specific context, which are less flexible to be reused to analysis farming systems in other contexts (Janssen and Ittersum, 2007, Gouttenoire et al. 2011, Groot et al. 2012, Van Passel and Meul 2012). In fact, a recent review of bio-economic farm models (BEFMs) conducted by Janssen and Ittersum (2007) shows that existing BEFMs are rarely re-used (non-transferability) for other purposes or locations, and the newly developed models and their applications do not add a lot of new features to approaches to the body of literature. Amongst the total 48 models they have reviewed, 42 used different models, suggesting a need of developing an easily transferable BEFM with a generic and modular structure that can be amended to specific locations or purposes, and be reused across datasets and farm types. This demand has triggered the development of generic and/or integrated models (e.g. Louchichi et al., 2010; Jassen et al., 2010; Lopez-Ridaura et al., 2002; Ripoll-Bosch et al., 2012) through mathematical modelling approaches to be applied to varying farming typologies across regions. Notwithstanding, researchers who undertake abstract analytical models often keep their analysis to a simple set of variables (Ostrom, 2007), which however limits its application to solving practical problems of the complex farming systems, whose dynamics are non-linear. Moreover,

farm activities often involve the interactions of social, economic and environmental impacts and conflicting goals, which means it is not possible to repeat one single model approach to analyse all different farm types across regions and to address different questions regarding each of the sustainable aspects. Or as Ostrom put it, «we should stop striving for simple answers to solve complex problems... Instead, we need to recognize and understand the complexity to develop diagnostic methods» to address the generic nature of the problems (Ostrom, 2007a: 15181).

Against this background, the present paper is developed with the ambition of developing a transdisciplinary research model that incorporates the diagnostic analysis of problems associated with the complex livestock farming systems into the process of seeking solution-oriented model approaches to solve these problems. In particular, this conceptual transdisciplinary research model will be useful for guiding various collaborative actors, including researchers and practice actors (such as farmers, decision-makers) in the farming system research to generate joint understanding of the sustainability problems to be addressed, to define research objectives and specific research questions, and to apply and adjust integrative research methods (Lang, et al. 2012). Moreover, the transdisciplinary research is characterised by continuous integration and application of created knowledge and interactions between researchers from different disciplines and different practice actors in livestock farming systems to identify evaluation methods that are generic for assessing the sustainability of the selected farm typology, in response to any changes in policies and regulations, market conditions and prices, and technological innovations over time, yet flexible to be adapted to specific farms and different socio-economic contexts,.

As far as we know, in spite of some isolated contributions, there is no existing systematic review of the use of farming modelling from a transdisciplinary research perspective. To keep the analysis «tractable», this paper does not cover all possible modelling approaches for the farming system assessment. Instead, it focuses especially on the challenge of integrating farming modelling into the transdisciplinary research cycle.

References

Bernués A., Ruiz R., Olaizola,A., Villalba, D., and I. Casasus, 2011, «Sustainability of pasture-based livestock farming systems in the European Mediterranean context : Synergies and trade-offs»,Livestock Science,139: 44-57

Gibon, A., 2005, «Managing grassland for production, the environment and the landscape: Challenges at the farm and the landscape level».Livestock Production Science, 96:11-31

Gouttenoire, L., Cournut, S., Ingrand, S., 2011. «Modelling as a tool to redesign livestock farming systems: a literature review».Animal, 5:1957-1997

Groot, J.C.J., Oomen, G.J.M., and W.A.H. Rossing, 2012, «Multi-objective optimization and design of farming systems»,Agricultural Systems, 110:63?77

Janssen, S. and van Ittersum, M.K. 2007, «Assessing farm innovations and responses to policies: A review of bio-economic farm models»,Agricultural Systems,94(3): 622-636.

Lang D.J., Wiek, A., Bergmann, M., Stauffacher, M., Martens, P., Moll, P., Swilling, M., C.J. Thomas, 2012, «Transdisciplinary research in sustainability science: practice, principles, and challgenes», Sustainable Science, DOI 10.1007/s11625-011-0149-x

Louhichi, K., Argyris Kanellopoulos, Sander Janssen, Guillermo Flichman, Maria Blanco, Huib Hengsdijk, Thomas Heckelei, Paul Berentsen, Alfons Oude Lansink, Martin Van Ittersum. 2010. « FSSIM, a bio-economic farm model for simulating the response of EU farming systems to agricultural and environmental policies». Agricultural Systems, 103 (8): 585?597

McCown, R. L., 2001. «Learning to bridge the gap between science-based decision support and the practice of farming: Evolution in paradigms of model-based research and intervention from design to dialogue»,Aust. J. Agric. Res. 52: 549-571

Ostrom, E. 2007a, «A diagnostic approach for going beyond panaceas»,PNAS.104: (39): 15181-15187

Ripoll-Bosch, R., Díez-Unquera, B., Ruiz, R., Villalba, D., Molina, E., Joya, M., Olaizola, A., and A. Bernués, 2012. «An integrated sustainability assessment of mediterranean sheep farms with different degrees of intensification», Agricultural Systems, 105(1):46?56

Van Passel, S. and M. Meul, 2012. «Multilevel and multi-user sustainability assessment of farming systems»,Environmental Impact Assessment Review,32: 170-180

The interactions between agricultural intensification and different aspects of governance: effects on agricultural expansions in tropical Latin America

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Summary
In this article we address two important questions: how does the interaction between the quality of governance and agricultural intensification impact on spatial expansion of agriculture? Which aspects of governance are more likely to ensure that agricultural intensification delivers its benefits in terms of reduced pressure to spatially expand agricultural areas? In order to tackle these questions, we complement the use of traditional governance indicators, with a proxy of environmental governance based on the proportion of terrestrial area under environmental protection. The results indicate that good public governance may interact with agricultural intensification and generate perverse results, by strengthening the incentives for agricultural expansion. On the other hand, the establishment of protected areas, seems to promote the desired sustainable agricultural intensification.

Abstract
The ongoing process of deforestation calls for urgent attention. The latest FAO report on the state of the forest resources estimates that over the period 2000-2010 more than 50 million ha have been lost. At the global level, the annual rate of deforestation seems to have slowed, from 0.20% p.a. for the period 1990-2000 to 0.13% for the period 2000-2010. This hides many regional differences. Central and South America accounts for over 20% of the remaining global forest resources and has almost half of its total land covered by forests. The annual rate of deforestation has decreased in Central America, from 1.56% for the period 1990-2000 to 1.19% for the period 2000-2010, while it has remained constant in South America at 0.45% p.a. In both cases this rate is significantly higher than the global average rate.
The Millennium Ecosystem Assessment pointed out the distinction between direct and indirect drivers of ecosystem changes. The main direct cause of tropical deforestation remains agricultural expansion (through land conversion to agricultural uses, including both crops and pastures for livestock) followed by wood extraction. Both are related to urbanization patterns. The main indirect causes of deforestation include economic growth, population growth and technological change.
The role of technology seems to be particularly important with respect to agricultural production, where much of the increase in output over the past 40 years has been attributed to increased yields rather than expansion of the area under cultivation. Given the coupling of agricultural land expansion and deforestation it is not surprising that both the scientific and the policy community are placing a significant emphasis on «sustainable» agricultural intensification as a means of reducing pressure on forests.
In this article we build on previous research and address two important interrelated questions: how does the interaction between the quality of governance and agricultural intensification impact on spatial expansion of agriculture? Which aspects of governance are more likely to ensure that agricultural intensification delivers its benefits in terms of reduced pressure to spatially expand agricultural areas? In order to tackle these questions, we complement the use of traditional governance indicators (e.g., rule of law, corruption control and accountability) provided by the World Bank, with a proxy of environmental governance based on the proportion of terrestrial area under environmental protection (as provided by the World Database on Protected Areas). Addressing these questions is important in order to determine whether (and under which conditions) agricultural intensification will reduce pressures on deforestation or whether it may

actually strengthen the incentives to further convert land to agriculture, signalling the existence of a Jevons paradox. Given the multiplicity of factors that affect the change in agricultural area, we also study the effect of demographic, economic and social variables.

We combine data from the FAO and the World Bank and the World Database on Protected Areas for 6 Southern American countries (Bolivia, Brazil, Colombia, Paraguay, Peru and Venezuela) to construct panel data, and study the major determinants of agricultural land expansion over the period 1970-2006.

Previous results (that are also presented here in order to provide a benchmark) indicated that the effect of agricultural intensification on agricultural expansion is conditional on the quality of public governance. In particular, for all the three governance indicators previously considered, agricultural intensification would lead to an expansion of agricultural area when governance quality is good. This result implies that good public governance may act to reduce some of the « fixed costs» associated with land conversion to agriculture. In this context, an increase in agricultural returns (as a result of intensification) is more likely to lead to agricultural expansion, thus signalling the existence of a Jevons paradox. However, when using the proportion of terrestrial area under protection as a proxy for the quality of environmental governance, the results are markedly different. Specifically, when environmental governance is good (i.e., high relative proportion of terrestrial area is protected), intensification leads to a spatial contraction of agriculture, thus signalling a sustainable intensification process. Additional results include the effect of service on external debt, population and per-capita GDP, all of which are ultimately positively correlated with agricultural expansion.

The results of the analysis help to shed some light on the role of agricultural intensification (after other important economic, institutional and demographic factors have been accounted for) and different governance components in the dynamics driving land conversion in Southern America and by so doing provide useful insight to policy-makers. The claim that agricultural intensification will be necessary to meet the food security challenge in the future appears to be a defensible position. In general, also the opportunity to strengthen public governance seems well founded, as it is likely to provide many benefits. However, when considering the specific issue of sustainable agricultural intensification it is important to understand its interactions with various governance components. By doing so it is possible to anticipate under which circumstances intensification may backfire and lead to a further expansion of agriculture, unless complimentary measures are adopted. Such measures could include the strengthening of environmental governance through (for example) the introduction of a capping mechanism on agricultural expansion and/or the strengthening and enforcement of land use controls protecting the remaining forests and/or the introduction of community-based forest management in the hands of indigenous/local people.

Individual Decisions or Institutional Dynamics? Reasons for the Intensive Use of Fertilizer in Eastern China

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Summary
The eutrophication of Lake Tai in the mid-east of China not only impedes social and economic development, but jeopardizes fresh water safety and supply for millions of local residents. It is caused by an excessive import of nutrients from agricultural non-point-source pollution with chemical fertilizers as the major nitrogen input source. In our research we aim to improve the understanding of the farmers' decision-making process applying chemical fertilizers. Based on data gained in household interviews in 2011 and 2012 we follow the question: Which factors influence the individual decision on the use of fertilizers? Our approach is twofold: first, we estimate a production function to assess nitrogen overuse. Second, based on qualitative data we analyse the influence of the institutional context on individual decision-making.

Motivation
The accelerated eutrophication of surface waters is one of the most important factors impeding sustainable economic development in the People's Republic of China (P.R.C.). Lake water eutrophication refers to the changes in water chemical properties triggered by the accumulation of excessive nutrients such as nitrogen and phosphorus. It can lead to rapid production of phytoplankton and other micro-organisms, as well as to deterioration of water quality (depletion of oxygen), both of which are detrimental to aquatic ecology and the normal functioning of the water bodies.
We focus on the catchment area of Lake Tai, the third largest freshwater lake in the P.R.C, which is known for its extreme level of pollution. It is located in the mid-east of China belonging to Jiangsu, Zhejiang, Anhei Provinces and Shanghai City. According to the Chinese environmental quality standard[1], Lake Tai water quality has deteriorated from grade I-II to grade IV-V (de Bruin et al. 2005). Being one part of the tremendous water pollution, eutrophication led to extensive outbreaks of algae bloom, not only impeding social and economic development, but jeopardizing fresh water safety and supply for millions of local residents (as for instance shown by Le et al. 2010). It is commonly understood that the eutrophication is caused by an excessive import of nutrients (nitrogen and phosphorus) from agricultural non-point-source pollution (NPSP) with chemical fertilizers as the major nitrogen input source (cf. among others Zhang et al. 2010).
Against this background, the Lake Tai region seems to be an adequate example to investigate reasons and motivations in famers' decision-making with respect to the use of chemical fertilizers. The objective of our research is to improve the understanding of the farmers' decision-making process with regard to their production intensity level. We aim to shed light on the influence of the institutional environment on the decision-making assuming that such decisions are not only led by instrumental rationality having given preferences, but rather by the interaction with the social surrounding (Vatn 2005). Herein we aim to improve the understanding of the so called « sufficient reason» for farmers' actions based on their perceptions and «beliefs» (cf. Bromley 2006).

Methods and Data
Being the most commonly cultivated plant in the target area, our research focuses on the production of paddy rice. The first step is to quantify a possible overuse based on an efficiency analysis. For this purpose we estimate a production function referring to the «von Liebig » response function (Leontief). Here, we stick to a short time horizon due to insecure land property rights. Based on the findings, we elaborate the influence of the institutional context on individual decision-making in the tradition of Classic Institutionalism in a second step. Institutions are understood as conventions, norms and officially sanctioned rules (Vatn, 2005). We assume that institutions shape the individual and define which rationality is relevant or appropriate in each type of setting. They influence perceptions, values, preferences and capabilities, and thereby

their (possible) choices (ibid.). In order to receive deeper insights into farmers' cognitive structures we use the findings of Self-Determination Theory (Ryan and Deci, 2000) and metaphor research (Lakoff, 1993).
In a first empirical phase in 2011, a survey with 150 semi-structured household interviews was conducted in the upstream area of Lake Tai in Jiangsu Province. Thereof, a selection of 32 households with considerable changes in yields and/ or fertilizer application was again interviewed in depth in 2012. Our data set contains socio-economic household features, details on yield and fertilizer; and perceptions of social interaction. The researched family farms show on average a land endowment of about 0.44 ha and the average age of the mainly male farmers is 61. In this economically very dynamic region, income is generated by the younger generation working off-farm.

Preliminary results
The data show rather broad ranges of fertilizer application like 200-750 kg of nitrogen (N) per hectare for 6 or 8 tons of rice for several yield levels. This supports our assumption of the «von Liebig» response function (Leontief). Given rather homogenous soil qualities and price levels, it is fairly surprising from an economic point of view why the same yield level goes along with such strongly varying nitrogen levels. In the period from 2005 to 2010 the amount of N increased by 22 %, but yield only by 7.3 %. For 2010 we find a mean N application of about 341 kg per ha, which is nearly twice as much as among others Shen et al. (2007) report as being the optimal level of nitrogen for average yields of paddy rice in that region (varies from 190 to 227 kg N /ha). First insights from the second empirical phase reveal that high amounts of applied fertilizer are associated with the dynamics between two basic psychological needs: the need for relatedness to neighbours and peers, and at the same time the need for competence and autonomy. The former is amplified by the Confucian ideal of a harmonious society and the latter by the recent changes in taxation and the memories of hunger. It may be hypothesised that the farms' focus is rather on output than on economic efficiency.

References
Bromley, D. W. (2006). Sufficient Reason. Volitional Pragmatism And The Meaning Of Economic Institutions. Princeton University Press, Princeton, New Jersey, U.S.
de Bruin, E., Frijns, J., Moens, R., Maessen, M., Y. Wu and H. Liu (2005). Masterplan for the Rehabilitation of Lake Tai, Dutch Ministry of Foreign Affairs, Grontmij, Netherlands.
Lakoff G. (1993). The contempory theory of metaphor. In Ortony A. (ed.), Metaphor And Thought. Cambridge University Press, 202-251.
Le, C., Zha, Y., Li, Y., Sun, D., H. Lu and B. Yin (2010). Eutrophication of Lake Waters in China: Cost, Causes, and Control. In: Environmental Management, 45: 662-668.
Ryan, R.M. and E.L. Deci, (2000). Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. American Psychologist 55(1): 68-78.
Shen, M.-X., Yang, L.-Z., Yao, Y.-M., Wu, D.-D., Wang, J., R. Guo and S. Yin (2007): Long-term effects of fertilizer managements on crop yields and organic carbon storage of a typical rice-wheat agroecosystem of China. In: Biol Fertil Soils, 44: 187-200.
Vatn, A. (2005). Institutions and the Environment. Edward Elgar Publishing Ltd. Glensanda House, Montpellier Parade, Cheltenham, Glos GL50 1UA, U.K.
Zhang, Q.-L., Chen, Y.-X., Jilani, G., I. Haider Shamsi and Q.-G. Yu (2010): Model AVSWAT apropos of simulating non-point source pollution in Taihu lake basin. In: Journal of Hazardous Materials, 174: 824-830.
[1] The Ministry of Environmental Protection of the People's Republic of China distinguishes in the ?Environmental quality standard for surface water' (GB 3838-2002) five different classes (I ? V: excellent, good, ordinary, poor and bad) based on the loads of contaminants.

ANALYZING FERTILIZER USE ON FARMLANDS WITH DIRECT EXPERIMENTATION

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Summary
A major concern in ecological economics is over-extraction of sources and over-pollution of sinks, i.e. overexploitation of the environment beyond so called social-optimum. There is worldwide evidence indicating that in conventional agriculture, chemical fertilizers are overused, excessive nitrogen is leached and consequently, freshwater systems are eutrophied. Fertilizer overuse by farmers provide a case for mismanagement of environmental resoruce systems, for which dynamic complexity matters and standard economic measures are difficult to implement. Observing such difficulties, agricultural experts are in well agreement that farmers' education is the leverage in restraining fertilizer use to the detriment of the environment. But, soil nutrient management is a dynamically complex problem involving delays, feedbacks and nonlinearities. In this research, we developed a dynamic simulation model to test and understand the factors leading to overuse of fertilizer beyond what is individually rational under the condition of private resources. The model is used as the basis of a computer simulation game for direct experimentation on farmers' behavior. Pilot experiments reveal that players apply fertilizers beyond near-optimal, which ensures highest farm profits with minimum nitrogen leaching. Experiments will be replicated with actual farmers in the field and agronomists to propose management guidelines that would reduce nitrogen leaching.

Abstract

A major concern in ecological economics is over-extraction of sources and over-pollution of sinks, i.e. overexploitation of the environment beyond so called social-optimum. Hence, scale in economic activity is a fundamental problem in ecological economics (see for example, Daly and Farley 2004, Chapter 2). In case of private resources, standard economic explanations of the overexploitation problem focuses on the existence of negative externalities and high discount rates, and in case of common pool resources, it focuses on the problem of free access. Externalities, high discount rates and free access provide perverse incentives for so-called individually rational agents to exploit their resources beyond what is socially efficient. Hence, appropriate pricing of the resources and pollutants are expected to correct the markets and internalize the costs to the society in case of private resources. Regulations that would discourage free access, institutions that would encourage cooperation and self-management are expected to restrain resource extraction in case of common pool resources (for a complete discussion, see Hahnel 2011, Chapter 4).

On the other hand, it is well understood that, resource overconsumption may occur because the systemic complexity and dynamics of the resource system is not well understood by the regulators and everyday users (Moxnes 2004, Moxnes and Saysel 2009). Moreover, in some cases, there can be impediments to internalizing the costs of pollution, enforcing regulations, or stimulating cooperation among the resource users. We suggest that, fertilizer use of farmers provide a case for mismanagement, for which dynamic complexity matters and above measures are difficult to implement.

There is worldwide evidence indicating that in conventional agriculture, chemical fertilizers are overused, excessive nitrogen is leached and consequently, freshwater systems are nutrient loaded and eutrophied (Yadav et al. 1997). However, there are impediments to implementation of standard economic policies. Firstly, increasing fertilizer prices for creating disincentives for farmers is not a popular, hence politically viable strategy since many medium and small scale farmers already live on considerably low profit rates, if not on negative profit rates. Secondly, taxing the amount of fertilizer that has leached from the farmlands is technologically as well as politically not feasible, because nutrient load from farmlands is a dispersed, non-point pollution which is difficult and expensive to measure and monitor. Thirdly, regulation through monitoring of farmers and fining of overuse is difficult, because in many cases, it is the private vendors of commercial fertilizer brands who prescribe fertilizing schedules and amounts to the farmers. Fourthly, fertilizer application on farmlands hardly possess the characteristics of a common pool resource problem, because the farmlands are individually owned but the pollutant receiving

medium is public with ill defined boundaries and beneficiaries. In other words, benefits are onto individual farmers but costs are not necessarily to the social group comprising the polluters.
Observing such difficulties, agricultural experts are in well agreement that farmers' education is the leverage in restraining fertilizer use to the detriment of the environment. But, soil nutrient management is a dynamically complex problem involving delays, feedbacks and nonlinearities. In this dynamic environment, farmers' task is to keep soil nutrients at appropriate levels in consecutive plant developmental stages so as to promote biomass growth and increase farm profits. In this perspective, fertilizer application and soil nutrient management is a dynamic decision making (DDM) problem. In DDM literature, there is rich experimental evidence indicating systematic misperceptions of stocks and flows, underestimation of delays, ignorance of feedbacks and nonlinearities (see for example Moxnes 1998 and Sterman 2006) Many studies reveal that, flawed mental models and misperceptions lead to overconsumption and overutilization of resources, even in cases where appropriate economic incentives are provided.
In this research, we developed a dynamic simulation model to test and understand the factors leading to overuse of fertilizer beyond what is individually rational under the condition of private resources. After that, the model is used as the basis of a computer simulation game for experimentation on farmers' behavior. The simulation model integrates soil nitrogen cycle and corn growth as influenced by soil nitrogen availability. It represents soil nitrogen dynamics during a growing season for agricultural crop maize, soil nitrogen availability, nitrogen uptake and corresponding growth of its organs and finally its kernel (Cole 1999 and Daniel 1999).
The the task structure of the game is identified after a field study among the maize farmers in Ödemi? in Turkey. Farmers were interviewed about their crop and fertilizer preferences, fertilizer application amounts, schedules, technologies and yields. It was observed that farmers in this specific region adopt almost identical fertilizer application practices. Their attitude is straightforward with predetermined dates and rates of application, constrained to a very short interval during the whole season, without active monitoring of the developmental stages of the crop in the field.
Simulation game lasts for 120 days (the whole groving season for mazie). The simulation time is clock driven, i.e. the players apply fertilizers in any day they like to. As simulation time unfolds, they observe plant biomass growth on their farmlands. At the end of the game they are provided with a payoff in proportion to income that they generate in the current season. Pilot experiments reveal that, players apply fertilizers beyond near-optimal, which ensures highest farm profits with minimum nitrogen leaching.
Further experiments will be conducted with alternative information treatments to help players improve their management strategies. Experiments will be replicated with actual farmers in the field and agronomists to propose management guidelines that would reduce nitrogen leaching, while not hurting farm profits.
References:
Herman E. Daly and Joshua Farley,Ecological Economics, Island Press, 2004.
Robin Hahnel,Green Economics, M. E. Sharpe, 2011.
Erling Moxnes, Misperceptions of Basic Dynamics: The Case of Renewable Resource Management,System Dynamics Review, 20(2), 2012.
Erling Moxnes and Ali Kerem Saysel, Misperceptions of Global Climate Change: Information Policies, Climatic Change, 93: 15-37, 2009.
Satya N. Yadav et al., Do Farmers Overuse Nitrogen Fertilizers to the Detriment of the Environment?,Environmental and Resource Economics, 9: 323-340, 1997.
Erling Moxnes, Overexploitation of Renewable Resources: The Role of Misperceptions,Journal of Economic Behavior & Organization, 37: 107-127, 1998.
John D. Sterman, Communicating Climate Risks in a Skeptical World,Climatic Change, 108: 811-826, 2011.
Cole, F. J. S. a. M. A.,Cycles of Soil: Carbon, Nitrogen, Phosphorus, Sulfur, Micronutrients, Wiley, 1999.
Daniel Plénet, G. L., Relationships between dynamics of nitrogen uptake and dry matter accumulation in maize crops. Determination of critical N concentration,Plant and Soil216: 65-82, 1999.

Assessment of eco-efficiency in agricultural sector in Japan: An application of System of Environmental and Economic Accounting and Sustainable Value

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Summary
This study investigates whether Japanese agriculture improves its eco-efficiency. To conduct the analysis, we, first, develop a System of Environmental and Economic Accounting (SEEA) for agriculture and forestry in Japan, and then estimate the eco-efficiencies and the Sustainable Value (SV). Eco-efficiencies are estimated based on greenhouse gas emission, acidification, eutrophication, air pollution, and energy and water use in every five year from 1985 to 2005. SV is estimated defining the benchmark as the eco-efficiencies of the year 1990 which have performed best during the estimation period. The results show that although the absolute amounts of environmental impact and resource use have declined, eco-efficiencies have worsened. SV is negative throughout the estimation period, which means that the agricultural sector have lost some value-added due to the worsening eco-efficiency.

Abstract
Reduction of environmental impact and resource use is a critical global issue. In the manufacturing sector, efforts are being made to promote eco/resource efficiency (hereafter, eco-efficiency) which try to reduce the input of resources and environmental impact while increase the value added. The agricultural sector is also required to reduce its impact on the environment, and it is important even for the agricultural sector to introduce the concept of eco/resource-efficiency to reduce the environmental impact and resource input by/to its production. However, farmers are not under the same level of pressure as manufacturers due to unique relation between nature and agricultural production and the difficulty in monitoring pollutants from agriculture. Therefore, eco-efficiency and Sustainable Value (SV) are not always taken into consideration.
In Japan, the agricultural sector is now facing severe competition with imported foodstuffs, and high quality of the products is one of the advantages of Japanese agriculture. However, in some cases, farmers use more resource input and its production emits more pollutant to produce higher quality and more value-added products. For sustainable and eco-friendly agriculture, farmers are required to reduce resource use and its impact on the environment, and to increase value-added at the same time. Therefore, it is important to introduce the concept of eco-efficiency in Japanese agriculture. Furthermore, it is also important for policy makers to understand eco-efficiency at national level to develop a new policy schemes to promote eco-efficiency.
To calculate eco-efficiency at national level, we think that the System of Environmental and Economic Accounting (SEEA) can be a support tool to clarify the relationship between economic activities and environmental impact. Additionally, Sustainable Value (SV) is also a practical tool to understand the relation between eco-efficiency and sustainability. Some studies addressed eco-efficiency in agriculture such as Keating et al (2011), Pelletier et al (2008), Zhu YuLina et al (2011) and Reith and Guidry (2003). However, these studies are focused only on specific inputs such as fertilizer input (Pelletier et al, 2008), energy use (YuLin et al, 2011), or on field analysis (Reith and Guidry, 2003) or specific faming practices (de Koeijer et al, 2002). Regarding to SV studies, van Passel et al (2007), and van Passel et al (2009) applied SV to measure sustainability of dairy farmers. To authors' knowledge, no studies addressed eco-efficiency and SV including whole agricultural sector at a national level. Ang et al (2010) applied the SV approach to the comparison with nations at macro level and find out that the SV approach is also workable at national level. Our study applies the SV concept to sector-level (the whole agricultural sector) in one nation, and we think the SV is also applicable to the sectoral level.
This study investigates whether agricultural sector in Japan improves its eco/resource-efficiency. To conduct the analysis, we address following research questions;
i) to develop an SEEA for Japanese agriculture and forestry (SEEA-AF)
ii) to estimate eco/resource-efficiencies and SV of the agricultural in Japan at national level
In this study, we developed a new framework of the SEEA that is applicable to agriculture and forestry in Japan (SEEA-AF) based on a Japanese SEEA compiled by the Economic and Social

Research Institute (ESRI) in 2004. We modified it to capture economic activities and environmental impact, resource use, and waste generation caused by production in agriculture and forestry. The estimated years are 1985, 1990, 1995, 2000, and 2005. Environmental pollutants and resource use we take into account are greenhouse gas (GHG) emission s (CO_2, CH_4, N_2O), acidification (NOx, SO_2, NH_3), eutrophication (T-N, T-P), air pollution (SPM), and energy use (oil, gas, electricity) and water use.

In our study, eco-efficiency is defined as the gross value added (GDP in System of National Accounting: SNA) per unit of amount of pollutants or resource input. A unit is one yen per pollutant emission, for example, yen/CO_2-eq. The definition of SV is modified to apply time series analysis for agricultural sector. The definition of benchmark is very crucial to results. our purpose to apply the SV approach to the analysis is to understand how much money has earned (foregone) by improving (worsening) eco-efficiency. We think the most efficient practices in the past can be achieved since ever. Therefore, we define the benchmark as the best performed year during the estimation period.

As for the absolute amount of environmental impact and resource use (GHG emission, acidification, air pollution, and eutrophication, energy use and water use) measured in appropriate physical terms, all items except energy use show a consistently slight decline, especially since 1990. The overall results show a declining trend for the absolute amount. From this result, we learn that Japanese agriculture was more energy intensive until 2000. This is because oil prices were very low during the period, and horticultural farmers use more oil to increase their production. Regarding to eco-efficiencies, the results show a declining trend in eco-efficiency of all items. These results indicate that the reduction in environmental impact is not sufficient compared with the decline in production. From the viewpoint of eco-efficiency, Japanese agriculture did not achieve environmental improvement. When we look at the results of SV calculation, as the benchmark is placed in 1990 which has achieved the highest performance among the estimation years, all the SV values are negative. After 1990, SV has rapidly declined, particularly, the value in 2005 is -1,127 million yen. This figure shows foregone GDP by not maintaining eco-efficiency at 1990 level.

The results showed that although the absolute amount of environmental impact is declining in Japanese agriculture, eco-efficiencies are worsening and the 1990-benchmarked SV are less than 1 throughout the estimated period: 1985-2005. The eco-efficiency of Japanese agriculture has been declining since 1990 when eco-efficiency performed best. Our study gives policymakers in agri-environmental policies important information. It is important for the local or national government to support farmers' efforts to reduce environmental impact, particularly in view of their limited access to the latest eco-friendly production technologies. It is also important to provide farmers with incentives to reduce environmental impact, such as direct payment and higher energy tax.

Additionally, our study proves that the SV approach is also applicable to the sector-level analysis and that the SEEA framework is practical tool to organize and manage statistical information used for the SV calculation.

Objective, Subjective and Phenomenological Environmental Effects

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The Various Environmental Effects of Human Action: Objective, subjective & phenomenological Environmental Effects. Abstract

This paper endeavors to shed some new light on the various environmental effects of human action through investigating the concept of ?environmental effects' from a philosophical and holistic perspective. The paper discusses holistic ontology in an effective and concise way and its implication for the concept of ?environmental effects'. Further the conceptual analysis hammers out the epistemological implications showing the need for a holistic view on knowledge incorporating both the natural-objective sciences and the human-subjective sciences (hermeneutics and phenomenology). A model for holistic environmental effects is developed. The model shows that environmental effects have both an objective-biophysical and a subjective-sensible and experiential dimension. This observation stresses the urgent need to understand more deeply the social meaning of human-created biophysical changes. The paper tests the model in light of a recent petroleum development project in the Norwegian Barents Sea. The paper discover that the environmental effects assessed for the oil project is not the holistic environmental effects but entirely biophysical effects and that social effects such as sound, smell, esthetics and subjective experience is absent.

Introduction
This paper endeavors to shed some new light on the various environmental effects of human actions through investigating the concept of environmental effects from a philosophical and holistic perspective. The paper discusses holistic ontology in an effective and concise way and its implication for the concept of ?environmental effects'. Point of departure for the discussion is the classical distinction and dualism between primary and secondary properties (Galilei and Descartes), or the objective paradigm (Taylor, 1985). The discussion illustrates effectively, with the use of examples, the importance of breaking down this distinction in order to hinder a reductionistic/atomistic concept of environmental effects. The paper launches a holistic model to environmental effects and illuminates, in a novel way, the deep subjective or psychological dimension of bio-physical change. The paper thus provides academicians and practicians with a novel and holistic way to understand environmental effects.
Theoretic perspectives The properties of naturePrimary properties
Galileo Galilei (1564-1642) and René Descartes (1596-1650) divided the properties of nature into primary and secondary properties. Primary properties being the physical, geometrical-mechanical and tangible (quantitative) properties of reality such as form, length, breadth, tallness, weight and so forth. These were considered to belong to physical substances as such or to the « thing-in-itself» (Ding an sich). Today we can also include the properties which are made possible to us through the use of theoretical observation, i.e., chemical and biological properties.

These properties they referred to as thereal or objectiveproperties of nature[1]. They are commonly regarded objective because they can be observed either through pure or theoretical observation, and because they are inter-subjective meaning that description of them will always be identical no matter who is observing them. For example qualities such as quantitative, tangible and instrumental (economic) properties are. These qualities constitute the abstract-mathematical or Scientific Worldview of classical mechanics (physics).

The objective perception of reality describes the «thing-in-itself» (Dinge an sich) or the primary qualities of nature. This is the description of reality for which the natural-mathematical sciences provides us with. Concretely this description constitutes atheoretical realityof how the environment is in itself. Describing nature by the help of models and structures from the physical sciences gives a description which can become common property for all cultures. This is possible because the description is purely abstract and superficial. A classical example illustrating the

limitation of objective description of nature is the one provided by A. N. Whitehead: ?Nature is a dull affair, soundless, scentless, colourless; merely the hurrying of material, endlessly, meaninglessly' (Whitehead, 1967, p. 54). On the other hand, the truly strength of objective description of nature, is the elimination of dogmas and metaphysical proposition (cf. the young Ayer, 1952).

Natural science

The epistemological tradition of the seventeenth century, or the objective paradigm, was designed to produce exact knowledge of the primary qualities of nature (Taylor, 1985)). The Kretz delving objective truth of reality most seriously was Logical Positivism and what later has come to be framed ?The Received View' of science (Suppe, 1979). The essence of the method of the natural sciences is neatly summarized by Chalmers: ?»science is derived from the facts» ... Science is to be based on what we can see, hear and touch rather than on personal opinions or speculative imaginings. If observation of the world is carried out in a careful, unprejudiced way then the facts established in this way will constitute a secure, objective basis for science' (Chalmers, 1999, p. 1).

The natural sciences provide us with a theoretical-physical reality. There is no place for experience (subjective and tertiary qualities) in the scientific worldview. Objective description of nature is therefore not nature as we intuitively know it, but rather ?an abstract structure of some kind ... merely several commonreference pointssuitable for mathematical description' (Næss & Rothenberg, 2001, p. 48). DesJardins description of the scientific worldview can help us understand the nature and limitation of objective descriptions: ?Because all these primary qualities can be fully described in mathematical terms, the real world turns out to be the world of mathematical physics and mechanics. Real trees, for example, have no color. They merely reflect light waves. If our eyes were constituted differently, they would appear differently. ... Therefore, description of natural objects that refer to secondary qualities such as color, weight, and taste are scientifically irrelevant. They are not really true, rational, or objective' (DesJardins, 2006, p. 213).

Secondary and tertiary properties

Secondary properties of nature encompass the properties which aresensibleto human and other living creatures. These are for example the colors, sounds, smells and tastes of the world in addition to felt heat and coldness. Secondary properties are often termedsubjectivebecause they are not objective in the sense that they are observable as physical entities, and because they are not intersubjective by definition. Colors, sounds, smell, taste and felt heat are all properties varying dependent on a subjects' embeddedness in time and place. For example the color of leaves shifts through the seasons, subjects experience them differently independent of seasonal variations, and so on.

Tertiary properties of nature encompass the properties which subjects, to a great extent and animals to a less extent, canexperiencefrom within; i.e., within the inner life (Frankfurt, 1971; Næss, 1999; Næss & Rothenberg, 2001; Taylor, 1985a). These are for example delight and joy, despair and anxiety. Tertiary properties are often termedphenomenologicalbecause they concern how environmental effects appear in our spontaneous experience, and because they are neither observable nor sensible as objective and subjective effects are. For example joy or anxiety cannot directly be seen, heard, smelled or tasted, but instead it appears to us as feelings, thoughts and physical-bodily reactions; such as blushing, tingling, convulsion and shivering.

Human science

The epistemological tradition designed to produce knowledge from this layer of reality is hermeneutics or The Science of Man (cf. the terminology of Taylor, 1985b) and phenomenology. Dilthey stated it famously as: «Die Natur erklären wir, das Seelenleben verstehen wir», which can be translated to «Nature we explain, the human soul we understand». In contrast to natural science, hermeneutics endeavor interpretation and understanding of reality ?from within by means of intuition and empathy, as opposed to knowledge from without by means of observation and calculation. In other words, first-person knowledge that is intelligible to us as fellow human beings' (Blaug, 1992, p. 43). Subjective and phenomenological descriptions thus mean to describe the inner reality of human beings. For this purpose it is necessary to avoid unprejudiced observation and instead endeavor empathic reading of the fellow human being. G. H. von Wright explains that empathy (in German Einfühlung) means a recreation in the mind of the reader or interpreter of the mental atmosphere, the thoughts and feelings and motivations, of the text or text-analogue of his study (Wright, 1971, p. 6). Also the famous psychologist, A. H. Maslow, put emphasis on the need to be mentally connected in a Buberian ?I-Thou' sense in order to

produce mental or ?experiential knowledge': ?More sensitive observers are able to incorporate more of the world into the self, i.e., they are able to identify and empathize with wider and wider and more and more inclusive circles of living and nonliving things. As a matter of fact, this may turn out to be a distinguishing mark of the highly matured personality' (Maslow, 1966, p. 50-1).

Summary of the theoretic perspectives

Recapitalizing what have been said in the conceptual analysis of this paper. Reality or nature consists of primary, secondary and tertiary qualities. Any attempt to reduce one or more of these consequently removes us away from reality. This observation provides implications for our understanding of knowledge. The natural sciences focus on exact and objective knowledge is suitable for descriptions of the primary qualities of nature and objective environmental effects. Hermeneutics and phenomenology focus on the inherent life of nature and subjects is suitable for subjective and phenomenological descriptions of the secondary and tertiary qualities of nature. Thereby our theoretical reading has lead us to a (meta) analytical tool for analysis of (ontology) the qualities of nature/reality as well as two research strategies (epistemology) we can use to gather knowledge about them. Furthermore, this framework can be used for a critical review ofenvironmentaleffetcswith respect to which parts of reality that are being assessed/studied and what research strategies that are utilized, and consequently to critically evaluate the extent to which the assessments are able to acquire knowledge / information about impacts/different parts of reality.

Figure 1 (Wathern, 1995, p. 8).

Objective, subjective & phenomenological environmental effectsEnvironmental effects

Environmental effectsarechangesin the condition of a particular natural, cultural or economic parameter (Wathern, 1988) (see figure 1). Effects thus referrers tochangesin nature or society, changes from one state to another. An effect is typically defined as a process, for example soil erosion or acidification of ground water, which starts by a particular projectaction(Figure 1). In the literature on environmental effects changes in primary properties are normally referred to as ?effects', and changes in secondary and tertiary properties are referred to as ?impacts' or the value judgment of that particular effect. According to our analysis in this paper this distinction between effects and impacts is fallacious or reductionistic because the subject cannot be decoupled from the object. Let's look at some examples speaking in favor of our claim here.

Objective environmental effects

Examples of the primary properties of nature, say for a mountain, refer to the shape and form of the mountain, the matter, metrical height, cubical volume, it's basal in square meters and the weight of the mountain. Objective environmental effects encompass the change in these primary properties (or environmental parameters) which the initiation of the project produces.

For example the objective change of blowing out a hole in the mountain is the form, range and extent of this hole measured in for example cubic meters, and all other physical, chemical and biological changes which the explosion brings forth. Another example of objective change can be illustrated with the killing of living life. Imagine that the explosion that was necessary to make the hole in the mountain also affect small creatures in the area such as birds, foxes, mouse, insects and so on and so forth. The objective change or effect on these living things includes physical, chemical and biological changes of their physical bodies. For example deformed body parts, change in body weight, reduced amount of blood in their veins, form and shape of the fur and so on and so forth which the explosion caused. With regard to an oil spill the objective effects are for example the chemical components of oil which zooplankton, fish and other biological life takes up, the association of PAHs[2] with other particles in air and sea, and so on and so forth (see e.g., Johansen & Sørnes, 2009).

Objective environmental effects thus encompass the pure physical and chemical changes of a specific cause. Objective effects are characterized by, we see, that they fit a mathematical or abstract structure or description of nature (Næss & Rothenberg, 2001).

Subjective environmental effects

Examples of the secondary properties in our example with the mountain, refers to the color, sounds, smells, tastes and the heat and cold of the mountain. Subjective environmental effects encompass the change in these secondary properties which the initiation of the project produces.

For example the subjective effects of blowing a hole in the mountain constitute the noise, smell, felt vibration of the explosion, the color of the crater, and so on and so forth. The subjective effects of killed or wounded living things is for example red blood on the ground, the noise of screaming animals, the smell of rotten carcasses and so on. With regard to an oil spill these effects are for example the black oil blended with the color of the blue sea or white sand on the beach or grey stones or green sea plants or shiny fishes or fury birds and mammals, the smell of oil, the noise of complaining and contaminated living things, the change in taste which oil contaminated fish meat represents, the drop in body temperature of birds due to reduced insolation as result of oil exposed feathers, and so on and so forth.

Subjective environmental effects thus encompass the pure sensible changes of a specific cause; i.e. those changes which can be seen, heard, smelled, tasted and physically felt.

Phenomenological environmental effects

Examples of tertiary properties in our example with the mountain, refers to the thoughts, feelings and bodily reaction that appear to us as we experience the mountain. Phenomenological environmental effects encompass the change in these tertiary properties, i.e., thoughts, feelings and bodily reaction, which the initiation of the project produces. For example the phenomenological effects of blowing a hole in the mountain encompass the experience of the bang, effects such as frightening, anxiousness, scary, exciting, and so on and so forth. The phenomenological effects of killed or wounded living things are for example sorrow, tragedy, despair, depression, and so on and so forth. With regard to an oil spill these effects are for example the anger and sorrow you feel from seeing contaminated birds, fish and organic life, the sadness of damage species and organic life, and so on and so forth.

Holistic Environmental Effects

The model below summarizes the conceptual part of this paper. The model shows that any action in the environment causing environmental effects must be analyzed /assessed in relation to three environmental properties, namely primary, secondary and tertiary properties. The effect which the action cause on the physical environment is termed objective environmental effects, while effects caused on the sensory environment is termed subjective environmental effects, and finally the effects caused on human experience is termed phenomenological environmental effects. While the two former effects concern the effects on the environment «out there», the latter concern the effects «in us» or more precisely the social meaning of the two former effects. The model also includes a scale showing that the degree of objectivity, defined as inter-subjective knowledge, is reduced the further we move from changes in primary qualities, i.e., objective environmental effects, to secondary and tertiary qualities, i.e., subjective and phenomenological environmental effects.

Figur 1 Holistic Environmental Effects

Example on Environmental Effect from a Norwegian Oil project in the Barents SeaThe case of Goliat

The Goliat project is an oil and gas development project located in the vulnerable Barents Sea approximately 70 km. north of Sørøya in the county of Finnmark, Northern Norway. Recoverable oil reserves are estimated to 28 million Sm3 (standard cubic meters). Total investment costs are stipulated to 27 billion Norwegian Kroner (about 3.58 billion euros). Three different project development concepts (PDC) have been assessed individually for their respective effects on the environment. The chosen concept (Alternative 1) is a so-called floating production circular facility (FPSO) containing a processing plant, oil storage capacity and accommodation facilities offshore above the field. The project also involves the laying of pipeline on the seabed for export of gas to existing peripheral gas-infrastructure from Snøhvit (a huge Norwegian gas field in the Barents Sea with onshore processing plant in Hammerfest, the northernmost city in the Arctic).

The environmental effects of the Goliat project are assessed in chapter 8 of the EIA-report on Goliat[i]. The report identifies and assesses five major groups of environmental effects: emission to air, regular emission to sea, physical disturbance, seismic and waste management. Already now we are getting the signal that the environmental effects studied in this report concerns changes in primary qualities such as physical and chemical condition, i.e., objective environmental effects. But we shall practice the principle of charity (from hermeneutics) in our interpretations meaning that we shall not read the report with a negative prejudiced state of mind.

The major environmental effects of the oil project are mainly resulting from five activities, these are drilling, energy consumption, seismic, the laying of pipelines and production of waste (p.

103). Drilling for oil has several effects on the environment. A total of eight oil wells will be drilled leaving 2900 m3 plus 14 100 m3 of drill-cuttings and 12 700 m3 ofdrill-fluid (produced water) and several chemicals (bentonitt, Soda Ash, Polymer, Ilminitt) released into the sea (p. 117). The drill-cuttings are expected to be mainly local, 100-150 meters surrounding the oil wells, and beyond this ?there is no further measurable biological traces' (p. 119). In addition to these estimates a spatial distribution of cuttings in case of oil spills is provided in the report, illustrating that drill-cuttings can be transported and distributed over an area covering 16 km2 (p. 119). In addition drilling has effects on the local biological flora and fauna surrounding the drilling areas, these include the ?smothering of bottom fauna' (p. 118, from Norwegian). Energy consumption in relation to drilling activities is also a major source for environment effects. The report has assessed that total fuel demand amounting from drilling activities, supplier and operation vehicles, and helicopter transportation amounts to 67 894 tons of fuels (p. 104-5). The corresponding emissions to air are shown in the table below (p. 104-5).
Tabell 1 Chemical emissions from drilling activites and transport

Consumption of fuel (tons)	67 894
CO2 emissions (tons)	219 577
NOx emissions (tons)	3 238
nmVOC emissions (tons)	339,8
SO2 emissions (tons)	190
Sum	

Another major potential source for environmental effects of drilling is in case there is a blowout of oil to the surface. These blowouts can be vast in size effecting both large amount of flora and fauna. Estimates for effects on birds state that as much as 20 % of whole stocks can be lost, however, it is very unlikely (only 1-5% probability). It is estimated, however, a probability of 60 % for razorbills, 80 % for puffins, 75 % for Brünnich, 50 % for great Cormorant, 40 % for King eiders, 35 % for sea otters, 30 % for fulmars, 40 for guillemots, the list goes on, that 1-5 % of stocks will be lost. There is a probability of 50 % that 5-10 % of all puffins will be lost (p. 147). No specific number on total expected losses is mentioned.

Seismic shooting impose an environmental effect in terms of physiological pressure, noise and frightening effects (133). Especially fish with swim bladder and marine mammals are sensitive. Frightening effects are expected in addition to behaviour effects on individuals.

Other physical effects of the Goliat projects are related to the anchor keeping the drilling rig in position during drilling operations. Anchoring the drilling rig leaves an anchor ditch on the seabed (p. 132). Other physical effects come from pipelines and cables buried on the seabed. These will, however, be covered by sand so they are not visible (p. 132).

Production of waste is also an important effect on the environment. The Goliat project will generate approximately 150 tons of waste annually. Sewage from treatment plants are estimated to 200 m3 annually (p. 134).

Analysis
The environmental effects of Goliat includes the chemical emission from drilling activities and transport (cf. table 1), physical disturbance of drill-cuttings, laying of pipelines on the seabed, anchoring the rig, the production of waste in addition to an analysis of the probability of killed birds, sea otters, and other living life. In relation to seismic activities, the environmental effects encompass physiological pressure on fish and whales, physical behaviour effects, in addition to noise, and the «frightening» effects on fish and sea mammals due to the pressure effects. We thus see that our concept of environmental effects in this paper can be used to understand the various

effects of human actions to the environment. We also see that the environmental effects of drilling, transport, laying of pipelines, anchoring the rig, production of waste, seismic and the loss of species is mainly dominated of objective or physical-chemical effects. The report thus lacks information and knowledge about the sensible and experiential effects of drilling activities, transport, laying of pipelines on the seabed, anchoring the rig, production of waste, seismic and the potential loss of species. This means that the noise, the smell, the visual, and the physical felt effects of these activities are not addressed. In addition comes effects with regard to the subjective experience of drilling, emissions to air and sea, the probability of loss of species, physical disturbance, disturbance of whales, sea otters, fish and so on and so forth. The absence of subjective and phenomenological environmental effects hinders decision makers in knowing how the effects of human action is actually perceived and experienced.

Conclusion

In this paper we have analyzed the concept of environmental effects in light of the holistic ontology of Deep Ecology. The holistic point of departure argued it being necessary to break down the dualistic split between subject and object. The result is a holistic view of reality/the environment constituted of both biophysical and psychological (sensory and experience) properties. Further the analysis hammered out the epistemological implications showing the need for a holistic view on knowledge incorporating both the natural-objective sciences and the human-subjective sciences (hermeneutics and phenomenology). The theoretical analysis culminates with the introduction of the concepts of objective, subjective and phenomenological environmental effects.

The discussion of the various environmental effects of blowing a hole in the mountain, the killing of living life and oil spills, illustrates the self-evident need to include also non-objective environmental effects. The discussion of Norwegian EIA-reports showed, however, that this is not currently the practice. The various ecological footprints of the big oil projects are almost exclusively reduced to physical and chemical effects. This observation stresses the emergent need of EIA reports to integrate subjective and phenomenological environmental effects and qualitative research on the socio-ecological effect of human actions in the environment. The gist of this must be to assess the social meaning of human actions, both with regard to basic need gratification and moral integrity.

Appendix Environmental Effects EIA-Report Action Objective Subjective Phenomenological
The Goliat Project
(O&G project in the Norwegian Barents Sea)
Drilling

Emissions to air (CO_2, NOx, nmVOC, SO_2)
Emissions to sea: drill cuttings, drill fluid, chemicals (bentonitt, Soda Ash, Polymer, Ilminitt), spatial distribution of cuttings, moderate effects on razorbills,

Operation of supplier, emergency vehicles and helicopter
Emissions to air (CO_2, NOx, nmVOC, SO_2)

Operation of Floating production facility (FPSO)
Emissions to air (CO_2, NOx, nmVOC, SO_2)

Construction work

Emissions to air (CO_2, NOx)

Anchoring the FPSO

Anchor-ditch on the seabed

Laying pipelines

Ditch on the seabed
Could lead to extinction of living life in a radius of 20 meters around the pipeline

Waste
Approx. 150 tons/year waste (food, oil, residual, cartons, etc.

Seismic

Noise

«Frightening effects»
Oil spill
Spatial distribution: approximately >400 ppb in an area of 20 x 20 km

Contact with sea otter, seal and whales: contaminated sea otter fur;
Whales could come to eat oil contaminated food

Freeze to death

Young fish will die

Contact with beaches and shores
Messy, discolored

Contact with molluscs, snails and crawfish

Contact with different types of birds: probability kill-rates

Ufølsom kultur: rent fysisk-økonomisk forhold til natur (naturskader er kun en fysisk/økonomisk sak)
Følsom kultur: psykisk-moralsk-opplevelsesmessig forhold til natur (naturskader er en moralsk/opplevelsesmessig sak).

Deleted text
The Prime Minister of Norway, Jens Stoltenberg, stated recently that, in regard to hydrocarbon extraction outside Lofoten, we should all «just relax» because in advance of development we

shall conductenvironmental impact assessment (EIA) which will clarify what is the best thing to do for society and the environment.

Environmental impact assessment (EIA) is an assessment of the possible positive and negative impacts that a proposed project may have on the environment (Noble, 2006). This information/ knowledge is significant because decision-makers base their decision to a large extent on this. In other words, the information in EIA is used to determine projectsustainabilityand desirability and so forth. In fact the World Bank regards EIA as the most widely practiced environmental management tool in the world (Noble, 2006).

EIA has received critics for being anthropocentric (Beanlands, 1988) -meaning that exposed changes in nature and the impacts of these are subjected to a human centered value judgment -, dominated by positivistic and numerical ideals (Wathern, 1988), unrealistic assumption (De Jongh, 1988) and social instrumentalism (Johansen, 2011). A study in Norway has revealed that EIA on petroleum development and operation assess social and socio-ecological impacts almost exclusively in a one dimensional, physical-economical perspective (Johansen, 2011).
Analysis of basic understanding of and use of methodology in assessing environmental effects in Norwegian Policy documents and EIA reports
This part of the discussion endeavors to illuminate, in light of our theoretic discussion, Norwegian EIA policy in relation to basic understanding of and use of methodology in assessing environmental effects.

Document analysis
There are several reasons for why document analysis is an appropriate method in this study. Maybe the most important reason is that document analysis is time and cost effective since it implies the use of secondary data meaning that gathering of new empirical data is unnecessary. The second reason which is maybe at least as important as the first one is that document analysis enables analysis of a wide and large amount of data...

Six documents have been analyzed in this study. Four of these six were manuals or guideline proposals for proponents of EIA developed by respective ministries in Norway. Three of these are developed after the year of our Lord 2000 and one from 1990. The remaining two documents are two EIA reports on petroleum development and operation in Norway. One of these is derived from 2008 and the other from 1987. The relatively long time difference in our sample was motivated by an interests to study change and development over time something we also show in this paper.

Findings
Not finished
Not finished
Even though objective descriptions of nature are ?objective' in the sense that it does not include subjective qualities, it does not represent how nature reallyis.For example description of colours and experience which nature provide us with are of course not merely creations in our minds. Therefore we cannot described nature merely through objective description. We have to supplement our description with subjective and phenomenological descriptions. Subjective descriptions describe nature as it is experienced by subjects or the «thing-for-me» (Dinge an mich). Subjective and phenomenological description of nature thus describes the secondary and tertiary qualities or subjective and phenomenological environmental effects.

Ayer, A. J. 1952.Language, truth, and logic. New York: Dover Publications.
Blaug, M. 1992.The methodology of economics, or How economists explain(2nd ed.). New York: Cambridge University Press.
Chalmers, A. F. 1999.What is this thing called science?(3rd ed.). Buckingham: Open University Press.
DesJardins, J. R. 2006.Environmental ethics : an introduction to environmental philosophy(4th ed.). Belmont, Calif.: Thomson Wadsworth.
Frankfurt, H., G. . 1971. Freedom of the Will and the Concept of a Person, Vol. 68: 5-20.
Maslow, A. H. 1966.The psychology of science : a reconnaissance(1. edition ed.). New York: Harper & Row.
Noble, B. F. 2006.Introduction to environmental impact assessment : a guide to principles and

practice. Don Mills, Ont.: Oxford University Press.
Næss, A. 1999.Økologi, samfunn og livsstil : utkast til en økosofi(5. omarb. utg. [i.e. Ny utg.] ed.). Oslo: Bokklubben dagens bøker.
Næss, A., & Rothenberg, D. 2001.Ecology, community and lifestyle : outline of an ecosophy. Cambridge: Cambridge University Press.
Suppe, F. 1979.The Structure of scientific theories(2nd ed.). Urbana: University of Illinos Press.
Taylor, C. 1985a.Human agency and language - Philosophical Papers 1: Cambridge University Press.
Taylor, C. 1985b.Philosophy and the Human Sciences - Philosophical papers 2. Cambridge: Cambridge University Press.
Wathern, P. 1988.Environmental impact assessment : theory and practice. London: Allen & Unwin.
Whitehead, A. N. 1967.Science and the modern world. LNew York: The Macmillian Company.
Wright, G. H. v. 1971.Explanation and understanding. Ithaca, N. Y.: Cornell University Press.

[1] Cf. Descartes' ?wax argument' in Meditation II,On the nature of the human mind.
[2] Polycyclic Aromatic Hydrocarbons
[i] Eni Norge (2009)Plan for utbygging og drift av Goliat,Del 2 Konsekvensutredning, p. 232, from Norwegian emphasis added). http://eni.offshorefilm.com/web/GOLIAT_Konsekvensutredning.pdf

The Building Blocks of per capita Ecological Footprint Inequality: A Regression-Based Decomposition.

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It is widely known that several countries consume further natural resources than others do. Global Footprint Network asserted that if everyone in the World at 2007 lived like an average resident of USA or of United Arab Emirates, more than 4.5 earths would be required to support humanity's consumption rates. If instead the World were living like the average person in India, humanity would be using less than half the planet's biocapacity (Global Footprint Network, 2010). This paper is aimed at disentangling the causal determinants of this global Inequality.

Ecological Economics literature is plenty of empirical work disseminating the main drivers that spur environmental impacts in a given economy. The study of these driving forces behind natural resource demand has been of profuse interest by researchers and policy makers in recent decades. One common framework was suggested by Ehrlich and Holdren (Ehrlich & Holdren, 1971) who first proposed the so-called IPAT identity, where the environmental impact (I) is related to Population (P), Affluence(A) and Technology(T). Hence I=PAT. The strength of this identity stems from capturing the key driving forces of environmental impact. Further research developed that accounting equation into a stochastic regression model (York, Rosa, & Dietz, 2003). It allowed both making test hypothesis and introducing further factors that may have some influence to the environmental impact. As a result there is a vast knowledge about driving forces of natural resource consumption (Caviglia-Harris, Chambers, & Kahn, 2009; Dietz, Rosa, & York, 2007; Fischer-kowalski & Amann, 2001; Rosa, York, & Dietz, 2004). These empirical analyses tell us about elasticities; the effect of a rise in Affluence, population or technology (or temperature or urban population share) would have to a particular environmental impact scale, here natural resource demand. However, they do not inform about the effect this causal factors will have on the international environmental impact distribution (its contribution to international inequality). Since Natural resource scarcity is not a remote possibility anymore, distributional analysis on Natural Resource consumption may become critical to global governance. Accordingly, papers focused on how natural resources are distributed internationally are becoming of greater interest: it is noticeable that empirical applications in this topic have risen significantly in recent years (Aubauer, 2011; Dongjing, Xiaoyan, Hairong, & Peiying, 2010; Steinberger, Krausmann, & Eisenmenger, 2010; Wu & Xu, 2010).

In this paper we merge two mainstreams in Ecological economics research: the ecological inequality measurement and the estimation of impact driving forces. To do so we perform the Regression-Based Decomposition to international EF inequality in order to disentangle the determinants behind the asymmetries among countries in natural resource consumption (as measured by per capita EF). We use a representative sample of countries along the period 1993-2007.

The empirical results indicate that country's Affluence became the most important contributor to total inequality in Ecological Footprint in recent years, explaining almost half EF's inequality. Indeed, we saw that when EF inequality rose in the first phase of the period analysed (1993-2001), the Affluence factor accounted for the bulk of inequality change. However, when EF inequality decreased (2001-2007), the inequality change was driven by Technology and Population structure. Such findings expand the typical growth-environmental damage trade-off: as countries became more affluent, that led not only to a more unsustainable scale but also to a less fair allocation of natural resources. In short, economic growth has increased ecological inequality. On contrast, the structural composition of economies does not contribute to EF inequality. Climate factor reduced its relative contribution to EF inequality until representing the 7% of whole EF inequality, what involves that the remaining contributors increased its relative weight along the period and meaning thus that anthropogenic factors are the ones that more and more are determining EF inequality (93%).

Mobilizing ground and underground Knowledge and uncertainties in Urbanisation: Multi-stakeholders and multi-criteria evaluation processes in a deliberative perspective

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In the article, we propose to frame an integrative approach for evaluation in two different projects of urbanisation ? one related to the definition of the kind of projects that can be developed (Poitiers) and the other is related to the choice of a green neighbourhood projects (Pessac). Using the INTEGRAAL environmental integrated evaluation meta-method, we propose to create an interface between knowledge producers (geologist, architects, hydrologist...) and knowledge users (politicians,...) in urbanisation decision making processes. Two opportunities of establishing a dialogue between the urbanisation projects stakeholders have been defined: (1) to develop a risk profile of areas on which urbanisation projects could take place and; (2) to compare different urbanisation projects.

Geological disposal of radioactive waste as a ? megaproject?: challenges and approaches to the evaluation of socio-economic impacts

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Brief summary

Geological disposal of high-level radioactive waste is a typical example of what have become called complex and large-scale industrial «megaprojects». Evaluation of such projects poses particular challenges, epitomised by the chronic tendencies of these projects to exceed their estimated budgets and timetables, and their failure to deliver their promised benefits. This paper reviews the weaknesses in the existing literature on megaprojects, especially from the perspective evaluation of the socio-economic aspects of radioactive waste disposal, and proposes an alternative approach to the dominant literature. It does so by examining three key areas: 1) conceptualisation and interpretation of megaproject «pathologies», 2) the role of the evaluation and evaluator in project politics and governance, and 3) integration of «the social» into the predominantly economic evaluation approaches.

Abstract

Long-term geological disposal of high-level radioactive waste ? the nuclear waste management option preferred by the majority of industry and government experts ? has not yet been implemented anywhere in the world. However, a number of countries, including France, have advanced plans for implementing such a disposal project. The French national radioactive waste management agency, Andra, has recently sought to introduce greater reflexivity into its operations, in response notably to the obligation imposed by the French nuclear waste legislation to ensure the reversibility of decisions and the retrievability of the waste packages.

This paper presents the key challenges of the evaluation socio-economic impacts of the radioactive waste disposal project, Cigéo[1], in France. The theoretical and methodological work, whose key results will be presented in this paper will lay the basis for fieldwork (in spring and summer 2013) examining the actual expectations, needs and «repertoires» (van der Meer 1999) of actors involved in the radioactive waste disposal project in France. This methodological paper will focus on three major themes and challenges: 1) Conceptualising megaprojects and interpreting the challenges typically encountered in megaproject evaluation; 2) the role of evaluation in policymaking, politics and governance of megaprojects, and 3) methods and approaches for integrating the social aspects (alongside the economic, financial, technical, and environmental) in the evaluation of megaprojects.

Long-term geological disposal of radioactive waste can be described as an extreme example of a «megaproject» (e.g. Flyvbjerg 2007). Such projects differ from many conventional industrial projects by the multiplicity of temporal and spatial scales involved; continuous evolution and dynamism owing to the uniqueness of the project and the long time scales; the complexity of the causal relationships involved; high degree of scientific, political and institutional uncertainties; and a great likelihood of disagreement among parties involved concerning the normative principles underpinning the project (e.g. Altshuler & Luberoff 2003 ; Flyvbjerg et al. 2003; Priemus 2010).The extremely long time scales involved distinguish radioactive waste disposal from other megaprojects, as the governance structures and the institutional framework are certain to undergo fundamental changes during the lifetime of the project.

Research on existing megaprojects has highlighted a number of «negative uncertainties» or « megaproject pathologies» that typically lead to chronic underestimation of costs and time needed for completion, as well as overestimation of the expected benefits from the projects (e.g. Flyvbjerg 2007, 12-13). These «negative uncertainties» have been explained in terms of theories of « strategic misrepresentation» and «optimism bias». However, alternative problem framings have been suggested, entailing notably the ideas of multiple rationalities, complexity, and «positive uncertainties» (e.g. van Marrewijk et al. 2008). Such positive uncertainties open a number of opportunities for project governance, notably the possibility for iterative reorientation of the project in line with changing context and expectations of the parties involved. Scientific and technological progress, institutional changes, and shifts in societal attitudes and preferences may facilitate social learning, reflexivity, reversibility, revision of dominant modes of thinking, in the spirit of «adaptive governance».

The challenge of taking into account the negative uncertainties while fully exploiting the positive ones can also be conceptualised through the typical tension between accountability and learning as the key objectives of evaluation. The evaluation of megaprojects ? including Cigéo ? should strengthen accountability and transparency in order to ensure that project planning is realistic, and the resources are used in an appropriate manner. However, evaluation should also introduce greater reflexivity, flexibility and adaptability to the project planning and implementation, through continuous mutual learning among the project participants. The dilemmas and tensions between these two objectives of evaluation have their parallel in megaproject management literature (e.g. between control and commitment), and in governance literature more generally (e.g. «Mode 1» and «Mode 2» strategies).

The evaluation of a megaproject such as Cigéo likewise raises the question of the use and influence of evaluation, which in turn has profound impacts on the role of the evaluator. The consequences of evaluation frequently extend beyond those of the above-mentioned objectives of accountability and learning, for instance when evaluations are used in the political arenas for various strategic, symbolic, and ritualistic ways. Arguably, the evaluator should seek to «make the best» of such uncertainties, rather than try to minimise these presumably undesirable consequences. Achieving such an objective, in the context of multilevel and network governance, would in turn require that the traditional roles of the evaluator be revisited. When the object to be evaluated is a dynamic network rather than a clearly defined project, the conventional roles of evaluator (e.g. measurer, describer, judge, negotiator, educator, consultant, social critic, agent of social change, facilitator of democratic dialogue, and advocate of cultural justice; see Benjamin 2009, 296) may not suffice. A key question concerns the extent to which an evaluator actually is free to choose his preferred role in policymaking (e.g. Hertin et al. 2009).

Finally, a central objective of the research project on the evaluation of Cigéo is to explore ways of extending the currently dominant emphasis on economic, financial, technical, and to a certain extent environmental aspects in megaproject evaluation towards the social aspects. Such an integration of «the social» poses challenges of largely paradigmatic, theoretical, methodological, and institutional nature. Research and practice in ecological economics in general and the various strands of the evaluation and assessment of social aspects in particular (e.g. SIA, social capital, capabilities approach, constructive technology assessment, sustainability assessment, sustainable livelihoods approach, human development) offer potentially useful avenues for the integration of «the social» in the evaluation of Cigéo? This entails in particular the need to integrate the subjective and the objective aspects of «the social», i.e. the objectively measurable aspects (e.g. unemployment rate, life-expectancy) on the one hand, and the «subjective», relational, and unquantifiable aspects (e.g. identities, social cohesion, social networks) on the other, through novel approaches to social monitoring, for example.

Ultimately, integrating the social in the evaluation of megaprojects requires bridge-building that aims at overcoming the usual dichotomies such as social/economic, micro/macro, subjective/ objective, short-term/long-term, accountability/learning. However, such bridge-building in itself poses a dilemma familiar to ecological economics in general: How to deal with the irreducible conflicts between alternative paradigms and approaches? What does methodological pluralism entail in the practice of the socio-economic impacts of megaprojects?

References

Altshuler, A. & Luberoff, D. 2003. Mega-Projects: The Changing Politics of Urban Public Investment. Brookings Institution Press.
Benjamin, L.M. & Greene, J.C. 2009. From Program to Network: The Evaluator's Role in Today's Public Problem-Solving Environment. American Journal of Evaluation 30(3): 296-309.

Flyvbjerg, B. 2007. Megaproject Policy and Planning: Problems, Causes, Cures. Summary of doctoral dissertation (Dr. habil.). Aalborg: Uni.print, Aalborg University, 2007, 62 pp.

Flyvbjerg, B., Bruzelius, N. & Rothengatter, W. 2003.Megaprojects and Risk: An anatomy of Ambition. Cambridge University Press.

Hertin, J., Turnpenny, J., Jordan, A., Nilsson, M., Russel, D. & Nykvist, B. 2009. "Rationalising the policy mess? Ex ante assessment and the utilisation of knowledge in the policy process." Environment and Planning A41(5): 1185-1200.
van Marrewijk, A., Clegg, S.R., Pitsis, T.S. & Veenswijk, M. 2008. Managing public?private megaprojects: Paradoxes, complexity, and project design. International Journal of Project Management 26(6): 591-600.

Van der Meer, F.-B. 1999. Evaluation and the Social Construction of Impacts.Evaluation5(4): 387-406.

Priemus, H. 2010. Mega-projects: Dealing with Pitfalls. European Planning Studies Vol. 18, No. 7: 1023-1039.
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Science, Innovation and Sustainability: Exploring Myths and Asymmetries

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In our efforts to foster the transformations needed to address sustainability challenges, a reflexion on the roles of science, innovation and precaution is central. A series of pervasive myths still underlie currently dominant visions of science and innovation, including in particular the myth of the possibility to fully understand, describe and control complex systems; the myth that uncertainty is always reducible or quantifiable; the myth of deterministic science; and the myth that technology can 'solve it all'. There are also a series of asymmetries often not accounted for in our ways of dealing with evidence in support of policies and action, including the fundamental ones between the three pillars of sustainability; asymmetries in the weighing up of pros and cons and costs and benefits; or the asymmetry in the levels of evidence for 'proof' of harm vs. those for 'proof' of safety required by proponents of a technology. Building in particular on collective work done in the framework of the Late Lessons from Early Warnings project of the European Environment Agency, this presentation will explore such myths and asymmetries and reflect on the nature and purposes of the scientific and technological enterprises in today's context, leading to some conclusions about the governance of innovation and innovations in governance.

Opening up Green Transitions: Acknowledging the Politics of Ecologies, Economies and Technologies

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The challenges of global Sustainability are on an unprecedented scale. So urgent are the imperatives and hard the constraints, that there seems little scope for discussion of choice. Inertia and entrenched interests are so powerful and obstructive, that it is tempting to invoke technical expertise as if it were unquestionable. Acknowledgements of uncertainty or ambiguity appear as signs of weakness. The scientific and moral stakes are so stark, they seem to leave no room for no alternatives. So, do we hear repeated reference tothe Sustainability Transition ? as if this were singular and self-evident. In this light, democracy and deliberation may seem inconvenient luxuries, threatening only to slow down a self-evident direction for change. Yet these tendencies miss the point ? and threaten the core ? of Sustainability. Serious solutions are profoundly dependent on ? and reinforcing of ? inclusive, deliberative democracy. Far from being inevitably weak and slow, these can offer more rapid and effective co-ordination. Openly acknowledging uncertainty and ambiguity can de-fuse the technocratic juggernaut of an apparently choiceless ? science-based', ?pro-innovation', ?knowledge-driven' economy. Indeed ? for the first time since the ?European Enlightenment' ? Sustainability discourse offers the possibility of enabling the collective steering of the directions (not just the pace or impact) of scientific, technological and institutional progress. Real hopes for truly progressive transformation, rest in celebrating diversity and dissent in a vigorous, plural politics of Sustainability..

MARKETS IN ENVIRONMENTAL GOVERNANCE. FROM THEORY TO PRACTICE

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The aim of this paper is to clarify what is meant by ?markets for ecosystem services' (ES). The defining characteristic of markets is interaction through trade. Two main dimensions are identified as basis for classifying markets in ES. Firstly, we have markets with and without intermediaries. Secondly, some markets are created by defined liabilities like caps on emissions while other transactions come about voluntarily. Altogether six forms of markets are identified, with two being incomplete. The paper also offers an analysis of the most important existing ?markets' for ES using the developed classification. Regarding payments for ecosystem services (PES), structures with intermediaries dominate. Moreover, the main intermediaries are states/public bodies. Hence, resources for payments are mainly raised through taxes or fees ? command not trade. Therefore the majority of PES systems cannot be classified as markets, or they are incomplete. Cap-and-trade systems qualify as markets, but depend crucially on the politically defined cap. Moreover, it is this cap that protects the environment. While the idea with markets in ES is to ?escape' command and control, it is observed that C&C is essential for these markets to work.

The UN System of Environmental-Economic Accounting (SEEA) ? Experimental Ecosystem Accounting. Implications for biodiversity policy

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Title of special session: Biodiversity: valuation, conservation and policy

The UN System of Environmental-Economic Accounting (SEEA) ? Experimental Ecosystem Accounting. Implications for biodiversity policy

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Summary:
A System of Environmental-Economic Accounting (SEEA) was made an international standard by UN Statistical Office in 2012. The central framework contains recommendations on accounting for natural resources and pollution. Ecosystem accounting was left out as it was difficult to handle within the central framework. Instead the UN together with the World Bank and EEA started work on an Experimental Ecosystem Accounting, including a proposed account for biodiversity. The main idea is to measure how far from a reference condition of a natural ecosystem an area is and to measure this yearly for a representative number of species, summarized as an index illustrating the development for different biomes and species. A particular challenge is the use of biodiversity accounts for policy formulation.

A System of Environmental-Economic Accounting (SEEA) was made an international standard by UN Statistical Office in 2012. The work had been going on since 1992. The central framework contains recommendations on accounting for natural resources and pollution. A main idea is to present information both in physical units and monetary terms. Ecosystem accounting was left out of the central framework as it was seen as too difficult to handle. Instead the UN together with the World Bank and EEA two years ago started work on what was termed an Experimental Ecosystem Accounting. A draft framework for SEEA Experimental Ecosystem Accounting was presented in November 2012 for an international hearing process. The objective is to present the final report in 2013. The term experimental indicates that further practical implementations have to be undertaken by different countries in order to test out the ideas presented in the framework. The purpose of this paper is to present the basic structure of the proposed Experimental Ecosystem Accounting. This innovative approach, highly relevant for ecological economics, has a large potential for improving the knowledge basis for biodiversity policy.
Ecosystem accounting is based on recording the state and changes in state of ecosystems and the flows to individuals and society from ecosystems, taking into account ecosystem capacity, ecosystem extent, and ecosystem condition as basis for ecosystem services. The recommendations are to make two principal types of accounts based on a fixed spatial Ecosystem Accounting Unit (EAU), for the flow of ecosystem services from these units and for changes in ecosystem extent and condition, including separate accounts for carbon and biodiversity.

Measurement of biodiversity, indicators and indices
The processes contributing to biodiversity loss are many and varied. At ecosystem level, biodiversity loss is characterized by the conversion of natural ecosystems into human-made

ecosystems such as agriculture and built up area. At species level, many species originally occurring in a particular area decrease in abundance while at the same time a few other, often opportunistic and invasive, species increase in abundance, as a result of human interventions. Extinctions of original species are the final step in an often long process of gradual reductions in numbers. In many cases, local or national species richness (i.e. the total number of species regardless of origin) increases initially because of species introduced or favoured by humans. Because of these changes ecosystems lose their regional specifics and become more and more alike ? a process described as "homogenization".
The Experimental Ecosystem Accounting framework addresses biodiversity loss at ecosystem and species levels.

Biodiversity indicators measure important aspects of the ecosystems within single measures. The Convention on Biological Diversity has identified 10 criteria for selecting biodiversity indicators. Based on the recommendations of the 9th meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA9) the 7th Conference of the Parties (COP7) agreed on a list of provisional indicators (COP decision VII/30, 2004) that can be implemented worldwide, or at national or regional scales. The four suggested indicators concerning the state of biodiversity were:
Trends in extent (size) of selected biomes, ecosystems and habitats

Trends in abundance and distribution of selected species (average quality or condition of ecosystem types)

Change in status of threatened species

Trends in genetic diversity (presently not a part of the proposed biodiversity accounts)

Together these indicators provide complementary information on the degree of homogenization, the core process of biodiversity loss, and they will be included in a biodiversity accounting process. The many single indicators of species abundance and threatened species can be summarized via composite indices, such as Natural Capital Index, the GLOBIO Mean Species Abundance Index, the Living Planet Index, the Biodiversity Intactness Index and the Norwegian Nature Index for the former, and in a Red List Index for the latter.
Geographical extent of ecosystems and biodiversity - Land use and land cover accounts
There is a strong relationship between the extent of ecosystems, land use, land cover, and biodiversity. Land set aside for conservation is of particular relevance for biodiversity accounting. Most countries have information on the area of national parks and other categories of protected areas (e.g. according to the IUCN Protected Area Categories and the World Database on Protected Areas). In addition, the Ramsar Convention on Wetlands (1971) currently lists just over 2,000 wetlands of international importance, covering nearly two million square kilometres. It is also necessary to account for the extent and condition of ecosystems outside of protected areas (i.e. the entire country).
Structuring information on species and groups of species - Accounts for threatened species and accounting for species abundance
The IUCN Red List Categories (IUCN-Species Survival Commission 2001) take into account a number of factors that contribute to the risk of species extinction in order to determine the overall status of species. This information may form the basis for accounts for threatened species, but will be difficult to establish on a local or regional level.
The reference condition of species should ideally refer to an ecosystem with minimal or low human influence. Although difficult to establish, such a baseline enables the calculation of the mean abundance of species relative to the reference state, and by this enables a comparison of the state between different ecosystems and between countries. It is important that the accounts are as representative as possible for the ecosystem type they describe, including species that are of characteristic to the ecosystem being measured, and priority should also be given to species that are known to be sensitive to human impacts (i.e. responsive to key drivers and pressures). Species may be grouped according to major ecosystem types (e.g. inland waters, forests, grasslands, tundra and marine etc.), taxonomic group, niche , trophic level or perceived usefulness to humanity), depending on the demand.
The condition of ecosystems can be monitored directly by measuring the population size of a selected and as representative as possible set of species. As this is costly, biodiversity condition is usually estimated using a range of data and methods, including sample monitoring and modelling techniques based on information about land cover, land use, fragmentation, climate

change and other pressures. The latter can be used as a surrogate measure as long as the monitoring of species has not been established yet.

The usefulness of biodiversity accounts

Biodiversity accounts can be used to track progress towards policy targets such as protection of threatened species or ecosystems (or habitats), sustainable use of harvested species, and maintenance and improvement of ecosystem condition and capacity. By making biodiversity accounts for particular spatially defined areas (EAUs), the accounts on ecosystem services may be linked to the geographical extent and condition of biodiversity. If the areas (EAUs) follow administrative or other boundaries for areas with economic or social data, it is possible to highlight how human activities cause changes in biodiversity. At national and sub-national scales, by linking biodiversity accounts with land cover, land use and environmental protection expenditure accounts of the SEEA central framework, the cost-effectiveness of expenditures on habitat and species conservation or returns on environmental investment may be analysed.

Biodiversity and ecosystem services: The Nature Index for Norway

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Paper for proposed session 9399: Biodiversity: valuation, conservation and policy

Biodiversity and ecosystem services: The Nature Index for Norway?

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Summary:
The focus on valuation of ecosystem services can be seen as an attempt to communicate the importance of nature and biodiversity into political and economic decision-making. While monetary valuation of ecosystem services is widely advocated for pragmatic reasons, criticism is raised against an excessive pragmatism, as monetary valuation of ecosystem services useful to humans may overshadow other values of nature and fail to address the unequal distribution of benefits and loss. This paper discusses relationships between biodiversity measurement and ecosystem services in the context of the Nature Index recently developed in Norway, considering the potential synergy between economic and ecological approaches to biodiversity policy.

Assessment and valuation of ecosystem services is a topic of large political and scientific interest, as expressed by the comprehensive frameworks of the Millennium Ecosystem Assessments (MEA 2003) and The Economics of Ecosystem Services and Biodiversity (TEEB 2010). The call for monetary valuation of ecosystem services can be seen as an attempt to bring biodiversity higher up on the political agenda, reflecting that "economists and policymakers speak the same the language" (ten Brink 2006). While monetary valuation of ecosystem services is widely advocated for pragmatic reasons, criticism has been raised against an excessive pragmatism, as the focus on ecosystem services useful to humans may overshadow other values of nature, and the idea of trading biodiversity off-sets may fail to address the unequal distribution of benefits and loss and the problematic aspects of relating environmental policy instruments to financial markets (Spash 2008).

The complexity of the relationship between ecosystem services and the ecosystem functions and biodiversity that support them challenges the conceptualization of ecosystem services and their use in practical implementation of biodiversity policy (Mace, Norris and Fitter 2011). The United Nations (2012) is currently developing recommendations for a system ofExperimental Ecosystem Accounting.A core concept of this system is ecosystem capacity ? the capacity to deliver ecosystem services in the future, depending on ecosystem extent (area) and ecosystem condition (quality).

In this paper, we discuss the relationship between biodiversity measurement, ecosystem functions and ecosystem services in the context of the recently developed Nature Index for Norway (Nybø (ed.) 2010, Certain and Skarpaas et al. 2011). The purpose is to consider how the usefulness of ecosystem services as policy tool can be improved by taking into account a comprehensive framework and knowledge basis for biodiversity measurement. The Nature Index for Norway is a framework for integrated biodiversity measurement, with similar conceptual basis as the Natural Capital Index, the GLOBIO Index, and the Biological Intactness Index (Alkemade et al. 2009, ten Brink et al. 2002, Scholes and Biggs 2005).
The Nature Index gives a comprehensive overview of the state and development of more than 300 biodiversity indicators, representing biodiversity in 9 major marine and terrestrial ecosystems (biomes): ocean bottom, ocean pelagic, coast bottom, coast pelagic, open lowland (extensively used agricultural areas with high biodiversity), mires and wetlands, freshwater, forest, and mountain.

The aim of the Nature Index, initiated by the Norwegian government, is to provide a tool for biodiversity measurement, in order to assist environmental managers and policymakers in setting biodiversity policy targets and monitoring priorities (Nybø (ed.) 2010, Certain and Skarpaas et al. 2011). It is an ongoing discussion to consider to what extent the Nature Index in itself? a framework for biodiversity measurement in terms of biophysical indicators - will contribute to increased political focus on biodiversity loss, or whether it will be more useful to supplement the Nature Index with assessments of the value of ecosystem services. The ecosystem service approach may be less suitable for expressing the entire value of nature types and ecosystems at a larger scale, such as forests or mountains, as a collective entity. We discuss the situation of the Nature Index in the polarity between ecological and economic approaches to biodiversity policy. The issue is not quantification itself, the dilemma is whether to use numbers as instruments to compare different elements of biodiversity and to rank biodiversity values relative to other values in society, often expressed in monetary terms.

For each indicator of the Nature Index, the current state (measured on a relative scale from 0 to 1) is compared to a reference state of value 1, representing a given interpretation of intact ecosystems.
The current value of the Nature Index can be interpreted as a measure of ecosystem capacity. The deviation between the current value and the reference state can be interpreted as a reduction in ecosystem capacity, irreversibly or reversibly - to some extent depending on the time horizon ? due to land use change, over-harvesting, unsustainable harvesting methods, and other negative impacts (pollution, climate change, invasive species).

We discuss to what extent the biodiversity indicators in the Nature Index can be interpreted as relevant indicators for ecosystem services and what type of other indicators that should be included in order to express the potential for ecosystem services. The paper reports results from a study where experts responsible for the data of the Nature Index were asked to consider to what extent the biodiversity indicators included in the Nature Index can be interpreted as expressing supporting, provisioning, regulating, and cultural ecosystem services.. The study gives valuable input for the interpretation of the Nature Index in the context of ecosystem services.

Ecosystem services need to be identified at local scales and linked to relevant policy instruments, e.g. for agriculture and forestry, through management targets, set for different geographical areas and ecosystem types. The potential for ecosystem services is enhanced by the presence of larger undisturbed areas, and it may be useful to supplement the Nature Index with data on the extent of connectedness or fragmentation of ecosystems. Experts representing local policy and management levels may contribute experience and knowledge on local conditions that impact the ecosystem services. In order to communicate the Nature Index in a way that makes it interesting and relevant for policy makers and the general public, it can be useful to select particular indicators and develop thematic indices for important ecosystem services, such as carbon storage, climate adaptation, flood control, recreation.

The Nature Index as policy tool may develop through a process of practical application which may have impact on selection and definition of management targets and contribute to make nature visible for policy makers and the general public. If the Nature Index indicators can be linked to various ecosystem services in a meaningful way, it would add another dimension to the use of

the Nature Index and contribute to integrate economic and ecological approaches as knowledge basis for biodiversity policy.
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References:

Alkemade, R., M. van Oorschot, et al. (2009) GLOBIO3.Ecosystems12:374-390.

Certain, G., Skarpaas, O., Bjerke, J.-W., Framstad, E., Lindholm, M., Nilsen, J.-E., Norderhaug, A., Oug, E., Pedersen, H.-C., Schartau, A.-K., van der Meeren, G.I., Aslaksen, I., Engen, S., Garnåsjordet, P.-A., Kvaløy, P., Lillegård, M., Yoccoz, N.G., Nybø¸, S., 2011. The Nature Index: A General Framework for Synthesizing Knowledge on the State of Biodiversity. PLoS ONE 6, e18930.

Mace, G.M., K. Norris and A.H. Fitter. 2011. Biodiversity and ecosystem services: a multilayered relationship. Trends in Ecology and Evolution, 1445.

MEA (2003). Millennium Ecosystem Assessment. Ecosystems and Human well-being. A Framework for Assessment. Island Press.

Scholes, R.J. and R. Biggs (2005): A biodiversity intactness index.Nature 434, 45-49.

?
Spash, C.L. (2008) ?How Much is that Ecosystem in the Window? The One with the Bio-diverse Trail.'Environmental Values, Vol. 17, pp. 259-284.

ten Brink, B. (2006): A Long-Term Biodiversity, Ecosystem and

Awareness Research Network. Indicators as communication tools: an evolution towards composite indicators. www.alter-net.info

ten Brink, B. et al 2002. Biodiversity: how much is left? RIVM report. Bilthoven.

TEEB (2010).The Economics of Ecosystems and Biodiversity for National and International Policy Makers ? Summary: Responding to the Value of Nature.

United Nations 2012.SEEA Experimental Ecosystem Accounting.United Nations Statistical Office.

Path-dependent policyscapes: a theoretical approach to the evaluation of policymixes for biodiversity conservation

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The paper discusses how the functional role of economic instruments such as PES in a policymix for biodiversity conservation in forests varies according to the scale of analysis (project versus landscape) and the forest transition stage of the study area in question. The paper discusses theoretical linkages between the public-private benefits analysis framework at the project level (Pannell 2008)(figure 1), and the von Thunen approach to forest transition theory (Angelsen 2007) at regional level, and shows how these meet at a landscape level in terms of a ?policyscape' . A ?policyscape' is defined as the spatially explicit modeling of a policymix of economic incentives (EI) and command-and-control (CC)measures. With this theoretical backdrop we then provide examples of how the functional role of PES can vary depending on context, drawing on the example of Costa Rican conservation policies since the 1950s and studies conducted within the EU FP7 POLICYMIX[1].

The paper shows how conservation incentives at a particular location as determined by Pannell's public-private benefits framework depends on whether that location is in a deforestation or reforestation forest transition phase (Figure 1). The paper proposes a revised public-private benefits framework to account for this difference. This revision is justified by the proposition that relative private and public net benefits - both to forest and non-forest sectors ? as a result of landuse change should in Pannels normative framework determine the distribution of positive and negative incentives. The relative size of public-private net benefits in these sectors depends in turn on which forest transition phases the landscape location is in (Figure 2). The revised public-private benefit framework predicts a mosaic of policies across the landscape which is established as the forest transition progresses. The distribution is path-dependent.

Possible outcomes of a theoretical and path-dependent approach to policyscapes are discussed in light of recent findings on PES impact evaluation in the literature (Pfaff and Robalino 2012) and reserve site selection modeling with opportunity costs (Naidoo et al. 2006; Naidoo and Adamowicz 2006). Several studies have observed that both private and public policies location throughout the landscape are correlated with opportunity costs (Joppa and Pfaff 2009; Pfaff and Robalino 2012). Our theoretical approach predicts a conceptual forest landscape in the regeneration forest transition stage 3-4 in which positive and negative conservation incentives have been distributed in previous transition stages (1-2) according to opportunity costs, as well as forest characteristics (Figure 3). The paper illustrates how functional redundancies and complementarity of instruments such as voluntary forest conservation arise across the landscape mosaic (Figure 4).

We end the paper by discussing implications of such a theory of ?path-dependent policyscapes' for empirical research.

Theory predicts that reserve site selection models with costs (Watts et al. 2009) should identify greater gains from cost-effectiveness targeting of conservation locations in early stages of forest transition with deforestation (compared to an approach without opportunity costs). In regeneration forest transition stages and stable landscape mosaics, forest conservation characteristics are expected to be more negatively correlated with opportunity cost than in the deforestation. While algorithms such as Marxan with Zones can target different types of incentives according to their cost-effectiveness, the theory predicts that algorithm outcomes are more unstable in landscape mosaics because of this spatial correlation of opportunity costs and forest conservation features.

A theory of ?path-dependent policymixes' theory also illustrates how functionally overlapping ? and sometimes redundant or conflicting ? conservation incentives can arise, despite short term

targeting of conservation incentives following a public-private net benefit maximizing strategy. Multiple adjacent or overlapping conservation incentives such as found in multiple use protected areas, may also explain lacking impact observed in studies of the effectiveness of PES in countries such as Costa Rica.

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Genesis of environmental management arrangements in Amazonia. A comparison between France (French Guiana) and Brazil (Amapá).

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Summary
French Guiana (France) and the Brazilian state of Amapá are Amazonian territories sharing a common frontier. Both present a high number of protected areas, whose management objectives are based on different conceptions of environmental management. The historical analysis of their construction, looking on the knowledge and representations mobilised, as well as on the actor arrangements that led to their creation, gives a better understanding of the management hypothesis they are based on. On both territories, we try to show what the specific processes leading to the creation of protected areas are, by analysing 1) Who the actors supporting the construction of these management arrangements are, 2) what is at stake in each case? 3) How and when environmental data are mobilised?

Abstract

The idea that it is necessary to manage some territories in order to preserve the ecosystems is old. However, the recommendations concerning the ways of doing it have changed in the last forty years, and a huge number of different environmental management «dispositives» have emerged. By «management dispositive» we mean a broader concept than «management tool » which «specifies what arrangements of humans, objects, rules and tools seem appropriate at a given time» (Moisdon1997 : 10) in order to achieve a given objective. In our case, we work on environmental management dispositives, whose objective is to preserve natural ecosystems, and which are often defined on a specific territory. These management dispositives aren't neutral: they carry management values and beliefs that justify their actions, and that are often neither clarified nor perceived (Leroy 2010). A diachronic analysis of their construction allows clarifying of the hypothesis they are based on, by studying the knowledge, representations and social interactions they are built on.

The Amapá (Brazilian state), and the French Guiana (French Ultramarinedépartement),located in Amazonia, present a particularly well preserved forest cover. Moreover, 70 % of their territory is concerned by a big diversity of environmental management dispositives which objective, at least partial, is the preservation of remarkable ecosystems (national parks, biological reserves, managed forests, indigenous territories, extractivist reserves, etc.). These dispositives are promoted by very different groups of actors responding to their own logics. By comparing the French and the Brazilian territories, we mean to analyse these logics, the data and hypotheses they are based on, and the way they produce concrete management dispositives.

The data production was done by intersecting information related to (i) event's chronology (ii) maps of the concerned areas (iii) management documents related to the construction of the dispositives, (iv) the environmental data they are based on, (v) scientific literature, (vi) and semi-directive interviews conducted with managers and others persons involved in the construction processes of the dispositives.

The first results, produced through a chronological analysis of the dispositives' construction in French Guyana and Amapá, show that interrelations can be established between the environmental management logics existing on both territories and the dominant paradigms present on an international level. In the 80ies, we have a first phase of creation of strictly protected areas,

characterised by a strong opposition between nature preservation and human activities. Then, from the 90ies, some «sustainable development» areas are created, aiming at integrating nature preservation and human activities (in the logic of the Rio UN conference, 1992). This doesn't necessarily imply a direct top-down interaction. However the creation of some dispositives (huge national parks on both territories) is indeed a direct consequence of announcements made in the Earth summits of 1992 and 2002. In a parallel independent dynamic, indigenist movements have been defending the indigenous cause since the 70ies, allowing an international recognition by the International Labour Organisation in 1989. The homologation of the indigenous territories in Amapá, and the areas of collective use rights in Guiana are based on these movements.

In this context, we try here to understand what processes led to the definition of these protected areas. Who are the actors supporting the construction of these management arrangements? What is at stake in each case? How and when are environmental data used? The actors at the origin of the dispositives belong to different categories. Biologists and naturalists are mainly at the origin of the protected areas created in order to protect specific ecosystems or species. Marine turtles are quite symptomatic of this phenomenon, and we find an example both in French Guiana (Amana natural reserve) and in the Amapá (Parazinho biological reserve). The dispositives created in these contexts are often aimed at strict environmental protection, without necessarily foreseeing the possible conflicts with local populations. Other scientists, the anthropologists, supported more specifically the creation of dispositives for the preservation of the indigenous population lifestyle and culture. If the environmental rhetoric was present from the beginning, their potential for nature preservation was officially recognised in the Brazilian «national plan of protected areas» published in 2005 by the ministry of the environment. In France, the matter related to these populations stayed marginal, and recognising them as different from the rest of the population in opposition with the constitutional concept of equality. Therefore, the actors involved focused on building a dispositive that valorised the pre-existing French legislation, allowing from 1987 the existence of collective rights for land use. The link between ecosystem preservation and autochtonous population came back in French Guiana in 2007, with the creation of a new national park taking population lifestyle into account. Other categories of actors are the syndicates of rural workers in Amapá and Acre. They imagined the creation of new dispositives of protected areas aiming at defending the social rights of extractivist populations (who make a living out of the gathering of non timber forest products) that were maintained in semi-slavery conditions by big companies. They used the environmental rhetoric to defend them and give then a specific territory. No similar movement can be found in French Guiana.

We notice that the creation of these environmental dispositive always benefited from a favourable political context (partly influenced by international tendencies), and often from the mobilisation of actor networks providing political support. One good example of articulation between local politics favourable to the creation of environmental management dispositives and the international tendencies is the Iratapuru reserve of sustainable development proposed by the Amapá's Governor Capiberibe (1995-2002). On the contrary, the areas created by the central/ federal government with very little local dialogue encounter strong opposition from the local political level (Mangal 2010), as well as from the economic lobbies like those of mining exploitation or agribusiness (Taravella 2008). In French Guiana, the major part of protected areas was created by the French government with the idea of preserving a sample of specific ecosystems or species in prevision of future economic development. If this logic also exists in Amapá, some dispositives were also mobilised as an emergency response to massive ecosystem destruction brought on by big foreign enterprises. These characteristics impact the way scientific data produced on the ecosystems is used in the creation process: if they hold an important place in French Guiana, they are less important in Amapá, where the dispositives' creations are faster and where the social context is more influent. However, in both cases, we show that political lobbies mainly related to mining activities can sometimes be more influent that scientific data and imply compromises when defining the limits of the areas.

Finally, we see that construction processes of all these very diverse protected areas imply the mobilisation of various legitimation modes by very different actors. They could be summarized in the following way: (A) Processes mobilising pre-existing legislative categories of protected areas, in order to preserve the environment for (i) maintaining specific ecosystems or species (on both territories), (ii) limiting the progression of destructive activities (mainly in Amapá), (iii) or showing at the international level the country's efforts towards preservation (the two big parks); (B) Processes transforming pre-existing categories of managed areas to give them an environmental objective. It is the case of exploited public forests of both territories, or also of the indigenous territories in Brazil; (C) Finally, the creation of new categories of environmental management to respond to preoccupations that were not taken into account in their socio-environmental articulation. This third type of processes implies to build new actor networks that

will allow creation, stabilisation and formalization of these new dispositives. If «extractivists reserves» in Amapá and Acre are very representative of this process, the creation of the new French model of National park, or the specific status created for indigenous population are other interesting examples in French Guiana.
The study of the creation processes that occurred on these very specific territories could help to understand what dynamics led to create protected areas in a more general way in other places and time.

The mechanisms for quantifying the costs incurred by asbestos removal projects.

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Since the 1970s, the subject of environmental accounting generates numerous debates within our scientific community. During the various stages structuring the notion of environmental accounting, the phase of formalization of this instrumentation began in the 1990s (Gray, 2002). In France, the Accounting National Council («Conseil National de la Comptabilité») sketched, from 1980, the beginnings of an environmental balance sheet. But it is only in 1996 that the Order of the Chartered accountants («Ordre des Experts Comptables») proposes a classification of the environmental allowances or still that the first work on «green» accounting is published (Christophe, 1995). At the European level, it is as well during this decade that the System of Economic and Environmental Accounting (SEEA) is created.
These attempts of instrumentalisation of the social and environmental responsibility of the company constitute a means to bring a quantified "proof" calculated of the commitment (Burnett and Hansen, 2007; Lehman, 1999), to perfect the decision process (Kitzman, 2001), to legitimize the organization towards its environment (Cho and Patten, 2007; Larrinaga-Gonzalez and Bebbington, 2001) or still to improve the performance of the organization (Clarkson et al. 2008; Cormier and Magnan, 2007).
However, if they symbolize a necessary evolution of accounting to integrate the environmental and societal dimensions, these accounting systems also face numerous challenges. If an easy consensus exists as soon as it is a question of saving the planet, the situation becomes more difficult when it comes to pay the price or to assign the efforts to the various stakeholders. But how much costs the protection of our environment and on what depend these costs? What are the factors that drive environmental costs?

Our research relates to the dynamic of environmental cost accounting practices. Through different case studies on asbestos removal we try to capture the stakeholder's roles in the total cost of the events. Beyond technical concerns the total cost appears to be a social construction where stakeholder's activism, ignorance or avoidance have a major impact on the final result. The way project responsible respond and manage stakeholders and the time and period of time stakeholders are involved in the project are crucial on the final result. Our research shows four situations : the strong activism of stakeholders has the major impact on cost as the perimeter of the project always change. In one case, stakeholders are encapsulated with a technical solution which prevents them to change the context of the operation. In the third situation, stakeholders are managed to be avoided sequentially. That limits their impacts on cost. Finally, the last case refers to situations in which stakeholders are absent. The cost is then only drives by technical issues. The fundamental issue is the way the perimeter of relevant costs is modified by interactions between projects and their stakeholders. Theses interactions allow in some cases a re-internalization of externalized costs. The challenge to capture environmental costs through «new » accounting systems such as EMA (Environmental Management Accounting) is seriously questioned as it only takes into cost the most visible cost, in a static design, without any understanding of the dynamic of the costs incurred.

Experimenting with technique. How to make an agro-environmental management device?

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Summary
The purpose of this paper is to question unheard-of forms of partnership, deliberation and agreement; in other words, the way of conventionalizing environmental alternatives in vine growing, between professionals in agriculture, farmers and environmental authorities. It relates to favour a way of paying attention to the anticipating capability and the reactivity of stakeholders in designing and solving environmental issues, at the expense of a reading focuses on the normative power of government. The paper analyses capacities of wine-growing community for facing uncertainties linked with the ecological injunction that hangs over wine-growing practices. This work focuses on a French south-western vineyard (Gers) and an environmental standards setting device that aims at developing weed-killers alternative techniques. It shows that emerging solutions don't cover the strict environmental issue but are more widely comprehended, ranked and taken as adjustment tools or balancing items adaptable to the goals and the professional arrangements of an industrialized wine production and marketing system (like, for example, protected geographical indication standard, known as a high-yield production system).

Proposal
In the three last decades ? due to the effect of decentralisation, growing intervention by the European Union, and both social and political demands for a less sectorial and more integrated management approach (Duran, 1999) ? there has been a progressive evolution from a vertical, centralized model of public intervention directed by the State, into a more pluralist model characterized by the diversification of partnerships, and the emergence of multi-polar systems of action displaying frail hierarchies. In this «post bureaucratic model of public action» (Nevers, 1998) the process of institutionalising collective action (Duran and Thoenig, 1996) is characterized by the multiplication of contracts or incentives based upon a co-construction of problems, taking the form of local directives which frequently go beyond the traditional politico-administrative territories (watershed, catchment area, local employment, suburb, etc.) and which mobilize a denser and more elaborate network of actors. The shifts in perspective which are transforming public action or public initiatives bring to the forefront a certain number of ideas concerning governance (Le Galès, 1992), the networks used in public action (Gaudin, 1995), proceduralization (Gaudin, 2004) in order to characterize the links and partnerships between public and private actors in the political construction of public arrangements. These analyses are intended to complement our understanding of «top down» public management policies, by reducing the relative normative powers exercised by the ruling elites, and by considering the conditions of public action governability as having a more complex manner of coordinating the diversity of public administrative actors, professional actors, and intermediaries.
By highlighting these new relationships between various actors, scientific research into piloting management arrangements for public intervention reveals just how much their legitimacy relies nowadays upon their capacity to produce action and collective consent than on a sort of intrinsic legitimacy, usually supported by their legal status. This type of public action legitimacy focuses our attention on the collaborative conditions under which the public action mechanisms are formulated and implemented, and questions the processes that lead people to undertake collective action. Comprehending these modes of coordination between diverse actors and stakeholders and the problems needing to be solved on-going, is to make the hypothesis that they should not be seen as «a priori» but that they are constitutive of action; and also implies that uncertainty constitutes a driver for mediation, and defining management situations.
Adopting these hypotheses means also admitting that there is a pragmatic analytical perspective on public action that acknowledges the indeterminate nature of situations as being a determinant factor in solving problems. If we look at the work of Gilles Jeannot, this perspective reveals another version of public action in which management arrangements appear as indeterminate spaces in which situations define what the problems are, as well as which actors will work together

to solve them, and where identifying the possible outcomes is constitutive of the arrangement devices management (Jeannot, 2005).

The object of this paper is to demonstrate how an environmental standards setting project, - one which conducts experiments testing alternatives to traditional chemical methods of weed control in viticulture ? when issued from a debate between the representatives of public authority and the agricultural community, leads to a conception of collective action as a series of conventions. By «convention» we mean the result of a process where the wine growing greening-process becomes collectively adopted, as an action allowing the qualification of the actors and the problems to be solved, or in other words, to instigate a collective solution to a collective problem needing public intervention. This paper reveals the dynamics of how an ecological convention constitutes itself as a «management arrangement» around the capacity of the project to propose effective technical, financial and agronomic solutions, as well as its capacity to coordinate the diversity of stakeholders (in particular, public authorities and agricultural community).

More empirically, this work aims at analysing, step by step, the work of contextualization and problematization herbicides reduction issues in the French southern vineyards of the Gers (32): what choices were made for the technical approach to the experiment? How was the management arrangement built? Who were the actors who carried it out? How did the network of actors develop? How was the ecological solution achieved and how did it become the alternative to traditional chemical weed control methods? How does the technical management arrangement constitute itself as a collective, coordinated action confronting problems needing to be solved, especially under economic pressure, or resistance from the traditional hierarchy within the viticulture community? This paper reveals that the convention constitutes itself throughout a series of tests of qualification and disqualification of the alternative, resulting in a process of arbitrage, which is affected by a changing selection of priorities upon which judgement is based. If this process of arbitrage is essentially orientated by routine, or by the established social order and commercial strategy linking the chain of production and marketing of the wines of the Gers, it nevertheless shows how an environmental problem might be dealt with in real management terms i.e. how to actually deal with agricultural pollution caused by using chemical herbicides in viticulture. However, the actual management of the problem ultimately appears less concerned by the environmental efficiency of the ecological alternatives to chemical weed control that are proposed, and more dictated by maintaining the status quo within the professional network and satisfying the demands of wine markets.

Community Energy in the UK: examining grassroots innovations for sustainable energy transitions

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for the special session: Distributed innovation/agency in sustainable energy transitions

System-changing innovations for sustainability transitions are proposed to emerge in radical innovative niches. ?Strategic Niche Management' theory predicts that niche-level actors and networks will aggregate learning from local projects, distilling and disseminating best practice. This should lower the bar for new projects to form and establish, thereby encouraging the innovation to diffuse through replication. Within this literature, grassroots innovations emerging from civil society are an under-researched site of sociotechnical innovation for sustainable energy transitions.
We consider the emerging community energy sector in the UK, in order to empirically test this model. Community energy is a diverse grassroots-led sector including both demand- and supply-side initiatives for sustainable energy such as community-owned renewable energy generation, village hall refurbishments, behaviour change initiatives and energy efficiency projects.
Our analysis draws on in-depth qualitative case study research with twelve local projects, and a study of how intermediary organisations aim to support local proejcts and encourage replication. This rich data allows us to examine the extent and nature of interactions between project and niche in order to evaluate the utility of niche theories in the civil society context. In particular, we investigate which types of knowledge, support and resources were needed by our case study projects to become established and thrive, and compare and contrast this with those offered by the emerging community energy niche. Our findings indicate that while networking and intermediary organisations can effectively collate and spread some types of learning and information necessary for replication, this is not sufficient: tacit knowledge, trust and confidence are essential to these projects' success, but are more difficult to abstract and translate to new settings.
We draw out the implications of our findings for niche theory, for community energy and other grassroots practitioners aiming to build robust influential niches, and for policymakers eager to harness civil society's innovative potential for sustainability.

Participation, politics and actor dynamics in sustainable energy transitions

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The field of sustainability transitions has a strong theoretical emphasis on the sites and modes of intervention in socio-technical systems, with the intention of informing the purposive ?steering' of the system. Such aspirations have led to the emergence of a growing debate around ideas of reflexive governance. The literature on reflexive governance has raised questions not only about the limitations of modulating an objectified system from the ?outside', but also about the multiple forms of politics which surround any attempt to intervene in the dynamics of complex systems. For critics, questions of power and politics are often obscured in what, it is argued, are optimistic and technocratic transition mechanisms. In addition, the dynamics of participation in, and the democratic implications of, transitions processes have been under-explored in the literature hitherto.
In order to address this lacuna, this paper develops a more comprehensive and systemic perspective on what it means to participate in socio-technical transitions, with specific reference to sustainable energy transitions in the UK. Through bringing the transitions literature into a more systematic and sustained conversation with participatory and democratic theory we offer a conception of civil society engagement in low carbon energy in terms of diverse, coexisting and interconnected assemblages of participation. We then apply this framework to understand distributed forms of innovation and agency in UK low carbon energy transitions through analysing a series of case studies based on initial empirical insights from ongoing research as well as the findings of a workshop that brought together international scholars in the sustainability transitions field.
Our comparative analysis of these cases of civil society involvement in low carbon energy transitions -ranging from those orchestrated by formal institutions (e.g. public consultations and open innovation processes) through to interventions that are more organic, spontaneous and citizen-led (e.g. transition towns initiatives, climate camp protests) - highlights the similarities and differences in how these participatory assemblages are mediated and organised, their particular exclusions, the dynamics of their interaction in broader ?ecologies of participation', and the multiple and conflicting temporalities of energy transitions. In doing so, the paper provides a richer account of the unfolding actor dynamics and the multiple ways in which actors contribute to the ongoing reproduction of the system, as well as the many different sites of system innovation. We conclude by sketching out the development of a research agenda that takes seriously the theoretical, methodological and governance implications that are raised by engagement with broader conceptions of socio-technical participation.

Who uses smart homes? Representations of users by the smart home industry

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Through ambient intelligence and automated control systems, smart homes have been presented as a key means by which households can optimize their use of energy-consuming appliances in order to save both energy and money. Whilst the adoption of smart home technologies and their appropriation within everyday domestic lives is critical to the overall success of smart homes, to date visions of smart homes have been strongly driven by technology push and have not been based on a clear understanding of user-centric benefits, nor have users been engaged with in any clear or systematic way. There is thus an important need to understand how smart home users are being represented and understood within these technology-driven visions. The paper presents the results of a content analysis of industry-produced smart home marketing materials that focussed on representations of the technology itself, its users, and of technology-user interactions. The content analysis was based on a coding template derived from a systematic review of the academic literature on smart homes and their users. The paper concludes by examining the implications of these findings both for the future development of smart homes and for broader sustainable energy transitions. In particular, it explores how innovative technologies being developed by technology developers can struggle to deal with the complex and distributed forms of agency and innovation exhibited by smart home users in the course of their normal everyday lives.

Strengths and weaknesses of state initiated Payments for Ecosystem Services: Actors' roles and implementation performance

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Summary: This research looked at governmental agri-environmental PES schemes in Germany and the US. In particular, it focuses on different actors' roles for and contributions to a successful scheme implementation. Different schemes based on national or supra-national programs from three German and three US states were institutionally classified and analysed regarding the different actors' roles in the scheme's success. Therefore, the relations between institutional setup and success were assessed by Qualitative Comparative Analysis (QCA). Furthermore, a single Vermont (US) scheme was examined using an in-depth qualitative study, determining actors involved and their contributions to the program's performance. It has been worked out that different level actors are important for the success of schemes. Beside state actors, civil society actors particularly may be crucial when it comes to transaction cost and labour intensive issues.

Abstract: From a widespread economic point of view, environmental problems arise because air, water, soil, and other natural resources are considered as available everywhere and everything that is accessible can be used free of charge. The problems are based on several issues, as e.g. incomplete property rights distribution, problems of free-riding, opportunism etc. The state has a broad range of policy instruments for solving environmental problems and different types have been fundamentally characterised as regulations, economic means, and information. Since several years, the open access problem has been counteracted by the Ecosystem Services (ES) concept, which aims to give natural provisions such as clean air, fresh water, and fertile soil a value. Furthermore, economic means in terms of environmental policy instruments are at the forefront. The provision of payments for ES (PES) is an idea that emerged out of this development. So far, the majority of the existing PES has been government founded, financed, initiated, or implemented ? if not completely state run. Following a broad PES definition, describing them as«...a transfer of resources between social actors, which aims to create incentives to align individual and/or collective land use decisions with the social interest in the management of natural resources...»(Muradian et al. 2010 inEcological Economics69, p. 1205), most German agri-environmental measures (AEM) and US conservation programs (CP) can be understood as governmental PES. Many ES are or may be provided by the agricultural sector, based on the way land is used. In both countries, the agricultural production of such ES is mainly governed by AEM and CP. Due to the states' big influence on overall environmental governance through these payment mechanisms it appears crucial to research such governmental programs against the backdrop of their PES character.

In my work I focussed on the actors of governmental schemes and their roles. AEM and CP schemes may include different actors at different levels from both state and civil-society, which can be of different relevance for the scheme's success. Different actors could be important e.g. for co-financing, organization, and education. Therefore, I analysed different actors' roles in and impacts on the implementation of governmental PES. My analysis is two stepped. Firstly, I inventoried and compared the relevant institutional setups and evaluated them regarding the actor driven, necessary and sufficient conditions for success. Particularly, I clarified which roles the actors play under the different setups and which actor involvements are sufficient and necessary for the success of certain types of governmental agri-environmental PES in Germany and the US. I considered single AEM implemented in different German federal states (Brandenburg, Lower Saxony, Mecklenburg-Hither Pomerania) and CP in certain New England states (Vermont, New Hampshire, Massachusetts). Methodically, I structured the policy instruments based on New Institutional Economics theory and different existing classification systems from literature. Then, I examined the success of the different instruments based on aSurveyMonkey(http://de.surveymonkey.com/) online questionnaire, evaluating the success of the respective measures by asking the relevant experts in the field. Finally, I assessed the relations between the institutional setup and the success of the instruments using Qualitative Comparative Analysis (QCA). Secondly, I focussed on one conservation program (Wetland Reserve Program) in the US. I conducted in-depth semi-structured qualitative interviews with experts from agri-environmental

administration (US Natural Resource Conservation Service) and civil society organizations to understand the strengths and weaknesses of the single payment scheme. There, I focussed especially on the different actors involved and their different contributions to the program's performance as well as needs for a changing actor involvement or behaviour.

I understood from these interviews that different level state actors are always involved and useful for a successful implementation of the agri-environmental PES schemes. Regional state actors with good and often personal contacts to farmers have a big influence on the acceptance of certain measures. However, state actors have several deficiencies due to monetary and personal restrictions. Civil society actors on the other hand may be very useful for the PES implementation process, especially in terms of scheme advertisement and initial conceptual planning. Initial « broker functions» are often much easier fulfilled by civil society actors, because there is less reluctance from a farmer's point of view to work with civil society actors than with state actors. The inclusion of civil society actors can make such governmental schemes much more successful e.g. in terms of willingness to participate. Furthermore, good monitoring and sound evaluation are broadly dependent on non-state actors, due to the labour intensive and very complex processes. Thus, I conclude that different actors' participation, especially civil society actors, can be one important factor for the successful implementation of governmental agri-environmental PES. Thereby, civil society organisations may be especially useful at the regional level, where broad personal contacts as well as man power, special skills, and local knowledge are demanded.

Decision-making in payments for ecosystem services scheme design: Findings from case studies in Germany and the UK

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Summary:
Payments for Ecosystem Services (PES) have come to the fore as a relatively new strategy in environmental governance. In this paper, I will discuss how the idea behind the PES scheme ? namely the provision and maintenance of an ecosystem service - can spread to and establish in society and therefore support the scheme's concept beyond the financial incentive they provide. Therefore I hypothesize that deliberation in scheme design is the main driver of learning processes. I analysed schemes that are (co-)initiated by civil society initiatives and focused on their decision-making processes for scheme design. This paper's research question is: How are decision-making processes in PES design realized and what role does civil society play in these processes? I analysed the studied PES projects from Germany and the UK concerning their decision-making processes for scheme design, in accordance to their organizational setting. Then I will discuss what types of decision-making and actor constellations support the spread and establishment of the scheme's idea, which therefore could contribute to the ecosystem service concept beyond its economic perspective.

Abstract:
Our societies still must face the environmental crisis, even though efforts have been undertaken at all levels of governance with aim of solving environmental problems. Market-orientated strategies, like Payments for Ecosystem Services (PES), emerged as a relatively new approach in environmental governance. This strategy has been developed against the backdrop of the ecosystem services (ES) concept. The concept itself has changed over time. First developed to raise public awareness (e.g. Ehrlich, P. and Ehrlich, A., 1981: Extinction. The causes and consequences of the disappearance of species. New York: Random House), it later started to translate environmental pollution, biodiversity decline and the overconsumption of resources into a new economic language, calling attention to the benefits humans are gaining from ecosystems. These developments not only led to great attention among scientists; they also fed into the establishment of the concept in policy making, which therefore got a noticeable number of different payments for ecosystem services schemes implemented.
So far PES are mostly discussed against the backdrop of economic effectiveness and efficiency, which are the difficulties that arise with the valuation of ecosystem services and the ecological outcome of PES. Economic and ecological questions thus dominate the debate. This paper takes a different view and looks at PES as an approach for maintaining ecosystem services through other mechanisms than the financial incentive it provides. I hypothesize that a deliberative decision-making process within the design of a PES scheme also plays an important role in making the scheme function, spreading the scheme's idea as well as establishing it in society. I argue that a deliberatively designed scheme will contribute to learning processes among all groups and individuals participating in the decision-making process.
Since state-initiated schemes are known for having only limited opportunities for stakeholder participation, I focus therefore on schemes (co-)initiated by civil society, which take a wider public opinion into account. This paper's research question then asks: How are the decision-making processes in PES design realized and what role does civil society play within these processes? I will also discuss what conditions, which forms of decision-making and which types of actor constellations support the spread and establishment of the scheme's idea and therefore contribute to the ecosystem service concept beyond the economic perspective.
To answer the research question I undertook an in-depth case study analysis of twenty cases that are chosen by qualitative sampling. They are located in two countries: Germany and the UK. The sampling follows three core criteria: (A) All cases represent projects in which a financial incentive is given to maintain or recreate an ecosystem service. (B) The cases are heterogeneous

regarding their form of deliberation. Such heterogeneous characteristic allows me to draw conclusions on the assumption that rather deliberatively designed schemes contribute to learning processes. (C) Every case involves some form of civil society engagement within the design process of the respective scheme (regardless of whether it is an initiative or a legally organised form, such as an association or a foundation). Therefore, I could draw conclusions on the connection between the role civil society played and the influence it could have on the decision. The data was collected through guided interviews, media reports, project reports and project home pages. The data was subsequently analysed by qualitative content analysis.
Overall, civil society actors took on different roles in the decision-making processes of designing the PES scheme. The roles civil society took on varied between being the initiator of the scheme, the cooperative partner within scheme design, and the moderator or the knowledge broker in scheme design. In some of the projects civil society took on more than just one role. The forms of decision-making in PES scheme design ? and therefore the influence civil society could have - differed as well. They varied within the scope of having almost no influence on the decision of the scheme design, the option to express opinions and proposals, having an equal say on the decision of scheme design by discussing different arguments or leading the process and trying to convince other partners. Fairly few projects decided to have a formal (in the legally binding sense) decision-making process and only few decided to have a standardised form of deliberation. More often communication and deliberation took place on a rather informal level. My results show that until now civil society often does not play an important role in financing PES schemes but in PES scheme design. It identifies local problems and reacts to them. It therefore meets regional characteristics and is often more likely trusted by the public than public bodies. Inclusive deliberation particularly plays an important role in providing learning processes and therefore contributing to solutions that help spread and establish the idea of ecosystem services at society level.

HOW TO ENABLE CIVIL SOCIETY INITITATIVES TO FACILITATE EFFICIENT AND EFFECTIVE PES IMPLEMENTATION? - AN ELABORATION OF THE ISSUE ON GERMAN LANDCARE ASSOCIATIONS -

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Summary
The paper explores the role and potential of non-governmental actors to support implementation activities of payments for ecosystem services (PES). In particular the paper (1) highlights the potential of German Landcare Associations (LCAs) to improve economic efficiency and environmental effectiveness within public PES scheme implementation and (2) assesses the necessary and needed framework conditions to practically enable LCA managers to exploit their potential. The results of the paper are based on expert interviews, an expert workshop and an online survey sent to 155 local landcare association groups in Germany.

Abstract

In the European Union (EU) payments for ecosystem services (PES) are most generally public payment schemes that are developed and executed in a complex legal and institutional environment. The overall framework for PES is set by the EU, policy design of PES measures are worked out at the individual member state level. In Germany, precise regulations and measures are executed at the federal state level, i.e. the Länder. Funding for those public PES schemes comes from the EU and the individual member states.

Participation in public PES schemes is voluntary for ecosystem service providers. For an efficient and effective implementation of PES a high degree of understanding, acceptance, participation and commitment on the provider side is thus required. In this context, the importance of intermediaries within PES schemes has frequently been highlighted. For public PES schemes, intermediaries are particularly important in the provision of advisory services between public agents and land stewards. The coming EAFRD regulation will further stress and prioritise the importance of such intermediaries providing advisory services.

In Germany, one actor group that is well suited to adopt the role of an advisory intermediary are German Landcare Associations (LCAs).

LCAs are collaboratives, combining local stakeholders of three societal actors (state, market and civil society) and operate at the rural district level. The first German local LCA group was established in 1986 and since then approximately 155 regional groups have developed all across Germany. LCAs satisfy specific criteria: they operate independently and they are not committed to any political party or will but are only bound to protect and minister to the environment (which is also defined in their articles of association). Currently LCAs are for instance frequently involved in the management of Natura2000 areas, implementation of the German Environmental Intervention Regulation, implementation of the Water Framework Directive etc.

LCAs hold the potential to increase economic efficiency and environmental effectiveness for certain activities of public PES scheme implementation.

To assess how and for which activities of PES implementation LCAs can increase economic efficiency and/or environmental effectiveness (and for which their involvement is likely to be rather counterproductive as only costs are increased) a document specifying all necessary implementation activities in a chronological order was prepared. The document was sent iteratively to experts to verify and complete listed PES implementation activities.

LCA's potential to increase economic efficiency is based on transaction costs theory. LCAs exhibit certain prominent characteristics and features that influence Williamson's determinants of transaction costs. Based on expert interviews and an expert workshop held in Berlin, Germany, in October 2012, the outstanding characteristics and features of LCAs were elaborated. It has been assessed how LCAs can ? at least potentially - affect the behaviour of actors and the attributes of the transaction and hence the relative level of overall transaction costs. Subsequently it has been discussed with experts (1) how these findings relate to the separate steps and activities of

PES implementation and (2) for which activities LCA involvement will be beneficial in terms of improved economic efficiency and environmental effectiveness.

Finally and based on these findings, the paper explores the necessary overall framework conditions that enable local LCAs to adopt an intermediary-in-trust role providing advisory services.
Providing advisory services for public PES implementation is new and most LCAs do not have much experience with these activities so far. The question on what kind of support is needed to enable those actors to provide adequate services has not been researched so far. What needs to be done to empower local LCAs and their managers to facilitate efficient and effective PES implementation? How important is financial remuneration of advisory activities? Do local LCA managers actually feel confident to provide such advisory activities? Where do local LCA managers foresee their own shortcoming to provide advisory PES implementation support? How can these shortcomings be overcome? Is there need to train the multiplicator and if so where and how? Results are based on an online survey sent to all 155 local LCA managers.

On the misuse of metaphors: are payments for environmental services instruments of commodification of the nature?

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There is a surprising convergence between advocates of market's solutions for environmental management and their ideological opponents who prioritize the public regulation. They include into the very the same category called « market-based instruments» (MBIs) all of these different tools as different as transferable permits, environmental taxes and payments for environmental services (PES).
Such a category is both used to idealise those instruments in the name of their alleged efficiency or to discredit them as neoliberal solutions aiming at commodifying nature. Both propositions are equally contestable. They result from a metaphoric conception of «the market». Institutional economy helps us to determine what is a market and the nature of what is effectively exchanged on it, and not in a metaphorical way. To the extent that what is exchanged on a market are, first of all, property rights (the right to perform certain actions), and because PES do not involve any transfer of property rights between land users and payers (land use rights are suspended by contract but not transferred), it is a sufficient condition not to confuse PES with genuine « market-based instruments » (the same reasoning applies for taxes).
Equally surprising is the detected frequent assimilation of incentives and markets, on the grounds that incentives modify the relative prices, which is featured as the essence of the market. This association is even more puzzling from critics of the mainstream economics. One can argue that sanctions mechanisms under a regulatory regime may also be analysed in terms of incentives and calculus. This suggests that incentives are not the exclusive privilege of markets. This assimilation demonstrates an attempt to establish a hierarchy ? and not simply a distinction - between incentives-oriented (assimilated to market-based) instruments, implicitly featured as « smart and efficient », and administrative regulations, featured as « inflexible and inefficient ». In such a binary opposition, the market is obviously on the right side. Such a classification therefore leads to either to magnify the PES or, on the contrary, to reject them as instruments for commodifying the nature. Another vision is to consider PES as environmental easements (more or less) negotiated and compensated, and to analyse the effects of their implementation under various forms and in different political and economic contexts.
We will focus on the necessary distinction between commodification and the axiomatic of the interest, specific to utilitarianism. One of the possible perverse effects of PES is to put financial profit-sharing at the center of social relations related to nature. We would suggest that assets-building PES focusing on investments into alternatives to undesirable land-use practices, could limit PES's beneficiaries temptation to exercise environmental blackmailing. One of the critical challenges for public action programmes is to set up appropriate combinations of instruments that can create systems effects limiting perverse effects linked to each taken one by one.

How do Civil Society Actors use the ES concept? A Case Study of Ecological Economic Valuation and Participatory Ecological Conflict Resolution in the Work of an Environmental NGO in Costa Rica

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The concept of ecosystem services is part of a strong critical analysis trend present in recent ecological economic literature that questions what it calls the traditional understanding of methodological pluralism (Norgaard, 1989; Norgaard, 2003; Norgaard, 2007) calling for a more robust definition of its preanalytic vision. These authors have developed qualifiers and typologies that seek to distinguish clearly how Ecological Economics aims to go beyond the confines of mainstream economics towards a progressive political economy of the environment. They characterize what should be understood as the boundaries of a Social/Radical Ecological Economics. They also define what they call conservative and critical approaches (Spash, 2011; Spash, 2012; Anderson and M´Gonigle, 2012; Barkin, 2012).

This trend highlights the divisiveness created by what it calls a confusing array of literature to appear under the title of Ecological Economics. It claims that measurement and value issues have been high on the agenda of Ecological Economics, in part because of the various attempts to get old wine into new bottles to attract economic and political support for action. They state that for some, mainly «ecologists and conservation biologists, large monetary numbers regardless of their theoretical foundation have been lauded a success. For others, physical numeraires of environmental impact are sought and ecological footprints proposed. Yet others believe environmental economists were basically right all along and all needed is more cost-benefit type studies extending into ecosystems services». This process results in a «mix, or muddle, of literature, none of which learns from past experience in economics or addresses the basic problem of developing a coherent theory of value» (Spash, 2011).

The critical analysis of using traditional methods of monetary valuation of ecosystem services includes questionings of value monism (and cultural determinism) as incompatible with the need imposed by the complex systemis focus of Ecological Economics for value pluralism (Funtowicz and Ravetz, 1994; Norton and Noonan, 2007; Söderbaum, 2007; Kumar and Kumar, 2008; Norgaard, 2010; Lo, 2013). The prevalence of this type of studies has been criticized methodologically for being vertical and tending to use rapid assessment methodologies with serious theoretical questionings (Pascual, et al, 2010; Liu et al, 2010). These problems are aggravated in developing countries where the application of these methods is done with less critical analysis and insufficient consideration of cultural and ecosystemic specificities (Aguilar-González, 2004; Christie et al, 2012). Popular policy instruments associated with ecosystem service valuation, such as Payment for Ecosystem Services (PES) have been criticized for promoting overreliance on market solutions, regressive income redistribution, low environmental additionality, commodity fetishism, etc. (Farley and Costanza, 2010; Kosoy & Corbera, 2010; Muradian, et al, 2013).

Methodological alternatives proposed by these critical positions include a range of proposals which focus on biophysical, participatory and culturally sensitive methods to determine social relevance with diverse measuring scales. They have been able to show that different realms of value may be complimentary by capturing pluralism in public concern over environmental change. Issues such as multiple values, incommensurability, lexicographic preferences, social justice, fairness and non-human values have been integrated into this work (Spash, 2007). Many theoretical contributons recognize today the value of integrating these scales within multicriterial frameworks (Curtis, 2004; Christie et al, 2012; Gamendia & Gamboa, 2012).

This process of critical discussion on the meaning of methodological pluralism is by far not over in the theoretical fora.The general acceptance of Ecological Economics as a postnormal science implies that constructivist processes that may contribute to enrich these discussions (Frame & Brown, 2008). This understanding is reflected in recent effortsthat seek to demonstrate that Ecological Economics is not only about research but is also action oriented , combining a scientific motivation to study questions and provide answers, with interest in practical action and solutions. This normative and action-oriented character of Ecological Economics has played a central role in the creation and development of this transdisciplinary field over the last 30 years (Farley, Erickson and Daly 2005; Antunes. et al, 2013). An interesting trend in this line is the complementarity in the use of Ecological Economics and Political Ecology tools in focusing on the understanding and potential resolution of the problems that cause distributional environmental conflicts. These conflicts involve the ownership or appropriation of stocks of natural capital and the ecosystem services they provide. The divergent interests are frequently expressed in differences in the language of valuation between stakeholders (Gerber, Veutney & Martínez-Alier, 2009; Martínez-Alier, et al, 2010).

This study seeks to contribute, through the critical presentation of a case study involving two environmental conflicts in Costa Rica, an applied perspective on several of the questions of methodological pluralism, valuation and the appropriateness of policy tools presented above that affect the use of the concept of ecosystem services within Ecological Economics.

Costa Rica has become an interesting context to apply Ecological Economics and Political Ecology in the last decade. The country´s dependence on its green image has created an increasing need for accountability. A consistent increase in the number and intensity of environmental conflicts is pointed as one of its main problems. This growth is related to the lack of adequate governmental application of environmental regulations, a larger and more active number of environmental civil society organizations (CSO) and the increase in potentially environmentally damaging development projects in diverse areas of the country. Further, institutional mechanisms developed within Costa Rica´s legal system have increased not only the opportunities for civil society participation in natural resource governance but also the possibility of CSO to challenge development projects in the judiciary system and to play a mediator role in socio-ecological conflicts (Estado de la Nación, 2011; Estado de la Nación, 2012; Aguilar-González, et al, 2012; Aguilar-González and Moulaert, 2013).

In this context, Fundación Neotrópica, one of the oldest environmental CSO in Costa Rica, has used the concept of ecosystem services as a strategic tool. It has used diverse ecological economic and Political Ecology tools to address the yuxtaposition of diverse interests in some of the environmental conflicts taking place in the last five years in Costa Rica.

The case study presented here includes the use of participatory valuation methodologies and alternative funding schemes in order to promote policy tools that address diverse environmental threats potentially affecting the wetlands in the Osa peninsula region in Costa Rica including its most important wetland reserve (Térraba-Sierpe National Wetland-TSNW) and the Dulce Gulf mangrove ecosystems. An increase in large scale tourism and real estate projects along with a hydroelectric dam and international airport projects add to the existing pressures coming from land uses incompatible with wetland conservation (Aguilar-González and Moulaert, 2013). Further, the lack of a participatory approach to protected area creation has led for the last three decades to a stalemate in the possibility of implementation of policy tools for proper land use zoning and regulation.

Specific methodological tools used include ecosystem service valuation, biophysical indicators and Social Multicriterial Assesments to gauge community support for different development scenarios including zoning regulations. The results of this analysis contributed to the approval of a Management Plan for the TNSW (Aguilar-González and Moulaert, 2013). Further a voluntary funding mechanism for community-based mangrove conservation has been implemented with corporate sponsors. A process of critical review of these experiences is now being undertaken by the CIVI.net project, under the Seventh Framework Program of the European Union. This evaluation, perfomed by specialized European scientific organizations, includes an assessment of the effectiveness and efficiency of the management instruments used with a special focus on PES. It also includes an evaluation of the success of existing environmental governance models and the role of CSO. Finally, the potential transferability of the model to other areas in Costa Rica is also being evaluated. The advance in these processes is reported here.

We hope with this case study of a post-normal science approach to shed light into the usefulness and potential pitfalls of the use by CSO of the concept of ecosystem services in order to better address environmental conflicts. Further, we hope this presentation also contributes to clarify, from an applied perspective, some of the important theoretical questions that were posed above about the evolution and identity definition of Ecological Economics.

La RSE, une source de création de valeur partagée en PME ?

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Dans leur article paru dansHarvard Business Review(2011), Porter et Kramer interpellent la communauté économique. Selon eux, les entreprises n'ont pas compris les opportunités qu'offre la prise en compte des besoins sociétaux. En déconnectant les trois piliers de la RSE, elles en ont dénaturé le sens, utilisant la RSE comme un moyen de soigner leur image, de manière détachée de leurs objectifs économiques. L'instrumentation de la performance lorsqu'elle se veut justement globale est symptomatique de cette séparation ;« [...] l'autodiagnostic, le contrôle ou le reporting externe, reste séparée dans les trois domaines principaux : économique, environnemental et social/sociétal. »(Quairel, 2006)
Dans ce contexte de RSE insuffisamment aboutie selon lui, que Porter et Kramer proposent le concept de création de valeur partagée, comme une nouvelle étape de RSE. Pour ces auteurs, les entreprises sont à même de répondre aux besoins réels qui doivent être perçus comme étant des potentialités, cette démarche se voulant créatrice de valeur économique pour l'entreprise et créatrice de valeur pour la société. La création de valeur passerait alors par trois voies : (1) repenser les produits et les marchés ; (2) repenser chaque activité de chaîne de valeur et (3) opter pour le développement des clusters.
La mise en perspective du concept de Porter et Kramer avec la littérature académique couvrant les champs de la RSE et de la création de valeur nous permet de faire deux constats : (1) les éléments constitutifs de la création de valeur partagée sont déjà présents à plusieurs niveaux de la littérature et (2) la critique faite par ces deux auteurs ne semble pas correspondre à la réalité des PME.
Parmi les éléments de littérature, citons Schmitt et Bayad (2002) qui rappellent que Marshall dansThe Principles of economics(1920) décrit la valeur comme étant le reflet à la fois de la demande des consommateurs, et de la réponse des producteurs satisfaisant cette demande. Cette approche de la valeur appelée valeur co-construite, tournée vers la satisfaction de parties prenantes externes, n'est pas sans rappeler la création de valeur partagée. Par ailleurs, l'idée d'une création de valeur partagée entre les différentes parties prenantes est déjà évoquée dans les travaux de Hill et Jones (1992) sur la théorie de l'agence élargie.
Les trois voies possibles de création de valeur partagée décrites par Porter et Kramer sont également présentes dans la littérature « classique » de la RSE. A titre d'exemple, la redéfinition des activités de la chaîne de valeur, notamment des choix logistiques, de l'utilisation des matières premières, des méthodes de commercialisation font déjà l'objet de travaux de recherches (Hoffmann et Saulquin, 2009). Ces derniers exposent même l'idée que la chaîne de valeur est rarement à la charge d'une entreprise, mais qu'elle est souvent le fait de plusieurs organisations, constituant une chaîne de valeur externe. Les impacts des pratiques RSE des entreprises sur la chaîne de valeur externe peuvent être décrits comme étant créateurs de valeur partagée par les différentes parties prenantes de ce système.
La redéfinition des produits fait également l'objet de travaux de recherche. Daudigeos et Valiorgue (2010) dans leur typologie des effets externes, basée sur la rivalité et sur l'excluabilité des parties prenantes aux effets externes, montrent que, dans certains cas, l'entreprise aura intérêt à changer son processus de production en vue de proposer une offre « responsable » à ses clients. Ce cas de figure présenté par Coase (1960) permet de conjuguer les objectifs économiques de l'entreprise et la performance sociale et environnementale. Dans un même ordre d'idée, les pratiques d'écoconception témoignent de la volonté d'entreprises de placer la RSE au coeur de leur stratégie (Capron et Quairel, 2001).
Ainsi, les éléments constitutifs du concept de création de valeur partagée peuvent-ils se retrouver à plusieurs niveaux de la littérature sur la RSE. Cela dit, l'article de Porter et Kramer semble dirigé vers les entreprises de taille importante. En effet la nature des critiques des deux auteurs ne paraît pas correspondre à la réalité économique des PME.

Le deuxième axe de cette communication portera sur les démarches RSE à l'échelle des PME. Historiquement rattachées au cadre des grandes entreprises, les démarches RSE comme objet de recherche sont de plus en plus souvent axées sur le terrain des PME (Spence et Rutherfoord, 2003 ; Jenkins, 2006 ; Perrini, 2006 ; Spence, 2007 ; Gendre-Aegerter, 2008 ; Bonneveux, 2010) Même si ces travaux n'abondent pas nécessairement dans le même sens, plusieurs caractéristiques se retrouvent tout au long des études et des observations. L'un des dénominateurs communs des PME, c'est la position centrale du dirigeant, et son statut bien souvent de dirigeant propriétaire (Berger-Douce et Paradas, 2012). En étant ainsi omniprésent dans la PME, les démarches de RSE sont souvent le fait du dirigeant, et moins des éléments venus de l'extérieur. Le cadre de ces démarches est à la fois volontaire, car les PME sont moins sous la pression de leurs parties prenantes que les grandes entreprises, et en même temps, elles correspondent aux valeurs et aux attentes du dirigeant (Spence, 2007). Dans les travaux de recherche, si le statut du dirigeant de PME fait consensus dans la mise en oeuvre de démarches RSE, le manque de ressources financières et de compétences pour leur mise en oeuvre est également reconnu comme étant le principal frein (Berger-Douce, 2008 ; Bergeron et al. 2010).
L'approche proxémique (Torrès, 2003) pour comprendre le comportement stratégique et organisationnel des PME est pertinente, étant donné cette position centrale du dirigeant au sein de sa PME. Cette loi proxémique définie par Moles et Rohmer (1978) comme« [...] un principe d'ordonnancement qui hiérarchise le degré d'importance des actions et des réflexions de l'individu. »est d'autant plus intéressante dans le contexte de cette étude, que l'un de ses effets en PME se traduit par une attitude éthique envers les parties prenantes (Courrent et Torrès, 2005).
Finalement, l'objectif de cette communication sera de comprendre, au travers d'une recherche intervention (David, 2000) réalisée auprès d'un panel de PME françaises, comment les éléments de création de valeur partagée décrits par Porter et Kramer, et plus largement les éléments théoriques qui y contribuent, sont une réalité dans les PME. L'analyse appuyée sur la loi proxémique et l'effet de grossissement (Mahé de Boislandelle, 1996) mettra en évidence la capacité des dirigeants de PME, à répondre aux besoins réels de la société, à repenser leur chaîne de valeur et à oeuvrer pour leurs communautés locales, créant ainsi de la valeur partagée. Ce travail de recherche aura également une portée managériale, puisqu'elle devrait permettre aux PME de mettre en avant leurs spécificités comme source de création de valeur.

A Change management approach to sustainability in Small and Medium Enterprise

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Focus of the research

Environmental management practices refer to various types of actions undertaken by a business « to reduce the environmental impact of their operations» (Gadenne, Kennedy and McKeiver, 2009, pp. 45). Although rates vary by country, generally speaking small and medium enterprises (SMEs) adopt green practices at a much lower rate than large firms (3-4% of micro firms, 6-8% of small to medium firms, compared with 16-17% of large firms, according to the Danish Technological Institute, for example). Moreover, SMEs represent 99% of European firms, and responsible for 60-70% of industrial pollution. Thus, to have a significant impact on the environment, it is important to have a better understanding of how and why certain SMEs engage in and are able to successfully implement green practices. In particular, this study explores whether change management principles can be used to improve our understanding of successful implementation of environmental practices.

Theoretical and conceptual background

The existing change management literature aids us in describing the implementation of environmental practices as a form of change process. Drawing on this literature, in the initial part of the paper, we present the following five insights: (1) the level of change induced in the organization, (2) the strategy and the process followed, (3) the importance of leaders, (4) the involvement of employees in the change process, and (5) the role of firm's stakeholders.

The most frequently implemented environmental practices aim at reducing energy and raw materials consumption and at recycling waste. A few SMEs adopt an Environmental Management System (EMS) although it often enables a firm to improve its operation process and its organization (implementation of procedures, scoreboards, etc.) Consequently, the level of change induced by the environmental practices is incremental in most cases, that is to say: a step-by-step movement towards an organization ideal. Furthermore, there are two types of strategies related to a change process: deliberate or emergent. A deliberate strategy leads to the implementation of a linear change process based on various and logical steps. If the firm scrupulously follows these steps, the objective(s) fixed initially will be achieved (for example, to get an environmental certification for a production site). Conversely, an emergent strategy leads to test solutions, follow intuitions, and drive the environmental change process without precise objective(s).

With respect to the role of SMEs' owner-manager during the environmental change process, he or she must be personally convinced by the necessity to act in favor of the environment, and be highly committed to the endeavor. The success of the environmental approach also relies on the SMEs' director ability to act as a leader-- that is to say defining a vision and aligning employees. Fourth, according to change management principles, to assure the total adoption and integration of the environmental approach in the firm and avoid all forms of resistance, employees have to be involved in the environmental change process by having the opportunity to express their opinion and by being trained. Finally, the support and the integration of SMEs' stakeholders in the environmental approach (suppliers, clients, public authorities, consultancies, etc.) are also highly important. Stakeholders can mitigate the need of financial and expertise means of SMEs and be a source of proposals.

Method:

To provide additional inputs and to understand how SMEs actually proceed to implement environmental practices, interviews were carried out with five SME directors, all of whom had implemented environmental practices. These five SMEs operate in various business lines, and vary in size (with respect to number of persons). The interviews were semi-structured, and aimed at exploring the various points highlighted by the literature review, that is to say:the type of

environmental practices implemented,the way the environmental approach has changed the organization,how SMEs' directors have proceeded to implement environmental practices,the role the director plays, the way they have motivated and involved their employeesand finallythe place given to the firm's stakeholdersduring the environmental change process

Main results:

The interviews confirmed some insights from the literature review and provided additional insights as well, regarding the applicability of the change management process. First, the environmental practices implemented in all participating SMEs were related to the firm operations and aim at reducing waste, energy and raw material consumption. In addition, three of the SMEs had obtained ISO 9001; ISO 14001 or ISO 26000 certifications. The level of change induced by the environmental practices was incremental in most cases. Moreover, all the SME owner-managers had a high level of awareness regarding environmental issues, were personally convinced by the necessity to reduce the environmental impact of their firm and highly committed to the environmental change process. They also acted as leaders by defining a vision and aligning their employees. With respect to stakeholders, all the participating SMEs included clients and suppliers in their environmental approach and relied upon the support of French public utilities and/or consultancies. Furthermore, in each case, directors reported that employees were heavily involved and empowered in the implementation process. However, except for the implementation of an EMS, the environmental change process was not linear but designed according to organization's characteristics and the environmental approach objective(s). Moreover, a successful implementation of environmental practices required a significant amount of time dedicated to the environmental change process.

Practical implications:

Although the data collected thus far is rather limited, further exploration of this line of research could lead to a number of useful guidelines with respect to implemenatation of environmental management practices. First, the SME director must be aware of environmental issues, be willing to reduce the environmental impact of the firm and be highly committed to the environmental change process. Second, the implementation process should be suited to the organization characteristics and to the objective(s) of the environmental approach (being certified, greening the production process, developing an ecological offer, etc.). Third, employees should be empowered to suggest greening opportunities, but to be successful, such empowerment should be coupled with relevant training and their being assigned appropriate authority for implementation. Fourth, the firm's stakeholders should be integrated in the change process at a very early stage. Fifth, the relationships between the firm and its stakeholders (including employees) have to be based on dialogue, open discussion and transparency. Finally, the amount of time required should not be underestimated. It is highly important to take and dedicate time to implement an environmental approach.

Directions for future research:

As is evident from applying principle of the change management model, innovation and environmental practices are two intertwined concepts and lead to the same result: changing an organization. Viewing environmental management practices as a type of innovation leads to a number of other possible directions for future research. The last part of the paper describes possible useful research questions and avenues to gain better understanding of implementation of environmental practices. For instance, how does innovation lead to the implementation of environmental practices? Recent research shows a link between innovation strategy and adoption of environmental management practices. But is this because innovation-oriented SMEs have an easier time adopting changes required to implement such practices? If so, then one might propose and test an additional guideline for augmenting environmental management practices: establishing an innovation-oriented culture in the firm.

L'engagement responsable de dirigeants de petites entreprises

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Cette communication présente une recherche sur les facteurs favorisant l'engagement responsable des dirigeants de petites entreprises. A partir d'une grille de lecture identifiant les principales sources de l'engagement responsable, une étude à méthodologie hybride a été réalisée auprès de 87 chefs de petites entreprises indépendantes. Un premier regroupement d'items a permis d'identifier quelques modalités pouvant faire l'objet d'une analyse des correspondances. Cet outil de traitement est particulièrement adapté à l'un des objectifs de la recherche tendant à observer la proximité entre les représentations et les actions. Les différentes analyses permettent de proposer une nouvelle grille de lecture de l'engagement responsable et de la boucle d'apprentissage.

Profil de l'entrepreneur et adhésion à la vision «business case» des politiques sociales et environnementales des PME

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Introduction

Le «business case» (les bénéfices tangibles à retirer de la pratique du développement durable (DD) dans l'entreprise) est l'argument qui a souvent été avancé par les pouvoirs publics pour inciter les PME à s'engager dans le DD. Cette approche est ainsi vue comme un moyen de faire des affaires, des bénéfices, d'accéder à de nouveaux marchés et de maximiser les opportunités et l'innovation (Jenkins, 2009). Ceci est supposé créer pour les entreprises qui l'adoptent un scénario gagnant sur tous les plans (Jenkins, 2004). Cette approche est toutefois controversée pour au moins deux raisons. La première est que le «business case» en matière de DD ayant été développé pour les grandes entreprises, son application aux PME reste à démontrer. La seconde raison tient au fait que ses tenants postulent implicitement que les entreprises auraient une sorte de penchant spontané vers le DD et que les gouvernements n'auraient pas besoin d'intervenir dans cette formule win-win (Brabet, 2010).

Cependant, quelques études ont démontré que même si les dirigeants de PME n'ont pas une vision claire de ce qu'est le DD, l'idéologie du «business case» serait bien présente chez certains d'entre-eux. Ainsi, nombre de typologies qui classent les entreprises selon leur propension à s'engager dans le DD présentent au moins un profil qui adhère au «business case» (Battisti & Perry, 2011; Spence, Gherib & Ondoua, 2011). Il semblerait donc que certains dirigeants de PME soient sensibilisés à cette problématique et qu'ils en aient une approche instrumentale. S'ils s'engagent dans le DD, c'est qu'ils pensent que cela facilite les affaires (Courrent & Gundolf, 2009).

L'aspect perceptuel du dirigeant de PME semble important pour prédire l'intérêt pour l'argument du «business case» en ce qui concerne le DD. Même si cette hypothèse s'inscrit largement dans le discours postulant que l'une des principales spécificités des PME réside dans le rôle dominant que jouent les entrepreneurs (Brilius, 2010; Jenkins, 2009; Elke & Bos-Brouwers, 2009), rares sont les études qui se sont penchées sur l'aspect cognitif ou sur les systèmes de pensée qui motivent les dirigeants à développer le DD au sein de leur PME. L'analyse de l'adhésion des PME au DD gagnerait ainsi à avoir pour point de départ les dirigeants des PME avec une approche davantage centrée sur les individus.

En nous situant plus spécifiquement dans le cadre de l'adhésion des dirigeants de PME au « business case» et en cherchant à analyser les éléments incitateurs et des dynamiques qui y sont associés, les questions que nous posons dans cette recherche sont donc :

- Quels sont les valeurs, les éléments identitaires et les croyances qui sous-tendent les représentations du DD parmi les dirigeants de PME sensibles à l'argument du «business case»?
- Quels sont les indicateurs démographiques qui jouent un rôle sur les représentations du DD

parmi les dirigeants de PME sensibles à l'argument du «business case»?

Éléments théoriques

Même si plusieurs chercheurs ont préconisé l'adoption de perspectives cognitives dans les études en économie et en gestion (Fassin, Van Rossem & Buelens, 2011; Simon, 1947; Weick, 1995), les méthodes utilisées sont diverses et rendent difficiles le développement d'un corpus cohérent. Construction de sens commun («sensemaking» Basu et Palazzo, 2008), représentations sociales (Filion & Bourion, 2008; Abric, 1994), théorie de l'effectuation (Sarasvathy, 2001), théories de la motivation (McClelland, 1987; Hackman et Oldham, 1976; Wroom, 1964; Roussel, 2000, Klein, 1989), raisonnement (Parrish, 2010), normes sociales (Meek et al, 2010) et opportunité entrepreneuriale (Renko, Shrader et Simon, 2012) sont quelques-unes unes des multiples approches touchant aux facettes de la perspective cognitive en gestion. Bien que ces approches aient des objectifs et des points de vue variés, certaines idées communes peuvent en être extraites : Les processus cognitifs sont des processus de construction de sens et de représentations mentales qui déterminent les actions et les comportements des individus. Des éléments incitateurs ou préconisateurs ? des valeurs, des éléments identitaires, des croyances ? stimulent, incitent ou inspirent, à la manière de scriptes cognitifs (Klein, 1989) les représentations mentales. Dans une situation précise, ces éléments incitateurs agissent à la manière de tensions, inconscientes ou conscientes (théorie de la motivation ou de l'effectuation). Ces processus sont dynamiques et donc changeants en fonction du temps (des générations, des années d'expérience) et de l'environnement (de l'entourage, la culture, l'économie, l'accès à l'éducation). Ces dynamismes peuvent, en règle générale, être analysés par des indices démographiques.

Une recension des écrits sur les profils des entrepreneurs de PME adhérant à la philosophie du DD met en exergue d'une part les aspects démographiques des dirigeants tels que le genre (Paradas et al., 2012), l'âge, l'éducation et l'expérience en gestion (Kuckertz & Wagner, 2010), d'autre part leurs valeurs personnelles et entrepreneuriales. L'éthique de l'entrepreneur a fait l'objet de nombreux débats (Courrent & Gundolf, 2009; Spence & Perrini, 2009; Spence & Rutherfoord, 2003; Fassin, Van Rossem & Buelens, 2011) ainsi que le sentiment d'appartenance géographique (York & Venkataraman, 2010; Courrent et Gundolf, 2009; Spence et Perrini, 2009). Les stratégies entrepreneuriales (Jenkins, 2009) et les objectifs entrepreneuriaux incluant la survie et la croissance (Spence, Gherib & Biwolé, 2011; Jenkins, 2004; O'Gorman, 2001) peuvent aussi avoir un impact sur l'engagement dans le DD. L'adhésion au «business case» a été illustrée par la légitimité, l'accès aux marchés et les apports financiers (Boiral, Cayer & Baron, 2009; Russo & Perrini, 2010).

Cette approche a permis de formuler trois hypothèses :

Hypothèse 1 : Les profils démographiques influencent la représentation qu'ont les dirigeants des PME du«business case»dans le contexte du DD.

Hypothèse 2 : Les valeurs personnelles et entrepreneuriales influencent la représentation qu'ont les dirigeants des PME du«business case»dans le contexte du DD.

Hypothèse 3 : Les profils démographiques ont un rôle modérateur sur l'influence des valeurs sur la représentation qu'ont les dirigeants des PME du«business case»dans le contexte du DD.

Méthodologie

Un questionnaire en ligne administré en 2010 à un échantillon de plus de 6000 petites entreprises (PE) canadiennes de moins de 100 employés (qui représentent 98% des entreprises du pays (Industrie Canada, 2012)) a résulté en 188 observations exploitables, soit un taux de réponses de 5%. La base de données utilisée a été celle d'industrie Canada qui regroupe environ 60 000 entreprises de toutes tailles et tous secteurs confondus.

Le questionnaire identifiait le profil démographique des entrepreneurs selon leur genre, âge, niveau d'éducation et expérience en gestion; leurs valeurs éthiques en fonction de leur niveau d'activisme et d'altruisme et de leur appartenance géographique (locale ou globale); leurs valeurs entrepreneuriales selon leurs objectifs (survie ou croissance) et leur stratégie (claire et à long terme ou financière). L'adhésion au «business case» couvrait la perception de légitimité octroyée par un engagement dans le DD, la possibilité d'entrer dans de nouveaux marchés et d'améliorer la performance financière.

Résultats

La mise en perspective de ces éléments incitateurs et dynamiques identifie des traits spécifiques qui caractérisent les dirigeants des PME adhérant au «business case» dans le contexte du DD. Tout en révélant une certaine complexité, ces traits montrent des constantes sur lesquelles peuvent s'appuyer les politiques de promotion du DD auprès des PME :

- Les dirigeants des PME ne montrent pas de penchant spontané à l'adhésion au DD. Seuls certains d'entre eux, ayant un profil particulier, semblent adhérer au «business case».
- Les trois dimensions du «business case» sont influencées par différentes caractéristiques des entrepreneurs, d'où la difficulté d'identifier de façon précise les PME les plus adeptes à s'engager.

- Les profils démographiques des dirigeants de PME n'ont aucune influence sur leur adhésion au «business case» dans le contexte du DD.
- Différentes valeurs personnelles influencent la perception de légitimité et d'accès aux nouveaux marchés fournie par l'adhésion au «business case» dans le contexte du DD.
- Les valeurs personnelles et entrepreneuriales n'ont qu'un faible effet sur la perception d'amélioration de la performance financière fournie par l'adhésion au «business case» dans le contexte du DD.

Implications

Les résultats de cette étude permettent d'amorcer une réflexion sur les manières de motiver les entrepreneurs en utilisant notamment les recherches autour de la théorie de la motivation (McClelland, 1987; Hackman & Oldham, 1976; Wroom, 1964; Roussel, 2000, Klein, 1989) pour trouver des moyens d'inciter les dirigeants de PME à adhérer au «business case» dans le contexte du DD. Inclure cette démarche dans les politiques de DD pourrait influencer le succès de ces politiques.

Pour aller plus loin dans cette analyse, produire un échantillonnage plus grand pour certaines catégories démographiques, comme les femmes et les jeunes, permettrait d'affiner les recherches. De plus, il serait intéressant de contextualiser les résultats en comparant ce qui est de l'ordre de la pensée, du discours et de l'action (Basu & Palazzo, 2008; Fitzsimmons & Douglas, 2011).

Références

Abric, J.-C. (1994). Pratiques sociales et représentations, Presses universitaires de France, Paris, 251 p.

Basu, K., & Palazzo, G. (2008). Corporate social responsibility: A process model of sensemaking. Academy of Management. The Academy of Management Review, 33(1), 122-136.

Battisti, M. & Perry, M. (2011). Walking the talk? Environmental responsibility from the perspective of small-business owners. Corporate Social Responsibility and Environmental Management, 18, 172-185.

Brabet J. (2010). Le champ contesté de la responsabilité sociale des enterprises. Revue internationale de psychosociologie, 17(1), 31-41.

Boiral, O., Cayer, M. & Baron, C. (2009). The Action Logics of Environmental Leadership: A Developmental Perspective. Journal of Business Ethics, 85(4), 479-499.

Brilius, P. (2010). Economic crisis and SMEs sustainability policies: Application of emotional well-being function for analysis. Journal of Advanced Research in Management, 1(1), 18-29.

Courrent, J., & Gundolf, K. (2009). Proximity and micro-enterprise manager's ethics: A french empirical study of responsible business attitudes. Journal of Business Ethics, 88(4), 749-762.

Fassin, Y., Van Rossem, A., & Buelens, M. (2011). Small-business owner-managers' perceptions of business ethics and CSR-related concepts. Journal of Business Ethics, 98(3), 425-453.

Filion, L.J., C. Bourion & Bayad M. (sous la dir.)(2008) Les représentations entrepreneuriales. Revue internationale de Psychosociologie, 14(32), 262 p.

Fitzsimmons, J. & Douglas, E. (2011). Interaction between feasibility and desirability in the formation of entrepreneurial intentions. Journal of Business Venturing, 26 (4), 431-440.

Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work - test of a theory. Organizational Behavior and Human Performance, 16(2), 250-279.

Elke, H. & Bos-Brouwers, J. (2009). Corporate sustainability and innovation in SMEs: Evidence of themes and activities in practice. Business Strategy and the Environment, 19(7), 417-435.

Industrie Canada, (2012). Principales statistiques relatives aux petites entreprises. Juillet. www.ic.gc.ca/statistiquespe

Jenkins, H. (2004). A critique of conventional CSR theory: An SME perspective. Journal of General Management, 29(4), 37-57.

Jenkins, H. (2009). A 'business opportunity' model of corporate social responsibility for small- and medium-sized enterprises. Business Ethics, 18(1), 21-36.

Klein, H.J. (1989). An integrated control theory model of work motivation. The Academy of Management Review, 14(2), 150-172

Kuckertz, A., & Wagner, M. (2010). The influence of sustainability orientation on entrepreneurial intentions - investigating the role of business experience. Journal of Business Venturing, 25(5), 524-539.

McClelland, D.C. (1987). Human motivation. Cambridge, Cambridge University Press, 663p.

Meek, W. R., Pacheco, D. F., & York, J. G. (2010). The impact of social norms on entrepreneurial action: Evidence from the environmental entrepreneurship context. Journal of Business Venturing, 25(5), 493-509.

O'Gorman, C. (2001). The sustainability of growth in small- and medium-sized enterprises. International Journal of Entrepreneurial Behaviour & Research, 7(2), 60-75.

Paradas, A., Debray, C. Revelli, C. & Courrent, J.-M. (2012). Femmes dirigeantes de petites et

moyennes entreprises (PME) et responsabilité sociale de l'entreprise (RSE): une étude exploratoire. 11e CIFPME, Brest, France.
Parrish, B.D. (2010). Sustainability-driven entrepreneurship: Principles of organization design. Journal of Business Venturing,25 (5), 510-523.
Renko, M., Shrader, R. C., & Simon, M. (2012). Perception of entrepreneurial opportunity: A general framework. Management Decision, 50(7), 1233-1251.
Roussel, P. (2000). Notes du LIRHE (Laboratoire Interdisciplinaire de Recherche sur les ressources Humaines et l'Emploi), N326, octobre 2000.
Russo, A. & Perrini, F. (2010). Investigating stakeholder theory and social capital: CSR in large firms and SMEs. Journal of Business Ethics,91(2), 207-221.
Sarasvathy, D. S. (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. Academy of Management. The Academy of Management Review, 26(2), 243-263.
Simon, H. (1947). Administrative Behaviour: A Study of Decision-Making Processes in Administrative Organizations, McMillan, New York, 259p.
Spence, L., & Perrini, F. (2009). Practice and politics: Ethics and social responsibility in SMEs in the European Union. African Journal of Business Ethics, 4(2), 20-31.
Spence, L. & Rutherfoord, R. (2003). Small business and empirical perspectives in business ethics: Editorial. Journal of Business Ethics, 47(1), 1-5.
Spence, M., Gherib J. & Ondoua, V. (2011). Sustainable entrepreneurship: Is entrepreneurial will enough? A North-South comparison. Journal of Business Ethics, 99(3), 335-367.
Wroom, V. H. (1964). Work and motivation. New York, Wiley, 331p.
Weick, K. E. (1995). Sensemaking in organizations. Thousand Oaks, SAGE Publications, 483p.
York, J. G., & Venkataraman, S. (2010). The entrepreneur-environment nexus: Uncertainty, innovation, and allocation. Journal of Business Venturing, 25(5), 449-463.

The future of socioeconomic metabolism in a changing world: transition dynamics between saturated industrial and rapidly growing emerging economies

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Summary
Globally two phases of the socio-metabolic transition are currently ongoing, leading to steady increase of global annual resource use. While only 18% of global population are currently part of an industrial fossil fuelled metabolism, another 60% are currently in the take-off and acceleration phase of exactly this transition into a mode of production and consumption based on high levels of resource use. But globally conditions are changing, as these complex transitions are happening on an increasingly strained global resource base and in a protracted economic crisis. Therefore the continuation of past developments seems unlikely and the chance for a take-off of a sustainability transformation might at least be on the horizon.

Proposal
Currently, globally two phases of the sociometabolic transformation happen more or less simultaneously.
The first is the transformation from a biomass based, agrarian mode of production and consumption to a fossil fuel based industrial mode. Many Asian and South American emerging economies are currently at the take-off or acceleration phase of this transition, comprising approximately 60% of the global population, as we will empirically demonstrate. Most spectacular in its acceleration is China, while India shows many signs of a take-off.
The second is an end of growth of the fossil fuelled industrial metabolism, with it's high resource use mode of production and consumption, currently serving only approximately 18% of global population. Empirically, we will demonstrate that all high income OECD countries show signs of saturation in material and energy terms since the 1970s, and some even a biophysical decline. In analogue to Pfister's «1950s syndrome» we call that the «1970s syndrome». Not yet, a transition away from fossil fuels towards renewable energy sources and/or lower energy use can be observed, but stabilization, while incomes kept increasing until the 2008 crisis.
Since the beginning of this century, at the global level the superimposition of these two processes is clearly dominated by the transition towards fossil fuel and increased resource use and leads to a currently observable steep increase in annual resource extraction (biomass, fossil fuels, metals and minerals). A continuation on these pathways would lead to a tripling of annual resource extraction by 2050 ? it is not plausible that the Earth would yield that.
But conditions are changing: these complex transitions happen in the context of an increasingly strained and declining world resource base (peak oil, declining ore grades, sharply rising resource prices and stress induced by progressing climate change) and in a protracted economic crisis in the industrial core countries. Thus we cannot expect previous developments just to continue. This is an interesting situation, in suspense somehow, in which no business-as-usual pathway seems to lead anywhere.

Globally, and for a number of countries for which we have generated consistent time series data of energy and materials use (EFA, TPES and MFA data) across centuries, we will show that this pattern of transition can be identified for many high income industrial countries. The later the transition started, the faster it proceeded, but the turning point to stabilization of metabolic rates in all of these countries happened in the early 1970ies. We will apply econometric analysis techniques to identify turning points. Next, we will show empirically, again with EFA and MFA time series data, that this was not just a «historical» socio-ecological transition. Currently, a substantial number of countries comprising more than half of the world's population are following a similar transitional pathway at an ever accelerating pace. Based on empirical data on physical resource use and the above sketched methodology, we can show that these so-called emerging economies are currently in the take-off or acceleration phase of the very same transition. We will investigate the effect of external shocks and their impact on the dynamics of energy and materials use. The first such shock we will explore is the oil crisis of 1972 that possibly triggered the end

of rapid physical growth in high income countries. This could contribute to understanding the potential effect of other such shocks such as the rise in energy prices preceding the recent crisis, or future shocks related to the risks of nuclear energy or unconventional fossil fuels.

The presentation will consist of three parts:
The growth phases of the past century, in energy and material use, population and income, and trajectories since for European countries and emerging economies New conditions: could they enforce a take-off into a post-fossil metabolic regime? Outlook into the future: how can we expect these different dynamics to interact? What do various long term modelling exercises (such as GEO5, World Bank, Randers/Club of Rome...) make of this complex situation, and what can a focus on the physical economy contribute?
References:
Krausmann, F., S. Gingrich, N. Eisenmenger, K.-H. Erb, H. Haberl, M. Fischer-Kowalski. 2009. Growth in global materials use, GDP and population during the 20th century. Ecological Economics. 68(10): 2696-2705.
Krausmann, F., M. Fischer-Kowalski, H. Schandl, N. Eisenmenger. 2008. The global socio-metabolic transition: past and present metabolic profiles and their future trajectories. Journal of Industrial Ecology. 12(5/6): 637-656.
Pfister, C. 1996. Das 1950er Syndrom: Der Weg in die Konsumgesellschaft. Bern, Wien: Haupt.

Okavango Delta: society in Transition. Social metabolism of a rural community in Ngamiland, Botswana.

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Introduction and problem statement

The Okavango Delta, Ngamiland, Botswana, is threatened by a number of developments, among which the increasing pressure through human settlements along the Okavango River. Yet, the delta is the main source of livelihoods for people settling on its shores and on the shores of Panhandle north if it, as well as it is the home to a large variety of wildlife. The eastern side of the Panhandle especially, our area of interest, is fairly isolated. Agriculture and pastoralism are the main sources of food, raw material and livelihoods for the local population, and cash economy is limited.

In the perception of the population, there exist two main threats to their livelihoods in the short and in the long term. First, the thriving of wildlife, and the related destruction of crops by elephants, causes human-wildlife conflicts. The high and increasing density of elephants lead to important yearly damages to crops and local farmers engage in important measures to minimize losses. Second, productive land is getting scarcer as a result of population increase and poor soil fertility management leading to fertility loss. Encroachment of fields on lands formally wild also exacerbates the pressure on wildlife. Finally, the area is slowly embedded in the larger cash economy.

These drivers affect human-nature interactions and the sustainability of the management of the ecosystem and people's well-being.

Aim and Means

Our research focus is to assess the biomass-related and energetic socio-metabolic profile of Seronga in order to understand how much energy and biomass is allocated to the different activities of the community and related to key ecosystem services. These are the human-wildlife interaction and the management of soil fertility.

The Material Flow Analysis (MEFA) and Energy Flow Analysis were chosen as a method to investigate the human-environment relationship at the scale of a rural community, focusing on the village of Seronga, Ngamiland, Botswana as a case study.

By focusing our analysis on biomass and energy flows, we obtain a fair overview of the social metabolism of the Seronga community. In addition, this approach provides us with an opportunity to calculate non-monetary values for the key ecosystem goods provided by the wetland ecosystem and especially for the ecosystem services related to soil-fertility and wildlife.

Case study.

The rural community of Seronga, Ngamiland, Botswana, consists of 950 households. Main livelihood activities are dry land agricultural, fishing and cattle keeping. Seronga enjoys a semi-arid climate (450 mm rain per year). The village is located to the South-East of the Panhandle and is difficultly accessible.

Data collection

Secondary data include results of a baseline questionnaire at the households level on amounts harvested of main income and subsistence crops and the collection of natural resources, as well electricity consumption records for the village of Seronga, migration rates, the human and the livestock stocks.

Own data collection was constrained to a period of two months in from October to December 2011. Observations and households diaries were used on a very small sample of 2 households to get an idea of the labor and food flows. These served as a basis for the conduction of two focus groups aiming at gaining year long reliable data on these two issues. Material flows were the subject of a short questionnaire at the household level among 20 households. Materials were weighted during the interviews and at various occasions such as reed harvest in the wetland, house building with thatch grass, ... The methods used are complementary and allow for cross checking of data.

Results

Results will be organized as to document the dynamics of the socio-ecological system Seronga with regard to biomass and energy flows. This will enable us to compare this case to the study of other communities in the world. Second, we will look at how the flows of biomass and energy are allocated to the management of soil fertility and wildlife, as a valuation indicator. This is especially relevant in the context of Botswana where agriculture and tourism are the two main sources of income for the Ngamiland region. Specifically, biomass plays a key role in the livelihoods of the population while labor efficiency seems to constrain management possibilities. Our results suggest that the investigated community is in a transition stage from an agricultural to an industrial society, with the appearance of cash economy and as population pressure becomes greater.

Rethinking the concepts of Virtual Water, Socioeconomic Metabolism and Water Metabolism. Towards a new paradigm: Integrated Water Metabolism

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Years ago the concept of Socioeconomic Metabolism (SecM) was popularised as a methodology the objective of which is to quantify the inputs and outputs of materials and energy in economic processes. Nevertheless, the idea of metabolism as something else than the mere quantification of inputs and outputs has also been elaborated, and, accordingly, SecM has also been presented as a framework of analysis. There has been a protracted development of scientific and academic studies, which, in their attempt to delve into the metaphor, have generated an increasing confusion around the concept. Thus, one single term (metabolism) is presently used to designate two different concepts.
The incorporation of the physical dimension into economic considerations represented a great step forward, although, in what regards metabolism, the study of the water flows was excluded from most of those works. However, water flows have been introduced in the debate and in the analysis through the definition of two indicators ? Virtual Water (VW) and Water Footprint (WF)? and, subsequently, through the application of Socioeconomic Metabolism to water, which was denominated Water Metabolism (WM).
Against this background, the present work sets out a double objective. On the one hand, to rethink the concepts of VW, SecM and WM in the light of the different scientific paradigms. The intention is to demonstrate how these concepts, despite having been born with a critical vocation, could actually conform to the old Cartesian-Newtonian paradigm. The second objective consists in proposing a change of paradigm through the definition of Integrated Water Metabolism (MIntA, in its Spanish acronym), developed from the idea of WM. Acknowledging the role and work of all those who have advanced on the road towards complexity this research represents a warning on the current confusion and an opportunity to establish some order, through the rethinking of the different concepts associated to MIntA, and to return to the essential, i.e. the paradigms.

The Global Metabolic Transition: Regional Patterns and Trends of Global Material and Energy Use, 1950-2010

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Since coal fired the industrial revolution in the UK 300 years ago, the agrarian metabolism ? sustaining society's resource requirements over more than one millennium - is transforming into an industrial metabolism. Fuelled by coal, oil and gas, societies built up long-lasting stocks with metals and non-metallic minerals, sustaining the energetic requirements of humans and livestock with constant inflows of biomass. In terms of annual inflows, non-renewable resources dominate the metabolic pattern of mature industrial countries. On average, 75% of DMC are non-renewable resources, 25% fossil fuels, and 50% all other non-energy containing mineral resources. On the other hand, developing countries and the emerging economies show a different pattern, with a much higher share of biomass in total DMC, and still a comparatively low consumption of construction minerals, metals and non-metallic mineral resources. Furthermore, their patterns show a much broader diversity than the industrial economies, depending on factors such as population density, economic performance, resource endowment and integration in world trade. Despite the heterogeneity of patterns, various country-wide studies on the long-term evolution of resource extraction and consumption have shown evidence for a transition towards an alignment with an industrial metabolism, despite different biophysical and socio-economic factors that shape countries resource use patterns. During this transition, not only changes their metabolic profiles in terms of composition, but also their per capita rates are growing continuously. Due to the sheer size of these «non-industrial» world regions, inhabiting 80% of the total world population, their metabolic patterns are getting more and more formative for the global metabolic pattern.

In order to trace the evolution of material and energy use since World War II, we have compiled the first methodologically consistent global material and energy flow dataset, covering material and energy extraction, trade, and consumption of 177 individual countries and regional aggregates from 1950 to 2005 (in ten years intervals. An update for 2010 is currently underway). Based upon the standardized methodological framework of economy-wide material flow accounting, we have compiled data on direct material flows, i.e. used extraction (domestic extraction, DE) of raw materials as well as imports and exports of raw materials, semi-manufactured and manufactured goods. In accordance with the MFA framework, all materials (except for water and air) are accounted for. Based upon MFA data, we have used regionally adapted conversion factors for all energy containing matter to calculate energy flows, and compiled data for energy flows that do not show up in the material flow data, namely energy from water, nuclear, geothermal, solar and wind sources, and imports and exports of electricity. This dataset is the extension of the firstly published country-by-country MFA dataset from Schaffartzik et. al (forthcoming), and provides two novel aspects: The first novelty will be an update for 2010, the second one is that the dataset is now supplemented by energy flows, and therefore the first global country-by-country dataset that contains material and energy flows since 1950. Based on this newly compiled database we explore patterns and trends in global resource use for six major world regions. We investigate the changing relation of extraction and trade, the composition of material and energy use and compare trends in per capita material and energy use across world regions. In terms of material patterns, there has been a massive increase in the amount of traded resources and a strong shift in regional resource extraction and consumption since 1950. A first growth phase until 1970, with a steep increase in global per capita metabolic rates, was mainly a result of growth in Europe, Northern America and a few countries in the Asian Pacific region.

Since, patterns have changed. In the industrialised world, growth of domestic extraction slowed down, even at a faster rate than domestic consumption, while the significance of imports increased. This means that global metabolic rates stagnated from 1980 to 2000 at a rate of about 8 t/cap/yr for the whole phase. But this seems to be over, and rates are showing an upward trend since 2000. In order to trace significant shifts in the contributions from different parts of the world to the global evolution of material use, we have analysed the metabolic profiles for six major world regions (Industrial, Asia, (Former) Soviet Union, Middle East and Northern Africa, Latin America and the Caribbean, and Sub-Saharan Africa) and their dynamics during the last 60 years. While globally average material consumption amounted to 10,3 t/cap in 2009, the metabolic profile of the average Industrial country was significantly higher than the world average, and those of the average Sub-Saharan African country significantly lower. This also holds true for their energetic profiles, where per capita rates in Sub-Saharan Africa are still far below the world average. The most significant shift which took place between 1950 and 2010 was that Asia surpassed the Industrial region in terms of total extraction and apparent consumption of materials in absolute terms. Next to the Asian region, we find that also the (Former) Soviet Union and the Middle East and Northern Africa are developing an Industrial metabolism. But the picture changes when the per capita rates are compared, which are still much lower in the latter three regions than in the industrial region (except for some oil extracting countries in the middle east). Latin America and the Caribbean or Sub-Saharan Africa still lag behind in both terms, absolute and per capita material consumption. The adoption of the industrial metabolic profile also changes the energetic profile that is more and more depending on the consumption of fossil fuels. Energy flow accounting data reveals shifts in the energetic base of societies from land-based resources to point resources, changing a wiede range of institutional settings in societies. Asia, traditionally a net-exporter of natural resources, now became a net-importing region, leading to changes in formal policy and military decisions. The rise of the recent discussion on land grabbing in Sub-Saharan Africa is one well-known discourse addressing the rising resource requirements of countries that have little resources of fertile land. Still, notwithstanding several decades of growth, the metabolic rates in most of the emerging economies are considerably below the global average. The metabolic rates of Sub-Saharan Africa are still the lowest of all world regions, still dominated by biomass and even declined since 1950. The high share of biomass indicates that little stocks were built up, and a huge share of the social metabolism in this region is required for sustaining the basic metabolism of the population and the livestock. This database provides the empirical basis for the analysis of patterns of nation-wide resource extraction and use for the last 60 years. This presentation explores resource use patterns by major world regions, illustrating how large the regional differences in metabolism hidden in globally aggregated data are.

Institutional dimensions of ES and their main application, PES: what sociology and political sciences can bring to economic approaches?

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The aim of this communication is to discuss different economic approaches' input for the analysis of Ecosystem Service (ES) concept. Since the beginning of 2000 (notably through the Millennium Ecosystem Assessment), many countries of high biodiversity implemented policies or projects based on Payment for Ecosystem Services (PES). Economic literature described at length the processes of PES setting up. Questions of local governance, evaluation, and link to poverty remain central. Several debates and controversies helped to show how different economic analysis approaches explain this evolution. Through case studies at international level and in different countries (Costa Rica and Madagascar), we will show that economic analyses could be strengthen by sociology and political sciences contribution. Indeed, PES emergence in specific contexts may be explained through the general spread of ES concept at international level. It appears necessary to show how and why this concept recently developed and what framework debriefs this development. Our argument is that PES importance can be explain not only with a better understanding of economic stakes linked to biodiversity conservation at local level but also through the process of international diffusion of novel concepts, policy transfer... that sociology and political sciences may well explain.

The institutional foundations of the ecosystem services approach

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The ecosystem services approach has been elaborated by ecologists for political advising. It is now widely adopted by mainstream environmental economists who estimate the value of ecosystem services. However, the idea that all ecosystem services should be valued may lead to assume their substitutability, paradoxically a conception of Nature which is contradictory to the one of many natural scientists and also to the logic of most of institutions that Human has built to manage ecosystems. This communication examines the institutional foundations of the ecosystem services approach, with two objectives: first, to understand why scientists from different disciplines may have been led to use the same concept with sometimes opposite view of its usefulness, and second, to demonstrate that any attempt to evaluate ecosystem services should be based on an analysis of the institutions which define the status of these services.

Payments for Ecosystem Services as Incentives for Collective Action

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Payments for ecosystem services (PES) are probably the most important policy innovation in the field of environmental conservation during the last decade. The design and thrive of this type policy instrument have occurred as a response to the relative failure first of national parks and later of integrated strategies in reconciling conservation and development. The most widespread definition of PES conceives these payments as markets to solve environmental externalities. The paper analyzes the limitations of this «Coasean» approach, from the perspective of transaction costs economics, and it pleads for looking at PES with different analytical lenses. In particular, it argues that PES should be seen as «incentives for collective action».

Based on insights from transaction costs economics, the paper argues that key features of the manegement of ES (high coordination costs, high uncertainty, Imperfect and asymmetric information and High level of asset specificity) makes markets not the most appropriate governance structure for shaping the interaction (transaction) between beneficiaries of ES and users of the resource base. In addition, a long geographical and social distance between beneficiaries of ecosystem services and the users of the resource base tend to make the cost of bureaucracy extremely high. In addition, these two social groups often belong to different political and legal systems, which also impose constraints on the possibilities to control directly or through governmental regulations the activities of the users of the resource base. Furthermore, the users of the resource base are often multiple and spread geographically, which also increase the cost of monitoring and control. All these factors likely make the cost of hierarchical modes of governance very high. The corollary is then that hybrid modes of governance are expected to render more efficient outcomes. The appropriate management of ecosystem services needs the right combination of market and hierarchical elements, within an institutional framework that comprises both control and incentives for collaboration.

The conceptualization of PES outlined in this paper is also based on (a) framing the problems in the management of ecosystem services basically as social dilemmas and (b) acknowledging the distinction between rewards, incentives and markets, and their potential contribution to solve such dilemmas. Each of these modes is characterized by a different set of rules, and are appropriate in different contexts. Incentives could play a role in facilitating the required collective action to deal with social dilemmas in the management of ES, though they may also entail some risks. The extent to which monetary incentives can contribute to the management of ES should be therefore not taken for granted. The effects of incentives are determined by their «social meanings », which are by definition are context and culture-dependent. Emphasis is hence needed on understanding the complex responses of humans to monetary and other types of incentives across social contexts. As argued above, one of the distinctive features of the Coasean definition of PES is its appealing simplicity. In contrast, the theoretical framework here developed is in line with the proposition that «simple blueprint policies do not work» in complex socio-ecological systems (Ostrom, 2009b). Simple assumptions and one-size-fits all approaches should be avoided, and PES interventions should be based on sound evidence, not only about the environmental effectiveness but also about their behavioral and ethical implications.

Forest Use Rules in South Asia's Community Governed Forests: Does Gender Make a Difference?

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Forest use rules determine what products are extracted from community governed forests, in what quantity, by what methods, and by whom. The nature of rules and the process by which they are formulated (e.g. who participates in formulating them) can prove key to institutional sustainability, given their potential impact on the commitment and incentive to protect, and the equity and conservation outcomes. This is well recognized in the substantial literature on institutions governing common pool resources. It is also well recognized, although in relation to other types of institutions, such as legislatures and village councils, that there can be notable differences in women's and men's policy priorities. Yet there is surprisingly little existing work on, or statistical testing of, potential gender differences in rule making in institutions managing ecosystems such as forests. Based on the author's primary data for India and Nepal, this paper examines why we might expect women to favour different rules from men, and statistically tests whether and how the gender composition of the executive committees ? the main decision making bodies of community forestry institutions in South Asia ? makes a difference to the strictness of forest use rules. **xml:namespace prefix = o ns = "urn:schemas-microsoft-com:office:office" />**

A comparative study on valuation methods and decision-aid tools: cases on ecological restoration

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Summary:
Among the variety of valuation methods and decision-aid tools developed to improve biodiversity and ecosystem management, this paper focuses on four of them (contingent valuation, deliberative monetary valuation, multicriteria analysis and a participatory method) and discuss their main differences, similarities and limits; both from a theoretical and empirical point of view. Concerning the latter, the comparison is based on four case studies, each having implemented one method during an ecological restoration project. The idea is to analyze how the process frames the outcome, testing the hypothesis that a) the level (or type) of participation and b) the capacity of methods to address conflicting values or interests, both have a considerable influence on results. More broadly, this paper aims to highlight the links between theoretical underpinnings of valuation methods and their practical uses, as well as opening up a discussion about the space and role of those valuation methods within Ecological Economics.

Abstract:

Valuation of ecosystem services is promoted as a new approach to improve biodiversity and ecosystem protection (TEEB, 2010) and an array of methods and decision-aid tools are available in the literature. Their potentials and limits are widely discussed within the field of Ecological Economics (de Groot et al., 2002; Spash, 2007, 2008; Spangerber and Settele, 2010), but discussions does not allays confront the theoretical and methodological aspects identified with case studies available. Therefore, this paper aims to contribute to the complex and deep debate related to ecosystems services valuation, by discussing different approaches of valuation (and integration of ecosystem services values into decision making processes), through the comparison of four types of methods and decision-aid tools: contingent valuation, deliberative monetary valuation, multicriteria analysis and a participatory method; both from a theoretical and empirical point of view.

Furthermore, this paper aims to contribute to the debate over the place of institutional dynamics within the field of Ecological Economics, by analyzing valuation methods as value articulating institutions (Jacobs, 1997; Gatzweiler, 2003; Vatn, 2009; Gasparatos, 2010). This perspective emphasize that, as institutional structures, valuation methods play a key role in the definition of what isvalue(i.e. which dimensions ought to be taken into account), but also frame how their object is understood (i.e. which components of ecosystem services and/or biodiversity) and therefore reflect a specific ontological perspective or worldview (Gasparatos, 2010). On this basis, this paper seeks to understand how the process - i.e. the use of a specific tool - frames the outcome - i.e. the results, its characteristics and influences on the final decision, by comparing four types of methods often opposed.

Before entering in the comparison of case studies (which developed a specific use of specific methods), we review the main theoretical underpinnings of each method, emphasizing differences between reductionist tools (i.e. monetary in our case) and non-reductionist tools (Gasparatos, 2010) and present their main methodological differences (e.g. whether the valuation step is clearly discernible from the overall decision-making process, or instead if the approach allows leading both steps simultaneously). From this review we draw the hypothesis that a) the level (or type) of participation and b) the capacity of methods to address conflicting values or interests, are two important lines of differences and therefore should have a considerable influence on their results. The core of the analysis is then a comparison of four different case studies, each of them being based on one type of method, applied during the implementation of an ecological restoration project. General elements concerning the case studies are presented, along with a discussion around their comparability. Indeed, the effect of choosing a specific method or tool could only be discernible if different methods would be applied to solve the exact same issue, which is a

difficult criterion to fulfill. Therefore, our analysis is based on carefully chosen cases, presenting a set of similar characteristics that we highlight and our results are then discussed regarding to this issue.

In order to facilitate the comparison process, we firstly implemented a pair-wise comparison between monetary methods in the one hand and non-reductionist tools in the other, before gathering the analysis. This first step allowed us to clarify the typology of comparison criteria we present. Indeed, we analyze differences between methods regarding: the information given to participants (form of expressed values, occurrence of a process of value construction and overall quality and direction of information), which allow to conclude about the level of participation (e.g. information, consultation, engagement, empowerment) - as an end in itself - but also as a mean to improve the information quality. We also analyze how issues related with sample size, representativeness and stakeholder participation are framed; how preferences or value inputs are aggregated; and what are the costs of the several valuation processes.

In the other hand, we draw several comparison criteria that aim to highlight a) different views on what is the problem at hand, looking at how the analysts describe the goals of the methods (e.g. justifying public spending or addressing a management issue) but also which limits and advantages they identify b) different views on which dimensions of values are considered (e.g. WTP and their interpretation, or political and social arguments) and c) different views on the objects under valuation (which ecosystem services are considered and what is the vocabulary and definitions provided).

From this analysis, valuation methods and decision-aid tools seem to have considerable differences, but also present some similarities. More specifically, considering the participation level and the quality of information given to participants, as well as regarding which dimension of value are considered important, contingent valuation appears very different from all other methods. However, the characterization of the problem seems more similar in contingent valuation and deliberative monetary valuation, but different from multicriteria analysis and the participatory method considered. Definitions and characterizations of ecosystem services appear very different from one method to another.

This paper presents several important differences between monetary valuation and non-reductionists tools, as a way to emphasize how does the framing of the process influences the outcome. It also indicates differences of vocabulary between types of methods (e.g. references to «stakeholders» or, «jurors» and «respondents»), which calls for a real integration of different fields of knowledge when drawing such valuation processes.

We conclude that the ontological underpinnings of valuation methods have very real implications and our analysis shows that valuation methods, as any measurement tools, are not neutral but refer to specific political uses and conceptions. Given those differences of status and objectives, we aim to introduce first elements of discussion and debates around difficulties that may emerge from a pluralistic acceptance stating complementarities between methods.

Valuation of Ecosystem Services - An ex-post analysis of Marine Spatial Planning Processes in Europe

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Summary:
The emerging initiatives being developed on marine ecosystems are intensifying the pressures on these systems. This growing interest on marine environments call for new methodologies capable of integrating the value of services provided by these ecosystems into decision-making processes. This paper presents an ex-post analysis on Marine Spatial Planning initiatives in Europe aiming to analyse how these processes have integrated ecosystems services values, whether they are framing the process according to an ecosystem services approach and how participation has being used to improve the process and the outcome. The results will feed the integrated participatory framework developed within the scope of this research.

Abstract:

Marine and coastal ecosystems are extremely exposed to anthropogenic pressures arising from different decisions with impacts on the function and provision of services (MEA, 2005). The complexity of maritime problems and the inaccessibility of the majority of goods and services provided by marine and coastal ecosystems call for new methodologies capable to support decision-makers.

It is uncertain whether recent policy initiatives (e.g.blue growth) are likely to add pressures on marine and coastal ecosystems. Some authors have been pointing out the importance of having a deeper understanding of marine decision-making frameworks (Syme et al., 2012) in order to address these threats.

Valuation of ecosystem services emerged as an option within this debate. Different methods for valuing ecosystem services have been developed, each with several associated problems (Martinez-Alier et al., 1998; de Groot et al., 2002; Spangerberg and Settele, 2010). The limitations of these approaches have given room for the expansion of alternative forms of valuation, with deliberative methods gaining importance in this area (Curtis, 2004; Kenter, 2011).

An integrated participatory framework was developed (Lopes and Videira, 2012) setting out as its main aim the valuation of marine ecosystem services through the articulation of different values (social, ecological, economical) with active involvement of stakeholder groups aiming to support decision-making processes. The framework comprehends three major phases: 1)Setting the Scene, where institutional analysis and stakeholder involvement is fostered; 2)Deepen Understanding, where the impacts of project proposals are identified, as well as, the ecosystem services affected, the variations on flows of services and the associated social, ecological and economical values; 3)Values Articulation, where the integration of knowledge is fostered to support and inform a given decision.

It is possible to identify an extensive portfolio of decision-making processes at different governance levels (e.g. policies, plans, programs and projects). Different decisions are associated with different instruments, ranging from sectorial to crosscutting level in terms of applicability subject and from local to international scale. These two axes of action are crucial when deciding who needs to be involved and which initiatives are interdependent. From these several decision-making processes, occurring at different governance levels, we have chosen in this paper to focus on Marine Spatial Planning (MSP) due to its recent and growing importance in Europe.

Blue Growth, a long-term strategy to support growth in maritime sector (CEC, 2012) fosters traditional maritime activities (e.g. fisheries; shipping) and the development of emerging activities (e.g. offshore wind; blue biotechnology). Growing human pressures potentiate the existence of conflicts. The European Integrated Maritime Policy (CEC, 2007) calls for the integration of ecosystem services in decisions, the need of having participatory approaches and the incorporation of ecosystem services valuation. On the other hand, good practices on MSP support ecosystem-based management (IOC, 2009; CEC, 2010), which truly advocates participation and deployment of an ecosystem services approach. These broad policy guidelines underscore the relevance of the proposed research approach.

This paper presents a comparative analysis of MSP processes in Europe (e.g. Norwegian Sea & North Sea; the Netherlands; Germany Baltic Sea & North Sea). All plans are available at the

UNESCO platform - Marine Spatial Planning Initiative from the Intergovernmental Oceanographic Commission. This study has three main objectives: 1) understand how ecosystem services have been framing the planning processes; 2) determine whether and how valuation of ecosystem services has been integrated and if economic, ecological and social values have been included; 3) assess if participation has been promoted in the different phases of the planning and assessment processes.

This ex-post analysis was framed by the aforementioned integrated participatory framework (Lopes and Videira, 2012). The cases presented and evaluated in this were selected to identify trends and to draw lessons from the already developed and ongoing MSP processes in Europe.

We developed a set of criteria to answer different sets of research questions. Hence, for theSetting the Scenesome ofthe questions incluided were: How was the institutional context analyzed? Were the procedures compatible with existing legislation? Was the social network explored?; forDeepen Understandingthe goal was to answer questions like: were the impacts of the decision identified? Were social values mentioned? Were economic values estimated? Were ecological values considered? Which methods were used to conceptualize the problem?; Finally, with respect toValues Articulationwe answered the following questions: were participatory approaches integrated? Was the plurality of values considered? How did the decision affect the relationship between actors?.

The ex-post analysis shows that MSP processes are still lagging best practice covering recognition of ecosystem services, value articulation and participation. For example, regarding the institutional context the observed trends showed a high focus on space conflicts between different economic activities, as well as economic value creation as the main driving forces for developing such plans. External drivers like climate change were less important.

Different criteria on participation (e.g. stakeholder analysis, level of participation, length) indicated that incorporation of participation in these decision-making processes has occurred. Notwithstanding there is room for improvement, namely in what concerns the promotion of inclusive participatory methods to map ecosystem services values. Although ecosystem services were mentioned on the majority of the studies they do not frame the process. A few cases integrated ecologic indicators for biodiversity and biological functions (e.g. vulnerable and endangered species, pollutants, spatial distribution of seabirds) and economic value derived mainly from direct use values.

The results supported our assumption that although ecosystem services valuation has been gaining importance, it is recommended to focus on how this information can actually support and influence decision-making processes in maritime areas to consider the plurality of values and the incommensurability of some ecosystem services. To overcome these barriers, we advance a set of recommendations for improving the elicitation and articulation of values in MSP, emphasizing the role of participatory methods that accommodate the plural perspectives of users and other stakeholder groups.

Talking money. How economic valuation can undermine the support for environmental protection

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Summary
In economic valuation (EV) a hypothetical price is put on environmental, non-market goods in order to evaluate the relative importance of these goods. In this paper, we examine a possible side-effect of EV, namely ?commodification in discourse'. We want to clarify both the meaning of this phenomenon and its possible normative problems. Its meaning will be clarified by connecting it to Sandel's notion of corruption and to the notion of crowding out. The main potential problems with ?commodification in discourse' are, first, the potential disappearance of a particular type of valuation and, second, the potential decrease of intrinsic motivations. We want to analyze when and why both mechanisms lead to less willingness to protect the environmental goods in question.

Abstract
Economic solutions for environmental problems aim to create markets for environmental goods by putting a price on them. There are two variants of this idea. First, one can set up a real market by creating tradable property rights so that goods can be traded for money (e.g. emission trading). Second, one can set up a hypothetical market by having people valuing non-market goods as if they were market goods. In evaluative procedures like cost-benefit analysis (CBA), one measures people's valuation (e.g. of a specific piece of nature) in terms of their willingness-to-pay. This is called economic valuation. In this paper, we seek to provide a conceptual analysis of one specific problem with such economic valuation, namely the side-effect that Arrow (1997: 761-762) labels ?commodification in discourse' (which contrasts with real commodification that can result from the introduction of real (not hypothetical) markets).

Putting methodological problems aside, there are two types of normative problems with economic valuation. First, there is the standard criticism that a monetary value simply cannot express the total spectrum of valuation (Anderson 1993). How to express my attachment to a specific species in terms of willingness-to-pay? This criticism, however, evokes a pragmatic defence from the proponents of economic valuation who argue that there are little or no real alternative decision-procedures to CBA and that economic arguments are among the most powerful in the political sphere (?if you want influence, talk money'). However, the second normative criticism reacts against this pragmatic defence. One can argue that the use of economic valuation contributes to the spread of markets norms and that this is problematic because this determines how we perceive things (?if you talk money, money is the only thing you can think of') (O'Neill 2001). This second criticism does not so much address an intrinsic problem of economic valuation but stresses its undesirable side-effects. While this criticism sounds appealing, its exact meaning and force are less evident than appears at first glance. This paper seeks, first, to clarify this idea of ?commodification in discourse' and, second, to examine why it may be normatively problematic.

In this paper, we focus on two aspects to understand economisation. First, we examine Michael Sandel's so-called ?corruption' argument against market expansion (e.g. prostitution, selling organs, admittance at university) (Sandel 1998). Sandel states that economic instruments (the possibility of buying and selling some good) can undermine our initial valuation (of these goods). Second, we look at the empirical notion of ?crowding out', namely the phenomenon that external rewards can drive out intrinsic motivations (Frey 2001, 2012). This allows us to distinguish between three types of corruption: (i) pure corruption (e.g. friendship, selling pets for experiments), (ii) motivational corruption, and (iii) motivational spill-overs.

The basic idea of crowding out is that a particular kind of attitude or mode of valuing is replaced

and thus disappears. From a normative point of view, this can be problematic because of different reasons. First and foremost, there is a risk that particular goods will be valued less or will even be no longer valued at all. Consider, for instance, the argument that defends biodiversity by referring to the ecosystem services it provides. If one only defends wildlife that has clear ecosystem services, some species might no longer be in need for protection ? a reasoning used, for instance, by Bas Haring (2011).

Several counterarguments can be raised, however. First, crowding out does not always occur. It is an empirical phenomenon that depends on particular conditions. Second, replacing one attitude with another does not necessarily need to have a behavioural effect. This requires examination of the strength of two types of motivations:instrumentalmotivation (?I act environmentally-friendly because its benefits society') versusintrinsicmotivation (?I act environmentally-friendly because I believe nature is valuable as such'). We examine two arguments why motivations based on intrinsic valuations have greater force. First, an intrinsic motivation is said to be a more fundamental element in the process of preference formation. If we are making choices, we are confronted with different reasons. We balance these reasons and form an overall preference ranking, which determines our choices. An instrumental valuation can disappear at the level of the reasons as soon as there is something else that is a better instrument to realise a particular goal. The good valued instrumentally derives its value from a specific characteristic that another good may possess to a greater extent. By contrast, an intrinsic valuation provides a kind ofprima faciereason. We know that this is something we want as such (even though it needs to be balanced because of scarce resources). Another reason why intrinsic motivations might be stronger than instrumental ones relates to free-riding. An instrumental motivation might be more susceptible to free-riding. In the case of public policy, what is valued is a collective good, which typically evokes free-riding behaviour. By contrast, intrinsic motivations seem stronger. While an intrinsic motivation is also vulnerable for free-riding (?why should I help save an intrinsically valuable nature reserve if others can do it as well?'), it nonetheless allows for expressive actions, namely actions which express what I think is important, even if the goal would not be realised. This expressive aspect seems to be excluded in the case of instrumental motivations (Hargreaves Heap 1989: 148-52).

Three major remarks should be added to this story. First, an important distinction should be made between the use of economic instruments and a discourse of economic valuation. Installing a real market mechanism (e.g. cap-and-trade) or using real economic incentives (e.g. taxes) is different from the hypothetical market mechanism of economic valuation. Most of the arguments above are primarily focused on the use of real market mechanisms. We need to examine to what extent this distinction is important here. On the one hand, not all discourse necessarily leads to changes in valuations. On the other hand, philosophers argue that there is a vague line between speech and conduct and that both often have the same effect (Anderson 1993; Radin 1996). Second, while our aim is mainly to provide a conceptual analysis of corruption and economisation, it should be reminded that crowding out is an empirical phenomenon (Arrow 1997). We thus need to examine whether our analysis is compatible with the main results of empirical research on crowding out. Third, economic valuation might in some cases have a positive effect on our overall valuation of environmental goods, namely if we were unconscious of their use. A crucial question is under which condition this positive effect occurs (and does not outweigh possible negative effects).

The main purpose of this paper is to provide a conceptual analysis of commodification in discourse as a side-effect of economic valuation, and to indicate which normative problems this can entail. The relevance should be clear. The goal of economic valuation of environmental goods is to reflect the existing valuations of these goods in order to realise the ?preferred' level of protecting them. However, the idea of commodification in discourse states that the side-effect of economic valuation is that the initial valuation changes and, moreover, that this new valuation affects other goods. If so, the proper goal of economic valuation will be undermined by its implementation.

References

Anderson, Elizabeth (1993),Value in Ethics and Economics(Cambridge, MA: Harvard University Press).
Arrow, Kenneth J. (1997), 'Invaluable Goods',Journal of Economic Literature,35 (2), 757-65.
Frey, Bruno S. (2001),Inspiring Economics. Human Motivation in Political Economy (Cheltenham: Edward Elgar).
Frey, Bruno S. (2012), 'Crowding out and crowding in of intrinsic preferences', in Eric Brousseau,

Tom Dedeurwaerdere, and Bernd Siebenhüner (eds.),Reflexive Governance for Global Public Goods(Cambridge, MA: MIT Press), 75-83.
Hargreaves Heap, Shaun (1989),Rationality in Economics(Oxford: Blackwell).
Haring, Bas (2011),Plastic Panda's. Over het Opheffen van Natuur(Amsterdam: Nijgh & Van Ditmar).
O'Neill, John (2001), 'Markets and the Environment: The Solution Is the Problem',Economic and Political Weekly,36 (21), 1865-73.
Radin, Margaret Jane (1996),Contested Commodities. The Trouble with Trade in Sex, Children, Body Parts, and Other Things.(Cambridge, MA: Harvard University Press).
Sandel, Michael J. (1998), 'What Money Can't Buy: The Moral Limits of Markets', in Grethe B. Peterson (ed.),The Tanner Lectures on Human Values: vol. 21(Chicago: University of Utah Press), 87-122.

The Deliberative Monetary Valuation (DMV) a powerful tool for arbitrated between two inter-related ecosystem services with negative jointure.

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The Deliberative Monetary Valuation (DMV) a powerful tool for arbitrated between two inter-related ecosystem services with negative jointure.

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Summary (800 characters)
Management of ecosystem services aims to maintain or protect the service from natural origin. In general, the politico-economic process that leads to ecosystem service's management is the result of a process that has been defined by the Millennium Ecosystem Assessment and improved by the DPSIR approach. Such a process, based on cost-benefit analysis, seems appropriate when one considers that public policy choices in favor of maintaining an economic service does not generate negative consequences on the preservation or protection of other ecosystem service. We demonstrate within this workingpaper that the solution of such a problem can be bring by the Deliberative Monetary Valuation (DMV). In other to illustrate our theory we used the concrete case of Banuyls vineyard region (French Pyrenees Orientales).

Abstract (1200 words)
Management of ecosystem services aims to maintain or protect the service from natural origin. In general, the politico-economic process that leads to ecosystem service's management is the result of a process that has been defined by the Millennium Ecosystem Assessment (MEA, 2005) and improved by the DPSIR approach (Spangenberg et al. 2009). Such a process, based on cost-benefit analysis, seems appropriate when one considers that public policy choices in favor of maintaining an economic service does not generate negative consequences on the preservation or protection of other ecosystem service. For example, the European community has recently adopted a series of measures to encourage farmers to reduce the amount of pesticides. This type of measure is intended to improve the quality of water resources without degrading the quality of other environmental resource.
In this paper, we intend to take into account, in the process of nature's conservation, the possible existence of negative joints between ecosystem services. Thus, we assume that two ecosystem services, A and B (eg, water quality and landscape amenities) related to human activities and both contributing to social welfare can compete. In other words, the activities that promote the maintenance of A deteriorate B and vice versa. In this situation, the arbitration policy choices becomes more complex: Should one make a choice between A and B? If yes, what ecosystem services do we decide to protect in priority? What criteria (financial, social, ecological, economical ...) is it appropriate to adopt in making the choice? What policy instruments should one promote? etc..
The complexity of the answers and the moral dimension of the choices to be made seem to justify the use of the DMV methods (Deliberative Monetary Valuation) as suggest today a number of ecological economics authors (Gregory and Wellman 2001, Niemeyer and Spash 2001, Spash 2001, Macmillan et al., 2002, 2006, Wilson and Howarth 2002, Aldred 2005, James and Blamey 2005, Howarth and Wilson 2006, Lienhoop and Macmillan 2007). The interest of the DMV is

to combine traditional methods of economic evaluation and participatory methods (Spash 2007).
Concrete case: the wine-growing area of "Banyuls" in the French Pyrenees Orientales.
In the territory of Banyuls, the vine is cultivated since antiquity on steep slopes. This culture has been developed thanks to the establishment of terraces which rise from sea level to about 500 m altitude. Formed of narrow strips of land supported by dry stone walls, the terraces comprise a remarkable landscape. This has greatly contributed to the reputation of Banyuls.
The vineyard's terraces of Banyuls are now maintained by small farmers, often pluriactives or retirees. These farmers rely heavily on chemical herbicides in order to fight against the invasion of weeds in vineyards. The reason is that the narrow terraces do not allow them to use means of mechanical weeding.
The use of chemical herbicides starts to be questioned because of its negative impact on the quality of drinking water. Furthermore, the use of less polluting new practices is increasingly advocated by the government. The development of organic viticulture which we are witnessing in the territory of Banyuls can be considered from this point of view as a positive development. However, this is less obvious if one takes the point of view of landscape conservation. Indeed, mechanical weeding with animal traction or expansion involves enlarged plots, and thus the removal of walls and terraces.
Therefore, in this territory, people are confronted with a social and moral dilemma: Should they focus on safeguarding the landscape heritage to the detriment of the quality of the water or should they be willing to sacrifice a part of this remarkable landscape in order to improve water quality?
Current approaches and problems of negatively jointed environmental services
The economic valuation of the environment
Economic valuation of ecosystem services such as the water quality and the landscape amenities could be done using the stated preference approaches. The method caracterizating this approach estimate an economic value through a hypothetical market.
The resulting environmental monetary valuation can be used to help public decision. Indeed, helping to make visible environmental problems, monetary valuation appears to be an essential step towards making political stakeholders aware of their responsibility (Wilson, 2002).
Nevertheless, the methods show some difficulty in taking into account the diversity of ecosystem services and the complexity of the relationships between these services and human activity, especially when they are antagonist in the above way.. Indeed, the monetary valuation results from an aggregation of individual willingnesses to pay. Nevertheless, this aggregation does not always reflect faithfully the preferences of the related social group. In addition, the presence of more or less commensurate values at stake tend to complicate the tradeoffs between ecosystem services in competition. For example here: What value should one assign to the amenity provided by the Banyuls' landscape (willingness to pay to preserve this landscape, revealed preference method, etc..)? What is the value attributed to the quality of water (health costs ...)? Is this type of monetary and individual evaluation satisfactory?
Deliberative orparticipatoryapproaches
Heavily influenced by the theory of participatory democracy (Dryzek, 1990), deliberative approaches are considered as a possible answer to the problem of values'conflict between actors. The approach is caracterized by the use of a democratic debate between participants that aims to promote collective reasoning and reaching agreement about collective choices. Indeed, the decision is deemed to establish a framework conducive to mutual understanding and seeking justifiable compomises from a non-individual perspective. Thus, during the deliberative process each participant is supposed to review the merits of what is reasonable in relation to the concerns of others. Motivated by the desire to achieve impartial solutions, participants favor the demonstration rather than the justification (Lo and Spash, 2011).
Therefore, the deliberative methods have two interests. On the one hand, their use should facilitate the search for an agreement on moral principles having universal value (Vatn 2005, 2009; Vatn and Soma, 2010). On the other hand, these methods allow to take into account a plurality of values, some of which may be difficult to quantify and not substitutable (ie incommensurability). This opening to multiple values, made possible by deliberative methods, is often considered as an advantage as far as it enlarges the spectum of the decision process. However, this advantage has to be counterbalanced by a certain closure necessary for the effectiveness of a pragmatic public policy (Spash 2007).
The Deliberative Monetary Valuation (DMV)
Why is it a solution for the Banuyls case?
The DMV combine stated preference methods and deliberative methods. It has the advantage of integrating the strengths of both methods while eliminating some of their weaknesses.
We consider here a conception of DMV conform to the ethical model of Habermas conception (1986). Thus, we do not grasp it as a simple method that aims to complement information of

individuals with limited rationality. Rather, we will consider it as a social process based on free and open communication between individuals. Therefore, it will place the mutual understanding and cooperation in the heart of the assessment process. While maintaining their own convictions, each of the actors involved will be driven by the desire to respect the values of others. Thus actors would seek to achieve a legitimate monetary valuation from their point of view and from that of others. In other words, the DMV will be seen as an evaluation method based on the implementation of a fair selection process (Wilson, 2002).

Methodological details

DMV is used to assess the monetary value that a social group attributes to the ecosystem services considered here, namely water quality and landscape amenities. Using the Gregory and Wellman (2001) method, we prefer, therefore, the search for a social willingness to pay (SWTP) or a social willingness to accept (SWTA) rather than the individual ones. Thus, the SWTP or SWTA is the result of deliberations conducted through social interactions. We see three benefits of doing it in this way:

1) Assign a non-use value to ecosystem services in question, and thus better integrate the interests of future generations in monetary valuation.

2) Promote, through interaction with others, the adoption by the participants of non-individualistic economic behaviors such as altruism and donation. This is important given the public nature of the ecosystem services evaluated.

3) Consider the opportunity costs,i.e.compromise between economic and non-economic gains and losses of both ecosystem services, water quality and landscape amenity, here in competition.

The deliberation step is caracterized by a representative group of social actors involved in the conflict between the improving water quality stake and the preservation of landscape amenities one: Landscape protection associations, local authorities, farmers, fishermen, consumers (permanent and seasonal). The purpose of the deliberative process is to reach a monetary agreement (not free of disagreement) on the optimal combination between the social value of WTP the water quality and social WTA the degradation of the landscape (combination 1). The result is compared to results from the reverse combination (combination 2). On the organizational point of view, the participants are divided into two workshops. Each workshop examines a possible combination (1 or 2). After the workshops, the results of combinations 1 and 2 are presented first by a leader elected by each of the two groups, and then compared. This comparison is then used to establish a vote on the best combination of WTA and WTP. To strengthen the reliability of the results, we reproduce once the process.

References

Aldred, J., 2005. Consumer valuation and citizen deliberation: towards a comparison. In: Getzner, M., Spash, L., Stagl, S. (Eds.), Alternatives for Environmental Valuation. Routledge, London, pp. 187?208.

Dryzek, J.S. (1990). Discursive Democracy. Cambridge, Cambridge University Press.

Gregory, R., Wellman, K., 2001. Bringing stakeholder values into environmental policy choices: a community-based estuary case study. Ecological Economics 39 (1), 37?52.

Habermas, J. (1986). Morale et communication (C. Bouchindhomme, trad.) Paris, France : Champs Flammarion. (Ouvrage original publié en 1983 sous le titre Moralbewusstsein und Kommunikatives Handeln Frankfurt am Main : Suhrkamp)

Howarth, R.B., Wilson, M.A., 2006. A theoretical approach to deliberative valuation: aggregation by mutual consent. Land Economics 82 (1), 1?16.

James, R.F., Blamey, R.K., 2005. Deliberation and economic valuation: National Park Management. In: Getzner, M., Stagl, S., Spash, C. (Eds.), Alternatives for Environmental Valuation. Routledge, London, pp. 225?243.

Lienhoop, N., MacMillan, D.C., 2007. Valuing a complex environmental change: assessing participant performance in deliberative group-based approaches and in-person interviews for contingent valuation. Environmental Values 16 (2) (May).

Lo A, Spash CL, 2011. Articulation of plural values in deliberative monetary valuation: beyond preference economisation and moralisation, Munich Personal RePEc Archive paper, 30002, Online at http://mpra.ub.uni-muenchen.de/30002/

Macmillan, D.C., Hanley, N., Lienhoop, N., 2006. Contingent valuation: environmental polling or preference engine? Ecological Economics 60 (1), 299?307.

Macmillan, D.C., Philip, L., Hanley, N., Alvarez-Farizo, B., 2002. Valuing the non-market benefits of wild goose conservation: a comparison of interview and group-based approaches. Ecological Economics 43 (1), 49?59.

Millenium Ecosystem Assessment, 2005. Ecosystems and human well being: a framework for assessment. Report of the conceptuel framework working group of the Millenium Ecosystem

Assessment. Washington, DC.
Niemeyer, S., Spash, C.L., 2001. Environmental valuation analysis, public deliberation and their pragmatic syntheses: a critical appraisal. Environment and Planning. C, Government & Policy 19 (4), 567?586.
Soma, K., and Vatn, A., 2010. «Is There Anything Like a Citizen? A Descriptive Analysis of Instituting a Citizen's Role to Represent Social Values at the Municipal Level». Environmental Policy and Governance, 20, 30-43.
Spangenberg J, Martinez-Allier J, Omann I, Monterroso I, Binimelis R, 2009. The DPSIR framework for Biodiversity Assessment, Ecological Economics, vol69 Issue1, pp9-11.
Spash, C.L., 2001. Deliberative monetary valuation. 5th Nordic Environmental Research Conference. Denmark, University of Aarhus.
Spash CL, 2007. Deliberative monetary valuation (DMV): issues in combining economic and political processes to value environmental change, Ecological Economics, vol63, pp690-699.
Vatn, A. (2005). Institutions and the Environment. Cheltenham, Edward Elgar.
Vatn A., 2009. «An institutional analysis of methods for environmental appraisal». Ecological Economics, 68, 2207?2215.
Wilson, M.A., Howarth, R.B., 2002. Discourse-based valuation of ecosystem services: establishing fair outcomes through group deliberation. Ecological Economics 41 (3), 431?443.

Governance system of fisheries quota management: a bio-economic approach in the case of the sole fishery in the bay of Biscay

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Summary
The paper describes the French governance system for fisheries quota management in the case of the sole fishery in the bay of Biscay. In France, management of quotas is conducted by the administration and mainly by the POs within a hybrid system. Following increasing constraints on the sole quota, POs have developed various management systems that rely on a quota pooling system and a global redistribution by fleet or an individual redistribution according to either historical allocation keys or ad hoc keys. Roles of the Producers Organizations and of the administration in the management of sole quotas are detailed in the paper and a formalization of the system is proposed. Bio-economic impacts of various governance systems are then tested.
Abstract
Management of fisheries mainly relies on quota management in western European countries. TAC (Total Allowable Catches) by stock are decided at the European level and then split into national quotas according to historical allocation keys. Management of quotas in France is then operated by the Administration and the Producer's Organizations (PO) with an increasing role of the POs for several years. The governance systems developed for quota management is however very poorly or not at all documented.
The Bay of Biscay sole fishery offers a good example to illustrate existing governance mechanisms for quota management and consequences of possible alternatives in a context of a management plan. The Bay of Biscay sole fishery is one of the most important fishery in France. It represented, in 2008, more than 400 vessels and generated a total gross revenue of 168 million euros. The fishery is exploited by French trawlers and gillnetters and by Belgium trawlers. Since 2002, the sole in the bay of Biscay is under a management plan defined at the European level. First step of the plan was to recover the stock, second step is to define management objectives based on the Johannesburg international objective of achieving Maximum Sustainable Yield (MSY) by 2015. This plan is to be defined within a multispecies context in the following years. It requires however a good representation of the fishery dynamics and governance in order to assess the different management options and their consequences.
The paper first describes and formalizes the governance system of quota management in the case of the Bay of Biscay sole fishery. Exhaustive semi-directive face to face interviews have been conducted in 2012 with the nine Producers Organization of the bay of Biscay concerned with the stock of sole in the bay of Biscay with this objective. Following increasing constraints on the sole quota compared to resource availability, POs have developed various management systems that rely on a quota pooling systems with either quotas by fleet or individual redistribution according to historical allocation keys or ad hoc keys.
Impact assessments based on traditional bio-economic modeling tools include for several years Management Strategy Evaluation : uncertainty associated with the observation and decision making of TAC is traditionally well represented in these approaches. However, governance systems of TACs and quotas management are not explicitly taken into account in this kind of models.
The paper analyzes and compares the bio-economic impacts of different governance mechanisms for the management of fishing quotas in the case of the sole fishery in the Bay of Biscay. The bio-economic model IAM (Impact Assessment Model for fisheries management) is used to perform simulations. The model classically represents the biological dynamics of stocks and the fleets dynamics and simulates the impacts of various management measures on the stock productivity and as a consequence on the fleet's profitability. A model of governance is coupled with the bio-economic model to test several governance options.
Three options for governance are tested:
- A quota pooling management system with redistribution of individual quotas based on appropriate keys by Producer Organisation. This option corresponds to the status quo

- A management of quotas based on the strict initial right allocation decided on the 2001-2003 basis
- A market of individual transferable quotas.

The impacts of the three options in a context of management plan towards the MSY are analyzed in terms of biological and socio-economic viability.

Factors influencing adaptability of fish Producers Organizations: lessons from Portugal

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To ensure the best market conditions for their fish, vessel owners are incentivized to create fish producers organizations (POs), with the obvious advantages for fishers. However, the management of the fish POs is not an easy task. To respond to pressures in fishery systems, i.e. overfishing, market, a regulation, fish POs need to continuously change their production and marketing activities and adjust organizational structure while securing livelihoods in the long term. This paper explores what (factors) influence this adaptability in organizations. To achieve this, we apply an analytical framework for studying organizational adaptability to a multi-case study of twelve continental Portuguese fish POs. POs leaders, fishers-POs members (some with double-membership experience) and other key persons were interviewed over 3 years, many of them several times, to comprehend the Portuguese fish POs realities and explore the relative weight of the factors contained in the framework and the relations between them. Results revealed six critical factors able to nurture adaptive capacity of the fish POs: homogeneous membership, exclusive set of rules, land-based facilities, strong leadership, altered communication pattern amongst PO members within the same PO and a crisis as an opportunity for change. Framework application also helped to identify POs structural problems as well as decisive contextual (ecologies, market and culture) differences among Portuguese fish POs. This may partly explain why many of them failed in improving marketing of their member production and why their role in resource management is limited. Hence, we conclude that by boosting its adaptive capacity fish POs could embrace broader resource management objectives and become more important for adaptive co-management of fisheries.

LOCAL KNOWLEDGE OF POND FISH-FARMING ECOSYSTEM SERVICES: IMPLICATIONS OF FISHFARMERS' PERCEPTIONS FOR MANAGEMENT IN THREE CONTEXTS (FRANCE, BRAZIL AND INDONESIA)

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This article addresses ecosystem service perceptions in the case of pond fish-farming systems in Brazil, Indonesia and France. The Millennium Ecosystem Assessment (MEA, 2005) vision suggests a more integrated reflection on environmental policies with greater adaptability to local knowledge and the development of social learning processes, which tend to promote more sustainable changes in behaviors and practices than do sanctions. These latter generate diversion strategies whereas adaptability and social learning lead to appropriation.

ABSTRACT

Introduction:
This article addresses ecosystem service perceptions in the case of pond fish-farming systems in Brazil, Indonesia and France. The Millennium Ecosystem Assessment (MEA, 2005) proposes a structural change in the reference framework for environmental policies, stressing the importance of reconciling the natural environment and anthropic activities. This vision suggests a more integrated reflection on environmental policies with greater adaptability and the development of social learning processes, which tend to promote more sustainable changes in behaviors and practices than do sanctions. These latter generate diversion strategies whereas adaptability and social learning lead to appropriation. Such appropriation concerns two levels:
- Firstly, the appropriation of the ecosystem services by giving them value, not only use or exchange values but also intrinsic value,
- Secondly, the appropriation of ecosystem management rules.
Resource management is usually entrusted to market forces, but ecosystem services lack the characteristics necessary for efficient market allocation, as they are non-excludable, non-rival, and damaged by negative externalities (Silvano et al., 2005). This change of reference framework increases the importance of more cognitive aspects to adapt public policies and promotes social learning. We therefore studied these aspects through social representations. At the individual level, social representations determine the comprehension of behavioral development when facing regulatory measures to maintain ecosystems (Lewan and Söderqvist, 2002). At the collective level, they determine the support for, and confidence in, the institutional mechanisms for the implementation of such measures. In addition, perceptions capture the degree of knowledge that the actors have of ecosystem services. Local ecological knowledge is an important element in the design and structure of natural management strategies (Lewan and Söderqvist, 2002; Silvano et al., 2005). The main goal of our research is the identification of fishfarmers' social representations in order to identify their knowledge of their working environment and the extent to which their representations correspond to the main measures of ecosystem management. This study considers part of the identification phase of ecosystem services. We worked in three countries with similar production systems (ponds) but varying ecosystem and regulatory situations.
In the first part, we outline the studied cases. The second part presents the methodology we used to study social perceptions. In the third part, the results show that current measures are the key determinants of choices but that studying perceptions reveals their diversity in relation to other determinants. In the discussion we argue that local knowledge often provides guidelines and new information for ecosystem management and reciprocally strong regulatory measures influence perceptions. In fact, Silvano et al. (2005) argue that «a landowner with incomplete knowledge of the ecosystem services provided may therefore give them less weight than direct market

benefits». This observation argues for the involvement of farmers in the development of ecosystem management schemes. This involvement has to extend to a more general unit which is stakeholders (Gregory and Wellman, 2001).

Studied cases:
As part of a French research project (Piscenlit) funded by the National Research Agency, we identified ecosystem services provided by fish-farming ponds. The project seeks to identify ways to achieve ecological intensification (Griffon, 2010) in fish-farming ponds to produce ecosystem services as both a pillar to sustain production and a means to diversify production. We studied three sites in France, Brazil and Indonesia:
(1) Ancestral systems of extensive polyculture in France (Lorraine and Brenne) associated with recreational activities (angling, walking and nature observation). These are situated in specific wetland areas subject to conservation measures (Natura 2000 or Ramsar sites). The activities in these areas are heavily regulated by the European water directive.
(2) Recent multi-trophic systems based on recycling of effluents and utilization of byproducts with low nutritional valor in Brazil (Chapeco and Itajai). These activities are situated in areas with high topographical variations. These areas are heavily regulated by measures concerning Permanent Preservation Areas (Area de Preservacion Permanente) under the environmental Code. These measures seek to preserve the vegetation, the biodiversity and the functions of river banks.
(3) Recent systems of semi-extensive monoculture in Indonesia (Jambi area, Sumatra). These activities are situated in areas focusing on pineapple crops. These activities are heavily guided by the Minapolitan regulation which aims to increase production by 353% by 2015.

We used the four MEA categories (provisioning, regulating, cultural and supporting) to harmonize the information we collected.

Methods:
To assess local knowledge and ecosystem service perceptions we interviewed farmers using semi-structured questionnaires which were developed on a multidisciplinary basis. Open questions dealt with the perceptions of the region, of the roles of the pond and its contribution to the environmental, economic and social dimensions. Farmers were also asked to rank a list of ecosystem services that we had developed using our expertise and the literature. The questionnaires have a common core with some parts adapted to each country.

Results:
The results show that French farmers highly ranked supporting and regulating ecosystem services. In Brazil, service categories were uniformly ranked. In Indonesia, provisioning services associated with cultural and regulating aspects were highly ranked. These results show the importance of regulatory measures in social representations and the farmer's interest in broader aspects, looking at responses to the open questions. These aspects have to be integrated into ecosystem management measures to provide incentives to preserve ecosystems.

Discussions:
We provide support for the view that ecosystem management measures may be improved if they integrate locally based information provided by farmers using social representations with global and empirical perspectives provided by scientific data. Land degradation problems in tropical American countries are usually site-specific, and therefore are better addressed through local case studies that consider the farmer's point of view. Indeed involving farmers in land management decisions is crucial to the success of conservation programs (Silvano et al., 2005).

Reference

Gregory R., Wellman K. (2001) Bringing stakeholder values into environmental policy choices: a community ?based case study. Ecological Economics, 39: 37-52.
Griffon M. (2010) Pour des agricultures écologiquement intensives, éditions de l'Aube, La Tour d'Aigues, 144 p.
Lewan L., Söderqvist T. (2002) Knowledge and recognition of ecosystem services among the general public in a drainage basin in Scania, Southern Sweden. Ecological Economic, 42: 459-467.
Millennium Ecosystem Assessment (2005) Ecosystem and Human Well-being: A framework for Assessment, Island Press, Washington DC.

Quétier F., Rivoal F., Marty P., De Chazal J., Thuiler W., Lavorel S. (2009) Social representation of an alpine grassland landscape and socio-political discourses on rural development. Regional environment Change, 10/2: 119-130.
Silvano R. A.M., Udvardy S., Ceroni M., Farley J. (2005) An ecological integraity assessment of a Brazilian Atlantic Forest watershed based on surveys of stream health and local farmers' perceptions: implication for management, Ecological Economic, 53: 369-385.

Social learning among resource users: fish producers' organization experience

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An obvious example of resource users' self-organization, invented to deal with claimed individualistic type of fishers' behavior is fish producers organization (PO), which bring together fishermen or fish farmers on a voluntary basis with the aim of improving the marketing of their products. The adaptability of fish POs to apparent changes in the fishery system depends at least partly on behaviour and adaptability of their members. Conversely, a failure to understand how fishers perceive and make sense of their membership experience and what do they learn from it may undermine PO performance and prospective. This article contributes to understanding the potential and limitations of fish PO to foster social learning among its members. We explore these issues by in-depth analysis of one Portuguese fish PO and their members perceptions in relation to: membership incentives, satisfaction with the PO, PO influence on type and frequency of members communication and interactions and on generation of new knowledge (problems and opportunities). We further analyzed these perceptions by using the social learning model, built from the literature, which aims to understand what influence (attributes) social learning and what is meant to change when people learn together (outcomes). Results suggest that PO provides potentially good context for social learning, as it entails a number of process attributes that foster social learning such as economic and other incentives, experience based knowledge, extended engagement, change in resource management practices, informal type of interaction and a crucial figure of local leadership. Although these elements are necessary they are not sufficient. PO partially contributes to change in attitudes and behaviour and transformation of relationships within the PO and with other actors in the sector. More importantly, results show that PO members lack shared understanding of problems pertinent to their fishery. We conclude that social learning potential of the PO is inhibited by two distinct aspects, which might be relevant for other resource users groups: externally, historically good relationships with other actors that have embedded historical problems and might lead to institutional inertia and internally, members' rivalry, good for their activity and fish marketing, but bad for communication and needed reflection on concrete fishery experiences.

La responsabilité économique du consommateur, déterminants et conséquences sur le fameux «Acheter Français» !

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Depuis de nombreuses années, les recherches ou les enquêtes d'opinions ne cessent d'expliquer que le consommateur a de plus en plus conscience des conséquences de sa consommation sur son environnement physique et social. Cette « conscience » du consommateur intéresse les chercheurs en marketing depuis la fin des années soixante (Webster, 1975). Tout d'abord focalisées sur les préoccupations environnementales des individus, ces recherches ont ensuite intégré la dimension sociale avec Roberts (1995). Tout comme la Responsabilité Sociale des Entreprises (Capron, Quairel-Lanoizelée, 2007), la consommation responsable est un construit directement lié au concept de Développement Durable. On y traite, en effet, de préoccupations environnementales et sociales, ou encore du choix entre l'intérêt collectif et l'intérêt personnel. Néanmoins, ces mêmes articles et sondages (CREDOC, 2011) s'accordent à dire que même si le consommateur est prêt à payer plus cher pour un produit d'origine française, dans les faits son comportement réel est bien différent. La raison la plus souvent évoquée : la crise ! Les produits d'origine française sont jugés trop chers et peu compétitifs, pour d'autres c'est l'offre qui n'est pas adaptée ou trop étroite. Les excuses et justifications ne manquent pas. Comment peut-on expliquer cela ? Comment le consommateur perçoit il son rôle, sa responsabilité dans la santé économique de son pays ou de sa région ? Quels sont les éléments, les facteurs ou les traits de personnalité qui influencent cette responsabilité économique du consommateur ?

A partir d'une étude qualitative basée à la fois sur des entretiens, de la netnographie et sur l'analyse de plus de 400 articles de presse et d'enquêtes du CREDOC, cette communication a donc pour objectif de présenter la responsabilité économique du consommateur. Dans un soucis de clarification conceptuelle, nous définirons, dans une première partie, ce que nous entendons par « responsabilité », puis nous nous attacherons à faire le parallèle entre développement durable et consommation responsable pour enfin finir par proposer notre définition de la Consommation Economiquement Responsable (CER). Notre seconde partie, consacrée plus particulièrement à notre étude exploratoire, visera à établir les déterminants de cette responsabilité économique du consommateur. Les résultats et apports théoriques et managériaux seront discutés dans une dernière partie.

Responsabilité, Consommation responsable et développement durable

Lorsque l'on étudie l'étymologie et les définitions lexicales, la notion de responsabilité est souvent associée à une connotation négative. Nous cherchons toujours un bouc émissaire, une personne qui assumera les conséquences et les réparations des actes commis. C'est aussi souvent cette connotation que reprennent les disciplines de sciences humaines que ce soit en philosophie (Hegel, 1810), en droit, ou encore en sociologie (Fauconnet, 1928). Mais ces définitions ne correspondent pas vraiment à l'idée que l'on se fait de la responsabilité en sciences de gestion, et plus particulièrement en marketing. En effet, lorsque l'on parle de consommation socialement responsable, ce n'est pas le côté négatif ou punitif qui est mis en avant mais des choix et des comportements réfléchis dans le but d'agir de façon raisonnable et éthique... Contrairement aux autres disciplines, en marketing, la responsabilité est conceptualisée de manière proactive.

Comme nous l'expliquions en introduction, le parallèle entre le développement durable et la consommation responsable (CR) est aisé. Non seulement, de par l'intégration à ce concept de l'intérêt collectif et des préoccupations environnementales et sociales mais également par le souci de modifier les comportements de consommation dans une optique de durabilité. En effet, aujourd'hui la consommation n'est plus seulement utilitaire ou identitaire, elle est devenue symbolique. Réel moyen de pression ou vote du consommateur, les actes d'achats ne sont plus anodins. La responsabilité sociétale des entreprises est donc directement liée à ce pouvoir retrouvé de l'individu consommateur (Brown et Dacin, 1997 ; Mohr, Webb et Harris, 2001).

Néanmoins dans le contexte de crise que nous connaissons actuellement, la conception de la CR doit être revisitée. Les dimensions environnementales et sociales ne suffisent plus à la définir.

Les préoccupations économiques touchent, aujourd'hui, de plein fouet les français. Nous nous proposons donc, à partir de notre revue de la littérature et de l'étude exploratoire mise en place, d'adapter la définition de François-Lecompte et Valette-Florence (2006) et de définir la CER comme : L'achat de biens ou de services perçu par le consommateur comme le moyen d'exprimer ses valeurs, son attachement et sa loyauté envers son « territoire d'affiliation » en le soutenant économiquement à travers ses choix de consommation et/ou l'utilisation de son pouvoir d'achat.
Principaux Résultats : Antécédents de la responsabilité économique du consommateur.
Les croyances, les valeurs et les traits de personnalité de l'individu ont une influence directe sur son appréhension de la responsabilité en général et donc de la responsabilité économique en particulier. Deux variables ressortent de notre étude documentaire et de l'étude exploratoire : le locus de contrôle (Rotter, 1966) et l'efficacité personnelle perçue. L'identité sociale et plus précisément territoriale joue également un rôle : un consommateur en fonction de si il s'identifie comme un citoyen du monde, européen, français, catalan, ou marseillais n'aura pas la même perception de l'économie et des produits locaux. Nous étudions donc ici l'effet d'ethnocentrisme/ cosmopolitisme ainsi que le sentiment régional (Dion, Remy et Sitz, 2012)
Mais on ne peut pas aborder le patriotisme ou l'ethnocentrisme sans se préoccuper de l'effet d'origine du produit (Nebenzahl et Jaffe, 1996 ; Usunier, 2002). Bien que sujet d'actualité privilégié des médias et des politiques, la notion de « made in » reste floue pour les consommateurs. Perdus dans ce système de marché mondialisé ils ne savent plus vraiment ce qui est français ou pas. Une marque peut être d'origine française mais ses produits fabriqués à l'autre bout du monde et inversement. Le consommateur devient alors de plus en plus sceptique. Ce doute ayant pour conséquence directe la diminution du sentiment de responsabilité.
Cette responsabilité économique aura donc des conséquences directes sur des valeurs comme le patriotisme économique mais aura également un effet sur la décision d'acheter local. Plus le consommateur aura conscience de sa responsabilité vis-à-vis de l'économie de son pays, plus il aura tendance à acheter des produits d'origine domestique.
Discussion et conclusion
Cette communication a donc pour objectif de mettre en avant un pilier souvent occulté dans les recherches sur le développement durable : la dimension économique. La conception durable de l'économie d'une région du monde est pourtant essentielle au développement des deux autres piliers. Nous partageons la vision de Carroll (1979) où la responsabilité économique et la base de la « pyramide de la RSE » et la transposons au comportement du consommateur. L'intérêt managérial de ce type de recherche est d'identifier les facteurs pouvant influencer et susciter l'envie d'acheter des produits locaux ou domestiques. Touchant à l'identité, à la personnalité et à la culture de l'individu, cette recherche peut être transposée pour comparaison avec de nombreux pays ou régions du monde et offre donc de réelles perspectives et voies de recherche.
Références Bibliographiques
Brown et Dacin, (1997),The company and the product corporate associations and consumer product responses, Journal of Marketing, 61, 1, 68-84
Capron et Quairel-Lanoizelée,(2007),La responsabilité sociale d'entreprise, Paris, la Découverte
Carroll (1979),A Three-Dimensional Conceptual Model of Corporate Performance, The Academy of Management Review, 4, 4, 497-505
Dion, Remy et Sitz, (2012),Légitimité et authenticité des affiliations ethniques : le cas du régionalisme, Recherche et Applications en Marketing, 27, 1, 59-77
Fauconnet, (1928),La responsabilité. Étude de sociologie. Paris, Alcan, 1928
François-Lecompte et Valette-Florence , (2006) , Mieux connaitre le consommateur socialement responsable, Décisions Marketing, 41, 67-79
Hegel (1810),Propédeutique philosophique, Nüremberg.
Mohr, Webb et Harris, (2001),Do consumers expect companies to be socially responsible? The impact of corporate social responsibility on buying behavior, Journal of Consumers affairs, 35, 1, 45-72
Nebenzahl et Jaffe, (1996),Measuring the joint effect of brand and country image in consumer evaluation of global product, International Marketing review, 13, 4, 5-22
Roberts, (1995),Profiling levels of socially responsible consumer behavior: a cluster analytic approach and its implications for marketing,Journal of Marketing and Practice, 3, 4, 97-117
Rotter, (1966),Generalized expectancies for internal versus external control of reinforcement, Psychological Monographs, 80, 1, 1-28
Usunier, (2002),Le pays d'origine du bien influence-t-il encore les évaluations du consommateur ?, Revue Française de Marketing, 189/190, 49-65
Webster, (1975),Determining the characteristics of the socially conscious consumer, Journal of Consumer research, 2, 3, 188-197

La réalité sectorielle comme défi à la RSE pour les TPE

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La question de départ posée : xml:namespace prefix = o ns = "urn:schemas-microsoft-com:office: office" />
Cet article a pour objectif de montrer que de nombreux écueils interdisent de considérer la démarche de la RSE de façon systémique dans les TPE. L'absence de stratégie, le manque de temps (notion très présente dans la littérature) et le peu d'intérêt pour les parties prenantes voire la méconnaissance de celles-ci sont des freins, au-delà d'autres spécificités des PME-PMI (Marchesnay, 1997, Julien, 1997, Le Roy et Yami, 2007), limitant la portée de toute démarche RSE. Cependant l'entreprise, petite ou grande, réalise souvent sans le savoir, des actes correspondant à ce type de démarche car la RSE y est « moins formelle et plus intuitive » (Bazillier et Suarez, 2011, p. 4). Ainsi, l'objectif de cette recherche est d'étudier le rapport de la TPE avec la RSE. Nous tenterons de répondre à la question suivante : la démarche de RSE est-elle ou non adaptée à la réalité du fonctionnement d'une TPE du secteur viticole ?

La thèse défendue :
De nombreux travaux ont mis en évidence les spécificités des TPE par rapport aux grandes entreprises. Dans un contexte de responsabilités élargies, de performances globales, la RSE, présentée comme la traduction managériale du développement durable (Berger-Douce, 2009), demeure, pour ces TPE, un concept flou, ambigu, peu explicite. Cette complexité s'amplifie lorsque nous considérons la variable sectorielle, ici la production de vins. L'étude de cas abordée ici montre que la RSE dans les TPE reste informelle, intuitive, faite de bon sens. Ni passives, ni proactives, les TPE s'adaptent pas-à-pas aux normes et obligations légales sous pression des contraintes sectorielles. La réalité sectorielle hypothèque l'optimisation d'une performance environnementale. Pour ce qui est de la RSE, l'entreprise parle plus de bon sens que de processus formalisés.

Méthodologie
Nous choisissons la méthode de l'étude de cas. Dans le cadre de notre recherche ni l'expérimentation, ni l'approche historique ne peuvent être des méthodes robustes pour aborder notre question de recherche : la démarche de RSE est-elle ou non adaptée à la réalité du fonctionnement d'une TPE (en 2012) ? Des trois stratégies recommandées dans la littérature, nous nous focalisons sur la troisième, à savoir l'étude de cas (Yin, 1984). Il s'agit d'une observation dynamique interpellant le dirigeant sur ses pratiques en termes de RSE. L'analyse conduite à partir d'une seule entreprise et sur un secteur particulier (la production de vins) paraît la méthode la plus pertinente, à même de limiter les biais ou effets du "bruit de l'environnement" (Eisenhardt, 1989). Les chiffres communiqués dans cet article sont les données réelles de ces deux dernières années. Le nom de l'entreprise n'est pas communiqué pour respecter la confidentialité. Le prénom du dirigeant est un pseudonyme.
Les quatre responsabilités ont été abordées selon les quatre pôles du schéma proposé dans l'article. L'analyse des performances économiques découle des documents comptables des deux dernières années. Nous nous concentrons sur ces données de base et utilisons la technique descoringafin d'apprécier la vulnérabilité de cette performance. Au titre de la Performance sociétale nous avons administré un questionnaire[1] portant sur cinq grands thèmes (29 questions en tout avec une échelle de Likert à 5 échelons de "pas du tout d'accord" à "tout à fait d'accord" en passant par "neutre") : démarche sur le lieu de travail (4 questions), politiques sur l'environnement au cours des trois dernières années (7 questions), approches du marché (6 questions), politiques relatives à la "société" (5) et enfin les valeurs de l'entreprise (7 questions).
Bien que disposant du guide d'évaluation AFAQ 26000 et considérant la complexité des réponses en décalage avec la structure simple (taille) de l'entreprise, nous avons préféré cette posture, sans doute incomplète, mais qui aborde une majorité des sept questions centrales de la norme ISO 26000 (schéma proposé dans l'article).
Les entretiens (3) ont été semi-directifs, composés d'un mélange de directivité/formalisme

(questionnaire RSE notamment) et de souplesse afin de s'adapter aux propos du répondant et de recueillir le plus d'informations possible (Gavard-Perret et al, 2008, p. 97). La durée de ces entretiens fut de 1 h 15. Les verbatim seront restitués en italiques dans le texte.
Au titre de la performance environnementale et climatique (PEC) l'entreprise n'a pas réalisé de Bilan Carbone© ni ne connaît,a fortiori, son empreinte écologique[2].

Les éléments théoriques :
Nous nous appuierons d'une part sur la théorie des parties prenantes (TPP) et le concept de la responsabilité sociale et sociétale de l'entreprise (RSE) fortement décrit dans littérature (Capron et Quairel, 2006, Quairel et Auberger, 2006, Benseddik, 2006, Berger-Douce, 2008, Mercier, 2010). D'autre part, nous partirons des spécificités des PME, elles aussi largement abordées (Auberger et Quairel, 2004, Le Roy et Yami,, 2007, Berger-Douce, 2008, Bazillier et Suarez, 2011, Courrent, 2012), afin de relier les deux termes RSE et TPE (entreprises de moins de 20 salariés).

Les principaux résultats :
La TPE en question ne connaît pas les termes RSE, parties prenantes... La stratégie ici n'est pas explicite, l'opérationnel prime avant tout. Dans ce secteur particulier (viticulture), la responsabilité environnementale est contrainte par les facteurs climatiques influant sur les perspectives économiques et sociales. Le dilemme sectoriel mis en évidence montre les limites, pour ces firmes, d'une réalisation de la RSE. En effet, les conditions d'exploitation et la nature même de l'activité participent à favoriser la démarche d'une RSE « accomplie ».
[1] Issu de la Commission européenne.
[2] Nous concédons ici que ce ne sont pas les seuls indicateurs ou outils de mesure existants. En mentionnant cette absence de mesures nous voulons simplement signaler que cette TPE n'a pas réalisé d'étude d'impact ou autres bilans susceptibles de la renseigner sur sa contribution aux émissions de gaz à effet de serre via le CO2 ou autres gaz contributeurs.

Economie de la réglementation des OGM. Une approche par la qualité.

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Dans la littérature économique sur la réglementation des organismes génétiquement modifiés (OGM), des réponses différentes sont souvent données à une question réglementaire unique sans qu'il soit possible de contester la légitimité scientifique des différentes propositions. En matière d'étiquetage par exemple, ces réponses peuvent reposer sur le principe du libre choix des consommateurs, sur leur protection ou sur le respect de la liberté du commerce international. Chacune peut se justifier d'un point de vue analytique, et le même constat peut être fait pour les réglementations relatives à l'amélioration variétale ou à la coexistence entre cultures de plantes génétiquement modifiées (GM) et non GM.
L'hypothèse que nous ferons dans notre contribution est que les différences entre les réponses à ces questions réglementaires porte sur le principe de qualificationdes produits GM. Ces questions ne se posent en effet pas de la même manière selon qu'on considère que produits GM et non GM sont « équivalents en substance » (comme aux Etats-Unis), que les producteurs et consommateurs doivent avoir le droit de produire et consommer avec ou sans OGM (comme dans l'Union Européenne), ou que certains OGM peuvent comporter des risques sanitaires ou environnementaux (comme en France pour le maïs MON 810).
Selon nous, chaque définition de la qualité des OGM correspond un type d'attribution des droits qui peut permettre de justifier une forme particulière d'intervention publique. Chaque intervention puisant sa justification dans une conception de la qualité différente il n'est pas possible de comparer les différents modes d'intervention. Nous revisiterons ces débats à travers trois conceptions différentes de la qualité des produits GM (trois "régimes de qualité") : industrielle (les droits sont attribués aux innovateurs), marchande (les droits sont attribués aux consommateurs) et civique (les droits sont attribués aux citoyens).

Revisiting the Sustainability Transitions in Doubly Green Chemistry

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This communication is the introductory lesson to the special session : «Sustainability Transitions, Doubly Green Chemistry and Biorefinery»

To organize the discussion on the transition from cheap oil era to renewable resources uses, it is necessary to use interdisciplinary approaches. In our ANR Program, an interdisciplinary research network between economists and chemists mobilize : green chemistryscience studies (Garnier, 2012, Nieddu, 2011, Vivien et al, 2012),economic anthropologyof doubly green chemistry (as in Nieddu and Vivien, 2012),evaluation ofsustainability(see in Vivien & Marty, 2013),socio-economic studiesof the various biorefineries supply chains (Nieddu, Garnier, Bliard, 2012),case studies(as in Brullot and Gobert, 2012), on the bigger biorefineries scientific projects (such as PIVERT in France or Eurobioref, Biocore and Suprabio at the European level) orindustrial and territorial ecology approachof the metabolism of bioeconomy (as in Brullot 2012 or Buclet, 2011).

The communication will both discuss this approach and confront it to the dominant model of Sustainability Transition Research, the multilevel perspective [Geels, 2002, Grin J., et al. ed. (2010), and the special issues ofResearch Policy(2010, 2012)). The secondSustainability Transition Research Network(STRN) conference in Copenhagen (2012) made a focus on the rules of innovation niches in the changes. But in fact, concrete political practices are «visions to the future» construction that engage «backcasting operations» to organize the happening changes in a dominant design. Therefore, it is important to study how dominant entrenched actors can influence the backcasting and produce lock-in in the technological trajectories (Joergensen and Andersen, 2012).

Our introductory lesson to the special sessions will underline three issues and results of the ANR project.

At the level of laboratories, an opposition between two conceptions of the chemistry of biomass : the perfecting of the "destructuring" fractionation pathways that are typical of the oil industryorthe «non-destructuring" pathways which preserve the functional properties or active principles contained in the complexity of living organisms.

At the level of interactions in R&D programs between researchers and industrial actors, a cartography of technological trajectories that can be explained with 4 « productive heritages ». The two first search to mimic the oil supply chain to replace term to term oil refinery by biorefinery and to be easily integrated in the petrochemistry scheme. The two last search to use «non-destructuring" pathways and develop new products and ecoconception strategies.

At the level of territorial problematics, this question is crucial : one can see a new « green petrol rent » or « green gold » strategy, transforming biomass or ethanol and biooils in worldwide commodities that can be used in habour biorefineries ; the territorial ancorage on a local renewable ressource depends strongly of the disponibility of a set ofvarious scaletechnological solutions to adapt technologies and local ressources.

In the multilevel perspective model, the transition is achieved when a dominant design creates the new socio-technological regime. Socio-technological regimes are funded on an dominant artifact (eg car in mobility STR or refinery in chemical STR). Our question is : can an harbor biorefinery STR be sustainable ? Revisiting the 4 productive heritages, our proposition suggests that a new STR must bepluralisticin order to become sustainable. This is of major importance because :

The transition to a cleaner chemical industry and the transition towards the use of renewable resources to replace petroleum can be very opposite.

There are three conflicting issues in sustainability transitions: intensification of natural resources use, optimizing industrial sites based on industrial ecology principles, which principles may be isolated from local constraints and requirements, and finally creating a post-petroleum era by using more renewable feedstocks rather than striving for a low-carbon economy.

3. The wide range of chemical research programs indicates that different philosophies of chemistry are being developed to achieve a «doubly green chemistry».

From bioenergy to biorefinery: controversies in the Danish transition towards a fossil free society

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SUMMARY:
Danish bioenergy controversies are analyzed as transition perspective on industrialized societies. Bioenergy plays a role in several Danish climate plans, but there are controversies over biomass sources and amounts. Path dependency is identified. Energy companies convert coal fired power plants to biomass to sustain the role of these plants. A biotech company develops enzymes for processing of biomass for biofuels. The alignment with the car regime is strong because biofuel sustain fuel-driven vehicles as dominating transportation mode. Farmers see manure as source for biogas and reduction of climate impact and nuisances. Some NGOs fear manure-based biogas is used as argument for increased animal husbandry. Recently biorefineries got some support as concept for combined production of energy, fodder and chemicals. The analysis of controversies identifies issues for the shaping of legitimate Danish bioenergy strategies.

ABSTRACT:
The paper analyses the shaping of recent controversies in Denmark about the roles of bioenergy as part of transition processes towards a fossil free society. Theoretically the paper is based on the arena of development approach (Jørgensen, 2012) in combination with path dependency and path creation approaches to technological changes.

The Danish bioenergy arena is today more complex and show more conflicts about the present situation and visions for the future than 20 years ago. Earlier bioenergy systems were primarily local and were developed without many conflicts. However, the recent international focus on mitigation of climate change and the related Danish vision of becoming independent from fossil energy in 2050 has implied focus on increased use of bioenergy as a possible way of reducing greenhouse gas emissions. This increased focus on bioenergy has made the Danish bioenergy arena more complex and with more controversies. The involved socio-material systems are more national and international than earlier with respect to material flows and governance mechanisms. An example of international bioenergy sourcing is wooden biomass sourced outside Denmark for Danish power plants Global sourcing of energy resources is not new, as coal, which is one of the most important energy sources in Denmark, is not produced in Denmark. However, the globalized structures of food production and consumption imply that bioenergy sourcing might affect food supply, directly or indirectly, negatively in other parts of the world because of lack of available land or increasing food prices. The knowledge networks and governance structures are to some extent also international. Researchers cooperate internationally, certification schemes are international, and NGOs within environment and development cooperate internationally and share knowledge about for example how local civil society conditions are affected by bioenergy sourcing.

The Danish bioenergy arena is characterized by several controversies about existing bioenergy initiatives and about desirable future directions. Controversies have been identified in relation to the following recent Danish bioenergy initiatives:

Conversion of power plants from coal to straw Conversion of power plants from coal to wood Development and production of biofuels for transport Increased production of biogas from conventional and organic farms Biorefinery as concept for integrated production of energy, fodder and chemicals

These initiatives show path dependency related to the present dynamics of the energy sector, the food and agricultural sector, and the transportation sector. Big energy companies want to convert big coal fired power plants to biomass fired plants and some have already done so. Up till now straw from Danish agriculture has played an important role, creating a link between the energy sector and Danish agriculture. The recent years' increasing import of biomass from a variety of forests have developed more globalized supply chains and created controversies about the environmental and social impacts of the sourcing.

The national and international support for a Danish biotech company's attempt to develop enzymes for production of second generation biofuels show alignment between the Danish biotech industry and the international petrol industry, because biofuel is seen as enabling a

continuation of the gasoline and diesel car regime. Some of the arguments in favor of support for the Danish development of second generation biofuels focus on the export and employment possibilities, creating links between the bioenergy arena and the national economy and employment. Recently the concept of biorefineries has become part of the controversies around biofuels. Proponents of the biorefineries see the concept as a possibility for producing more fodder, biofuels, and chemicals for bio-based chemical products and materials. Recently the promotion of this concept has been combined with a focus on Danish biomass resources. More discussions of the concept and its assumptions are needed as the concept at the moment very much is a «black box»,

The application of manure from animal husbandry has caused conflicts during the recent years. The farmers' association is promoting manure as energy source for biogas production, while arguing that the biogas production is reducing both climate impact and the nuisances from the application of the manure as fertilizer. Biogas from manure got better economic conditions in the recent Danish national energy agreement and could also be seen as a way of strengthening the existing natural gas infrastructure. The manure-for-biogas strategy is questioned by some NGOs who fear the biogas path might be used as argument for increased animal husbandry. These NGOs argue that the biogas production is not solving the basic problems of the big Danish animal husbandry, like high resource consumption in terms of land and fodder protein. The controversies around biogas include the way to assess biogas. The above mentioned NGOs claim that the environmental assessment of the biogas should include impacts from the production and use of fodder for animal husbandry and not consider the manure as a ?free' waste product from animal husbandry.

The controversies within the bioenergy arena include disagreement about the methodologies for environmental assessments of bioenergy initiatives, for example whether so-called in-direct land use changes (ILUC) should be included and how specific bioenergy initiatives should be assessed. Furthermore international certification systems for biofuels are discussed. Some researchers and NGOs are critical about the capability and reliability of the schemes to ensure socially, environmentally and economic sustainable global sourcing of biomass.

How the Danish bioenergy arena develops in the future depends on what level of societal legitimacy incumbent actors are aiming at. In order to obtain broad legitimacy of the bioenergy development, businesses, research institutes, and governmental agencies should also be willing to involve a wide range of environmental NGOs in the design of future research and innovation programs, strategies etc., and the evaluation of experiences.

An increased focus on Danish biomass for energy might increase the legitimacy among civil society organizations of the Danish bioenergy strategy. However, such a focus on Danish bioenergy needs to be seen in a broader context than just energy resources. Kaphengst (2011) points to the need to broaden the focus from ?energy self-sufficiency' towards ?resource self-sufficiency' and proposes three issues for consideration in the process of developing more national and local self-sufficiency, which might inspire the future shaping of a Danish strategy for higher resource self-sufficiency:

Are energy sufficient villages, communities, regions etc. also self-sufficient in food, materials and other resources? If not: where do they get these resources from and what are the impacts on the land used and the people living in those areas? Could the degree of self-sufficiency on food, materials etc. change when a higher degree of energy self-sufficiency is developed? What could be the impacts on sustainability in other regions?

To make self-sufficiency more achievable it is necessary at the same time to look at the possibilities for reducing the domestic biomass needs through changed mobility patterns and changed dietary patterns. Such changes in consumption patterns are important parts of two Danish civil society organizations' climate and energy plans. Similarly, Bringezu et al (2009) show the possibilities for reducing German biomass needs by introducing demand side regulation (higher vehicle fuel efficiency, lower consumption of animal based nutrition and reduced food waste). This modeling shows that such initiatives could enable German national self-supply with land for biomass and even leave some land for the production of biomass for materials, food export, larger areas for nature protection, or further transition towards organic agriculture.

Which analytical framework to analyse territorial anchorage of the productive activity based on forestry biomass?

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A fundamental shift to a cleaner and more reliable energy system seems unavoidable. The development of such an ecological transition raises some important technologies issues. Which technologies can make the transition happen? How firms and industries could adopt new technologies in order to develop some « green » strategies. However, the researches on the case study about biorefineries showed the diversity of potential technological transformations (Nieddu, Garnier et al. 2010). From a multidimensional view of industries, these technical changes depend on political constraints, institutional environment but also individual and collective strategies of actors. In this context, it is relevant to examine the meso-level but not only to show how macroeconomic and political characteristics are translated within the firms. Thus, following the seminal work of Jullien Smith about the industries regulation, we study an industry as a relatively autonomous entity (ie institutional Order) by focusing on four main institutionalized relationships (employment, purchase, finance, commercial) that shape it (Zimmermann 2001; Jullien and Smith 2008; Jullien 2012).
In this communication we aim to grasp the development of the energy industry based on forestry biomass valorisation, which could emerge by mutations of different chemical industries, forest and wood paper. Furthermore, this development seems really constraint by the access and the availability of wood resources. Indeed, different production models are possible between larger firms entailing a strong wood specialisation and some controversies in terms of environmental impacts and some small firms that correspond to territorial demand and political will.
In this context characterised by radical uncertainty and controversy fields (Godard 1993), the challenge of industrial analysis is to grasp the diversity of territorial anchorage linked to the development of such a production. According to Zimmerman (2001), territorial anchorage comes from a collective process leading to the generation of new resources. This notion was introduced to study the nomadic firm's (Zimmermann 2001).
Given the fact that we focus on the dependence of the industry on specific natural resources, our main question is to characterise the relations between natural wood anchorage and territorial anchorage of the energy industry based on forestry biomass valorisation. On the one hand, the approach above mentioned, in terms of regulation of industries, allow us to take into account the different relations that contribute to the dynamics of industrial organisation through processes of institutionalization and deinstitutionalization. On the other hand, numerous researches in institutional economics focused on the integration of the environmental dimensions in the analysis of productive systems' regulation (Ostrom 1990; Paavola 2007; Zuindeau 2009; Vatn 2010)
By literature survey, in this different field of institutional economics and political sciences, our purpose is to offer a theoretical framework leading to the understanding of the territorial anchorage complexity of the energy forestry based on biomass industry.

References

Godard, O. (1993). Stratégies industrielles et convention de l'environnement : de l'univers stabilisé aux univers controversés. Actes du colloque: Economie, environnement, 15 et 16 février 1993, Paris, INSEE.
Jullien, B. and A. Smith (2008). Industries and globalization : the political causalty of difference. London.
Jullien, B., Smith A. (2012). "Le gouvernement d'une industrie " Gouvernement et action publique 1(1): 224-245.

Nieddu, M., E. Garnier, et al. (2010). "L'émergence d'une chimie doublement verte." Revue d'économie industrielle 132 (4ème trimestre,2010)
Ostrom, E. (1990). Governing the commons: the evolution of institutions for collective actor. New York
Paavola, J. (2007). "Institutions and environmental governance: a reconceptualization,." Ecological Economics 63: 93-103.
Vatn, A. (2010). "An institutional analysis of payments for environmental services." Ecological Economics 69(6): 1245-1252.
Zimmermann, J. B. (2001). "The firm/territory relationships in the globalization: towards a new rational." European Journal of Economic and Social systems 15: 57-76.
Zuindeau, B. (2009). "Analyse régulationniste de l'environnement: éléments théoriques et pistes de recherche " Economie appliquée 62(3): 159-188.

The continental biorefineries: a civil privatization of the agro-industrial choices?

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A biorefinery is an agro-industrial facility which creates an interface between the industry and agricultural worlds, between the technological and natural assets, as a «biorefinery should produce a spectrum of marketable products and energy [from biomass]. The products can be both intermediates and final products, and include food, feed, materials, chemicals, and energy (defined as fuels, power and/or heat). (...) a true biorefinery has multiple energy and non-energy products.» (IEA Bioenergy, 2009)

A biorefinery is also one element of a global socio-technical system; it seems to illustrate that the Western society is changing the «referential» (Muller, 2005) of reflection and action to better integrate the environmental constraints and sustainable development. As a matter of fact, the use of agricultural or forest resources to product energy or high-valued products (chemicals, pharmaceuticals, bio-plastics...) is considered as a way to become independent from fossil energies and to fight against climate change. Biomass is considered to be a renewable resource; consequently the bio-products and bio-energy should be sustainable.

Biorefining is apprehended as one solution (in combination with the development of other renewable energies) to tackle long-term energy problem in promoting environmental innovation. But this optimization of the biomass resources is a conflicting issue. Is this new «official » framework an evidence of a «green revolution» which could change how power is distributed and exercised? Or is this global consensus on bio-products potential an opportunity to not modify the balance of power?

In fact, this way of thinking together industry and agriculture isn't really a revolution. It doesn't give a new meaning to the behaviors of private stakeholders, who expect to create wealth and to keep their industrial patrimony. Likewise, the local/regional/national public authorities accept this framework because they think they could create new economic and innovative niches and offer opportunities to their country/regions so as to remain competitive in a sustainable way.

Moreover the development of biorefineries needs very important investments, particularly because new generation biorefinery has to take into account sustainable criteria in response to criticisms of the older generation (not using food parts of the plants and minimizing the energy and water consumption). That's why the technological changes induced by biorefining process are less the result from an isolated firm than from a private-public project.

However, while the public actors lack of expertise and aren't anymore able to unilaterally decide and control over the activities of people, they are deeply influenced by private actors.

«Entrenched actors have a major influence to the technological trajectories» at a sub-regional and local levels, to save or to consolidate their business positions and to convert old industrial units (pulp mills, corn or sugar refineries...) in new infrastructures. Not only the petrol refiners attempt to impose harbor refineries but also dominant firms or industrial coalitions try to demonstrate they epitomize a new environmental-friendly industry with the continental bio-refineries.

In order to check this hypothesis, we refer to the results of a socio-political study based upon a comparison of four biorefineries. We use a sociological method in reading the available and relevant documents, explaining the transformation of the industrial process. We also carried out semi-directive interviews with different institutional stakeholders and firms which develop the biorefinery project.

We could observe that no dominant model in the continental biorefinery was apparent. Each developer used very differently the local resources. According to the size of the dominant firms and the governance system, even if the public actors were involved in the project (financial aids, infrastructure enhancement...), they didn't really influence the industrial trajectory determined by the private actors. «The fragmentation, diversification and disorientation of the state were reflected in what David Ashley (1997) refers to as the forms of postmodern ?civil and vocational

privatism'.» (Shaun, 2002)

Adapting institutions for balancing environmental and economic needs in the electricity sector under climate change

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This paper investigates requirements for institutional change in the management of cooling water from thermoelectric power plants. Water use conflicts may become more severe due to climate change. One important use of the river water is to cool down power plants. During droughts or heat waves, power plants are forced to reduce production due to environmental regulation. This can be a threat to energy security, as is has already been observed at the river Rhine catchment in Europe during the 2003 and 2006 heat waves. To safeguard energy security, there were several exemptions of environmental regulations, but losses to energy producers were also substantial. This paper investigates ways to adapt to such stimuli by taking the Rhine catchment as a case study. There are assessed in terms of an institutional analysis and a model-based estimation of economic costs. Costs from reduced production during heat waves can be substantially reduced if there are less large-scale thermoelectric power plants, being a potential co-benefit of climate change mitigation. However, costs for energy consumers are multiple times higher than costs for energy producers. On the institutional side, we show that standard solutions (as emission charges) are not applicable due to inappropriate transaction costs. We thus investigate the potential of contract solutions, starting from the minimum power plant concept (MPP), which has been newly introduced in one federal state in Germany. Is there a gain from upscaling the MPP to the catchment level? We conduct interviews and examine publicly available documents by using the SES Framework (Ostrom), in combination with a transaction cost analysis and an environmental economics model. The MPP is meant both to balance ecosystem and energy security concerns on the one hand, and upstream-downstream use conflicts on the other. It evolved in a bottom-up way as a (secret) contract between private and public actors. First, the analysis indicates that the MPP might be appropriate for upscaling only, if the expectations about the change rate of the frequency and intensity of heat waves are configured in a specific way. Second, such an arrangement should be tied to public institutional arrangements in a more formal way.

Exploring polycentric approaches to mitigate the contribution of maritime transport to climate change

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Maritime transport carries the bulk of the world's traded goods. The regulation of shipping presents a particular interest in terms of the effectiveness of global governance. The governance framework of the maritime transport is complex due to the international nature of shipping coming not only from the inherent mobility of ships but also from the «trans-border nature of vessel operation occurring as a consequence of the separation of ships from their ownership and from their operators in terms of nationality (flag) that makes the industry a globalised one» (Sampson et al., 2007). Efforts to establish an effective pattern of global governance have been long-standing and sustained, dating back to the beginning of the 20th century. Shipping has its own rule-making authority for the facilitation of global governance, the International maritime organisation (IMO), which adopts marine policies. The traditional model of maritime policy-making is that of the hierarchy (Roe, 2009). Regulations emerge from the higher levels (the IMO) to cascade down the hierarchy to lower levels (states) to be applied to the sector. However, this hierarchical dynamics and the power games between the different maritime stakeholders are changing; maritime governance «is increasingly embedded in a multi-level setting and in a rapidly changing institutional context» (Van Leewen et al., 2010). This comes from the time-consuming process of multilateral decision-making, the lack of IMO enforcement mechanisms and the fact that leading political and commercial nations are no longer the major maritime countries. The reduction of greenhouse gas (GHG) by the shipping industry is one special issue where the hierarchical governance framework is challenged. The paper examines how shipping deals with climate change, with a view to establishing what type of governance arrangements exist and determining whether they are well suited to provide an effective policy response.
The interest in mitigating climate change by international shipping came rather late for different reasons such as the difficulties to apportion international shipping emissions to nations that resulted in their omission from national inventories under the Kyoto Protocol, the reputation of shipping as an energy-efficient mode and the prime focus of marine environmental policies on local pollutants (Gilbert et al., 2012). Maritime transport is estimated to be responsible for 3.3% of total CO2 emissions, and this share is projected to increase significantly, due to the expected growth in global goods traded. For this reason, shipping is an important sector to direct decarbonisation policies towards, to uncouple growth in shipping from contribution to climate change. Ship-based CO2 emissions reductions are different from reduction in other industries because the primary responsibility to mitigate climate change from international shipping has been attributed to the IMO by the Kyoto Protocol. The complex nature of both shipping and climate change ideally requires a global solution. However many challenges hinder the adoption of a stringent policy by the IMO, not least of which are reaching a consensus over the degree of mitigation of shipping CO2 emissions and reconciling the ?Common but Differentiated Responsibility' principle with ?No More Favourable Treatment' ? a maritime principle to ensure shipping standards apply to all nations. IMO has adopted in 2011 mandatory limits on the Energy Efficiency Design Index (EEDI) for new ships. The EEDI requires a minimum energy efficiency level per tonne-mile shipped. Although this is a breakthrough towards mitigating shipping contribution to climate change, the EEDI is not considered as a stringent measure since this rule-based policy will be applied only for new ships. The EEDI is not expected to yield significant reductions, and therefore complementary policies are required to abate the sector's emissions.
As a response to the shortcomings of regulatory processes at the IMO, the European Union plans to implement its own regional market-based instrument in order to give an impetus to a global policy. This regional market-based instrument could result in an inclusion of the shipping sector in the EU Emissions Trading Scheme or in a GHG Fund for shipping, as early as 2018. Non-state actors have also started to take steps themselves. The Green Award Fundation is an independent, non-profit organisation managing a certification scheme for ships. The Clean Shipping Project is a public/private partnership that aims to promote sustainability in the shipping industry. These initiatives are alternative form of regulation and have given rise to a network of private actors establishing voluntary rules.

The emergence of these policy iniatives can be understood from a governance perspective. International governance embodied by the IMO has failed so far to provide an appropriate response to shipping GHG emissions. In response, new policy instruments and appoaches are created by the EU and private actors to complement IMO efforts. Multi-level governance is a conceptual approach that steps away from the assumptions that policy-making occurs within a nested hierarchical set of government layers (Marsden et al., 2010), and recognize the participation of non-state actors in the governance process. It offers a framework to studying the development, implementation and effectiveness of policies. The objective of the paper is first to understand the policy environment underlying the question of the reduction of CO2 emissions by the shipping industry using a multi-level governance framework. Given this context, the paper seeks then to determine if polycentric approaches provide effective policy responses for the issue of mitigating climate change by the sector of shipping and if these forms of governance should be further encouraged. Polycentric approach is a form of multi-level governance that mixes scales, mechanisms and actors. It is a complex set of governance institutions, linked with flexible ties. In a stagnant IMO process and failing multilateral negotiation processes, the paper argues that these governance arrangements can contribute to an effective environmental policy-making that go beyond hierarchical steering and the sovereign authority of nation states.
The rationale for polycentric approaches comes from the recognition of scale diversity, the reduction of error-proneness and promotion of learning. Policies at sub-global scales can target and tackle specific aspect of the marine system. While global measure are better suited for dealing with some aspects of the shipping system such as ship design, there is other areas down the supply chain the IMO has less influence over (Gilbert et al., 2012), and nations or regions or port authorities are better positioned to intervene. Moreover, non-state actors initiating alternative forms of regulation through voluntary norms and rules can provide more flexible and dynamic frameworks than traditional form of government regulation. Furthermore, it is argued that actions organised at multiple scales generate benefits to those who act. For example, carbon policies implemented within national waters and ports improve welfare by mitigating other externalities (like local pollution), investments in energy-efficient technologies enable fuel saving for the ship operators, motivations to be involved in private voluntary initiatives like the Clean Shipping Project come from the hope of cargo-owner and shipping companies to improve their reputation, meet customer demand and thus increase their competitiveness (Wuisan et al., 2012), efforts in innovation may offer new market opportunities for shipbuilders, etc. In addition, polycentric approaches facilitate experimental efforts and learning at multiple levels, an asset to deal with problems involving uncertainty and complex systems. However, polycentric governance is not without challenges. Divergent rules can lead to the redundancy of regulation, inefficiency and confusion, and the profusion of actors risks to dilute rather than promote effective policy-making.

References

Gilbert, P., Bows, A., Exploring the scope for complementary sub-global policy to mitigate CO2 from shipping. Energy Policy (2012).
Marsden, G., Rye, T., The governance of transport and climate change. Journal of Transport Geography (2010).
Roe, M., Maritime governance and policy-making failure in the European Union. International Journal of Shipping and Transport Logistics (2009).
Sampson, H., Bloor, M., When Jack gets out the box: the problems of regulating a global industry. Sociology (2007).
Van Leeuwen, J., Van Tatenhove, J., The triangle of marine governance in the environmental governance of Dutch offshore platforms. Marine Policy (2010).
Wuisan, L., Van Leeuwen, J., Van Koppen, C.S.A., Greening the international shipping through private governance: a case study of the Clean Shipping Project. Marine Policy (2012).

The German energy transition as a regime shift

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Summary: In this paper, we interpret the German «Energiewende», that is, the project of transforming the German energy system into a renewable energy sources (RES)-based system, as a regime shift. This regime shift comprises several transformations, which are currently occurring in the technological, political and economic sub-systems. To build our argument, we first sketch how technological, political and economic developments reduced the resilience of the conventional fossil-nuclear energy regime and created a new RES-regime. Second, we cast recent changes in German public discourse and energy policy as a shift to the RES-regime. Third, we show which developments would foster the resilience of the RES-regime. In particular, sufficient resilience of the electricity transmission sub-sub-system appears to be crucial for completing the transformation of the whole energy system.

Introduction

In 1981, an environmental think tank coined the notion «Energiewende», defined as «growth and prosperity without oil and uranium». At that time, the «Energiewende» was only a vision at the fringe of German political discourse. Thirty years later, in the wake of the Fukushima-disaster, a Conservative government committed Germany to phase-out nuclear power until 2022. This spectacular policy U-turn (the same Conservative coalition had previously overturned the first attempt to ban nuclear power in Germany) completed a broad political consensus regarding the transformation of the energy system towards a purely RES-based system. Already before, Germany had agreed on ambitious policy targets aiming at eighty percent RES-generated electricity in 2050. Altogether, the «Energiewende» is now seen as one of the most important issues on the German political agenda. At this point, two important questions emerge: First, how did the notion of a RES-based energy system, within 30 years, move from an environmentalist vision to a broadly supported societal project? Second, how far has the transformation advanced and what are the challenges ahead?

In this article, we shed some light on these questions by framing the «Energiewende» from the perspective of resilience theory. While some approaches describe the energy system as a combination of technical and social aspects, e.g. as a «socio-technical» system (Geels 2002), there is, up to now, no analysis to the energy transformation with reference to the concept of resilience. Based on the classic definition of resilience as ??the capacity of a system to absorb disturbance and reorganize while undergoing change, so as to still retain essentially the same function, structure, identity, and feedbacks" (Walker et al. 2004), we conceptualize the « Energiewende» as a shift from a fossil-nuclear energy regime to a RES-based regime.

Main argument

Resilience offers a fruitful conceptual frame for understanding the history and the future challenges of the «Energiewende». In particular, the resilience perspective highlights the dynamics of persistence and change on different levels of the energy system. In this perspective, the energy system comprises three sub-systems:

I. Technological sub-system: energy generation and transmission
II. Political sub-system: policies, politics, institutions
III. Economic sub-system: economic actors and their relations

Thus, a shift of the energy system from a fossil-nuclear to a RES-based regime consists of three related transformations.

The conventional fossil-nuclear regime was characterized by a set of specific traits within each sub-system. On the technological level, energy was generated mainly by nuclear power and fossil fuels in a centralized production structure upon being transmitted to a multitude of consumers. On the political level, the state subsidized conventional power generation. The public discourse centered on security of supply and affordability as main targets of the energy system. On the economic level, an oligopoly of four big companies shared the biggest part of the German energy market. As each of the «big four» disposed of its own transmission network, the regional separation of networks effectively inhibited competition and fostered a very rigid market

structure. In sum, the fossil-nuclear regime was very resilient for several decades because technological, political and economic factors mutually reinforced the system configuration.
However, the regime's resilience steadily decreased when political changes spilled over to the economic and the technological areas. After the environmental movement had become an important agenda setter in German politics, RES-support policies were initiated in the 1990s. This lead to technological improvements and increasingly decentralized energy production. In consequence, from 1996 to 2012, the share of energy generated by RES increased from four to twenty-five percent. Decentralized, small-scale energy production with renewables significantly changed the energy market structure, thereby threatening the fossil-nuclear power oligopoly. Additionally, the liberalization of the electricity market within the EU, empowered consumers and forced producers to unbundle production and transmission. From a conceptual perspective, the same processes that lowered the fossil-nuclear regime's resilience created an RES-based regime. «Institutional entrepreneurs», who advanced RES-support on the political agenda, may have played a key factor in building a politically and technically feasible alternative to the fossil-nuclear regime (Westley et al. 2011).
However, the main beneficiaries of the fossil-nuclear regime successfully prevented a complete regime shift using their bargaining power in the political process. Yet, the Fukushima-shock « changed everything» (Merkel 2011) and lowered the bargaining power of the fossil-nuclear oligopoly in Germany. Thus, the «ideological thirty years war» was decided against nuclear power (Kohler 2011). Since 2011, the question «should Germany phase out nuclear-fossil energy? » in public debates is replaced by the question «how does Germany best achieve full RES energy supply?» In resilience terminology: the broad political consensus on Germany's future energy trajectory shifted the energy system towards the RES-regime.
Currently, the resilience of RES-regime is rather shallow. Completing the energy transition requires a substantial increase of the regime's resilience. To that end, further decentralization of the economic market structure and further changes in electricity generation and transmission infrastructure are necessary. For instance, the transmission grid must be adapted to altered electricity generation patterns.
Resilience of the transmission grid ? as a sub-sub-system of the energy system ? turns out to be a crucial factor for the continuous transformation of the whole energy system. As security of supply is a prioritized aim of German energy policy, the transformation process must take place without adversely affecting the system's overall performance with regard to electricity supply. The energy system cannot be constructed from scratch but has to be adjusted while running. Also, blackouts or intentional shutdowns («brownouts») would threaten to undermine public trust in the reliability of RES. Completing the transformation process of the whole energy system therefore necessitates sufficient resilience of the transmission sub-sub-system. In more poetic words, the «Energiewende»-project is well described by Otto Neurath's famous metaphor:
«We are like sailors who on the open sea must reconstruct their ship but are never able to start afresh from the bottom. Where a beam is taken away a new one must at once be put there, and for this the rest of the ship is used as support. In this way, by using the old beams and driftwood the ship can be shaped entirely anew, but only by gradual reconstruction.»

Conclusion

In this paper, we frame the «Energiewende» as a shift from a fossil-nuclear to a RES-based regime of the energy system. The resilience framework provides fruitful insights on the energy transition in two ways. First, the resilience framework's focus on scale serves to elucidate the role of persistence and change on different levels of the energy system: On the highest scale, that is, the socio-economic level, resilience of the fossil-nuclear regime needs to be decreased and resilience of the RES-regime must be increased in order for the energy transition to succeed. Yet on a lower level, the technological sub-system must continuously fulfill its function to generate and distribute electricity ? in particular, the electricity transmission sub-sub-system needs sufficient resilience to avoid blackouts and other disruptions which would undermine public support for the overall transformation process. Second, the resilience framework's focus on time and dynamic processes highlights the interplay of gradual transformation and sudden shifts: While the energy transformation occurs on a timescale of decades, the Fukushima-shock and the ensuing German energy policy consensus in 2011 constitute a sudden regime shift. Since then, the issue whether Germany should phase out nuclear-fossil energy has been replaced by an argument over the best way to achieve full RES energy supply.

Social Impacts of CO2 Pipeline Installations

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World energy demand is forecast to rise by 55% by 2030 and fossil fuels are predicted to meet 84% of this extra demand, potentially resulting in global CO2 emissions being 57% higher in 2030 than in 2005 (OECD/IEA 2007). Carbon Capture and Storage (CCS) is a technology designed to reduce CO2 emissions associated with burning fossil fuels by offering the possibility of reducing CO2 up to 90% from fossil fuel powered stations (WorldCoalInstitute, 2009). The CCS process involves the capture of CO2 which is then transported to a permanent storage site. CO2 can be transported in different ways with pipeline the most economic and efficient option. This paper will firstly assess the social impacts of other existing and planned pipeline developments, using case studies to understand how the consultation process was managed, the public response to these pipeline developments and the strategies adopted in the context of the response and secondly assess public perceptions of transporting CO2 in pipelines. Two, full day focus groups were held in two locations along a proposed pipeline development in the Yorkshire and Humber region, UK in October 2012. Focus groups consisted of 9 and 10 participants respectively and allowed the researchers the opportunity to explore specific concerns about CO2 transport and identify the appropriate content and form of information provided to the public in order to improve any future consultation processes. Given the importance of quantitative risk assessments to the regulation of pipelines, the focus groups also considered how communities accommodate and engage with risk and the differences between expert and lay conceptualisations of the risks associated with CO2 transport. CO2 pipelines are a highly visible element of CCS technology and this research is the first study of the social processes specifically related to CO2 pipeline development.

Since 2008 a number of CCS projects have encountered opposition from local communities and as a consequence been cancelled or gone ahead in reduced form. Public acceptance is essential for the future uptake of CCS projects across the UK and for any new pipeline planning application, there will be a mandatory public consultation process. It is proposed that engaging with the public in the research process has a number of benefits for those who participate, these include an increased understanding of the pipelines and the CSS process and feeling included in the planning process. For a large proportion of people CCS is a relatively unknown subject and an increased awareness could be beneficial to both present and future CCS projects. Evidence from the case studies suggest that genuine early engagement that is responsive and reflexive is a pivotal part of the process in establishing trust around a proposed development. Trust plays a key role in shaping perceptions and it has been reported that public trust in the stakeholders involved affects the acceptance of CCS projects and is important for the successful implementation of the technology in general (Terwel et al., 2009).

There is currently very little understanding relating to CO2 transport in pipelines, although it is a highly visible component of the development and one which affects a range of socially and geographically diverse populations. The local community surrounding the pipeline may not fully understand the importance of CCS and through the focus groups we identified the level of participants' understanding of the technologies and explored their concerns. The UK is well placed to develop CCS with significant storage potential beneath the North Sea but realising this potential depends on successful future public engagement. CCS is a relatively new concept to the British public, the way that it is introduced will be crucial to the success or otherwise of projects. The perils of a poorly managed consultation process were well illustrated at Barendrecht in the Netherlands where fierce opposition from local residents resulted in the delay and then the abandonment of the project. Other recent (non-CO2) pipeline projects in the UK have also attracted high levels of controversy and damaging opposition; public engagement during the CCS process represents a key element of the development of pipeline projects. By undertaking case studies and focus groups we can understand the processes through which opposition towards a pipeline evolves, how it manifests itself and what drives observed responses. Understanding these findings will contribute to establishing improved support for CCS projects.

The Opportunity Costs of Conserving Pasture Resources for Mobile Pastoralists in the Greater Caucasus

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Ecological damages caused by unadjusted and raised stocking rates are persistent problems in grazed mountain areas in developing countries, including in post-Soviet Asia. An assessment of this degradation is difficult due to site heterogeneity and insufficient knowledge about the grazing systems. We present an integrated appraisal of the potential stocking rates of sites based on physical site properties. We combine these ecological and agrarian analyses with the economic calculation of opportunity costs in scenarios. We apply this approach to a high mountain region in the eastern Greater Caucasus in Azerbaijan, which provides valuable ecosystem services and is heavily used as summer pasture by mobile pastoralists. Hence, an impact assessment of reducing the legal prescriptions of stocking rates or the calculation of payments for ecosystem services is possible. Our results show that stocking rates on many pastures are spatially unadjusted and destocking measures need to be implemented in order to preserve ecosystem services. We also discuss different distribution possibilities of the opportunity costs.

Combining Institutional and Technical Innovation to improve the Acceptability of Agri-environmental Measures. The example of teritorialized agri-environmental measures in France.

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In France, among the different agricultural policy schemes, the locally-focused agro-environmental contractual measures, called Mesures Agro-Environnementales Territorialisées Directive Cadre sur l'Eau (MAET-DCE), aim to encourage farmers located in a given area to adopt farming practices which contribute to the preservation of water resource. We propose to analyse the MAET-DCE policy measure as a technical and institutional innovation. We consider that, as such, this measure will be effective in terms of water quality improvement only if it appears to be legitimated for farmers. Based on a case study of two experiences of MAET-DCE launched in the South-West of France, we analyse the on-going legitimisation process. Our conceptual framework is based on concepts borrowed mainly from economists, who, like Daniel Bromley (2008) and Arild Vatn (2010), consider that individual preferences are multiple and in evolution. ABSTRACT 1. Objective of the communication This communication focuses on a French public agro-environmental policy, called Mesures Agro-Environnementales Territorialisées - Directive Cadre sur l'Eau (MAET-DCE). These measures are voluntary and aim to encourage farmers to reduce their use of pesticides in exchange of a financial compensation for a potential overcost or decrease in yield. The objective is to bring farmers to adopt practices, which contribute to the preservation of water resource. However, despite the financial subsidies, the number of farmers who adopted the MAET-DCE is far less than expected. The Conseil Général de l'Agriculture, de l'Alimentation et des Espaces Ruraux (CGAAER, 2009a, 2009b), a public organism which participated to the design, follow-up and evaluation of public policies, gives a rather negative assessment of such measures. According to the CGAAER, the inertia of the production-consumption system, the instability of the agro-environmental policies, the economic risks associated with the adoption of new practices and the lack of flexibility of the proposed measures are among the factors which can explain the poor acceptability of the MAET-DCE. Given this low rate of adoption of the MAET-DCE by farmers, we consider these agro-environmental measures as both a technical and an institutional innovation, and we aim to study the conditions to improve their acceptability. We hypothesise that the MAET-DCE acceptability depends on their legitimacy. In this perspective, we propose to question the concept of legitimacy: What does it mean? When can one consider a public policy as acceptable for the stakeholders? How can collective action influence the processes of legitimisation and of change in individual preferences? In final, to what extent can legitimacy contribute to the MAET-DCE acceptability? To answer to these questions, we conduct an in-depth case study of two experiences of MAET-DCE launched by agricultural cooperatives in the Midi-Pyrénées region, located in the South-West of France.2. Originality of the subject The originality of the subject relies upon: · The fact that the agro-environmental MAET-DCE scheme is considered as both a technical and an institutional innovation, whose legitimacy depends on the capacity of the stakeholders to

manage numerous risks and uncertainties. · The hypothesis that the MAET-DCE legitimacy implies the transformation of a «restraining» rule into a «rational» rule, understood as a « reasonable» working rule. We pay a particular attention to the study of individual and collective learning processes within the legitimisation process. Legitimisation allows stakeholders to update their «sufficient» reasons[1]. · Our conceptual framework is based on concepts borrowed mainly from economists, who like Daniel Bromley and Arild Vatn (see bibliography) belong to the American Old Institutionalism School of thought. Considering that individual preferences are multiple and in evolution, these authors offer a renewed framework to study the concept of rationality. This conceptual framework allows us to better understand how stakeholders can integrate collective values in their choice for action. This is the more important since we are interested in environmental public goods, like water quality, which are subject to multiple and competing uses. The originality of the approach developed by these authors also relies upon their analysis of the impact of the surrounding institutions on the stakeholders' preferences and « sufficient» reasons. 3. Methodology Consistently with the conceptual framework, we develop a methodology combining: · A qualitative analysis of the standards and norms underlying the MAET-DCE, in order to identify, on the one hand, the «restraining» rules, and on the other hand, the rationalities/preferences challenged by these rules. In doing so, we can identify the cognitive constraints farmers have to face. · A comparative analysis of the individual preferences (defined as «sufficient» reasons) of two groups of farmers, those who have contracted a MAET-DCE and those who have not:o The individual preferences revealed through the study of farming practices and through some specific quantitative indicators of the private and collective costs and benefits of individual choice of practices;o The individual preferences revealed through a textual analysis of the different stakeholders' discourses (farmers and cooperative counsellors) 4. Results Two major sets of results and implications: (1) From a research standpoint: the development of a conceptual framework and a methodology, which are both quite original for the study of the issue addressed in this communication. (2) From a policy standpoint: a. The understanding of the conditions necessary for the adoption of environmental friendly farming practices. We show evidence here that financial incentives, constitutive of the agri-environmental schemes, are far from being sufficient for an efficient rate of adoption; b. The assessment of the role of institutional schemes, such as the MAET-DCE, in the transformation of individual preferences in the way expected by public authorities and also by the society; c. The evaluation of the extent to which farmers' individual rationalities/preferences have evolved and have integrated collective values. In final, through this work, we aim to identify the conditions necessary for the improvement of the efficiency of the MAET-DCE and other similar policy schemes. 5. Bibliographical references Bromley, D. W. (1998). Searching for sustainability: The poverty of spontaneous order, Ecological Economics, 24, 231?240Bromley, D. W. (2006). Sufficient Reason: Volitional Pragmatism and the Meaning of Economic Institutions, Princeton University Press, Princeton, 268 p.Bromley, D. W. (2008). Volitional pragmatism, Ecological Economics, 68, 1-2, 1-13.Conseil Général de l'Agriculture, de l'Alimentation et des Espaces Ruraux (CGAAER). (2009b. Évaluation de la mise en oeuvre 2007-2008 du PVE et des MAET-DCE enjeu EAU du programme de développement rural hexagonal. Rapport, n°1904, mai. Godard, O. (2004). De la pluralité des ordres ? Les problèmes d'environnement et de développement durable à la lumière de la théorie de la justification, Géographie, économie, société, 2004/3 Vol. 6, p. 303-330.Nguyen, G., Del Corso, J.P., Képhaliacos, Ch. (forthcoming), Rôle de l'apprentissage collectif dans l'adoption de pratiques agricoles visant à réduire l'utilisation de produits phytosanitaires : une approche par les coûts de trans?action appliquée à la mise en place d'une MAET-DCE, Économie Rurale, 133.Sen, A.K. Rationality and Freedom, Harvard University Press, 2002. Soma, K., and Vatn, A. (2010). Is There Anything Like a Citizen? A Descriptive Analysis of Instituting a Citizen's Role to Represent Social Values at the Municipal Level, Environmental Policy and Governance, 20, 30?43.Scott, W. R. (2001). Institutions and Organizations, second edition. Thousand Oaks, CA: Sage Publications.Vatn, A. (2005). Institutions and the Environment, Edward Elgar, Cheltenham. Vatn, A. (2009a). An institutional analysis of methods for environmental appraisal, Ecological Economics, 68, 2207?2215.Vatn, A. (2009b). Cooperative behavior and institutions, The Journal of Socio-Economics, 38, 188?196.Vatn, A. (2010). An institutional analysis of payments for environmental services, Ecological Economics, 69, 1245?1252.[1] « Sufficient » reason is defined by Daniel Bromley (2006, p.218) as «thoughts that give us fixed belief and that then authorizes action.»

ANALYSING THE PROBLEM OF CULTIVATED PLANT GENETIC RESOURCES FROM THE VIEWPOINT OF CRITICAL INSTITUTIONAL ECONOMICS

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Plant genetic resources for food and agriculture are the basis of food security and consist of diversity of seeds and planting material of traditional varieties, farmers' varieties and modern cultivars, crop wild relatives. The loss of cultivated plant genetic resources or a lack of adequate linkages between conservation and their use poses a severe threat to our food security in the long term. A broader and better use of plant genetic resources on-farm as well as through collective actions could stimulate conservation.

The professional literature of agro- and environmental economics relating to cultivated plant biodiversity did not examine at all or examined in very few studies the institutional factors which influenced individual and collective decisions. Since institutions influence choices at all levels of society and individual habits both reinforce, and are reinforced by, institutions the Critical Institutional Economics approach was applied to understand the problem of biodiversity loss in cultivated plant genetic resources. Evolutionary and open-ended research framework was developed to analyse how farmers' variety choice decisions are influenced by institutional factors and to explore the context of collective actions on conserving crop genetic diversity. Besides offering explanations of the processes and institutional factors causing the loss of agrobiodiversity, I also aimed to find and evaluate institutional solutions to stop or slow down genetic erosion.

Critical institutionalism delivers a more convenient theoretical framework to understand the issues in this study, compared to the frameworks of new institutional economics or agro-economics. I pointed out that institution examinations on a critical and ecological base did not have a uniform methodological framework. I determined the methodological principles by which processes behind the reduction of cultivated plant biodiversity and institutional factors could be explained and I also reviewed the potential institutional solutions.. Then relevant institutional factors influencing individual decisions and institutional solutions emerging in the participants' dialogues were examined in a structural research process of five stages that involved several data collection and analysis methodologies.

The research process can be divided into five phases. Each phase is a separate unit which examines the very same phenomenon but delivers a deeper analysis of the institutional context. A special feature of the process is that data is elaborated and analysed at the stage of data collection and the cycle of data collection-elaboration-analysis repeats itself again and again. I attempted to generate deliberative discourses to start the procedure of joint learning and hopefully contributed to the conservation of cultivated plant biodiversity. Individual and collective actions were jointly analysed in my study to reveal the institutional context. I also reviewed the historical implications of the formations of and changes to institutions concerned about the use and conservation of cultivated plant biodiversity. I demonstrated that using a combination of qualitative, quantitative and deliberative data collection techniques in public policy oriented research could ensure that specific (legitimate) public policy proposals were made by the end of the research process.

It is elaborated that in the current context of institutions/regulations/markets farmers as individuals are not interested in the conservation of landraces from an economic perspective and in such activities they encounter several obstacles of legal seed regulation issues. Hungary is also affected by the problems of ?conservation dilemma? and ?contribution dilemma?. Landraces are regarded as community assets and they are currently not affected by the tragedy of anticommons, which is supported by the fact that in our research no one expressed claims for the possible exclusion of a particular farmer from the use and benefits of a given landrace.

This study also revealed that many local initiatives in Hungary and Europe are already developing a variety of dynamic conservation practices linked?to the?sustainable?use, development?and?valorization?of?cultivated?biodiversity. It is important to build up and preserve the local seed systems from the perspective of the use and conservation of landraces. Further initiatives and

model projects would be needed.
Individual and collective actions are required for change that will result in improved institutional support for landraces. These changes can take many forms, ranging from more efficient system for farmers to access genetic resources stored in genebanks to more transparent plant variety protection (PVP) system that effectively articulates the needs of farmers as well as to more simplified seed registration and testing for local varieties. New types of rights (agricultural producers' rights, collective proprietary rights, benefit sharing rights) should be elaborated and applied to lift the barriers of the asymmetric ownership situation which is based on the intellectual property rights (e.g. rights of breeding) of breeders who helped commercial breeding with their scientific innovation. Diverse polycentric institutions are required to help the innovativeness of farmers, the learning and cooperation of different stakeholders at multiple scales to conserve plant genetic resources.

Carbon storage in boreal forests ? economic and environmental policy approaches

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Carbon storage in boreal forests ? economic and environmental policy approaches

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Summary
: Many types of ecosystem services may be obtained from a forest. Timber production and carbon storage are two important ones, but others as recreation and biodiversity are also of great importance. Actually there is a basket of different services, and the vital policy issue is the selection of a possible basket both now and in the future. There must be made a trade off between the different types of service, as some can be jointly produced while others represent a conflict of interest. We analyze in two case studies of protected areas the conflict and synergy between timber production and carbon storage in a hundred years perspective. The trade offs are described in monetary terms. In addition the situation in terms of biodiversity development and potential use for recreation is discussed.

Abstract:

In the research community and among policy makers it has traditionally been common to assume that wood from boreal forests is a carbon neutral energy source because the regrowth of a felled tree will capture the same amount of carbon that was released through combustion of the harvested biomass. Consequently, wood fuels have been considered an attractive alternative to fossil fuels from a climate perspective and policies have been implemented to increase the use of wood as an energy source. Moreover, the carbon neutrality assumption leads to the conclusion that there is a conflict between a forest management policy that is in the favour of the environment and a forest policy that emphasize the recreational and biodiversity values of a forest.

However, a number of recent contributions show that the carbon neutrality assumption is misleading, not least when dealing with wood from boreal forests (Haberl et al 2012, Schulze et al 2012) When wood in a slow-growing boreal forest is harvested and combusted, it may take almost a century before the released amount of carbon again is stored in the forest. As the analysis of this paper illustrates, taking the capacity of the forest as carbon storage into consideration

might support the conclusion that forest conservation is socially optimal. Hence, instead of conflicting interests, there might be a synergy between concern for biodiversity and climate in increased forest conservation. Using different prices on the ecosystem service of carbon storage, referring to different scenarios for the development of prices on carbon quotas, we analyze to what extent and under which assumptions forest conservation becomes socially optimal.

The purpose of this paper is to analyze the societal trade-off between forestry and forest conservation, taking into account the benefits from carbon sequestration, as compared with the cost of forest conservation. The benefit of forest conservation will be enhanced by the additional benefit of biodiversity protection. Given different carbon price scenarios, it will be discussed to what extent additional forest conservation will be socially optimal.

A national analysis will require a national set of priorities of forest conservation. It will have to be specified both in terms of conservation targets and measures and in terms of area productivity and volume of timber stock. It should also be specified in terms of different geographical areas, representing different types of forest qualities. At present the conservation of productive forests in Norway is limited to 2.5 %. A biological evaluation recommends a minimum of 4.6% as a target (Framstad et al. 2002). In a recent report WWF recommends as much as 10%, with a national list of important areas to consider (WWF 2012).

To make some preliminary illustrations of the potential trade-offs between the societal goals of traditional forestry and carbon sequestration, two case studies will be analyzed. Both will be in recently protected areas. The first one is Trillemarka nature reserve which is about 147 km2. Here both the land owners and the local communities were economically compensated. The second case study will be areas that have been part of a new voluntarily forest conservation program, that in 2010 had reached a total of 4329 km2 (Framstad et al. 2010) An area taking part in the voluntary forest conservation program, comparable to Trillemarka in size, will be selected in the Telemark or Buskerud counties. The land owners will have received compensation according to the expected value of the standing forest stock, or on average about 10% over that level (Barton et al. 2012).

The starting point for our numerical analysis will be the forest model described in Holtsmark (2012). This model includes the dynamics of the forests' multiple carbon pools and how their dynamics are influenced by harvest. For example, Asante and Armstrong (2012), Asante et al (2012), Hoel et al. (2012), and Holtsmark et al. (2012) demonstrate importance of the dynamics of the pools of dead organic matter (both naturally deadwood and residues). These pools are therefore emphasized in the model.

The model will be recalibrated to two new versions, to fit to the characteristics of Trillemarka and the selected forest area in Telemark or Buskerud, respectively. The recalibration of the model will be based on data on age structures and other characteristics. A possible extension of the model that will be included is the dynamics of soil carbon and how this is influenced by harvesting (Olsson 1996)

Simulation of the models, considering different conservation and harvest scenarios will shed light on the issues mentioned above. We will draw on the theoretical studies of Hoel et al. (2012) and Holtsmark et al. (2012).

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References:

Asante, P., Armstrong, G. W., 2012, Optimal forest harvests age considering carbon sequestration in multiple carbon pools: A comparative analysis. J. Forest Econ. 18, 145--156.

Asante, P., Armstrong, G.W., Adamowicz, W.L., 2011. Carbon sequestration and the optimal harvest decision: A dynamic programming approach considering biomass and dead organic matter. J. Forest Econ. 17, 3--17.

Barton, D.N., Lindhjem, H., Rusch, G.M., Sverdrup-Thygeson, A., Blumen trath, S., Sørheim, M.D., Svarstad, H. and Gundersen, V. 2012. POLICYMIX- Assessing the role of economic instruments in policy mixes for biodiversity conservation and ecosystem services provision.

Issue No. 1/2012 NINA
Framstad, E. and Blindheim, T. 2010.
Naturfaglig evaluering avFrivillig-vernområder. NINA Rapport 534.
Framstad, E., Økland, B., Bendiksen, E., Bakkestue,V., Blom, H. and Brandrud, T.E. 2002. Evaluering av skogvernet i Norge. NINA Rapport 54.
Haberl, H., et al., 2012. Correcting a fundamental error in greenhouse gas accounting related to bioenergy.
Energy Policy, 45, 18--23.

Hoel, M., B. Holtsmark, K. Holtsmark (2012) Faustmann and the Climate. Under review.

Holtsmark, B., M. Hoel, K. Holtsmark (2012) Optimal harvest age considering multiple carbon pools - a comment.Journal of Forest Economics(in press)

Schulze, E. D., Körner, C., Law, B. E., Haberl, H., Luyssaert, S., 2012.
Large-scale bioenergy from additional harvest of forest biomass is neither sustainable nor greenhouse gas neutral.
Glob. Change. Biol. Bioenergy 4: 611--616.

WWF. 2012. Skogkur 2020. Redningsplan for Norges unike skoger. WWF Rapport N 2012.

Holtsmark, B., 2012: Harvesting in boreal forests and the biofuel carbon debt.
Climatic Change
112: 415?428.

Olsson, B.A., Staaf, H., Lundkvist, H., Bengtsson, J., Rosén, K., 1996. Carbon and nitrogen in coniferous forest soils after clear-felling and harvests of different intensity. For. Ecol. Manage 82, 19-32.

Consequences of Uncoordinated Responses to Diffusing Invasive Alien Weed Stocks: a Dynamic Game Analysis

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Invasive species are non-native species that exist and thrive outside their natural distribution. Invasive species are a threat to native biodiversity in several ways: they reduce the survivability of native species through increased competition, predation, and hybridization?and through their impact on the food web and the physical environment (Natureserve 2012). The invasive species problem is recognized as one of five main drivers of biodiversity loss (Millennium Ecosystem Assessment, 2005), and is claimed to be the second most serious driver for biodiversity loss after habitat destruction (Natureserve, 2012). The need to manage invasive species is explicit in the UN Convention on Biological Diversity (CBD, 1993) which states that «Each Contracting Party shall far as possible and as appropriate...prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species;...» (Article 8 paragraph (h)). The four most important strategies for controlling the impact of invasive species on native species are: prevention of additional introductions, early detection and rapid response, control and management of established problem species, and restoration and recovery of natural ecosystems (Natureserve, 2012).

Early detection and rapid response can prevent a sudden increase in the long-term control costs of an invasive species. For example, an alien plant species (weeds) may be introduced to a new location through multiple events of bioexchange. If the species thrives, geographically dispersed and highly viable satellite populations are gradually formed. As satellite populations grow and increasingly become connected, the overall population and the control costs may all of a sudden become quite large. The lack of natural predators is one common reason that an alien weed is able to grow so rapidly in its new location. Through purposeful and accidental introductions, invasive weeds have already become a costly problem to agriculture across the world. Pimentel et al. (2005) estimated that invasive weeds cost the U.S. $27 billion annually, while in Australia, Sinden et al. (2004) estimated the annual impact to over $3 million.

The high costs caused by invasive weeds already indicate that early detection and rapid response often fails in practice. The early satellite populations of an alien weed species typically appear on the properties of multiple landowners who may be unaware of the presence of the weed. Consequently, these landowners may not realize the need for careful weed control.

Furthermore, coordinated efforts to detect and control the invasive weed among neighboring landowners would be more effective than the uncoordinated management that usually takes place in the early stages of invasion. Uncoordinated and differing responses to invasive weeds among neighboring landowners results in negative cost externalities?a problem that is receiving increasing attention. For instance, a lax management approach among hobby farmers will negatively affect professional farmers (Ceddia, Heikklä, and Peltola, 2008; Ceddia, Heikklä, and Peltola, 2009). Thacher et al. (2012) finds that among cattle ranchers, the larger the scale of production the greater is the probability ranchers will treat an invasive weed. While there are externalities among landowners in relation to invasive weeds there are also externalities between agricultural producers and society. Ceddia, Heikklä, and Peltola (2009) point out that farmers' private invasive species management decisions may not necessarily be adequate from a social point of view. This is particularly important to consider in relation to biodiversity loss.

This paper constructs a dynamic game in order to explore the consequences of uncoordinated weed management strategies among neighboring ranchers. The dynamic game model permits the inclusion of temporal and spatial effects in relation to invasive weed management and demonstrates the importance of and challenges to rapid response to invasive alien weed species. In the game, two weed satellite populations grow and diffuse over time. The profit maximizing cattle ranchers may choose to treat the weed using herbicides. The ranchers determine how large portion of their field to treat with herbicides in each time period. The game produces Nash optimal, closed-form solution trajectories for weed control and weed population when solved as a standard linear quadratic dynamic game.

The dynamic game is parameterized for the invasive weed Yellow Starthistle (YST) (Centaurea SolstitialisL) which has been is spreading throughout the United States since its accidental

introduction via Russian seed mixtures in about 1850. YST is currently invasive in California, Idaho, Oregon, New Jersey, Utah, and Washington. In the most severely affected state, California, the focus is now on control rather than eradication because the cost of complete eradication has become too high. YST has now formed satellite populations in New Mexico and is categorized as a class A noxious weed which means that the eradication of the weed from the state is still considered possible.

The solution trajectories for a game with symmetric landowners show that delayed management decisions permit the weed to become invasive. In asymmetric scenarios, the landowner that delays management benefits financially through reduced management costs from the other landowner's early efforts. Perhaps surprisingly, the management costs of the landowner who manages early is largely unaffected by weed diffusion from the delaying neighbor. This result is most likely a consequence of herbicides being assumed to be one hundred percent effective in this scenario. As the effectiveness of the herbicide is reduced, however, the financial consequences of having a neighboring that delays weed control becomes more serious. Additional scenarios show that low productivity of the land reduces the profitability of weed control and increases the incentive to delay management. Shorter planning horizons have similar effects.

These results provide insights into the impacts these different characterizations have on the outcomes, and consequently may provide direction for public policy. For example, in the case of uncoordinated and delayed management of an invasive weed, it is expected that effective management of an invasive weed by one landowner (e.g. the government) can have a positive spillover effect for ranchers in the surrounding community. Effective treatment of invasive weeds by public landowners becomes especially important if private landowners find treatment of the invasive weed too costly due to low productivity on their land or because of short planning horizons. Financial support for landowners who control invasive weeds can be justified because the control of invasive weeds has positive externalities for neighboring landowners and society in general.

Future research can expand on this analysis in a number of directions. There is a need to explore the impacts of various spatial and temporal heterogeneity among neighboring landowners. There is also a need to improve the specification of the based problem to incorporate more detailed spatial functions for weed diffusion.

References

CBD, 1993. UN Convention on Biological Diversity. Available on-line at: http://www.cbd.int/convention/text/. Last visited Dec. 13, 2012.

Ceddia M.G., J. Heikklä, and J. Peltola. 2008. «Biosecurity in agriculture: an economic analysis of coexistence of professional and hobby production.» Australian Journal of Agricultural and Resource Economics 52(4): 453?470.

Ceddia, M.G., J. Heikkil, and J. Peltola. 2009. «Managing invasive alien species with professional and hobby farmers: Insights from ecological-economic modelling,»Ecological Economics, 68 (5): 1366-1374.

Millennium Ecosystem Assessment, 2005.Ecosystems and Human Well-being: Biodiversity Synthesis.World Resources Institute, Washington, DC.

Natureserve, 2012. «Conservation Issues: Invasive Species» Available on-line at: http://www.natureserve.org/consIssues/invasivespecies.jsp. Last accessed Dec.13, 2012.

Pimentel, D., S. McNair, J. Janecka, J. Wightman, C. Simmonds, C. O'Connell, E. Wong, L. Russel, J. Zern, T. Aquino, T. Tsomondo 2001. Economic and environmental threats of alien plant, animal, and microbe invasions. Agriculture, Ecosystems and Environment 84 (2001) 1?20.

Pimentel, D., R. Zuniga, and D. Morrison. 2005. «Update on the Environmental and Economic Costs Associated with Alien-Invasive Species in the United States»Ecological Economics52(3): 273-288.

Sinden, J., R. Jones, S. Hester, D. Odom, C. Kalisch, R. Jones, and O. Cacho. 2004. «The economic impact of weeds in Australia,» CRC for Weed Management Technical Report #8.

Thacher J.A., J. M. Chermak, K. M. Grimsrud, K. Krause. 2012. «The Decision to Manage Invasive Weeds: Which Factors Matter?» Working paper. University of New Mexico. (contact jthacher@unm.edu for a copy)

Ethical and political considerations on the commodification of ecosystem services

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Summary
In the last decade a growing number of environmental scientists have advocated economic valuation of ecosystem services as a pragmatic short-term strategy to communicate the value of biodiversity in a language that reflects dominant political and economic views. This paper revisits the controversy on economic valuation of ecosystem services in the light of twoa spects that are often neglected in ongoing debates. First, the role of the particular institutional setup in which environmental policy and governance is currently embedded in shaping valuation outcomes. Second, the broader economic and sociopolitical processes that have governed the expansion of pricing intopreviouslynon-marketed areas of the environment. Our analysis suggests thatwithin the institutional setup and broader sociopolitical processes that have become prominent since the late 1980s economic valuation is likely to pave the way for the commodification of ecosystem services with potentially counterproductive effects in the long term for biodiversity conservation and equity in access to ecosystem services.

The ecosystem services concept was originally conceived as a metaphor to reflect societal dependence on ecosystems. However, in the last two decades environmental science and policy have made increasing efforts to value ecosystem services in monetary terms, and to articulate such values through markets in order to create economic incentives for conservation. The growing reliance on economic valuation (hereafter valuation) and related market-based instruments has triggered a heated debate among environmental scientists. Contending views in this controversy range fromthe support of valuation and market solutions as core strategies to solve present environmental problems (which from this perspective are framed as market failures), to an outright rejection of utilitarian rationales for conservation. In between, there is a strategic endorsement of valuation as a pragmatic and transitory short-term tool to communicate the value of biodiversity using a language that reflects dominant political and economic views. The latter has become a prominent position as the environmental movement attempts to look for novel conservation strategies where traditional ones have failed to halt biodiversity and habitat loss. In this paper, we revisit the valuation controversy in the light of existing institutional structures for environmental governance to develop a critical perspective on the links between economic valuation and the commodification of ecosystems services.
The concept of commodification refers to the expansion of market trade to previously non marketed areas. It involves the conceptual and operational treatment of goods and services as objects meant for trading. It describes a modification of relationships, formerly unaffected by commerce, into commercial relationships. Commodification of ecosystem services thus refers to the inclusion of new ecosystem functions into pricing systems and market relations.
Why is commodification an issue? There are several lines of criticism of the commodification of ecosystem services. The most intuitive critique posits that for ethical reasons some things ought not to be for sale. This controversy around commodification concerns where to draw the line demarcating the commodity frontier ? i.e. what should be within the sphere of markets and trade and what should not. In fact, material elements of nature have been sold as commodities since the birth of markets and few contributions criticize commodification in its totality. The main issue is where to set the limits of commodification in the realm of ecosystems and wildlife.
A second line of criticism concerns the alleged effect of commodification as complexity blinder and mystification. This is manifested by the masking of critical processes underlying the production of ecosystem services behind the homogeneity of monetary figures, thereby transforming a symbolic value into an objective and quantifiable relationship.
A third line of critique concerns problems involved in the treatment of things that are not produced by humans as commodities. The commodity fiction presents serious technical difficulties at the operational level. The first of them stems from the interrelated nature of ecosystem functions and services. Recent research on ecosystem services has stressed the need to establish discrete

and well-defined ecosystem service units that can be incorporated within economic accounting systems. The attempt to compartmentalize ecosystem services as discrete units, however, is at odds with the fact that ecosystem functions are inextricably linked to each other. In words of Georgescu-Roegen, this would correspond to an attempt to frame as an artimomorphic concept (i.e. a concept with discrete and well-defined limits) what in reality is a dialectical concept (i.e. a concept with overlapping, interactive and diffuse borders). It therefore reflects an attempt to fit the complex nature of ecosystem functions into a mechanistic analytical.

A fourth line of criticism is political in nature, and addresses equity issues involved in the commodification process. Commodification turns ecosystem services that in principle were in open access, public or communal property into commodities that can be accessed only by those having purchasing power. This involves a substantial institutional and social change that we can evaluate positively or negatively depending on our normative ideology. For example, from the political ecology perspective, commodification is assumed, rather than empirically proven, to be socially undesirable, because by institutionalizing differential access to ecosystem services according to the ability to pay, commodification is likely to exacerbate social inequalities.

We believe that the idea of ecosystem services is a powerful concept that can advance the ontological position that ecosystems are not only a matter of ethics and aesthetics, but also a basic condition for human life and subsistence. Furthermore, we feel that economic valuation can be a potent information tool when not used as a single decision making criteria (e.g. Cost Benefit Analysis), and if used alongside other valuation methods that capture the non-economic value dimensions of nature. Our criticism is not directed at the ecosystem service concept itself, not even to economic valuation in its totality. Our criticism is aimed at the idea that economic valuation can capture a comprehensive picture of nature's societal value and at the belief that economic valuation can solve the problems and shortcomings of traditional conservation. More specifically, we claim that within the ideological, institutional and economic context in which ecosystem services science operates it is not realistic to assume that monetary valuation can be used without acting as a driver of commodification. Appraisal of valuation cannot be detached from the analysis of the sociopolitical processes through which the market expands its limits and through which economic value colonizes new domains. Monetary valuation of ecosystem services does not equate to commodification of ecosystem services, but it paves the way (discursively and sometimes technically) for commodification to happen.

In conclusion. Economic framing of the environment and monetary valuation methods cannot be considered neutral tools. Concepts like natural capital and ecosystem services set human-nature relations into one of utility and exchange, thereby expanding the economic rationality of the profit calculus into the sphere of ecosystems and biodiversity. Similarly, valuation methods frame choices within a narrative of scarcity, efficiency and profit, and therefore often serves as discursive framing and metrical technology for the commodification of ecosystem services Through the effort it has put into monetary valuation and market-based instruments, the ecosystem service approach has served, often against the will of its promoters, the market conservationism agenda of ecosystem services commodification. This is the tragedy of wellintentioned valuation.

Agri-environmental designs: failure of substantive efficiency appeals for procedural effectiveness

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The purpose of this contribution is based on a retrospective account of three decades of agri-environmental policy in France by paying attention to the design and implementation of dedicated settings. Based on a theoretical framework ofDispositifcrossing system thinking, organisation studies and environmental sociology, we claim that many agri-environmental settings have been grounded on principles of public action that were muddled through substantive rationality, while conflicts of value were being smoothen by sustainable development discourses. Nevertheless, collective action has occurred leading to outcomes that have been poorly assessed and impacts rarely accounted. This situation has convoked many critiques, but it also calls for a reflexion on the design of agri-environmental. This is particularly the case when uncertainty and lacks of knowledge are blurring the definition and the measurability of objectives. It calls for the need to put procedural effectiveness first, and to elicit the consequences of that orientation.

Differentiating Payment for Ecosystem Services arrangements as a necessary step to discussing their strengths and weaknesses

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Summary:

Nowadays, the acronym PES (payment for ecosystem services) has become an omnipresent concept in the funding of environmental projects, in scientific publications as well as in arenas where environmental and developmental policies are discussed.
Companies, politicians, NGOs, donors and researchers all use this acronym and comment on it. However, the concept only gives the appearance of being a specific and operational notion. So what are the particularities of PES? How does this instrument compare with other available environmental management tools? What are its strengths and weaknesses? To what extent could PES arrangements be widely applied as funding tools for environmental policies?
By answering these questions, this paper offers an in-depth reflection on the PES concept and provides a fundamental key to improved understanding and use of this tool.

Abstract:

The acronym PES (payment for ecosystem services) has become an omnipresent concept in the funding of environmental projects, in scientific publications as well as in arenas where environmental and developmental policies are discussed. Companies, politicians, NGOs, donors, researchers all use this acronym, and comment on it. However, the concept only gives the appearance of being a specific and operational notion.

The implementation of PES «tools» has produced a plethora of management arrangements which may puzzle any observer. To illustrate this, let us consider two actual examples of a PES, one in Mexico, and the other in Tanzania.
Faced with intensive deforestation and over exploitation of their aquifers, the Mexican government launched a national program of payment for hydro-environmental services in 2002. In 2010 it devoted several tens of millions of euros to this program. Every year a tender is launched by the CONAFOR (Comision Nacional Forestal), the Mexican governments body in charge of forest management. Landowners wishing to participate are requested to present their proposals to the CONAFOR.They are selected according to a set of predetermined criteria. The CONAFOR then negotiates multi-annual contracts with a number of landowners who are paid to maintain the ecosystem in a defined area of forest cover.
The second example occurred in Tanzania. In a plain of the northern region, farmers, usually from outside came in and started to cultivate land bordering a national protected area. They tended to supplant the native Massai pastoralists and posed a direct threat to zebras and wildebeest whose annual migration became perturbed. Confronted with this situation, a local tour operator, a hotel, a conservation consultant and a researcher proposed an annual fee of two thousand five hundred euros through the intermediary of a local NGO to one of the villages bordering the protected area, provided they didn't cultivate the land, or allow anyone else to do so. The proposed contract with the village was for a period of five years. The village council agreed, and then used the fees from the first year to recover legal property rights on land that had been illegally cultivated by a trespasser.

Not only do the actors, the financial sources, the volumes, the mechanisms proposed, and the scales of implementation reveal striking discrepancies, but the diversity of PES initiatives

illustrated in these two examples raises a number of important questions. Should any payment for maintaining an environmental service be called a PES? Almost all actions for environmental purposes could then be considered as such. However if we take the most common definition of PES as defined by Wunder, there would be no «real» existing PESs. According to Wunder, a PES is characterised as a voluntary transaction organised between a payer and a provider on a clearly defined service and matched to specific conditions. Such an arrangement is particularly rare as these criteria are rarely brought together. As emphasised by Wunder himself (2005): «If our field search thus produced barely any ?true PES hits' is it perhaps because the above PES definition was too narrow?»

Confronted with this lack of clarity, how does any actor wishing to participate in financing the preservation of the environment, and more specifically the biodiversity, can tackle this mechanism? What choice of PES might they make from this unclear range of arrangements? What are the strengths and weaknesses of the system they will be bound to implement? These are the questions any financial organisation, whether it be an NGO, a donor, or a government or private sector entity is facing if it wishes to implement this tool wisely.

By answering these questions, this presentation offers an in depth reflection on the PES concept and provides a fundamental key to improved understanding and use of this tool.

First of all : what are the specific features of PES ? PES are instruments which aim at protecting the environment by inciting the ecosystem service producers to voluntarily alter their practices by offering them payment. These features give PES a specific position within the scope of public environmental policy instruments. It differs from prescriptive or coercive approaches, such as regulatory instruments where producers are required to pay to offset any environmental impacts they cause.

Secondly, on the basis of the definition given above, and in order to understand the mechanism we are dealing with, this paper will describe the general operation of the PES system. These systems rely on a combination of various actors including some kind of payers, ecosystem service (ES) producers and intermediaries. Each of these actors requires a specific presentation to identify each of their roles.

Third point, the archetypical PES approach consists of a voluntary, contractual and bilateral agreement entered into by a group of ecosystem service beneficiaries and a group of producers. Although there are numerous examples of this approach, a great number of PES systems differ, especially when payments are not voluntary any more and even more so when payments come from mandatory taxpayer contributions. This assessment has led us to define and illustrate a « mapping» which positions each type of PES in relation to one another. This «mapping» constitutes the major outcome of our research. Based on what is really expected from these PES systems, we propose to differentiate them according to two criteria :

Is the payer voluntary, or compelled? Is the payer specifically an ES consumer, or not necessarily?

Four subsequent categories stem from this differentiation :
PES where the payer is voluntary and an ES user. PES where the payer is voluntary but not necessarily an ES user. PES where the payer is compelled and an ES user. PES where the payer is compelled and not necessarily an ES user.

The final step of this paper is to be aware of these differences, and on the basis of the mapping, to relevantly discuss the precise strengths and weaknesses of each PES arrangement, in order to define them and implement them more effectively.

To conclude, this research suggests that the attraction of PES systems comes from their ability to mobilise economic agents, associative intermediaries, public, and financial entities/bodies. Their main features are pragmatic. In certain circumstances they can provide functional, sustainable and profitable arrangements to partners. However the conditions for their widespread adoption remain problematic: (1). Dependency on the States sovereignty related powers, (2). Potential difficulties in overcoming the pilot project stage, (3). the risk of diverse adverse effects, etc. Such difficulties hinder the PES systems potential to establish conditions that will profoundly change environmental policies in Developing Countries (DCs). Caution and pragmatism are therefore to be favoured. Furthermore PES arrangements should be viewed as monetary transfers

which form part of an existing, effective transfer network constituting an areas economy, but which are far from being consistent. In that sense, PES systems could help us go further in understanding the coherence of money transfer policies targeting environmental objectives aiming at effective, sustainable development.

A management perspective on economic tools for biodiversity

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Abstract
Tools approaching biodiversity management issues in monetary terms, especially Ecosystem services valuation (ESV), or through monetary instruments (like Payments for ecosystem services (PES), easements or biodiversity banking) are routinely seen as economic tools, and assigned to economic theory to guide analysis and action. By contrast, we see them, both analytically and pragmatically, as management tools, to be analyzed essentially in view of multidimensional management situations and mechanisms. Based on an extensive review of the actual use of such « economic tools», the paper identifies the multiples difficulties met in implementation and shows the benefit of diagnosing them alongside with similar, non monetary-based environmental management tools.

Summary

Economic tools for biodiversity (ETB) have been discussed for decades. They have recently been promoted with increasing zeal and now enjoy much visibility in debates on how to manage the biodiversity crisis. ETBs include both tools that use monetary valuation for decision-making support (Ecosystem Services Valuation ? ESV), and tools that involve actual monetary payments. Of the latter, we have considered essentially three types. Payments for Ecosystem Services (PES) - ecosystem services users making payments to ecosystem services providers. The purchase of land-based rights (either of some rights only, through easements, or of the whole bundle of rights associated with land ownership) consists in intervening in land-ownership markets for biodiversity management reasons. Biodiversity banking is an extension of offset systems: operators causing damage to biodiversity through projects (e.g. housing development, mining, infrastructure) can purchase compensation from operators who have developed a biodiversity-supporting project precisely for the purpose of selling them as compensation for biodiversity-damaging projects.

The paper will expand on some of the results from a research project that has focused not on the economic rationale for such tools, nor on their potential for deployment from an environmental economics perspective, but on the actual use of such tools on the ground[1]. The project's aims were (1) to acquire a systematic and detailed overview of the issues raised by actual implementation of ETBs and (2) to propose a new research strategy for the study of ETB implementation for biodiversity management. The project's methodology was based on (a) a systematic review of the literature, centering on evidence of, and issues relating to the actual use of ETBs on the ground, (b) a series of interviews with academics and ETB-users (or potential users) and (c) an in-depth examination of theoretical resources that may be mobilized for in-depth analysis of actual use of ETBs for better management of biodiversity on the ground.

Implementation of ETBs: very limited, or very different from environmental economics principles

A first salient result from the review of ETB use is that the high visibility currently enjoyed by ETBs contrasts with the low level, or the mediocre understanding, of their actual implementation on the ground. Starting with ESV, a recent systematic review of the literature («Use of ecosystem services economic valuation for decision making: questioning a literature blindspot», Laurans et al., submitted) shows evidence of actual use for decision making is very scant. This may be due to various biases leading to under-documentation, but quite possibly also to very low levels of actual use of ESV in actually making decisions about the environment. Regarding PES, many schemes exist in practice, but systematic review shows that a vast majority of cases falls completely short of the archetypal definition of PES as provision of services on a market (http://www.sylvamed.eu/docs/07-VA-A-Savoir.pdf) and rest on quite different mechanisms. Purchasing land-rights has been a tool for biodiversity management for a long time. The environmental economics literature, however, discusses mostly the partial acquisition of such rights (easements) whereas the issues raised in using the tools are largely similar whereas one purchases part of the bundle of rights associated with land ownership, or the whole bundle of

rights. The overall understanding of the issues in implementing such tools is quite limited in the literature. Finally, whereas biodiversity banking, as a new item in the tool box gets a lot of coverage (both promotional and crictical), actual examples on the ground are very few indeed. The bulk of the literature rests on a handful of cases.

No need for a specific ETB toolbox: the compartments in the environmental-management toolbox will do

Beyond this overview of the state of use of ETBs, the project has allowed to identify precisely the specific issues and difficulties that practitioners have to face when endeavouring to use each type of ETBs on the ground. These issues and difficulties are very different from one type to the other. On the other hand, seen from the perspective of how they play out in the field, and what function they can serve in actual biodiversity management arrangements, each of the four types of ETBs we have studied appears to be closely related to some of the wider, non-economic, tools of biodiversity management.

ESV is part of the wider category of environmental indicators. It is, in effect, a monetary indicator. The considerable difficulties met in actually using ESV for making decisions are essentially the same that confront the implementation of biodiversity indicators. Root causes of such difficulties are shared, for instance the reliance on an unrealistic view of how decisions are actually made, or of how they could, or should be made (Ecosystem services economic valuation, measurement or advocacy? Towards «utilization-focused» valuation ««Laurans and Mermet, submitted).

PES is part of the wider category of contractual tools and arrangements. The critical issues in implementation are essentially those of striking ? and implementing - deals between actors with diverging interests and perspectives confronted to one another in the management of a given territory or limited resource. Relevant analyses and capacities come mostly within the competency of strategic, negotiation or governance approaches.

Easement and land-purchase raise issues very similar to other biodiversity management tools based on land-control by a specialized operator, especially protected areas. Before acquisition, acceptance by other actors is the central issue (the a priori impression of a market transaction independent from other stakeholders than the buyer and seller is absolutely not confirmed by field cases). After acquisition, long term viability of land-management arrangements and management of relations with multiple stakeholders become the central concerns, both for protected areas and in managing a portfolio of acquired land and land-rights.

Finally, biodiversity banking is an extension of offsets, which are themselves an extension of the whole mechanism of environmental impact assessment (EIA). Examining the existing biodiversity banking schemes shows that the entire system demands very strong political commitments to environmental regulations, high levels of involvement of administrative organizations and personnel in their enforcement, and high levels of technical input into administrative and legal decision-making. Biodiversity banking is not an alternative to the regulation- and expertise-based system of permitting. It is rather a way of pushing it to its acme.

Conclusion

In the context of biodiversity management on the ground, i.e. of management situations, strategies and arrangements, ETBs are more closely related to various other, non-monetary, biodiversity management tools, than they would be to one another under the category of «economic» tools. There is no need for a separate «economic tools» toolbox, and implementation issues will be best understood by relocating clearly each economic tool in the specific, wider category of biodiversity management tools to which it belongs in terms of its managerial foundations and practical functions. These findings from literature reviews, interviews and cases confirm the relevance of our wider, theoretical, project: to uproot ETBs from the background of economic theory and market dynamics to which they are routinely ascribed, and to posit them clearly in the context of the (multi-dimensional) environmental management situations, strategies and arrangements that will condition their feasibility and relevance for acting on the biodiversity crisis

[1] «Economic Evaluation Methods and Instruments for Biodiversity (ETB) : how to analyse their contexts of use and implementation?», SSEE (Oxford University) / AFD, 2011-2013, L. Mermet, Y.Laurans, T.Leménager.

Evaluation of the FSC Forest Certification Scheme from an Environmental Effectiveness Perspective: Methodological Challenges and Proposals

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Voluntary multi-stakeholder instruments such as certification schemes have played an increasing role in global environmental governance. Implemented for nearly two decades, the Forest Stewardship Council is emblematic of these new forms of private environmental governance based on market values. It has emerged as one of the most promising solutions to global forest concerns. Although there have been many studies on the impacts of FSC, this remains a controversial and contested issue. Drawing on a critical review of the methodologies used to date to assess the impacts of forest certification schemes, this paper identifies three challenges that evaluation scholars have to address in order to assess the FSC scheme in terms of environmental effectiveness: developing a point of reference to which certification measures must be compared; extending and contextualising the scope of the evaluation; and analysing all effective management measures that contribute to obtaining the environmental result observed before examining the specific role of certification. The paper then shows why the concern-focused evaluation framework appears to offer some interesting perspectives for addressing these challenges.

Three conceptual tools for CSR - of which only one (externalities) is traditional - and inappropriate

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THREE CONCEPTUAL TOOLS FOR CSR
OF WHICH ONLY ONE (EXTERNALITIES) IS TRADITIONAL - AND INAPPROPRIATE

Externalities are usually considered (at least by economists) as the most efficient tool to take into account all the dimensions of CSR, especially the environmental ones. Quite apart from the practical problems, we suggest that, even if it is a pedagogical second best, it could not be the main foundation for CSR. We will refer to what we shall call the Tirole's dilemma : if all the external effects could be computed according to the «Stakeholder view» of the firm, then that view would be unnecessary : the «shareholder-view», cleverly amended, would do the job. So, if we need the stake-holder view (modelized through externalities), we can't use it; and if we can use it, we don't need it.
The deep problem which is revealed by this dilemma is the awkward postulated symmetry of all stakeholders, in spite of their obvious apparent specificity (shareholders, creditors, labour, sub-contractors, neighbours, public authorities, and ... nature). Even if the notion externality generates more specific problems, nevertheless, we have already got the hint that we need a theory of the firm more coherent and analytically more powerful than the stakeholder model.
The two other tools suggested come, directly or indirectly, from the so-called Bernardins-project. The 1st new tool is the concept of «common» or «common good», as studied in political philosophy (Arendt, Esposito) and social science (Boltanski & Thévenot, Oström), which suggests that a firm should be studied as a political entity of a new kind. In the Bernardins-project, that notion is the key to a renewed approach to the question of «responsibility», with the mediation of a 3 rd term : «power», but defined within Law, as the opposite of a subjective right (like property right). This last term is quite useful to displace the conventional wisdom according to which shareholders would be the owners of the firm. If they are not (cf Robé, 2010), then the legal personality comes to the fore, as a political entity of its own, because no one is its owner (exactly as no one is the owner of the state ? another legal person, albeit public) and it is endowed with much power.
That notion of «common» will be combined with the 2nd new tool, borrowed from Herbert Simon's science of the artificial: an artifact is the interface between an inner environment and an outer environment. By asking for what is «common» between both environments and their interface, we prove economists can make some steps toward laying foundations for CSR, much stronger than what can be drawn from the sole notion of externality. One consequence is that we should rely less on soft law than is currently suggested, and on the contrary we call for a renewal of hard law.
References
ARENDT, Hannah,The human condition, University of Chicago press, 1958
BOLTANKI, Luc et THEVENOT, Laurent,De la justification, Gallimard, Paris, 1991
ESPOSITO, Roberto,Communitas : origine et destin de la communauté, PUF, Paris 2000
OSTRÖM, Elinor,Governing the commons, Cambridge university press, 1990
ROBE, Jean-Philippe, « The legal structure of the firm »,Accounting, Economics and Law ? a convivium, December 2010, 1st issue
ROGER, Baudoin (ed.),L'entreprise: formes de la propriété et responsabilités sociales, Lethielleux-Collège des Bernardins, Paris 2012
SIMON, Herbert,The sciences of the artificial, MIT press, Cambridge, 1981
TIROLE, Jean, «corporate governance»,Econometrica, 69(1), January 2001, 1-35
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SOCIAL RESPONSABILITIES: FROM A STAKEHOLDER TO A MANAGERIAL THEORY OF THE FIRM

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For years, research has worked on corporate social responsibility (CSR) to incorporate social and environmental objectives into management practices. Its has shown that companies can increase their impact on society whilst remaining economically sustainable (Capron, 2007; Carroll, 1991). Yet, the present crisis reveals that the results are clearly mitigated: firms do not pay enough attention to the environmental externalities.
In the literature, the reason for these limitations is often found in the logic of «voluntary ethics ». According to many authors, this logic could be historically justified (Marens, 2008) but it would result in a logical trap: either the socially desirable activity is profitable, and then CSR is irrelevant. Or it is not, and then company should be required by law or regulation to undertake it (Karnani, 2011).
In this paper, we would like to examine another hypothesis of the limits of CSR: instead of debating on the voluntary or compulsory consideration of environmental responsibility, we wonder whether the CSR research hasn't been trapped in a restrictive theory of the firm. Isn't a renewal of the theory of the firm needed to address environmental issues?
The paper will make three proposals:
- First, the research on CSR has usually not questioned the legal framework of the firm. It has striven to integrate various stakeholders within the normal strategy of the firm, or to demonstrate the compatibility of traditional economic reasoning and social responsibility, for instance by trying to show the strategic value of responsible behaviour (Margolis et Walsh, 2003). Instead of challenging the classical approach of the firm, the research has proposed a stakeholders-oriented interpretation of the corporate law (Blair et Stout, 1999): in law, the directors would not be agent of shareholders but would be in charge of balancing the often competing claims and interest of the all the different constituencies that contribute to the team production process (Lan et Heracleous, 2010).
- Yet, ultimately, the managers are accountable solely to shareholders(Kaufman et Englander, 2005). This system, by its very nature, is liable to create an imbalance in governance. In our view, the current legal framework does not allow companies, except in very particular conditions, to behave in a responsible manner.
In these conditions, the research needs to investigate alternative approaches. The role of management and its effects have been underestimated by the stakeholder theory of the firm. Following Berle & Means (Berle et Means, 1932; Segrestin, 2011), the analysis of the role of modern management call for new governance principles in the firm. In effect, we show that considering the role of management leads to revise the scope of the firm without including all stakeholders, but by differentiating the participants according to their degree of commitment. And we discuss the managerial and legal implications of a managerial theory of the firm regarding environmental issues

How Karl-William Kapp was received by economists

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If he is considered a major author by environmentalists and CSR theorists, Karl William Kapp is ignored by "mainstream" economists, even by those dealing with externalities and social costs, two concepts to which he significantly contributed.
The purpose of this communication is to understand this ostracism by returning to the reception of his book (The social cost of business enterprise) when it was published in the early fifities. It has been reviewed in several magazines at a time when neoclassical orthodoxy did not hold the hegemonic position it has since conquered. Most of his reviewers criticize an holistic and "philosophical" approach that Kapp mainly developed later on in several papers, especially in a book, Towards a science of man (1961), in which he develops an in depth critique of neo-classical economic theory.
This analysis helps relocate his thought in the intellectual context in which it was formed against Ludgwig von Mises (a member of his dissertation committee) and Friedrich Hayek, in the context of a reflection on planning, and with Karl Polanyi, Adolph Lowe, Arthur Cecil Pigou and John Maurice Clark, in the context of a reflection on the embedding of the economy in society.

Carbon Finance or the price-value myth caught in the act of ineffectiveness

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Prometheus believed he could harness the forces of nature. Our western regulators and supervisory authorities thought that the implementation of carbon trading would automatically reduce carbon emissions. However, as Perthuis & Petit (2005) state, «The financial market is intrinsically neither perverse nor virtuous. It is what the players make of it.» The promethean myth continues in the ideology of price and value: for an object to be preserved, it must be given more value. More than this, to extend the lifecycle of a product and its market, liquidity must be guaranteed, trading must be maximised. Trade becomes more important than the object. Filippi, the former president of CCF ? HSBC France confirms this, stating that: «the ideology of liquidity and the determined progress of the self-regulated market illustrates nothing other than the fatal assault of price on value. As long as a tradable object can be given ? on a real market ? an unquestionable price, then this price becomes value, and eliminates the necessity for the object.» If we are justified in denouncing triple-embeddedness ? society is embedded within the economy, which is itself embedded within finance (Fimbel and Karyotis, 2011, 2012) ? which has developed over the last thirty years under the influence of the extreme financialisation of our economies, we can doubtless speak today of quadruple embeddedness. In this notion we include the biosphere, which can be viewed either a heritage that it is vital to preserve or merely a pool of resources to be turned into profits and exploited. The initiators of carbon finance believed in the benefits of negotiating pollution rights even if, as Juvin taking up the ideas of Polanyi (1944), deplores, « There is something monstrous about making nature part of the economic system, and even more monstrous in hoping that it will become a product like any other.»
Even more than this, in the name of facilitating trade and ensuring the holy grail of liquidity, financiers used the technique of securitisation (a financial arrangement to make an illiquid asset liquid), which became notorious with the subprime crisis; according to the Prada report of 19 April 2010, the first three Collateralized Debt Obligation instruments appeared as early as 2008 in carbon finance.
In this contribution, we propose first of all to study, how the neoliberal trend of hyper-financialization and its corollary, the marketization of the economy, have enabled the promethean myth to establish itself at the heart of the biosphere, through the development of carbon trading. Then we will study the practices of these markets, practices that appear paradoxical, at least when we analyse them conventionally, but which also seem to unify two types of debt that have become unsustainable, environmental debt and financial debt. In other words, are not the CDO for CO2 and the CDS ? Credit default swap ? simply the consecration of the notion of «a market for everything»? Finally, we will ask whether it is necessary to go beyond traditional analyses if we are to really understand the degree of responsibility of unbridled liberalism in creating the multi-faceted crisis that the whole world has been struggling with since 2007.

Neither Internal, Nor External: Understanding Corporate Governance Failures in the Financial Sector

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Why do the corporate governance problems of greatest concern persist in the financial sector, even if there have been seemingly prominent proposals for governance reforms? The paper argues that the current modes of thinking in corporate governance, either inward-looking or outward-looking, are severely limited. The causes of corporate governance problems are not purely rooted in the internal governance structures or external institutional environments alone. Rather, they reside in the interlinkage of internal and external governance systems, where corporate governance is «captured» in practice. The paper suggests that a critically-reflexive mode of thinking is needed to facilitate our deeper understanding of fundamental governance problems.

The development of bio-agriculture in the Candidate Countries between challenges and opportunities. Results of a survey on the situation in Serbia

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Abstract. With a decision of the European Council, by March 2012, Serbia became Candidate Country. This status entails the need to undertake a process of harmonization with the criteria set by the European Union. For Serbia, the sector of bio-agriculture could represent a point of strength in this process of transition. In fact, Serbia's potential lies in competitive natures, abundant agricultural land and long agro industrial tradition. The capability of the operators in this sector to take advantage of opportunities arising from the European Union depends on a set factors related to the structural and organizational setting of business, to the level of preparation of human resources, as well as the support role of national government and financial institutions. This paper presents a survey which aims to map the drivers that influence this capability from the perspective of farmers and agricultural entrepreneurs which, for this purpose, have responded to a specific questionnaire. The results of the survey represent the possibility to give voice to the needs of those who actually has to face a moment of historical changes.

Integrating the role of participatory action research and governance into resilience and socio-ecological assessment

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Summary
Most previous adaptations have been based on technical solution or policies that deal with either the current natural resources or the physical infrastructure. The belief is that this approach will effectively improve the resilience of a community. Little space remains to examine the social-ecological factors that could influence decision and effectiveness in any types of actions. Using coastal communities, we examine novel governance forms through a participatory action research process and co-construction, to reduce their vulnerabilities and enhance their resilience. Our operational model was developed based on six aspects of resilience and eight dimensions of sustainable territorial development. Amoeba representations can visualize the 48 interfaces of this model or in a desegregated way to evaluate how PAR may influence globally community resilience.

Abstract
In 1973, the ecologist Holling suggests that the??resilience determines the persistence of relationships within a system and is a measure of the ability of these systems to absorb changes of state variables, driving variables, and parameters, and still persist"(Holling 1973, p.17). Coastal ecosystems are fragile and subject to impacts that are caused directly by various human activities, or indirectly due to changes and damage linked climate change (Delusca, Vasseur et al. 2008). The need to enhance the resilience of these socio-ecological systems is primordial.

1. How to address the resilience of social-ecological systems?
An innovative way to address adaptation to these impacts are to use Participatory Action Research (PAR). Its originality lies in taking into consideration uncertainties, conflicts, social representations, local knowledge, stakeholder interactions and capacity building to deal with resilience. Through PAR it is possible to define modes of governance and adaptive strategies to climate and environmental changes based on co-construction and co-production i.e., the development of solutions by partnership and dialogue between various stakeholders and researchers. The strength of this approach is based on recognition of the need to involve stakeholders from the beginning of the process of analyzing vulnerabilities and potential adaptation strategies to the end of the decision-making process and implementation of solutions (Smit and Wandel 2006). As this PAR approach integrates co-construction and co-production, individual and collective learning and institutional transformations coming from this process can promote the emergence of sustainable changes in socio-ecological systems (Reason and Bradbury 2006).

2. How to effectively assess the effectiveness of any socio-ecological resilience actions?
This interest of engaging civil society in public policy decision-making has significantly increased in recent decades (Rowe and Frewer 2005; Faget 2006). Assessing and monitoring such processes and their effectiveness however has been a challenge that few have tackled. The evaluation of participatory processes (PP) has so far focused on the internal dynamics of PP or their immediate context of implementation. Measuring procedural effects of PP and how communities may have influence the decision making process remain a challenge (Bherer 2011). In the case of climate change adaptation and improvement of resilience of communities, we hypothesize that it is possible to evaluate the effects of PAR over time by measuring changes in the level of resilience within these communities. In this project, we have built an operational model to monitor and assess the changes in level of community resilience using a grid of indicators. This grid allows assessing and monitoring resilience over time during the use of PAR.

In order to effectively assess the effectiveness of any actions in the socio-ecological systems to improve resilience using PAR, we first dissect the concepts of resilience into dimensions and aspects. Following the Holling's definition, several academic works highlight different aspects of resilience (Horne III and Orr 1997; Carpenter, Walker et al. 2001; ISDR 2005, for example; Folke 2006). Eight aspects of resilience -considered as keystones for resilience when a hazard occurs - have been extracted from literature. They are: absorption capacity, ability to recover, ability of adapting behavior, capability to innovate, capability of self-organization, learning process, acceptance and management of risk uncertainty and capability to anticipate.
These aspects of resilience are in perpetual interaction and will influence each other in a socio-ecological system (endogenous or exogenous factors). We argue that these factors relate to six dimensions of sustainable territorial development (STD): social sphere (psychosocial and social dimension), environmental sphere (ecosystem-based dimension), economic sphere (economic dimension) and governance sphere (territorial governance and government).

3. Implementation and interpretation of the operational mode
In this project, we will evaluate the level of resilience of nine targeted communities of Atlantic Canada to climate change by measuring through interviews these six dimensions of the STD with our eight aspects of resilience. Our operational model is built in the form of a short list of simple or composite indicators for all these interfaces between the STD dimensions and aspects of resilience.
An integrated approach requires that the selected indicators are representative of all components to be considered. In our case, those of the resilience of communities are confronted with a problem created by climate change. The second major challenge concerning indicators is their expression in a simple way that can help understand and explain the origins of the potential positive and negative effects of PAR.
The Amoeba approach (Ten Brink, Hosper et al. 1991) seems to be a promising approach to integrate all this information in a more global visioning, which will help understand the transformations of our aspects of resilience. A series of Amoeba representations that can include a general one representing the 48 interfaces or more specific ones that include either the dimensions or the aspects can be built for more accurate analysis. A global change, either in the dimensions and aspects, will give us insights on the reasons for improvement or deterioration of the level of the resilience in a community and we will provide guidance on which components may need to be improved for greater resilience.
In addition to the monitoring of the PAR processes, amoebae representations may also help communities in their decision making as they can envision different adaptation strategies and analyse how the interfaces could vary globally. In this context, several dimensions and aspects must be considered in order to obtain consensus on the one hand, and the participants in the communities will be able to visualize their initial Amoeba and decide together how to focus their efforts in function of the various options. We strongly believe that these tools from PAR to Amoeba model can help communities to become aware of the conditions in which they operate and, depending on the selected options, visualize the consequences that these decisions can have on their communities.

Bherer, L. (2011). "Les relations ambigües entre participation et politiques publiques." participations 1: 105-133.
Carpenter, S. R., B. H. Walker, et al. (2001). "From metaphor to measurement: resilience of what to what?" Ecosystems 4: 765-781.
Delusca, K., L. Vasseur, et al. (2008). "Marées de tempête et communautés à risques dans le sud-est du Nouveau-Brunswick: Cas de la communauté de Pointe-du-Chêne." Revue Canadienne des Sciences Régionales XXX(1): 19-38.
Faget, J. (2006). "Médiation et post-modernité. Légitimation ou transformation de l'action publique ?" Négociations 6(2): 51-62.
Folke, C. (2006). "Resilience: The emergence of a perspective for social?ecological systems analyses." Global Environmental Change 16: 235-267.
Holling, C. S. (1973). "Resilience and Stability of Ecological Systems." Annual Review of Ecology and Systematics 4: 1-23.
Horne III, J. F. and J. E. Orr (1997). "Assessing behaviors that create resilient organizations." Employment Relations Today 24(4): 29-39.
ISDR (2005). Hyogo Framework for 2005-2015: Building the Resilience of Nations and Communities to Disasters. Extract from the final report of the World Conference on Disaster Reduction (A/CONF.206/6). Geneva, United Nations, International Strategy for Disaster Risk

Reduction: 28.
Reason, P. and H. Bradbury (2006). Handbook of action research. London, Sage Publications Ltd.
Rowe, G. and L. J. Frewer (2005). "A Typology of Public Engagement Mechanisms." Science, Technology, & Human Values 30(2): 251-290.
Smit, B. and J. Wandel (2006). "Adaptation, adaptive capacity and vulnerability." Global Environmental Change 16(3): 282-292.
Ten Brink, B. J. E., S. H. Hosper, et al. (1991). "A quantitative method for description & assessment of ecosystems: The AMOEBA-approach." Marine Pollution Bulletin 23: 265-270.

Stakeholders' cognitive pathways and Decision Support System for resilience : case study of a FP7-Theseus's project.

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Risk governance involves a question of representation both in the process of knowledge production and in decision making. This representation has always focused on cognitive pathway constructed by the actors, and based on theoretical paradigms or trace the historical experiences. Thus, an actor perceives the risk in respect to his or her heuristic on this latter. In the context of multi-stakeholder and multi-criteria based-decision risk, the conception and satisfaction of alternatives choices are the crucial moment in the process of decision-making. A priori, this may result in a problem of cognition. In reality, it is fundamentally linked to différentes heuristics resulting in a lack of consensus on risk. In fact, these differences show the failure of deterministic scientific model simplifying the risk process. This model follows a universal formalism following logic paradigm. At the same time, we are now witnessing the emergence of new types of actors denouncing the excessive linearization in the treatment of social problems. These stakeholders want not only to be more involved in the production of knowledge serving as decision making. But also they request more respect for their heuristic and the integration of them into what could influence their behaviors, practices, and methods. Indeed, the decision is to be taken aback by a range of choices within what Paul Slovic (1995) said the "construction of preferences", through theories of behavioral decision research. Or making these choices can focus on what Ortwin Renn (2008) notes as "normative, pertinence and causality claims. Scientists construct their heuristic on the legitimization of rationality and objectivity in risk representation while lay people claim for values, ethics, interests, equity and social justice issues. This is observable in the perception of risk where the problem of cognition seems to be related to the disarticulation between the scientific model called as rational and non scientific model considered as intuitive or emotional. These situations create uncertainty because it leads to how to rationalize choices in decision-making. And observation shows that the differences in the representation of risk can (in case of undecidability), the efficient implementation of public policies for impacts mitigation. This study concern about an European Commission project FP7- Theseus («Innovative technologies for safer European coasts in a changing climate»). We focus primarily on differences in risk representations that structure actors' cognitive pathways and secondly, the conception of a Decision Support System to build social resilience. The objective is to incorporate the complexity in the development of cognitive models on epistemological and methodological aspects of coastal risk for policy makers and managers (end users) in context of changing climate.

Portfolio of resilience options: Operating framework of application of resilience principles to the coastal risk management, case of study: the Gironde estuary

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?'Portfolio of resilience options: Operating framework of application of resilience principles to the coastal risk management, case of study: the Gironde estuary"

ABSTRACT:
The coastal risk management is currently facing a significant rise of the natural disasters combined with a high exposure to hazards at the risk areas level. High frequency and severity of natural disasters, due to climate change impacts, is further amplified by the phenomenon of increasing urbanization and the consequent concentration of persons and goods on areas especially submitted to flood risk. While risk governance approaches call for changes to strengthen resilience at the coastal areas, the associated efforts and measures of current risk management seem to be much more focused on prevention and risk reduction than on the crisis response plans, if risks occurs, and the post crisis management to recover from any eventual impacts. Besides, actions undertaken independently, as various entities are concerned by the risk management, conduct to some adverse externalities which hamper resilience.
In regard of the current context of the coastal risk management, the present article aim to elaborate a portfolio of options to enhance the coastal areas resilience through the application of resilience principles into the coastal risk management.
Resilience, here, refers to system capacity to maintain structural and functional characteristics following a disturbance or a choc. Empirical observations highlights that systemic principles as homeostasis, omnivory, high-flux, flatness, buffering and redundancy enhance the resilience capacity of systems at risks.
Homeostasis: the regulation, through multiple feedback loops, should be integrated at the risk management to counteract disturbances and stabilize the system.
Omnivory: Diversification of resources and means reduce the system vulnerability.
High flux: Faster rates of resources' movement at the system level ensure faster mobilization of these resources to cope with disturbances.
Flatness: local structures involvement at the risk management allows fast, and no standard, responses for unforeseen events. A flexible transfer of competences among hierarchical and less hierarchical levels is likely to cope with surprises.
Buffering: The system capacity to absorb disturbances should be exploited. Till a critical threshold, the buffering allows additional time and means to the risk management.
Redundancy: system should dispose of many copies of the same mean/approach. If one fails, others can take over.
The present article gives an operating framework for the resilience at the coastal areas through the implementation of the systemic principles of resilience within the land use planning, the recovery plans after disruption, the warnings systems and evacuation plans, the insurance programs and the post-trauma management.
We would like to note that the present article is resulting within the framework of the European project THESEUS "Innovative technologies for safer European coasts in a changing climate" of the 7th Framework Programme (FP7).
The data collected is based on field extensive surveys, 38 interviews, with the principal stakeholders concerned by the risk management (environmental planners, land use planner, risk managers, business owners, NGO's, harbor administrator, elected mayors, academic researchers ...etc) and other resources such as THESEUS deliverables and scientific literatures.
The plan of the article:
Introduction
q Problematic and reaserch objectives
q Material and methods
q Results analysis and discussions

q What about resilience?
q Operating framework of application of resilience principles

Conclusion

The application of the resilience principles enhance coastal systems resilience such as homeostasis and buffering offer more capacity to reduce the impacts of disturbances, high-flux promote a fast crisis response, flatness encourage a collective cooperation and stakeholders' synergy and omnivory and redundancy enable a crisis preparedness and a fast recovery from the disaster.

In addition, the application of the resilience principles will contribute to (1) greater reconciliation of tools/measures, towards coherent management, and (2) better efforts distribution amongst prevention, crisis response and post-crisis management: Insurance programs and the Post-trauma management, made basically for financial compensation and psycho-physical injuries reparation, will integrate incentive mechanisms encouraging risk mitigation and decreasing exposure of goods and persons at the risk areas. Land use planning, mainly made for the prevention plans will allow, by the resilience principles application, sustained crisis preparedness and crisis responses capacities. Warning systems and evacuation plans, uniquely dedicated to cope with the risk occurrence, will provide more constant and collective risk awareness.

The Pivotal Role of Exposure in Shaping the Vulnerability and Resilience of SMEs: Theoretical Linkages and Empirical Findings

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Summary:
This paper aims to offer a conceptual framework to understand the inter-linkages between the different dimensions that shape the vulnerability and resilience of small and medium enterprises to climate variations and extremes in two localities in Mexico. The proposed framework was built by empirically testing the theoretical constructs of the two concepts as described in the existing literature. It was found that higher levels of exposure are associated with higher levels of coping capacities. When the examination is done from a post-disaster perspective, experiencing climate events can sometimes grant benefits, as they can trigger a process of self-protection. Moreover, improving short-term coping capacities constitutes a first step to augment the resilience of SMEs in the long-run.

Abstract

This paper aims to offer a conceptual framework to understand the inter-linkages between the different dimensions that shape the vulnerability and resilience of small and medium enterprises to climate variations and extremes in two localities in Mexico. Throughout the years, numerous frameworks have been proposed to understand the vulnerability and resilience of socio-ecological systems, mainly on country, community and household scales in the context of climate change. The majority of these frameworks differ between each other to different degrees according to the specific circumstances they focus on. But when it comes to the business sector, the number of frameworks that have been suggested to analyse its vulnerability and resilience to climate related events has remained small. Regarding vulnerability approaches, the majority has focused on the risks that climate change represents for businesses (e.g. UKCIP, 2004), while others have centred on adaptation processes undertaken by corporations (e.g. Berkhout et al., 2006). In the case of resilience, the number focused on businesses is even more limited. Only a few have emerged in recent years, and they diverge considerably depending on how the notion of resilience is understood (Seville et al., 2006). On the other hand, the great majority of studies have concentrated on examining big corporations, while SMEs have only been marginally taken into account (Ingirige et al., 2008). Moreover, almost all apply to developed nations. Unfortunately, and to the best of the author's knowledge, no research has been conducted on the vulnerability and resilience of SMEs in a developing-country context.

Vulnerability has been conceptualised in many different ways. In the case of business-related studies, vulnerability has been generally framed according to a risk-hazard approach. In terms of its determinants, vulnerability has traditionally been regarded as being a function of exposure, sensitivity and coping/adaptive capacities according to the IPCC (2007) definition. But more recently, the Special Report on Extremes (IPCC, 2012) has suggested that vulnerability is solely determined by the sensitivity dimension (i.e. the propensity to be harmed). On the other hand, the concept of resilience has been equally studied from several perspectives and various definitions have been proposed. Nonetheless, there is not yet a consensus about which are its major components. In this paper, resilience is conceptualised as the capacity to absorb change and «bounce back», not only to an initial state but to a different regime if there are existing capacities to learn and renew (Folke, 2006).

Some researchers have hypothesised that these concepts are not mutually exclusive, but only a few have proposed potential ways to link them. According to Cutter et al. (2008), who have classified the term according to the different connotations it has adopted in the literature, resilience can either be embedded in vulnerability or form an integral part of adaptive capacity which, in turn, can also be nested in vulnerability. However, these authors also consider that both vulnerability and resilience can be separate but linked concepts, and they even propose a framework to analyse them from this viewpoint. Furthermore, contrary to other frameworks (Clark et al., 2000; Twigg, 2007), where resilience and vulnerability are considered as opposites, Cutter et al. (2008) suggest that «they are not mutually exclusive, nor mutually inclusive» (p. 602). Hence, there are elements that belong specifically to vulnerability, others that relate only

to resilience, and still others that may pertain to both. This same posture will be adopted in this paper.

The framework proposed in this paper was built by empirically testing the theoretical constructs of the two concepts as described in the existing literature. Variables were chosen through a theory-driven approach and then included in a paper-based survey administered to 345 SMEs located in two sites in the Yucatan peninsula. Factor analysis was then used to determine each of the different dimensions of vulnerability and resilience, and in this way produce indices of sensitivity, exposure, coping and adaptive capacities, learning and renewal. The literature suggests that indices and indicators represent a common tool for assessing the determinants of vulnerability. They have proved to be very useful, since they allow making comparisons, identifying relevant actors, and detect significant traits.

When empirically exploring the linkages between the three theoretical dimensions of vulnerability (sensitivity, exposure, coping capacities/adaptive abilities), the results illustrate that sensitivity is the only dimension showing negative correlations against all others. In this sense, higher levels of sensitivity are associated with lower levels of coping/adaptive capacities. It can thus be said that when sensitivity grows, vulnerability also does. However, it was also found that exposure shows a positive correlation with coping capacities. Hence, higher levels of exposure are associated with higher levels of coping capacities. This contradicts in some way the general agreement in the literature that states that these two dimensions move in opposite directions. In this sense, it can be argued that when the examination is done from a post-disaster perspective, experiencing climate events can sometimes grant benefits, as they can trigger a process of self-protection. Firms with higher levels of exposure implement more coping measures. The findings do not imply that the definitions given by the IPCC and others are wrong in relation to exposure. On the contrary, the present findings suggest there is another side of the coin that needs to be taken into account, particularly when trying to measure vulnerability. Overlooking it could result in an over-estimation of vulnerability.

Another relevant finding is that there is a relationship between the short-term and long-term actions. The short-term coping capacities are positively correlated to resilience, which constitutes a long-term process. While coping capacities augment, so does the process of learning, renewal and the implementation of adaptive strategies. This suggests that short-term actions, triggered in turn by certain impacts, are a first step to activate a long-term process of learning, renewal and adaptation. In this way, an organisation could surpass its previous level of functioning.

Long-term resilience processes, however, are determined by its sensitivity (i.e. the business characteristics). This fact stresses the importance of reducing sensitivity. Consequently, in order for organisations to adapt in the long-run to changes in their environment, they have to diminish their sensitivity (e.g. increase the access to credit, diversify their market, etc.). And they also have to increase their coping capacities (DRR strategies, external support to recover after the impact of a climate event, such as governmental credit). Strengthening these two dimensions (sensitivity and coping) is the first step to manage current climate events. And at the same time this is the door that triggers long-term adaptations. I therefore argue here that if an organisation cannot cope with certain current stressors, it will enter into a negative feedback loop where it will not be able to foster other abilities and will be forced to end its operations at some point in the future. Therefore, it is essential to reduce a firm's sensitivity and strengthen its coping capacities.

The results from this research contribute by offering a way of understanding how the different dimensions enveloped in these two concepts interact among each other. The findings are also useful to formulate policies to support the adaptation of community enterprises, which are crucial role for the economy. If their existence was to become affected by climate-related impacts, economic development could be compromised.

References:

Berkhout, F., Hertin, J., Gann, D.M. (2006). Learning to adapt: organisational adaptation to climate change impacts. Climatic Change 78(1): 135-156.

Clark, William C., Jill Jäger, Robert Corell, Roger Kasperson, James J. McCarthy, David Cash, Stewart J. Cohen, Paul Desanker, Nancy M. Dickson, Paul Epstein, David H.Guston, J. Michael Hall, Carlo Jaeger, Anthony Janetos, Neil Leary, Marc A. Levy, Amy Luers, Michael MacCracken, Jerry Melillo, Richard Moss, Joanne M. Nigg, Martin L. Parry, Edward A. Parson, Jesse C. Ribot, Hans-Joachim Schellnhuber, Daniel P. Schrag, George A. Seielstad, Eileen Shea, Coleen Vogel, and Thomas J. Wilbanks. (2000) «Assessing Vulnerability to Global Environmental Risks.» Report of the Workshop on Vulnerability to Global Environmental Change: Challenges for Research, Assessment and Decision Making. (May 22-25, 2000), Airlie House, Warrenton, Virginia. Cambridge, MA: Belfer Center for Science and International Affairs (BCSIA) Discussion Paper 2000-12, Environment and Natural Resources Program, Kennedy School of

Government, Harvard University, 2000. Available at http://www.ksg.harvard.edu/sust.
Cutter, S.L., L. Barnes, M. Berry, C. Burton, E. Evans, E. Tate, J. Webb. (2008). A place-based model for understanding community resilience to natural disasters. Global Environmental Change 18 (2008) 598?606
Folke, C. (2006). Resilience: The emergence of a perspective for social-ecological systems analyses. Global Environmental Change, 16 (3), pp.253-267.
Ingirige, B., Jones, K., Proverbs, D. (2008). Investigating SME resilience and their adaptive capacities to extreme weather events: A literature review and synthesis. Working paper. Online http://www.irbnet.de/daten/iconda/CIB11642.pdf
IPCC. (2007a). Summary for Policymakers. In: Climate Change 2007: impacts, adaptation and vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. In: M. PARRY, O. CANZIANI, J. PALUTIKOF, P. VAN DER LINDEN & C. HANSON, eds.: Cambridge University Press, Cambridge, UK.
IPCC (2012) Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation, A special Report of Working Groups I and II of the Intergovernmental Panel of Climate Change [field, C.B, V. Barros, T.F. Stocker, D. Qin, D. J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor and P.M. Midgley (eds)]. Cambridge University Press, Cambridge, UK, and New York, NY, USA, 582 pp.
Seville, E., Brunsdon, D., Dantas, A., Le Masurier, J., Wilkinson, S., Vargo, J. (2006). Building Organisational Resilience: A Summary of Key Research Findings. Resilient Organisations Programme, New Zealand,
Twigg, J. (2007). Characteristics of a Disaster Resilient Community. A Guidance Note. Version 1 (for field testing). Disaster Risk Reduction Interagency Coordination Group. August 2007.
UKCIP, United Kindom Climate Impact Program: Metcalf, G., Jenkinson, K. (2004). A changing climate for business: business planning for the impacts of climate change. UK Climate Impacts Programme. Oxford

Resilience and adaptation of urban systems to cope with and to respond to climate change adverse effects

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Confronted with climate change, cities appear to be spaces at risk, not so much because of their exposure to climatic threats but rather because of their present and future vulnerabilities to such hazards taking into account their limited capacities to cope with or to respond to such events. In the context of urban and climatic co-evolution, this article attempts to clarify, through a systemic, complex and dynamic approach, why planned adaptation strategies aimed at reducing vulnerabilities and enhancing proactive resilience of cities have progressively become in both academic and institutional discourses a key feature, and even a tipping point, for urban sustainable development pathways. In this context, the aim of this paper, essentially theoretical in scope, is double. Firstly, we explain why the adoption of a systemic approach of urban resilience can represent a pertinent framework to envisage the (sustainable and imprevisible) futures of cities in relation with climate change. Secondly, we explore how a complex and dynamic approach of urban resilience can provide a renewed vision of climate disasters and risk management and become a critical condition for an urban sustainable development.

Costa Rican Payment for Environmental Services: Between international and national influence, a feedback analysis

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The program of payment for environmental services (PPES) is one of the pioneer national PES program, and the most analyzed PES schemes (Daniels et al. 2010; Pagiola 2008; Wünscher, Engel and Wunder 2006). Considered as the reference, the discrepancy between the Wunders definition of PES and the actual Costa Rican PES schemes has been discussed. By the way, the Costa Rican experience is analyzed as a PES like scheme, as government and public institutions play a key role in its governance (Muradian et al. 2010). The specificity of this program is that it is rooted in a national law and was institutionalized since its beginning (Le Coq et al. 2013). However it has evolved overtime (Le Coq et al. 2011). Through internal and external feed backs, local and international actors, public and private ones, have interacted to shape it. In this paper, we propose to identify and analyze the influence of internal and external feedbacks that shape the PES functioning overtime.

Based on stakeholder's interviews and a review of grey materials of public or private expertise and consultancy generated around the program, we identify 2 main dimensions of feedback processes that shape the program along its 15 year of functioning: national (internal) and international (external) dimension. Both internal and external dimension are often closely intertwined in what we called the "feedback paths". We identify 5 «paths of feedback»:
1. The monitoring system of the PPES as such. This system evolved under the influence ofEcomercados projects(external) but not only. New criteria and indicators were added for a closer monitoring of the PPES activities. The knowledge produced by the monitoring system nourishes the PPES management but also other studies or evaluations.
2. Technical or scientific studies that instructs PPES academic consultants or local or international. These are often linked to demand or donor or national institutions.
3. PPES capitalizations for wide dissemination mainly targeted to international cooperation actors. Such document tends to build a narrative on PPES, as the pioneering and reference experience of PES.
4. PPES assessments as part of the project cycle World Bank World Bank or other donors to provide financial help to the PPES. PPES assessments by institutions such as Costa Rican general control body of the republic («Contraloria General de la Republica»), as required by the 7575 Act and the PPES statute which is a program that turns public estates.

The feedback path 1 to 3 tend to be a mix of national and international processes. The 4th feedback path is a more international process, linked to the aid programs. The 5th feedback is pure national and seems to be the most influencing on PPES evolution.
The external dimension of feedback processes (international) are based on the activity of a wide range actors: international organizations (World Bank, GIZ...), NGO's (CI, IIED, PRISMA...), and scientific literature (path 3). Its importance is diffuse in the governance of PES evolution.
The internal dimension of feedback processes (national) are based on the strong institutions of Costa Rica such as the General Controller of the Republic (Contraloria General de la Republica) but also on local environmental NGO's or forestry/environmental representatives organizations (ONF,...) and scientific community (CCT). These actors may have strong links with international levels.
Both type of feedback have played an important role in the evolution of PESP. Nevertheless, the internal dimension plays a major role and more directly in changes of modalities and governance aspects, whereas external feedback tends to change some marginal aspects. Moreover, rapid changes occur when the combination of both types of feedback are reinforcing each other in the

same direction.
We analyzed different changes of the PPES: the suppression and reactivation of the forest management PES modality, the change of the status of management unit of PPES, the inclusion of indigenous specific modalities and forest owner without land title, the differentiation of payment, and its targeting, as well as the attention to gender issue in the PPES.
We show that changes in PES modality and management unit status results mainly from the internal feedback, whereas the introduction of indigenous and forest owner without land title as well as diversification of payment and the targeting result from a combined influence from external and internal feedback. The attention to gender is more an adjustment to respond to external feedback.
Finally, we also identify a continuous learning process and lessons drawing from the actors in charge of PPES management. This learning process capacity has been one of the factor of success and sustainability of the program.

References
Daniels, Amy E., Kenneth Bagstad, Valerie Esposito, Azur Moulaert, and Carlos Manuel Rodriguez. 2010. "Understanding the impacts of Costa Rica's PES: Are we asking the right questions?"Ecological Economics69:2116-2126.
Le Coq, Jean-François, Géraldine Froger, Thomas Legrand, Denis Pesche, and Fernando Saenz. 2011.Continuity and Inflexions of the Program of Payment for Environmental Services in Costa Rica: A Learning Process and Stakeholders' Balance of Power Perspective. Paris: Programme Serena.
?. 2013. "The Governance of Costa Rica's Programme of Payments for Environmental Services: A Stakeholders' Perspective." Pp. 67-86 inGoverning the Provision of Ecosystem Services, edited by Roldan Muradian and Laura Rival: Springer Netherlands.
Muradian, R., E. Corbera, U. Pascual, N. Kosoy, and P. H. May. 2010. "Reconciling theory and practice: An alternative conceptual framework for understanding payments for environmental services."Ecological Economics69:1202-1208.
Pagiola, Stefano 2008. "Payments for environmental services in Costa Rica."Ecological Economics65:712-724.
Wünscher, T., S. Engel, and S. Wunder. 2006. "Payments for environmental services in Costa Rica: increasing effciency through spatial differentiation."Quaterly Journal of International Agriculture45:319-337.

Development of ecosystem-services-based policy tools in Cambodia

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Cambodia is characterized by a weak institutional framework (Clements et al. 2010), which makes the enforcement of formal law difficult. This is particularly the case for property rights, which legal system is often locally replaced by a system where access to natural resources (NR) remains either unmanaged or governed by informal private ordering. Besides, externalities produced by the different NR users are rarely taken into account, which result in a situation characterized by a rapid degradation of natural resources on the one side and increased inequalities and social conflicts on the other side.
In this context, the policy response in the conservation and environmental realms has progressively evolved/changed. The notions of Ecosystem Service and Environmental Service (ES) have been key in driving changes from the original regulatory approach, based on a system of protected area, the enforcement of law and the polluter-payer principle (Chervier et al. 2012). These changes materialize, amongst others, through the development of incentive-based mechanisms for the provision of ES (also called PES, Payment for Ecosystem services).
However, these ES-based policy instruments remain scarcely implemented on the ground or at the pilot stage: they fail to reach a wider use, to be replicated or scaled-up. In this context, this paper aimed at shedding light on some of the issues associated with the design of tools integrating the notion of ES in the Cambodian context.
Building on the framework of heterodox institutional economics regarding institutional change and value formation and articulation (Hodgson 2002), the emergence of ES-based institutions is analyzed taking into account the effect of the following aspects: the modification of the conditions of the overall system, the preexisting institutions and path-dependency, the processes of crossing and grafting of institutional principles (especially from abroad), stakeholders' habits of thought and interests, and the political processes and power relations through which these habits articulate.
Rather than being constrained by a lack ofex posteffectiveness ?which has rarely been formally assessed in the country (Clements et al. 2013), we assume that the design and implementation of these tools face a number ofex anteinstitutional blockages at various levels. These blockages limit their scope of applicability, prevent them from being designed and/or used as initially desired and affect their reach and the level of participation/ involvement of target beneficiaries (Milne and Adams 2012).
We conducted about 40 semi-structured interviews with key-stakeholders involved both in the diffusion of the notion of ES in general and the development of some concrete policy instruments based on this notion; we reviewed relevant Cambodian laws and policies connected to the diffusion of the notion of ES in various sectors; we analyzed scientific and grey literature around the notions of PES and ES in Cambodia.
We first give an exhaustive list of the PES schemes in Cambodia, and analyze their broad characteristics (type of target-ES, institutional arrangement, type of payment, key-chronological facts and stage of design/implementation, theoretical or practical reference model...). We show that only a few of these schemes have actually reached the stage of implementation and for these that did, the range of arrangement is bounded and different from the one of the reference models. Then, in order to highlight the underlying mechanisms, we analyze aspects of the design of two cases of ES-based instruments -one Payment for Watershed Services (PWS) scheme on a dam site and one case of certification of wildlife-friendly products. We find contrasting results. The PWS scheme faces significant blockages in its early stages of development, which significantly constraint its design and the subsequent arrangement. These are associated with formal laws in

domains such as financial management of public resources, property rights, energy and investment. They are also linked to the interpretation of these rules by key decision-makers and political processes. On the other hand, in the case of the wildlife-friendly label scheme, blockages occur at the later stages and are mostly associated with conflicts with preexisting local institutions such as the patronage system, and in domains related to property rights, collective action and agricultural products markets.

Finally, we discuss the importance of taking into account various informal institutions at different levels because they are key in influencing institutional changes in the context of weak institutional framework. Further, we stress on the gap between norms and rules underlying preexisting institutions and those associated with ES-based institutions: the concepts of ES, the ES-user-pays principle, decentralized financial management, democratic principles and collective action for local governance, by-law property rights framework. We also emphasize the importance of power relations both at the local and national levels in extending these conflicts.

References:

Chervier C., Neang M., Déprés C. 2012. «Emergence de la notion de service environnemental et des dispositifs de rémunération des fournisseurs. Le cas du Cambodge».Vertigo(http://vertigo.revues.org/). In press.

Clements, T., A. John, K. Nielsen, D. An, S. Tan, and E.J. Milner-Gulland. 2010. «Payments for Biodiversity Conservation in the Context of Weak Institutions: Comparison of Three Programs from Cambodia.»Ecological Economics69 (6): 1283?1291.

Clements, T., H. Rainey, D. An, V. Rours, S. Tan, S. Thong, W.J. Sutherland, and E.J. Milner-Gulland. 2013. «An Evaluation of the Effectiveness of a Direct Payment for Biodiversity Conservation: The Bird Nest Protection Program in the Northern Plains of Cambodia.»Biological Conservation157: 50?59.

Hodgson, G. M. 2002. «The Evolution of Institutions: An Agenda for Future Theoretical Research.»Constitutional Political Economy13 (2): 111?127.

Milne, S., and B. Adams. 2012. «Market Masquerades: Uncovering the Politics of Community-level Payments for Environmental Services in Cambodia.»Development and Change43 (1): 133?158.

Can payments for environmental services be used to reduce local vulnerability?

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Abstract
The concept of payment for environmental services (PES) arises whenever environmental policies and development are being discussed. Great hopes have been placed in it as a way of conserving ecosystems in the countries of the South. As it name indicates, a PES primarily involves payment in order to benefit from the services rendered by ecosystems.

Since the 1990s, nature conservation policies have attempted to add social and economic objectives to their ecological aims. This is particularly true of «Integrated development and Conservation Projects» and «Sustainable Management Projects» for ecosystems (Brandon et al., 1998; Hughes et Flintan, 2001). However, all these projects, like all traditional regulatory policies, fail to make sure that biodiversity is preserved. They are in fact incapable of producing lasting changes in land use; there is not enough public financing, and regulatory policies are often detached from the local problems facing the users (Laurans et al., 2012). These shortcomings highlight the need to introduce measures that are likely to have an impact on plans for land use, to provide new sources of funding, to use instruments at a local scale on a pragmatic basis while at the same time responding to social and economic aims. Poor populations in rural settings in developing countries are usually dependent on natural resources, and are therefore directly or indirectly affected by land conservation measures. We have to go beyond a simple picture of poverty, and explicitly take into account the vulnerability of local populations. The term « vulnerability» has been used to mean various things that are related but different[1]. One of the best known definitions is that of Chambers (1989), according to which vulnerability «designates exposure to the unexpected and to stress, [...] a situation against which it is impossible to protect oneself, signifying the lack of means to cope with it without incurring damaging losses» (Ibid., p. 1). Dercon (2006) gives a fairly similar definition: «Vulnerability designates the existence and the amplitude of a threat of poverty and deprivation ? the danger that a socially unacceptable level of wellbeing will ensue» (Ibid., p. 81). In this context, we think that the individuals, households and communities that are described as being «vulnerable» are those that are severely exposed to the risk of poverty and that have a limited capacity to reduce their exposure to this risk (by diversifying their activities and sources of income, for instance).

PES appears to offer an instrument to deal with the gaps in the conservation programmes referred to above (Redford and Adams, 2009). What are the different forms of PES? To what extent can they be used to combat poverty and reduce the vulnerability of populations in the countries of the South? What are their limitations and potential perverse effects? We will attempt to propose a classification of PES, and a discussion of its supposed advantages that can account for the success of this mechanism. We will also describe empirical cases in which PES has had positive or negative impacts on poor and vulnerable populations in several countries of the South, and conclude by considering the sustainability of the reduction of poverty and vulnerability.

References
Alwang J., Siegel P., Jorgensen S. (2001),Vulnerability: A View from Different Disciplines, Social Protection Unit, Human Development Network, World Bank, Washington D.C.
Brandon K., Redford R., Sanderson S. (Eds) (1998),Parks in Peril. People, Politics and Protected Areas, T.N. Conservancy, Island Press, Washington D.C.
Chambers R. (1989), «Editorial Introduction: Vulnerability, Coping and Policy»,IDS Bulletin, 20(2), p. 1-7.
Dercon S. (2006), « La vulnérabilité : une perspective microéconomique»,Revue d'économie du développement, 20(4), p. 79-118.
Hughes R., Flintan F. (2001),Integrated Conservation and Development experience: A Review

and Bibliography of the ICDP Literature, IIED, London.
Laurans Y., Leménager T., Aoubid S. (2012),Payments for Ecosystem Services ? From Theory to Practice ? What are the prospects for Developing Countries?, À savoir 07, AFD, April, Paris.
Redford K.H., Adams W.M. (2009), «Payments for ecosystem services and the challenge of saving nature»,Conservation Biology, 23, p. 785-787.
[1] For a presentation of the various different definitions identified in the literature, see Alwang et al. (2001). Also see the special issue ofMondes en développement"Vulnerabilité, pauvreté et stratégies de survie" numéro 140 - 2007/4.

Environmental services and market coordination: the role of local intermediary organizations in the program of Payment for Environmental Services in Costa Rica

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The program of Payment for Environmental Services (PESP) in Costa Rica is considered as a reference since it has been a pioneer program (it starts in 1997), it has been sustainable (it steady works for almost 15 years) and its has been successful regarding total contracted area and the level of investment (Pagiola 2008). Nevertheless, many debates have been developed regarding its environmental efficiency (Daniels et al. 2010, Robalino, Pfaff A. and Villalobos 2011, Arriagada et al. 2010) and its poverty impacts (Ortiz, Borge and Sage 2003, Zbinden and Lee 2005, Miranda, Porras and Moreno 2003). Whatever the definition of PES, the PES mechanisms supose a transfer of ressources between actors (Muradian et al. 2010) or a transaction between ES users and providers (Wunder 2005) that suppose a function of the intermediary that enable this flow to take place. In the case of PESP, the main intermediary actor is the state organization called FONAFIFO, which role has been widely analyzed in the literature (Pagiola, 2008). Conversely, the role of others intermediary actors that facilitate the access of ES to PESP has been poorly analyzed yet.

This communication aims at analyzing the role of the local intermediary organizations in the functioning and the results of the PESP, en particular regarding its environmental efficiency and its impact on poor forest owners.

To analyze the role of these local organizations in the PESP, we mobilized the concept of global value chain (Gereffi 1995), transaction cost (Williamson 1985) and system of services (Albert, Henckes and Elfring 2001). We carried out interviews to representatives of a panel local organizations forestry organization throughout the country, including organanization that play a role in PES intermediation or not. For each organization, we analyze their activity, trajectory, and strategy regarding forest issue and PES program.

We show that these organizations come from very different origins and have a different structure and resources. Moreover, they have different visions about the forest sector; some are promoting forest conservation or restoration, while others have a commercially-oriented vision of the forest. Even when most organizations are conscious of the economic interests in developping PES intermediation activities, some of organizations lack of capacity to assume PESP intermediation service for their members. When they are involved in PPES intermediation services, this activity contributes substantially to their financial equilibrium. As the access to PESP asks for specific capabilities especially regarding administrative and technical matters, these organizations play a key role especially regarding small forest landowner to access to the program. Although they are not necessarily reducing most landowners' transaction costs, they clearly play a role in reducing asymmetry of information.

Moreover, these organizations develop different strategies and propose a chain of services that facilitates smallholders' reforestation or forest conservation in a complementary way to PPES. Thus, according to their vision and strategy, they specifically developed a set of tangible and intangible services: such as supply system of tree seedling, specific credit system, wood extraction, processing or marketing services that facilitate farmers reforestation, development and valorization of wood production, and/or services that enables income diversification, and generating activities (tourism) for small farmers that are engaged in forest conservation. They also developed alternative schemes and funding sources to supports farmers that are excluded from PPES.

In coherence with the reflexion on the hybrid nature of PES (Muradian and Rival 2012), the PESP appears neither as a pure market coordination nor a hierarchical coordination, but a complex hybrid institution, where public private partnership is taking place between central public intermediary (Fonafifo) and private local organizations (forestry organization), and where local private organizations is playing a role contributing to the success of the PESP and their current results in terms of overall reforestatoin and forest conservation in the country.

Reference

Albert, H., C. Henckes & W. Elfring. 2001.Services for Market and Consumer Oriented Agrifood Systems - GTZ agribuisness approach - (conceptual aspects and practical examples).Eschborn: GTZ.

Arriagada, R., P. Ferraro, E. Sills, S. Pattanayak & S. Cordero (2010) Do payments for environmental services reduce deforestation? A farm level evaluation from Costa Rica.Public Policy, 1-36.

Daniels, A. E., K. Bagstad, V. Esposito, A. Moulaert & C. M. Rodriguez (2010) Understanding the impacts of Costa Rica's PES: Are we asking the right questions?Ecological Economics,69, 2116-2126.

Gereffi, G. 1995. Global Production Systems and Third World Development. InGlobal Change, Regional Response: The New International Context of Development,ed. B. Stallings, 100-142,. New York: Cambridge University Press

Miranda, M., I. T. Porras & M. L. Moreno. 2003. The social impacts of payments for environmental services in Costa Rica. A quantitative field survey and analysis of the Virilla watershed. 75. International Institute for Environment and Development, London.

Muradian, R., E. Corbera, U. Pascual, N. Kosoy & P. H. May (2010) Reconciling theory and practice: An alternative conceptual framework for understanding payments for environmental services.Ecological Economics,69, 1202-1208.

Muradian, R. & L. Rival (2012) Between markets and hierarchies: The challenge of governing ecosystem services.Ecosystem Services,1, 93-100.

Ortiz, E., C. Borge & L. Sage. 2003. Impacto del programa de pago de servicios ambientales en Costa Rica como medio de reducción de la pobreza en medios rurales. 62 p. San José, Costa Rica: Unidad Regional de Asistencia Técnica (RUTA). Serie de Publicaciones RUTA. Documento de Trabajono #8.

Pagiola, S. (2008) Payments for environmental services in Costa Rica.Ecological Economics,65, 712-724.

Robalino, J., Pfaff A. & L. Villalobos. 2011. Assessing impacts of institutional design of Payments for Environmental Services. The Costa Rican experience. InEcosystem services from agriculture and agroforestry. Measurement and Payment,ed. D. Rapidel, Le Coq, Beer (eds),, 305-318. London: Earthscan.

Williamson, O. E. 1985.The Economic Institutions of Capitalism. Firms, Markets, Relational Contracting.New York: The Free Press.

Wunder, S. 2005.Payment for Environmental Services: Some Nuts and Bolts. Occasional Paper n°42, CIFOR, Bogor.

Zbinden, S. & D. R. Lee (2005) Paying for Environmental Services: An Analysis Of Participation in Costa Rica's PSA Program.World Development,33, 255?272.

Ecosystem Service Frameworks, Where Do Soils Fit In?

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This presentation is the opening presentation of the session called sustainable land-care and will provide an overview over the various issues addressed in this special session, address many of the challenges we face when bringing soils into the NC/ES approach, as well as give an overview over the important issues economists need to learn from soil scientists.

Indicators for soil sustainability

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This paper i) identifies the need for the assessment of soil sustainability, ii) develops a first set of SoilTrEC Sustainability Indicators For Soil (SIFS) that can be universally applicable and further developed and iii) identifies potential improvements that the framework and/or indicators proposed will benefit from.
Methods used were meta-analysis, collaborative discussion techniques, and the Bellagio STAMP was used as a guiding tool in the indicator selection process.
Applying the methods, a total of 44 proposed indicators that are divided between the three sustainability dimensions; nature, economy and society & wellbeing. Each dimension is divided into themes and sub-themes. The chosen indicators have also been categorized within the DPSIR framework, to clarify causal relationships between indicators and other issues important for policy and decision makers.

An ecosystem services approach to the evaluation of soil conservation policy in New Zealand hill country pastures.

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In New Zealand, Regional Councils have the responsibility of natural resource management, and are increasingly under pressure from the general public to deliver high environmental standards when managing land for sustained use of resources. Over the last 50+ years, investment in soil conservation has run into billions of dollars. Soil conservation policies aim to reduce the risk of soil erosion in hill and steepland country, the downstream costs associated with nutrients losses and sediment loadings in waterways, and damage to productive farmland and towns due to siltation.

The current evaluation of soil conservation policies is largely limited to the assessment of a reduction in soil loss and sediment and impact on productive capacity and downstream community. The value of the full range of ecosystem services, below and above ground, lost following an erosion event is not considered, beyond the loss of some of the provisioning services. Until the full range of services are considered in the analysis the true cost of erosion and full value of soil conservation practices is not available for land use decision-making.

An example of how an ecosystem services approach can be used to inform decision making for policy on the ground is the initiative taken by Hawke's Bay Regional Council in New Zealand. In April 2011, the Hawke's Bay region was affected by a heavy rain storm which provoked landslides on hill slopes, including gullying and reactivated earth flow erosion on older sediments along a 250km coastal strip. Following that storm, Hawke's Bay Regional Council used satellite imagery to estimate the proportion of land affected by landslides. Overall 43 km2 of bare ground was classified from a total area of 5900 km2, including 86% new. The cost to the Regional Council of storm recovery for the April 2011 event was put at $NZ 39 million for damage to infrastructure, and land, personal and commercial damage claims. As part of a wider analysis the Hawke's Bay Regional Council commissioned AgResearch to estimate the total cost of the storm event by quantifying and valuing the ecosystem services lost as a consequence of erosion and the wider environmental and social benefits of existing soil conservation measures and assess the cost-efficiency of future ecological infrastructure investments. This study is presented here.

The study is based on a theoretical framework specifically developed to inform the provision of ecosystem services from soils (Dominati et al., 2010). This framework was chosen to show how an ecosystem services approach can actually support resource management and decision making. Dominati et al. framework (2010) brings together Soil Science and Ecological Economics concepts to inform the connections between soil natural capital stocks, land use, management and the supply chain of ecosystem services. That framework was combined with above ground ecosystem services frameworks to form the theoretical basis of the study.

The ecosystem services studied include the provision of food, quantity and quality, wood and fibre, the provision of support for human infrastructures and farm animals, flood mitigation, the filtering of nutrients and contaminants, the decomposition of wastes, net carbon accumulation in soils and conservation trees, nitrous oxide regulation, methane oxidation, pollination and the regulation of pests and diseases populations.

To quantify the provision of ecosystem services from sheep and beef operations on steep hill country prone to erosion, information from existing tools supporting planning in the region was used, including monitored soil quality indicators, land use capability classes maps and the OVERSEER® Nutrient budget. Neo-classical economic valuation techniques, including market prices, defensive expenditures, replacement cost and provision cost, were used to determine the economic value of each service.

To answer the question of the Council, the study covered different aspects of soil conservation through the following steps:

Quantification and economic valuation of the provision of below and above ground ecosystem services from a typical East Coast hill country sheep and beef operation, to assess the baseline flows of ecosystem services under current land use, based on information from existing tools supporting planning in the region. Quantification and economic valuation of the provision of ecosystem services from the land affected by landslides in April 2011 to evaluate how much

ecosystem services was lost compared with non-eroded land. Characterisation of the recovery profile of the provision of ecosystem services in the 30 years following a landslide event based on soil recovery data, to assess if the provision of ecosystem services recovers fully or not after a landslide event. Assessment of the provision of ecosystem services over 30 years from a pasture planted with wide spaced poplars for soil conservation, to see where and how the presence of wide-spaced trees impacts on the provision of ecosystem services. Cost-benefit analysis of an ecological infrastructure investment in soil conservation on hill pasture land at risk from soil erosion using an ecosystems service approach, to assess the return on investment from the soil conservation policy.

Quantitative information is currently being scale up to identify critical areas for soil conservation and the impacts for the provision of ecosystem services long term at the regional scale.

Preliminary results indicate that for every dollar invested in soil conservation on a sheep and beef operation on steep hill country there is an 80$NZ return (net present value over 30 years using a discount rate of 3%) associated with the provision of additional ecosystem services, avoided ecosystem services loss with erosion and avoided costs of damage to infrastructures.

This study addresses a real-world conservation issue and shows how an ecosystem services approach can be integrated and used on the ground to advance existing governance frameworks and to solve resource management challenges.

Understanding how current investments in built capital and current and future investments in ecological infrastructure are likely to change the flow of ecosystem services from managed landscapes is critical to assess the efficiency, cost-effectiveness and sustainability of resource management policies, and to increase political and public awareness of the value of land.

Institutional dynamics in managing common pool resources: community-based shrimp aquaculture in the northwestern Sri Lanka

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Purpose of this paper is to explore and understand the how small scale shrimp aquaculture governance system is organized in managing common pool resources within community-based settings. The study was carried out in three small scale shrimp farming communities in the northwestern province of Sri Lanka. An exploratory case study approach was adopted and the findings were validated through key informant interviews. Data were also supplemented by the contextual understanding obtained during the field data collection period. Findings revealed that the existing governance structure is comprised of multi-level community-based institutions and a collaborative decision making body, which involves the government. The three levels of community-based institutions are: community level shrimp farmers associations, zonal level associations, and the national level sector association. This paper explains the role and the influence extended by each of the levels and the collaborative decision making body within the institutional structure. The bottom-up approach and participatory process of involving sector stakeholders are the major characteristics of the existing governance system. The paper argues how effective is the prevailing multi-level institutional structure in minimizing the impact from shrimp farming practices on common pool resources. It also identifies and analyzes the drawbacks of the existing governance system in detail. Finally, it proposes policy related modifications for further improving the effectiveness of the existing system.

Urban solid waste in southern countries: from a blurred object to common pool resources

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It has been too long that the question of the municipal solid waste management in developing cities has had the replication of Northern operating devices as the only valued answer. Countless ? white elephants' have followed. Comprehending this issue implies reconsidering the proper definition of garbage: where does the product end and where does trash begin? Garbage appears as a blurred object. Through our two case studies of one-million inhabitants' cities from emerging countries, we show that the frontier between garbage and resource is untraceable. Appropriation conflicts arise, which do not only oppose municipal service operators to actors from the informal sector, but huge industrial groups as well. Industrial ecology, livelihood issues and public service delivery unfold in urban areas. This leads us to refuse the dichotomy between trash and resource and to argue that the whole urban waste deposit should be seen as common pool resources.

The prospects of using community land title deeds (CLTDs) to counteract land grabbing and to promote sustainable agriculture in Thailand

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This paper explores the potential that community land title deeds (CLTDs) can be used to promote more equal distribution of land and the development of sustainable agriculture in Thailand. CLTDs contest the primacy of the private property system, using inspirations from pre-capitalist norms of the governance of common pool resources (Na-moorights). Land under the form of CLTDs is governed by community rules established democratically. It cannot be sold to people outside of the community to prevent land grabbing and to safeguard agricultural land for small-scale farmers, with a higher goal of promoting sustainable agriculture. In many ways, CLTDs initiatives have positive influences on their members, local communities, sustainable agriculture development and on civil society in the country. Nevertheless, there are still many challenges which include how the Thai state resisted having to de-centralise political-economic power, how CLTDs might be suitable only where there is still a sense of community, and how there are still no national plan to safeguard prime agricultural land for food security purposes. In addition, sustainable agriculture requires a lot of knowledge, time and labour; hence it is very difficult for small-scale farmers to switch to such production methods, as they are concerned with short-term economic survival. Building alliances to strengthen the movement and gain more political-economic bargaining power might be difficult, but it is necessary and important.

The transmission of sustainable harvesting norms when agents are conditionally cooperative

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Experimental and observational studies have highlighted the importance of agents being conditionally cooperative when facing a social dilemma. We formalize this mechanism in a theoretical model that portrays a small community having joint access to a common pool resource. The diffusion of norms of cooperation takes place via interpersonal relations, while individual agents face the temptation of higher profits by overexploiting the resource. Agents remain conditionally cooperative, unless other individuals are behaving selfishly already. We can observe a bubble of conditional cooperators slowly building up followed by a sudden burst, which means that the cooperative social norm is no longer followed and widespread non-cooperation occurs. Interestingly, in some parameter regions alternative stable states and limit cycles arise. The latter implies that the same community goes through such a transition repeatedly over long time spans ? history thus repeats itself in the form of the creation and erosion of social capital.

Biorefinery concept and ecosystem services of a territory: an exploration within an agricultural region

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Biorefinery concept as an overall concept of a processing facility producing marketable goods as fuels, materials and some other products becomes dominating all aver the world as a substitution to a crude oil refinery model, in line with moving the society to use of renewable resources as a base of sustainable development.
PIVERT project aims at developing a model of a biorefinery, based on multiple renewable sources of raw materials (e.g. rapeseed) as well as multiple output products.
In the article emphasized the necessity of account for ecosystem's capacities to provide ecosystem services in the context of an agricultural region with existing and planned biorefineries.

Do we need a unified appraisal framework to synthesize biofuel impacts?

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In the past decade a significant evidence base has been built about biofuels' environmental and socioeconomic impacts. What is still missing is a discussion about whether it is desirable, or even feasible, to synthesize this evidence in a clear, coherent and policy-relevant manner, and if so, how exactly such a synthesis should be conducted.
This paper presents arguments for and against the adoption of a unified framework for synthesizing biofuel impacts (?thesis' and ?antithesis'), and seeks common ground between the two perspectives.

Thesis: Synthesizing the biofuel literature with a unified framework can improve biofuel policymaking
Synthesizing biofuels' trade-offs with a consistent conceptual framework can be as important as ensuring a robust assessment of individual sustainability impacts. Two very promising unifying frameworks are sustainability science and the ecosystem services (ES) approach. There are at least four reasons why synthesizing biofuel literature with these two frameworks can be beneficial.
First, both frameworks employ a systems-perspective. They explicitly seek to link environmental impacts and human wellbeing, two key elements of the biofuel debate evoked by supporters and critics of biofuels alike. In fact, both frameworks have been extensively used to study coupled social-ecological systems such as those in which biofuel production and use take place, and can capture all major drivers and impacts of biofuel production and use [1]. Second, transdisciplinarity is a key element of both frameworks, thanks to their ability to integrate insights from different knowledge sources, including the natural and the social sciences, as well as experiential and local knowledge. Furthermore, they can accommodate empirical findings from economic, biophysical and indicator-based valuation tools that represent radically different value perspectives. Third, both frameworks approach research questions in a use-oriented, rather than a curiosity-driven manner, linking thus practical knowledge with action. This means that they are ideal for tackling practical problems associated with human activity and its environmental and socioeconomic impact. Fourth, sustainability science and the ES approach are widely accepted internationally by academics, practitioners and policymakers.
However, despite these attractive features, to our best knowledge, the two frameworks have rarely been applied to synthesize the evidence about biofuel impacts and thereby to frame, explain, assess and convey the direct and indirect impacts of biofuels. Lack of such unified syntheses contributes to a piecemeal understanding of biofuel sustainability and may have already compromised the effectiveness of policies concerned with biofuel sustainability.

Antithesis: Unified synthesis as a pipedream and a distraction
The starting point of the discontent with the «thesis» presented above is the emphasis on biofuel appraisal as essentially a technocratic formalized assessment procedure, in which ?objective appraisal' leads straightforwardly to ?better' decisions via instrumental forms of learning. From this starting point at least four specific reasons undermine and partly invalidate the case for a synthesis framework.
First, not all disputes on knowledge can be resolved simply by providing more and better information. Often the opposite is the case, particularly when better knowledge merely provides an additional layer on the top of existing political battles, and enables policy advocates to better argue their positions. This has often been the case in biofuel contexts [2]. Second, aiming to « structure the biofuel debate» essentially entails an attempt to framing the issues at stake. It also suggests that a single biofuel «debate» exists, whereas in reality biofuel decision-making encompasses various, often mutually incompatible, «debates» that are strongly influenced by

the diverse values, preferences and expectations of the involved parties. Third, the search for a unifying conceptual framework, in the name of ensuring an integrated synthesis of biofuel trade-offs and avoiding ambiguity, adheres to an ideal of holism. Yet, such an ideal obscures the irreducible conflicts between competing paradigms and worldviews, as well as the complexity of the real world. Any overarching synthesis framework embodies an implicit or explicit, non-neutral belief system, and imposing such a framework risks downplaying real and significant differences between diverging normative, interest-based and epistemic perspectives. Fourth, appraisals based exclusively on a unified framework risk to favor ?stealth issue advocacy'. Assuming a consensus on underlying values and worldviews among the parties involved, as well as on the degree of certainty on the relevant scientific facts and their interpretation leads to the domination of one cognitive and normative framework over the others, the suppression of uncertainty, and an unjustified narrowing down of the range of choices available for the policymaker.

Even though biofuel debates must, at given decision moments, be closed down in order to arrive at an agreement on a course to be taken at a given point in time, currently the balance is skewed in favor of prematurely «closing down» debates. Often, what is needed is ?opening up' the biofuel debates to a variety of equally legitimate perspectives and framings, and broadening the range of options available to the decision-maker. Attempts to synthesize biofuel evidence with a single unified framework would further consolidate the dominance of appraisal approaches that seek to prematurely «close down» biofuel debates.

Unified synthesis of biofuel impacts or not?

Despite these divergent opinions on whether or not biofuel impacts and trade-offs should be synthesized through a unified framework, we cannot disregard the fact that any such decision bears significant implications for decision-making processes. Crucially, any choice between the two significantly conditions the policy process by framing the problem, shaping the type and form of available evidence, and influencing judgments on what type of information and actors are seen as legitimate. As a result, both approaches can offer significant advantages and facilitate biofuel policymaking in certain contexts, while being obstacles to well-informed policy processes in other contexts.

Unified synthesis frameworks can be appropriate in «structured» policy situations when facts are relatively certain and policy priorities consensual [3]. In our opinion biofuel domains that can benefit from such a unified synthesis need to combine the following characteristics:

a consensus among policy actors about the definition and framing of the key problems; a substantial body of literature about the impacts of the specific biofuel/feedstock; a scientific consensus about the type and magnitude of impacts; relatively low uncertainties for each impact; a shared understanding among policy actors about the meaning and significance of these impacts; a relative consensus among the key stakeholders about the policy goals and appropriate instruments; institutions that can benefit from an integrated exposition of the sustainability impacts of the biofuel in question.

Cases in which these criteria may be fulfilled are likely to be found in some decision-making situations concerning maize ethanol (in the US), rapeseed biodiesel (in Europe) and sugarcane ethanol (in Brazil). In such cases a common synthesis framework can greatly facilitate policy formulation, decision-making and help move towards a legitimate closure of the debate.

To conclude, we strongly believe that any decision on whether to adopt a common synthesis framework should be informed by the needs and expectations of the decision-makers and parties involved, as well as by a detailed understanding of the policy context. Whichever the choice between a unified synthesis or a disaggregative approach, this choice should ideally be made in collaboration between the analyst and the relevant policy actors, and in any case, the reasons for the choice should be provided and made available to the relevant parties, rather than being a priori «imposed» by the analyst. In other words, analysts should not advocate the adoption of a unified synthesis framework (or the rejection of one, for that matter) as a standard recipe in all situations. Whether through the adoption of a unified framework or a disaggregative approach, the ultimate aim of appraisal must be to provide a basis for an informed and balanced democratic debate on the one hand, and transparent decision-making on the other.

[1] Gasparatos, A., Stromberg, P., Takeuchi, K., 2011. Biofuels, ecosystem services and human wellbeing: Putting biofuels in the ecosystem services narrative. Agriculture, Ecosystems and Environment 142, 111-128.

[2] Pilgrim, S., Harvey, M., 2010. Battles over biofuels in Europe: NGOs and the politics of markets. Sociological Research Online 15, doi: dx.doi.org/10.5153/sro.2192

[3] Stirling, A., 2008. «Opening Up» and «Closing Down»: Power, participation, and pluralism in the social appraisal of technology. Science, Technology & Human Values 33, 262-294.

What if Science follows Policies?

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1. Introduction

As underlined by Heath and Mann (2012) , there is a strong need for harmonisation of Life Cycle Analysis (LCA) results, especially to support policy makers. The purpose of LCA harmonisation is to identify and quantify key factors that influence a product's environmental impacts in order to be more conclusive regarding its real performances. Meta-analysis appears to be an appropriate tool to synthesize the available LCA literature (Brandãoet al., 2012). In this paper, a specific econometrics method is used to perform meta-analysis: the meta-regression analysis (MRA). This method designed for quantitative literature review aims at the quantification of the main determinants of the variability of LCA results in order to perform harmonisation. In addition, potential biases are investigated in order to strength harmonisation.

Given growing concerns about global warming and energy security, alternative transportation fuels are being developed, such as advanced biofuels which are claimed to have lower environmental impacts than conventional biofuels. Here, the term "advanced biofuels" refers to biomass-based transportation fuels produced from lignocellulosic materials (ethanol and synthetic diesel - BtL) and microalgae (fatty acid methyl ester and hydrogenated vegetable oil), also known as second (G2) and third generation (G3) biofuels. One of the drivers for their development is the will of policy makers to increase the share of biofuels in the transport sector. For instance, the United States (US) and the European Union (EU) have recently developed regulations inciting biofuel production: the Renewable Fuel Standard (RFS2) and the European Directive 2009/28/EC (a.k.a the Renewable Energy Directive ? RED), respectively. Even if those regulations rely on specific designs, both set minimum thresholds for life cycle GHG emission savings compared to a fossil fuel reference as the most important environmental criteria that should be met to be eligible as sustainable biofuel. Despite a substantial literature on advanced biofuel LCA; there is no consensus about their GHG emission benefits compared to fossil fuels and the fact that they can meet legal GHG emission targets remains unclear. Conversely, the extent to which literature that meets those targets are more likely to be published has to be investigated.

Hence, this paper aims to: 1. Investigate the potential influence of policies on LCA GHG emission results of advanced biofuels by identifying potential publication biases. 2. Perform harmonisation for LCA GHG emission results of advanced biofuels through the use of the MRA, corrected from publication biases, in order to provide more conclusive results to support policy makers.

2. Materials and methods

To perform this literature review, a database has been built, called the meta-database. It contains a vector of the dependant variable, i.e. the variable that we want to explain, which is here Global Warming impact indicator results (expressed in gCO2eq/MJ) extracted from LCA studies on advanced biofuels. The meta-database also contains vectors of explanotory variables that correspond to the factors that can potentially influence LCA results, such as technical data (mass yield, type of technology, etc), methodological choice (method to account for coproducts, uncertainties, etc) and typology of the study (year of publication, geographical location of the authors, etc). The MRA method assumes that the dependant variable is a function of these explanatory variables and their effects are assessed by the mean of specific econometrics methods. It allows the identification and the quantification of explanatory variables that lead to the greatest impact on the results. Besides, this framework gives the possibility to perform harmonisation, i. e. to estimate «mean» values of the dependant variable after controlling for its moderators by establishing the extent to which a variation is systematic. Indeed, once statistically estimated, the meta-function can be used to deduce original values by specifying new values for the main drivers identified corresponding to relevant case studies. Advanced biofuel LCA results from

peer reviewed articles, research reports (grey literature) and regulatory texts (RFS2 and RED) are included in the database through systematic research of relevant databases. Finally, 47 LCA studies are included, providing 593 observations.

The harmonisation process aims to provide representative values for the dependant variable synthetising the literature. Hence, the dependant variable should be corrected from potential biases for the harmonisation to be as relevant as posible. As explained by Zumsteget al.(2012) there are at least two levels of bias that need to be assessed when performing a systematic review: bias within each primary study and bias occuring accross sudies. The former involves the correlation of results drawn from a same study as they can rely on the same data sources or assumptions. Regarding the latter, the most important source of bias across studies is publication bias (a.k.a. the «file-drawer problem») which can be considered as a form of sample selection. It exists two types of publication bias: i) asymmetry one (when authors, publishers, referees, etc. tend to favour results that point in a specific direction) and ii) variation excess (when the research and publication process favours statistical significance, regardless of direction).

In this article, bias within and across studies are analysed and treated thanks to specific econometrics methods (panel-data fixed and random effects models/estimators). Publication bias is also investigated thanks to specific set of analytical techniques such as Funnel graphs and Galbraith plots.

3. Results and conclusions

Using statistical description, we notice that 82% of GHG emissions results from NA authors are compliant with their more restrictive GHG emissions minimum threshold whereas it is the case for only 59% from EU authors. This systematic difference between NA and EU observations may come from the use of a different set of technical variables, for instance, but it may also reveal the existence of a potential publication bias in the literature.

Then, we conducted a MRA in order to identify the key factors influencing the results. Among others, we set the geographical location of authors as well as some technical data (type of technology, mass yield, etc) as explanatory variables. Results show that the geographical location of authors always has an influence on the LCA GHG emissions what ever the sample considered (G2 and G3 biofuel, BtL, Ethanol) and that NA observations are always lower than EU ones, ceteris parisbus,i.e.after controlling the results from the influence of the other explanatory variables.

Investigating more in-depth a potential bias linked with the geographical location of authors, the Funnel graphs reveal the existence of an asymmetrical publication bias of North American (NA) vs.European studies. This publication bias is then statistically tested by proposing an adaptation of the Funnel Asymmetry Test (FAT) of Stanley (2005). This test reveals a systematic publication bias of NA studies to publish results under the minimum thresholds for life cycle GHG emission savings specified by the RFS2, which is not the case for European Studies. This result is of primary importance as it highlights the influence of the design of some public policies on the very scientific research and/or publication process. Policy makers have to be aware of this potential bias when designing new policies.

Finally, we perform harmonisation after correction from those biaises. Our results indicates a hierarchy between advanced biofuels. Mean value of LCA GHG emissions weighted by the influence of its main drivers and its corresponding Confidence Interval associated to BtL, G2 ethanol and G3 biofuel production are estimated to 19.5 (ranging from 16.7 to 22.2), 19.7 (ranging from 17.4 to 22.0) and 60.0 (ranging from 43.3 to 76.7) gCO2eq/MJ of biofuel respectively. Note that this range of values is lower than the fossil reference (about 83.8 in gCO2eq/MJ). However, only G2 Ethanol and BtL do comply with the GHG emission reduction thresholds defined in both the US and EU directives.

Economic analyze integration to Life Cycle Assessment: agricultural case from Turkey

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The scope of Life Cycle Assessment studies and components are highly diverse. Related to LCA, one of the most important fields is agricultural sector which needs to investigate on different subjects for agricultural activities. Though there are many restrictions in working with agricultural data, it is also hopeful to use some devices which give opportunity to do further studies. Greenhouse tomato production has been increasing for the last decade in Turkey. Turkey is the fourth biggest tomato producer country in the world. Beside many advantages of greenhouse production system, it has caused landscape changes, ecosystem flux variations and rising on the energy inputs and residue generation. Also this production system is often perceived as an artificial process, characterized by low nutritional quality of the final product and the heavy usage of chemical inputs. The objective of the study relies on applying LCA methodology on agriculture and focuses on tomato production in greenhouses in Turkey. In this work, LCA is applied which is one of the ecological models. With the help of the LCA analysis within the research scope, environmental effects and differences of those kinds of production systems are introduced. After the ecological effects of different production systems related to tomato -which is economically important in region and country- are examined, the relation of these results and agriculture establishment variables is tested.

Act when the window of opportunity is open: Enhancing time-sensitive connectivity between research and policy-making in sustainable development

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Although both researchers and policy makers recognize the importance of science-based knowledge for policy-making, they at the same time approach the science-policy interface from very different perspectives. The difference in perspectives can be summarized in two intertwined issues, namely, conflicting agendas and conflicting timeframes. Together, they set the stage for science-policy brokerage as one of occasionally opening windows of opportunity. Brokerage here refers to structural and procedural arrangements aiming to overcome the conflicting agendas and timeframes of policy-relevant research and policy-making in specific policy settings. On the basis of interviews conducted with the European Commission's Directorate General Research, this paper lays out a heuristic framework for identifying the temporal windows of opportunity for science-policy brokerage. It then provides tentative verification of the framework with illustrations of science-policy interaction from different domains of sustainable development.

Conflicting agendas in science-policy interaction arise from the fundamentally different nature of science and policy: what is considered relevant knowledge in science differs from that in policy. For the policy maker, issues raised in research may not appear as policy relevant. Conversely, topics that the policy maker considers policy relevant may for the researcher appear as old, trivial, lacking focus or too constrained by politics. Conflicting timeframes have to do with the fact that the policy maker usually needs to make decisions immediately or in the very near future. In contrast, the researcher thinks in terms of the time span of research projects, which usually ranges from 2 to 5 years. What the policy maker considers as normal dynamics of policy-making often leads to constant shifting of research priorities that the researcher considers a threat to the consistency of research.

Despite conflicting agendas and timeframes, there are overlapping areas between the perspectives of researchers and policy makers. The researcher often struggles to be heard in society, both because she feels her scientific discoveries can help solve socially relevant problems and because public visibility often improves the likelihood of obtaining research funding. In other words, the agendas of the policy maker and the researcher do sometimes match. Furthermore, research on the process of scientific discoveries indicates that a researcher may have, often at a very early stage of a multi-year research project, an intuitive understanding of the right solution to the research problem. She then spends the remaining project years to justify and fine-tune, with scientific rigor, the soundness of the scientific argument. In other words, there is often a match in the timelines of the policy maker and the researcher during the first stages of scientific discovery.

The existence of common ground between science and policy is well known by those who study the role of science in society. Efforts to conduct socially robust and relevant transdisciplinary research at the interface of science and society have been termed Mode 2 ?science (Gibbons and Nowotny) and post-normal science (Ravetz and Funtowicz). Susan Owens views such activity from the viewpoint of knowledge production, calling it co-production of serviceable truths by researchers, policy makers and stakeholders. Andrew Jamison puts the issue in terms of expertise, calling individuals interfacing between science and policy hybrid experts capable of intellectual engagement. It appears that the existence of intellectually oriented policy makers in administration and societally oriented researchers in the scientific community is a key prerequisite for successful science-policy links.

This paper aims to respond to more detailed questions about science-policy links in sustainable development. The paper develops a heuristic framework for finding commonalities in the agendas and timeframes of researchers and policy makers. The framework is based on written and oral interviews conducted at European Commission's DG Research in 2009. The framework is a four-

field developed on the basis of the duration of policy on one hand and its urgency on the other. Placing the science-policy interface within the framework yields four distinctly different brokerage activities tailored for specific policy-making purposes. (1) Urgent quick fixes demand short-term workable answers that need not necessarily penetrate the governance system (i.e., short projects). (2) Learning from quick fixes requires setting up a longer lasting system that ensures the accumulation of experiences from rapid responses (i.e., personnel and knowledge infrastructures). (3) Changing course in time to avoid undesirable or mobilize desirable things requires longer-term brokerage that penetrates the governance system (i.e., institutional experiments, programs and long projects). (4) Finally, preparing for the long-term future calls for longer-term brokerage activities that are at the same time flexible enough to take into account future contingencies (i.e., organizational practices).

Having developed the framework for science-policy brokerage, the paper provides initial indications of the applicability of the framework by applying it to various cases of sustainable development policy brokerage with different agendas and timeframes. In conclusion, reflections on the broader applicability of the framework are developed.

Environmental policy implementation as a legal battlefield: The changing role of street-level bureaucrats in Europe

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Introduction

Policy implementation is a research field of high significance in the social sciences (Pressman?Wildawsky 1984; Bardach 1977; Lipsky?Winter 1980; Sabatier?Mazmanian 1980). The process of implementation is influenced by interest groups, work norms, customs and culture (Riccucci 2005). Particular relevance is attached to street-level bureaucrats (SLBs) or front-line workers who personally encounter the public, or clients, and make their discretionary decisions during the policy implementation process.

Empirical research concerning front-line workers is not very abundant, especially not in research related to ecological economics. The term ?SLB' was pioneered by Michael Lipsky (1976, 1980) whose studies emphasised the discretionary power of SLBs. This discretionary power was also highlighted by Maynard-Moody and Musheno (cited by Riccucci 2005), who claimed that discretion is necessary for making decisions in real world situations. Since rules are often contradictory in practice, SLBs have to match rules to the situation in their decisions and this necessitates discretion as well (Riccucci 2005). Prottas (1979) elaborates the theory of SLBs underpinned by several case studies from other earlier research. Riccucci (2005) examines the implementation of welfare policies and the role of management in public encounters in a quantitative study applying the concept of SLBs. The study of Fineman (1998) focuses on environmental agencies in England and Wales and attempts to understand how inspectors construct regulation in this field through face-to-face encounters with clients. He identified different practices and tactics like consultation, convincing and snatching and found numerous roles that inspectors played in order to reach their objectives. Fineman also highlighted the emotional and personal side of inspectors' daily work and underlined the policy-forming character of their decisions. Lowe (1997) conducted qualitative research among inspectors in Her Majesty's Inspectorate of Pollution, in which he aimed at understanding how inspectors and other stakeholders interpreted the pollution of dairy farms. He and his colleagues examined pollution from a historical perspective. Additionally, they found that SLBs have comparatively high professional freedom and discretionary power on the one hand, and considerable administrative burden on the other.

In the field of ecological economics most of the analyses concern the conceptual foundations of environmental policy (e.g. Underwood?King, 1989; Vatn, 2005) as well as the design and characteristics of different environmental policy instruments (e.g. Perrings, 1989; Shogren et al., 1993). While all of these studies contribute to the development of ecological economics as a policy science (Shi, 2004), they primarily focus on the first phases of the policy cycle and leave the last phase, that of implementation, almost untouched. However, the importance of policy implementation in policy effectiveness and integration is frequently emphasised by students of

public policy analysis (Hogwood?Gunn, 1984; Hay, 2002).

Method and results

In our study, which is based on our four-year empirical research (2007?2011) financed by the National Scientific Research Fund of Hungary (OTKA, No. K67744), we embarked on exploring the working conditions of SLBs in environmental administrations in Austria, Bavaria (Germany), France and Hungary. We investigated how they cope with their problems, what their strategies are and how they contribute to improved decision-making on sustainability. In order to analyse these social encounters, constructivist methodologies were employed (Tacconi, 1998), qualitative methods were used and inductive data analysis was applied.

In this paper our main focus is on the conditions that determine and influence policy implementation in street-level bureaucracy. The implementation of both national and EU level policies is influenced and distorted by numerous factors. These are organisational structure, the professional background of inspectors and the structure and quality of the legal framework they have to implement.

In all the visited countries environmental bureaucracies were in transition. The driving force of this transition was twofold: implementation of EU-related regulations (e.g. Aarhus Convention, IPCC, EIA, EMAS, etc.) and national austerity measures. The outcomes of this transition were more or less similar in all the countries: (i) strengthening the legal framework of procedures mainly in licensing and public participation along with a budgetary cut back affecting mainly the institutional system (including privatisation of counselling service organisations and/or outsourcing of those tasks); (ii) changes in the quantity (reduced number of employees) and the quality (training requirements) of human resources; also priorities in procedures given by EU law and between procedural phases (administration of work compared to on-site visits). While SLBs mainly agreed with the rationalisation of bureaucracy, the effects were diverse and some negative impacts were reported in all countries.

The quality of environmental policy implementation is very much dependent on the relationship between the legal and technical approaches embedded in organisational structures or taken by street-level bureaucrats. The profession and education of street-level bureaucrats are highly diverse, but two main groups are dominant: engineers and lawyers. Lawyers are in general perceived as non-professionals, because they seldom go to clients in the field and often do not know the engineering side of the work, which ? according to engineers ? actually forms the professional core of inspectorates. The role (in the various phases of decision- making) of lawyers and engineers in the procedures have a direct impact on the interpretation of environmental policy and its enforcement. Growing importance of strict procedural accuracy and less emphasis placed on factual technical knowledge as compared to safe legal solutions were witnessed trends in all countries.

Standardisation of certain parts of the European environmental legal framework overwrote national legal structures and moved priorities from earlier issues into new directions. Here licensing procedures, obligatory inspections and public participation were the most prominent. The strict prescription of the licensing process and the activities subject to regular inspection together with austerity measures crowded out on-site inspection and led to the loss of site-specific information.

The above mentioned developments hinder the ideal functioning of environmental inspectorates as constructive, compromise-seeking institutions within a trust-building and service-oriented negotiation process, where public consultation plays an important role. As a result, legal conditions start to dominate decision making and compromises are forced in court instead of in the field.

Literature

Bardach, E. 1977. The Implementation Game: What Happena after a Bill Becomes a Law. Cambridge, Mass.: MIT Press

Charmaz, K. (2006): Constructing Grounded Theory: A Practical Guide through Qualitative Analysis. SAGE, London.

Fineman, S. (1998): Street-level bureaucrats and the social construction of environmental control. Organizations Studies, 19(6):953-974.

Fineman, Stephen, Sturdy, Andrew (1999): The emotions of control: a qualitative exploration of environmental regulation. Human Relations, 52(5):631-663.

Gouldson, A. ? Murphy, J. (1998): Regulatory Realities: The Implementation and Impact of Industrial Environmental Regulation. Earthscan, London.

Hay, C. (2002): Political Analysis. A Critical Introduction. Pelgrave New York.

Hill M. 2005. The Public Policy Process. Longman

Hogwood, B.W.; Gunn, L.A. (1984): Policy Analysis for the Real World. Oxford University

Press, New York.
Hudson, B. 1989. Michael Lipsky and steet level bureaucracy: A neglected perspective. In: Barton, L. (ed.), Disability and Dependency. London, Falmer Press
Lipsky, M. (1976):
Lipsky, M. (1980): Street-level Bureaucracy. Russell Sage Foundation, New York.
Lipsky, M. () In Goodsell
Lowe P., Clark J., Seymour S., Ward N. 1997. Moralizing the Environment: Countryside Change, Farming and Pollution. UCL Press, London
Perrings, C. (1989): Environmental bonds and environmental research in innovative activities. Ecological Economics, 1:95-110.
Pressman J.L., Wildavsky A. 1984. Implementation. 3rd edn. Berkeley: University of California Press.
Prottas M. J. 1979. People-Processing. The Street-Level Bureaucrat in Public Service Bureaucracies. Lexington Books, D.C. Haeth and Company, Lexington
Riccucci, M. N. 2005. How Management Matters? Street-level Bureaucrats and Welfare Reform. Georgetown University Press. Washington, D.C.
Sabatier P.A. 2007. Theories of the Policy Process. Westview
Sabatier P.A., Mazmanian D.A. 1980. The Implementation of Public Policy: A Framework of Analysis. Policy Studies Journal 8(special issue):538-60
Shi, T. (2004): Ecological economics as a policy science: rhetoric or commitment towards an improved decision-making process on sustainability. Ecological Economics, 48:23-36.
Shogren, J.F., Herriges, J.A., Govindasamy, R. (1993): Limits to environmental bonds. Ecological Economics, 8:109-133.
Tacconi, L. (1998): Scientific methodology for ecological economics. Ecological Economics, 27:91-105.
Underwood, D.A., King, P.G. (1989): On the ideological foundations of environmental policy. Ecological Economics, 1:315-334.
Vatn, A. (2005): Rationality, institutions and environmental policy. Ecological Economics, 55:203-217.

Viral Agency in Heterogenous Assemblages: An interdisciplinary reframing of the challenge to regulate endocrine disrupting chemicals in wastewater

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Summary
In defending the scientific soundness of the precautionary principle, Stirling and Gee (2002) caution against both over-extending risk assessment and paralyzing technological innovation, where environmental issues are characterized by incertitude. However, they leave open the details of regulatory design. Drawing on Bennett's conceptions of «vibrant matter» and using endocrine disrupting chemicals (EDCs) as a case study, we propose a new design based on reframing the problem via the two dimensions ofheterogenous assemblageandecosocial rhythms.Drawing a parallel to viruses, EDCs can be viewed as artifactual viruses participating in assemblages linked horizontally with current EDC regulatory regimes. As such, a regulatory design can be implemented that addresses the urgency of the issue.
Abstract
In an influential defense of the scientific soundness of the precautionary principle, Stirling and Gee (2002) caution against both over-extending the application of risk assessment and paralyzing technological innovation, where environmental issues are characterized by uncertainty, ambiguity or ignorance. As a scientifically robust way forward, they outline principles for a precautionary approach to regulation, including humility over science, completeness of regulatory scope, attention to pros and cons, consideration of a range of alternatives, diversity of disciplines and perspectives, and an emphasis on research and monitoring. What they leave open are the details of the regulatory design that implements the principles of precaution.
This paper discusses the implementation of the principles of precaution in the incipient design of a regulatory approach to the endocrine disrupting chemicals (EDCs) found in wastewater effluent in Helsinki, Finland. EDCs interfere with the hormonal systems of animals, including humans (most importantly, they impair their reproductive capacity), but their non-traditional response curves and the cumulative effects of multiple low exposures challenge most scientific and regulatory frameworks. Using Helsinki's wastewater as an example, the paper aims to outline a methodology for reframing problems characterized by environmental and public health uncertainties, ambiguities and ignorance and turning them into a more tractable ones for environmental regulation. The data come from chemical analyses of EDCs in the city's wastewater effluent and from workshops organized with key stakeholders in EDC governance.
Preliminary results of the knowledge integration exercise indicate that the regulatory solution space has two dimensions: one based on the notion ofheterogeneous assemblagesand the other based on the notion ofecosocial rhythms. Workshop discussions and chemical and toxicological literature on EDCs indicate that the steroidal compounds that were the focus of this study are only a small part of the overall EDC complex. Yet chemical analyses at the Helsinki plant show that steroids alone are made of a suite of different compounds that undergo complex reactions in the treatment process. This suggests that EDC regulation would benefit from analogies to regulatory regimes beyond traditional chemical risk regulation.
First, in exploring ways to reframe the problem and to establish grounds for policy intervention, we draw on the work of Jane Bennett, who asks: «How would political responses to public problems change were we to take seriously the vitality of (nonhuman) bodies?» (2010: vii). Bennett seeks specifically to establish (shared, political) grounds for action that do not conceive of environmental problems as based in relations between passive objects on the one hand, and active subjects on the other. Showing explicit concern for ecological survival, she argues that a specifically non-anthropocentric materiality is a consequential yet unacknowledged component of politics, and we suggest, of policy. Bennett argues for a politics that takes «vibrant matter » seriously, and therefore shifts the position of the human subject in relation to «environmental problems».
Drawing on a Spinozist conception of connectedness and shared substance (God or Nature) on one hand, and a pragmatic conception of politics as conjoint action (inspired by Dewey and Latour among others) on the other, she develops a notion of a reality (ontology) that is organized ?

temporarily but consequentially ? as a shifting terrain of assemblages rather than a system of wholes. Her focus is the doing more than the doer. Consequential doing involves not subjects so much as assemblages that are mutable, ontologically heterogeneous and not governed by one single «head» or intent: entities or bodies are continuously affecting and being affected by other bodies, being endlessly incorporated into other bodies and transformed. Bennett's approach emphasizes that being affected is as significant for understanding environmental change as being effective.

The world to which policy should thus address itself is volatile, vibrant and contingent. Bennett posits a world where agents certainly exist, but they are temporary and ad hoc. Further, «agentic capacity is ... seen as ... distributed across a ... range of ontological types» (2010: 9). This does not make the human subject unimportant, rather, it suggests that the «I» is not merely an agent, it is also being affected. In Bennett's ontology, the human is in a horizontal rather than in a subject-object (hierarchical) relationship with other possible agents. Therefore, human (political) action is more accurately described as participating in a heterogeneous assemblage than being constrained by a socio-ecological context. If human agency is an element in a horizontal assemblage, the political aim becomes not so much to care for the environment (imagined as something over which humanity has power or vice versa) as to attend to the materialities in which (our) bodies participate.

Second, workshop discussions and toxicological literature indicate that ecosystems are particularly susceptible to EDC impacts in spring, the reproductively active season. This suggests a rhythmic regulatory regime, one that would limit the use of products containing EDCs during ecologically sensitive periods. As EDC-containing products, and the organic compounds they eventually mutate into, circulate and assemble with elements of the Helsinki ecosystem, wastewater flows, organisms human and non-human, wastewater management systems, EU regulations, and concerned environmental (social) scientists, this seasonality indicates a real if indeterminate material agency. Strikingly, the rhythm of EDC-induced vulnerability appears as the inverted mirror image of the annually returning flu epidemic that affects thousands of inhabitants in the region each winter. It appears that as the EDCs reassemble with live organisms, such as fish or human bodies, they show specific agentic qualities similar to those of viruses. Like viruses, they occupy a place at the borderline between the living and the dead; the exquisite result of human artefactual ingenuity, their agency is most easily perceived ? most obviously pathological ? when they cross this boundary. Furthermore, fears of a devastating global pandemic have their counterpart in the fear of still unknown yet potentially disastrous effects that these chemicals could exert as they assemble and reassemble.

There are thus interesting parallels between the implementation of the precautionary principle in potential new pandemics and in the case of the EDC assemblage that deserve critical consideration. For whilst the pandemics elicit a heightened sense of urgency and preparedness, a variety and breadth of epidemiological modeling, and a recognition of the need to engage the public in the precautionary endeavor, EDCs are not equally well problematized. In our view, the pending threat of artefactual chemical viruses is at least as urgent as the threat posed by the biological ones. After all, the latter always leave part of the population alive, while the former at worst shut down the reproductive systems of entire populations. Approaching EDCs as virally agentic parts of a heterogenous assemblage thus suggests promising resources for a new regulatory design that not only manages to address the urgency of the issue, but does so in a thoroughly horizontal way.

References

Bennett, J. Vibrant Matter. A political ecology of things. Duke University Press.

Stirling, A. and D. Gee (2002) Science, precaution and practice. Public Health Reports 117: 521-533.

Comparing the sustainability of the 27 European Countries. A robustness approach

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SHORT ABSTRACT
The current economic crisis can be seen as arising from a failure to properly address sustainability, which too often is thought as concerning the natural environment rather being referred to the general ability of a society (and its economy) to reproduce itself. By using a wide notion of sustainability, this paper aims to assess the relative sustainability of the EU Countries. Similarly to Luzzati and Gucciardi (2013) and Floridi et al. (2011), rather than building a single composite indicator (score) for each country, we combine different normalization and aggregation rules, and different weighting systems to calculate many composites (308). As a result, we obtain a distribution function of the ranks and a plausible rank range for each country. The reasons for our ranking are then scrutinised. Such an approach looks as a good compromise between the need of synthesis when looking at many variables and the loss of relevant information that occurs when indicators are aggregated into a single composite indicator.

Addressing Agency in the Institutionalised Timescapes of Endocrine-Disrupting Chemicals Governance

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SUMMARY
Endocrine-disrupting chemicals (EDCs) and the attempts to regulate these have lately received considerable political and scholarly attention. However, the regulatory responses to govern these have been slow, which has given rise to considerable temporal mismatches within EDC governance. In this paper we integrate the concepts of timescapes, temporal institutions and temporal agency to gain a better understanding of how these mismatches are coupled to institutional processes. We illustrate our theoretical framework by highlighting the attempts of an international community of EDC researchers to change the rigid EDC institutionalised timescape. We argue that focusing on the interrelatedness of time and institutions is a valuable way of making sense of the EDC governance temporal mismatches.

ABSTRACT
Endocrine-disrupting chemicals (EDCs) and the attempts to regulate these have lately received considerable political and scholarly attention. However, despite a deeply felt concern regulatory communities worldwide have been slow to incorporate the chemicals posing endocrine concerns into existing legislations (Hecker & Hollert 2010; Vogel 2004). Surprisingly few policy analysts have dealt with the issue of this temporal mismatch of EDC governance head-on. In this paper we use the concept of ?timescapes' put forward by Adam (1998; 2004; 2008) as a starting point for examining EDC governance from a temporal point of view. The aim of this paper is to examine how the research on timescapes, on the one hand, and temporal institutions (e.g. Orlikowski & Yates 2002) and temporal agency (Flaherty 2011), on the other, can be integrated in order to address these temporal mismatches.

The aim of the paper is thus to develop a theoretical framework for making sense of the temporal complexity of not only EDCs, but also the attempts to govern them. Our main argument is that focusing upon temporal agency and practices within institutionalised EDC timescapes can open up appealing strands of research. We illustrate the theoretical framework by examining the governance of EDCs within European Union's REACH.

The timescape approach put forward by Barbara Adam is highly valuable when assessing temporal complexity. A timescape can be depicted as a ?cluster of temporal features, each implicated in all the others but not necessarily of equal importance in each instance' (Adam 2004: 143). By using the word timescape, she lays an emphasis on the relationship between the temporal and spatial; time as well as the understanding of time becomes contextual. Furthermore, it transcends the much-debated division between «social» and «ecological» time. Adam (2008) portrays seven timescape characteristics that can be studied, but in this paper we focus on the Four T's; time frame, temporality, tempo and timing. While useful in describing complexity, the timescape approach is less capable of addressing temporal similarities and order in a sufficient manner. The four T's should not be seen as fully arbitrary; rather they are coupled to the institutional context. Therefore, we argue that the timescape approach would benefit from drawing upon insights from the literature on institutional theory.

Studying the regularity and stability of human activity has been a central focus of the institutionalist scholars. Institutional theory states that social institutions are to a large extent « sticky», resistant to external influence and enduring (e.g. March & Olsen 1989; North 1990: 6). In this paper we apply a broader conception of institutions by seeing them not only as regulative, but also as normative and cognitive (Scott 1995). We also acknowledge that institutions have a dual characteristic ? they both influence human activity and is being shaped by that same activity (c.f. Giddens 1984). Despite the fact that research on the temporal organisation of social activity has the last couple of decades been flourishing, only limited scholarly attention has been directed towards the institutional facet of temporality. In our paper we use the concept of ?temporal structuring' (Orlikowski & Yates 2002) to account for the continuous process of producing and

reproducing temporal institutions that simultaneously influences that particular activity (c.f. Giddens 1984). Thus, the focus is on the practices that are recreating a specific temporal order. Therefore, we will here use the concept of temporal institutions to refer to the rules, norms and cognitive maps that orient the time frame, temporality, tempo and timing of endocrine-disrupting chemicals governance.

While we take the argument of Orlikowksi and Yates (2002) concerning the duality of temporal structures seriously, we argue that we nevertheless need to pay closer attention to the ways in which actors shape temporal institutions. We do this by referring to the scholarship on institutional work (e.g. Lawrence et al. 2009) and temporal agency (Flaherty 2011). What both two strands of research have in common is that they question the supremacy of institutions vis-à-vis human agency. Temporal agency, however, places time at its core and refers to how individuals act on and ?resist external sources of temporal restraint' (Flaherty 2011: 3). According to Flaherty, temporal agency takes form in different ways dependent upon the grade of intent and change of a particular action. This not only allows us to asses whether agency takes place or not, but also opens up the different possibilities of how actors engage with the temporal order. It is important to point out that temporal agency should not be regarded as decoupled from institutional influence, but as happening within this influence (Giddens 1984; Orlikowski & Yates 2002). The continuum of the «temporal agencies» acknowledges the simultaneous influence of institutions on human behaviour and possibility for action and the different forms this relationship gives rise to.

In sum, the theoretical framework of agency in institutionalised EDC governance timescapes invites us to consider not only the various times of governance (timescape), but also how they are coupled to rules, norms and cognitive maps (temporal institutions) and how these are reproduced, contested and changed (temporal agency).

We illustrate the usefulness of the theoretical framework by analyzing the attempts of an international community of EDC researchers to change the currently rather rigid EDC timescape. Since EDCs challenge the scientific and regulatory frameworks by non-traditional response curves and cumulative effects of multiple low exposures, it is very hard to provide evidence of the harm they induce of the kind required by chemical authorities. The response by the EDC community has been to question existing EDC-related temporal institutions (especially relating to quantitative risk appraisal), and to take recourse to systems biology in order to find other ways of making visible the couplings between EDC exposure and observed effects (Krysiak-Baltyn et al. 2012). In this paper, we argue that by situating time coupled with institutional processes in the centre of analysis a greater understanding of the temporal mismatches in EDC governance can be achieved.

References

Adam, B. (1998)Timescapes of Modernity: The Environment and Invisible Hazards. London: Routledge.
Adam, B. (2004)Time. Cambridge: Polity Press.
Adam, B. (2008) Of Timescapes, Futurescapes and Timeprints. Paper presented in Lüneburg University, 17 June 2008.
Flaherty, M.G. (2011)The Textures of Time. Agency and Temporal Experience. Philadelphia: Temple University Press.
Giddens, A. (1984)The Constitution of Society: Outline of the Theory of Structuration. Cambridge: Polity Press.
Hecker, M. & Hollert, H. (2011) Endocrine Disruptor Screening: Regulatory Perspectives and Needs. Environmental Sciences Europe 2011 23(15), doi:10.1186/2190-4715-23-15.
Krysiak-Baltyn, K., Toppari, J., Skakkebaek, N.E. and Jensen, T.S. et al. (2012) Association Between Chemical Pattern in Breast Milk and Congenital Cryptorchidism: Modelling of Complex Human Exposures.International Journal of Andrology35(3): 294-302.
March, J.G. & Olsen, J.P. (1989)Rediscovering Institutions: The Organizational Basis of Politics. New York: The Free Press.
North, D.C. (1990)Institutions, Institutional Change and Economic Performance. New York: Cambridge University Press.
Orlikowski, W.J. & Yates, J. (2002) It's About Time: Temporal Structuring in Organizations. Organizational Science13(6): 684-700.
Scott, W.R. (1995)Institutions and Organizations. Thousand Oaks: Sage.
Vogel, J. (2004) Tunnel Vision. The Regulation of Endocrine Disrupters.Policy Sciences37(3-4): 277-303.

Avoiding unemployment under the growth dilemma: a short review of relevant economic literature

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Arguments that economic growth in the most developed countries does not add to wellbeing have been increasingly put forward. However, sustained interruptions in economic growth tend to lead to problems of socio-economic instability, including unemployment. Societies are thus faced with a ?growth dilemma' between long-term wellbeing and short-term stability. Two possible macroeconomic strategies have been identified in the literature as to potentially overcome the dilemma: work time reduction and reconfigurations of the production structure towards lower labour productivity activities. This paper conducts a review of issues that arise under these two solutions considering their side effects on economic efficiency, particularly by reviewing the existing economic literature on working time reductions and on the Environmental Tax Reform. It concludes that the two strategies have ground to overcome the dilemma, although with limitations in the scale of unemployment reduction achieved. The existence of such limitations supports the joint implementation of the two strategies.

Sustainability and making a living - Ideals of Green Work

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In this study we have applied the model of cultural worldviews from cultural theory, which in sustainability contexts, has previously mainly been applied for understanding sustainable consumption. We have applied it in a green work and working life context, where our aim was to gain a better understanding of the different green work discourses and the «ideal types» of green work or green workers. Data was collected through interviews with people who identified themselves as having pro-environmental values. Our findings indicate that there is a lack of available model narratives regarding green work, in comparison to the plenitude of green consumption and life style choice narratives. In conclusion, there is a need to promote different kinds of model narratives of green work, in order to improve our traditional and in many ways unsustainable work systems and working life practices.

Friday off - the case for reducing work hours in Europe

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Industrialised economies experience an unprecedented period of low, zero or even negative growth. For the environment this may be good [[i]]. With continuous growth it is very unlikely that dangerous climate change can be averted [[ii],[iii]]. However, degrowth is socially unstable in capitalist economies [ii]: increasing productivity in a context of zero or negative growth, increases the number of people left unemployed. Reducing work hours, and hence spreading more evenly the work-share, may allow those unemployed to remain active, while averting the pressure to grow the economy at all costs [[iv]]. Is the reduction of work-hours an effective policy to make degrowth socially sustainable?

This article conducts a thought experiment and uses it to structure a literature review on what we know about the effects of reducing work hours. We consider a hypothetical scenario of a statutory limitation of the workweek in Europe to 32 hrs, or 4 days of work. For simplicity, we assume an implementation scenario similar to the transition from the 48 hrs to the 40 hr workweek, i.e. a combination of international (ILO and EC) agreements and directives, followed by a diverse model of national implementation through legislation and collective bargaining. We conduct a literature review of theoretical and empirical studies on work-hours to evaluate the economic costs and benefits of such a scenario and to arrive on an informed judgment on whether, and if yes under what conditions, would a policy of reduced work hours make sense. In line with degrowth theory, we take a broad and multi-dimensional perspective on wellbeing to include, in addition to conventional economic and employment indicators, aspects of health, education, personal activities (leisure and work), political expression, social relationships, and the environment [[v]].

This article proceeds as follows. Section 2 shows that historically, economic development has brought a reduction of work-hours. However, the last worldwide standard reduction (to 40-hours) dates back to the Great Depression. Actual work hours in Europe have declined in the post-war era relative to the U.S., but in some European countries this tendency has been reversed. A main argument against a further reduction of work-hours in Europe is the potential losses in productivity and competitiveness. Following an economic logic and language, section 3 finds no unequivocal link between work hours and productivity. Whether marginal worker effectiveness increases or decreases by reducing work hours, depends on what we assume about substitution between hours and workers. Furthermore, even if there is potential loss of productivity on the individual level, there are reasons to believe that this can be more than compensated by flexibility in organisational structure and technological progress at the aggregate level. We do not find reasons why shorter work hours should reduce the trade position of Europe, and we speculate on ways in which shorter work hours may even enhance the attractiveness of Europe as a high-skilled knowledge economy. Section 4 examines the findings on employment and explains the often mistaken assumption of a ?lump of labour', according to which there is a fixed quantity of work, such that if we all work fewer hours there will arise new jobs to fill the void. Still, we do find evidence that reducing work hours increases employment, even if less than suggested by a lump sum view. We also argue that shorter work hours will have positive compositional effects, making it easier for women, elders or disadvantaged groups to join the workforce and increasing the labour force participation rate. Section 5 outlines the various wellbeing benefits of reduced work hours, not least in terms of more leisure. We show evidence which suggests a likely coordination problem whereby people prefer to trade work and income for more leisure, but they currently can not. Session 6 shows that there are potential, but not automatic environmental benefits from reduced work hours, unless complemented by environmental regulations and taxes. Finally, section 7 concludes, discussing also some of the open questions concerning the effectiveness and implementation of a reduced work hours policy.

We find that there are good reasons why a 4 day workweek may not be a bad idea. First, we have done this in the past and it worked. Saturday was not a day-off but it now is. In the long-term, neither national economies nor employment suffered from the reduction of work-hours first to 48 and then to 40. Employment does not benefit from reduced hours as much as some advocates argue, but there is a «kick» in the short-term, that is important in times of recession such as the

current one when unemployment is high. General welfare stands to improve, which is also important for times of recession when the economic conditions reduce wellbeing. People who work less and people who live in countries that on average work less are happier. Many people want to work less, even for less money, but currently can't. A policy for an extra day-off will help people coordinate their preferences and their time off. It may also benefit the environment, and reduce resource use and carbon emissions, if accompanied by carbon and resource taxes and limiting regulations. It will also make adaptation to a future without growth easier and more stable.
A main objection is that in times of crisis, Europeans should work more and harder, not less. However the current crisis in Europe is an outcome of the bursting of asset bubbles and of a poorly designed monetary Union, not of European laziness. Europeans do not work less because of cultural reasons, but because of stronger labour unions, progressive taxation and a social multiplier effect, that led Europeans to coordinate their longer vacations in August. Historically, work hour reductions have been introduced in times of crisis, to create extra employment and to compensate workers with leisure. Labour productiveness may even improve by working less, since reduced work-hours may lead to more focused work, in the increasingly intellectually-intensive European service economy. Labour productiveness will also improve if some of the time liberated from work is devoted to training and human capital formation. Changes in social security and training policies to reduce the fixed cost of labour can reduce negative offsets on the cost of labour and employment.
For all these reasons, a reduction of work-hours in Europe makes sense, even in economic terms, which are the ones typically mobilised against the proposal. This does not mean that it is a proposal without problems. If hourly wage decreases, reduced work hours are an indirect form of unemployment and redistribution of the costs of the crisis from capital to labour. If hourly wage stays the same, the time released from worked may be directed to resource-intensive consumption and intensify environmental problems. If enforcement is uneven, high-paid service workers will benefit at the cost of low-paid manufacture workers. More importantly, one cannot rule out that working less might have positive effects on the growth of the economy, and hence increase environmental pressures; more research is needed on this, and the exploration of the conditions under which reduced work hours will lead to socially sustainable degrowth, rather than renewed growth.
Whereas further research is needed on many aspects of the proposal, such as more robust correlations between worked hours and quality of life or environment indicators, or more thorough sectoral level analyses, policy always advances through experimentation and learning by trial-and-error in the face of uncertainty. We believe that on balance, Europe should take the risk and lead a new round of reduction in work-hours, getting us one step closer to Keynes´ vision.

[i] Friedlingstein, P., Houghton, R.A., Marland, G., Hackler, J., Boden, T.A., Conway T.J., Canadell, J.G., Raupach, M.R., Ciais, P. and C. Le Quéré; Update on CO2 emissions,Nature Geoscience(2010), 3, 811-812.
[ii] Jackson, Tim. Prosperity without growth: Economics for a finite planet. Routledge, 2012.
[iii] Victor, P.A.,Growth, degrowth and climate change: a scenario analysis. Ecological Economics. in press, available on-line. 2012.
[iv] Coote, A., Franklin, J. and Simms, A.21 Hours. NEF, The New Economics Foundation, London, United Kingdom, 2011.
[v] Stiglitz, J., Sen, A., Fitoussi, J.,Mismeasuring our lives. Why GDP doesn't add up. The Report by the Commission on the measurement of Economic Performance and Social Progress.New York, The New Press. 2010.

Green jobs: what are they, and how many?

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This paper addresses the concept of green jobs, a topic which has generated considerable debate, academic activity and policy analysis. Green jobs are, for some, part of a vision of transition to a post-carbon economy. The paper offers immanent and external critique of the concept and measurement of green jobs, as presented by leading policy organisations, such as the EU, UN, and the US Bureau of Labor Statistics. These organisations offer a range of definitions, some of which are of Green jobs, others being of sectors (for example the Environmental Goods and Services sector). The paper argues that existing conceptualisations have strengths, such as that they are formulated in terms of mixed evaluation criteria. However, they are also rather blunt instruments which take inadequate account of ecological details. For example, we argue that existing definitions do not capture sufficiently many of the dynamics of the economic-ecological nexus.

The paper argues that current definitions would benefit from paying greater attention to ?shades of green': i.e. that some jobs are greener than others. We attempt to augment definitions and measurements of green jobs by combining sectoral and occupational factors. Further, via the application of ecological metrics including ecological footprint and carbon accounting, we examine green jobs measurement in a set of detailed cases. We then arrive at a set of estimates for green jobs. We argue that current measures of green jobs simultaneously over- and under-estimate their number.

This paper principally addresses the following conference themes: Interdisciplinary and transdisciplinary theoretical approaches; Methodological and epistemological issues; Governance, policies and institutions; Towards a Socio-Ecological Transition; and Institutionalization of Ecological Economics.

Useful work and Portuguese economic growth, 1856-2009

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Summary:
In this work we present a detailed methodology for useful work accounting. We center our analysis of exergy accounting on final uses instead of energy sources, contrarily to conventional analysis. Furthermore we include important energy flows such as food for humans and feed for working animals, which are usually absent from energy statistics. We apply this methodology to account for useful work in Portugal from 1856 to 2009. We conclude that the share of each useful work category varies slowly and is linked to structural changes in the demand for energy services. Also, contrarily to the trends in energy and exergy intensity, useful work intensity varies no more than 20% above and below its 154?year average value.
Abstract:
Dramatic changes occurred in the energy use patterns over the recent centuries. There were evident changes in the natural resources used to provide energy. In the 18th century industrializing countries shifted from wood to coal and later from coal to oil. More recently electricity was introduced as a new energy carrier playing its own role in the energy system. An exponential increase in quantities of energy uses as well as drastic changes in energy quality took place and were linked to enormous wealth accumulation, population growth and an impressive improvement in the standards of living. These changes in terms of energy quantity, quality and the way in which energy sources are used are commonly known as energy transitions.
A vast bibliography explores the changes in the paradigms' patterns of energy use. However most studies focus either on primary energy or final energy variables. These approaches tend to focus on energy supplies (where the energy comes from), and do not consider how energy is used productively within the economic system.
In this work we start by reviewing the theoretical basis of exergy-related concepts as well as the useful work variable, present the link between useful work and conversion efficiencies and the detailed methodology followed to obtain historical data on useful work for a given country.
Finally this methodology is applied to the Portuguese data of energy use from 1856 to 2009. We obtain exergy and useful work series. Historical data is presented and we describe the exergy breakdown in terms of natural resources, types and categories of use, and the evolution of exergy to useful work conversion efficiencies. We conclude discussing the useful work results in the context of other European countries, the observed characteristics of the energy transition, and the intensity measures.
Portuguese final exergy consumption and useful work dramatically increased since mid-19th century. However in this period structural changes in the mix of exergy final consumption took place. The transitions from combustible renewables, namely firewood, to coal and later to oil and electricity are apparent. Also, the share of food in the societal exergy inputs dramatically decreased with the massive use of high-density energy carriers. Food and feed products evolved from essential to irrelevant in the Portuguese energetic context.
Allocating exergy inputs to useful work categories enabled the assessment on the evolution of exergy uses instead of sources. In global terms is visible the transition from poor to nobler uses, such as medium and high temperature heat, mechanical drive and other electric uses instead of low temperature heat and food & feed. This allocation was done for each energy product and final consumption sector individually. However, grouping data in groups of energy carriers enabled more detailed information on the evolution of exergy inputs.
Types of energy use have also changed. In this context it is more adequate to analyze the evolution of the share of each useful work category than analyze the share of exergy by type of use. Useful work shares by useful work categories are much more stables and influenced by structural changes in the demand for energy services. The structure of useful work categories changed in the analyzed period in Portugal. Such changes show a transformation of useful work needs. The economy evolved to a much greater dependency on mechanical drive services than in the past. Also, other electric uses and higher temperature heat uses gained importance. These changes take effect as

a consequence of the industrialization of the country and mobility needs that drove to increases in the transport sector energy uses. Notwithstanding, these changes occur slowly and in very well defined historical periods.

When compared with final exergy intensity, useful work intensity is almost constant since 1856 with a variation of about 20% below and above the 154?year average value. This result seems to confirm the assumption that useful work allows for an analysis closer to final uses, centered in types of exergy use and energy service provided rather than a quantitative description of the amount of energy resources used to the same result.

The constancy of useful work intensity enables further research concerning future GDP growth trends. The consistency of such result must be confirmed by running the presented methodology for other countries. If so, the consistency of previous results relating the strong relation between useful work and economic growth may be confirmed and new insights on growth theory may be obtained.

Grassroots innovations in context: lessons in transition governance from two Belgian case studies

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Various forms of grassroots innovation practices are currently emerging in many domains, thus questioning the transition governance that could foster such alternative and more sustainable practices. What are the felicity conditions of such initiatives and to what extend can the lessons from grassroots innovations in context be enlarged to design relevant policies?
This paper intends to address this issue through two case studies conducted for the EU FP7 project InContext, which are dealing respectively with the food and energy domains. They both highlight the critical role played by public authorities and policies at various scales, from the general policy framework to the very local authorities, and enable to sketch some direction for innovative adapted transition governance.

Grow-your-own Green Money: Grassroots Currencies and Sustainable Development

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Grassroots currencies are parallel sustainable monetary systems, developed by civil society groups and non-governmental organisations (NGOs) as an innovative response to a range of social, economic and environmental problems. Frequently informed by ?new economics' perspectives on development, value, economic scale and growth, and by the desire to challenge consumerist lifestyles, they have multiple sustainable development objectives: localising economic development, building social capital and substituting for material consumption, valuing work which is marginalised in conventional labour markets, and challenging the growth-based monetary system. This international movement is pioneering novel community-based economic practices, whilst attempting to create new systems of financial services provision, yet it remains significantly under-researched. This paper presents new empirical evidence from the first international study of the scope and character of grassroots currencies. It identifies the diversity, scale, geography and development trajectory of these initiatives, discusses the implications of these findings for efforts to achieve sustainable development, and identifies the challenges to be overcome, to help harness the sustainability potential of these grassroots innovations.

Do many small rivers can make a big river? or how local initiatives are contributing to the foundation of a new conventional regime

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According to what is at stake with sustainable development, many actors are at the origin of local initiatives (AMAPs, fair trade, Local System Exchange...). These initiatives are observed with sympathy, as they seem to go into a sustainable direction. Yet, the question of scale always comes out. Criticisms and skepticism are expressed in this way: these initiatives are too small, they are too local, but we need to act at the global scale. These criticisms, I argue, are related to the way of thinking of the current conventional regime. The point I wish to present in this paper is that the multitude of these initiatives are sharing common principles. Although sometimes very different in practice, these initiatives are based on a common ground of values. Taken together, they are representing an important movement of actors following an intention of conventional regime to propose in alternative to the existing one.
The aim of the paper is to demonstrate this last assertion. After a first part defining what is intended with conventional regime, in the theoretical field of the economy of conventions, mostly based on French authors (Godard, 1990, Boltanski & Thévenot, 1991; Orléan, 1994, Favereau, 2010,...), several case studies will be presented and analysed through this theoretical background. Cases are chosen both in a European context and in the «South» context, in order to better figure their diversity. An analysis of these cases will then be presented, in order to show the similarity of thesea priorivery different initiatives in terms of conventional principles. This paper, the which ambition is programmatic, aims at demonstrating that a track for sustainability could be found in the extension of this alternative conventional regime, based on principles such as proximity (Colletis et al., 2005), increasing of capabilities (Sen, 1999) and the use of participatory democracy, such as presented in Buclet (2011). The change of scale should then be necessary in terms of principles and values, and not in operational terms, through the creation of big entities trying to reproduce what has been succeeded at a local scale.

Viable local societies enlightened by ecological economics.

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In this paper we study the transition process towards environmental and social sustainability in six different local societies in Norway. The project is based on cooperation between Centre for ecological economics and ethics (CEEE) at Nordland University and the regional authorities in Nordland County in Norway. Nordland County has decided to become a leading eco-county in Norway with emphasis on high quality of life for residents. xml:namespace prefix = o ns = "urn: schemas-microsoft-com:office:office" />
To develop a concrete action plan, we (CEEE) were invited to develop a research project based on information from all stakeholders (e.g. residents, business and industry) in the region. We chose to develop the project based on bottom-up based information. The methodology was anchored in dialogues with different stakeholders arranged as 6 café dialogues. The dialogues were focused on the following questions: How do the participants in the café dialogues describe viable local societies in 2030, and how can we move in the right direction?
Nordland County is situated in the northern part of Norway, there are app. 239 000 inhabitants and the main economic activities is fisheries, tourism, and public sector.
The purpose of this paper is therefore twofold. Firstly to describe how people in different regions in Norway describe their vision of ecologically and socially sustainable local societies in 2030. Secondly describe how to move in the right direction.
Our theoretical approach is based on interdisciplinary perspectives developed within the field of ecological economics. Transdisciplinarity indicates that ecological economics goes beyond our normal conceptions of scientific disciplines and tries to integrate and synthesize different disciplinary perspectives and practice.
The empirical content is obtained through two different methods; café dialogues and a questionnaire. The idea behind a Café dialogue is that different people have many things in common and in a communicative setting, they will explore their common interest, sparking collaborations and stimulating ideas that address issues of great importance. It is particularly suitable for dialogues, evaluation and development within areas characterized by multiple stakeholders representing different perspectives and interests. One important purpose is therefore to raise the awareness of the participants own understanding and values, and to be aware of other people's values and perception of reality. To catch the spontaneity in the dialogues the participants are encouraged to write and make drawings on the paper tablecloth under the sessions and these notes are later transcribed and interpreted.
Before the dialogue starts, the participants were given 4 lectures, one with general perspectives on the future, one lecture by a local resource person, a lecture introducing an ecological economic perspective on the future and an introduction to the dialogue as working form.
The café dialogues were open for all inhabitants in the local communities. They were circulating between 3 different questions on three different tables, on each table there was a host which facilitated the dialogue and wrote down the themes and conclusions. After the dialogue the hosts summed up the discussion for everyone, and the participants were encouraged to fill in if something was neglected.
The qualitative data from the café dialogues therefore consists of the participants writing on the table cloth, a summary and presentation by the hosts and additional comments from the participants. Everything was transcribed and interpreted. From the interpretation there seem to be a common understanding of the necessity of working together for a change towards more viable societies. The dialogues indicated that in all regions the participants described a greener future as a society characterized by less transportation and more cooperation within businesses and society aiming for more ecologically sound production, distribution, consumption and redistribution.
After the dialogue they were also encouraged to fill out the questionnaire to provide some demographic information and additional attitudes. 144 persons filled out the questionnaire, totally there were approximately 200 persons participating in the café dialogues. The questionnaires were analyzed with a factor analysis, and we were able to group the participants in 4 different categories.

We have labeled the first category, «Ecological economics». This category describes persons who share ideas toward a society based on circular value chains, pluralistic value systems, cooperation more than competition, bottom up solutions and a focus on collective goods. The people in this category have a perspective on the future which exceeds the local level and stress the importance of building national and international networks. The practical solutions must integrate ecological, societal and economic values.
The second category is named «Small is beautiful». The persons who are placed in this category are characterized by ideas and visions towards a future society based on qualitative values, local resources and competence, small scale solution and local initiatives. The people in this category have their focus on the small local societies, with a preference for use of local resources at site.
The third category is described as «Entrepreneurs», because they focus on change processes without focus on the direction of the change. The group is different from the two others because they focus on means such as networking, establish new relations, new thoughts and ideas, and build a society on creativity based on diversity, without focusing on values and visions of the goal.
The fourth category is a seemingly a traditionalistic group, their ideas for the future are based on a growth, in economic terms as well as in population. The want to build a strong region based on centralized solutions, we have named this group «Growth and control».
The findings indicate that most participants prefer either the way we describe as «Ecological economics» or «Small is beautiful», while very few prefer the other two categories. This is could be interpreted as an indication that the growth theorem, bigger units and a constant craving for higher consumption is not the important parts in peoples image of a viable society. More importantly is the connections between people and their ability to live their lives as part of a functioning society.

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Analyzing data from a questionnaire the participants are grouped in the following categories; « Ecological economics», «Small is beautiful», «Entrepreneurs» and «Growth and control». Most participants prefer either the way we describe as «Ecological economics» or «Small is beautiful ».

Social norms and consumer's green behaviour: theory and evidence from France

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Sustainable consumption involves discussion of how to include environmental dimensions in preferences and how these dimensions may affect consumer behavior. We distinguish between two levels of sustainable consumption (Fuchs and Lorek, 2005). First, sustainable consumption in terms of an increase in the eco-efficiency of consumption, which means a reduction in resource or energy consumption per consumption unit due to improvements in production processes or in the design of products (weak sustainable consumption, hereaffter WSC). Second, sustainable consumption in terms of drastic changes to consumption patterns and reductions in the consumption levels of certain industrialized products and services (strong version of sustainable consumption (SSC) which requires structural changes to consumers' behaviour).
Fuchs and Lorek (2005) show that WSC, focusing only on the eco-efficiency of consumption and on the role of innovation, has received much policy attention since the 1994 Oslo Symposium. In this context, buying services (or specific subscription to services), instead of buying goods, such as renting a car or flying less, may even appear attractive while they are becoming largely diffused by groups of individuals instead of staying on heroic individual actions.
Increasing returns of adoption are the necessary condition for a large diffusion of green behaviours (which may be a path towards WSC or a way to achieve SSC). As it has been shown for innovations, the scale of adoption has positive externalities that are generated as soon as the newness goes beyond restricted communities of users (Arthur, 1988). Groups are producing significant levers for change and promote social new behaviours. The process requiring social learning for the diffusion and imitation of the successful habits needs to be coordinated at the macro level through the actions of groups of consumers and institutions. Sociologic literature on consumption emphasizes the role of social norms and status seeking behaviours. The literature on status-seeking consumption originates with Veblen's work on «conspicuous consumption » (Veblen, 1994, 1899) and Duesenberry's «relative income hypothesis» (Duesenberry, 1949). Veblen coined the famous ?conspicuous consumption' for explaining why consumption is used as a way to gain and signal social status. Thus, consumption integrates a potential element of waste (waste of time, effort and of goods) (Veblen, 1899). In this context social groups are significant parameters given the tendency for people to imitate prestigious individuals (Buenstorf and Cordes, 2008; Maréchal and Lazaric, 2010). Social learning may overcome potential inertia and can be encouraged by emulation and imitation within and between groups of individuals (Buenstorf and Cordes, 2008).

DATA
On the basis of this framework, we conducted an original survey in 2011 among more than 3000 households in France (phone interviews). Our results scrutinize consumption habits for two types of goods: yoghourts and the use of washing machines in order to observe recurrent purchases (and associated waste collection practices) and less frequent acts of consumption such as buying a new equipment for home. Surveyed households were also interviewed on their own definition and perception of sustainable consumption. This set of questions enables to characterize the profile of consumers in terms of their perceptions and their motivations on environmental concerns. A set of questions also concerns the role of social interactions in shaping households' ?green' consumption behaviours. Variabled derived from this set concern: the role of the social support (entourage and circle), the propensity to mimetism, the assumption that individual behaviours (concerning consumption and other environmental dimensions) are nested in

territorial/regional dynamics (average ?green' behaviour, policy...).

METHODS

We apply factorial and cluster analysis to identify groups of households that exhibit similar environmental practices. Such analysis is applied for each set of variables: food practices; habits of consumption of washing machines; household-waste sorting; energy consumption; transport habits. We construct a synthetic indicator for each set of practices at the household level.

RESULTS

An econometric analysis is conducted to provide some evidence, after controlling for socio-economic and demographic factors, on the role of social norms for adopting green behaviours in daily consumption. We consider the impact of social imitation and social pressures for paving the way towards green behahiours and sustainable consumption. We show the weight of WSC in our French survey and househeolds? profiles in the direction of SSC. Finally, the importance of social imitiation for green behaviours (both in the direction of SSC or WSC) is observed and discussed.

?Habitual Practice' and household energy consumption: opening the black-box through discussing people's relationship with their homes

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The transition towards a low carbon society requires modifying current energy consumption patterns in households. Bearing this diagnosis in mind, policy-makers have mainly focused on technological solutions to this issue, thereby enthroning the promotion of energy efficiency as anendin itself rather than as ameantowards the reduction of energy consumption. The main drawback of such an approach is that it obviously neglects the behavioral side of the energy consumption coin (Maréchal, 2010). To put it simply, technologies are not isolated artifacts. Although they can be considered for a great part as being prescriptive of the related usage, technologies (such as energy-efficient refrigerators) are bound to be used by real people with related life and personalities.

Considering the insufficient results achieved so far by policies aimed at reducing energy consumption, this suggests a need for escaping from the obsessive rationality-efficiency perspective. According to our expertise of the field, this implies departing from an ?expert' view and basing the analysis on those energy-related practices that are meaningful for the practitioners (e.g. ?shower before going to work to wake up' or ?cook meals for their children', etc.). In order to look at this issue of energy consumption through innovative lenses, we use an alternative conceptual framework building on the concept ofhabitual-practice. Adopting this perspective amounts to emphasizing both the automaticity/unconsciousness and the multi-dimensional nature of domestic energy consumption behavior.

The rationale is to provide a precise characterisation of household energy-related practices allowing for a good understanding of their content (i.e. meaning, devices used, actors concerned, resources available, competences, understanding, etc.) together with a picture of how they are formed and sustained over time. Modifying energy-consuming behaviour is better viewed as a dynamic process of triggering, sustaining and stabilising a change of interconnected practice (cooking, showering, etc.) which are themselves an entanglement made of the stabilized arrangement of their different constitutive elements: material aspects (infrastructures, appliances, resources, money, etc.) cognitive aspects (motivations, beliefs, emotions, competences, etc.) and social interaction aspects (imitation, standards, reputation, social identity, relatedness, etc.) (see Maréchal and Holzemer, 2011).

The complexity that ensues from this innovative perspective on consumer behaviour undoubtedly constitutes both its richness as well as potentially its main drawback. Getting a grip on and adequately characterizing habitual practical does indeed entail a series of difficulties: less tangible (albeit crucial) aspects linked to a practice are often difficult to measure: studying practice means entering households' private and intimate sphere; most practice are highly routinised which makes it difficult for people to spontaneously talk about aspects that are deeply ingrained and an integrant part of the organization of their day-to-day life; the normative content of practice also renders quite complex its possible discursiveness. Indeed, as mentioned in Shove (2003, p. 395), «(...) domestic consumption and practice are intimately linked in reproducing what people take to be normal and, for them, ordinary ways of life.»

The need to overcome these challenging obstacles has led us to consider a promising research avenue: discussing the relationship of people with their homes provides a legitimate ?entry door' to the world of habitual practice.

Dealing with energy-consuming practice is made difficult by the fact that the ?product consumed' is not visible and tangible to individuals. People do not ?consume energy'per sebut for the services that it offers. However, when it comes to field experiments, getting people to speak about the meaning, beliefs and interpretations attached to those services that are enabled by consuming energy is not something obvious (and often turns out to be quite delicate). One evident aspect for people is that they live in a dwelling, made of different rooms, equipped and decorated in a certain way. Asking questions about those tangible and concrete aspects and making people

explain and provide justification for how a room is organized, where and why certain devices are positioned quite ?naturally' leads them to express parts of those underlying forces driving their energy-consuming practices. Broad notions of comfort and well-being are quite often linked to some aspects of the home (e.g. a comfortable living room, a convivial kitchen, a pleasant bathroom, etc.). Beyond specific rooms, it even appears that it is the objects that are in themselves carriers of social meanings and of symbolic value. Objects are more than mere inanimate and static things. Through the possibilities they offer, objects form the focal point around which activities are put in practice so that they can become intimately linked to the intentions and goals of the practitioners (Coolen and Meesters, 2012, p. 4).

The dwelling serves as an anchoring point for daily practice and for a myriad of ritualized actions (e.g. switch on the lights before climbing up the stairs). From this physical ?envelop' (i.e. the dwelling) and its surrounding environment which form the house, families create a ?home' through the way they handle, in their daily life, this material structure and the objects it contains (Gram-Hanssen and Bech-Danielsen, 2004). Through discussing the home that people live in, it is possible to get from the material dimension (dwelling, appliances, energy used, objects, etc.) to the more global and inclusive notion of ?habitual practice at home' which also integrates the related cognitive and social interaction aspects. It follows that the homes can thus serve for analyzing ideas and practices about intimacy, family, kinship, etc. (Mallett, 2004, p. 84).

Accordingly, if policy-makers wish to modify current energy consumption patterns, those notions of comfort, convenience, hospitality and so on are central to study as they are both the intentionally-aimed consequences of implementing practice (e.g. one showers to get clean or to feel well) while also being shaped through the repetition of those very practice (e.g. the constructed need that waking up requires the habitual morning shower). Approaching the home and energy-consuming practice in parallel thus is in line with those researchers that see energy-intensive practices as being more adequately analyzed through a framework of socio-technical co-evolution (Shove, 2003; Foxon, 2011).

It follows from these considerations that placing the surveyed people in situation which are close to what they undergo in their real life provides a suitable basis on which to build a finer understanding of energy-consuming practices and of their underlying drivers. This is precisely what we intended to do through our empirical enquiries based on the implementation of a ?role' game followed by focus groups. This empirical material thus aimed at opening the black-box of energy-consuming practices through, among others, discussing the notion of comfort, hospitality and convenience in connection with different elements of the home. One first interesting result is that there are some key appliances which could greatly contribute to our understanding of household energy consumption in that discussing them seems to often trigger a broader argumentation with respect to meanings, norms of usage, social punishment, practical issues, etc.

Mentioned references:

Coolen H. and Meesters J. (2012), House, home and dwelling,Journal of Housing and the Built Environment27: 1-10.

Foxon T. (2011), A coevolutionary framework for analysing a transition to a sustainable low carbon economy,Ecological Economics, 70/12: 2258?2267.

Gram-Hanssen K. and Bech-Danielsen C. (2004), House, home and identity from a consumption perspective,Housing, theory and Society21/1: 17-26.

Mallett S. (2004), Understanding home: a critical review of the literature,The Sociological Review, 52: 62?89

Maréchal K. and Holzemer L. (2011), Habitual practice' and domestic energy consumption: identifying and describing potential ?grips' for change,Peer-reviewed Proceedings of the 2011 ECEEE Conference«Efficiency first: the foundation of a low-carbon society», Hyères, France, June 2011, pp. 2021-2029.

Maréchal K. (2010), Not irrational but habitual: the importance of ?behavioural lock-in' in energy consumption,Ecological Economics, 69/5: 1104-1114.

Shove E. (2003), Converging Conventions of Comfort, Cleanliness and Convenience,Journal of Consumer Policy, 26: 395?418.

Initial Effects of a Community-Based Energy Saving Initiative: a Field Experiment

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Key themes of current energy policy debates are the need to reduce greenhouse emissions from fossil fuel use and to conserve fuel stocks. Consequently there is interest in reducing household energy use, particularly by energy efficiency measures. Yet efficiency enhancing measures on their own may not reduce energy use because of potential rebound effects (Hong et al., 2006; Sorrell et al. 2009). Therefore it is important also to consider the role of behaviour and how this may be influenced to lock in potential savings. Recently there has also been considerable interest in the role of communities as mediators of behaviour. This partly reflects the current prominence of social practice concepts in the social sciences in reaction to the individualistic models of behaviour typical of prevailing work in psychology and economics (Shove, 2003). This has led some to propose that behavioural intervention could be more effectively conducted by involving communities rather than directing behaviour change campaigns at individuals. However, there to be little existing hard evidence bearing on this proposal.

We report on a field experiment designed to measure the effects of improvements in dwelling thermal performance, interacted with community intervention to promote energy saving. The experiment, which is ongoing, is a collaboration between civil engineers, economists and political scientists. Household energy use is measured using smart metering supplemented with conventional meter readings and a comprehensive survey covering food, transport and consumption behaviours. Our set of measures provides a very rich dataset, designed to detect both any short term effectiveness of specific events such as meetings led by a community greening group (CGC), and longer term behaviour change.

The design is a matched case and control study (N=180 households) conducted over a 3 year period in the South of England, in which the treatment group receive behavioural intervention, including a focus on potential rebound effects. Both treatment and control groups receive improvements to the thermal performance of their homes, comparable to recent government initiatives. The quantitative measures are supplemented by qualitative comparative work designed to provide information about the processes at work, and to provide information on the extent to which conclusions may generalise to other contexts.

The treatment and control settlement were matched using ONS output area classifications, namely 4a,b (?prospering suburbs'). The settlements are distinct but located only 12 miles apart, which largely controls for differences in ambient temperature. Households were recruited to the study using an offer of free insulation upgrades. They agreed to the installation of smart metering equipment, to the completion of regular surveys on their wider energy use, and to attend at least one event per year run by a community greening organisation. In return they received a package of insulation measures the key components of which were cavity wall and loft insulation. The smartmeters record electricity use, which can be separated into baseload and discretionary components, and lounge temperature, which we use as a proxy for spatial heating consumption. In this paper we focus on results for household electricity use and spatial heating following the first community event. Since this event marks the initiation of interaction between this the group and the households, we treat it as a singular episode.

The first householder event was conducted approximately 13 months after the beginning of the recruitment phase. By this time most households had received insulation upgrades. The content of the householder event was determined by CGC with assistance from the research team. Topics covered included how to read and interpret the smartmeter data, ranking exercises of different types of activity by energy intensity and the rationale for the project in terms of demand reduction, climate change and reduced greenhouse emissions. Short interactive activities were devised which required participants to engage with the information rather than passively receiving it in lecture format.

Our results suggest effects of behavioural intervention on household electricity use and on

temperature, which proxies for spatial heating consumption. Electricity use fell by an estimated 5% of the national average based on a differences-in-differences comparison to the control settlement. No effect was observed for lounge temperature, which proxies for spatial heating. The effect on electricity use appears to have been sustained for several months following the event, but that on temperature was not. This may indicate that households find difficulty in adjusting to lower comfort levels to those they are accustomed to. We also consider an alternative explanation based on the Hawthorne effect, that is, that households are responding to the experience of being the objects of research. This explanation seems less plausible because of the asymmetry with the result for power consumption.

Further analysis of the energy monitor data reveals that there is no difference in the evolution of baseload power use across the two groups. Thus, it seems that households were able to make substantial reductions to their discretionary load. The effect was sustained for at least 14 weeks after the event, which is as far as we have so far processed and evaluated the data.

Potentially, there are significant policy implications. Policy with regard to households has tended to focus on technical measures to enhance energy efficiency, and schemes to subsidise and / or incentivise their adoption. Our initial data suggest in contrast that there may be potential for behavioural interventions alongside or independently of engineering measures, perhaps with community involvement. Such interventions are also relatively inexpensive. The financial cost of the behavioural intervention was two orders of magnitude less than that of the insulation measures. Against this must be weighed the practical difficulties of community-based engagement over energy saving. Attendance at the meetings was around 70% of the treatment group sample. Thus, the result should be interpreted as the average treatment effect on the treated, rather than on the target population. To arrive at the latter one has to discount by the rate of attendance. One limitation is time constraints on community groups, since these comprise volunteers, often with full-time jobs and families. We anticipate that further time and resources could be devoted to boosting attendance to good effect, however, if similar behavioural interventions were to be applied by governments.

References

Hong, S.H., Oreszczyn, T. and Ridley, I. (2006). The impact of energy efficient refurbishment on the space heating fuel consumption in English dwellings. Energy and Buildings, 38, 1171-1181.

Shove, EA (2003) Comfort, Cleanliness and Convenience: the Social Organization of Normality. Berg.

Sorrell, S. Dimitropoulos, J. and Sommerville, M. (2009) Empirical estimates of the direct rebound effect: A review. Energy Policy, 37, 1356-1371.

Do community currencies enhance sustainable quality of life?

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Summary

Community currencies and their contribution to a sustainable development have been quite widely discussed. In contrast, their potential to raise the personal quality of life of their members and users has been less noted. Combining these two strands, we argue that community currencies enhance an
individual sustainable quality of life underpinned by empirical data of an online survey of members
and users of community currencies in Austria and Germany. We base our analysis on the Capability Approach and its notion of quality of life, saying that a high quality of life is characterized by high freedom of choice. A sustainable high quality of life would then be characterized by a high freedom within the limits given by planetary boundaries and further sustainability criteria. From this more encompassing perspective, it becomes clear that community currencies do not just contribute to sustainable development via their often emphasized effects in the field of regionalization and local value added, but in a much deeper way.

Extended Abstract
1. Introduction

Within the current European financial crisis, citizens increasingly look for alternatives to an intransparent financial system that seems to redistribute funds from the poor to the rich. Community currencies as local currencies and Local Exchange Trading Systems are one example of this kind of local answers on global challenges and crisis. Local currencies do not use the official national currency, but create alternative ones for transactions which are usually bound to local or regional consumption. In addition, Local Exchange Trading Systems are exchange systems
not using any money at all, but other kinds of transaction mediums or credit systems (such as

time banks). In this paper we focus on the options that community currencies and Local exchange trading systems (LETS) are providing to their members, considering their impact on changing collective capabilities, norms and individual behaviour. We argue that community currencies enhance a sustainable quality of life, based on the Capability Approach saying that a high quality of life is characterized by high freedom of choice for a valuable life. A sustainable high quality of life would then be characterized by a high freedom of choice but within the limits sustainability is setting, i.e. using resurces in a just way for current and future generations.. Our empirical data supports such an increase of freedom of choice for sustainable behaviour and herewith a higher quality of life resulting from this behaviour.

2. Theoretical background: Quality of life as viewed in the Capability Approach

The Capability Approach (CA) developed by Sen (1985) focusses on the freedom of individuals to achieve what is in their view a valuable life. What a person can do and be ? her capability-set ? depends on the one hand on her resources and on the other hand on conversion factors which impact her ability to use resources for achieving doings and beings.
Resources are mainly thought of as material resources: commodities and services available. Conversion factors can be classified in three groups: personal, social and environmental conversion factors. Personal conversion factors refer to skills and talents of the person. Social conversion factors relate to the opportunities and constraints given by the social environment of the person and cover social norms and habits. Environmental conversion factors refer to climate, geographical characteristics and so on. Due to its concentration on values such as freedom and agency, the CA provides a framework for a development towards individual well-being. Social structures such as currencies only have instrumental value. For our analysis, we refer to an extension of the CA which takes into account the additional value of social and societal actions, namely Collective Capabilites. The concept of collective capabilities is relatively new. While the discussion about it is still going on, we base our approach on the definition of Solava Ibrahim (2006). She defines collective capabilities as «the newly generated functioning bundles a person obtains by virtue of his/her engagement in a collectivity that help her/him achieve the life he/she has reason to value» (Ibrahim, 2006, 398).
Quality of life according to the CA is determined by the individual freedom of choice and agency. In contrast to GDP and income based approaches, the CA is open to the importance of non-material values in people's lives: Even appreciated income and other resources only become valuable (i.e. real freedoms) through their interaction with social, personal, and environmental conversion factors.
A sustainable quality of life hence realizes a high degree of choices within limits given by the concept of sustainability. The definition of sustainable development we refer to is the well-known Brundtlandt defintion: "Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs» (WCED 1987).

3. Empirical researchs

We analysed the current literature pointing out main questions and research strands concerning community currencies and their impact on social behaviour. Based on this and the CA, we developed six hypotheses which were validated by an expert interview. Based on these hypotheses, an online survey was performed in July 2012 addressing users of regional currencies and members of local exchange trading systems. Data on general attitudes, value orientations, sustainable lifestyles and the usage of the respective community currency (frequency and motivation of use, etc.) as well as socio-demographics were collected. A total of 160 questionnaires were completed. In the analysis we compared the sample data with different representative data (e.g. Sozioökonomisches Panel 2012, European Social Survey 2006, Eurobarometer 2009).

4. Results: Community Currencies expand collective capability sets and enhance sustainable quality of life

Being fundamental for individual well-being as well as basis for society, trust is a crucial factor for the social dimension of sustainability. Since people actively choose to use an alternative

transaction medium to national currency, the issue of trust is a major one. Since the rewarding system functions differently than usual repayment-systems, exchanges are based on different values. Studies show an enhanced trust in others regardless of whether the other people are taking part in community currencies or not. We found significant differences between members of community currencies and the average population. Approximately half of the people we asked have confidence in most people (47%) and believe in the fairness of others (52%), whereas less than a quarter (14% and 21%) of the average popoulation share these opinions.
Considering the global dimension of current problems (e.g. climate change, scarcity of resources etc.) combined with a certain urgency to start solving these problems, empowerment is becoming a crucial term as people often feel unprotectedly exposed and resign. Hence, feeling to be able to impact on social structures might be essential in order to actually cause some changes. In our survey, it was found that users of community currencies assign some actors (e.g. producers, consumer) a higher potential to influence global developments as climate change.
Another question we tried to answer with our survey was whether members of community currencies have integrated sustainability into their personal norm system stronger than the average population: This is underpinned for example by 76% of our sample buying organic food «often» or «very often» compared to 19% of the average population. In both examined fields of behaviour (food and mobility), the personal environment of members of community currencies implement a more sustainable way to satisfy their needs: Buying organic food or chosing public transport, bicycle or walking instead of driving a car show a significant difference to habits of average population.
Additionally to alterations concerning general conversion factors for sustainable behaviour it can be demonstrated that in the specific field of sustainable consumption enhanced capability sets can be found. First, due to their limited reach most of these initiatives are oriented towards local or regional consumption-production cycles. This can be shown by our survey: 54% of people stated that they buy regional products more often, since they joined community currencies. Second, due to the focus on services and personal interaction or the mutual use or re-use of material things, the overall material and energy use is cut down, since people orient themselves towards «sufficiency» as 31% of members of community currencies state.

5. Conclusions

We discussed that community currencies expand capability sets in various ways. As increased capability sets enhance quality of life, we argue that community currencies raise quality of life. This is an important, but so far rarely considered notion on the effects of community currencies. Analysed from this more encompassing perspective, it becomes clear that community currencies do not just contribute to sustainable development via their effects in the field of regionalization and local value added, but in a much deeper way: The capability sets of members of community currencies are enlarged via extended conversion factors and extended capabilities for sustainable consumption. Through these various ways community currencies can raise a sustainable quality of life and contribute therefore to sustainable development at a fundamental level.
A quite important question we couldn't answer with our study is the one concerning the causalities of the shown correlations. So it's still open whether only people with a higher level of trust join community currencies or whether trust is built through this initiatives. As the same question of causality is valid for many of our findings, further research concerning causalities is required.

Basic Literature:

Ibrahim, S. (2006). From Individual to Collective Capabilities: The Capability Approach as a Conceptual
Framework for Self-help. Journal of Human Development 7 (3), 397-416.

Sen, A.K. (1985). Commodities and Capabilities. Oxford University Press, New Delhi.

WCED (United Nations World Commission on Environment and Development) (1987). Our Common Future. http://www.un-documents.net/wced-ocf.htm 13.12.2012.

Quantitative analysis of French marine and coastal environmental policy performance: first step from a local scale

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We propose to elucidate in a quantitative way the performances of five French marine and coastal policies. We will begin by a statistical analysis at a local scale, based on two types of environmental management sites (Natura 2000 and water management sites), in order to identify the effect of socio-economic, biophysical and institutional factors on the nature of decisions and instruments, and eventually on environmental results. This will constitute a basis for a more qualitative analysis at upper institutional scales, at supra-regional, national and European levels.

Our work falls within the scope of positive institutional economics: our aim is to give a quantitative perspective on the factors of smooth functioning of French coastal and marine environmental policies. These policies are: the Birds and Habitats directives (Natura 2000), the Water Framework Directive, the Marine Nature Parks, the Marine Strategy Framework Directive, and the environmental instruments of the Common Fisheries Policy. We propose here to develop our communication through four sections.

First, we define our performance criteria. We consider that environmental results are the reference target of environmental policies, in other words their only necessary criterion of "success" : they must be taken as a basis for the definition of institutional performance (final explained variable) and the ex-post assessment of policy design[1]. The underlying guiding principle of our institutional analysis is the "efficiency" issue, that is to say the question of "resource" allocation optimisation for a given environmental result. Other "judgment criteria" as local participation degree, equity, political feasibility, the speed of the procedure, the nature of undertaken actions, are procedural or operational control criteria, and potential intermediate explained variables for our analysis. We consider that these criteria of «procedural performance» are in the best case "obligations of means", which can influence the environmental results, but they are not the primary underlying social justification of these policies. Nevertheless, we are aware that the legitimacy of performance criteria could be discussed from a philosophical point of view, and that some authors give equal emphasis to "social performance criteria" (e.g. Ostrom 2009; Pahl-Wostl et al. 2012).

Second, we will try to identify the factors explaining operational outputs and environmental performances at a local, national and European scale. Our ambition is to find specific socio-economic, biophysical or institutional conditions, which help in implementing environmental policies (Garcia-Sanchez and Prado-Lorenzo 2008; Pahl-Wostl et al. 2012). As underlined by these articles, most studies are limited to context-specific case studies, at the risk of drawing conclusions falling into a "my-case-is-unique" analytical trap (Basurto and Ostrom 2009). Conversely, other approaches, based on theories and simplistic assumptions, can lead to the opposite "panacea analytical trap"(id.). Acknowledging these limits, the "diagnostic approach" attempt to reconcile empirical, theoretical and statistical approaches in order to identify significant success factors regarding environmental management goals (Ostrom and Cox 2010).

Third we will present our methodological approach based on a statistical analysis at a local scale. This geographical scale is the one where some or all concrete actions will be decided, and where the effects on the targeted "environmental good" will be observed. Of course, decisions regarding measures to apply must integrate some specific local constraints especially those related to financial, informational or human resources, institutional factors (e.g. interactions between local institutional instruments[2]), but also biophysical or socio-economic factors (e.g. local species diversity, local importance of tourism activities). The effect of these constraints on actions and results can be quantitatively assessed.

We have planned to carry out our statistical analysis through two local geographical reference units: Natura 2000 sites (terrestrial, coastal and marine areas) and Water Development and Management Schemes (coastal "SAGE" and implementation instruments), corresponding respectively to the implementation of the Birds and Habitats European Directives (1979 and 1992) and of the 1992 Water Law.

Given the important differences between the biodiversity conservation policy and the water policy (object of the policy, history, available data...), the two statistical analysis will be performed separately. Nevertheless, our aim is to draw a common analytical framework inspired by Elinor Ostrom's works (Ostrom and Cox 2010), so as to improve the comparability between the study of the coastal "SAGE", more advanced and whose results are supposed to be observable, and marine Natura 2000 sites, which are generally at an earlier stage of development. This framework is initially dedicated to the study of "common-pool" resources (typically forests, fisheries, irrigation and pastoralism). As a consequence, it needs several conceptual and practical adaptations. But the basic architecture will be preserved, and we will distinguish different types of variables outlined above, related to the system of actors, to the governance system or to the biophysical system.

The available data for these statistical analysis are numerous but need an important work of standardization. The main available data bases come from the INSEE (French National Institute for Statistics and Economic Studies) for socio-economic data, Water Agencies and national databases on aquatic ecosystems, the National Inventory of Natural Heritage (managed by the National Museum of Natural History) for environmental protection instruments, and the European Environment Information and Observation Network. More specific data on marine ecosystems and activities will be available at IFREMER (French Research Institute for Exploitation of the Sea) and at the Marine Protected Areas Agency. Given that most of environmental policies are quite recent, we are aware that environmental results will not be necessarily available for all the sites. Nevertheless, some of missing data ? especially as regard to the management issue ? will be completed by questionnaires which will be sent to site managers and by expert interviews.

Fourth, we will give the first results of our statistical analysis, showing the role played by existing structures (e.g. inter-communal bodies) and by the means available for implementation and rule enforcement. It will clarify the influence on decisions of the nature of stakeholders involved in local steering committees, of the quality and quantity of information regarding the environmental good and of the nature of the good itself (public, common, private, club). Our final goal is to make explicit the link between the nature of decisions and instruments on the one hand, and the results observed on the field on the other.

Once local key factors, driving or blocking forces, will be identified, we will be able to search for their roots at higher institutional levels, using qualitative and quantitative comparative analysis. In particular, at a supra-regional scale (marine sub-region and watersheds), the Action Plan for the Marine Environment, stemming from the Marine Strategy Framework Directive, can be studied in the light of feedbacks of the Master Plans for Water Development and Management ("SDAGE") stemming from the 1992 Water Law. The study will be completed by a comparison with other European Countries which will allow us to assess the role of some French institutional instruments.

[1] This does not mean that "environmental results" must be preferred to "undertaken actions" as a day to day control criterion: the choice of this criterion can be discussed from an environmental efficacy point of view (Gibbons et al. 2011).

[2] For instance, sites of the Conservatoire du littoral, nature reserves, regional nature parks, marine nature parks, inter-communal bodies, Integrated Coastal Zone Management projects, territorial coherence schemes, environmental contracts...

The Moroccan Agdal as an archetype of Community Based Natural Resources Management system. Contributions and limits of a ?new institutionalist? perspective on environmental management.

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Summary
Community based natural resources management (CBNRM) has been adopted worldwide over the past 10 years. Based on a case study in Morocco, this paper shows how the translation of a particular collective management systems (theagdal) as an archetype of successful Common Pool resources system has been used by Scholars to promote policy instruments that take into account local and collective action. This translation rests on theagdaldescription through a new institutionalist framework that accounts for 4 analytical categories, considered as stable: resource, user group, rules, external environment. However the paper demonstrates that these categories are not stable over time as a result of their weak inscription: actors are constantly bargaining to delineate the resource system, who is part of the user group, which rules are to be used, in particular when new actors enter the game. As a consequence, the implementation of a new policy instrument meant to promote a collective management of resources is difficult.

Abstract

Community based natural resources management (CBNRM) has been promoted worldwide over the past 10 years. Theoretical and empirical reflections about CBNRM started at the end of the 70' and the beginning of the 80', in order to move away from a dichotomous approach that places, in matter of natural resources management, coordination by the State on one side, and coordination by the market on the other. This was particularly true with respect to forest and water management, where States had had imposed themselves as main regulators with contrasted results. The promotion of CBNRM rested on the intense theoretical and field work carried out by Scholars dedicated to the study of common property institutions. They have indeed developed a new institutional theoretical framework that has been applied to numerous case studies in a comparative perspective (more than 1000 case studies were taken into account by Ostrom in her first seminal book (1990)). This comparative work resulted in the identification of a small number of «design principles» favouring the possibility for a given system to be sustained over time, and thus to the definition of an archetype of successful common pool resources system (CPR).

In Morocco, collective management systems of sylvo-pastoral resources had been described in the early 30' throughout the whole country. Some of these management systems have been requalified as «textbook cases» of CBNRM at the end of the 90'. These systems are calledagdals. Anagdalcan be definedroughly as an area where access rights and uses of natural resources are governed by a local institution, with a temporary respite from use with the aim of conserving or deferring the use of resources at critical periods. These descriptions of the agdal as perfectly matching the archetype of a successful CPR system have afterwards been used to promote the introduction of community / collective based management systems in forest and rangeland policy (Genin & Benchekroun, 2007).

Thus, the question this contribution would like to address is the following:

How has the translation of the agdal as an archetype of a successful CPR contributed to the evolution of the Moroccan forest policy, and what are the limits of such a translation?

Three main results allow answering this question.

A first result shows how theagdalhas been translated as an archetypal successful CPR. Management situations where anagdalexists have first been analysed through the prism of the analytical model proposed by Ostrom (1990, p. xv) and then systematized by Agrawal (2001, 2003, 2007): four analytical categoriesa prioriconsidered stable are described: the resource system; the attribute and behaviour of the user group; the institutional arrangement (that determines the relationships between both the group and the resource system and the members of the group towards the resource system); the external environment (Auclair, 1996). This first description allows scholars to demonstrate that theagdalperfectly fits the design principles given

by Ostrom as favouring the success of a given CPR (Romagny& al., 2005; Romagny& al., 2008). On a second level, we discuss the consequences of this translation work on the evolution of forest public policies. We show how various Scholars contributing to the translation of agdal in terms of successful CPR are involved in different public policy forums, with the forestry administration or international funders. At the same time, increasing importance is given to the principle of community management by various funders working in Morocco (World Bank, FAO, European Union, GTZ), which is materialized by the implementation of numerous projects based on a community management. It is at the meeting of these processes that a new forest policy instrument is adopted that marks a form of reappropriation of «community management» by the Moroccan forest administration.

A third result level concerns the blind spot of the conceptual model on which the translation of theagdalin terms of CPR rests. Indeed, the four analysis categories on which the analyse rests ? the user group, the managed resource, the institutional arrangements, the outside environment- are not, at least in Morocco, stabilized, notably due to the weak inscription on which they rest. They are thus recombining in a dynamic manner through the struggles that oppose some actors and the arrival of new actors, whose stakes are to define the contours of the user group, the content of the institutional arrangements and the limits of the resources to be managed.

We conclude and open our contribution on two points. We first underline the necessity to operate an analytical decentering to grasp the reconfigurations that evade a «Commons» type of modelling. This decentering rests on two operations: an «in context» recentering of the management arrangement (theagdal), which consists in shedding light onto what it produces with respect to its aims. This allows to capture the potential dynamics or factors on which it must act to be efficient. Then, the use of other analytical categories that are more open than those of resource-user-institution-outside, in the frame of a more inductive and less positivist epistemology (Johnson, 2004), that clarifies its normative standpoint (Putnam, 1989). Finally, we think this decentering is all the more important that the following hypothesis emerged from recent observation: the new policy instrument meant to promote a collective management of resources is precisely difficult to implement due to the recombinations mentioned earlier: difficulty to define user groups, conflicts on the limit of the resource, disagreements on the institutional arrangements to adopt or to keep.

Bibliographie

Agrawal A. 2001. "Common Propery Institutions and Sustainable Governance of Resources". World Development, 29 (10), p. 1649-1672.

Agrawal A. 2003. "Sustainable Governance of Common-Pool Resources: Context, Methods, and Politics".Annual Review of Anthropology(32), p. 243-262.

Agrawal A. 2007. "Forests, Governance, and Sustainability: Common Property and its Contributions".International Journal of the Commons, 1 (1), p. 111-136.

Auclair L. 1996. "L'appropriation communautaire des forêts dans le haut Atlas marocain".Cahiers des Sciences Humaines, 32 (1), p. 177-194.

Genin D. & Benchekroun F. (dir.) 2007.De la parole aux gestes. Éléments de réflexion sur les dispositifs de gestion concertée des ressources forestières et pastorales au Maroc. Rabat, IRD - ENFI - SCAC de l'Amabassade de France.

Johnson C. 2004. "Uncommon Ground: The ?Poverty of History' in Common Property Discourse".Development and Change, 35 (3), p. 407?433.

Ostrom E. 1990.Governing the Commons ? The evolution of institution for collective action. New York, Cambridge University Press.

Putnam H. 1989. "Objectivity and the Science-Ethics Distinction".dans: M. Nussbaum & A. Sen (dir.),The Quality of Life. 143-157.

Romagny B., Auclair L. & Elgueroua A. 2008. "La gestion des ressources naturelles dans la vallée des Aït Bouguemez (Haut Atlas) : la montagne marocaine à la recherche d'innovations institutionnelles".Mondes en Développement, 36 (1), p. 63-80.

Romagny B., Elgueroua A. & Auclair L. 2005. "L'évolution des institutions et des modes de gestion collectifs des ressources dans la vallée des Aït Bouguemez (Haut Atlas marocain)". Communication au colloque:Séminaire Intern. «Le développement durable des zones de montagne», AMAECO, Rabat, 1-2 décembre 2005.

Protected Areas in the Brazilian Amazon: from "Paper Parks" to Efficient Environmental Management Arrangements against Deforestation. The Case Study of the Terra do Meio (Pára State)

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The Amazon ecosystem has undergone rapid changes in the past four decades. Until 2011, 762,000 km2 of natural forests were converted to predominantly cattle ranching and crop production (INPE, 2009). This implies that 19% of the original Amazon forests were cleared. The pace of forest conversion varies through the years, but in the last three decades official statistics show that around 5% of the original forest was lost per decade (Nkonya et al., 2012). The highest level of annual deforestation registered was observed in 2003-2004 with an annual rate of 72,000 km2. This period marked precisely a tipping point in the dynamics of the Amazon destruction. Indeed, since 2004 the deforestation rate has started to decline dramatically year after year to achieve the lowest deforestation rate ever recorded in the Amazon in the 2010-2011 period (INPE, 2012). Two sets of factors, endogenous and exogenous, have been identified at the regional level to explain the change (Verrismo, 2012). First federal, state and municipal governments have taken strategic actions to deter the advance of the pioneer frontier. With the support from Brazilian and International NGOs, the Ministry of Environment created more than 450,000 km2 of new protected areas between 2002 and 2006. Second, the decline of the international prices of the main commodities has strongly reduced the liquidity available to finance deforestation and reduce the profitability of ranching activity in the Amazon (Fearnside, 2009). Even if most of the literature recognizes the importance of the creation and enforcement of new protected areas, very few studies have sought to understand the roots causes behind the efficiency of these instruments of territorial management. This gap is more than surprising, since for more than a decade the creation of inefficient «paper parks» in Latin America and especially in Brazil have been frequently criticized (Redford et al., 1998).

In order to understand how the creation of new protected areas, as an environmental management arrangement, has affected the advance of the pioneer frontier in the Amazon, we centered our study on a region of the Eastern Amazon, the Terra do Meio («Middle Lands»), well-known as one of the main «hotspots» of the Amazon deforestation in the early 2000´s (Alencar et al., 2004). The Terra do Meio is a region of 79,000 km² located south of the Pará state, between the Xingu and Iriri rivers. Even if the vast majority of the region's land cover is constituted by closed canopy tropical forest, small enclaves of naturally occurring savannah grasslands give to this region a specific importance in the national strategy for biodiversity conservation (MMA, 2001). Before 2000, less than 500 km² were deforested in the region. Between 2000 and 2004, the annual surface deforested in the Terra do Meio has varied between 500 to 700 km². As political answers to the murder of Dorothy Stang in February 2005, an American nun who had worked for twenty years among small farmers of the Transamazon Highway, the Brazilian government decreed the sudden creation of two restricted protected areas: the Serra do Pardo National Park (445,392 ha) and the Terra do Meio Ecological Station (3,373,111 ha). This resulted in a sharp reduction of around 80% of the cleared areas into the newly created protected areas.

For the inquiry conducted over a period of 18 months, we combined participant observations undertaken in the Terra do Meio region and semi-structured interviews with key informants of the pioneer frontier. Based on the ethno-definitions commonly used by pioneers (Barth, 1969), we identified three local groups: small farmers (colonos), middlesize ranchers (fazendeirinhos) and large ranchers (fazendeiros). We interviewed 128colonos, 35fazendeirinhosand 71fazendeirosobtaining in each case qualitative data (on their migration history, their relationships with others actors, their vision of the territory) and quantitative data (through a questionnaire on their property, ranch, livestock, home). The socio-anthropological investigation of forest management was guided by the sociology of the collective action framework (Crozier and Friedberg, 1980), in order to understand the nature and the consequences of the relational constructs which individual and collective actors create in order to manage their

interdependencies in a collective effort (Friedberg, 2000). The framework posits a heuristic hypothesis: collective action is necessarily sustained by a socially constructed order, i.e. an artificial and therefore always conditional order that solves the problem of collective action (Friedberg, 1993). This political construct implies a simple assumption: if patterns of relations and dependencies between actors can be empirically observed, then certain «game» structures which coordinate and integrate the conflicting strategies of the various participants must also exist, as well as an encompassing «concrete system of action» which articulates and regulates the relations between the game structures it contains. We then focused on the identification of these «games» related to the advance of the pioneer frontier in the Terra do Meio and how they have been impacted by the creation of the protected areas in the region.

The results of our study demonstrate protected areas could be efficient environmental management arrangement. The creation of the protected areas in the Terra do Meio jeopardized the functioning of the local socioeconomic organization of the pioneer frontier. By suddenly freezing the informal land market and splitting the pioneers in two distinct groups with distinct strategies and interests, «those who are in» and «those who are out», the protected area and their enforcement deeply reshaped the systems of interdependencies and cooperation that previously existed between the pioneers (small farmers, medium-size ranchers and large ranchers). Before the creation of the protected areas, all the participants benefited (not equally) from their participation in the organization and for that reason they collectively acted, especially against the environmental police operations, to protect it. The creation of the protected areas directly impaired the common goal (the advance of the pioneer frontier) that had sustained for years the « games» that regulate all the relationships between pioneers and ensure cooperation between them. As a consequence, very distinct strategies of action have arisen on the «stabilized» pioneer frontier: those who have their possession outside the protected areas have patiently waited for the land regularization that have been promised as a compensation of the protected areas creation, those who have their passion inside the protected areas have engaged in a hard juridical and legal fight against the creation of the protected areas. In both cases, clearing new areas of tropical forest is no more in the agenda.

CO2, energy and GDP per capita: a reassesment of the EKC

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Building on a previous piece of research (Luzzati, Orsini 2009), this paper re-examines the environmental Kuznets' curve hypothesis (EKC) both for CO2 emissions and total primary energy supply for the period 1971-2012 and for 142 countries.
The following are the distinctive traits of our approach.
1) It looks for a robust estimate by (a) using both parametric and semi-parametric methods, and (b) analysing different levels, that is, the whole panel, a sub-sample of it which excludes potential outliers, the world as a whole, and country patterns.
2) Differently from standard analysis, CO2 and energy are taken in absolute rather than in per capita terms. The reason for this choice is that sustainability is about absolute rather than per capita emissions. Moreover, this is consistent with the standard EKC narrative.
Our findings confirm the importance of robustness exercises, supporting the idea that the evidence in favour of energy and/or CO2 EKC, if any, is a statistical artefact.
Keywords: Environmental Kuznets Curve, CO2, semi-parametric estimates, robustness
LONG ABSTRACT
The environmental Kuznets curve (EKC) debate, which started in the 1990s and is still very much alive, has produced mixed results. This is due both to the multifaceted nature of the issue and to the research strategies adopted. Indeed, criticism has often been levelled at the scant attention paid to robustness (for a thorough survey on the EKC see Stern, 2004). Several facets of robustness have been investigated, for instance by applying non-parametric methods (e.g. Bertinelli and Strobl, 2005; Azomahou et al., 2006), by comparing alternative datasets and different parametric setups (Galeotti et al., 2006a), and by testing for series stationarity (Galeotti et al., 2006b).
Our robustness exercise involves both comparison between parametric and non-parametric methods, and the validation of cross-country findings by looking at other levels of analysis (i.e. the world as a single country and individual countries). This should mitigate the risk of statistical artefacts arising from pooling heterogeneous country patterns.
Another innovative element is that we take emissions in absolute rather than per capita terms. This is required for empirical analysis to be consistent with the EKC hypothesis, «an inverted U-shape relation between environmental degradation and income per capita (Stern 1998, 173) » according to which «higher levels of development [... will] result in levelling off and gradual decline of environmental degradation» (Panayotou, 1993, 1). While theoretical contributions (see Aghion and Howitt, 1998, 151-171; Brock and Taylor, 2005) consider environmental degradation in absolute terms, the empirical EKC literature has focused on per capita terms. However, as far as ?Nature' is concerned, what matters is total human pressure and not per capita pressure.
Following the literature, we investigate here a reduced form in which only per capita income is taken as ?explanatory' variable; in other words, we do not seek the determinants of anthropogenic environmental pressures, which would entail modelling the structural linkages explicitly. Convincing reasons for considering only per capita income are provided, for instance, by Azomahou et al. (2006,1348). We apply our exercise to CO2 emissions, one of the most widely studied indicators.
Our dataset is made of annual observations for the period 1971-2012 for 142 countries, as published by the International Energy Agency, and freely available online as «CO2 Highlights».
We follow a standard EKC regression model,
Yit=?i+g(percapitaGDPit)+?it
whereYis either energy orCO2and?iare country-specific intercepts capturing differences that are independent of income. As usual, we also investigate the effect of including a time trend in the regression.
As a preliminar step we check for all series their order of integration. Then, we move to panel

data analysis. We perform it both for the whole sample of countries and for a restricted one (99 countries) that excludes very peculiar countries (e.g. «oil» economies) since it is implausible that other countries can follow similar patterns, and very small countries to avoid their pattern to affect the overall estimate disproportionately.

In order not to force data into a specific frame, we start from a non-parametric approach that allowsg(.) to be a smooth and continuous (possibly non-linear) function of the regressors. This is particularly important since the existence of a turning point is crucial.

We then perform a semi-parametric regression and fit the data with a Generalized Additive Model. We use the routines contained in the MGCV package for R (Wood 2006). Since standard diagnostics do not apply, the package provides estimated Bayesian confidence intervals for the non-linear term. Parametric analysis is then performed by using a cubic specification, which is standard in the EKC-debate. The dummy variables?ican be taken either as fixed or random effects. A Hausman test allows checking for inconsistency in the random effects estimate. Autocorrelation and heteroskedasticity are checked respectively by the test discussed in Wooldridge (2002,282) and by a likelihood ratio test. Thus, we fit our model by using feasible generalized least squares (FGLS). We also look at the issue of series stationarity by running the tests developed by Levin, Lin and Chu (2002) and by Im, Pesaran, and Shin (2003). When adding a deterministic trend, diagnostics suggest using FGLS again.

Finally, we check for group differences by pooling countries according to their income: low ($10,000). We run parametric regressions after including dummy variables to allow for different coefficients. This specification yields estimates that are consistent with the semi-parametric results.

We claim, moreover, that the EKC has also to be tested at the world level. Actually since the very beginning of the EKC debate (Grossman and Krueger, 1991), the relationship between rich and poor countries has been held as crucial due to the presence of two countervailing forces, transfer of cleaner technologies and «environmental displacement»; when looking at the world as a whole such effects are neutralised. The lack of any evidence for an inverted-U relationship is so clear that there is no need for any econometrics. Nonetheless we perform some co integration analysis that confirms such intuition.

Finally we look at country level , since this is viewed as appropriate by several scholars, such as De Bruyn and Heintz (1999,671-672) and Stern et al. (1996,1159). Visual inspection of the scatter plots of income vs. CO2 and vs energy show a strong (i) heterogeneity of patterns, (ii) few cases of inverted-U or decreasing curve. For those countries we perform a cointegration analysis. We hope that our exercise will contribute to the idea that a robustness check, at different levels of analysis and with different methods, helps reducing the perils of statistical artefacts implied in cross-country analysis.

References

Aghion P. and P. Howitt, 1998, Endogenous Growth Theory (MIT Press).

Azomahou T., F. Laisney, and P. Nguyen Van, Economic Development and CO2 Emissions: a Nonparametric Panel Appoach, Journal of Public Economics, 2006, vol. 90(6-7), 1347-1363.

Bertinelli L. and E. Strobl, 2005. The environmental Kuznets curve semi-parametrically revisited. Economics Letters 88, 350?357.

Brock W. and S.M. Taylor, 2005, Economic growth and the environment: a review of theory and empirics, in P. Aghion and S. Durlauf, eds., Handbook of Economic Growth (Elsevier).

Caporale G.M. and M. Cerrato, 2004, Panel data tests of PPP. A critical overview, Institute for Advanced Studied Vienna, Economics Series 159, July

de Bruyn S.M. and R.J. Heintz, 1999, The Environmental Kuznets curve hypothesis, in J.C.J. Van den Bergh, ed., Handbook of Environmental and Resource Economics (Elgar) 656-677.

Galeotti M., A. Lanza, and F. Pauli, 2006b, Reassessing the Environmental Kuznets Curve for CO2 emissions: a robustness exercise, Ecological Economics 57, 152-163.

Galeotti M., M. Manera, and A. Lanza, 2006a, «On the robustness checks of the environmental Kuznets curve», WP13, Università degli Studi di Milano.

Grossman G.M. and A.B. Krueger, 1991, Environmental impacts of a North American Free Trade Agreement, NBER WP3914.

Im K., H. Pesaran, and Y.Shin,2003, Testing for Unit Roots in Heterogeneous Panels, Journal of Econometrics 115, 53-74.

Levin A., C.F. Lin., and C.S. Chu, 2002, Unit root tests in panel data: asymptotic and finite sample properties, Journal of Econometrics 108, 1-24.

Luzzati T. Orsini M., 2009, "Natural Environment and Economic Growth: looking for the energy-EKC". Energy 34, 291?300

MacKinnon, J. G., 1996, «Numerical Distribution Functions for Unit Root and Cointegration Tests», Journal of Applied Econometrics, 11, pp. 601?618.

Panayotou T., 1993, Empirical tests and policy analysis of environmental degradation at different stages of economic development, WP238, Technology and Environment Programme, ILO, Geneva.
Shafik N. and S. Bandyopadhyay, 1992, «Economic growth and environmental quality: time series and cross-country evidence». World Bank Policy Research, WPS 904, Washington, DC.
Stern D.I, 2004, The rise and fall of the environmental Kuznets curve, World Development 32 (8), 1419-1439.
Stern D.I., 1998, Progress on the environmental Kuznets curve?, Environment and Development Economics 3, 175-198.
Stern D.I., M.S. Common, and E.B. Barbier, 1996, Economic growth and environmental degradation: the environmental Kuznets curve and sustainable development, World Development 24 (7), 1151-1160.
Wood S.N., 2006, Generalized Additive Models: An Introduction with R. (CRC/Chapman&Hall).
Wooldridge J.M., 2002, Econometric Analysis of Cross Section and Panel Data (MIT Press)

Residential Energy Consumption across Europe: The Effect of Policy within a Dynamic Panel Approach

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Residential energy consumption has returned on the top of agenda's in academia, business and policy. The first wave of residential energy debates of the early eighties succeeded a severe oil crisis, which stressed the importance of energy efficiency from a political point of view. Today, energy efficiency regained importance, this time in order to contend the outlook of depleting energy resources and the harmful effects of climate change that result from increasing carbon dioxide emissions. Given that the 160 million buildings across Europe account for almost 40% of total energy consumption and represent 40% of carbon dioxide emissions, real estate markets are an obvious target for energy conservation debates[1]. Within the European Union a wide collection of policy instruments has been implemented over the years, all with the aim to enhance the energy efficiency. For instance, stricter building codes that increase the thermal quality of newly constructed dwellings were introduced from 1974 onwards in France, subsidies for dwellings retrofitting have been granted since 1978, again in France, and the first energy labels were issued in the Danish housing market in 1997. But whether all these measures have been effective in reducing the total residential consumption of energy, is still unclear.

In this paper, we explore and examine the time series of the largest real estate sector, the residential market, across 17 European market using three decades of data. We use close to 25% of our total energy consumption to heat, light, and cool our homes, a proportion that is currently targeted by the introduction of new and more efficient technologies and stricter legislation. Using unique data, and both the dimension of time and international cross sections, we analyze the importance of various factors that the available literature has identified as residential energy consumption drivers. These factors include climate, demographics, household income, energy prices, and we add the implementation of energy conservation policies. We track residential consumption by separating gas and electricity use, as the relative use of both varies greatly across our sample. The sample of countries consists of Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Spain, UK, Greece, Norway, Portugal, Sweden and Turkey.

We examine the long-run and short-run relationships between the variables using the Pooled Mean Group (PMG) estimator developed by Pesaran, Shin, and Smith (1997, 1999). We benefit from the recently developed panel data econometric techniques in order to overcome the identification problems arising due to the existence of non-stationary variables, the heterogeneous effects and the cross section dependence across panel members. Our results indicate that gas consumption is a function of climate (the number of heating degree days), household income, the price of gas, and the energy policies that are put in place. We find that gas consumption is highest in the coldest markets, increases with income and is only mildly price elastic. Regarding the energy conservation policy measures, we report significant lagged effects of imposing stricter building codes by lowering u-values, the measure for thermal quality of construction materials in new construction. Our error correction framework has more difficulties with explaining the dynamics of residential electricity demand. Here we find that electricity demand is mainly a function of household income, which can also be considered as a proxy for the electrical appliances that are used within the respective homes. Our set of policy measures does not leave any pervasive traces in the time series of residential electricity use.

[1]See ACE, 2004, Briefing on the energy performance of buildings directive, from the Association for the Conservation of Energy for a more detailed discussion on European energy consumption.

Sustainable bioenergy: UK drivers of innovation priorities

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Policy context
Within its overall policy on transition to a low-carbon economy, the UK government has given ?sustainable bioenergy' an important role. Under the 2009 Renewable Energy Directive, EU member states must obtain 10% of their transport fuel from renewable sources ? mainly meaning biofuels in practice by the 2020 deadline. The UK must obtain 15% of all its energy from renewable sources by 2020 and seeks ways to fulfil more than half through bioenergy.
?Sustainable bioenergy' has been also advocated for various benefits such as energy security, technology export and waste management as well as GHG savings. Bioenergy has been defined as ?sustainable' (or not) according to its biomass sources, conversion methods, products and uses. Given the future limits of ?sustainably sourced' biomass, UK policy seeks to broaden the range of biomass convertible to energy in cost-effective and environmentally sustainable ways. Technoscientific innovation has been advocated for this aim and for wider economic benefits. Such innovation has been promoted through various support measures, especially R&D funds and scale-up investment.
Research design: questions, theory and methods
Aim: This paper identifies how decision-making agents drive bioenergy innovation to pursue some pathways and benefits rather than others.
Questions: The study investigated the following questions: What have been UK public-sector priorities for bioenergy innovation, from among a wider range of possibilities? What agents have shaped them? Given the central aim to reduce GHG emissions, what opportunities are pursued (or neglected) through innovation?
Theory: Technological expectations have been theorised as ?real-time representations of future technological situations and capabilities'. Such expectations can help to convince funders and other practitioners to support some potential developments rather than others. Technology innovators may exaggerate their promises to stimulate agenda-setting processes (Borup et al., 2006; Geels and Smit, 2000).
Given that renewable energy has spatially distributed sources (sun, biomass, etc.), this broad sector has been seen as an opportunity for decentralised forms of energy production. For example micro-generation can be designed for a cultural-behavioural shift towards users' control and responsibility, linked with knowledge of renewable energy sources; this linkage offers greater opportunities to reduce energy usage and GHG emissions (Bergman and Eyre, 2011). When creating new energy pathways, however, large incumbent firms generally attempt to protect their previous investment, thus extending a path dependency (Meadowcroft, 2009; Kemp and Rotmans, 2005; Lovio et al., 2011).
Hypotheses: Those perspectives lead to alternative hypotheses: UK bioenergy innovation could facilitate decentralisation or else reinforce centralised systems through new lock-ins, in turn depending on which agents and expectations are most influential.
Methods: The study underpinning this paper used two main methods of data gathering: documents and interviews, as means to identify technological expectations within policy processes. The study analysed more than thirty documents from several bodies ? especially government departments, Research Councils, research institutes, Parliamentary hearings, industry and NGOs. Through twenty semi-structured interviews with representatives of the same bodies, the study investigated the process of selecting priorities for bioenergy innovation. Data analysis identified actors' accounts of three benefits ? economic competitiveness, environmental sustainability and valuable knowledge ? especially divergent or convergent accounts of each one.
Results: roles of actors and expectations
Since the 1990s EU-wide policies have been liberalising the energy supply. Such changes have weakened government ownership or control over the sector (Faij, 2006). Although some European countries retain state control over energy companies (e.g. EDF, E.ON), the UK electricity system was entirely sold to foreign-owned multinational companies. Thus the UK government is relatively more dependent on them for bringing energy R&D to the commercial stage ? which

could happen anywhere in the world.
Policy language is ambiguous about responsibility for fulfilling environmental targets, which will be delivered by ?technology' or ?the market', as if these were independent external forces. Likewise policy language is ambiguous about techno-scientific priorities for bioenergy innovation: policy makers say, ?We do not pick winners; industry is better at it.'
Despite such ambiguous policy language, agency can be identified: support measures for bioenergy innovation have been steered through arrangements between state bodies and industry, e.g. the Technology Strategy Board. Scientists' R&D proposals advocate specific technological pathways as means to fulfil various policy aims and to attract private-sector sponsors; such co-funding has been an advantage or even a requirement for gaining Research Council grants. Through the Energy Technologies Institute (ETI), scale-up projects depend on agreement among several multinational companies sharing financial risks and benefits. Such capital investment is meant to bridge the ?valley of death' between research and commercial application.
Various priorities have been promoted by linking expectations for environmental and economic benefits. Multiple criteria for benefits offer opportunities to advocate many different innovation pathways. Prospective economic benefits have two main categories: reducing the costs of GHG emissions, and enhancing or capturing economic value. The latter includes: building on or contracting out UK technoscientific expertise, gaining patents and globally licensing them, creating employment in ?green-collar jobs', maintaining the capital-investment value of current infrastructure, reducing the costs of waste management, etc.
The strategy anticipates a national competitive advantage. By targeting technoscientific areas of particular national strength, the UK is expected to capture 5-10% of the global market within select niches of bioenergy. Yet UK research institutes and companies have been competing against each other for arrangements with overseas partners.
Conclusion: innovation priorities and recommendations
Although innovation agenda-setting is distributed among diverse agents, they incorporate similar economic drivers. Resulting from those agency-drivers, UK innovation priorities favour bioenergy mainly as input-substitutes within centralised large-scale infrastructures, especially current ones. Such priorities reinforce high-carbon, energy-intensive infrastructure such as electricity-only plants and the internal combustion engine dependent on liquid fuel, thus extending a path dependency (cf. Lovio et al., 2011). As a potential exception, anaerobic digestion (AD) has been widely advocated as an opportunity for small-scale local production, yet AD expansion too has begun to accommodate the large-scale centralised model.
Those path dependencies marginalise other bioenergy pathways. Apart from decentralised AD, for example, micro-generation systems could enhance GHG savings by lowering transport burdens and involving users in energy conservation. Yet UK policy assumes that bioenergy sources are best kept invisible to consumers, thus avoiding dependence on their behaviour to reduce GHG emissions.
Thus current priorities constrain bioenergy innovation and its potential benefits within the dominant energy model. Special efforts are necessary to go beyond the current policy framework in order to realise the wider societal and environmental potential of bioenergy. Such efforts would depend upon stronger involvement of actors such as SMEs, local authorities and environmental NGOs.
Key words: UK; bioenergy; GHG savings; decarbonisation; innovation; agency; infrastructure; economic value; expectations
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References
Bergman, N., and Eyre, N. (2011) What role for microgeneration in a shift to a low carbon domestic energy sector in the UK?, Energy Efficiency 4(3): 335-353.
Borup, M., Brown, N., Konrad, K. and van Lente, H. 2006. The sociology of expectations in science and technology, Technology Analysis & Strategic Management 18 (3/4): 285-298.
Faij, A.P.C. (2006) Bio-energy in Europe: changing technology choices, Energy Policy 34: 322?42.
Geels, Frank W., and Wim A. Smit. 2000. Failed technology futures: pitfalls and lessons from a historical survey, Futures 32 (9-10): 867-885.
Kemp, R., & Rotmans, J. (2005) The management of the co-evolution of technical, environmental and social systems, in M. Weber & J. Hemmelskemp (eds), Towards Environmental Innovation Systems. Berlin: Springer.
Lovio, R., Mickwitz, P. and Heiskanen, E. (2011) Path dependence, path creation and creative destruction in the evolution of energy systems, in R. Wüstenhagen and R. Wuebker (eds), The

Handbook of Research on Energy Entrepreneurship, pp. 274-301, Cheltenham: Edward Elgar.
Meadowcroft, J. (2009) What about the politics? Sustainable development, transition management, and long term energy transitions, Policy Sciences 42: 323?340.

Smart meters as an opportunity to motivate households for energy savings? Designing innovative policy instruments based on the coupling of smart meters and non-financial incentives

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In the process of deploying smart meters in EU's households, Member States were requested by Directive 2009/72/CE to make a cost-benefit analysis by September 2012. But no man is a prophet in his own country, and in the Brussels Region, the very place where the Commission is based; the cost-benefit analysis mandated by local authorities shows negative results (PWC, 2012). Indeed, in the estimations, the benefits including energy savings for the customers are not sufficient to counterbalance the cost of the metering infrastructure. But what is the rationale behind such energy savings in households and how are they evaluated? A major strand of research in this field has investigated to which extent the feed-back provided by smart meters could lead to behavioural changes or investment decisions that could, in turn, lower energy consumption.
In this respect, the results of a series of recent studies in the EU tend to indicate that the energy savings potential due to feed-back and information would be rather limited (i.e. 2-4%). However, there is another dimension to the matter which has, in our view, not received the attention it deserves. This dimension revolves around households' motivation to actually use the feed-back and advices provided in order to lower their energy consumption. Besides, how this motivation could be sustained over time is also a crucial issue, as some studies show that energy savings tend to fade with time.
This paper is addressing the possibility to use the smart meter infrastructure to motivate households for energy savings. It is centred on the design of innovative policy instruments that couple non-financial incentives (complementary currencies) to smart meters. Indeed, non-financial incentives have specific features in terms of symbolic value, social dimension, limitation of the rebound effect and «green challenge» that could initiate and sustain household motivation over time. A form of regulatory architecture is also explored, as well as the coupling with a market-based financial incentive inspired by the concept of white certificates with households as obliged actors.
The paper is structured as follows. The rationale which led to the coupling of complementary currency and smart meter into an innovative energy saving instrument is first presented in section 2, as well as the methodology used for the design phase. A rewarding and a regulatory system design that integrate complementary currencies and smart meters are presented in section 3. The potential and weaknesses of the designed systems are then discussed in regard to their objective of initiating and sustaining households' motivation for energy savings in section 4.

Debate over Renewable Energy in Rio+20 ? Role of Energy Sector in UN Negotiations on Sustainable Development

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Summary

This paper looks at the development of power shifts in United Nations (UN) sustainable development negotiations with focus on Rio+20 and a chosen business sector, energy industry. We analyze the development of the institutions framing the preparation and actual negotiations. Our main data consists of official policy documents by UN and different business actors around Rio+20. In addition we look at the development in negotiations discourses from the original Rio Summit in 1992 and Johannesburg 2002.Our focused empirical interest lies in the debate that energy questions raise in sustainable development negotiations. Our paper contributes to the understanding of UN negotiations as an institutional forum for business corporations' role and power in global environmental governance.

Introduction

The phenomenon of the shift in power structures in United Nations (UN) Sustainable Development (SD) negotiations towards more influential positions of business and industry agents is widely discussed in the literature on global environmental governance. Historical development of the negotiation process shows that soon after its establishment the requirement for stronger involvement of stakeholders (private sector and civil society) on all levels was realized and officially proclaimed in Rio 1992 final document ? Agenda 21. The Agenda refers to nine ?major interest groups', business and industry being one of them. Corporate sector is mainly represented by trade and industry organizations specialized in generally economic issues, such as ICC, WTO, industry specific groups, and various others of which many are specialized in sustainability and responsible business issues (e.g. BASD).

To trace the implied increasing role of business agents we focus on certain problem which provides us the empirical evidence of the business impact and enables to make understand existing power shifts.

Firstly, our study concentrates on the recent Rio+20 Summit. It provides the fresh knowledge on the current power allocation in UN SD negotiations and the instruments of this power execution. Secondly, the business and industry negotiating group is multifaceted and representing a variety of businesses according to scale, lines of business, and geographical locations. However, for the purpose of this paper we have decided to take the energy sector as one of those holding the major power within negotiation group since (1) the global oil gas industry sector is represented mainly by large-scale companies dominating the world ratings of top largest corporations and (2) at the same time the activity of oil and gas industry is associated with the high environmental impact and risks accompanied with the growing pressure from the society.

Finally, energy is considered as crucial element in achieving goals of sustainable development. Key energy sector players shape the world policy in respect of the resource extraction, refining and sale. All these combining to the problem of resource depletion raise the agenda of looking to alternatives for potential business restructuring in future and switching to new energy sources. Thus, the debate takes place strongly in discussions over renewable and low carbon energy solutions, the latter arguing for example for new technologies of fossil fuels.

Problem statement and research questions

In our study we aim to trace the process and outcome of promoting the interests of the key oil

and gas sector players in the negotiations.

We approach this by answering questions:How the positions are argued and how the argumentation points towards claimed corporate hegemony in UN negotiations, and what are the forms and effects of the argumentation?We also specifically look athow corporate sustainability and responsibility policies can be seen in the argumentation. Secondly, we aim atmapping the channels used to communicate the ideas on Rio+20 conference. And thirdly,how and to what extent were these main ideas reflected explicitly in the final documents presented on Rio+20?

Theoretical background

We draw our core theoretical basis from the literature discussing institutional power structures and shift in those (Barnett & Duvall 2005; Bernstein & Ivanova 2007; Ruggie 2007; Avelino & Rotmans 2009). Channels of business influence of international negotiations on environmental issues and previous studies on this subject create a wider framework for the case (Biermann 2012; Newell 2008; Barnett & Duvall 2005: 16-17; Clapp 2003, 2005; Orsini 2011). The research studying the influence and role of business in environmental governance in general and UN negotiations ? in particular started to appear mainly after WBSD in Johannesburg (2002) where the business and industry group was represented in abundance especially in comparison with previous similar events (Clapp 2002; Levy & Prakash 2003; Vormedal 2008). Supporting literature discussing businesses in society and politics is utilized as e.g. the literature on corporate social responsibility has been focused more strongly especially lately to the dimension of politics, power and ideology that draw partly from similar backgrounds as governance studies (Banerjee 2008).

Empirical base and methodology

Our empirical data consists of the official UN conference documents and those of business and industry representatives in Rio. Additionally, we look at the institutional development of UN negotiations. We analyze the argumentation, implicit and explicit change of agendas of different actors, and the overall structures of industry representation. Data also includes direct company documentation concentrating on their public sustainability statements, and host state reports concerning UN processes. We have chosen a set of world's largest oil and gas companies from Forbes Global 2000 list to look at. As methods of analysis we use content and discourse analyses, combining them with contextual analysis, e.g. historical development of UN negotiations.

Preliminary results

Increasing presence and input of business actors in global environmental negotiation process could be traced through a variety of overlapping channels, such as execution of business structural power, direct corporate lobbying, developing of business standards and codes of conducts. Looking at the discussion over renewable energy at Rio+20 international forum we see that business actors actively utilized a variety of channels to achieve the most suitable outcome.

Results show that the renewable energy R&D is rarely mentioned in corporate initiatives toward sustainable energy development and in the prevailing majority of cases is listed within a group of variety of low-carbon energy projects together with such conventional energy sources as natural gas and nuclear energy or even is not mentioned at all.

Further, in order to battle the interests of business communities in SD negotiations on international level most of oil and gas MNCs participate in BASD initiative, which was actively involved in Rio+20 negotiation process. In particular, tracing the amendments of BASD to zero draft of Rio+20 outcome document suggested that the ?renewable energy' term along the document text was replaced by the term ?low-carbon' energy which leaves room for variety of interpretations. In addition, business and energy group spoke against setting a precise goal for the share of low carbon energy in the total energy production by 2030. At Rio+20 the main discourse of major business and industry group from the SD perspective and negotiations aiming at binding agreements, still remains the discourse of voluntary actions that can be considered argumentation against binding regulations of business activities.

As main goal of international community, the transition towards supporting mainly renewable

energy as the main solution for sustainable energy production is seen as negative path development for oil and gas industry. The contradictory positions of actors are articulated in negotiations over suitable energy solutions for sustainable development. Path dependency of energy solutions not only impede overall goals of sustainable development but also businesses. This development can be seen also as shift in structures of UN negotiations where large MNCs are increasingly represented and more actively participating for pushing through policies supporting goals of powerful industries. Oil and gas sector belongs to these major actors while renewable energy companies are often smaller actors without equally strong industry networks and established institutions. We have identified discourse that point towards unwillingness of key actors of oil and gas industry group to undertake any serious steps towards renewable energy development and this unwillingness is reflected in communication during UN processes.

Fire risk and smallholders in the Brazilian Amazon: use of a role playing game to conceive incentives for forest conservation

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Summary
In the Brazilian Amazon, uncontrolled fire is one of the main drivers of forest degradation leading to important loss of biodiversity and ecosystem services (ES). Fire is used particularly by smallholders for agricultural management activities, but it often escapes to surrounding areas, causing large accidental damages, inducing environmental, social and economic costs. Current policies tend to prohibit its use, but they often are unsuccessful, partly because they tend to individualize this problem. Strong expectations exist regarding incentive schemes (such as REDD+), but the risk of fire is often ignored. This typical free-rider problem should involve collective solutions, but they are currently inexistent. Using a role-playing game with smallholders in communities with considerable problems with fire in Eastern Amazon, we aim at exploring possible institutional arrangements for limiting risk of fire. Through this Companion Modelling approach, we wish to discuss the perceptions the stakeholders have of the advantages and costs of fire, the possible rules which could be implemented within the community and what type of policy instruments could encourage the conservation of remaining forests.

State-of-the-art
Although the level of deforestation has strongly decreased since 2005 in the Brazilian Amazon, studies show that fire occurrence has increased by 60% in areas with reduced deforestation (Aragão et al., 2010), leading to important loss of biodiversity and ecosystem services (ES). Fire is generally associated to agricultural management activities, but it often escapes to surrounding areas, causing large accidental damages, inducing environmental, social and economic costs. Alternatives to fire use exist, but are often costly (such as mechanization) or labour-intensive (such as slash-and-mulch). Adoption of such alternatives by smallholders is limited, and fire for land preparation or pasture cleaning is still the most common practice. Forest degradation linked to accidental fire from smallholders has become a strong preoccupation, as small deforestation areas (less than 25 ha) now represent more than 60% of deforestation (against 20% in 2002) (INPE, 2012).
Up to now, policies to limit the impact of fire are rare and mainly aim at prohibiting use of fire. However, they often are unsuccessful, partly because they tend to individualize this problem, putting the responsibility on the farmer who lights the fire and eluding the failings of the institutional arrangements to bring about a transition out of fire (Sorrensen, 2008). Many accidental fires result from a free-rider problem, as fire may enable individual benefits for the farmer who uses it but involves high costs for the other stakeholders (damage of farmland and forest degradation). It can in fact jeopardize possible investments by other farmers to make a transition out of fire use.
Some experiences encouraging collective action to reduce risk of fire have been reported, with reduction of 75% of fire accidents after adoption of collective rules (Carvalho et al., 2007), but their scope remains limited. Strong expectations exist regarding incentive schemes, such as REDD+, to enhance preservation at a larger scale, but the risk of fire is ignored (Barlow et al.,

2012). How could such incentives limit the risk of fire and possibly enable a transition out of fire? Individual PES seem little adequate to address this collective problem. There is a need for explorative thinking to invent new types of institutional arrangements. Although there are many macro- and regional level studies on the drivers of fire, ground-based studies to identify determinants of fire use and management solutions are insufficient, revealing the need for more participatory approaches to explore possible solutions (Carmenta et al., 2011).

Methodology

Because of the prohibition of fire and to avoid conflicts with neighbours, farmers are reluctant to discuss fire among themselves, and even more so with outsiders. To explore what institutional arrangements could encourage the management of fire, we chose to address this problem indirectly, through a role playing game, with the members of communities severely touched by fire. This study will be conducted in the Municipality of Paragominas, which has been promoting a «zero deforestation» pact since 2008. Although medium and large producers have collaborated with this objective, smallholders continue to deforest, intentionally or not, and massively use fire. We will work in one of the largest settlements of the Amazon, with more than 1200 families, organized in four main communities. Each community has its own characteristics (level of communication among community members, types of production, level of openness of the landscape) which can affect the impact of fire on environmental services.

The role-playing game will be used associated with computer simulation, following a Companion Modeling approach (http://www.commod.fr, Etienne 2010). These instruments can enable to mediate among different stakeholders and favour exchange of perceptions, appropriation of knowledge and discussion of collective scenarios (Becu et al. 2008). This process will be conducted simultaneously to a quantitative work which will assess the costs and benefits of fire and the level of communication or collective rules already existing, as well as the perception the stakeholders have of environmental services. The Commod methodology aims at revealing elements that wouldn't emerge in conventional interviews. Moreover, the game can enable the stakeholders to take some distance from reality and debate issues which are usually taboo.

Expected results

We hope this process will encourage discussion about different components of current institutional arrangements and enable to explore possibilities to limit fire risk:

-Revealing the motivations of stakeholders in using fire:in usual interviews, smallholders generally elude the issue of fire, and it is difficult to know whether they set fire because they have no other option, or whether they consider it really brings better results for the crops. During the process to collectively build the game, we hope to bring about discussions on the advantages and limits of fire in their own perception.

-Discussing possibilities of collective rules for better managing fire:we do not intend to diabolize fire, but wish to bring about discussions about possible ways that the risk of fire can be reduced, even without totally banishing it from agricultural practices. The game can both enable to explore short-term possibilities, such as better communication between neighbours or collective meetings to decide on dates to set fire, and longer-term solutions through the simulation and scenarios, such as modifying landscape elements (hedges, roads), developing alternatives, empowering community members to have more social control.

-Exploring different policy instruments:the game can allow the participants to imagine innovative policy measures or regulations (fines, individual payments, collective incentives), adapted to their reality and which meet the legal requirements for preserving forests and enhancing environmental services.

References

Aragão L., Shimabukuro Y., 2010. The Incidence of Fire in Amazonian Forests with Implications for REDD. Science 328 : 1275

Barlow J, Parry L, Gardner TA, Ferreira J, Aragão L, Carmenta R, Berenguer E, Vieira I, Souza C, Cochrane MA, 2012 The critical importance of considering fire in REDD+ programs. Biological Conservation 154 (2012) 1?8

Becu N., Neef A., Schreinemachers P., Sangkapitux C., 2008. Participatory computer simulation to support collective decision-making: Potential and limits of stakeholder involvement. Land Use Policy, 25(4): 498-509.

Carmenta, R., L. Parry, A. Blackburn, S. Vermeylen, and J. Barlow. 2011. Understanding human-fire interactions in tropical forest regions: a case for interdisciplinary research across the natural and social sciences. Ecology and Society 16(1): 53.

Carvalho E., Mello R., Sousa ML., Silva LA., 2007. Tecnicas de Prevenção de Fogo Acidental.

Método Bom Manejo de Fogo para Areas de Agricultura Familiar. IPAM, Belem, Brasil. 44 p.
Etienne M. (ed), 2010. La modélisation d'accompagnement. Une démarche participative en appui au développement durable. Editions Quæ. pp. 384
Sorrensen C., 2008. Potential hazards of land policy: Conservation, rural development and fire use in the Brazilian Amazon. Land Use Policy 26 (2009) 782?791

Funding reforestation with Payments for Ecosystem Services in Indonesia: Does it trigger institutional innovation?

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Funding reforestation with Payments for Ecosystem Services in Indonesia:Does it trigger institutional innovation?

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Summary
This article thoroughly analyses the governance of a payment for environmental services (PES) scheme in Indonesia, based on a 200 households' field survey. The buyer is a water private company, and annual payments to farmers upstream are managed by an intermediary (a forum involving stakeholders) in charge of monitoring their compliance to the contractual conditions. Several issues are discussed: the institutional nature of the scheme (feasibility, conditionality, perceptions, participation), actor's motivations to sustain the scheme, impacts on actual land-use and behavioral change. Overall, we challenge the innovative character of the scheme (compared to older State rehabilitation programs), and discuss the use of concepts to be accurately applied to such policy instruments (marketvs. bilateral governance).

Abstract
Based on the results of a survey covering 200 households (with additional key-informant interviews), this article provides an in-depth analysis of the governance structure (the emergence and evolution) of a payment for environmental services (PES) scheme in the Cidanau watershed in West Java, Indonesia.
In this payment for watershed services scheme, the buyer is a private company treating and distributing water from a river to 1) steel companies, 2) bottling companies, and 3) the nearby local municipality. Building on the assumption that the quality and quantity of water downstream depend on the good condition of forests upstream, the company has been paying farmers for several years for reforestation activities on their lands. Annual payments to farmers are managed by an intermediary (a forum involving stakeholders) in charge of monitoring farmers' compliance to the contractual conditions.
As an experiment that has been on-going for many years now with negotiated contracts and regular monetary transactions between private (water company, NGOs, etc.) and public actors (local authorities, forest agency, etc.) as well as rural communities, this PES scheme is a relevant case study for the analysis of a «market-based instrument» for ecosystem services in the Asian context.
Based on our field surveys, we discuss several issues. First, we look at the institutional nature of the scheme and its mode of governance. This relates to previous work in Indonesia carried out by Van Noordwijk and Leimona (2010) who study PES schemes in South-East Asia through the RUPES programme. Therefore we deal with several research questions: to what extent is the governance structure in place oriented specifically towards the provision of environmental

services (is the schemerealistic?)? Are payments to farmers' groupsconditionalto the actual provision of environmental services (or proxies)? Is farmers' participationvoluntary? In this context, looking at service providers' perceptions on current and future environmental problems, enrollment and participation rules, and decision-making processes, indicates the degree of innovation from such a scheme. For instance, it remains to be demonstrated whether payments are viewed by farmers as really different from previous government programs for land rehabilitation and what that means for their perceptions of the current scheme's impacts.

Second, we study actor's motivations to participate in and sustain the project. This allows us to assess whether the scheme meets the environmental additionnality requirement, and whether it will promote future sustainability (related to the leakage and permanence issues).

Third, and in relation to the above, we present actual land-use changes undertaken by farmers participating in the scheme in order to assess environmental impacts from this PES. In particular, we analyze to what extent incentives provided, farmers' perceptions and motivations have triggered real changes in behaviors as well as the adoption of alternative land management techniques providing watershed services.

In total, building on previous conceptual neo-institutional work (Williamson, 1979) which distinguishes betweenmarket governance(such as commoditized environmental services), bilateral governance(contractual approaches) schemes andhierarchies(coercion by the government), the overall assumption to be tested in this study is that such a PES experiment might only perpetuate older institutional approaches, e.g. State forest rehabilitation programs (hierarchies), yet under different names. More theoretically, this case study sheds light on the broader policy debate on the use of market-based instruments for reducing deforestation and biodiversity erosion. There is a lot of confusion, we argue, in the rhetoric and ideological use of terms to characterize these policy instruments for environmental conservation. This confusion, as could be illustrated by this case study, might eventuallyprevent sound policy-making and actual implementation on the ground, and is addressed in the discussion part of the paper.

Fences and property: participation dynamics and institutional change in carbon forestry

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This paper analyzes the implementation of a carbon forestry project in five communities in the state of Chiapas, Mexico. The project pays farmers to carry out a number of tree-planting activities depending on the local agro-ecological systems. We investigate how such activities have been promoted in and adopted by the communities and we identify a series of community-based, institutional, resource management and asset-related factors that explain farmers' willingness to participate. Our analysis highlights a number of shared motivations for joining the project but varied levels of understanding the project rationale. We also show how community norms, access to land tenure, financial and physical assets differ among participants and non-participants which translates in increasing inequalities in access to income and other development projects. However, we also demonstrate that project activities, as currently designed, motivate some farmers to participate because of the potential of the project to act as a mechanism to bridge existing social divides through cooperation in the project and therefore financially and politically benefit from participation. Overall, the paper demonstrates that the projects result in a mechanism for transforming local livelihoods and institutions, somewhat unintentionally and unfortunately not always as originally desired.

Willingness of small farmers to make a transition out of deforestation and implications for REDD projects: insight from São Felix do Xingu (state of Pará, Brazil)

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Summary
Although the Brazilian Federal regulation approach against deforestation has been effective with large landowners, it has little touched smallholders and may have aggravated their poverty conditions. In this context, REDD+ is seen by many institutions as a useful tool to promote conservation by small farmers, as it could encourage a transition towards alternatives livelihoods, which would reduce deforestation. In the context of a REDD+ pilot project in São Felix do Xingu, we aimed at analysing the perceptions of deforestation by small farmers and what would bring them to stop. Three groups are identified: the environmentalists, the innovators and the objectors. They each have very different needs to reduce deforestation, questioning the relevance of one-fits-it-all payments, given that commercialization and technical assistance are also essential for most of them. A REDD+ project would have to adapt to this diversity by offering various forms of support.

Context
While annual deforestation rates in the Amazonas declined by almost 75% between 2003 and 2010, deforestation still accounts for 57% of Brazil's annual Greenhouse Gas (GHG) emissions and makes Brazil the 6th global emitter. In terms of emissions due to land-use change, Brazil is second after Indonesia. This has led the Brazilian Federal government to take strong action against deforestation.
The municipality of São Felix do Xingu, situated in the State of Pará has one of the highest deforestation rates in the Amazon since 2001, and as part of the Fire Arch (the 47 municipalities with the highest deforestation rates), the Brazilian government considers it as one if its priority municipalities for preventing, monitoring and controlling against illegal deforestation. It is the second largest municipality of Brazil and the municipality with the largest cattle herd, with over two million heads. Cattle farming is the main economic activity, due to the high rent of cattle, its secure and immediate return and the little required effort, leading to important extension of pasture areas. Following the 2009 federal edict for embargo on cattle production in São Felix by the slaughterhouses, the local government signed a Pact Against Illegal Deforestation with the representatives of the agricultural sector, established a Commission of this Pact and initiated an environmental governance in this municipality. The NGO TNC has suggested a pilot project of REDD+, aiming to develop positive incentives for conservation.
The involvement in this environmental governance has been a crucial step for the small farmers, who suffered of the strong regulation approach of the Brazilian government accompanied by sanctions of the forest police, the IBAMA. Despite of its success of deforestation reduction, this approach was not effective for them on the long term because it was not accompanied by the adequate policies of support for the small farmers and aggravated poverty instead. For the small farmers, benefits are still directly correlated with the deforested area. To overcome the dichotomy between development and the protection of the environment, there is a need to incentivize the transition towards sustainable alternatives to cattle farming, that are profitable for the small farmers but don't imply deforestation of new areas. One of the main debates is the modality that

such incentives should take, between results-based payments for the non-use of the forest resources, or sustained investment aimed at asset-building. However, the effectiveness of such incentives will strongly depend on the willingness of the farmers to make this transition. How do small farmers see the possibility of making a transition out of deforestation and what instruments would be most adequate to encourage them this way?

Methodology

To answer this question, we interviewed 15 small farmers from different communities of the municipality São Felix do Xingu to analyse their perception of deforestation and its alternatives. In order to obtain comparable responses by avoiding that the farmers deviate from the questions or answer with usual discourses, we used the Q Methodology, developed by comparative psychology. Each farmer is confronted with a series of opinion statements, which he has to classify according to his level of agreement or disagreement. Here, the opinion statements referred to 8 topics: the perception by the farmer of its farm, his capacity to change practices, his perception of the environmental regulations, of deforestation, of his responsibility, his needs to be able to stop deforesting, his perception of a payment for conserving forests and the modalities of such a payment.

Results

By analysing how the farmers perceive the transition towards sustainable alternatives to cattle farming and what would be necessary to incentivize them to realize the transition, we found that there were certain aspects on which all interviewed farmers agree. They all think that technical assistance is at least as important as financial support, if not more important in many cases, which shows that REDD+ should not be limited to individual payments for the non-use of the forest resources. However, a more detailed analysis reveals clearly that the farmers are too diverse to establish a one-fits-it-all solution. In fact, we identified three categories of farmers, namely the environmentalists, who conserve their forests because they are conscious of the need to protect the environment; the innovators or pioneers with much willingness but little financial means, motivated by the profitability of the production alternatives; and finally the conservative objectors, not willing to change their habits because they are convinced that they can make profits only by deforesting. Among the factors explaining this difference of positioning is the difference in forest cover of the property, revealing that the actors are at different moments of a deforestation trajectory: the environmentalists already deforested most of their area, the innovators have an intermediary amount of forest area, while the conservative objectors have still highly forested proprieties, which makes it more difficult for them to switch towards the production alternatives. This reveals that the motivations of each profile are relative on their position in trajectory.

According to their characteristics, the farmers have different needs to be able to stop deforesting, which have to be taken into account in an effective policy against deforestation. Environmentalists mainly need better commercialisation of the new types of products they already produce; innovators mainly need technical assistance and more financing mechanisms to enable them to diversify their production. Finally, for the objectors, it seems like the priority would be building awareness that some sustainable alternatives can be profitable and that it is in their own interest to protect their forests. An initial or short-term payment can be a necessary instrument to immediately dissuade them from deforesting, given that for them, without a payment the forest has absolutely no benefits. In a following step, they will also require technical assistance and financial mechanisms to start producing sustainable alternatives to cattle.

Discussion

This diversity of the farmers' perceptions can be better understood if we consider the transition towards sustainable alternatives as a complex process, and the farmers' needs vary according to their position in this process. Based on this divergence of the farmers' needs according to their profile, the debate on REDD+ should not be limited to whether it should consist of a payment or not, but involve a reflexion on which moment of the transition such a payment could be effective.

This diversity of the farmers' needs have various implications for the definition of the governance of a REDD project. In order to adapt the project to the necessities of the different farmers, the governance scheme needs to plan an inclusive space for information, representation, consultation, participation and decision-making. Moreover, in such a flexible scheme, institutions to provide a mechanism to organize and coordinate control, supervision and a clear conditionality link between the service and the avoided deforestation become particularly important.

Analysis of a national programme for wetland rehabilitation in South Africa: lessons for environment and development policies

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SUMMARY. This paper assesses the impact of a multi-partnership poverty alleviation and environmental conservation project on workers' livelihood, their capacities and their perception about development and the environment. The policy formulation process of the Working for Wetlands programme in South Africa is critically described and its strengths and limitations are identified. The link between the macro and the micro level is analysed through an in depth study based on a combination of methodologies to collect primary quantitative and qualitative data in the field. The programme is attaining positive achievements, yet critical issues originated at the policy formulation level may hinder the micro socio-economic improvements to be sustained in the long term. This analysis of the policy process and the impacts on the ground provides lessons for strengthening the design of further environment and development policies.

ABSTRACT. Multi-partnership projects for environment and development are widely implemented worldwide as a promising win-win policy. The path from their conceptualization to their actual effects on the ground is long and complex and there is no satisfactory explanation of how to overcome the tensions between both objectives that often arise in practice. Key reasons for that is that policy making institutions are distanced from local scale management and that they move with different dynamics, hence failing to appreciate people's needs and understandings. This paper assesses the impact of a multi-partnership poverty alleviation and environmental conservation project on workers' livelihood and on their perception of the environment and development. An in depth assessment of the link between policy processes at the macro level and the impacts on livelihoods at the micro level reveals what trends the programme is encouraging and how it is actually improving people's livelihood. It also allows to detect inconsistencies and areas for improvement, as well as to envision its reproducibility and validity in other contexts. The paper answers the following questions:

How does the programme improve workers' livelihood and capabilities?

How is the initial policy design and formulation process reflected on the ground?

How does the project change workers' discourses and perception on development and the environment?

This analysis is focused on the Working for Wetlands (WfW) programme in South Africa, where between 35% and 50% of the wetlands have been lost, and the remaining ones continue threatened. Wetlands play a major role in water supply in this country where water is increasingly scarce. WfW is a national programme for poverty alleviation and wetland rehabilitation managed by different national departments. In 2008 it had already 40 projects throughout South Africa targeting 91 wetlands and providing direct employment to almost 2,000 people. The micro level impacts are analysed at the WfW project in Seekoeivlei, a wetland in the upper Orange river basin. This basin is one of the most important ones in Southern Africa since it provides water to Gauteng province which constitutes the main centre of economic activity in Sub-Saharan Africa. Seekoeivlei is also one of the only twenty Ramsar sites amongst over 114,000 wetlands that have been mapped in South Africa. This is an adequate location both for its environmental history and for its representativeness of many townships in the region, with which it shares common history and patterns of social dynamics.

The link between the macro and the micro level is analysed through an in depth study based on a combination of methodologies to collect primary data in the field that included cross-sectional surveys, structured interviews, in-depth interviews to key informants, focus groups and policy document analysis. A questionnaire including open-ended questions was designed and tested and it was administered face to face to 58 people, half of which were current employees of WfWet,

and the other half were a control group of similar age and gender balance, sampled through a multi-cluster random sampling. Additionally, 11 further questionnaires were administered to five workers of WfWet in other location of the same basin, and to 6 members of the white community in the area. After conducting the surveys, two focus groups were organised in order to obtain more detailed information on issues in which the survey data was limited, to see how core issues were debated and agreed within a group dynamic, and whether gender differences existed. Quantitative data was statistically analysed and qualitative data was transcribed and analysed using digital tools in order to cluster comments about each topic, as well as to quantify the frequency and the ways in which particular topics were mentioned.

At the macro level, the policy formulation and implementation process at a national scale is critically described. The paper explains the institutional and policy context of WfWet and how it was conceptualized and developed among different organizations, as well as the general goals and the implementation process. In-depth interviews were conducted with eight experts who were involved in WfWet management at different levels. This information is contrasted with secondary data which includes internal monitoring and auditing documents, procedural documentation, general statistical data, historical documents about the Wetland, and geographical data.

At the micro level, changes and trends in the livelihood of workers and in their perception on environment and on development are analysed. By using surveys, open-ended interviews and focus groups, the livelihood assets among the employees of the rehabilitation programme are compared to a control group. The analysis borrows the concept of five capital assets from the Sustainable Livelihood Analysis approach. This approach has been criticized for various reasons, yet the five capitals framework still provides a suitable, simple and pragmatical structure to investigate livelihood qualities and changes. In addition, in order to obtain a more comprehensive understanding of the impacts of this policy, the differences in discourses and perception about the environment and development between both groups are discussed based on the interviews and the focus groups.

Particular features of the policy process are clearly reflected on the ground and the programme is attaining positive achievements in both the socio-economic and in the environmental dimensions. The policy process analysis reveals five key institutional strategies which strengthen the programme. In parallel, the complexity of such large scale projects and the difficulty of putting sound principles into practice entail limitations and constraints that are also identified. Critical issues originated at the policy formulation and implementation processes may hinder the micro socio-economic improvements to be sustained in the long term.

The policy is the result of the convergence of isolated efforts addressed to different problems of public concern. This multiple origin reinforces its foundational solidity and its legitimacy. The actual implementation of the project is consistent with the basic principles, as well as with the initial objectives of the initiative. An important downside is originated at the conceptualization of the programme, where the environment and development objectives are isolated from each other from the very beginning. This environment development dualism alienates both concepts from each other along the policy process and the lack of a holistic definition of sustainability is reflected on the ground as uncertainty in post-programme employment.

The environmental awareness of employees has increased and enhanced. In general, they are aware of the need to conserve water and to avoid soil erosion. However they perceive environmental conservation mainly as an attraction for tourism. Their perception about conservation is rather alienated from their quotidian life, thus leaving out other important pieces of environmental awareness. The five assets approach helps to understand this incomplete view in which basic needs are perceived as related with financial and human capital, while natural capital is seen as something given or secondary.

This analysis of the policy process and the impacts on the ground provides lessons for strengthening the design of further environment and development policies. It also shows that it is possible and necessary to integrate both perspectives, the macro and the micro, in order to obtain a more accurate assessment of policy impacts. This may enrich the debates on how to effectively and sustainably merge environment and development goals in policy-making.

Role of Institutions in Governance of Urban Wetlands in Kolkata, India

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Cities have multidimensional planning challenges ? conservation of ecosystems is one of those critical challenges. Natural ecosystems are progressively affected by urban functions ? in extraction of resources, in accumulating waste, in increasing pollution and in energy consumption. Some of the largest metropolitan cities of the world are located in water-based ecosystems (rivers, lakes, coasts), and consequently, their conservation has been a critical dimension of planning in these cities. Urban wetlands are possibly the most critical ecosystems, having to lose its biodiversity characteristics while evolving as giant receptacles for urban waste and pollution. This study focuses upon Kolkata, a megacity of eastern India with its vast hinterland and thriving millions, located in deltaic West Bengal. The city had an initial locational advantage, being situated on the levee along the Hugli, a major distributary of the Ganga. Located to the east of this levee, is more than12000 hectares of wetlands, part of the intrinsic waster-based ecology of the deltaic region. Over the decades, the eastern wetlands, as well as a large number of other water bodies have borne the dynamic pressures of urban growth. While there has been unprecedented unplanned and haphazard growth, numerous development projects also belong to the «planned» domain. This has led to a steady decline in wetland area and its associated ecosystem services. As most development projects are responses to human needs, a«for the people »argument takes precedence over every reason to conserve wetlands. The aim of this study is to assess the role of institutions in governance of this critical urban entity. An overview of policy perspectives and institution building reveals adequate prioritization, but repeated failures to protect wetlands and water bodies seem to indicate the lack of a holistic approach. It seems necessary to place the wetlands in perspective for all stakeholders. In many cities, peoples active participation at different levels of planning, as well as protest movements have helped steer existing institutions, as well as to create new institutions. Such processes have led to the creation of Local Environmental Institutions (LEI's), for example, and increasingly communities are turning to them to meet environmental challenges (Meyer and Konisky, 2007). The attempt of this study to look at wetland management through the lens of people's participation is a precursor to the proposal for robust institution building. It is noted that citizens have engaged in different modes of participation and protest across wetlands and water bodies of Kolkata. An analysis of eight such cases reveal strong linkages between access to political power and realization of ecological benefits. Also, larger citizens' groups or ones with stronger affiliations have been able to make themselves heard as opposed to smaller groups of conscious people with no political affiliation. In case of Kolkata, unresponsive institutions of governance have resulted in citizens increasingly turning to public interest litigations, whose steady rise reveals the exigencies. Further, the system also fails to address the conservation issues through litigation, as there is no ecological sensitization among legal professionals to enable them to make correct interventions. In the absence of environmental governance and lack of holistic understanding of ecosystem services, a process of sensitization, awareness and education must be undertaken for citizens, who may then evolve effective participatory processes for conservation of urban wetlands.

Key words: conservation, governance, participation, protest, institution-building

Reconciling livelihoods with ecosystem integrity in Ga-Mampa wetland, South Africa

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Despite their national and international protection status at levels (e.g. under the Ramsar Convention), wetlands are amongst the world's most threatened ecosystems. Complex and various reasons explaining this situation include not only inadequate land and water use within the wetland, but also harmful management of upstream catchments, external pressures such as climate change and population growth, and institutional factors affecting management such as unclear or overlapping spheres of authorities and lack of effective power to enforce laws and regulations. As their multiple benefits accrue to a variety of users, management must thus balance these competing needs, as well as the threat of degradation from external pressures. xml:namespace prefix = o ns = "urn:schemas-microsoft-com:office:office" />

The Ga-Mampa wetland, located in the Olifants river basin, is an example of the many small wetlands used for multiple purposes in South Africa. It is mainly fed by groundwater from the surrounding mountainous catchment, and also submitted to seasonal river floods, and runoff and seepage from one of the local gravity irrigation schemes. The wetland has traditionally supported livelihoods of neighbouring rural community, through natural vegetation collection for food, crafting and building activities, playing a role of safety net for the poorest. Since the mid-1990s, it has been progressively drained and the natural vegetation cut and burned for subsistence maize cultivation. As a result, its ecological integrity is jeopardized and traditional provisioning services and current farming opportunities are put into question.

A participatory decision support framework was developed under the WETwin project (funded by the 7th European Framework Programme) to assess the trade-offs between wetland ecosystem services provision and ecosystem integrity and to support decision makers and stakeholders in wetland planning and management. In this case study, a particular focus was given to stakeholder involvement in the assessment process. Their knowledge, opinions and preferences were requested at several stages of the research, through individual interviews, focus group discussions, role-playing game sessions and multi-stakeholder workshops.

Stakeholder and problem analysis showed that institutional change in the resource system of the whole valley (including not only the wetland but also the irrigation schemes and upland grazing areas) after the end of apartheid regime, is the main cause behind the breakdown of local irrigation schemes, the encroachment of the wetland for maize cropping, and more generally the abandonment of resources management policies. This was compounded by several flooding events, which destroyed part of the irrigation infrastructure and drained a significant portion of the wetland.

Based on this diagnosis, potential management options were identified and characterized through stakeholder consultation, literature review and expert interviews. Several sets of Management Solutions, combinations of options targeting different balances between the three pillars of sustainable development were proposed to stakeholders' assessment. A specific set of evaluation criteria was developed based on stakeholders' value principles for wetland management. Management solutions were then assessed through qualitative assessment techniques complemented when possible by various modelling tools (system dynamic model and farming system models). Finally, analysis of trade-offs between ecosystem services was performed using themDSSsoftware.

The analysis confirmed potential trade-offs initially identified. It showed that all the proposed solutions could induce improvement in terms of environment sustainability and social equity.

However, regarding economic development, a clear trade-off appeared between food production and cash cropping both in the wetland and irrigation schemes.
All proposed solutions present a theoretical reduction of land concentration. However, such achievements are questioned by the traditional importance of landholding, which makes land redistribution among farmers rather unlikely. Therefore although it is possible to find wetland management solutions that improve ecosystem health while increasing economic development and enhancing social equity, such solutions display higher capital costs and require a high degree of collective action and institutional change, which make them risky and difficult to implement.
Ranking of management solutions appeared to be little sensitive to the set of weights or decision rule. This is probably due to the high number of criteria and resulting homogeneity of corresponding weights, as no stakeholder dared to give extreme weight to any criteria. Direct ranking of solutions by groups or individual stakeholders and expert based scoring gave different results, e.g. the preferred solution in the expert MCA was almost never chosen directly by stakeholders. These differences can be explained either by the complexity of such exercise leading stakeholders to focus on a limited number of criteria, a lack of understanding by stakeholders of the potential impacts of the proposed solutions, or inaccuracy in expert based scoring of solutions.
Because of the cognitive complexity of the multi-criteria decision process, revealed by the last stakeholder workshop, it was not possible to reach a unique compromise solution accepted by all stakeholders. In order to develop a functional wetland management plan further work is necessary to make sure that all stakeholders i) understand the consequences of options and their combined effects in proposed solutions; ii) are aware of the implementation hurdles associated with each of the solutions; and iii) if necessary, elaborate new combinations of options more adapted to their objectives of development. This process would need to be led by a neutral and well accepted organisation.
The participatory MCA conducted in Ga-Mampa allowed initiating and strengthening dialogue between very diverse stakeholders, from local farmers to representatives of sector departments at municipal and provincial levels up to conservation organization at national level. The exercise also provided reflective material for decision makers in the form of a diagnosis of stakes, and documented management options and solutions adapted to the situation and validated by stakeholders, some of which proposed by local stakeholders. The process itself was more useful than its outcome, as it raised external stakeholders' awareness of the complexity of the socio-ecological system and accompanied local farmers in building their own project. Finally, the exercise showed that if it is possible to undertake participatory MCA with various levels of stakeholders at different scales, the stakeholder engagement process requires a careful and progressive approach.
Discrepancies between individual direct ranking of management solutions and ranking based on expert scoring and stakeholders' criteria weights suggest reducing the number of valuation criteria for multi-criteria analysis. It also demonstrates that sound information on management options, in a format adapted to various audiences, is crucial.
In terms of solutions, the research made clear to all stakeholders that the origin of wetland problems lay outside the wetland, and the necessity to consider the Ga-Mampa valley resources system as a whole. Rehabilitation of the adjacent irrigation systems and livestock management are therefore at the core of all proposed solutions. The research results recommend taking into account the diversity of farmers' situations and objectives when implementing technical, economic or institutional changes in the valley, and implementing pilot projects with small groups of volunteer farmers. Additional research on sustainable wetland farming practices would help fine tuning the wetland plan.
Institutional empowerment and stimulation of collective action appear necessary to move towards a balance between private, intensive cropping use of the wetland and community driven, multiple uses that ensure resilience of the ecosystem and maintenance of wetland capacity to support livelihood of the poorest. This entails assisting the local community in collective action plans and projects and long term capacity building.

Biorefinery Techno-fixes for Resource Constraints?

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A future ?diversified biorefinery' has been promoted as a solution to resource constraints, given the conflict between rising global demand (for food, feed, fuel, other oil-based products) versus resource shortages and environmental damage from resource extraction. Biofuel expansion provoked a ?food versus fuel' debate, which gave extra impetus to the search for a biorefinery which could convert diverse non-edible organic material into various products. In this future cornucopian vision, a biorefinery more efficiently converting ?waste' material would yield high-value products plus energy production, thus enhancing overall economic viability. Closed-loop design would further minimise input demands and pollution.

Promotional arguments attribute current sustainability problems mainly to dependence on oil or edible material, alongside inefficient available techniques for converting waste material. Damage from biofuel production is portrayed as remediable, contingent side-effects of using food biomass. From such assumptions, environmentally sustainable solutions lie in non-food biomass ? e.g. non-food parts of food crops, off-cuts from forests, straw ?from agricultural fields, energy crops growing on ?marginal land', etc. ? to be converted in more eco-efficient ways.

This techno-optimistic cornucopian vision has been widely questioned by reference to current resource usage, especially so-called ?waste'. For example, non-food plant material remains crucial for replenishing soil fertility, contrary to its classification as ?waste biomass'. Much ?waste' wood already has commercial uses, which could become more expensive and undermine other industries. The concept ?marginal' land obscures its various uses by rural populations, especially in the global South. As well as crop cultivation itself, biomass processing requires enormous quantities of water, which is readily diverted from other local needs, regardless of feedstock shifts to non-food biomass.

More fundamentally, the vision can be questioned from theoretical standpoints, in particular:
that eco-efficient techno-fixes have historically intensified the resource problems they were meant to alleviate, e.g. through rebound effects (originally called the Jevons Paradox), and that the primitive accumulation of capital has been historically extended through both old and new forms of dispossession, e.g. through land grabs, commoditisation of resources, etc.

Such dispossession is not simply a negative side-effect. Rather, prospective access to cheap land, labour and natural resources has incentivised the development of new agri-industrial technologies over the past century or more. As current features of biofuel production in the global South, environmental sustainability problems and land-use competition result from industrial monoculture systems producing standard commodities for global markets.

From such historical experience, there are grounds to doubt techno-optimistic claims for diversified biorefineries if they become technically successful. Even if non-edible biomass is chosen, such developments will still seek the most fertile, well-watered land. More efficient crop cultivation and use will strengthen financial incentives to grab more land, while also exploiting or removing labour within agro-industrial production methods.
As a more socially beneficial means to use true waste, anaerobic digestion has been feasible for a long time and has recently undergone technical improvements. It is being increasingly promoted for turning a food-waste burden into energy and biofertiliser. Perhaps paradoxically, however, future inputs depend on destructive practices ? ignoring the environmental cost of ?cheap' food, excessively purchasing food, wasting a large proportion and then collecting the waste through public authorities. This paradox highlights systemic sustainability problems which also have relevance to a diversified biorefinery vision.

Green chemistry, its eco-concepts and its practices: A dialogue between science and philosophy

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This lecture explores how chemists are transforming their own current background in order to act upon the world without jeopardizing life. These changes of practices gradually induce the reformulation of the operational, symbolic, and normative frameworks within which chemists give sense and direction to their actions. In line with Clark (2006), we will first identify the economic, societal and environmental drivers for change. In this respect, chemistry will be understood as deeply embedded in a society and interrelated to it. Moreover, this society defines the meaning of the word ?environment' and the laws and norms that limit chemists' action upon it. Following this line of reasoning, we will not describe chemistry as an autonomous science oriented only by ?paradigms' (Kuhn, 1970) nor do we consider it to be merely propositional. On the contrary, we will depict it as anengagedscience (Rouse, 1996) that comes to grips not only with social and political requirements but also with the needed co-evolution between industry and academic research. In a nutshell, we will highlight the ecological economics and the institutional dynamics at stake in such evolution (Nieddu, 2000).
We will point out that sustainable chemistry is not a delineated field but encompasses heterogenuous ways of doing chemistry from nanochemistry to chemical engineering. All those chemists mostly use the same molecular representations, but they do not have the same chemical culture and know-how. Moreover, they do not use the same resources in the same sites with the same aims: their scientific ?forms of life' differ to refer to the second Wittgenstein (1997). The unity of sustainable chemistry is the result not of a strict identity or of a unique reference but, on the contrary, that of a network of overlapping resemblances none of which run through the totality. It is theconjunctionof those forms of life that is subsumed under the label ?sustainable chemistry' (Llored, 2011). To do so, we will first study how French chemical communities which previously existed within separate fields became involved in the French interdisciplinary program ?Chemistry for Sustainable Development' developed since 2006 (Maxim and Rico-Lattes, 2013). The dynamic overlaps of diverse chemical networks generate new similarities and make it possible for a large collection of chemical processes, green metrics, environmental norms, and new instruments to co-exist and to co-evolve within various projects of research. Those crossroads challenge the underpinning ?field autonomy' assumed by Kuhn (Llored, 2012).
We will then scrutinize the modes of circulation of concepts between those different fields. Some concepts come from other realms such as sustainable development, ecology, and ecodesign (Caillol, 2013; Llored, 2013). They are then translated into the green chemical schemes. Others come from sustainable chemical practices themselves such as atom economy, life cycle analysis, and ecochemistry. This study may help chemists to analyze their own concepts and to articulate their activities with philosophical and ethical debates.
The study of chemical change enables us to query the Kuhnian concepts of ?scientific community' and ?paradgims'. In this respect, chemistry is a spring for querying philosophical models to think about science, innovation and ways of doing philosophy of science, especially from the standpoint of scientific practices and in collaboration with chemists. And conversely, philosophy may provide green chemists with interesting insights to strenghten and widen their own reflection about the new forms of chemistry. As a consequence, this lecture first and foremost proposes an open dialogue between philosophy and green chemistry as regards methodological and epistemological issues.
References:
Anastas, P. T., Warner, J. C. (1998). Green Chemistry: Theory and Practice. (New York: Oxford University Press).
Bachelard, G. (1968). The Philosophy of No. Translated by G.C. Waterston. (New York: Orion).
Caillol, S. (2013). Life cycle analysis and ecodesign: innovation tools for a sustainable and industrial chemistry. In J.-P. Llored (Ed.), Philosophy of Chemistry: practices, methodologies and concepts. (New Castle: Cambridge Scholars Publishing), forthcoming.

Clark, J. H. (2006). Green chemistry: today (and tomorrow). Green Chemistry, 8: 17-21.
Deleuze, G. & Guattari, F. (1996). What is philosophy?, 2nd edition. (Columbia: Columbia University Press).
Harré, R. (1986). Varieties of Realism. A Rational for the Natural Sciences. (London: Basil Blackwell).
Kuhn, Thomas. (1970). The Structure of Scientific Revolutions.2nd Ed., Enlarged (1st Ed., 1962). (Chicago: University of Chicago Press).
Llored, J.-P. (2011). L'apport d'une approche épistémologique de la chimie verte, in Chimie 2: la nouvelle donne, L. Maxim (Ed.). (Paris: CNRS Publisher, France).
Llored J.-P. (2013). Towards a practical form of epistemology: the example of sustainable chemistry, in Practical realism towards a realistic account of science, Endla Lohkivi (Ed.), Studia Philosophica Estonica, in press.
Lynch, Michael. (1982). Technical Work and Critical Inquiry: Investigations in a scientific Laboratory, Social Studies of Science 12: 499-534.
Nieddu M.et alii.(1999). Biopolymères et agromatériaux : les entreprises prennent position, Industries Alimentaires et Agricoles, 11/12: 52-59.
Nieddu M. (2000). Science et dynamiques économiques, le cas des biopolymères,Sciences de la Société, 49: 87-104.
Nieddu M. (2007). Le patrimoine comme relation économique, inEcon. AppliquéeLX, n°3: 31-57.
Pickering Andrew (Ed.). (1992). Science as practice and culture. (Chicago and London: The University of Chicago Press).
Pitt, J.C. (2011). Doing Philosophy of Technology. Essays in a Pragmatist Spirit. Philosophy of Engineering and Technology 3. (London and New York: Springer).
Rico-Lattes, I. & Maxim, L. (2013). Sustainable chemistry. In J.-P. Llored (Ed.), Philosophy of Chemistry: practices, methodologies and concepts. (New Castle: Cambridge Scholars Publishing), forthcoming.
Roberts, J.A. (2005). Creating Green Chemistry: Discursive Strategies of a Scientific Movement. Ph.D. dissertation. Virginia Polytechnique Institute and State University.
Rouse, J. (1996). Engaging Science. How to Understand Its Practices Philosophically. (Ithica and London: Cornell University Press).
Trost, B. M. (1991). The Atom Economy ? A Search for Synthetic Efficiency, Science, 1471-1477.
Wittgenstein, L. (1997). Philosophical Investigations. Translated by G.E.M. Anscombe. 2nd edition. (Oxford/ Blackwell).
Woodhouse, E., Breyman, S. (2005). Green Chemistry as Social Movement? Science, Technology, and Human Values, 30 (2), 199-222.

Towards a dominant design for the sustainable chemistry? The analyze of the relationships between green chemistry and doubly green chemistry for academic research and industrial innovation

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Since the last two decades the rise of environmental concerns leads to the sector of chemistry to develop new practices and new products for the transition to sustainable sociotechnical régime. For this, the concept of green chemistry is presented as a solution by scientists, companies and policy makers in order to drive the sustainable transition. Today, another paradigm seems to be embedded in it : the doubly green chemistry which concentrates rather its efforts in biomass. This paper aims to understand precisely if there are the emergence - or not - of a new techno-economic paradigm in this sector. In other words, if the emergence of a new sociotechnical regime from a dominant design and a "winning" technology could exist. Our methodology is based on the theory of "Transition to sustainable development" (Geels, 2011). The originality of our work is to analyze two places in the sector of green chemistry. Firstly, we focus on academic research in downstream, then from industrial innovations in upstream. Finally, linking the both will give us a better understanding of the convergence of sustainable socio-technical transitions.
Our results emphasize the fact that two levels are identified in the academic field in terms of representations and of development for a sustainable chemistry. After having shown that many forms and various names was proposed in the wake of the 1990s (eg "environmental chemistry" or "soft chemistry"), sustainable chemistry has been stabilized thanks to the concept of "Green Chemistry" (GC). Yet, during the 2000s, the dominance of this concept was gradually modified until a radical change in the situation. Indeed the academic world has based increasingly its efforts to develop a sustainable chemistry by valuing plant resources. The most of tools which are used by "Green Chemistry" are redeployed in order to develop a new kind of chemistry : we call it the "doubly green chemistry" (2GC) (ie the sustainable chemistry of the plant). Then we focus on innovation strategies of chemical industries in the case of resilient floorings. Our conclusions point out that this sector applies both the concept of the "Green Chemistry" and of the "Doubly Green Chemistry". As a matter of fact three kinds of design are in competition. Firstly plastic products are made by integrating new PVC and by PVC recycling (GC strategy). Secondly various products are designed from 100% biobased products such as linoleum which requires sawdust and linseed oil (2GC strategy). Thirdly various products needs new PVC, PVC recycling and biobased plasticizers in order to prevent dangerous chemicals (phthalates) while avoiding the effects of price elasticity of petrol (mixed strategy between GC and 2GV). To put it in a nutshell, there is no emergence of a winning technology and a dominant design for sustainable chemistry today.

Reference

Anastas, P.T. & Warner, J.C., 2000. Green Chemistry: Theory and Practice, Oxford University Press, USA.
Debref, R., 2012. The Paradoxes of Environmental Innovations: The Case of Green Chemistry. Journal of Innovation Economics, n°9(1), p.83?102.
Garnier, E., Bliard, C. & Nieddu, M., 2012. The emergence of doubly green chemistry, a narrative approach. European Review of Industrial Economics and Policy, (4).
Geels, F.W., 2011. The multi-level perspective on sustainability transitions: Responses to seven criticisms. Environmental Innovation and Societal Transitions, 1(1), p.24?40.
Nieddu, M., Garnier, E. & Bliard, C., 2010. L'émergence d'une chimie doublement verte. Revue d'économie industrielle, (132), p.53?84.
Pluijmert, T. et al., 2008. Industry approach to life cycle assessment. Plastics, Rubber and Composites, 37(9-10), p.406?410.

How to build the filieres of the Doubly Green Chemistry? The variety of strategies of involved firms

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How to build thefilieresof the Doubly Green Chemistry? The variety of strategies of involved firms
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Recently, a lot of debates are hefting the path undertaken in chemistry; a transition from a « traditional chemistry» to a «sustainable chemistry» (Maxim & alii., 2011). The sector of doubly green chemistry emerges through the pression of agro-industry, intending to find new growth opportunities. Based on an institutionalised compromise, we observe four technological trajectories. The aim of this paper is to describe how the economic actors mobilize various resources (innovation, intellectual propriety, alliance building) to build biobased filieres. With firms monographs we intend to show the variety of strategies developed to take position on the filieres.

Biorefinery ; Institutional & sectoral dynamics ;filieres; productive heritages

Our work examines the emergence offilieres, based on agro-resources and the dynamic of emanation of the sector called ``doubly green chemistry`` (Nieddu&alii., 2010) and defined as a sectoral recomposition that implies to rethink the articulation of agriculture with chemistry. This sector is based on thebiorefinery. We consider it as anintermediary object(Nieddu, 2012). This concept is depicted as a technical object and a vision for the future. Thus, it becomes a mode of coordination, which is return is portrayed as an institution. The principle of an institution is to provide behavioral rules for the actors. Coriat (2012) explains that when rules are produced, the actors involved in its production also plan the way it can be used. Consequently, a vision for the future is established and shared by all actors of the fourproductive heritages(Bliard& alii, 2011). This defined space allows the organization of the sectoral system of innovation of the doubly green chemistry (Béfort& alii, 2012) and the competition within it. Thus, the biorefinery is aninstitutionalized compromisebetween communities supporting the four productive heritages. Each of those productive heritages produces a technological trajectory and so, it becomes an interest of the actors involved to reproduce these heritages.
Our hypothesis is that, after having defined the structure of the sector, actors are drawing the filières they will belong to but unfortunately they are not succeeding. This is due to multiple reasons, such as a variety of inputs and of processes. This is quite evident, especially when industries make public declarations in order to claim subventions, protection against competition (especially on ethanol coming from USA or Brazil), stabilization of agricultural markets and low taxes (like at theRencontres du pole IAR 2012or the 2012 CGAAER conference). In order to succeed building such filières, firms mobilize the following resources: scientific research, intellectual property rights strategies and politics.
The scientist ? especially in chemistry where there are strong links between science and industry- is seen, by the industrial economist, as a production force, embedded in a socio-economic context. The firms turn themselves towards science (like inside call for projects) and bring learning on limited parts of the value chain (Béfort& alii, 2012). Intellectual property rights allow firms to maintain open a portfolio of options (Carpentier, 1998) and to develop pilot plant to sell (for now) licenses of the process that they use (like futurol at the biorefinery of Pomacle-Bazancourt). Finally, politics is meant here as a sense given to by Jullien & Smith (2010). However, instead of considering politics as first upon economic strategies, we consider it as a resource used by actors. For example, the form taken is the presence at the conferences we cited above or participating in defining the rules (like thebiorefineryas a mode of coordination).
We will illustrate our point by focusing on three great firms of the chemistry. We will mobilize three entries: scientific publications, patents and firms communication. By this, we will be able, with narratives, to point out the diversity of economic models.

[1] Phd. Student in economics, « Productive heritages, actor's strategies and knowledge apropriation in Doubly Green Chemistry » (under dir. of M. Nieddu). We gratefully thank our colleagues M. Nieddu (REGARDs), FD. Vivien (REGARDs) and C. Bliard (ICMR) from the ANR project «An Economic Approach to the integration of socio-economic and technological dimensions in Doubly Green Chemistry Research Programs" ref. ANR-09-CP2D-01-01 AEPRC2V (under dir. of M. Nieddu) for their stimulating discussions.
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ENVIRONMENTAL INNOVATION AND TECHNOLOGICAL LEADERSHIP: A FIRM-LEVEL EMPIRICAL ANALYSIS

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Environmental and climate change concerns have come to be ranked very highly on the competitive, political and socio-technical agendas of market economies over the last two decades, as demonstrated by the 2009 Copenhagen summit. This context appears to be an opportunity to reconcile economic imperatives and ethico-ecological requirements. This paper seeks to contribute to the green building debate in economics and innovation management by focusing on environmental innovation and innovation leadership?the latter is the dynamic capability of an innovative firm to seize new innovation opportunities as a result of a proactive investment policy and enhanced innovativeness. The paper defends the thesis according to which firms that are consistently «innovation leaders» are those that encourage environmental innovations in both integrated technologies and end-of-pipe technologies. We use French CIS Surveys and employ a binary probit model using a sample of 1180 firms to study which different forms of innovation leadership increase the propensity to develop environmental innovations. We find a strong impact of innovation leadership that is measured in a novel way, using innovation persistence, with a greater effect on cleaner production technologies.

Do socially responsible firms implement green innovations? An empirical study based on surveys

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The aim of this research is to examine if enterprises adopting a corporate socially responsible behavior (CSR) with respect to the environment also implement innovations that are beneficial to the environment (green innovations). For this purpose we exploit data of two different surveys carried out in Luxemburg in 2008. The first survey aims at measuring CSR behavior in Luxembourgish firms. The second is the Community Innovation Survey which measures the private sector's innovative behavior. We find that many firms (but not all) expressing a social attitude in favor of environmental concerns carried out green innovations. The econometric estimations clearly show that the dummy variable for firm environmental responsibility has a significant positive impact on the probability of implementing green innovations. A negative binomial model on the number of environmental benefits of firm's innovation indicates that introducing an environmental innovation in response to existing environmental regulations plays a significant positive role. By contrast, introducing an environmental innovation in response to incentives for environmental innovation has a negative impact. Finally the firm's value for environment has the greatest positive impact.

Policy design, eco-innovation and industrial dynamics in an agent-based model: an illustration with the REACH regulation

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Abstract. This paper proposes an agent-based model to study the impact of European regulation REACH on industrial dynamics. This new regulation adopted in 2007 establishes a new philosophy in how to design environmental protection and health. For this reason, REACH appears as a privileged object of study to analyze the impact of regulation on innovation strategies of firms and the structure of market. Our model focuses on the interactions between clients and suppliers in the metallurgical industry and, more particularly, in surface treatment activities. Interdependencies in the heart of vertical relationships affect the development of technologies particularly in the surface treatment activities and they are upset by the new principles introduced by REACH. The main contribution of this paper is to show, through an agent-based model, how different combinations of flexible and stringent instruments designed on REACH regulation (Extended Producer Responsibility, authorization process and restrictions) create the incentives and the constraints to shape market selection and innovation.

The intensity of the firm's eco-innovative performance

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: The aim of this article is to analyze the factors that influence French industrial firms in their eco-innovation performance. An econometric model for analyzing the characteristics that are conducive to the development of eco-innovations is tested using individual data on innovation, representative of all French industrial sectors (CIS 2008). The results highlight the structuring role of firms' internal characteristics, especially the positive role of the innovative activity of the firm. Also, they show the great influence of the firms' external environment, in particular, the rate of sectoral adoption, on the firm's eco-innovation intensity.

Consumer's perceptions on environmental and social communication: the case of organic and fair trade products.

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Abstract
Abstract. The aim of this paper is to better understand how responsible communication has a positive impact on the customer's perceived value. Our research leads us to believe that a positive consumer perception about CSR (Corporate Social Responsibility) communication on organic and fair trade products, can determine their purchasing decision. In order to enhance understanding with regards to our research question, our qualitative data has been integrated with the empirical model of customer value for consumer markets by (Lai, 1995). Twenty interviews were conducted with consumers from Mexico and France who were particularly aware of the product value when making food purchasing decisions.
Key Words: CSR communication, perceived value, consumer experience, France, Mexico

1. Introduction

According to Pinkston and Carroll (1994), the stakeholder perspective is increasingly gaining ground, and companies have been put under growing pressure to exhibit good corporate citizenship in each country in which they operate. Hence, food companies all around the world have developed an interest in producing and communicating in a more responsible way. Battacharya and Sen (2010) asses that by engaging in Corporate Social Responsibility (CSR) activities, companies will not only generate positive stakeholder attitudes and better support behaviours but also, in the longer term, improve their corporate image, strengthen stakeholder relationships, and enhance stakeholder advocacy behaviours. Moreover, the role of culture shouldn't be underestimated in the formation of consumers' perception of CSR activities. In fact, (Andreu et al, 2005) asses that there are notably four dimensions of national culture that can be related to consumer buying behavior: individualism versus collectivism, masculinity versus femininity, uncertainty avoidance and power distance.

Objective and contribution to the literature

The broad objective of this study is to increase understanding of the value perception in CSR communication of two different cultures and economic environments: French and Mexican. Also, the discernment of the business activities considered by consumers as being the most relevant for CSR and a deeper comprehension about their buying behaviour with regards to CSR communication in the food category. The vast majority of research on CSR communication discusses the effectiveness of message content and the efficiency on communication channels, within the case of multinational enterprises. However, there is little research linking CSR communication and brand equity (Hoeffler and Keller, 2002; Keller, 2003; Parguel, 2007) and virtually no research linking CSR communication and perceived value, whereas it is a natural antecedent of customers brand equity and loyalty. As a result, we consider integrating these two concepts as a significant contribution toward CSR communication research.

2. Methodology

We conducted 20 personal semi-structured interviews: ten interviews in France and ten interviews in Mexico. The interviews were conducted in several towns in the south of France and two important cities in Mexico: Mexico, DF and Morelia, Michoacán. The interviews lasted about half an hour, and they were conducted at interviewee's home places. The conversations were recorded and then transcribed (verbatim). Subsequently, each transcript was reviewed analysed and discussed in detail with other consumer behaviour researchers. The four main topics in the interviews were: the definition of CSR, CSR dimensions, CSR communication responses and perceived value, CSR communication channels, and obstacles for CSR communication. The sample group in France included 3 males and 7 females, ranging from 30 to75 years old and in Mexico included 4 males and 6 females from 25 to75 years old. Moreover, grocery buyers living

in urban or rural environments, with high, or less level of sensitivity with regard to social and environmental issues were our criteria for the respondent's selection. Professions, income level and marital status varied among participants.

3. Results and implications

We can show evidence through our research that there are considerable differences between countries especially in terms of which business activities are perceived by consumers as signifiers of CSR communication. These differences can be trace to differences in Hofstead's cultural dimensions and the different communication channels utilized in each country in regard to CSR. Moreover, the exploratory study suggests the relevance of a positive perception to CSR communication in French consumers through three main responses: well being, empathy and pride. In comparison, results show relevance only for two main responses in Mexican consumers: wellbeing, and pride. Nevertheless, there are two main obstacles for this perception in both cases with lower or higher impact: purchasing power and scepticism. Finally, findings site a few key recommendations for managers: they should carefully study their CSR communication value propositions by evaluating which are the key activities consumers may be interested on by a CSR. Additionally, CSR companies should communicate in a more clear, open, and transparent way to consumers about their CSR activities, through reliable communication channels. Future research may examine the practice of green washing in Mexico. Also, the understanding of French and Mexican consumer's response with regard to CSR communication in SME's (small and medium enterprises). Does the same phenomenon of scepticism hold true for SME's? Similarly, studies in the future could show how managers see obstacles to CSR communication, purchasing power concern, and scepticism, and look at possible coping mechanisms by consumers. Finally, we cannot ignore several methodological limitations, regarding time and sampling size. Despite the fact that, twenty informants in Mexico and France provide strong evidence on Lai's model of consumption values, it would be interesting to increase the number and the length of the interviews and to measure the values through a quantitative research method.

Bibliography

Andreu, L., Beckmann, S. C., Bigné, E., Chumpitaz, R. & Swaen, V., (2005),An international comparison of CSR perceptions. Proceedings of the 12th World Marketing Congress ? Marketing in an interconnected World: Opportunities and challenges, Academy of Marketing Science, Münster.

Berthoin,A., Sobczak, A.,(2007),Corporate Social Responsibility in France: A Mix of National Traditions and International Influences,Business and Society; 46, 1

Du, S., Bhattacharya, C.B. and Sen, S., (2007), Reaping relationship rewards from corporate social responsibility: the role of competitive positioning. International Journal of Research in Marketing, 24, pp. 224?241.

Du, S., Bhattacharya, C.B.,Sen S., (2009),Maximizing Business Returns to Corporate Social Responsibility (CSR): the Role of CSR Communication,International Journal of Management Reviews, 10.1111,1468-2370.

Hoeffler, S., Keller, K.L. (2002),Building brand equity through corporate societal marketing, Journal of Public Policy & Marketing, 21, 2, 78-89.

Holbrook M. B. (1994).The nature of customer value, Service quality: New directions, in theory and practice, R. T. Rust et R. L. Oliver, London, Sage Publications, 21-71.

Holbrook M. B. (1999).Consumer value: A framework for analysis and research, New York. Routledge.

Hofstede, G. (1980).Culture's Consequences: International Differences in Work-Related Values. Beverly Hills, CA: Sage publications.

Hofstede, G. (1991).Cultures and Organizations: Software of the Mind. London, McGrawHill.

Keller, K.L. (2003),Strategic brand management: building, measuring, and managing brand equity. Upper Saddle River NJ: Prentice Hall.

Pinkston, T. S., Carroll, A. B. (1994),corporate citizenship perspectives and foreign direct investment in the US. Journal of Business Ethics, 13(2), 157-169.

Parguel, B., Benoit-Moreau, F., (2007). Communication sociétale et capital-marque,Actes du XXIIIème Congrès International de l'AFM, Aix-les-Bains.

Sirieix,L.,Santiago de Abreu,L., Aico Watanabe, M., Kledal,P.R.,(2007).Comparing organic urban consumers in developing countries: First results in Brazil and France. Montpellier, Supagro, UMR,MOISA,working paper 4

Redefining progress and prosperity: with which indicators?

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For more than twenty years now, there has been a large dispersed movement toward the development of new indicators of wealth or prosperity, to complement GDP and growth, or to replace them. This movement can be read as an expression of a growing protest vis-à-vis the macroeconomic indicators when used as univocal representation of prosperity or progress.
If initiatives are multiplying to provide other indicators, they are also very diverse in the content of what they offer, and in the methods to achieve the aim followed. They are the expression of highly contrasting visions of this new prosperity to which it would be useful to converge.
The purpose of this conference is to provide a discussion of the plurality of objectives behind this movement, in the light of some recent initiatives, being they at an international level (UNDP new challenges toward sustainability) or at national and even territorial levels.

Macroeconomic relationships within a green economy

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Macroeconomic relationships within a green economy

Towards a comprehensive conceptualization of the policy mix: the case of renewable power generation technologies

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Summary

In light of current sustainability challenges and the resulting need for multi-faceted policy intervention the growing popularity of the term policy mix comes as no surprise. Yet, a unifying and comprehensive policy mix concept is missing. For our research case of renewable power generation technologies, we therefore develop a more comprehensive concept of the policy mix encompassing (i) elements, including the policy strategy and the instrument mix with its interacting policy instruments, and (ii) the processes of policy making and implementation. We characterize the nature of these elements by ?consistency' and the processes by ?coherence'. In addition, our concept incorporates the complex and dynamic nature of policy mixes through its dimensions, such as governance level, actors and time. Ultimately, our concept might serve for evaluating the impact of policy mixes and deriving more precise policy recommendations.

Abstract

Motivation and research question

In recent years, the term policy mix has been increasingly used in the context of climate policy (IEA 2011; Matthes 2010), environmental policy (OECD 2007; Ring, Schröter-Schlaack 2011) and innovation policy (Flanagan et al. 2011; Nauwelaers et al. 2009). In light of the sustainability challenges with their associated market, system and institutional failures and the resulting need for multi-faceted policy intervention (Braathen 2007; Lehmann 2010b; Weber, Rohracher 2012) this growing popularity comes as no surprise. However, existing studies tend to apply a rather narrow policy mix concept focusing on the combination of instruments only. In addition, they typically use their own set of varying policy mix characteristics, often without specifying their meaning or connecting them to related contributions in other disciplines. [1] This lack of a uniform set of well-defined policy mix characteristics is particularly problematic for terms without established definitions, such as consistency and coherence (Den Hertog, Stroß 2011; Picciotto 2005). As a consequence of this limited scope and unclear terminology, existing policy mix analyses and their resulting policy mix recommendations may be difficult to assess, compare and unite, which may lead to ambiguous findings and policy recommendations without much substance and impact.

This study addresses the identified lack of a common, comprehensive and well-defined policy mix concept, thereby following Flanagan et al. (2011) and their call for a reconceptualization of the policy mix for innovation. More precisely, we are interested in clarifying what constitutes the term «policy mix». That is, we aim at identifying and defining the key elements and processes of a policy mix and how they can be characterized, thereby also considering its overarching dimensions. Our ultimate objective is to provide researchers from various academic backgrounds with a uniform and all-encompassing conceptualization of the term policy mix to be used as starting point for empirical analyses, thereby also enabling more precise and valuable policy recommendations for policy makers. We develop our policy mix concept for the research case of renewable power generation technologies (RPGTs) whose accelerated development and diffusion is a major prerequisite for the transition to a decarbonized energy system (Kern, Smith 2008).

Literature on the policy mix

A growing number of studies in different scientific fields uses the term «policy mix», e.g. Lehmann (2010a) in environmental economics, Nauwelaers et al. (2009) and de Heide (2011) in innovation studies, and Howlett and Rayner (2007) in the field of policy analysis. Some studies

use the term «policy mix» interchangeably with «instrument mix» (e.g. Ring, Schröter-Schlaack (2011)) while others only refer to «instrument mix» (e.g. OECD (2007)), but thereby typically meaning the same as studies using the term «policy mix» (see Table 1). However, most of the studies employing the term «policy mix» do not explicitly define it (e.g Lehmann 2010a; Matthes 2010; OECD 2007; Persson 2006).
The few studies providing a definition of the term policy mix only exhibit some minor differences, e.g.:
Guy et al. (2009) (p.1)
«An R&D and Innovation Policy Mix can be defined as that set of government policies which, by design or fortune, has direct or indirect impacts on the development of an R&D and innovation system.»
Kern, Howlett (2009) (p.395)
«Policy mixes are complex arrangements of multiple goals and means which, in many cases, have developed incrementally over many years.»
Nauwelaers et al. (2009) (p.3)
«A policy mix is defined as: The combination of policy instruments, which interact to influence the quantity and quality of R&D investments in public and private sectors.»
De Heide (2011) (p.2)
«A policy mix is the combined set of interacting policy instruments of a country addressing R&D and innovation.»
While these definitions point to interactions of policy instruments, the ultimate objectives of policy mixes and to their dynamic nature, an extended policy mix concept needs to go beyond existing studies at least in three regards. First, a comprehensive policy mix concept needs to consider its complexity (see definition by Kern and Howlett (2009)). Flanagan et al. (2011) stress that a policy mix is more than a combination of policy instruments as it is shaped by several factors, namely actors, instruments, institutions and interactions. Second, this also involves a better understanding of policy processes, i.e. of «the processes by which policies emerge, interact and have effects» (Flanagan et al. (2011), p.702). In this regard, Howlett and Rayner (2007) and Kern and Howlett (2009) specify principles for designing policy mixes in the most optimal way. Third, empirical studies in the field of climate policy point to the importance of including long-term policy targets as an additional element of a policy mix due to their essential meaning for companies' innovation strategies (Rogge et al. (2011b), Rogge et al. (2011a), Schmidt et al. (2012b)). This implies a need of incorporating a strategic component of policy mixes.

Approach

Given our research case and the desired interdisciplinarity of the concept, we reviewed the contributions of policy mix studies in the field of environmental economics, innovation studies and policy analysis literature. Relevant conceptions and definitions from these diverse and often still largely separated literatures have been collected and integrated. In addition, where needed, we complement our literature survey with contributions from other fields, such as the strategic management literature.

The policy mix concept

The comprehensive policy mix concept we propose consists of elements, processes and dimensions (see Figure 1). First, the elements of the policy mix include the policy strategy, i.e. long-term policy objectives and principal plans, and the instrument mix, which is comprised of interacting policy instruments. Second, by including policy processes we capture the procedures and institutional provisions of policy making and implementation, such as agenda setting, policy formulation and policy adaptation, which determine the policy mix elements. While we characterize the processes of the policy mix using the term coherence, we capture its state of affairs by the term consistency. Finally, we reflect the complex and dynamic nature of policy mixes by introducing a number of dimensions with which studies can specify the scope of their policy mix analysis both in terms of its elements and processes.
More precisely, we define the policy mix as a combination of a policy strategy and interacting policy instruments, i.e. the instrument mix, which, intentionally or unintentionally, influence, together with policy making and implementation, the achievement of policy objectives, and whose complex and dynamic nature is illustrated by its key dimensions. We apply this definition to our research case by specifying the overarching policy objective to be the promotion of innovation in renewable power generation technologies.

Contribution of the study

We see two main contributions of our concept: First, it recognizes the complexity of policy mixes, which go beyond combinations of instruments, and encourages the precise use of notions such as ?policy mix' and ?instrument mix' enabling a better comparability of future studies. In a similar vein, through boundary setting and more precise language our concept improves the transparency of what is actually being meant (and what is not). Second, the strengths of the concept include its suitability as overarching, interdisciplinary framework, which is flexible enough to allow for applications in different research settings. Examples are the boundary setting through the dimensions or the choice of which elements and processes are considered in which forms.

The ?policy mix' for sustainable urban development: Lessons from the city district Hammarby Sjöstad in Stockholm

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This paper will contribute to the conceptualization of «policy mix» by drawing on insights from studies in urban policy, institutions and sustainability transition. It will analyze the opportunities and limitations of using the policy mix as a tool for sustainable and integrated urban development. Many scholars emphasize the context of institutions and actors in which the policy instruments operate (Flanagan, et al. 2011; Foxon and Pearson, 2007). This study will shed new insights on the role of institutions and organizations in creating a coherent and integrated policymaking framework for sustainable city district, which has not been systematically addressed in the current debate on policy mix.

The wider institutional and actor context in which the innovation policy operate can change over time, which require flexible policy instruments. According to Flanagan, et al (2011:711) «A key role for innovation policy studies should be to highlight the trade-offs and tensions inherent in any policy mix», which call for appropriate institutional arrangements to create a balanced and right composition of different policy instruments both across sectors and over time. By examining the trajectory of urban policy in building the eco-district Hammarby Sjöstad, this paper will discuss the interaction between policy instruments across sectors (e.g. urban water, wastewater, energy, transport and housing) and over time (1990 until present). These sectors have their own communities with particular preferences, objectives and activities. It will be discussed how the sectoral policies are mixed up over time to achieve the environmental visions of Stockholm City. The case of Hammarby Sjöstad offers opportunities to conduct an in-depth analysis on how the policy instruments for different sectors have evolved and adapted over time.

To summarize, urban arena provides a good example of operationalization of policy mix, where many actors and institutions work together for an efficient use of urban resources and artifacts. The district of Hammarby Sjöstad is internationally recognized for its integrated closed loop system characterized by efficient reuse of resources such as stormwater, wastewater, solid waste and energy. However, there is limited and fragmented research about the applied policies. A case study of this eco-district provides new insights on how different policy instruments has got together to carry out a successful urban project. It will be analyzed if the policy instruments have been flexible and coordinated across sectors and if they have been complementary and evolved over time. The key question would be how the interaction and trade-offs between different policy instruments has been occurred. The information finding methods will largely be desk study, participant observations (e.g.by attending seminars and workshops organized by actors), and semi-structured interviews with key stakeholders.

References

Flanagan, K., Uyarra, E., & Laranja, M. (2011). Reconceptualising the «policy mix» for innovation. Research Policy, 40(5), 702?713.

Foxon, T. J., & Pearson, P. J. G. (2007). Towards improved policy processes for promoting innovation in renewable electricity technologies in the UK. Energy Policy, 35(3), 1539?1550.

Re-Thinking Consistency and Coherence in Policy Design: Intentionality and Non-Intentionality in the Creation of Policy Mixes

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Thinking about policy mixes is at the forefront of current research work in the policy sciences. Complex problems, it is said, require complex arrangements of institutions and instruments to successfully address them. However, policy mixes raise many significant questions of policy design, especially with respect to the choice of policy tools and instruments, processes of policy formulation, and the evolution of tool choices over time. Not the least among these questions is whether multiple policy tools can achieve complex and ambitious policy goals in an efficient and effective way or whether they are more likely to suffer from disabling internal contradictions than designs that rely on a single or few instrument(s). This paper develops a comprehensive evaluative framework for policy mixes based on the observation that policy mixes are typically the outcome of distinctive process of policy change, in which elements are added and substracted from the mix over time.

Previous work on policy mixes has highlighted evaluative criteria such as "consistency" (the ability of multiple policy tools to reinforce rather than undermine each other in the pursuit of policy goals), "coherence" (or the ability of multiple policy goals to co-exist with each other in a logical fashion), and 'congruence" (or the ability of goals and instruments to work together in a uni-directional or mutually supportive fashion) as important measures of optimality in policy mixes. And previous work on the evolution of policy mixes has highlighted how these three criteria are often lacking in mixes which have evolved over time as well as those which have otherwise been consciously designed.

The paper revisits work by historical institutionalists, including Thelen, Hacker and others, in order to more clearly assess the reasons why many policy mixes suffer from inconsistent, incoherent or incongruent elements. The change processes identified in this literature, notably layering, conversion, drift, replacement and exhaustion, all have characteristic effects on policy mixes. However, this literature also contains a characteristic confusion, in which a term such as layering is used to refer to both a process of change and an outcome (a policy mix made up of different elements layered over time). This confusion has hampered the otherwise important debate over the extent to which particular policy mixes are the unintended consequences of change processesversusthe possibility of intentionally exploiting the possibilities of a process like policy drift to achieve a particular outcome. Adding the dimension of 'intentionality' to earlier thinking about processes such as policy layering, drift, conversion, exhaustion and replacement, it is argued, helps to make sense out of these different processes and how they relate to 'design' and governance.

The paper concludes with a discusion of the consequences of distinguishing between intentional and unintentional process of policy change for the practices of policy design, especially where complex policy mixes are involved. The central dimensions of consistency, coherence and congruence remain relevant to the evaluation of policy mixes. However, more precise specification of the micro mechanisms of policy change that can be used to steer broader trajectories of change reveals the need to distinguish different design processes such as 'policy patching' from the usual assumptions made about wholesale policy replacement. These arguments are illustrated with examples of empirical case materials in European and North American energy policy making, creating the opportunity to compare policy designs that incorporate a more strategic vision with those that have adopted a more piecemeal approach. The classic pattern of policy change in energy sectors has been lengthy periods of apparent stability of a complex policy mix punctuated by sometimes dramatic policy innovations whose impact on the overall mix and outcomes has often disappointed the innovators. Distinguishing between intentional and unintentional policy innovations, it is argued, is central to a better understanding the nature of design processes at work in the sector and the factors which lead to policy success and failure.

Beland, Daniel. «Ideas and Institutional Change in Social Security: Conversion, Layering and Policy Drift.» Social Science Quarterly 88, no. 1 (2007): 20?38.Braathen, Nils Axel. «Instrument Mixes for Environmental Policy: How Many Stones Should Be Used to Kill a Bird?» International Review of Environmental and Resource Economics 1, no. 2 (May 16, 2007): 185?235.del Río, Pablo, Anxo Calvo Silvosa, and Guillermo Iglesias Gómez. «Policies and Design Elements for the Repowering of Wind Farms: A Qualitative Analysis of Different Options.» Energy Policy 39, no. 4 (April 2011): 1897?1908.Dodds, Anneliese, and Naonori Kodate. «Understanding Institutional Conversion: The Case of the National Reporting and Learning System.» Journal of Public Policy 32, no. 02 (2012): 117?139.Feindt, Peter H, and Andrew Flynn. «Policy Stretching and Institutional Layering: British Food Policy Between Security, Safety, Quality, Health and Climate Change.» British Politics 4, no. 3 (September 2009): 386?414.González-Eguino, Mikel. « The Importance of the Design of Market-based Instruments for CO2 Mitigation: An AGE Analysis for Spain.» Ecological Economics 70, no. 12 (October 2011): 2292?2302.Hacker, J. S. «Policy Drift: The Hidden Politics of US Welfare State Retrenchment.» In Beyond Continuity: Institutional Change in Advanced Political Economies, edited by W. Streek and K. Thelen, 40? 82. Oxford: Oxford University Press, 2005.Howlett, M. «The Lessons of Failure: Learning and Blame Avoidance in Public Policy-making.» International Political Science Review 33, no. 5 (October 24, 2012): 539?555.Howlett, Michael, and Jeremy Rayner. «Convergence and Divergence in ?New Governance' Arrangements: Evidence from European Integrated Natural Resource Strategies.» Journal of Public Policy 26, no. 2 (2006): 167?189.Howlett, Michael, and Jeremy Rayner. «Design Principles for Policy Mixes: Cohesion and Coherence in ?New Governance Arrangements'.» Policy and Society 26, no. 4 (2007): 1?18.Howlett, Michael, and Raul Lejano. «Tales from the Crypt: The Rise and Fall (and Re-Birth?) of Policy Design Studies.» Administration Society (2012).Howlett, Michael. Designing Public Policies: Principles and Instruments. New York: Routledge, 2011. http://www.routledge.com/books/details/9780415781336/.Kay, Adrian. «Tense Layering and Synthetic Policy Paradigms: The Politics of Health Insurance in Australia.» Australian Journal of Political Science 42, no. 4 (2007): 579?591.Mahoney, James, and Kathleen Thelen. «A Theory of Gradual Institutional Change.» In Explaining Institutional Change: Ambiguity, Agency, and Power, edited by James Mahoney and Kathleen Thelen, 1?37. Cambridge: Cambridge University Press, 2010.McConnell, Allan. Understanding Policy Success: Rethinking Public Policy. Basingstoke: Palgrave Macmillan, 2010.Siddiki, Saba, Christopher M. Weible, Xavier Basurto, and John Calanni. «Dissecting Policy Designs: An Application of the Institutional Grammar Tool.» Policy Studies Journal 39, no. 1 (February 2011): 79?103.Taylor, Christopher, Simon Pollard, Sophie Rocks, and Andy Angus. « Selecting Policy Instruments for Better Environmental Regulation: a Critique and Future Research Agenda.» Environmental Policy and Governance (May 8, 2012). http://onlinelibrary.wiley.com/doi/10.1002/eet.1584/abstract;jsessionid=4CDF645433E1B12BE5ED64A308BB7B15.d02t03?userIsAuthenticated=false deniedAccessCustomisedMessage=.Thelen, K. «How Institutions Evolve: Insights from Comparative Historical Analysis.» In Comparative Historical Analysis in the Social Sciences, edited by J. Mahoney and D. Rueschemeyer, 208?240. Cambridge: Cambridge University Press, 2003.Thelen, Kathleen. How Institutions Evolve: The Political Economy of Skills in Germany, Britain, the United States and Japan. Cambridge: Cambridge University Press, 2004.van der Heijden, Jeroen. «Institutional Layering: A Review of the Use of the Concept.» Politics 31, no. 1 (January 10, 2011): 9?18.Van Gossum, Peter, Bas Arts, and Kris Verheyen. «?Smart Regulation': Can Policy Instrument Design Solve Forest Policy Aims of Expansion and Sustainability in Flanders and the Netherlands?» Forest Policy and Economics 16 (March 2012): 23?34.Voß, Jan-Peter, and Basil Bornemann. «The Politics of Reflexive Governance: Challenges for Designing Adaptive Management and Transition Management.» Ecology and Society 16(2): 9. 16, no. 2 (2011): 9?32.

Sustainability transitions in the perspective of ecological macroeconomics

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Globally, societies are facing a number of serious environmental, economic and social crises. Although the multiple crises are interrelated, research communities tend to be organised around specific complexes of problems. This paper is intended to contribute to the development of an ecological macroeconomics that addresses multiple crises by including insights from different, partly overlapping research communities. The main idea is to explore the usefulness of combining three different system perspectives in the study of sustainability transitions: socio-technical provision systems, distributional systems and macroeconomic systems. First, the theoretical concept of sustainability and the different system perspectives are outlined, and then the perspectives are brought together in the discussion of a specific topic that is key to sustainable transition: the need for considerable resources to invest in the transformation of provision systems.

Transition to sustainability: Scenarios towards a low-carbon economy

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The focus of this paper is to evaluate different policies that may promote the transition to sustainability, with particular focus on energy sector. We present a model where three different strategies for sustainability are identified: reduction in GHG emissions, improvements in energy efficiency and the development of the renewable energy sector. Our aim is to analyze the dynamics that those strategies may produce in the economy, looking at different performance indicators: rate of growth, unemployment, poverty, inequality, fiscal position, GHG emission, and transition to renewable energy sources.
A second important goal of the analysis is to evaluate whether it is possible to disjoint wellbeing and economic growth (Victor, 2008).
In this respect, an increasing number of contributions show the existence of a stationary level of subjective wellbeing in developed country. Moreover there is not evidence that, reached a certain threshold of development, the economic growth is neither necessary nor sufficient for achieve objectives such as full employment, environmental protection and reductions in inequality. These considerations open the possibility to reduce consumption, without undermining levels of wellbeing (Jackson, 2009).

Sustainability is a complex concept. In our framework we aim to take into account this complexity in three stages. First, we build a macroeconomic model where disequilibrium between aggregate demand and supply is possible since aggregate demand has autonomous components. Adjustments in consumption and investment shape the demand for production factors, in particular labour. This model allows us to analyze the dynamics of GDP, unemployment and public and private debt, when different policies are implemented.
Secondly, we integrate the core of the model, with an analysis of the energy sector. While this sector is often underestimated in economic analysis, some recent publications of European Commission recognize as a priority goal for Europe, the development of an efficient energy system. We investigate three different strategies: abatement in GHG emissions, investment in energy efficiency and the development of renewable energy sources (see, for instance, Manna, 2010).
Those strategies can be seen as complementary in the transition to sustainability. Indeed, they aim both, to control climate change and to reduce the dependency of the economy from fossil energy sources. However, given budget constraints, there is a quite strong competition among those strategies. Scenario analysis is a powerful tool to evaluate the dynamics generated by alternative policies which tend to favor one of those strategies. Furthermore, an increase in public expenditure in the energy sector (e.g. through monetary incentives) may reduce the availability of resources for improvements in other performance indicators such as unemployment, inequality and poverty. The model allows for the investigation of this kind of trade-offs.
Finally, while the model can be easily adapted to different countries, we apply it to Italy, making calibration and robustness analysis of the crucial parameters.
Preliminary results show that 'business as usual' scenario is not able to attain European Union prescriptions on renewable energy sources and emissions standard. Moreover, limits on the exploitation of fossil resources generate irreversibility thresholds which may induce the collapse of the whole economy (see, for instance, D'Alessandro et al. 2010). Policies must take into account those thresholds and induce a significant increase in the investment in the renewable energy sector. However those investments are costly, and may reduce the rate of growth and increase unemployment at least in the short run.
At this stage of the analysis, we get that the three strategies have different outcomes. Abatements in GHG emissions and increases in energy efficiency are effective in the short run, while the development of renewable energy sector has higher effects in the long run.
References
D'Alessandro, S., T. Luzzati, and M. Morroni (2010). Energy transition towards economic and environmental sustainability: feasible paths and policy implications. Journal of Cleaner

Production 18, 291?298.
Jackson, T. (2009). Prosperity without Growth. Economics for a Finite Planet. Earthscan.
Manna, C. (2010). Rapporto energia ambiente. Analisi e scenari. Technical report, National agency for new technologies, Energy and sustainable economic development.
Victor, P. (2008). Managing without growth: slower by design, not disaster. Edward Elgar.

How close are countries to a socially sustainable steady-state economy? Results from the Degrowth Accounts

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Summary
In order to determine how close national economies are to a steady-state economy, I have created a set of biophysical and social indicators, organised into two separate accounts. The Biophysical Accounts measure the annual rate of change of biophysical stocks and flows over a 10-year period, and the scale of these flows in relation to ecosystem sources and sinks. The Social Accounts measure the functioning of the socio-economic system, and how effectively it delivers human well-being. I use these indicators to measure how close ~180 countries are to the idea of a steady-state economy, and explore whether there is any relationship between a country's proximity to such an economy and its overall social performance.

Extended Abstract

The declaration from the first international degrowth conference, held in Paris in April 2008, called for the development of new, non-monetary indicators to assess whether economic activity contributes to or undermines social and environmental objectives. In an attempt to fulfil this objective, I have created the Degrowth Accounts, a set of indicators whose purpose is to measure progress in the degrowth transition to a steady-state economy.

The indicators are organised along a continuum from means to ends, and are split into two separate accounts: biophysical and social. The Biophysical Accounts are constructed around Herman Daly's definition of a steady-state economy. This definition contains three components: stocks (the absolute size of the economy), flows (the throughput required to support the economy), and scale (the size of the economy in relation to the environment). The Biophysical Accounts include three stocks (built capital, human population, and domesticated animals) and four flows (material inputs, material outflows, energy use, and ecological footprint). In order to determine how close a country is to a steady-state economy, I measure the annual rate of change of the above biophysical stocks and flows, and the scale of the flows in relation to ecosystem sources and sinks.

The Social Accounts are constructed around the stated goals of the degrowth movement, as articulated in the Paris Declaration. There are 24 individual social goals within the text of the declaration, which I have grouped and reduced to seven general goals. These goals are human well-being, health, equity, the elimination of poverty, increased social capital, participatory democracy, and decreased working time. To the seven goals from the Paris Declaration, I have added two other goals that I think are important items to measure. The first is low unemployment, and the second is stable prices. The result is a set of social indicators that measures the functioning of the socio-economic system, and how effectively it delivers well-being.

I have calculated the indicators in the Degrowth Accounts over a 10-year time period (1997-2007), for about 180 countries. I have also created two composite indicators: the Biophysical Stability Index (BSI) and the Social Performance Index (SPI). The BSI measures the average rate of change of the biophysical indicators, and the SPI measures how well each country does on the social objectives identified in the Paris Declaration.

Some of the findings that emerge from the Degrowth Accounts include:

(1) Over 80% of people live in biophysical growth economies, 12% live in biophysically stable economies, and less than 2% live in degrowth economies.

(2) There is only one country in the world (Japan) that achieves relative stability in all seven of the biophysical indicators, while five countries (Denmark, France, Poland, Romania, and the U. S.) achieve stability in six out of the seven.

(3) There are no countries in the world that achieve a true steady-state economy (i.e. overall biophysical stability at a level of resource use that is environmentally sustainable). However, a small number of countries come relatively close, including Colombia, Cuba, Kyrgyzstan, Romania, and South Africa.

(4) Countries with stable stocks and flows tend to be better places to live than countries with either growing or degrowing stocks and flows. Stable economies are more democratic and more equal, and their citizens are happier and healthier than those in growing or degrowing economies. This is encouraging news for achieving a steady-state economy. However, social performance

is also higher in countries with greater per capita resource use, and a high level of social performance is in general only attained at a level of resource use that is too high to be environmentally sustainable (given current global population at least).
(5) The unemployment rate appears to be unrelated to biophysical or economic growth rates. This finding runs counter to conventional economic wisdom, and suggests that unemployment may be less of a problem in a degrowing or steady-state economy than previously thought.
Taken together, these findings suggest that while a biophysically stable economy may be socially sustainable, the level of resource use required for a "good life" may be too high to extend to all people on the planet without surpassing ecological limits. In fact, if all seven billion people on Earth are to lead a good life within ecological limits, then we need to become three to four times more efficient at translating resource use into human well-being.

The implications of a multi-dimensional degrowth for happiness

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Happiness economics provides a number of important insights for degrowth1. The lack of association between income growth and reported subjective well-being over time, and once basic necessities have been met, (Easterlin 1995) is one of the finding which is particularly relevant in the context of degrowth. Social comparison and adaptive expectations are normally suggested as the two processes which mediate and dampen the positive impact of income increase on happiness. Social comparison generally means that people systematically adjust their material aspirations with these of their social environment. At the same time, people continuously adapt their perceptions of what consists a sufficiently high level of material welfare on the basis of past trends, including increases in their own income level (Clark and Oswald 1996, Luttmer 2005, Clark et al. 2008).

Exploring the relevance of these findings for degrowth is complex. Degrowth as an equitable multidimensional downscaling of production and consumption capacities, which is voluntary and collective has not been observed yet, implying that all judgements about its effect on happiness are far from straightforward. Yet a few careful conclusions can be drawn. The present article builds upon the results of an empirical study exploring key factors which determine life-satisfaction in Barcelona over a period of five years (between 2006 and 2011). Based on a sample of 840 individuals we look at the way changes in income, notably income reductions, associated with the current economic situation in Spain affect subjective well-being.

Theoretically, due to the social comparison effect, if a particular decline in consumption, or purchasing power, is widespread and equitable, subjective well-being is not likely to be affected. On the contrary, if a group residing in a society of abundant material wealth goes through an income decrease, as it happens in times of economic crisis, satisfaction with life could come under strain. As an illustration, if the majority of the population in a particular city switch from car to public transport use, due to social comparison it is unlikely that they are going to suffer a decrease in life-satisfaction. Furthermore, as well-being tends to adapt to changes in income if degrowth takes place in a way that provides for basic material needs, its long-term impact on subjective well-being will be non-negative. In the Barcelona case we ran a standard happiness regression, introducing (among others)income decreaseandincome increaseover a period of five years as independent variables. Results demonstrate that nether an increase, nor a decrease in income (which does not bring individuals below the so-called 'poverty line') tends to affect happiness in the shorter or longer run. This is a rather peculiar finding, given that the economic crisis has been affecting the economic situation of citizens considerably and unequally, and has generally been associated with a massive social discontent. One possible explanation for this finding is that reference incomes tend to decrease, together with individual ones.

Furthermore, while happiness adaptation to income change is often found to be complete, adaptation to other factors is only partial. Improvements in happiness determinants such as health status, free time, state of the urban environment, political freedom and importantly, to the quality of social relations often translate in permanent and positive increase in well-being. Another reason for the little impact of the deterioration of the personal economic situation on happiness could be the (possible) improvement in one of the other subjective well-being domains, such as free time and social interactions.

As general conclusions relating the findings with literature insights, satisfaction with life is unlikely to decrease, and could even «grow», if degrowth (understood as a multi-dimensional and multi-scale process) takes place so that:

Reduction in high-earnings is compensated by a decrease in conspicuous and rivalry-based consumption. Considering the importance of income equality for well-being, if reduction of paid work and increase in work-sharing results in a narrowing of the income gap between individuals and countries and a decline in rivalry, subjective well-being is very likely to permanently increase (also on an international level).

Increasing the time dedicated to reciprocity, community and/or manual work is compensated by

more rewarding social interactions. Evidence from the Barcelona dataset, for example, shows that the practice of sharing (housing, vehicles, electro-domestic appliances and tools) is associated with a permanently higher level of life-satisfaction.
Reduction of purchasing power is compensated by an increase of personal free time;
Downscaling fast modes of transportation is accompanied by an increase in the amount of time available for travelling.
In sum, degrowth implies a variety of actions and policies whoseneteffect is unlikely to adversely affect subjective well-being in the shorter or longer term. Nontheless, in the context of Barcelona, we find that one isolated degrowth proposal, such as a decrease in purchasing power, implemented on its own, could have zero, or negligible, impact on happiness when implemented on a scale which does not bring individuals below the threshold of meeting their basic material needs.

1Here we follow the tradition generally adopted in happiness economics of using the terms happiness, subjective well-being and satisfaction with life interchangeably.

The ecosystem services approach as an interdisciplinary research framework

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SourceURL:file://localhost/Volumes/NO%20NAME/ESEE/V5-Loft%20et%20al-ESS%20as%20interdisciplinary%20research%20framework_ESEE%20Abstract.doc

The concept of ecosystem services (ESS) dates back at least to the 1970s but gained momentum in the scientific literature in the 1990s (e.g. De Groot, 1992; Costanza et al., 1997; Daily, 1997). The concept was mainstreamed by the Millennium Ecosystem Assessment (MA, 2003, 2005), and since then efforts to put the concept into practice have increased strongly (e.g. Daily and Matson, 2008; Tallis et al., 2008). A recent focus by scholars, such as de Groot et al. (2002, 2006, 2010) and Haines-Young and Potschin (2010, 2011) has been put on developing a coherent and integrated approach to come to practical application of the concept of ecosystem and landscape functions in planning and management at the landscape level, to support decision-makers on how to decide on the optimal allocation and management of different land use options. However these approaches do not specifically factor in effects of climate change.

At the Biodiversity and Climate Research Centre (BiK-F, Frankfurt, Germany) we investigate climate induced changes of biodiversity and ecosystem services, and their effects on society. We frame human-nature interactions as social-ecological systems (SES). Within the SES, ESS play a crucial role as they are the benefits humans derive from nature. The ESS are being affected by climate change, and intended and unintended human actions. Based on the concept of ESS we developed a research framework, which specifically incorporates climate-induced changes. Additionally it integrates management and policy instruments as means for securing a sustainable provision of ESS.

As a first step of our work a coherent and complete framework for ESS assessment was developed, consisting of nine steps: (1) As starting point we identified the need for defining criteria to narrowing down the number of ESS being assessed in the case study. (2) Then ecological assessments of core structures and processes of the ecosystem, ecosystem functioning (EF) could be conducted. (3) As a result, parameters and indicators for EF would be deducted, and (4.) ES supply of the ecosystem predicted. Then social empirical methods would be used to predict societal demand of these services in non-monetary units. (5) Where appropriate monetary valuation studies for the identified services could be conducted, as decision-making support tool. (6) Scenario analysis and modelling approaches would be applied to predict possible futures (including and their possible impact on ES). (7) GIS based mapping could be used as visualization of current status of ES provision and possible changes. (8) Trade-off analysis should be conducted to show possible conflicts in the use of ESS. (9) As a result recommendations for adaptive management for regulating and financing biodiversity conservation and resource management would be derived.

The framework was tested and refined in three case studies:

- A tropical marine ecosystem with distinct coral reefs (Socotra Archipelago), with local and regional population being especially dependent upon fish biomass for food security.
- A savannah ecosystem in West Africa with a local population being especially dependent upon non-timber forest product provision by baobab trees for household income.
- South African savannah ecosystems with a unique diversity of large mammals, which are the basis for wildlife tourism, an important source of income in eastern and southern Africa.

In the implementation of the case studies special emphasis was put on studying and standardising the transdisciplinary process of implementing the ESS approach, i.e. necessary consultation steps in the interfaces between natural and social sciences, and optimisation of the stakeholder involvement. The case studies showed that a complete implementation of the framework turned out as way to complex and time consuming. Depending on the research emphasis and questions not all but only a selection of steps were taken. In addition the order of the applied research steps varied between the different case studies. As a result the research framework was refined and is now perceived as a set of modular building blocks (steps 1-9 outlined above), which can be combined in different ways, depending on research and decision-makers needs, to show societal relevance of climate-induced changes in the provision of the ESS in the case studies.

The application of the refined framework and its adaptation to specific case study contexts proofed to support prediction of climate-induced changes in ESS provision, and their social relevance in economic terms. The results obtained helped deducting management options for a sustainable provision of ESS within the case study contexts. In addition the research framework did bridge natural and social scientist's work and facilitated interdisciplinary work between biologists and ecologists, and social scientists within our working groups.

Transdisciplinarity as a Research Practice to Approach Biodiversity - a Social-Ecological Perspective

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The aim of the presented paper is to show, how a social-ecological biodiversity research can be implemented. As an introductory talk to the session "Transdisciplinary Research ? Challenges and Opportunities for a social-ecological biodiversity research" the paper will frame the foundations of transdisciplinarity, and will in particular touch upon the following questions: (1) What is the added-value of transdisciplinary research on biodiversity? (2) What research issues arise for a social-ecological biodiversity research? (3) What are trajectories for fostering transdisciplinary approaches in biodiversity research? In our paper application examples from biodiversity research draw from a consultation process in 2011 where researchers, experts, representatives, and decision-makers discussed to increase the capacities of transdisciplinary biodiversity research.

Integrated assessment of economic tools for conservation management: A transdisciplinary research approach?

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The integrated assessment for identifying and planning economic tools

We present an integrated assessment methodology that intends to enable managers of protected areas (PA) and local authorities in the surroundings of PAs (e.g., buffer zones) to recognize the values of services provided by local ecosystems, and to identify and plan appropriate economic tools to enhance ecosystem service provision. The economic tools should thereby both contribute to biodiversity conservation (e.g., reduce pressures to the protected areas or generate funding) and at the same time improve the well-being of the local population. A step-wise assessment guideline leads the assessment team through a systematic and practice oriented procedure for relatively rapid identification of promising economic tools, for designing those tools, and for preparing their implementation process.

The integrated assessment methodology and the practical step-wise guideline are developed within the ECO-BEST project[1], a four-year effort (2011-2015) financed by the European Union, the Thai and the German Governments, with the general objective of applying economic tools for reducing terrestrial biodiversity loss in South-East Asia for the benefit of local communities. Within ECO-BEST, the guideline is developed and road tested at a series of pilot sites in Thailand. For 2013, a further application to protected areas in Laos is planned. Eventually, the methodology aims to be applicable to any protected area worldwide and to global efforts, e.g., by the CBD, for improving protected area management and biodiversity conservation through the identification and implementation of economic tools that integrate the values of biodiversity and ecosystems.

A transdisciplinary research approach?

The guideline for the integrated assessment builds on the 6-step approach of The Economics of Ecosystems and Biodiversity report for local and regional policy makers (TEEB 2011). This approach builds on a broad range of practical experiences with assessing and valuing ecosystem services. The guideline also uses information and tools from a variety of other relevant references, for instance from the Ecosystem Service Review (World Resources Institute, 2008) manual for corporate managers, or from the GIZ guideline for «Integrating Ecosystem Services into Development Planning» (GIZ, 2012). It incorporates findings from a wide range of the interdisciplinary literature and bio-physical as well as socio-economic knowledge on biodiversity and ecosystem services, policy instruments, and participatory processes, translating the scientific state-of-the-art into a manual for practitioners who are involved in protected area or buffer zone management and policy. The assessment is directly targeted atlocal societal and environmental problemsand the guideline attempts to make knowledge and tools operational and accessible to planners and decision-makers on the local level, in light of the typically limited data, budgets, technical and institutional capacity on the ground. Moreover, the methodology is designed toengage local stakeholdersalong the entire assessment process, not only to ensure acceptance and feasibility of the suggested economic tools, but also to improve the relationship between PA management and local communities, and to enhance public awareness of biodiversity values and the importance of conservation efforts.

The three components of interdisciplinarity, problem-orientation, and stakeholder engagement are in line with the transdisciplinary research approaches studied and propagated in this Special Session. We will present the assessment approach and first experiences on its application in the Thai pilot sites, and will then discuss its merits and challenges in light of the transdisciplinarity paradigm.

References

TEEB. 2011. The Economics of Ecosystems and Biodiversity in Local and Regional Policy and Management. Edited by Heidi Wittmer and Haripriya Gundimeda. Earthscan, London.

World Resources Institute. 2008.The Corporate Ecosystem Services Review: Guidelines for Identifying Business Risks and Opportunities Arising from Ecosystem Change. Washington, DC.

GIZ. 2012. Integrating Ecosystem Services into Development Planning. URL: http://star-www.inwent.org/fetch/3cQ00j3XW0001lgmg4/giz2012-0154en-ecosystem-services.pdf.
[1] See URL: http://www.teeb-sea.info (last access: July 7, 2012).

Reframing resources and public goods: an integrative approach to natural resources security at regional scale

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Human history can be seen as a history of natural resources and their increasing over-exploitation (forcings). The consequence has been an ever-expanding ecological deficit and debt. Therefore, research must serve to increase human understanding of those resources and how best to use them for the public good.

The question is how to approach the problem in order to integrate the economy to the cycles and functions of the biosphere, while providing society-wide access to vital resources and services. In other words, pairing economic growth with the maintaining of a strong life supporting capacity of natural resources (resilient ecosystems) is becoming an urgent task. To do so, we need to measure very precisely the present deficits and debts and manage them accordingly. One option in achieving these goals is to develop an integrated monitoring and management of natural resources at regional scale insuring their sustainable /equitable production, access, use, distribution, and circulation. In doing so, issues such as climate change, biodiversity, food security, as well as energy and other poorly interconnected resources (water, soil, air etc) can be addressed in a coherent, context-specific manner. The agro-rural development in connection with integrated environmental policies is the priority of the project.

The project is a deep-interdisciplinary collaborative effort of several programs, centers, and laboratories (http://institutmichelserres.ens-lyon.fr) spanning life sciences, socio-economy, and legal studies. Ultimately, the project targets natural resources security as a whole, in both time (present and future generations) and space (regional specificities and limits). The following aspects constitute the foundations of the project.

is entirely reframing the field of natural resources and concentrates on the understanding of the ecological transition process according to territorial natural resources capacities / specificities and governance skills. It jointly addresses the issues of ecological deficit and debt, internalization of socio-environmental costs, carrying capacity, and economic competition. Vital needs and a public goods strategy are considered by coherently linking food, health, energy, education, and environmental components / factors.

aims at adapting and/or developing real-time monitoring tools and methods at regional scale in order to establish and understand the dynamics of physical natural resources as a whole on a yearly basis. In parallel, the financial, socio-economic, legal, normative, and political contexts, instruments, and skills are analyzed. The analysis concentrates on the trade-offs between environmental, legal, economic, social, and cultural outcomes.

In this frame, the authors discuss the following goals:(1) Surveys performed on the societal perception of the natural resources problematic, (2) Inventories and syntheses on natural resources institutions, programs, and data bases allowing to identify the main gaps and overlaps, (3) Resources efficiency studies, with emphasis on the productivity capacity of biological resources, but also water and soil productivity, (4) Ecosystem capital and natural resources accounting tools for land and marine systems (comparative studies of test-regions), and (5) Conditions of an equilibrium of local versus global-level legal systems as a sort of limit to globalization (i.e. to what extent a region can develop its own policies relative to natural resources security and public goods without infringing upon the international rules (intellectual property rights, WTO laws, international investment law, etc). The project has been designed to generate cross-disciplinary data and tools making it possible to better understand the dynamics of natural resources and their optimized and adaptive management according to the specific territorial potential, lato sensu.

Is corporate social responsibility compatible with institutional designs of Southern countries ? The case of Senegal

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NB : ce papier est proposé comme papier introductif à la session "Corporate social responsability in the south" mais peut également être présenté hors session.

Synthèse

Cet article vise à questionner la notion de RSE et sa pertinence au regard des terrains du Sud. L'origine occidentale de la notion de RSE situe celle-ci dans des cadres politico-institutionnels propres aux pays riches. L'émergence et, dans certains cas, la forte croissance des pratiques se revendiquant de la RSE dans les pays du Sud pose la question de la relativité ou de l'universalité de cette notion. L'article proposé cherche à contribuer à une typologie des pratiques de RSE en fonction de la nature de l'Etat et des acteurs publics.

Résumé

Au sein des études existantes sur la responsabilité sociale d'entreprise (RSE) dans les pays à faible revenu, on trouve souvent des travaux monographiques peu comparatifs, des expertises peu critiques sur la notion de RSE et les pratiques observées ou encore des travaux institutionnels (Banque mondiale, ONU, Think tanks, etc.) qui se contentent d'appliquer une grille de lecture standardisée de la RSE (i.e. par les parties prenantes) dans un ensemble plus large de notions portées par les bailleurs de fonds (gouvernance, partenariats multipartites, etc.) et largement déconnectés des pratiques et des conceptions locales.

Cet article vise à questionner la notion de RSE et sa pertinence au regard des terrains du Sud. L'origine occidentale de la notion de RSE situe celle-ci dans des cadres politico-institutionnels propres aux pays riches. L'émergence et, dans certains cas, la forte croissance des pratiques se revendiquant de la RSE dans les pays du Sud pose la question de la relativité ou de l'universalité de cette notion. L'article proposé cherche à contribuer à une typologie des pratiques de RSE en fonction de la nature de l'Etat et des acteurs publics.

Le papier sera composé de trois sections.

Une première section pose le cadre conceptuel et théorique de la RSE appliquée aux pays à faible revenu. Cette section cherche à montrer de quelle façon la notion de RSE a d'abord été portée par les acteurs de l'aide au développement et relayée par les grandes entreprises à travers une rhétorique internationale relativement déconnectée des réalités de terrain. En effet, la panoplie conceptuelle post-ajustement, fondée sur les nouvelles notions dominantes du discours de l'aide au développement (« bonne gouvernance », partenariats multipartites, contractualisation, participation, etc.), débouche sur l'idée que la RSE (et plus largement la responsabilité sociale des organisations, y compris celles de la société civile), serait la voie du développement. Ce cadre conceptuel fait l'objet d'un consensus sur les potentialités offertes par la responsabilisation de tous les acteurs. Mais cet apparent consensus cache en réalité des conceptions très diverses de ces différentes notions, en particulier celle de RSE. La question de la relativité de la RSE se pose donc avec acuité, derrière le miroir de fumée constitué par la rhétorique internationale bien installée par les bailleurs et les acteurs de l'aide et de la coopération internationale.

La deuxième section propose une classification des différentes formes et conceptions de la RSE

en fonction des différents cadres institutionnels présents dans les pays pauvres. Parmi les éléments majeurs de discrimination des cadres institutionnels, nous proposons la nature et la forme de l'Etat. En effet, plusieurs formes d'Etat coexistent dans les pays à faible revenu, Etat prédateur, Etat rentier, Etat fantôme, Etat en transition démocratique... Ces différentes formes influencent ainsi le contexte institutionnel (formel et informel) dans lequel les pratiques dites de RSE s'inscrivent. D'une approche de la RSE intégrant tous les acteurs dans une logique coopérative supposée aller de soi, nous proposons de passer à une grille de lecture mettant en exergue les effets des inégalités de pouvoirs sur les formes de RSE.

La troisième section propose d'illustrer la classification précédente par l'étude du cas du Sénégal, à partir d'une enquête de terrain fondée sur une revue documentaire et des entretiens qualitatifs auprès d'une vingtaine d'entreprises. Le matériau empirique est recueilli et en cours d'exploitation. Le cas du Sénégal est emblématique de la montée en puissance de la notion de RSE tant dans les discours des entreprises que dans les formations supérieures en économie, gestion et environnement.

Sustainable corporate strategies: bridging the gap between the triple bottom line and value-based management

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ABSTRACT

This article analyses if the corporate sustainability strategies adopted by two large Brazilian companies adhere to the theory of externalities. The reason for studying this adherence is to provide business managers with tools that could help them to effectively implement the well-known sustainability concept called «triple bottom line». Using the case study method, the case analyses show that there was adherence between the sustainability strategies established by the companies and the concept of externalities. Our research also indicates that the theory of externalities guided the process of formulating sustainability processes, aligning the triple bottom line and value-based management concepts.

1 ? INTRODUCTION

Although sustainability has become a popular theme in corporate environments, there is still a good deal of debate on whether there is a conflict between sustainability and value-based management. In value-based management, the ultimate objective of organizational management is to maximize the firm's long-term economic value (Martin et al, 2009). The objective of this study is to understand if the corporate sustainability strategies of the companies analysed adhere to the concept of externalities, reflecting on whether the theory of externalities can guide corporate sustainability management, thus complementing triple bottom line concepts.

Literature Review

In economics, the concepts of sustainability and sustainable development have their origins in macroeconomics (Pearce, Turner, 1990; Harriset al, 2001; Goodland, 2003; Figge, Hahn, 2004). Ecological economics addresses the question of sustainability as development without expansion of its physical basis (Daly, 1993; Daly and Farley, 2004).

The concept of externalities ? also from the economics viewpoint ? is at the centre of current socio-environmental problems (Buchanan, Stubblebine, 1962; Faucheux, Noël, 1995). Externalities arise when a real variable chosen by an economic agent becomes part of the production or utility function of other economic agents and there is no requirement or incentive for the first agent to consider the effects that his choices have on others (Pearce, Turner, 1990; Freeman III, 2003).

In general, according to economic theory, the solution of the externalities problem is the complete prohibition of the externality in question, creation of taxes or subsidies, establishment of voluntary agreements and development of market solutions (Pigou, 1932; Coase, 1960; Mishan, 1971; Randall, 1971; Baumol, Oates, 1988; Chimeli and Boyd, 2010; Unep, 2011). Climate change and the degradation of ecosystem services are important current negative externalities (Hansonet al, 2012).

The manufacturing sector is doubtless deeply related to the generation of environmental externalities. At the company level, sustainability theories address performance in the economic, environmental and social arenas, known as the triple bottom line (Figge, Hahn, 2004; Savitz and Weber, 2006; Elkington, 1998; Hart and Milstein, 2003). According to Steger, Inonescu-Somers and Salzmann (2007), attention to socio-environmental aspects by companies is related much more to compliance with legislation, especially in developed countries, than a voluntary attempt to achieve a triple bottom line. These authors believe that the response of organisations to stakeholder pressure to internalise externalities is a context closer to the reality of companies today than the idea that companies will voluntarily strive for a triple bottom line, attributing equal weights to economic, social and environmental performance.

At the opposite end of the spectrum from the triple bottom line is the idea that sustainability and social responsibility negatively affect efficiency in corporate management. Further: corporate managers are not trained to make decisions based on the common good of society, but rather in the logic of efficiency in allocating resources, known as value-based management (Friedman, 1970; Tirole, 2006; Jensen, 2010).

Seeking to combine sustainability and value-based management, Porter and Kramer (2006; 2011) defend the idea that strategies for sustainability and social responsibility only make sense from a business and social point of view if based on deep strategic and operational integration of business and society. Thus, the theory of externalities becomes an important bridge between the triple bottom line and value-based management.

2- METHODS

This project is an applied qualitative exploratory study, using the case study method. (Easterby-Smith, Thorpe, Jackson, 2008). The expected result of the application of this method is the development, or at least the start of development of a theory (Eisenhardt, 1989). Yin (2005) defines the case study method as an empirical approach that investigates a contemporary phenomenon within its real-life context.

The case study method has limitations, with the principal one being the impossibility of generalizing the results obtained. (Yin, 2005)

Primary data was obtained from the companies studied, from employees identified as responsible for formulating socio-environmental strategies, and through interviews guided by semi-structured scripts. Secondary data was also used. SamplesPseudonyms were used for company names, without affecting the analyses. The pseudonyms were chosen to honour two great Brazilian poets: Mario Quintana (MQ) and Cecília Meireles (CM). The table below is a quick summary of the companies studied:Table 1: Summary of company characteristics (please refer to supplementary data for table 1) 3- FINDINGSThe following table presents some thoughts on the inclusion of negative environmental externalities in the strategic plans of the companies analysed:Table 2: Summary of thoughts on the cases: (please refer to supplementary data for table 2) This work sought to determine if arguments common in value-based management could support managers in decisions related to sustainability management. In the two companies studied, we found adherence between sustainability strategies and economic arguments for sustainability (represented by the theory of externalities). The companies studied are large and important for the Brazilian economy; two are part of the Business Sustainability Index on the São Paulo Stock Exchange in 2012. As a synthesis of the empirical work, we can conclude that the companies studied were guided by the idea of minimizing the externalities they impose on society. But this occurred when and because it made sense from a business point of view, or in other words, because there was an intersection between the internalisation of these externalities and the idea of maximising the company's value. We also noted that this intersection occurred in areas which are scrutinized more closely by society.

Can Corporate Social Responsibility smooth the transition of the labour regime in the Chinese industry?

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The Corporate Social Responsibility movement (CSR-Qiye Shehui Zeren) has emerged in the Chinese industry during the 1990s. Confronted to the indignation of Western consumers and associations, the Multi-National Corporations (MNCs) subcontracting their production in Asia have elaborated discourses and initiatives promoting better working conditions for the workers located at the end of their supply chains (Vercher et al., 2011). Since then, the diffusion of ethical practices among Western brands raises intense debates. Analysts, managers and activists are positioned on a continuum oscillating between two extremes: on the one hand, the involvement of MNCs in a role usually assigned to the public authorities is seen as a salutary step to assist powerless states, when others criticize outright any kind of initiative taken by companies which, at best, would amount to a strategy of risk management, and at worst, would fit into a desire to hide the capital-labour conflict in order to sustain the exploitation of workers. This debate is often limited to measuring the impact of CSR on the performance of the enterprises or on the working conditions.

Our contribution is an attempt to overcome this alternative. Rather than focusing on the innovative nature of CSR, we fall in line with the authors inspired by the Regulation school, who see in the CSR movement a potential redefinition of the wage-labour nexus[1]. This approach is now well documented in the context of European economies, where this movement appeared in the context of degradation of the Fordist social compromise, and is perceived as an «attempt to articulate the need for efficiency and ethics» (Postel et al., 2006). Regarding China, few authors have gone beyond the question of the efficiency of the initiatives by replacing the CSR movement in the dynamics of the wage-labour nexus.

In Europe, the emergence of CSR can be interpreted as an attempt of the private sector to manage the welfare system, in a context of financial deregulation and weakening states (Postel et al., 2006., Bodet Lamarche, 2007). But in China, after having promoted the industrialization of coastal provinces through the commodification of labour, the State-Party started to develop from the 1990s a legislation protecting migrant workers coming from rural areas. The first CSR initiatives are thus simultaneous with the governments' desire to build an institutional framework to mitigate the exploitation of workers. The identification of this institutional dynamics led us to depart from the CSR studies developed in a «post-Fordist» context. Rather than considering CSR as a substitute to the public authorities, the aim of this contribution is to examine the ability of CSR to support the emergence of a social compromise more favourable to workers in the Chinese industry.

Regulationists works on CSR remind us of the importance of the historical and macro-social analysis that aims to assess its potential for regulation (Postel, Sobel, 2011; Vercher et al., 2011). This movement takes place in an evolution of an institutional framework which predates it, hence, we need to fall within «an historical institutionalist approach that allows to characterize the process of elaboration of rules (legislative, social...)» (Bodet, Lamarche, 2007, p. 6).

In the early 1980s, the authorisation given to the peasants to offer their labour force in the industry is the first step of China's opening to the international economy. MNCs looking for low-cost labour would gradually choose China as a privileged site of production, and contribute to the transformation of a largely rural nation into the "workshop of the world". Since then, the transition towards capitalist institutions is marked by unprecedented growth rates over such a long period. But due to the rise of social risks, Chinese leaders were required to establish regulations governing the use of labour. Yet, the last decade was marked by a rising dissatisfaction of a still marginalised working population. Despite the public authorities' willingness to stop the conflicts, they have steadily increased since China's accession to the WTO in 2001. They can take place through legal channels (arbitration) or not (strikes). It is in this context of institutional transition, in which some political decisions have still not produced the expected effects on the regulation of social relationships, that we propose to investigate the potential stabilisation of the wage-labour nexus brought by CSR. This requires focusing our attention on the process of implementation and dissemination of rules, considering that they are intended to provide guidance to the actors, and

thus stabilising behaviours. However, the mere formalisation of the rules administrating labour relations does not automatically secure their application in the enterprises. This approach allows us to consider that the wage-labour nexus is now in a transitional phase, and that no one can predict with certainty according to which modalities national laws and regulations will be assimilated by the actors, and even if they will finally be assimilated at all.

The CSR movement can thus be interpreted as an attempt to elaborate an intermediary level of rules that strengthen the institutional dynamics driven by the Chinese state. Indeed, the subcontractors have to comply with codes of conducts imposed by the MNCs, and these codes inspired by the International Labour Organisation standards are in theory no less demanding than legal principles. The objective of this contribution is not to review exhaustively the CSR initiatives, but rather to study their fundamental characteristics in order to evaluate their capacity to facilitate the transition of the wage-labour nexus in the industry.

This study is divided in 3 parts. We first come back to the dynamics of the Chinese wage-labour nexus and underline its specificities. We can then interpret the emergence of CSR as an attempt to mitigate the asymmetry of the employment relationship from the enterprise level (I). The existing initiatives are presented as an additional level of rules, but their implementation is unsatisfactory, and finally unable to drive a stabilisation of the wage-labour nexus (II). However, the importance of structural transformations taking place in China, and the invasion of the CSR field by new actors invite us to establish different scenarios on the role of this movement in the future, provided it is considered as a transitional institutional form facilitating the emergence of a new mode of regulation (III).

[1] The wage-labour nexus is the macro-relationship between capitalists, workers and the state, characterized by 5 elements: the type of means of production; the social and technical division of labour; the ways in which workers are retained in a firm; the direct and indirect determinants of wage income; and the workers' «way of life» (Boyer, 1986).

Sustainable long-term perspective of local development: Which drivers for small and medium-sized towns?

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A holistic approach and a long-term perspective in planning for sustainability can address a scale of issues emerging in small and medium-sized towns, facing continuous challenges of economic, demographic and technological changes. Certain contextual factors such as geography and institutional settings may induce new models of sustainable development in smaller towns that use social and solidarity economy, social cohesion, culture and heritage protection as drivers of local development. Thus, their long-run perspective of development is based on endogenous factors, building on local comparative advantages, local resources, and partnerships among local business leaders, community groups and local government.

Socio-ecological trajectories: the urban dimension. Paris, 18th-20th centuries

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During last decade, socio-ecological studies (SES) have gained importance. One of their achievements concerns the conceptualisation and identification of socio-ecological regime, trajectories and transitions (Fischer-Kowalski & Haberl 2007), in a way that it not completely similar to the one developed in science and technology studies (STS) (Fischer-Kowalski & Rotmans 2009). SES mostly focus on general trends: energy transition for instance is viewed as a kind of ineluctable process that occurred between 18th and 19th in Europe. Such a view is very useful in the sense that it helps the identification of global trends that characterise societies in the biosphere, and that it questions the present-day regime and its limits, the functioning of the society being analysed within the one of the biosphere of which it is indissociable. Social metabolism (i. e. material and energy flows consumed and transformed by the society) is then at the core of the analysis, as the very material expression of socio-natural interactions.
Such a macroanalysis masks local differences and does not completely allow thinking about alternatives (logical in an historical perspective, questionable in a prospective one), or specific situations (in connection to the notion of intrinsic logic (Löw, undated) for instance). It also makes difficult the understanding of the transition and trajectory processes themselves. We argue that, in addition to the researches conducted at national (or more) level, local empirical studies could help a better characterisation of these processes, and of the way societies shape(d) and are (were) shaped by their metabolism in particular historical and local conditions. As centre of power, innovation and consumption, cities can be good places to investigate according to this perspective.
The talk will address these questions through Paris case study from 18th century onwards, focusing on specific flows like energy, food, water and excreta. It will try to describe the way a particular socio-ecological trajectory began with the industrial revolution, and how did urban metabolism change. It will then try to merge the question of flows and the one of power (trying to answer the question: who governs the material and energy flows?). Both a big city and a political core, Paris ? as an administrative authority and as a territory in the geographical sense, that is the combination of a society and its milieu ? has long had huge metabolic needs in terms of wood (mainly for heating and cooking) than energy, food and feed (especially for transportation, i. e. horses up to the beginning of the 20th century). The city played a major role in resource and environment management, even if this role changed during last three centuries according to technological and political changes ? in the pubic domain, changes mostly concerned the intervention of the Stateversusthe one of the city; whereas some public prerogatives became private during 19th or 20th century and vice versa.
We of course don't pretend to cover this long and dense history. The idea here will be to try to find a way to describe synthetically the urban socio-ecological trajectory and to discuss some concepts and notions that could help a better understanding of socio-ecological regimes and transitions. We give here some of these notions.
One could say that the very characteristic of a city is theexternalisation of its metabolismin the sense that it mostly depends on outer resources (especially for food, and some say that it is the very definition of a city: a piece of society that does not produce its food). But when examining in depth a city like Paris, we remark that this externalisation picks with industrial revolution(s) with, for instance the partial externalisation of water cycle, the one of urban by-products transformation, etc. This externalisation is connected tourban environmental imprints: urban marks that can be observed far away from the city, such as ponds created in order to allow wood floating, or reservoirs dedicated to water storage, but also various ecosystem transformations ? to some extend, and up to 1970s, one could say that the Seine quality is urban as it mostly depends on urban discharge. These imprints can also have aninfrastructural dimension, like a wastewater treatment plant that can be considered as anurban dependenceorurban outinfrastructure. It can also be a kind ofecotechnological hybridlike the already mentioned reservoirs. As a result, the non-urban landscape becomes urban, for it is appropriated and shaped by urban needs.

In the case of Paris, most of theseurban extraterritorialitieshave been (and are now) governed by Paris itself, even if there are located very far from the city. In that senses, appropriation is also the one of power, and it questions the relationship between Paris and the concerned territories. We can then speak aboutinstitutional imprintsas a corollary of environmental imprint. This would not be the case in every city, and it is also what makes the intrinsic logic of Paris.
This approach is built on previous empirical research by the author of this proposal (see for instance: Barles 2005, Barles 2007a et b, Billen, Barles et al 2012, Kim & Barles 2012, Barles 2012), based on historical methodology (history of environment and technology) and energy and material flow analysis.

References

Barles, S. « Feeding the City : Food Consumption and Circulation of Nitrogen, Paris, 1801-1914 », The Science of the Total Environment (375), 2007, p. 48-58.

Barles, S. « The Seine and Parisian Metabolism: Growth of Capital Dependencies in the 19th and 20th Centuries », p. 94-112,in : Castonguay, S., Evenden, M. D. (eds.).Urban Waters: Rivers, Cities and the Production of Space in Europe and North America.Pittsburgh : Pittsburgh University Press, 2012. 302 p.

Barles, S. « Urban metabolism and river systems: an historical perspective. Paris and the Seine, 1790-1970 », Hydrology and Earth System Sciences, 2007, p. 1757-1769. Disponible sur la toile, format PDF [réf. du 15 nov. 2007], .

Barles, S. L'invention des déchets urbains, France, 1790-1970. Seyssel : Champ Vallon, 2005. 300 p.

Billen, G., Barles, S., Chatzimpiros, P., Garnier, J., « Grain, meat and vegetables to feed Paris: where did and do they come from? Localising Paris food supply areas from the eighteenth to the twenty-first century », Regional Environmental Change, 12(2), juin 2012, p. 325-335, disponible sur la toile, format PDF, [réf. du 10 juil. 2011], .

Fischer-Kowalski, M. Haberl, H.Socioecological Transitions and Global Change: Trajectories of Social Metabolism and Land Use. Cheltenham : Edward Elgar, 2007.

Fischer-Kowalski, M., Rotmans, J. « Conceptualizing, observing, and influencing social? ecological transitions »,Ecology and Society14(2), 2009. [online] URL: http://www. ecologyandsociety.org/vol14/iss2/art3/

Kim, E., Barles, S. « The energy consumption of Paris and its supply areas from 18th century to present », Regional Environmental Change, 12(2), juin 2012, p. 295-310, disponible sur la toile, format PDF, [réf. du 10 févr. 2012],
.

Löw, M. « The intrinsic logic of cities », [online] URL: www.stadtforschung.tu-darmstadt.de/

Towards the Establishment of a Green Belt in the Region of Montreal, Quebec: a Look at the Area, its Actors and Tools of Implementation.

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Abstract

Greater Montreal (Quebec) and its metropolitan area are currently experiencing a period of profound questioning concerning the future of their planning and development. This study proposes the creation of a Green Belt in order to create a dynamic network of protected natural and agricultural areas as well as to enhance ecological functionality, sustainability and accessibility. The realization of this regional network should be based on a common territorial strategy, deploying a mobilizing vision shared between institutions and persons whose skills in development planning and land management are both required and complementary. To achieve this, the study proposes an environmentally optimal perimeter, describes their ecological functions and the economic value of ecosystem services. It also offers an inventory of existing tools to ensure its implementation and offers a roadmap for its creation within a five-year prospect.

Introduction

The Greater Montreal is home to more than half of the population of Quebec, and it bears its richest ecosystems and best farmland. The coexistence of urban development, agricultural activities and natural systems in this densely populated region is a challenge that has grown in recent decades. Although protected since 1978, agricultural land is continually subjected to real estate speculation, as well as by natural environmental elements, creating a steady decline to the point of approaching thresholds of no return in many cases. Southwestern Quebec now contains the highest concentration of threatened or vulnerable species across the province (Tardif et al., 2005).

The entire community of the Greater Montreal area now recognizes the urgent need to protect and enhance the natural and agricultural ecosystems of the greater metropolitan area. The new Metropolitan Plan for Planning and Development proposes a development of the Montreal Metropolitan Community (82 municipalities) for the next 20 years focused on the development of public transport, the development of sustainable living environments and a healthy environment (Communauté métropolitaine de Montréal, 2011).

To address the problems of urban sprawl and provide a better combination among city, nature and agriculture, several major cities around the world are adopting policy instruments to manage the growth of urban areas and protect natural and agricultural ecosystems achieving varying effectiveness. Three main types of containment of urban development stand: green belts and greenways, urban growth boundaries and urban services boundaries (Pendall et al., 2002). These openings and significant progress on environmental governance in the region allow our team, made up of academics and environmental NGOs, to propose Land Management approach based on the Green Belt concept to counter the loss of biodiversity, ensure ecological functionality of the territory and maximize ecosystem services.

First, several questions need to be answered in order to define this proposal: What should the area covered by the Green Belt of Montreal be, in order to ensure ecological integrity? What tools are available to policy makers to support this implementation? What form of governance should be used? This study seeks to answer these questions in reviewing the relevant literature, and conducting a non-market economic analysis of the ecosystem services offered by benefit

transfers as well as interviewing the key stakeholders.
Firstly, the study offers an overview of the ecosystems of the Greater Montreal and their current status by highlighting the sources of deterioration and proposes an optimal ecological scope to create the Green Belt. It also describes the biophysical characteristics of the area and characterizes their current uses. To target priority intervention areas, biophysical indicators are linked to economic indicators. These indicators are defined by detailing the value of nine major natural services for thirty-one types of different ecosystems and identified by a benefit transfer approach. The study then makes an inventory of existing tools for the implementation of the Green Belt and, following workshops with key stakeholders, proposes a strategic roadmap for its creation in the next five years.

Target Area

The boundaries of the territory covered by the Green Belt of Montreal are the same as those of the natural region of the Upper St. Lawrence Plain (PHSL) of the Quebec's ecological reference framework. It includes two major bioclimatic regions, those of the maple-hickory and maple-basswood. This territory, an area of ??1.7 million hectares, covers the Greater Metropolitan Area and adjacent territories, whose boundaries are based on persistent elements of the regional landscape (geology, surficial deposits, relief, climate, network drainage, vegetation and wildlife). The boundaries and characterization of natural environments were obtained by crossing six different database maps.

The Economic Value of Ecosystem Services

The objective of the monetization of non-market goods and services provided by biodiversity and ecosystems of the Green Belt of Montreal is to provide new economic indicators for decision-makers. This in view of the creation of new public policies related to land use in southern Quebec which will enable policy-makers to distinguish areas of protection, acquisition or restoration priority. This is in the interest of consolidating the toolbox of decision support for policy makers and other stakeholders.

In performing an analysis of the scientific literature and by conducting a transfer of adjusted results, the value measured for nine different services of the target territory reached 4.29 billion Canadian dollars per year. Nearly three-quarters of this total value is provided by the services of climate regulation, recreation, tourism, and habitat for biodiversity, while ecosystems providing the highest nonmarket values ??are forests, riparian woodlands and wetlands in urban areas. With values ??between 100 and $ 400 million / year, the services of water supply, flow regulation and flood control, pollination, and erosion control are other services whose economic value is significant.

The Toolkit for Decision -Making

The study area for the proposed Green Belt has a very high variability in the dynamics of local development and planning. Despite the fact that the communities included in this area share biophysical similarities, many of them live completely different economic, social and environmental contexts. The study presents a set of tools from various backgrounds to achieve an integrated protection and enhancement of natural and agricultural environments. All these tools have their usefulness and relevance in meeting the challenges and constraints of localities and sectors of the region. They are placed in groups according to the areas in which they are developed and implemented: agricultural, forestry, tourism, municipal or conservation.

The Roadmap

In conclusion, this study provides strategic guidance to ensure effective and coordinated implementation of the Green Belt Montreal. Thirty workshops and strategic interviews, held in 2011-2012 with key development and planning actors, have yielded elements of continuity between their perceptions, priorities and concerns. A consensus identified the opportunities and obstacles with a glimpse at the deployment this great social project entails, as well as the defining the Green Belt with regards to the environmental, economic and social aspects to be taken into account.
A content analysis of interviews and workshops conducted identifies the vision shared by the stakeholders and defines the main strategic directions to be taken.

Conclusion

This approach contributes significantly to the development of a common vision for the creation of a Green Belt in the region of Montreal, both in biophysical diagnostic, non-market economics and political point of view. The identification of the territory, the priority areas of intervention,

the general strategic guidelines and objectives to guide its implementation are important foundations on which to build further development in the Montreal area and surroundings.

Bibliography

Communauté Métropolitaine de Montréal (2011). Un Grand Montréal attractif, compétitif et durable. Plan métropolitain d'aménagement et de développement. Communauté métropolitaine de Montréal, Montréal, décembre 2011, 184p.

Pendall, R., Martin, J. et Fulton, W. (2002). Holding the Line: Urban Containment in the United States. Discussion Paper. Center on Urban and Metropolitan Policy. Washington, DC: The Brookings Institution. 45 pages..

Tardif, B., G. Lavoie et Y. Lachance (2005). Atlas de la biodiversité du Québec. Les espèces menacées ou vulnérables. Gouvernement du Québec, ministère du Développement durable, de l'Environnement et des Parcs, Direction du développement durable, du patrimoine écologique et des parcs, Québec. 60 pages

Property Rights Regimes in Complex Fishery Management Systems: A case of the Tonle Sap wetlands, Cambodia

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Short Summary. The commercial Cambodian fishery management system was previously divided into zones of open access fishing and private fishing rights, involving private concessionaires bidding for exclusive rights to temporarily designated plots called fishing lots. The system has been abolished due to social and environmental sustainability concerns and new fishery regulations are being considered. This paper aims to investigate an auction based system to find out how this fishery management approach affects different groups of small scale fishermen. A choice experiment was used to model fishermen's choices in a hypothetical auction market. The results suggest that it is unlikely that the design of semi-private lots in itself would be an effective way of securing access to fishing resources for all groups of fishermen. This implies that open access fishing grounds or other regulations may also be needed for future implementation of fishery regulations as they serve an important role for poorer segments of the fishing community.
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Introduction. This research explores a mixed system that operated in the Great Lake Tonle Sap, Cambodia. The system was partly based on an auction system (like some ITQs) and partly on a zonal designation system. The rationale behind using an auction system was that a market based approach generates resource rents to the government, and that by securing property rights to the resource the system discourages overcapitalization (Mansfield 2004; Acheson 2006). A property rights system which includes the right to alienation, is often considered the most efficient as it can be defined as equivalent to private property (Ostrom 2003). However, it has also been argued that private property rights alone do not ensure resource conservation even when they are secure (Acheson 2006).
Tonle Sap not only supports Cambodian fisheries but also the fisheries of other countries by acting as an important fish nursery ground. The fishery management system in Cambodia was developed in the late 1980s; and has generated official income of between one to four million USD per year (McKenney and Prom 2002). The aim of the management system was, however, also to achieve a more sustainable fishery which has been less successful according to reports about the continuing degradation of fish stocks and fish habitats (McKenney and Prom 2002; Songet al.2005; Sneddon 2007; Nuorteva, Marko and Olli 2010). In addition, there was concern about inequitable access to rich fishing grounds (Keskinenet al.2007; Nuorteva, Marko and Olli 2010) which led to tension between the wealthy (fishing lot owners) and poor users (local fishermen). To minimise this tension, the fishing lot leases were abolished in late 2011 to allow fish stocks to replenish (DAP-NEWS 2011; Royal goverment of Cambodia 2012). With the possible future reintroduction of the auction based system, it is important and timely to study the impacts of potential future license based systems, to increase understanding of how alternative allocation systems impact different resource user groups.
This research therefore aims to understand how an allocation system that sells exclusive temporary access to designated fishing grounds impacts on the distribution of fishing rights and benefits from the Tonle Sap fishing grounds. In order to achieve this research aim, we investigate whether different groupings of fishermen can be identified in the study area, measured in terms of differences in their valuation of attributes of the fishing lots, and therefore their likely behaviour in an auction market. Furthermore, we explore how the allocation system influences different groups of fishermen by asking how the designation of lots, i.e. their size, location, potential catch and fishery management restrictions, affect the attractiveness of the lots and whether they are likely to bid for the individual lots in an auction.
Methodology. We measure attractiveness of alternative lot characteristics using a choice experiment (CE) (Hanley, Mourato and Wright 2001; Bennett and Adamowicz 2001), where the lot characteristics define the attributes of a choice consisting of fish catch[1], floor price[2], flexible finance schemes[3], leasing period[4], distance[5] and conservation management plans [6]. The data is used to model fishermen's choices in a hypothetical auction market by offering fishermen the choice between purchasing different potential fishing lots and a no purchase option,

implying fishing only in the communal fishing grounds. This approach allows us to assess the implications of using an auction-based system to allocate fishing rights and the conditions under which an auction-based system could help to improve access for smaller scale fishermen. Small scale fishermen are targeted because they are the largest group of fishermen in Cambodian fisheries but they have limited access to the most productive fishing grounds. We conduct data analysis of responses from 272 small scale fishing households collected in Kampong Chhnang, Pursat, Kampong Thom, Battambang and Siem Reap.

Conclusion and discussion. The analysis suggests that the CE design captured key aspects of the factors determining participation in an auction based management system. The latent class model specification with two segments represented a good portrayal of the preferences of fishermen in the study area and showed support for the existence of heterogeneous preferences. The results showed that the bidding behaviour of the more privileged group of small scale fishermen out-competed the other group irrespective of the lot characteristics. The flexible finance scheme was effective in giving some small scale fishing households the opportunity to bid for fishing lots, nevertheless others were still excluded. Furthermore, the results illustrated that the segment, consisting of slightly richer fishermen, appeared to be more influenced by conservation objectives. The richer group of small scale fishermen expressed a higher willingness to pay for fishing privileges and was more positive towards investment in fishing lots than the fishermen in the other segment. These results support the findings of other studies that have indicated that poorer groups in a community have more difficulty in accessing and exercising property rights (Beck and Nesmith 2001; Working Group on Property Rights 2008; Meinzen-Dick and Mwangi 2008). Not only is this related to their different budgets but also to levels of education, as wealthier fishermen are likely to be better educated and so more able to deal with the formal documents that form part of the official auction system.

[1] Fish catch means the ?official record' of the average of fish caught per year for the past few years in the fishing lot.

[2] Floor price is used to illustrate the minimum amount of money that the lot owners have to pay annually to the Cambodian government in order to get exclusive fishing rights over a fishing lot.

[3]Flexible finance schemes provide fishermen with access to a flexible payment system.

[4]The number of years that the lot owner has authority over the lot during the fishing season (around 6-8 months per year).

[5] Distance describes the distance from the respondent's house to the fishing ground.

[6] Conservation management plans define restrictions on the activities in the fishing lots.

Perceptions on Natural Resource Availability and Adaptations of Property Rights Institutions: Evidence from a Natural Experiment

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Summary:
Human reasoning in contracting about particular configurations of property rights institutions for natural resources is diversely discussed among scholars. Therein, the influence of properties of natural resources on human reasoning is often neglected. This paper contributes to this research gap by investigating persistence and adaptation of property rights institutions in German recreational fisheries at the micro-level by employing a natural experiment. As a result, humans rather centrally organize property rights with generous access and withdrawal regulations in case of perceived resource abundance, and locally organize property rights with strengthened access and withdrawal regulations in case of perceived resource scarcity.
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Abstract:
Natural resources are decisive for economic performance. In the last decades the influence of natural factor endowments, or in other words properties of natural resources, for economic development was revealed (Barbier 2011). Nevertheless, those natural factor endowments did not get much empirical evidence in economic studies. In particular, the relationship between natural resource availability and natural resource use regulations is still ill understood. Human use of natural resources is usually regulated by property rights institutions which secure access and use rights of privileged people or groups of people on natural resources regarded by other people and under the protection of an authority such as the nation state. The influence of institutions on economic performance is acknowledged among economists, and also that differences in property rights institutions affect economic activity. However, it is seen as important to «unbundle» property rights institutions because the study of specific contracting between private people or groups of people at the micro-level in the light of macro-level property rules is neglected in economic literature (Acemoglu and Johnson 2005).
Accordingly, this paper pursues a twofold objective. First, it aims at reviving awareness of the interaction between ecological systems and economic performance by looking at properties of natural resources and its influence on human decision-making and contracting about property rights institutions. And second, it aims at unbundling institutions by investigating contracting between private people about institutions at the micro-level and to look for the reasoning behind those contracting. By doing this, we are interested in answering the following research question: in how far do properties of natural resources, e.g., its grade of availability, influence human contracting at the micro-level and which reasons cause adaptation or persistence in particular property rights institutions? In order to answer this research question, this study investigates German recreational fisheries governance as an economic example of natural resource use which experienced the conditions of a natural experiment. Whereas East Germany (GDR) was subject to major constitutional changes after the World War II with a fundamental alteration of property rules to public property regimes in a socialist society from 1949 to 1990, West Germany (FRG) continued «undisturbed» with a civil society supporting private property. These changes and persistence of property rules at the macro-level in both parts of Germany influenced also specific regulations in recreational fisheries. In the GDR, centralized governance structures were implemented in recreational fisheries, whereas in the FRG (West Germany) mostly decentralized governance structures exist. This situation allows studying contracting about and comparing property rights institutions at the micro-level with respect to natural resource use where changes and persistence of property rules at the macro-level constitute the instrumental variable of the

natural experiment.
To be able to analytically distinguish between property rights institutions at the micro- and macro-level as indicated by Acemoglu and Johnson (2005), we refer to Williamson's framework of economic institutions (2000, 597). In particular the levels two and three in the framework can be connected to the differentiation between micro- and macro-level. In level two, defined as institutional environment, elected representatives of a nation state define the legal rules, i.e., property rules at the macro-level. In level three, defined as governance, citizens establish property rights institutions for economic activities at the micro-level according to the institutional environment. This legally secured system allows citizens to privately contract about detailed arrangements of property rights institutions at the micro-level without inference from the state. However, the established system of legal property rules at the macro-level doesn't disperse costs of enforcement, externalities, or definition and adaptation problems when applied or «played» at the micro-level, i.e., when private people contract about economic activities. Thus, the transfer of property rules to the third level, the governance level, is crucial to investigate because at this level individuals or groups of individuals negotiate and govern contractual relations determined by those macro-level property rules, and here it becomes clear whether a nation state's legal system is functioning in supporting economic activities of its citizens or not. To be able to analyse property rights institutions at the micro-level, we apply the conceptual schema by Schlager and Ostrom (1992) who differentiate between the following bundles of property rights institutions on natural resources: alienation, exclusion, management, withdrawal, and access rights.
We selected four cases (counties) according two parameters to compare reasons for property rights adaptations under varying conditions. First, cases are chosen according to the natural experiment setting, i.e., cases are derived from East and West Germany as treatment and control group in the historical development of recreational fisheries governance. Second, the case study areas reflect distinct geographical areas in Germany. There are two major geographical regions namely North German lowlands and Central German uplands with distinct water and fish resource properties such as types and abundance of water bodies, fish community structure with variation in pilot fish species, and distance to coastal waters. Central German uplands has mostly tributary river systems, small ponds and larger reservoirs whereas North German lowlands is characterized by large flatland river basins, canal systems, natural lake systems and proximity to the Baltic and North Sea. Both parameters guaranty to select cases which vary in governance structures and ecological features, and therefore provide a sound basis to compare potential adaptations in property rights institutions with respect to properties of natural resources. Data were collected in nine to ten in-depth interviews with angling club representatives and from a survey sent to all angling representatives in each of the four selected cases.
With respect to properties of natural resources, this study revealed that if anglers perceived scarcity in fish stocks a centralized governance structure becomes costly because externalities (low catch rates and rivalry among anglers) couldn't be internalized by regional anglers associations because of their inability to increase stocking or exclusion levels. Therefore, separate groups of local anglers started contracting to obtain their own property rights at fish resources. They contracted in detail about access (exclusion of non-local anglers) and withdrawal regulations which eliminated rivalry between the club members. In case of perceived abundance a decentralized governance structure seems to become costly because of high governance costs (separate contracting about fish stocking and sale of fishing permits by angling clubs) and limited fishing opportunities for anglers. Therefore, local angling clubs voluntarily started to cooperate, and merged their management rights by establishing common fish stocking and permit system for their club members. Thus, this study has shown that contracting about property rights institutions at the micro-level is influenced by the properties of natural resources. In detail, it can be concluded that adaptations in property rights institutions as an outcome of contracting within a group of individuals are a response to perceived properties of resources (scarcity and abundance).
Acemoglu, Daron, and Simon Johnson. 2005. «Unbundling Institutions.» Journal of Political Economy. 113, 5 (October): 949-95.
Barbier, Edward B. 2011.Scarcity and Frontiers: How Economies Have Developed Through Natural Resource Exploitation.New York: Cambridge Univ. Press.
Schlager, Edella, and Elinor Ostrom. 1992. «Property-Rights Regimes and Natural Resources: A Conceptual Analysis.» Land Economics. 68, 3 (August): 249-62.
Williamson, Oliver. 2000. «The New Institutional Economics: Taking Stock, Looking ahead.» Journal of Economic Literature. 38, 3 (September): 595-613.
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Quality regimes and property regimes: a framework for understanding/ assessing geographical indications sustainability implications

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Geographical indications (GIs) have been increasingly seen as potential tools for supporting sustainable production practices in the agrifood sector. GIs are defined as names reserved to identify goods with a given quality, reputation or other characteristic of the good essentially attributable to its geographical origin. They are defined as intellectual property right (IPR) under the TRIPS Agreement. However, contrary to other IPRs, they do not protect an individual, but a collective and territorially based ownership. While they have long been in place in Europe, GIs have significantly developed worldwide in the last decade, especially in developing countries. And they have taken a diversity of institutional forms, both at product and country level, making it more and more complicated to assess them globally.

This paper proposes a general conceptual framework for understanding GI governance structures and property regime, i.e. how trade-offs are nested into individual decision-making level, and collective and public ones. It provides an approach for assessing the potential associated with different GI institutional frames to ensure the sustainability of their resources. The analysis builds on an institutional framework that combines a quality regime approach (Allaire, 2010) with the property regime conceptualised by Schlager and Ostrom (1992), including specific considerations implied by viewing origin-based reputation as a common resource. In their diversity, GI systems and markets mobilize several common resource systems which are domains of co-operation for producers and with stakeholders. They include local natural resources which impact on the product qualification, tacit knowledge, collective reputation and the legal system itself with its specific provisions. Collective reputation by itself is a complex common resource system, integrating individual reputations of dependant producers as well as the reputation of the origin sign itself when labelled (e.g. PDO) and, which depends on multi-scaled governance structures. The considered commons here consist of both the governance structures that define the rules under which GI systems operate (working rules) and the reputation of the products, on which market benefits are based. We analyse how GI property regime, i.e. the institutions that determine the GI valorisation, works as collective and public management devices for sustaining GI based quality regimes.

A quality regime is the set of institutions and discourses linking tangible and intangible qualities. Intangibles qualities are those not dependent per se on the physical or biological intrinsic properties of a product but on the transaction formula including the mode and context of production and of consumption. The identification of intangible quality results from complex social inquiry processes that depend not only on the social devices directly underlying market transactions but also on complementary medias (quality guides, etc.).

Through the mediation of markets, GI is primarily a common resource both for producers and for consumers who value the quality attached to it materially and symbolically. In addition to the individual satisfaction attached to producing or consuming GI products, a variety of public benefits is also attributed to GI systems, their social significance being evidenced by policies in support to GI coordination and promotion structures. These benefits range, from agrobiodiversity conservation and indigenous knowledge, to the enhancing of rural economies. GI systems therefore consist of market-based systems (i) through which the GI product is being traded, (ii) which sustain collective reputation and (iii) deliver environmental services. The latter may either be directly incorporated into market valuation of the collective reputation or be sustained through

public policies that support collective processes underlying the regulation of these systems. These different dimensions constitute the critical aspects to be dealt with for sustainable GI systems.

Reputation results from interdependent mechanisms. Connoisseurs who value GI as a cultural resource can contribute to its management through clubs, fairs, etc., and producers can promote its image either collectively or individually, strengthening the product intangible quality properties and its reputation. Reputation can be viewed as an incomplete assessment of quality, thus opening the issue of quality crisis. Social and environmental conditions of production play a critical role both in the tangible and intangible properties of the GIs. The positive valuation of these properties on markets through premiums and secured access contribute to producers' investment in the locally shared resources. The continued existence of GI systems relies on different stakeholders' capacity to maintain or enhance the identity of the name, which is at the heart of its reputation and economic value, in a context of changing environments, in particular with regard to technologies, lifestyle and social expectations.

While GIs contribute to singularising products as do trade marks more generally, they are held collectively which reflects and creates interdependencies among GI producers who share the use of the names and their attached reputation. GI recognition as intellectual property establishes an exclusive right to use it but not an individual one. The benefits derived by a producer from using the protected name in the course of trade depends on how other producers also entitled to use it do so. While the use of the name by some does not per se directly precludes or reduces its use by others, it impacts on it through potentially affecting its intangible properties and market value, and therefore the rent each producer can effectively access. Both product quantity and quality intervene in determining market value. Therefore, the control of these two dimensions is the key issue of regulating markets for origin-based quality products through GI. Doctrinal debates developed on the rationales and on the instruments to regulate this type of markets. Opponents stress the restrictions on accessing GI benefits imposed to both producers and consumers while proponents put forward the threats posed on the specific quality production systems that underlie GIs through diluting their reputation, and therefore the risks of loosing the social benefits attached to them, both from a consumer perspective in relation to quality concerns and from a broader social perspective in relation to the associated provision of public goods.

To consider the reputation attached to the name as a common resource explicitly points out the need for regulation as evident. Since the 1990s the works of E. Ostrom and her colleagues have broadened the range of potential institutional arrangements of common resources, moving away from the divide between State property and control, and allocation of private property rights. Accounting for the multilevels and multiactors feature of the governance of common resources, Schlager and Ostrom (1992) have proposed a characterization of property regimes by identifying five types of rights and right holders, i.e. the right of access and of withdrawal (authorized users), of management (claimant), of exclusion (proprietor) and of alienation (full owner). A property regime is defined by a bundle of rights and the holders of these rights, by the duties this create to other stakeholders as well as by the authorities that ensure the enforcement of these rights. « In this view, private individuals, private associations or firms, and governments may hold well-defined rights to a resource that include or do not include all five of the rights defined above. This approach separates the question of whether a particular right is well defined from the questions of which rights are possessed and who possesses them.» (Hess et Ostrom, 2003, p125). Particularities of GI property regime concern the different bundles of rights. Authorized users are not predetermined but have to comply with a code of practice; they are interdependent due to the limitation of the size of the market and for change in individual quality can affect the others. The claimants are professional or interprofessional organizations. The right of exclusion (in particular in setting and modifying the area of production delimitation and the code of practices) is exercised by the claimants in enforcing the management rules and it depends on the effectiveness of the name protection by the legal system. In this case the full ownership is not identifiable, as in other cases of immaterial resources which are systemic.

References

Allaire G., 2010. Applying Economic Sociology to understand the meaning of ?quality' in food markets. Agricultural Economics, Vol. 41: 167-180.
Schlager E., Ostrom E. 1992. Property-Rights Regimes and Natural Resources: A Conceptual Analysis. Land Economics, 68, 3: 249-262.

Defining cost-effective strategies for off-reserve conservation actions in human-dominated landscapes

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In order to achieve conservation goals, it is important to develop strategies for managing conservation at landscape scale. Off-reserve conservation actions and approaches have been recognized worldwide to support existing protected area networks to achieve biodiversity conservation and sustainable natural resource management. It is necessary to explore the less costly ways to achieve a conservation goal, both within protected areas but also in wildlife corridors and areas outside reserves, as funding for conservation is limited. Most of the off-reserve conservation actions take place in human-dominated areas where the cost-effectiveness of conservation actions is strongly related to property rights over natural resources. Therefore the original distribution of those rights matters when starting to negotiate the implementation of a conservation action. These circumstances have not gained adequate attention yet within the academic literature on cost-effectiveness in conservation and a more holistic assessment tool is still lacking.

The aim of this research is to establish a new framework for assessing the most cost-effective strategies for off-reserve conservation actions in human-dominated landscapes in connection with negotiation situations as well as related property rights and to test this framework in case studies.

For the development of the conceptual framework we examine the costs of the conservation actions based on property rights regimes as described in Schlager and Ostrom (1992), and negotiation situations related to compensation agreements as categorized in Mauerhofer and Nyacuru (in preparation) based on Rothgang (1997). The case studies are Quirimbas Niassa Wildlife Corridor (Mozambique), and Selous Niassa Wildlife Protection Corridor (Tanzania). Both areas will be referred to in the following as the planning region. For assessing in particular the cost-effectiveness of the conservation actions, we use questionnaires and semi-structured interviews to relevant stakeholders to collect data. For the economic analysis of the data we will use different monetary and non-monetary valuation tools.

The analysis is currently in preliminary stage and the findings below are the result of ongoing work. In the following, first results are presented on the framework and its application.

When developing the conceptual framework, the combination of both approaches cited allows us to understand in theory how the bundle of property rights affects resource management and conservation. Furthermore, the framework provided the tool to disentangle costs of conservation actions by examining the characteristic of the negotiation situation, especially in a complex context such as in developing countries.

Our preliminary results in practice regarding the property right regimes suggest that under the legal frameworks of both countries local communities hold or are given the rights of access, withdrawal for subsistence purposes and management of the natural resources. However, alienation is an exclusive governmental right. The Government represents the State as the owner of land as well as of natural resources. Formally, the Government decides whether to sell, or to lease the exploitation of a natural resource by issuing licenses to a company or investor, or whether to preserve for biological conservation, upon a consultation process with local communities.

An analysis of the negotiation situations in connection with the distribution of property rights shows the following results: in general, three of the theoretical cases distinguished by Mauerhofer and Nyacuru (in preparation) could be found by us. Each of these three situations describes local communities as holders of compensation rights. The first situation is wherein conservationists do not have any right over the natural resources but do have the right to prevent the damage through non-conservationists. This arises when a protection corridor is declared in one area where communities have the right to withdrawal a resource. In this case they have to accept some restriction of use and management and the compensation offered. The second situation, wherein non-conservationists have rights over natural resources and restrictions are only possible upon acceptance of compensation, occurs for example outside protected areas when introducing agricultural and agro forestry conservation techniques while promoting a cash crop. In this case

communities hold the property rights and they may (or may not) accept compensation. The third situation take place when non-conservationists of the natural resources may cause costs to conservationists but have to compensate them. An example is the case of a mining or logging company, or game reserve, which obtains a license to operate in reserved communities´ land but have to compensate communities.

We then examine the cost of conservation in our planning region ? according to the differentiation made by Wätzold and Schwerdtner (2005) related to conservation actions and their (1) implementation, (2) monitoring and enforcement, and (3) decision making costs.

(1) Compensation to local communities is often done by in some scheme of management agreements. Examples are found in conservation agriculture and agro forestry practices, with measures such as technical assistance, supply of ecologically friendly inputs or new market opportunities (fair-trade, organic). In the case of forest, REDD+ programs and Payments for Ecosystem Services (PES) programs for carbon storage are the most common mechanisms of compensation. We also found a community wildlife management program in our planning region. Payments made there from logging companies or game reserves are not always directly allocated to local communities because they are rather concluded upon with the government.

(2) Costs of monitoring are often integrated into the management agreements with local communities in our planning region. Furthermore, the compliance of local communities with legislation appears usually low Nevertheless, monitoring is more frequently used than enforcement in order to not stress the relationship.

(3) Decision making costs are costs related to meetings, negotiations and resolving conflicts. Management agreements in our planning region appear to involve an important share of decision-making costs. In most cases the negotiation process incorporates various stakeholders as government, local communities or private actors with different interests, expectations and negotiation situations. Negotiation costs are an important issue for all stakeholders but especially for local communities in terms of opportunity costs. Time and resources spent in meetings and conflict solution activities need to be compensated with incentives. In the planning region local communities appear to have more incentives to participate in meetings and negotiations if they perceive that they have the right of exclusion and managing a resource.

The current paper provides first results regarding the application of the conceptual framework developed as methodological basis of the further economic valuation. The aim of the future work is to know which set of conservation actions is the most cost-effective one to achieve our conservation goal.

Mauerhofer V., Nyacuru F. (in preparation), Distributional dimensions of PES: general issues and critical aspects, Paper prepared for the Proceedings of the 19th Annual International Sustainable Development Research Conference, 1st to 3rd July 2013, Stellenbosch University, South Africa, www.isdrc19.co.za

Rothgang M., 1997. Ökonomische Perspektiven des Naturschutzes, Duncker & Humblot, Berlin, pp. 315.

Schlager, E., Ostrom, E., 1992. Property-rights regimes and natural resources: A conceptual analysis. Land Economics 68(3), 249?262.

Wätzold, F., Schwerdtner, K., 2005. Why be wasteful when preserving a valuable resource? A review article on the cost-effectiveness of European biodiversity conservation policy. Biological Conservation 123, 327?338.

Pathways to Sustainable Living - Integrating individual and structural approaches for sustainability transitions

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Developed countries currently face sustainability challenges that cannot be addressed by policies focussing on efficiency increases in consumption and production alone (be they implemented through command-and-control, market incentives, or nudging). Sustainability transitions can only be successful if they involve a shift in lifestyles beyond energy or material efficiency increase. Lifestyle changes, and this is our main argument, require both, individual and structural changes. By individual changes, we do not only refer to behavioural changes, but also to deeper changes in values and attitudes. Such intra-individual changes involve emotional challenges going up to questions about the sense of life. In order to be translated into individual and group behavioural changes, structures and structural changes play an important role.

Transition processes that encompass intra-individual, behavioural, cultural, and structural changes require an interdisciplinary foundation and a prudent process on how to facilitate such processes. Dealing with the current challenges and facilitating social innovation poses the following changes. It requires (i) new bottom-up participatory methods that empower citizens and other local actors and stimulate agency at the individual and collective level, (ii) the use of new conceptualizations how individuals and groups employ and change strategies for fulfilling their needs eventually leading to more sustainable consumption patterns, (iii) how this can lead to pathways of larger systemic change and societal transitions, which contribute to increased resilience of both local communities and societies at large, and (iv) how to combine and integrate all three aspects and perspectives including how to connect not only between the individual and collective, but also between the local and societal level. The interdisciplinary EU research project InContext has taken up this issue. It addresses the complexity of the contexts of individual behaviour by integrating both individual and structural explanations.

The paper presents theoretical as well as first empirical results: The theoretical approach is multi-tiered: First, at the individual level the theoretical framework is based on the capabilities approach and focuses on the fulfilment of individual needs through strategies that support sustainable development. Second, the capability approach has been extended into an intra-personal level by modelling the influence of values, learning, awareness and emotions on behaviour. Third, practice theory is used to link individual behaviour to societal structures.

On the empirical side, case studies and action research explore different aspects of the relevance of the theoretical frame. The case studies explore alternative consumption and production practices towards greater sustainability in both the energy and food domains. They focus on the conditions of emergence and diffusion of alternative and more sustainable niches, and herewith on the societal level. We analyse for different niches which factors have being relevant for their success ? success judged not by external sustainability criteria, but by internal factors, herewith looking at constellation of factors. One of these decisive factors has been the person of the front runner.

Action research, realized in three pilot projects, incorporates the individual and intra-individual theoretical and societal case study findings into a transition management process. The process, based on ideas from transition management, involves a group of frontrunners who go through a process of reflective learning, experimentation, awareness rising and capability development. Increased involvement and capability development will make communities more capable of addressing local sustainability problems. While theory and case studies aim to understand changes in individual sustainable behaviour in its interplay with the surrounding structures, the action research part explores ways to consciously manage this interplay. Its core aim is to foster

sustainable communities, as they establish to a large extent the system within which the individual is operating.

It is neither the aim of the paper to develop an overarching theory that integrates individual and collective approaches, both from an inner and outer perspective, nor to remain in a multidisciplinary perspective inserting the knowledge gained by each approach into a societal decision process. It is rather our idea to look for ways to change practices trough niche development via creating conscious new behaviour of individual and groups. As practice theory describes the 99% of actions that are done automatically it would in most cases be inappropriate to consider their actions as conscious choices, if one wants to get a better understanding of why people behave in specific ways. But practice theory does not offer possibilities for designing or evaluating policies to change behaviour.

One could say however that a confrontation with a successful niche may confront a member of a mainstream practice with a possible confusion. This confusion offers a possibility to change the practice, even more when discussed openly in a shared and safe space. Conscious decision-making becomes possible, and decisions can be influenced.

Ultimately, we aim at developing an approach that can make both: develop new niches in order to increase the probability that individuals leave mainstream, unsustainable practices and offer spaces which facilitate conscious decision-making and influence decision-making. Developing a research agenda, the developed approach may help answering questions at three different levels: How to create confusion of practices? How to create spaces for new behaviour to emerge out of this confusion and cluster in niches? How do niches scale up?

For the first question, the source of the confusion seems to be relevant: Confusions can stem from different elements of the practice at hand, such as the materials and technicalities, the culture and policies, values etc. It cannot be said which change in which element (or combination thereof) is sufficient for a confusion that questions the practice. E.g. While Al Gore's film had a confusing effect on some spectators, it was not so for all.

Once the confusion has been created, it may be used to let new, more sustainable behaviour emerge. Again, all elements of the practice can be used to make behaviour change, but we are particularly interested in a conscious change towards sustainability, as we assume that behaviour motivated by intrinsic motivation for sustainability is more stable and that this motivation can spill over to other behavioural areas. Possible ways to elicit confusions and to consciously change behaviour may be to create awareness, activate norms, inform/ stimulate learning on new behaviours in order to create self-empowerment and agency for alternative behaviours to meet individual and social challenges. A possible method for some of this may be to stimulate reflections in terms of strategies and needs ? those can also serve as integrating points between different theoretical backgrounds.

Nevertheless people usually come to sustainability transition arenas to change their outer context and not to reflect upon their inner context. On the procedural side, the facilitator takes a double role ? it is somewhere in between creating a save space and challenge the participants at the same time. It is important to create agency towards sustainability supported and stimulated by the facilitator.

Découplage entre croissance économique et impact environnemental: une analyse régulationniste

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En mai 2001, les ministres de l'environnement des pays de l'OCDE ont exprimé la nécessité de découpler les pressions sur l'environnement de la croissance économique. Pour atteindre cet objectif, ils ont fait du découplage un des objectifs majeurs de la première décennie du 21è siècle. Le découplage se réfère à la rupture des liens entre activités économiques et dégradation de l'environnement (OCDE, 2001). Cet objectif de découplage s'inscrit en droite ligne des recommandations du rapport Brundtland (1987) et du sommet de la Terre à Rio en 1992. En effet, à l'occasion du sommet de Rio, un plan d'action donnait naissance à des Agendas 21. Ce plan d'action qui comportait 40 chapitres, devait guider les pays à définir des stratégies nationales de développement durable. Dans le chapitre 40 de ce document, on parlait de la nécessité pour les pays d'élaborer les indicateurs fiables et pertinents de développement durable. Et c'est dans cette optique que plusieurs pays de l'OCDE vont élaborer des indicateurs de développement durable. Mais pour savoir s'ils sont en passe d'atteindre leurs objectifs en termes de développement durable, les pays doivent disposer des moyens de mesure. Ce besoin a été notamment manifesté en mai 2001, lorsque les ministres de l'environnement des pays de l'OCDE ont décidé de faire du découplage un des principaux objectifs de la décennie. Aujourd'hui, si la définition du concept de découplage fait l'objet de moins en moins de contradictions dans la littérature, les approches utilisées pour le mesurer ainsi que les possibilités pour y parvenir continuent de susciter les débats. Ce papier a pour ambition de traiter cette problématique à partir d'une approche régulationniste.

Construite au début des années 1970 pour expliquer la crise du système fordiste, la Théorie de la Régulation n'a jusque là été que très partiellement mise à contribution dans l'analyse de la problématique environnementale. Mais depuis quelques années, nous remarquons qu'il y a de plus en plus de travaux reliant la Théorie de la Régulation à la problématique environnementale (Becker et Raza, 2000; Gendron, 2005; Gibbs, 2006; Rousseau, Zuindeau , 2007; Zuindeau, 2001 ; 2007 ; 2009). En revanche, ces contributions restent encore assez déconnectées les unes des autres pour former une théorie régulationniste de l'environnement qui aura sa cohérence et qui couvrira tous le domaine de l'économie de l'environnement (Zuindeau et Rousseau, 2007). Pourtant, lorsqu'on regarde son cadre analytique, cette théorie pourrait se révéler très propice dans l'analyse de la problématique environnementale en général, et celle du découplage en particulier. Cette fécondité s'illustre davantage sur certains aspects du découplage, tels que : les dimensions temporelle et spatiale du découplage, la discontinuité (« grande crise » chez les régulationnistes) d'un processus de découplage, ou encore l'inconstance (« petite crise » chez les régulationnistes) de la dynamique de découplage, ...

La position que nous défendions dans cet article sur la question du découplage nuance un peu celle qu'on trouve généralement dans la littérature. Dans la littérature, on soutient souvent l'idée d'une quasi-impossibilité de parvenir au découplage absolu (lorsque l'économie croît alors que les pressions sur l'environnement stagnent ou diminuent), surtout pour le cas des émissions du dioxyde de carbone (Tim Jackson, 2010). Et dans les cas des pays où on décèle ce découplage, on a tendance à attribuer ce résultat à une migration des industries polluantes de ces pays vers les pays laxistes (en général les pays en développement) en matière de politiques environnementales. De notre coté, nous soutenons que le découplage absolu reste parfois bien possible, et cela même pour les polluants (notamment le CO2) les plus liés aux activités humaines. Cependant, nous estimons que ce découplage pourrait difficilement être pérenne à cause du lien très étroit qui lie les activités économiques à certains polluants. Ce découplage peut se réaliser principalement : à la suite d'une innovation technologique de grande ampleur ; pendant un changement structurel majeur dans l'économie ; ou en présence d'un rapport socioéconomique favorable à l'environnement. Parmi ses trois facteurs susceptibles de favoriser le découplage, le rapport socioéconomique à l'environnement nous paraît celui qui peut permettre à un pays de rester régulièrement dans le découplage absolu. Nous attendons par rapport socioéconomique à l'environnement, la place qu'on réserve à l'environnement dans un pays par rapport aux autres

dimensions (économie et social) du développement durable.
En effet, lorsqu'on analyse les deux autres déterminants (une importante innovation technologique et un grand changement structurel) du découplage absolu, nous nous apercevons que le découplage absolu n'est souvent qu'une conséquence collatérale d'autres objectifs recherchés (économique ou politique). Le changement structurel par exemple se produit en général dans un pays à la suite d'une crise économique qui affecte un ou plusieurs secteurs de l'économie. Quant au changement technologique, il intervient le plus souvent dans le but d'améliorer la productivité des entreprises, ou pour réduire la dépendance d'un pays par rapport à une ressource géostratégique (Exemple : le développement du nucléaire en France dans les années 1980). Donc l'impact de ces deux déterminants sur le découplage nous paraît limité dans le temps.
Avec l'analyse du rapport socioéconomique à l'environnement, il est possible d'avoir une idée sur la façon dont les problèmes environnementaux sont gérés, et sur l'intensité avec laquelle ils sont pris en compte dans un pays et selon les périodes. Cela dans la façon dont les pays préviennent la pollution et réparent les externalités environnementales. A ce niveau, nous faisons l'hypothèse selon laquelle : l'intensité avec laquelle la dimension environnementale est intégrée dans les formes institutionnelles (codification d'un ou de plusieurs rapports sociaux fondamentaux [Boyer et Saillard, 2002]) ainsi que le degré de cohérence de ces formes institutionnelles peuvent avoir une certaine influence sur la dynamique et la durée d'un processus de découplage.
Pour traiter ces différentes problématiques, nous nous intéresserons au cas des émissions du dioxyde de carbone (CO2). Ce polluant est non seulement parmi les polluants les plus liés aux activités humaines, mais aussi celui qui attire le plus d'attention au niveau international.

The use of technology within the context of degrowth ? enabling potentials of technologies

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The modern society is strongly formed and deeply pervaded by technology which affects all areas of human life. However, the dimension of technology (namely technological development, technological innovation or the use of technology) has been so far neglected within the frame of the debate on degrowth. Rather, visions on technology seem to be often drawn in a black or white manner ? positions and values of technophiles and technophobes seem to collide suddenly. On the one hand, the reason may be the fact that the pure idea of «technological development» may seem contradictory to the conceptual foundations of degrowth. On the other hand, technologies can offer specific potential which can provide a significant contribution to a degrowth society. The paper will use the case of information technologies to discuss how specific technologies can offer supportive potentials for the degrowth conception. Based on the analysis a normative framework will be proposed which can guide the further development and use of technology in the degrowth context.

Modern anthropology in a lock-in situation

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Summary
In this communication we show that the growth is the central and distinctive element of the modern praxis. Sciences studies, cultural studies and postcolonial studies each demonstrated from their part that there was no other specific characteristic of the modernity. Because of the explosion of the knowledges this fact remains however widely impensé. It explains nevertheless why modern societies meet so many difficulties facing not only a degrowthdiminution, but also in any quest of « new wealth » which would imply a diminution of the GDP. Everything, in our way of having a practice and of thinking of the world, depends on the growth. It is a real « lock - in » societal. To shake the ecological fears is not enough for going out of it and risks even to generate a tension on the fact that we have of more sacred, deteriorating paradoxically the situation, all the more that its causes are actively denied. We show that make a commitment in the other forms of wealth implies to bring out of the modernity and thus a shape or other one of Third-Worldism. It is a large-scale break, ideologically speaking.

Abstract

By « modern anthropology » we indicate the idea that modernity is made of Man. This anthropology expresses himself in all the domains of the knowledge which the modernity produces of itself : history, geography etc. To define itself this idea tries to contrast from what it is not : the past (Middle Ages, Ancien Régime, primitive societies) and the contemporary forms of non-modernity or unfinished modernity (primitive societies, again, underdeveloped countries, insufficiently modernized etc.).

According to Louis Dumont or Raymond Aron, on the liberal side, and Jacques Bidet or Jacques Droz, on the Marxist side, Modernity's characteristics are the following : individualism, mastery of the nature and democracy. Bertrand Badie's work on the political development allows to verify that such is good the case also in political sciences.

Since a few decades however these definitions are been deconstructed. Science studies (let us quote Sandra Harding, Bruno Latour) showed that the modern sciences have nothing specific, except the length of the bends which they use to establish their proofs; cultural studies and postcolonial studies demonstrated that individualism and democracy had nothing specifically modern, except the independence of the economic sphere and the consequences which it provokes; ecological economics, natural sciences (ecology) and anthropology (Jared Diamond) demonstrated that the « mastering of nature » and risks is not there.

If modern science distinguishes itself by the length of its tools, it is a direct effect of the division of labor. The growth of the class of the scholars and the increase of the number of disciplines is a result of the same effect. Modern specialists are not more intelligent than « savages » or « underdeveloped » people, he has only more time, and more tools, because of the extreme development of the tertiary sector, being a consequence of the collapse of the primary and secondary sectors. Consequently the more modern a science is, the more capital-intensive tools it uses (synchrotron, tokamak etc.).

If modern democracy distinguishes itself by the separation of spheres (economy / politics(policy) on the liberal side (« Liberty of the Moderns ») and the collective control of the « law of the value » on the Marxist side (planned economy or extinction of the State, after a dictatorship of the proletariat as a transition), it is a direct effect of the economic growth. What is striking, Marxist side, it is the radical opposition to every « luddite » criticism, who would attack machines (« It takes time and experience before the worker learns to distinguish the machinery of his capitalist use, and thus to transfer his attacks on production equipment to social exploitation »1), thus protecting the tool of growth. And what is striking, in the liberal side, is that in spite of all the statements on the « liberal neutrality » towards the plurality of the conceptions of the good, the only good being allowed, in terms of freedom, is what produces added value, a value which, as its name indicates it, has to be added to the already existing value.

All other transformations ensue from it: family's structure evolution, control of the collective rules, formation of nation-states, the emergence of a Central Administration which allows « to reduce transaction costs » as Jacques Bidet explains it etc. It is at the same time a commonplace

observation (a small cause produces big structural effects) and an extraordinary one (this small cause was not identified as such until now, the observers became attached to any sorts of aspects which are or inessentiels or too indistinct).
What all these studies, which are covering roughly speaking all the field of the knowledge, are telling, it is the extraordinary centrality of the economic growth in all the spheres of the modern activity.
The extraordinary centrality of the growth in the theories and the practices of modernity explains why degrowth is the good question to ask, on the philosophic and practical plan, to try to go out of technological, mental and societal lock-in in which modern societies are engaged. Facing every sorts of problems, moderns have only one answer : more means, more specialization, more added value. It is ourcosmos, a binding order which is taken as universal rationality itself. This way of looking at things as deformed and biased most of analyses which modernity produced on « underdevelopment » or « primitive societies ». Modernity dismissed in a unique and caricatural model of « non-modernity » all which was not itself. « Others » were considered incapable of mastering nature, of democracy (« oriental despotism ») etc. In brief the Third World, it is the poverty, the snarling iron (even if the native is, as everyone knows, rather hospital worker, has time to give and seems happy in spite of his decay).
Unlike science studies, cultural and postcolonial studies, which hardly went out of departments of universities, the ecological crisis pushes to a fundamental questioning of this modern paradigm, in the urgency. Ecologists anticipated it, often evoking a « change of paradigm ». But « ecologists » alone can only diagnose the danger, not the exit of crisis. They adequately state the problem, in the 70s: the only way was Third-Worldism, the quest for a new universalism. It is also the conclusion of the science, cultural and postcolonial studies.
This result implies to relaunch the basic job of anthropology, which was not to give to the colonists the instruments of knowledge allowing their domination but to enlighten the universality of the man. Go out of the situation in which we are trapped imples to go out of modernity.
1Karl Marx, Le Capital, Livre 1, 4e section, chapitre XV, V.

Quantifying regulating ecosystem services provided by urban forests in Barcelona, Spain

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Summary
Urban forests offer a variety of ecosystem services to city-dwellers. While an increasing number of scientific studies highlights the importance of these ecosystem services, urban policy making mainly focuses on technological solutions for the environmental problems caused by and suffered in cities. The potential of green infrastructure to comply with environmental standards and increase human wellbeing in cities is broadly neglected. Thus, our study aims to evaluate the contribution of urban forests to reduce air pollution and capture greenhouse gases (GHG), in the light of given city policy targets. The specific objectives of this research are twofold. First, we quantify biophysical and economic values of air purification and carbon sequestration and storage services, taking also into account the ecosystem disservice biogenic volatile organic compounds (BVOC) emissions of urban forests in the city of Barcelona, Spain. Second, we assess the contribution of urban forests to meet air quality and GHG emissions policy targets. We apply the Urban Forests Effects (UFORE) modeling to quantify these services based on field, meteorological and air pollution data. Our assessment quantifies positive and negative effects of urban forests and the relative contribution of different land use classes to the supply of ecosystem service in non-monetary/biophysical and monetary/economic terms. Results of the study highlight that the potential contribution of urban forests to meet city policy goals in terms of carbon sequestration and NO2 concentrations is relatively low. However, our results show a considerable potential of PM10 reduction by urban forests, accompanied with low disservices.

Abstract

Biodiversity and ecosystems in urban areas are increasingly gaining interest in the scientific and political agenda. This concern is underpinned by the fact that world population is progressively more urban and less rural. UN World Urbanization Prospects report (2011) expects a 72 per cent increase in the world urban population by 2050, from 3.6 thousand million in 2011 to 6.3 thousand million in 2050. Urban populations will progressively demand and appropriate more areas for the provision of ecosystem services within and beyond city boundaries in order to secure their needs and human well-being (food, water, health, security, good social relations, recreation, etc.). Many recent studies on urban ecosystems highlight the manifold positive effects of urban ecosystem services on quality of life in cities. According to these studies, the most relevant services in the urban context are fundamentally regulating, such as air purification, micro-climate regulation, noise reduction, runoff mitigation, and cultural services like recreation and amenity. Due to the high demand of ecosystem services in urban areas, social and economic values attached to them can be potentially very high.

Urban forests, understood as the aggregate of all urban trees, shrubs, lawns and pervious soils, offer a variety of ecosystem services to city-dwellers and to human society more broadly. Focusing on two regulating services, air purification and carbon sequestration, there is a significant body of literature which has attempted to assess the potential of urban forests in mitigating air pollution and offsetting CO2 emissions. Some of these studies conclude that managing urban forests for these purposes is just as cost-effective as other policies (e.g. based on technological improvements). However, possible trade-offs with other ecosystem services, ecosystem disservices caused by urban forests (e.g. biogenic emissions) and the specific urban context (scale of analysis, climate, pollution levels, urban forest structure and spatial distribution, etc.) should be taken into account when assessing the benefits provided by urban forests in terms of air purification and carbon sequestration.

Our study aims to evaluate the contribution of urban forests to reduce air pollution and capture greenhouse gases (GHG), in the light of given city policy targets. The specific objectives of this

research are twofold. First, we quantify biophysical and economic values of air purification and carbon sequestration and storage services, taking also into account the ecosystem disservice biogenic volatile organic compounds (BVOC) emissions of urban forests in the city of Barcelona, Spain. Second, we assess the contribution of urban forests to meet air quality and GHG emissions local policy targets.

Our study is placed in the European Mediterranean city of Barcelona, Spain, characterized by high population densities and low amounts of green infrastructure. Barcelona municipality is the second most populated city in Spain with 1.615 million inhabitants (2011) and one of the European cities with the highest population density (15 939 inhabitants/Km2). Even if the total green space within the municipal boundaries of Barcelona has an extension of 28.9 Km2 (representing 28.32% of the municipal area and 17.9 m2/person) due to the large periurban forest Collserola, the inner-city only includes 11.0 Km2 (10.75% of the city) of green space. This amounts in 6.8 m2 of green space per capita which, in comparison to other European cities constitutes a very low rate. As many other large European conurbations, one of the major environmental challenges of Barcelona is air quality improvement. In the last years, the city has exceeded the limit values for average annual concentrations of nitrogen dioxide (NO2) and particulate matter with a diameter of 10 micrometers or less (PM10) established by the EU (Directive 2008/50/EC) in various monitoring stations, currently set at 40 µg/m3 for both pollutants. Reducing air pollution has direct health and economic benefits. A recent study carried out in the Barcelona metropolitan area estimates 3,500 fewer annual deaths and several other health benefits if the air quality of this urban region would comply with World Health Organization recommended value for PM10 concentrations (20 µg/m3). The monetary benefits are estimated to amount in 6,400 million Euros per year. Reducing PM10 to comply with European Directive 2008/50/EC limit value would yield approximately one third of these benefits.

Likewise, as many other large cities, Barcelona generates a great amount of GHG emissions due to energy consumption in transport, industry, housing and other sectors. In 2008, Barcelona signed the European Union's Covenant of Mayors, an initiative to reduce GHG emissions by 20% (against a base year) in 2020 at the local level. In 2008 (base year for Barcelona), GHG emissions were estimated to be 4.05 million tons (a ratio of 2.51 tons of CO2e per inhabitant).

Unfortunately, fostering urban forest ecosystem services is generally not seen as a cost-effective option by policy makers in mitigating air pollution and reducing the carbon footprint of cities, mostly because of lack of awareness or knowledge. The case of Barcelona is not an exception since the Energy, Climate Change and Air Quality Plan of Barcelona (PECQ 2011-2020), the framework policy in terms of air pollution and GHG emissions reductions for the city, does not consider the enhancement of green infrastructure as a potential strategy for action in order to fulfill the ambitious objectives of the Plan.

We apply the Urban Forest Effects (UFORE) modeling developed by the USDA Forest Service to quantify the two ecosystem services and the disservice based on standard inputs of field, meteorological and air pollution data. Field sampling was built on 579 circular plots (each measuring 404 m2) randomly and proportionally distributed across 8 land-use classes or strata based on the 3rd edition of the Ecological Map of Barcelona: urban green (50 plots), natural green (125), low-density residential (20), high-density residential (204), transportation (30), institutional (39), commercial / industrial (70) and intensively-used areas (41). Fieldwork was carried out during 3 months from May to July 2009 by a crew of two people, although meteorological and pollution data were collected from 2008. According to the model input requirements, the data collection for each plot included, among other measurements: plot center GPS coordinates, plot tree cover, plot shrub cover, ground cover, shrub species, shrub height, shrub percent area, tree species, tree total height, tree crown width and tree percent canopy missing.

Quantitative results were obtained for air pollution removal and carbon sequestration services, and biogenic volatile organic compounds (BVOC) emissions disservice. The model estimates a total removal of air pollutants of 306 metric tons (mt), a total net carbon sequestration of 5,422 mt and total BVOC emissions of 184 mt for the year 2008. The filtering service impact of NO2, given existing city emissions, results in 0.52%, while urban forest reduces a 22.31 % of the total PM10 emissions. The net sequestration of CO2e constitutes 0.13% of the total GHG emissions of Barcelona.

The potential contribution of urban forests to comply air quality and GHG emissions policy targets in Barcelona is generally low, while baring an important potential in specific pollutants. The current policy strategy focusing on technological measures seems to be adequate in terms of NO2 and CO2e emissions. However, our results demonstrate a significant potential to reach PM10 targets with the effect of urban forests. Taking into account the manifold additional services and benefits urban forest provide for human well-being the enhancement of urban forest structure

make a promising strategy to comply with PM10 policy targets. Limitations and caveats in applying the UFORE model in European Mediterranean cities are given due to its development in the United States and missing adjustments for the Mediterranean climate and species.
Our study estimated the potential contribution of urban forests to comply with environmental standards, while accounting for existing disservices. We can conclude that the potential contribution of urban forests to meet cities policy goals in terms of carbon sequestration is relatively low. The same counts for the air filtering of NO2. However, our results show a considerable potential of PM10 reduction by urban forests, accompanied with low disservices.

Income inequality and willingness to pay for ecosystem services

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Extended abstract
We study how the distribution of income among members of society, and income inequality in particular, affects the average willingness to pay (WTP) for public ecosystem services. This is highly relevant for the practice of benefit transfer, and for policy recommendations aimed at both allocative efficiency and distributive justice.
To address this issue, we use a specification of the model of Ebert (2003) where a continuum of individual households have identical preferences over a market-traded private consumption good and a non-market-traded pure-public-good ecosystem service, which are represented by a constant-elasticity-of-substitution utility function. We extend Ebert's model by assuming that exogenous income is log-normally distributed over households. We consider two alternative measures of income inequality: the coefficient of variation and the standard deviation of income. These correspond to relative and absolute notions of inequality, respectively.
We show that (i) average WTP for ecosystem services increases with mean household income; (ii) average WTP for ecosystem services decreases (increases) with income inequality, if ecosystem services and manufactured goods are substitutes (complements); (iii) average WTP for ecosystem services normally changes more elastically with mean household income than with income inequality, except for extreme cases.
We quantitatively estimate and illustrate our theoretical results of how the income distribution influences WTP with empirical data concerning how WTP for (1) a cultural ecosystem service in Sweden (from Broberg 2010), (2) a provisioning ecosystem service in rural China (from Wang et al. 2011), and (3) a proxy for global ecosystem services (from the meta-study of Jacobsen and Hanley 2009) depend on their respective distributions of income. Among other results we find that, on global average, ecosystem services are systematically undervalued by up to 16 per cent, if one assumes the current grossly unequal global income distribution rather than the hypothetical case of an equal distribution.
Our results are relevant in several respects. First, when doing benefit or value transfer, one should correct WTP-estimates for differences in both mean household income and income inequality. Our study yields a handsome adjustment factor for this purpose. Second, when giving policy recommendations aimed at both allocative efficiency and distributive justice, one may correct WTP-estimates for grossly unjust income inequality, and use inequality-adjusted WTP-estimates for efficiency (e.g. cost-benefit)-analysis.

Key references:
Broberg, T. (2010), Income treatment effects in contingent valuation: the case of the Swedish predator policy,Environmental and Resource Economics46(1): 1-17.
Ebert, U. (2003), Environmental goods and the distribution of income, Environmental and Resource Economics25(4): 435-459.
Jacobsen, J. and N. Hanley (2009), Are there income effects on global willingness to pay for biodiversity conservation? Environmental and Resource Economics43(2): 137-160.
Wang, H., Y. Shi, Y. Kim and T. Kamata (2011), Valuing water quality improvement in China.

A case study of Lake Puzhehei in Yunnan Province,Policy Research Working Paper 5766, Washington DC: The World Bank.

Land use change as a determinant of the European agricultural vulnerability confronted with pollinator decline

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Abstract (8000 caracters)
Insect pollination is essential for the production of a large array of crops. In the last decade, there has been evidence of a worldwide pollinator decline. A major pressures for this decline seem to be land use change and agricultural intensification. Yet the policy response is not as fast as it should be. One can explain this reluctance by the low visibility of this impact into the agricultural sector in the near future. This paper analyzes the evolution in next years of the European agricultural vulnerability confronted with pollinator decline through the evolution of land use change. The vulnerability of agriculture to insect pollination loss is a combination of three indicators: 1) the economic value of insect pollination, 2) the vulnerability ratio, and 3) the social welfare loss. The evolution of these indicators until 2080 have been estimated in three scenarios: Growth Applied Strategy (GRAS), Business As Might Be Usual (BAMBU) and Sustainable European Development Goal (SEDG). The overall result is that the European agricultural vulnerability will increase in the near future in all scenarios and thus we demonstrate that policy is needed to protect pollinators.

Summary (1200 words)

Insect pollination is essential for the production of a large array of crops. Gallai et al. (2009) estimated the value of their contribution to 2005 world production to 153 billions of euros. The potential impact of pollinator loss on the social welfare has been estimated to 191 billion of euros. But the decline of insect pollinators is unlikely be to be complete and instantaneous, and so it is critical to evaluate the relative importance of pollinators in the future. In this paper, we will assess the evolution of the vulnerability of European agriculture towards pollinators over the 2005 ? 2080 period in order to provide elements for policy stakes taking into account insect pollinator protection.

The difficulty here was to quantify the evolution of European agriculture. For this purpose, we used the scenarios. The principle of this approach was developed in order to explain future trends of world evolution confronted with greenhouse gas (GHG) emissions. Indeed, future GHG emissions are the product of very complex dynamic systems, determined by driving forces such as demography, socio-economic development, and technological change (IPCC Special Report on Emissions Scenarios, Naki?enovi?et al.,2000). Their evolution is therefore highly uncertain and also influenced by policies. Scenarios are storylines explaining possible images of the future trends. They become an appropriate tool to analyze how driving forces may influence future emission outcomes and to assess the associated uncertainties. They assist in climate change analysis, including climate modeling and the assessment of impacts, adaptation, and mitigation. Thus scenarios were built assuming different evolutions of European society, including agriculture, following different political trends and these scenarios were used by the Millenium Ecosystem Assessment (MEA, 2005) and the Intergovernmental Program of Climate Change (IPCC, Naki?enovi?et al.,2000).

In order to switch from scenario storylines, which are qualitative projections of the future trend, to quantitative assessments of the future trends in Europe, we used the MOLUSC model of land use change (Model Of Land Use SCenarios ; Reginsteret al.,In prep). We also considered that prices would evolve in the future as a function of production and preferences of consumers. Preferences are represented within an interval of the price elasticity.

Our goal was to study how the dependence of European agriculture to insect pollinator would evolve in the future. However, European agriculture is not uniform and it varies first based upon climatic constraints, which will be taken into account in this chapter by a North-South division

of European countries. So we studied the vulnerability of agriculture confronted with pollinator decline in both regions separately in order to adapt political strategies.
In 2005, the total economic value of the pollination service was ?12 billion in Europe and the corresponding vulnerability ratio was about 10 percent. We estimated the loss of social European welfare between ?26 billion and ?19.9 billion considering that consumers had more or less flexible preferences on pollinator-dependent crops (i.e.for a price elasticity from -0.8 to -1.2). Thus we conclude that insect pollinators were important for European agriculture. More precisely, we found that the Southern European countries were significantly more vulnerable to pollinator decline than Northern ones.
The aim of this paper was to assess the evolution of European vulnerability to pollinator loss in order to determine the need for policy to protect insect pollinators. For this purpose, we studied the evolution of European vulnerability across three ALARM scenarios: GRAS, BAMBU and SEDG. Those scenarios included extreme policy orientations that will affect the vulnerability and social welfare due to pollinator loss. GRAS scenario policies are reactive to climate change while SEDG scenario policies are proactive. BAMBU scenario policies are simply an extrapolation of the 2005 policies. With proactive policies, by 2080 the vulnerability of agriculture from northern countries will decrease while that of Southern countries will not change. But with reactive policies, the vulnerability of Southern countries will decrease while that of Northern countries will not change. The consumer welfare loss for consumers that prefer insect-pollinated crops as well as those that do not will decrease in Northern countries regardless of the scenarios. On the other hand, the consumer welfare loss of Southern countries will increase for consumers that do not prefer insect-pollinated crops, while it will decrease for those that prefer insect-pollinated crops. The consumer welfare loss of people that have high preferences for insect-pollinated crops could even increase in the case of an accelerated increase in temperature.
We found that insect pollinators will have an important impact in the future European agriculture whatever the political strategy undertaken (proactive or reactive). Effective actions for insect pollinator protection or for consumer welfare protection will be necessaries. This paper demonstrated that an effective action has to be realized locally since agriculture of European countries are different and will evolve differently. Furthermore the action will be different depending on the impact of a pollinator decline since it will be measured either on the agricultural industry or on the consumer welfare depending on the countries.

References cited

Gallai, N., Salles, J. M., Settele, J., Vaissière, B. E., 2009. Economic valuation of the vulnerability of world agriculture confronted with pollinator decline. Ecological Economics 68, 810-821.
Millenium Ecosystem Assessment, 2005. Ecosystems and human well being: a framework for assessment. Report of the conceptuel framework working group of the Millenium Ecosystem Assessment. Washington, DC.
Naki?enovi? N., Swart R.,2000. Special Report on Emissions Scenarios. Cambridge University Press, UK. pp 570. Available at: http://www.ipcc.ch/ipccreports/sres/emission/index.htm
Reginster, I., Rounsevell, M., Riguelle, F., Carter, T., Fronzek, S., Omann, I., Spangenberg, J. H., Stocker, S., Bondeau, A., Hickler, T., 2012, The effect of alternative socio-economic and political strategies on European land use from 2006 to 2080. In prep.

Looking beyond academic applications of environmental valuation: What practical uses of economic valuation in decision-making processes? The case of marine environment.

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Summary
Monetarisation of the environment appears as the best solution to weight environmental issues with development projects. It is considered as a decision support tool and its wide use is urged at various political levels. Yet, a study of the peer-reviewed literature (Lanranset al.2011) showed that despite many academic applications, the question of the actual use of economic valuation remains poorly documented. To get a better understanding of this gap, the present study analyses grey literature dealing with economic valuation of marine environment. The main hypothesis is that grey literature provides more data on the actual use or non-use of economic valuation by stakeholders. Results should provide a better understanding of what is at stake in the field when using economic valuation.

Abstracts
Monetarisation, by revealing the value of the environment, is supposed to lead to an optimal efficiency of the market. Putting a price on nature allows economic agents to take the monetary value of the environment into account in their decisions, and to modify their behavior accordingly. The environment, biodiversity and ecosystem services should thereby be better taken into consideration in public decision and private choices. Economic valuation of the environment and ecosystem services appears as a relevant decision support tool. Several international, regional and national conventions, directives, guidelines... recommend the use economic valuation as a relevant policy instrument to include biodiversity in management decisions. Economic literature extensively addresses this field. Despite debates about the legitimacy of valuing the environment, methods are well-established procedure. Many application examples and study cases can be found in the academic literature.

And yet, in a recent study analysing peer-reviewed literature, Lauranset al.(2011) have shown that there is an issue regarding the actual use of this analytical instrument: only few articles from the studied corpus clearly mentioned examples of actual use of economic valuation in decision making. This analysis underlines a gap: beside the focus of the valuation itself, the question of the real (or even potential) use of economic valuation studies is left aside. Two main hypothesis are given by the authors to explain this: either the use of economic valuation is poorly used in decision making, or economic literature does not address this issue.

The present study intends to keep up and to go beyond Laurans'et al.analysis. Our main assumption is that grey literature should provide more details on the actual use of economic valuation in decision making processes. By extending the corpus, we make the hypothesis that peer reviewed literature focused more on the monetary result of the evaluation whereas grey literature could take a broader view, and could include more information on practical uses of economic valuation. More over, grey literature should be more focused on cases where arguments for environmental protection are needed and not only on the exercise of valuation itself. In such cases, economic valuation as support tool has more chances to be contextualised, that is, to give information about who uses economic valuation, in which context and for what purpose. The analysis will focus on grey literature dealing with marine and coastal environment to fit our personal field of research.

To define the corpus to be studied, an online research with the following combinations of keyword is conducted:

- "ecosystem service" and "valuation" and "marine" or "coastal"
- "biodiversity" and "valuation" and "marine" or "coastal"
- "environment" and "valuation" and "marine" or "coastal"
- "natural capital" and "marine" or "coastal"
- "total economic value" and "marine" or "coastal".

The wide database of the Marine Ecosystem Services Partnership, which compile economic valuation studies (available online at http://www.marineecosystemservices.org/) is also studied at depth here. The bibliographic references will be categorised and analysed according to (i) the three main categories of use of economic valuation defined by Laurenset al.: decisive valuation, technical valuation and informative valuation, and (ii) the way economic valuation use is mentioned: mention of a potential use, analysis of a use issue or report of actual use cases.

This wider analysis of the literature related to economic valuation of marine and coastal environment should provide useful material on the use of economic information in biodiversity management, decision-making and environmental governance. If it appears that the actual use of economic valuation is more addressed in grey literature than in the economic peer-reviewed one, it should provide interesting data on people actually using it to effectively manage the environment and on how agents use economic valuation to coordinate. If, despite an enlarged corpus, our results show that the use of economic valuation remain poorly used in the decision-making process, one can ask why there is such a gap between the political recommendations, the wide academic literature and its uses in practice. This raises several questions and hypothesises. We can wonder if decision makers and managers are trained enough to effectively use economic valuation. Another hypothesis is that the use of economic valuation is poorly documented because a significant part of the decision process remains informal. At this stage of the analysis, the "non-use" of economic valuation could also be seen as a strategy coming from actors involved in the decision process. Indeed, valuation is a tool within a wider process trying to coordinate actors with conflicting interests and diverging concerns. Including or not economic valuation can be seen as a significant part of involved parties' strategies. Therefor more research focusing on potential beneficiaries and losers of the economic valuation results could be interesting.

THE SYSTEMATIC INSTITUTIONAL APPROACH AS A NEW COGNITIVE FRAME IN THE STUDY OF THE CORPORATION

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The methodology of contemporary economic science stands at the crossroads: on the one hand, there is the orthodox approach centered on the utilitarian philosophy and an aspiration of total ordering, "digitization" of economic reality. On the other hand - the evolutionary paradigm, which recognizes at its core the multidimensionality of the human action motives and its non-deterministic nature. In the first case we can talk about a mechanistic worldview of economy and about organic worldview in the second . However, the second approach obviously loses to orthodoxy in the instrumental constituent. The ways of modeling economic processes existing in evolutionary paradigm have not acquired generally accepted character and therefore can't translated to the wider scientific community and also can't be taught at universities. In our view the reason for this is the lack of procedures of structuring the research subject, select it universal elements of evolutionary nature and the relationships between them. The report will discuss the corporation as an important part of the economy. If you abstract from the specific historical forms the corporation is institutionally autonomous universal form of material production. And the study of the institutional structure of corporation which has the evolutionary nature is an important scientific task.

We propose to consider the institutional structure of the corporation in the context of two levels: the level of institutions and the level of routines forming these institutions. An institution we are considering (in continuation of traditions laid by G. Hodgson) as totality of economic relations that structuring the specific type of social interaction. Based on the existence of three basic motives of social action: coercion, social norms and individual interests, we offer to allocate the triad of corporation institutions: institution of the force, institution of the promotion and institution of the opportunism respectively. The routine is the norm of interaction among its agents entrenched in corporation which is manifesting in repeated team skills. The routines forms the structure of institutions of the corporation as its institutional "atoms", and at the same time its forms the link between institutions. Meanwhile, each institution is formed by routines of different types, in the base of its allocation are different reasons for their actualization

The institution of force can be understood as a totality of economic relations bounded in space and time that structuring the implementation of coercive (domineering) motive of social action. The institution of force in the economy is an institutionalized violence, a manifestation of power that is asymmetrical interaction of subjects. The forms of coercion, which have significant impact on a corporation, may vary considerably, so in the structure of the institution of force routines of different types exist. We propose to distinguish three types of routines of force: routine of violence (embeds in the corporation interaction about direct, physical coercion), the routine of pressure (embeds interaction about economic coercion) and routine of conviction (embeds interaction about ideological coercion).

The institution of assistance we consider as totality of economic relations bounded in time and space that structuring the implementation of the collective motive of social action. The institution of assistanceincludesthree types of routines, which differ according to the type of economic relations, mediating community of individuals: the routine of involvement (based on participation, commitment to community action), the routine of communion (based on culture, the desire for generality of thought), the routine of creation (based on creativity, the desire to share a new discovery).

The institution of opportunism is considered as a bounded in space and time totality of economic relations that structuring the implementation of the individual (self-interested) motive of social action. It is necessary to note what it is proposed to go away from a narrow understanding of opportunism as following its interest with guile (as "cunning" is not amenable to scientific identification and is only an external manifestation of the real nature of the action). Opportunism is considered in its original meaning - as the ?use of opportunities', in fact, we mean the methods of the legitimization of following individual interests in the economy. The institution of opportunism has three types of routines different in the extent to which subjects allow to act "to

their advantage": routines of rationalization (corresponding to the legitimization of "simple" following his interest), routine of concealment (corresponding to the legitimization of opportunism by O. Williamson, that is associated with shirking, negligence, etc.) and routine of fraud (reflecting direct and secret profiting from corporations as insider's rent).

The existing forms of corporations are showing their institutional structure imbalances. So, the modern western Joint Stock Corporation has hypertrophied institution of opportunism, based on encouraging and control, while the Institute for assistance it is in a "subdued" state. "Mature" industrial corporations (existing today in developing countries) are based on the developed institutes of force, whereas the institutions of assistance and opportunism are weak. Corporation, built on the principle of the Japanese "keiretsu", rely more on the institution of assistance and force, whereas the institution of opportunism is suppressed.

Also it is necessary to note that each institution as part of a commensurate structure of the corporation has a positive impact on its integral characteristics: sustainability, activity and efficiency of corporation. However, each of the institutes extending further and suppressing other institutions of a corporation shows its negative side: the institution of force alienates the emergent property of corporation, the institution of assistance - purposefulness, the institution of opportunism - integrity.

It is very difficult to observe in practice a harmonious relation between the agents in corporation that suggests a dynamic balance of each institution. Even if some talented CEO or owners are able to create a proportional institutional structure in the corporation it becomes only a «well-proportioned» structure. In this case the proportionality of the institutions is not a guarantee of harmony because of the lack of adequate structure. The institutional structure of the corporation becomes dependent on the specific relevant actors (executives, opinion leaders) and outside of their influence divides into local short-living routines. This in turn will leads to serious systematic dysfunction of the corporation.

Thus, we propose to use the systems methodology for the operationalization of the evolutionary institutional theory of the corporation. The subject of the study is the corporation which is treated as a complex, organized and purposeful system and is formed by the elements and sub-systems of different nature, and there is a links between them. The link understood as a restriction on freedom of elements or subsystems. We identify two heterogenic structures of the corporation: agency and institutional and establish a correspondence between them. The institutional structure of the corporation is the inversion of its agent-structure. The links between agents in the corporation are routines in essence that is elements of their institutional structure. The elements of agency structure are links of routines, that is elements of the institutional structure. The agents connect heterogeneous routines and implement them in their economic activity while changing itself. The individuals change the routines and institutions, and they influence the behavior of agents in turn. As a result, the corporation evolves continuously, irreversibly changes and acquires new properties that help the better integration of the corporation in the environment and transformation of the environment. The highest values of the integral characteristics of the corporation (sustainability, activity and efficiency) achieve on the basis of the proportionality of all the institutions of the triad and the objectification of links between them, and this scientific problem should be in the focus of future heterodox research of the corporation.

Extended Exporter's Responsibility for waste management of durable goods

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Summary
Exportation of used durable goods from Europe such as vehicles and Electrical and Electronic Equipment brings developing countries both the blessing from cheap goods and the curse from uncontrolled waste management. Using a stylized economic model, this paper compares the interaction and incentives for exportation from policy instruments for waste management in Europe: Extended Producer Responsibility (EPR), disposal taxes, export taxes and subsidies for recyclers in developing countries. The paper shows that a disposal tax weakens EPR effectiveness. In addition, if demand for new goods is inelastic and export is possible, a European disposal tax increases global disposal of waste. Extended Exporter's Responsibility (EER) can improve global efficiency of waste management practices. EER is a combination of an export tax with a recycling subsidy in the developing world. Since EER would reduce the incentives for export of hazardous waste, the need for inspections on exported goods would decrease. As an equivalent alternative to EER, EPR targets can be implemented for exported goods. Producers would not only stimulate more sustainable recycling practices in the developing world but would also better internalize the external costs of waste management. In a more general way, the paper contributes to a better understanding of policy instruments such that resource efficiency in Europe can be improved without negative aspects for the rest of the world.

Extended Abstract
High volumes of used durable goods such as vehicles and Electrical and Electronic Equipment (EEE) are exported from developed countries in the North to underdeveloped countries in the South. For example, the EU exported 3,6 million color television sets in 2005[1] (EEA 2009). Also, only a small fraction of the new vehicles bought in Europe are recycled as End-of-Life Vehicles (ELV) in Europe. In Belgium for example, treated ELV only amounted up to one third of the new cars bought in 2010, the remaining fraction mainly being exported to the South (Statbel 2012, Febelauto 2012). On the one hand this export generates consumer surplus in the South from consumers that can only afford cheap second-hand cars or EEE. On the other hand this export adds to the burden of uncontrolled waste management in the South. Poverty and weak government authority lead to an end-of-life treatment of goods that is damaging for health and environment (UNODC 2009, EEA 2009, Basel Convention 2011). In addition, the export of durable goods does not only comprise valuable goods, but also illegal transports of hazardous waste. The UN estimates that about 100.000 tons per year of illegal hazardous wastes arrive in Western Africa (UNODC, 2009). The European Environment Agency indicates that although intercepted illegal shipments amounted between 6.000 and 47.000 ton per year from 2001 to 2005, they only constitute the outer layer of the problem (EEA, 2009). Evidently, policy makers have tried to reduce illegal waste shipments by improving the inspections on waste shipments. Unfortunately, these controls are plagued by several structural problems: inspection services are understaffed, authority for inspections is fragmented between regional, national and European level and most importantly the difficulty for inspectors to discern valuable and useless durable goods (Knack 2012).

European directives contain ambitious targets for the treatment of ELV and Waste from Electrical and Electronic Equipment (WEEE) in Europe. These targets implement the principle of Extended Producer Responsibility (EPR) that makes producers of consumer products financially responsible for the collection and recycling of end-of-life products. Directive 2000/53/EC imposes by 2015 a recovery rate of 95 % of the weight of an ELV treated in Europe, with at least 85 % material recycling. Directive 2012/19/EC leaves the Member States the choice between a WEEE collection target of 65 % of the EEE put on the market or a collection target of 85 % of

WEEE generated by 2019. Once collected, the directive determines recycling targets per product type. The directives focus on the treatment of end-of-life goods collected in Europe, not on exportation.

Remarkably, Member States implement diverging policies to obtain the long-term European targets. For example, in addition to existing EPR for EEE and cars, Flanders (North of Belgium) gradually increases its landfill taxes from 13 to 85 eur per ton in 2015 for residues from shredder installations that recycle materials from ELV and WEEE. Conversely, in the Netherlands landfill taxes have recently been abolished but car producers are paying a recycling fee of 45 eur for each new car to stimulate the treatment of Dutch ELV (ARN 2012, Rijksoverheid NL 2012). How do these different policy approaches influence the incentives for exportation?

Economic literature has already shown that the choice of instruments to stimulate sustainable waste management in the North has an impact on the exports of used durable goods to the South. Kinnaman and Yokoo (2011) highlight that in the absence of regulation in the South, disposal taxes in the North for recycling residues of durable goods stimulate exportation. An export tax would improve the efficiency of the incentives. Bernard (2011) shows that if exportation is important, disposal taxes in the North may weaken incentives for eco-design for new durable goods resulting from EPR.

This paper combines economic literature on exportation of durable goods with EPR literature on fast-moving consumer goods. Dubois (2012) showed that excise duties imposed on producers for the non-collected waste stream improves the EPR incentives for eco-design and prevention. In a similar way, this paper investigates how excise duties imposed on producers for the exported durable goods influences incentives for eco-design, prevention and exportation. What would be the effects if EPR is enlarged to Extended Exporter's Responsibility (EER)? How do excise duties, disposal taxes and EPR influence exportation incentives? Is an excise duty on exportation early in the product life cycle more efficient than an export tax at the moment of exportation?

The paper uses a stylized economic trade model with two countries (North and South) and four actors (producers, consumers in the North, recyclers and consumers in the South). Perfect competition applies to all market transactions and regulation on the treatment of end-of-life goods is assumed to be non-existent in the South. In a first period, durable goods are used in the North. In a second period durable goods are either treated in line with European legislation or exported to the South. The model borrows several important aspects from shinkuma (2007). Efficiency of EPR targets, disposal taxes, export taxes and excise duties on producers are evaluated against the benchmark of a first-best Pareto outcome.

The model confirms that disposal taxes for recycling residues of durable goods are negative in two ways. First, disposal taxes stimulate excessive export. Second, disposal taxes take away the incentives of eco-design. Disposal taxes transfer the incentive to improve waste management from producers to waste recyclers. Without financial incentives rational producers will not care about eco-design. However, if disposal taxes are combined with an export tax, exportation and European waste management can be at the first-best level. In contrast with disposal taxes, excise duties in combination with EPR targets strengthen the incentives to recycle waste streams in Europe in a sustainable way while maintaining an efficient balance between consumer surplus and environmental externalities in the South. In addition, excise duties make difficult to implement export taxes redundant. Implementation of EER such that producers are allowed to subsidize waste treatment facilities in the South to reduce their excise duties, allows to achieve the first-best outcome.

The paper contributes in a more general way to the understanding of economic policy instruments for waste and materials management. Currently, regional and national governments in Europe are trying to reach the long term goals for durable goods in a disparate way. Understanding and evaluating the different policies may help to achieve an efficient and successful waste management system in Europe without negative aspects for the rest of the world.

References

ARN, 2012, Waste Disposal fee, available at http://www.arn.nl/english/ARN-Auto-Recycling/Waste-disposal-fee, retrieved 6/10/2012

Basel Convention, 2011, Where are weee in Africa?, pp. 30

Bernard, S., 2011, Transboundary movement of waste: second-hand markets and illegal shipments, Scientific Series, 77, Cirano, Monréal

Dubois, M. (2012) Extended Producer Responsibility for consumer waste: the gap between economic theory and implementation, Waste Management & Research, 30(9), Suppl. 36-42

EEA, European environment Agency, 2009, Waste without borders in the EU? Transboundary shipments of Waste, pp. 20

Febelauto, 2012, Recycling-reuse-recovery results for Belgium: evolution 2006-2010, available at http://www.febelauto.be/userfiles/Resultaten%20Resultats% 20Results%283%29.pdf, extracted 25 june 2012

Kinnaman, T., Yokoo, H.-F., 2011, The environmental consequences of global reuse, American Economic Review, 101, 71-76

Knack, 2012, Second hand cars full of waste for Africa (tanslated from: Een occasie vol afval voor Afrika), Knack Extra, 4,13, 42-46

Rijksoverheid NL, 2012, Belastingsplan 2012: memorie van toelichting, pp. 146

Shinkuma, T., 2009, Reconsideration of an advanced disposal fee policy for end-of-life durable goods, Journal of Environmental Economics and Management, 53, 110-121.

Statbel, 2012, Automotive data (translated from ?Auto's in cijfers'), available at http://statbel.fgov.be/nl/modules/publications/statistiques/verkeer_vervoer/les_voitures_en_quelques_chiffres.jsp, extracted on 25 june 2012

UNODC, United Nations Office on drugs and crime, 2009, Transnational trafficking and the rule of law in West Africa: A threat assessment, pp. 100

[1] About 100.000 tons

What is the rationality behind a mass certification process? The case of the Rainforest Alliance in the Ivorian cocoa sector

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Summary
The pattern of voluntary sustainable standard diffusion in developing countries has recently received much attention from economists. We contribute to the literature through a case study of the Rainforest Alliance (RA) initiative in the Ivorian cocoa sector. Drawing on seminal contributions on the pervasive effects of information asymmetry and uncertainty in market, we scrutinize the RA standard. Concerning uncertainty of the standard's ability to satisfy the given demand, we argue that translation of criteria into auditable technical specifications is very rough. Concerning the uncertainty surrounding standard compliance, our results from producer surveys in Ivory Coast show that criteria improving traceability are almost always respected, allowing chocolate companies to increase quality and quantity procurements. On the contrary, the environmental dimension? however claimed by the RA standard ? is hardly complied.

Extensive abstract

The past several years have witnessed the rapid rise of voluntary standards and labeling initiatives in international agricultural trade. The growth of these private regulatory arrangements has been fueled by the increasing globalization of production, the declining state regulation, and the citizen concerns about environmental and social sustainability. Non-governmental organizations but also agrofood industrial complexes are thus promoting this new type of governance mechanism in response to rising consumer demand for sustainable food products.

The pattern of voluntary sustainable standard adoption in developing countries has recently received much attention from economists. While existing studies argue that certification has few significant impacts, others suggest that these efforts are an important institutional instrument for promoting environmental and social sustainability (for a literature review see Blackman and Rivera (2010)). Actually, evidence is mixed and mainly depends on the principles and practices employed in these initiatives (Raynolds et al., 2007). Most of the studies focus on organic or fair trade standards, and mainly on the coffee sector in Latin America (Blackman and Rivera, 2010; Vagneron and Roquigny, 2010). In our present paper, we therefore broaden this literature through a case study of the Rainforest Alliance initiative in the cocoa sector of Ivory Coast.

The Rainforest Alliance (thereafter RA) was founded in 1987, first in response to massive deforestation and the extinction of many tropical rainforest species, and later for more general improvements to environmental and social conditions in tropical contexts through conservation certification. The standard program version for cocoa came into being in 1997. The RA's growth strategy is linked to its ability to negotiate sourcing agreements for sustainable products with major manufacturers (with Kraft for cocoa in 1997) and includes a third-party certification (TPC) scheme that is clearly industry-oriented (Potts et al., 2010; Daviron and Vagneron, 2011).

Processing attributes that cannot be verified by consumers is what differentiates RA products. This implies that RA goods can be classified as credence goods. Credence goods are goods whose attributes cannot be evaluated by consumers, even after having consumed them. These goods' particularities lead to a common problem of asymmetric information on the quality properties of goods between producers and consumers (Akerlof, 1970). To overcome this issue, the new market instrument of TPC certification schemes has emerged (Lizzeri, 1999). TPC creates transparency by collecting and verifying information related to the production and trading practices at various stages of the supply chain. Thus consumers must rely on these schemes to assess unobservable qualities ? such as the sustainable production process. A wide range of literature has therefore become concerned with the efficiency of this third-party certification. Balineau and Dufeu (2010) ? following the seminal idea of Darby and Karni (1973) defining

credence properties ? underline that this type of certified product generates two types of uncertainties. First, there is uncertainty concerning the standard's ability to satisfy the given demand: are the technical specifications defined by the standard appropriate to supplying the quality required by buyers? Second, there is uncertainty surrounding standard compliance: are the technical specifications respected throughout the whole production process? In this paper, we endeavor to analyze these two types of uncertainty ? as identified by Balineau and Dufeu (2010) ? in the case of the RA certification process in the cocoa sector.

In their paper, Balineau and Dufeu validate their hypothesis of this first uncertainty by analyzing consumer preference results regarding fair trade standards and their mistrust towards these labels. We choose in our paper to examine this uncertainty through scrutinizing the RA technical specifications. We give our own interpretation of the standard's ability to satisfy the given demand (principles of the standards) through our expertise in the cocoa sector. Actually, while most of the 100 criteria of the RA may improve environmental sustainability; maintain biodiversity; and improve sociability, security, and hygiene for farmers; their translation into auditable technical specifications ? which are particular for the cocoa sector in Ivory Coast ? appears very rough. Yet, to ensure that the delivered goods possess the required stipulations, the guidelines rendering processes auditable become key to performance.

On the other hand, we analyze the second type of uncertainty surrounding standard compliance through the original data we collected in surveys with producers (40 certified and 40 non-certified) and cooperative surveys (10 certified and 2 non-certified) in Ivory Coast.

We found that the criteria that improve the traceability process, a new internal monitoring system for quality and productivity, seem to be almost always respected. Furthermore, new formal arrangements including price premiums ? between exporters with cooperatives and cooperatives with producers ? seem to act as incentives. Nevertheless, we show that criteria concerning the environmental dimension (reforestation with shadow trees, buffer zones for chemical application, etc.) are hardly complied with by the certified farmers. Indeed, the latter receive few incentives and/or monitoring to really implement these costly and misunderstood technical specifications. In a context where chocolate companies have a strong interest in ensuring the future sustainability of supply (Barrientos, 2012), our results suggest that the RA standard implementation allows them to reduce uncertainty concerning quality and quantity, and to enhance incentives provided to producers. Indeed the implementation of the standard encourages producers through price differentiation and third-party certification, which appears as an independent and more transparent quality guarantee system. In the Ivory Coast context, the increase of producers' trust in contract enforceability and net returns has a strong implication since cocoa producers receive high incentives for switching towards other commercial tree crops, such as rubber trees (Ruf, 2012). On the contrary, the environmental sustainability dimension ? however claimed by the RA standard ? seems to be the fifth wheel in the certification rationality.

?Into the wild?, pedagogical innovation for responsible management?

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Abstract: Increasingly questions are raised about management education and how could business schools' education encourage responsible management. From the literature we see that one of the wanted change is that students would be more connected to the natural environment.
After defining responsible management according to a cross disciplinary study done in 2009, we went on the field to discover a pedagogical innovation: An entire course at the European business school, Rotterdam School of Management Erasmus University is taught outdoors, at a botanical garden. We evaluated whether having a direct contact with the studied environment has an impact on its participants and if it does encourage responsible values towards the environment and ecology. This research uses the grounded theory and shows how impactful is the environment towards sustainable and responsible behaviours regarding environmental issues.

Market-based instruments for nature conservation: from the economic foundations to applications. Empirical results of the first experiments of French habitat banking.

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Led by an international collaboration of representatives from governments, companies, financial institutions and NGOs, the ?green economy' is booming internationally, becoming the ?green rush'. This new ?green economy', beginning from the 1970s and mainly launched from the 1990s, comes with various marketed forms for resolving contradictions between economic development and nature health, either reduce or even stop environmental harms.
Freshly, governments around the world actively implement public policy approaches aimed at halting or reversing environmental decline through internalising at least some environmental externalities. Thus, policymakers have embraced market-based instruments (MBIs) including the mechanism of biodiversity offsets. However, the use of MBI's constitute one particular mode of intervention that differs from other policy instruments.
In France, the mechanism of biodiversity offsets that create a habitat banking on the model of USA, was implemented for the first time in the south of France, in the plain of the Crau (Bouches-du-Rhône, 13), in 2009. Actually, four experimental habitats banking will be implemented shortly in France on the model of the first habitat banking in the plain of the Crau.
Supported by economic foundations, the underlying paradigm of MBIs designs is cost-effectiveness. An instrument is cost-effective when it allows for achieving socially efficient use of environmental resources at the least cost, whether that level is efficient (marginal damage equals marginal abatement cost), by shifting the cost of negative externalities associated resource use to users or polluters.
The theoritical conditions for an efficient market based-instrument are not met in practice. Empirical observations have shown some shortcomings in their regulatory goals and significant scientific uncertainties.
What lessons from market-based instruments enforcement for nature conservation issues, for economics foundations?
Is it possible to find in the internal resources of the economics doctrines, ways to improve the use of market-based instruments for conservation issues?
We assume it is resources in the economic doctrines that must be investigated further to find best ways to use the MBIs to preserve biodiversity.
The aim of this article is to analyze the economics foundation of biodiversity offsets mechanisms in order to situate more precisely this mechanism in the economic theory. Then, within the French regulatory context and its pilot-banking schemes as a case study, we will confront the economics foundations of biodiversity offsets mechanisms and its real applications. Thus, we will discuss the misalignments between theory and practice in environmental design policies in order to find ways to improve implementation of biodiversity offsets. We expand the discussion to the role of agriculture in biodiversity offsets, more broadly, the position of farmland in the development of offsetting mechanisms.
With the prominence in discourses and practice of MBIs and offsetting mechanisms, the aim of this article seems to be a major issue both theoretically and empirically.

Achieving no net loss? Biodiversity offsets and habitat banking in France

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The headline objective of the EU's most recent Biodiversity Strategy is to halt the loss of biodiversity and the degradation of ecosystem services by 2020, and to restore them as far as feasible. In this context, the European Commission announced an initiative under Target 2 of the Biodiversity Strategy ?to ensure there is no net loss of ecosystems and their services (e.g. through compensation or offsetting schemes)'. Determining what no net loss actually means and how offsetting can contribute to it will be critical to designing appropriate policy instruments for reaching the strategy's goals.

Offsets are defined as the last step in a sequence of avoiding, reducing and offsetting or repairing impacts on the environment that is known as the mitigation hierarchy. This hierarchy has been widely adopted as a key instrument for ensuring that environmental issues are properly accounted for in designing and implementing economic and social development policies, plans and projects. In fact, the requirement to avoid, reduce and offset or repair impacts has been central in much of the environmental legislation of the European Union and of several EU member states.

In France and Germany, the mitigation hierarchy was incorporated into environmental law in 1976. However, it remained ignored or ill-applied in France until the inadequate transposition of more recent EU legislation, and in particular the 1992 ?habitats' directive, motivated a stream of successive reforms between 2007 and 2012 which culminated in official guidance built on the concept of NNL published in 2012.

Since 2007, the scope of the mitigation hierarchy of avoiding, reducing and offsetting the impacts of authorized plans, programs and projects, as well as accidental impacts, has been expanded to cover protected species and habitats, wetland functions, as well as landscape-level connectivity. In 2012, requirements in terms of monitoring and effective implementation were also strengthened, with detailed liabilities and penalties for non compliance introduced for the first time.

The workability of these changes has come under scrutiny, not least because of their strong legal and financial implications for developers. They have also revealed knowledge gaps in the methods used for designing and sizing offsets, and the need to clarify the different frameworks under which responsibilities are set in terms of implementation and enforcement. To address these difficulties and streamline offset implementation, France has launched a pilot «habitat banking

» scheme whereby landowners carrying out actions in favor of specific species, habitats or functions ?e.g.through ecological restoration - can sell publicly authorized "credits" to developers with requirements to offset residual impacts on the same target components of biodiversity and ecosystems, and in the same ecological region.

In 2008, the French government launched an experiment with habitat banking, in partnership with a specialized subsidiary of a state-owned sovereign fund called CDC Biodiversité. The company has purchased over 300 hectares of industrial orchards in the Crau area (near Arles, Southern France) and and restored them into natural grasslands that it now manages as breeding and wintering habitat for endangered steppe-land birds such as the little bustard (Tetrax tetrax). The initiative has faced considerable criticism over its expected outcomes (is there a true biodiversity gain?) and the way transactions are made (how are prices set?). In spite of this, the bank has already sold publicly authorized credits to developers, but remains a long way from breaking even. This has raised concerns regarding the economic viability of the operation in a context where biodiversity offset rules have strict requirements in terms of ecological equivalence. In June 2011, the French government chose to expand this experiment to four additional operations in different regions.

With the French regulatory context and its pilot banking scheme as a case study, we will discuss two questions regarding conservation banking. First, we will analyze it through the lens of ecosystem services to pin-point commonalities and differences between the challenges faced by habitat banking and by the broader family of PES schemes. We will critically discuss under which circumstances habitat banking schemes can be considered as providing a well-defined environmental service (the offset requirement) that is being «bought» by at least one service buyer (a developer, which can choose amongst various solutions for offsetting his impacts) who compensates at least one service provider (the habitat bank) under the condition that specified requirements are met (e.g. in terms of ecosystem management and/or ecological metrics describing species or natural habitats).

Second, we will discuss whether the habitat banking scheme can be considered as an ecosystem market, especially with regards to the way offset credits are constructed and their prices set. Comparisons will be made with US wetland mitigation and conservation banking, as well as with the United Kingdom's pilot offset scheme which was also launched in 2012. We will discuss the intertwined technical, financial, legal, and governance issues raised by the implementation of habitat banking in France and we will offer perspectives on the potential for habitat banking to effectively contribute to balancing economic and social development goals with France's stated goal of achieving no net loss of biodiversity.

Environmental compensations and the problem of ? constitutive incommensurability?: a sociological analysis.

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The aim of this paper is to discuss environmental and ecological compensations from the vantage point of sociology. Usually investigated as an object raising scientific and technical challenges, and as the source of regulatory conundrums, environmental compensations have a social dimension as well, to which conflicts of environmental valuation are key.
In their mainstream definition, environmental and ecological compensations always rest on some kind ofcommensuration. In their translation into rules and regulations, environmental compensations are defined through the establishment of various forms of equivalence, from a simple equivalence of surface, to a more complex equivalence of ecosystem functions.
Commensuration, which is produced through the establishment of «conventions of equivalence » (Desrosières 1998), is not simply a technical issue, but as well a moral and political process (Espeland and Stevens 1998). In fact, the conventions of equivalence informing environmental compensation measures defines in what terms what is lost because of the negative impact caused on the environment by a project and what is gained through compensation have the same value. This operation of establishing an equivalence, so to assure compensation, is highly normative: in fact, it entails a privilege accorded to a specific «vocabulary of valuation» in order to define what accounts for a loss and what accounts for a gain. The normative dimension of the technical tools and rules used in order to decide compensations is usually hidden from open discussion. Expert authority based on scientific knowledge is largely assumed as what assures that commensuration is legitimate and compensation is sound.
However, the environments that have to deal with the future impacts to be compensated are not just «green spaces» of natural value but as well «places» (Tuan 1975), socially valued in plural ways by a vast and composite array of social actors. These actors entertain with this specific environments diverse kinds of relationship, from collective and individual interests to intimate attachments. In fact, environments «matter to us» humans for the pursuit of very diverse desirable goods (O'Neill et al. 2008) and the exercise of very diverse capacities required in order to assure these goods. This variety is evidence of a plurality of practical «engagements» (Thévenot 2006) of humans with the surrounding social and material world. These diverse practical engagements account for the wide variety of kinds of valuation we are confronted to when observing situations in which people have to agree on what makes the value of an environment. This means that plural definitions of what makes the «loss» caused by an environmental impact can emerge that account for environmental compensations being denounced as insufficient, inappropriate or unacceptable. Environmental compensation thus becomes a contentious social issue in which the conventions of commensuration established by experts to allow compensation are challenged. New forms of commensuration can be defined through this process, entailing a different way to conceive the loss generated by the impact and how to compensate it. But this process can bring as well to a claim that what would be lost because of the impact is valuable in an «incommensurable» way and no compensation is possible. In this sense, environmental compensation can be judged as unacceptable. In this case, no equivalence is possible between what is lost and what would be gained. We are here confronted to a claim of «constitutive incommensurability» (Raz 1986: 345-353). This concept has been coined, to point to certain social relations and evaluative commitments that are constituted by a refusal to trade them off. Love and friendship are usually invoked as examples of such social relations. Certain relations to the environment have been brought forward as well as examples of constitutive incommensurability (O'Neill et al. 2008). They are linked to a specific engagement with the world on the base of familiarity and they rest on forms of valuation based on personal and collective attachments to places.
To further clarify my argument, I will rely on a case-study, that of the project of extension of the Milan-Malpensa airport (Italy) - situated in the Ticino river park (a UNESCO biosphere reserve) - currently undergoing a procedure of Environmental Impact Assessment. In particular, I will analyze how a group of young local activists actively work to transform a specific environment

- the country road known as «Gaggio street» - into a «place» having a value with no possible equivalence. The specific environmental compensations meant to address the loss of this country road and the surrounding heathland where the airport third runway is planned to be built are rejected by activists as unacceptable. Behind this harsh opposition, there is the individual and collective memory of 40 years of lost struggles sustained by several groups of citizens to limit the airport expansion, a history marked by a lack of transparency in the decision process and an instrumental use of environmental compensations to impose contested infrastructural projects.

References

Desrosières, A. (1998)The Politics of Large Numbers: A History of Statistical Reasoning. Cambridge, Mass.: Harvard University Press.

Espeland, W. N. and Stevens, M. L. (1998) «Commensuration as a social process»,Annual Review of Sociology, 24: 313-343.

O'Neill, J., Holland, A., and Light A. (2008)Environmental Values, London and New York: Routledge.

Raz, J. (1986)The Morality of Freedom, Chicago: Clarendon Press.

Thévenot, L. (2006)L'action au pluriel. Sociologie des régimes d'engagement, Paris: La Découverte.

Tuan, Yi-Fu (1975) «Place: An Experiential Perspective»,Geographical Review, 65(2): 151-165

Mitigation banking for permitted losses of aquatic ecosystems in Florida, USA. A Strategic and institutional analysis

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Overview

In the United-States, the conservation of water and aquatic ecosystems is under the jurisdiction of the Clean Water Act (CWA). The Memorandum of Agreement (MOA, 1990) between the United States Environmental Protection Agency (USEPA) and the United State Army Corps of Engineers (USACE) defined the mitigation hierarchy that requires clients of the project to envisage measures to avoid, reduce and, if possible, compensate for significant adverse effects. Even after avoiding and minimizing impacts, most of the projects cause unavoidable residual negative impacts on aquatic ecosystems and therefore require some compensatory mitigation measures (restoration, establishment, enhancement and preservation). The goal of a final state with not any negative residual impact on the ecosystems is called theno net loss. Three mechanisms for compensatory mitigation exist in the United-States: the in lieu fee mitigation, the permitee-responsible mitigation and the mitigation banking. In 2007, the Water Resources Development Act (WRDA) established a preference for compensatory mitigation from mitigation banking. United-States is now the biggest mitigation banking market. This mechanism allows project developers to purchase credits from a mitigation bank in order to meet the requirements for compensatory mitigation. The mitigation bank must be in the same hydrologic unit but is not necessarily close to the impacted site.

Our communication discusses three things:

- What is the nature of the mitigation banking market (nature of transactions, level of regulation, how credit prices are set)?
- What are the main rules of the game in this market (role of power relationships and trust between stakeholders, weigh of the environmental stakeholders in the negotiations, etc.)?
- What are the ecological efficiency (in term of no net loss of aquatic ecosystems) and the economic efficiency (in term of transaction cost) of the mitigation banking for regulating compensation?

Concept & methods

Ecological and economic efficiency of compensatory measures are assessed through the Strategic Analysis for Environment Management coupled with an institutional analysis (based on transaction cost theory). The objective is to assess what are the main variables influencing the way in which the mitigation measures are carried out and how these variables help, or not, to increase the economic and the ecological efficiency of the compensatory projects.

Little information is available about the nature of the relations between the stakeholder involved in mitigation banking (e.g. conflicts, negotiations, trust, learning effect) and about the setting of credit price. Therefore, we have planned to collect data through three methods:

- Data collection in the RIBITS database (partial information on the bank transactions) (2012);
- First contacts with bank managers by e-mail to collect primary data (2012);
- A field work in Florida, planned at the beginning of 2013, in order to complete quantitative data with qualitative ones.

During the field works various stakeholders will be met in order to carry out interviews with triangulation: mitigation bankers, state and federal regulator (USACE, USEPA, Florida Department of Environmental Protection (FDEP)...), land planners and clients (end users of the banks), academics and scientists, associations etc. An institutional diagnosis will be built from these stakeholders interviews and will help us to better understand their individual strategies.

Results

Florida nearly matches the USACE district of Jacksonville. Compared to other districts, Jacksonville is the 4th in number of banks (85), the 4th in number of transactions (2 648), and the 1st in surface area covered by mitigation banks (200 000 acres). There are only private commercial banks and one in-lieu-fee mitigation. The oldest bank is nearly 20 years old and banks are in average 8 years old.

Our preliminary results (collected by e-mail) indicate that price depends on the quality of the

ecosystem credits, on the availability and the value of lands that are suitable for the development projects and for the compensation projects, on the production costs and transaction costs (depending on their specificity, frequency and uncertainty). Market forces (demand and supply) have a significant influence on the price of the credits. USACE and USEPA also influence the prices through the level of regulation they apply to these markets.

Mitigation Banking is ever evolving, as what was thought of as acceptable just a few years ago is no longer allowed or is not viewed as appropriate. These changes are related to the recent support of the state for mitigation banking (WRDA). Some clues indicate that mitigation banking could increase the likelihood to meet the requirements of no net loss goals for aquatic ecosystems because of three specific characteristics in comparison with the permitee-responsible system: the bank is createdex ante; large scale restoration plans (facilitated by mitigation banks) have more chance to be successful than small scale projects; monitoring and control of mitigation bank regulators is easier since the responsibility of the compensation is concentrated in the hands of few stakeholders. But these results must be validated by field work and need to be compared with other compensatory mitigation mechanisms.

Markets or Payments? Towards a better discrimination between institutional arrangements for biodiversity compensation

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Markets or Payments?Towards a better discrimination between institutional arrangements for biodiversity compensation

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Summary
?Biodiversity compensation' is often viewed as one well defined instrument (an ?ideal type') which can be applied in different contexts based on the same rationale. Yet, as in the case of other market-based instruments (MBIs), we argue that a lot of confusion remains regarding the meaning of the term ?compensation' and thus we call for a clarification of the economic characteristics of the instrument. Applying a theoretical typology of MBIs and building on new institutional economics, we show that so-called ?compensation' initiatives could be better characterized either as market governance or bilateral governance structures, depending on cases. We support our view with a number of empirical cases that illustrate the typology of MBIs specifically for instruments aiming at compensating for biodiversity loss.

Abstract
Market-based instruments (MBIs) have become the center of attention in the field of ecosystem services provision, along with the burgeoning of economic valuations purportedly supporting the implementation of these instruments and better policy-making. Yet, we argue that confusion remains regarding the economic characteristics of these policy instruments, which in reality tend to exhibit a vast range of approaches. The same assessment remains valid for biodiversity compensation and both cases deserve close examination for informing their better use in policy making.
In this article, we first discuss the variety in approaches for MBIs that serve various objectives (whether these expectations are fulfilled in practice goes beyond our scope). In order to give a sense of the variety in approaches, we present a typology of MBIs of our own: six categories are inclusive of all of these instruments ranging from direct markets, tradable permits, or reverse auctions, to contractual agreements with associated payments, regulatory price changes (taxes and subsidies) or voluntary price signals (ecolabelling). With respect to the variety in objectives, they range from providing incentives (e.g. subsidies) or supporting price setting (e.g. procurement auctions), to securing private funding sources (e.g. taxes) or enhancing efficiency with improved allocation of resources and price-setting (cap-and-trade systems, procurement auctions), just to name a few.
Beside, policy instruments operate at different levels and commonly exhibit multidimensionality. As a result, MBIs are to be combined in order to serve a given policy objective; just because they possess different characteristics, face different constraints, generate different risks and enable different outcomes, they usefully interact towards an ultimate objective. For instance, the REDD+ mechanism for reducing tropical deforestation could be viewed as the combination of (i) a cap-and-trade system at the international level if connected to carbon markets, (ii) the implementation of fiscal measures nationally for land use planning, and (iii) payments for ecosystem services to land owners at the local level for conservation and sustainable management.

Each of these layers would have its own rationale and justification, respectively a (theoretically) optimal allocation of efforts among countries, the provision of price signals to roughly orient land use planning towards more conservation, and the provision of incentives tailored to local contexts; but together they all contribute to reducing tropical deforestation.

In fact, the above-mentioned numerous distinctions between MBIs might ? usefully and for the sake of simplicity ? be narrowed down to the opposition between commodity markets and contractual payments. While obviously not keeping track of all information about different categories of MBIs and their dimensions and objectives, this opposition, building on new institutional economics (Williamson, 1979), is fruitful for it points to this very fundamental distinction to be made between two contrasted governance modes (alternatively labeled « institutional arrangements»). Indeed, commodity markets as «market governance» (i.e. faceless transactions of a standard good) differ dramatically from contractual payments as «bilateral governance» (i.e. specific agreement between few agents for a particular issue).

So what does it tell us for biodiversity compensation? Applying such theoretical clarification in a second part of the article, this actually serves as a lens through which one can analyze the very meaning and economic functioning of «biodiversity compensation» based on the study of existing practical experiments and propositions. In the end, this leads to the uncovering of a variety of compensation mechanisms as opposed to one ?ideal type'.

For instance, the principle of «entrepreneurial banking» or «species banking» as put in place in the US, refers to a system whereby project developers must (regulatory) or can (voluntary) purchase biodiversity units in order to compensate their own damages. It thus meets the characteristics of market governance: a market is in place with buyers and sellers of standardized biodiversity units. Alternatively, when intermediaries engage directly (voluntarily or not) into restoration activities for generating biodiversity, they might use agreements with land owners such as «payments for ecosystem services». These transactions thus meet the characteristics of bilateral governance as the contract is tailored for a specific objective. These two examples exhibit so contrasted rationales and characteristics that they must not be confused.

Why are these distinctions useful and go beyond the mere presentation of new fancy and conceptual analyses? Because the term «market» and its derivatives such as «market-based instrument» very often convey prejudices and reactions which appear misled in many instances. Instruments for biodiversity compensation are no exception here, and prejudices, going both directions ? very promotional or sharply critical ? are equally detrimental to policy making. Therefore, we argue that using appropriate terms that relate to specific characteristics for a given instrument informs stakeholders about its positive prospects (which ones?) as well as risks (which ones?); it is thus an essential prerequisite to good communication and hence sound policy making.

Advances in research for extended recognition in environmental justice conflicts

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There is an increased understanding of the diverse dimensions of environmental Justice in ecological distribution conflicts (Schlosberg (2003, 2007). Accordingly, the claims of environmental justice organisation include: (i) equity in the distribution of benefits and environmental burdens, (ii) recognition of identities, worldviews and rights involved, and (iii) participation in decision-making. Additionally, there is also a claim against the threats to the communities functioning and capabilities.
This communication mainly reports the common grounds about the recognition issue from two large FP7 projects currently promoting collaborative research on environmental justice conflicts. ICTA UAB participates in both projects.
EJOLT (Environmental Justice Organisations, Liabilities and Trade, www.ejolt.org) supports the work of Environmental Justice Organisations, uniting scientists, activist organisations, think-tanks, policy-makers from the fields of environmental law, environmental health, political ecology, ecological economics, to talk about issues related to Ecological Distribution.
ENGOV (Environmental Governance in Latin America and the Caribbean: Developing Frameworks for Sustainable and Equitable Natural Resource Use, www.engov.eu) focuses on the obstacles and possibilities for sustainable production systems that can generate both economic development and a more equitable knowledge input and distribution of benefits across ethnic, socioeconomic and gender lines in order to decrease poverty, exclusion, and environmental degradation in the region.
Some of the common insight so far:
As in other social movements, recognition as a legitimate partner in the debate is as important as the distributional outcome. In environmental mining conflicts, lack of recognition would be expressed through the devaluation of individual and collective rights of the communities by the promoters of external projects. In particular, activists groups argue that the approval of extractive projects entails misrecognition of local communities' material and cultural dependence on agriculture and local water sources (Walter and Martínez Alier, 2012). Interestingly enough, the review of the misrecognised actors allows portraying the evolution of the environmental justice debate itself, from consideration of fundamental rights of disregarded minorities and communities to the recognition of new subjects of rights, such as Mother Nature (Ozkaynak and Rodriguez-Labajos, 2012). As the concept travels and is being appropriated by new collectives and communities, the concept itself evolves. For instance, as the communities are informed about their rights, they claim the right of these ?new' rights to be recognised (e.g. women rights). At the same time, communities introduce their terminologies and worldviews in the conceptualisation of environmental justice (e.g. the recognition of the right to the'good living').
References
Gerber, J.F. 2011. Conflicts over industrial tree plantations in the South: who, how and why? Global Environmental Change, 21 (1) (2011), pp. 165?176
Giljum, S., 2004. Trade, materials flows, and economic development in the South: the example of Chile Journal of Industrial Ecology, 8 (1?2) (2004), pp. 241?261
Martinez-Alier, J., Kallis, G., Veuthey, S., Walter, M., Temper, L., 2010. Social metabolism, ecological distribution conflicts and valuation languages Ecological Economics, 70 (2) (2010), pp. 153?158
Martinez-Alier, J., Healy, H., Temper, L., Walter, M., Rodriguez-Labajos, B., Gerber, J.F., Conde, M., 2011. Between science and activism: learning and teaching ecological economics with environmental justice organizations Local Environment, 16 (1) (2011), pp. 17?36
Moore, J.W., 2000. Sugar and the expansion of the early modern world-economy: commodity frontiers, ecological transformation, and industrialization. Review, 23 (3) (2000), pp. 409?433
Moore, J.W., 2003. The modern World-system as environmental history? Ecology and the rise

of capitalism. Theory and Society, 32 (2003), pp. 307?377
Muradian, R., Walter, M., Martinez Alier, J., 2012. Hegemonic transitions and global shifts in social metabolism: Implications for resource-rich countries. Introduction to the special section, Global Environmental Change. 22(3), pp559-567.
OCMAL, 2011Base de datos de conflictos mineros. Observatorio de Conflictos Mineros de América Latina (2011) http://www.olca.cl/ocmal/
Özkaynak, B., Rodriguez-Labajos, B. (coord) , Arsel, M., Avc?, D., Carbonell, M.H., Chareyron, B., Chicaiza, G., Conde, M., Demaria, F., Finamore, R., Kohrs, B., Krishna, V.V., Mahongnao, M., Raeva, D., Singh, A.A., Slavov, T., Tkalec, T., Yánez, I., Walter, M., ?iv?i?, L., 2012. Mining Conflicts around the World: Common Grounds from Environmental Justice Perspective, EJOLT Report No. 7.
Perez Manrique, P., Brun, J., Gonzalez-Martinez, A.C., Walter, M., Martinez-Alier, J., 2012. The Biophysical Performance of Argentina (1970?2009). Journal of Industrial ecology (in press).
Russi D., Gonzalez-Martinez, A.C., Silva-Macher, J., Giljum, S., Martinez-Alier, J., Vallejo, M. C., 2008. Material flows in Latin America: a comparative analysis of Chile, Ecuador, Mexico, and Peru, 1980?2000. Journal of Industrial Ecology, 12 (56) (2008), pp. 704?720
Schandl, H.,West, J., 2010. Resource use and resource efficiency in the Asia?Pacific region. Global Environmental Change, 20 (2010), pp. 636?647
Vallejo, M.C., Pérez Rincón,M.A., Martinez-Alier, J., 2011.Metabolic profile of the Colombian Economy from 1970 to 2007. Journal of Industrial Ecology, 15 (2) (2011), pp. 245?267
Walter, M. and Martínez-Alier, J., 2012. Social metabolism, ecologically unequal exchange and resource extraction conflicts in Latin America. Analytical framework and case Studies. 27 p. Available at http://www.engov.eu/files/ENGOV_AFR_WP7_ICTA.pdf

The Political Effects of a Depoliticizing Mission ? Hydropower and Environmental Conflict in Sikkim, Northeast India

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Summary:
Commodification of Himalayan hydroscapes through hydropower development agendas creates new and distinct environmental conflicts, with unintended political effects. Adopting a political ecology perspective we scrutinized popular quiescence in Sikkim, Northeast India, vis-à-vis a State-led initiative to sell and dam the majority of the state's river flow. Popular responses were found to be muted partly by a combination of factors rooted in Sikkim's ethnic-political history, political economy and geographical isolation. This research also unveiled, however, that attempts by a techno-managerial State-private nexus to discursively and materially promote hydropower by means of depoliticization, expertocracy and high-handed environmental decision-making, have had the effect of re-politicizing dead-locked state politics. Locating the Sikkim case within the broader study of environmental conflicts and post-politics, we argue that new dynamics in the global large-dam scenario require new ways of theorizing environmental conflict.

Abstract:
Intro & Context: The commodification of entire Himalayan hydroscapes through the advancement of hydropower agendas creates new and distinct environmental conflicts, with unintended political effects. For decades, dam-building ambitions in India have created large-scale, sustained and heated conflicts. Civil society groups in diverse localities have mounted consolidated anti-dam mobilizations, often fermenting into larger social and activist movements. The Himalayan state of Sikkim, about to become one of the country's main hydropower pillars, appears a peculiar outlier in this respect. As national drive for energy security has prompted a rapid expansion of hydropower development into these ?untapped', isolated parts of the Himalayas, the Sikkim state government has been at the forefront of allocating 20+ hydropower projects to over 20 private and public power producers. While this bid to sell off, dam and divert through underground tunnels the bulk of the state's rivers has met only localized and sporadic popular resistance, the current hydropower development era has also seen a re-politicization of dead-locked state politics and State-society relations.
Research & Findings: This study originally set out to understand the paradox of relative popular quiescence in the face of high-impact State-led hydropower development. Adopting a political ecology perspective, we found that factors influencing societal responses are Sikkim's unique history of ethnic fragmentation and strong center-State-society dependencies (a legacy of British colonial influence and Sikkim's complex geography); its only recently initiated and therefore muffled experience with democratic politics; as well as the Government's active suppression of conflict by building on historical patronage relations and manufacturing popular consent. This research also unveiled, however, that attempts by a hegemonic, techno-managerial State-private nexus to discursively and materially promote hydropower by means of depoliticization, expertocracy and high-handed environmental decision-making, have profoundly politicizing effects. Thus in contrast to the widespread and long-standing popular acquiescence with the state-led development agenda (including dams), collective local advocacy movements struggling against hydropower development and other types of state intervention have proliferated in recent years. Moreover, there are visible signs of popular discontent with the autocratic governance strategies of the single-party government in power for nearly two decades.
We argue that this rise in emancipatory-democratic awareness, and the ensuing acceleration of civil society formation, must be seen as outcomes of the politicized environment that has been created around hydropower, and which has created deep-seated apprehensions among local communities and civil society groups. These latter refer to the current mode of governance of hydropower development, whereby for the sake of rapid capital accumulation and economic growth the state's resources are appropriated and commodified at will, while local development and sustainability concerns are sidelined. Secondly, the intrusion by private Indian companies

into the sacred heartland of the former Buddhist-animist kingdom, have stirred fears about the erosion of indigenous identity and sovereignty. Third, the state's at times autocratic and unyielding reaction to, and management of, the first nascent dam conflicts has not only raised concerns about the constitutionality of its methods of government, but has led to a cold stand-off between the conflicting parties. This has further helped to politicize the dam issue. Finally, the run-of-the-river dam technology ? an unusual dam layout with damaging effects on long stretches of riverine environments and adjacent hill-slopes ? and its implementation in a gradually expanding, network-like pattern can themselves be considered physical drivers of political change.

Theoretical Approach, Conceptual Implications and Conclusions: From a political ecology perspective this paper seeks to locate the Sikkim hydropower conflict(s) within the broader study of environmental conflicts. As such, it seeks to contribute to the question of why and how environmental conflicts emerge, particularly around large infrastructure projects which are framed as being in the interest of regional and national, social and economic development. Specifically, we try to contrast the outcomes of the Sikkim hydropower conflicts with previous ways of looking at environmental conflicts, either as «ecologized political conflicts» or as « politicized ecological conflicts». We thereby posit that new dynamics in the global large-dam scenario (expansion of hydropower frontiers, new hydro-promotion strategies, private sector involvement, complex novel dam technologies, speedy/simultaneous and network-like implementation of projects) require new ways of theorizing about environmental conflicts.

Thus we take issue with Robbins' (2004) representation of environmental conflicts as pre-existing political differences between social groups (in terms of gender, class, ethnicity) becoming ecologized, or as new political divisions emerging from existing ecological conflicts. We suggest that the Sikkim case study unveils further conflict dimensions which are not adequately captured. For one, theorizing about environmental conflicts must take into account actors at multiple levels. In Sikkim the dam conflict eventually played out between state, private-corporate and community actors. We posit that environmental conflicts between such heterogeneous groups of actors, rather than creating further social divisions have the potential to unite groups across ethnic divides. This allows the politicization of environmental problems while constituting at the same time a new force for political (and as a consequence social and environmental) change. Moreover, a conflict analysis must not preclude conflicts which do not visibly manifest themselves (or fail to do so homogenously across space and time) in the ?usual' scenario of violence and vociferous protest. Especially in states undergoing democratic transition, where civil society as a vociferous political actor is poorly developed, or in cultural realms where the use of violence has no strong historical roots, making sense of less vocal environmental conflicts requires a different lens. The Sikkim case also shows that political emancipation, where it is not manifest, may be actually the unintended outcome of environmental conflict, thereby serving in a critical way the re-distribution of powers in political-environmental struggles.

Leading on from this notion of (re-)politicization as an unintended outcome of environmental conflict, and based upon an in-depth analysis of the politicized environment created through and around Sikkim's hydropower mission, we then discuss to what extent the Sikkim scenario mirrors the key-tenets of the post-political and post-democratic condition. Hitherto, theorizing on the post-political (Mouffe 2005; Swyngedouw 2011) has mostly ascribed this condition to the context of industrialized democracies in the global North. We argue that many aspects of post-politics are part of a larger neoliberal hegemonic project which, through its global outreach (particularly in the realm of environmental governance) extends well into geographically isolated local settings, including in young transitional democracies as Sikkim. Interestingly however, while the post-political project is presented as undermining the ?democratization of democratic politics', in Sikkim it appears to stimulate the political and democratic process and its instruments. Such a take on post-politics and post-democracy then requires us to rethink these notions as potential drivers of emancipatory-democratic politics with profoundly politicizing outcomes.

References:

Mouffe, C. (2005) On the political London: Routledge

Robbins, P. (2004) Political Ecology: A Critical Introduction Malden: Blackwell

Swyngedouw, E. (2011) ?Interrogating Post-Democratization: Reclaiming Egalitarian Political Spaces' inPolitical Geography30 (7): 370?380

International environmental regimes Critical analysis and avenues for future researches

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International regimes theory developed in the late 1970s and early 1980s, and constitutes one of the branches of the ?neo-neo' consensus (Waever, 1997) in International Relations. The notion of «international regime» starts with the idea of a world without hegemony. In this context, the coordination between States becomes more difficult; however cooperation between States can lead to the constitution of «international regimes». Krasner's (1983) definition of international regimes remains a reference point today for both advocates and detractors of international regime theory: international regimes are«implicit or explicit principles, norms, rules, and decision-making procedures around which actors' expectations converge in a given area of international relations» (Krasner, 1983: 1).
The application of international regime theory to environmental issues began in the 1980s in particularly with the publication of Oran R. Young's bookInternational Cooperation. Building regimes for natural resources and the environment(Young 1989). As indicated by the title of this book, International regime theory had indeed found in environmental issues a fertile field of application. Notably in transboundary water issues, the theory has gained a progressively larger audience both in academia and in the operational field of international relations relating to the environment (Lindemann 2008, Blatter 2009).
Nonetheless, the methodological framework typically used to analyze international environmental regimes remains individualistic, and is based on the behavior of States or multilateral actors acting as individual rational actors in the international arena. Moreover, this theory assumes that States are the main actors of international relations, backgrounding the strategic role of others actors such as firms or NGO's (though see e.g. Haufler). This lack of concordance with actual relations and processes has led to assignment of progressively greater importance to other aspects, such as recognizing the role of key stakeholders in other societal arenas. The role of epistemic communities (Haas, 1989), for instance, can be seen as an attempt to integrate more effectively networks of international actors that are composed of scientists, decision makers, and policy-makers in the building of international environmental regimes.
This process poses important questions: (a) Precisely how have environmental issues been addressed by international regime theorists? (b) What are the primary hypotheses driving theorization and case study research in this area? (c) Which kinds of environmental issues have been analyzed and with what results? (d) What are the main strengths and weaknesses of international regime theory in understanding the processes involved in the building, development and performance of institutions designed to manage each regime? (e) Are there environmental issues which have not been addressed by this approach and why? (f) Can we distinguish several schools of thought or is there a strong unity among the authors who have used this approach? (g) Are there alternative ways to address international environmental regimes, based on radically different methods and hypothesis? (h) Does common patrimony provide a useful alternative or adjunct to international regime theory for addressing environmental issues affecting more than one country?
This paper summarizes the history and development of international regimes theory in the field of the environment, and characterizes it in methodological, epistemological and ideological terms. We then argue that another way to understand international regimes can be built based on the notion of common patrimony, which is a more holistic approach that explicitly recognizes the role of all the stakeholders (who are members of an international community) in the building and development of international environmental regimes.

An International Water Regime? The case of the river Scheldt

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Short Abstract:
This paper contextualizes the case of the river Scheldt in the framework of two different scales of water regimes: a) European Union (EU) level water regime, in the context of the Water Framework Directive, and b) the International River Basin governance regime in the context of the International Scheldt Commission. The establishment of these international water institutions was predicated on the assumption that cooperation could be politically feasible and therefore the regime formation could be viable. However, the history of the Scheldt international river is surrounded by years of intensive negotiations between different stakeholders, agreements/ disagreements («learning»), and eventual fighting. The authors argue that the collective-collaborative joint vision from different stakeholders is not immediately achieved by default once the water regime is set. Moreover, the State-centered approach of international regimes, need to be completed by local analysis to properly understand and implement international agreements. This approach will give prominent importance to local variables related to the institutional contexts of locally managed water resources.

Long Abstract:
The «international regime» framework makes it possible to understand how international equilibrium between States can be reached in a given political topic. An international regime on a given issue-area can be defined as a consistent set-up of principles and norms of management on the one hand, and decision making rules and procedures on the other hand, at global level (Krasner, 1983). The framework has traditionally been applied to issue-areas such as security, finance, or human rights. However, the rise of environmental damages and the increasing awareness of the impact of human development and economies on the environment, in particular at the international level, call for an application of the international regime framework to environmental issue-areas. Many works have then been conducted in environmental issue-area as a whole, or in particular environmental domains including fishery regulation, biodiversity management, or energy production. Here, we propose to focus on the formation and the dynamic of an international regime of water management.
Water management presents some characteristics making case studies illuminating as regard to the international regime approach, in particular applied to environmental issue-area: water is at the same time a resource in itself (for energy production, for transportation, for water uses...), and an ecosystem that conveys secondary resources (e.g. fish) and may be affected by pollutions; water is inscribed in a geographical space of regulation; and in the case of rivers, the biophysical properties of water (as a stream) define asymmetry between upstream and downstream stakeholders. As a result, analyzes need to account for the interplay between biophysical features of water, human uses, and institutional dimensions of management. Furthermore, there is no international convention operating in the field of water management, which weakens the

possibilities of an international regime? This implies to focus on the local processes of cross-border coordination.
More generally, we argue that the State-centered approach of international regimes ? i.e. the idea that the States can be treated as individuals with their own interests, power capacity and knowledge, need to be completed by local analyzes to understand properly international agreements. In this regard, and following Conca's suggestion (2006), our purpose will be to base our analysis of international water regimes on a specific river: the Scheldt River. This approach gives prominent importance to local variables related to the institutional contexts of locally managed water resources.
There are three aspects to consider while focusing on the cross-border agreements. Each of them has not been properly addressed in the international regime framework.
1. International regimes or local cross-border regimes are not the same, in the sense that they do not rely in the same way on the same causal variables. For instance, it is fair to assume that at local level, cultural variables ? i.e. custom and usage, are more relevant, and may balance variables such as interest or power. When culture is shared on both sides of the borders, this may also facilitate agreements. Stakeholder approach may then be useful to assess the ways in which variables are relevant for local cross-border agreements.
2. The State-based approach of international regimes can be challenged by adopting a systemic approach of agreements. The key variables defining the shape and the scope of international agreements are embedded within in a wider structure. Moreover, given the geographical, resource, population dimensions of water management, all these systems are part of a territorial system. As a result, the power system coevolves with the interests system, with the knowledge system... They all are jointly determined.
3. Taking into account the local contexts, i.e. the key variables at local level (including their dynamics), also requires putting local variables face to face with the international variables and see how they influence or compete with each other. This multilevel approachof cross-border agreements has two dimensions:
- The causal variables are also locally grounded, i.e. local actors influence international agreements (e.g. local interests, local knowledge, local norms...)
- States are not only individuals, but also collective entities, which requires at the State organizational level that there is an agreement upon the (political) objectives, but also the (technical) means to be implemented to achieve them.
Using a case study, it is argued that local approaches of IR are preferable to the global ones, especially when dealing with environmental issues. In regard to Scheldt management, we would say that we rather face an international water regime than an international regime of water. Finally two main implications are outlined. First, a locally based approach of international water regime needs an interdisciplinary method in order to better understand the local contexts and dynamics water management fits in: an historical perspective is necessary to replace the coordination problem in the processes of agreements-conflicts perspective (genealogy); studying the texts of the international treaties and conventions, illuminates the tensions in norms and principles between local and global levels (hermeneutics); field inquiry are fundamentals, on the one hand to capture the features of local contexts and, on the other hand to assess the consistency of decision-making procedures and rules of management, their effectiveness, and the possible conflicts in locally grounded norms and principles in regard to the international ones (socio-economics methods). Second, since there is only local cross-border coordination of water management, international comparisons are vital. They will allow highlighting the cultural dimension (custom and usage) of coordination which until now has not really been considered as an important variable in the formation of international regimes. And since water management is a global matter, it will enable bridging local cross-border agreements between them. The condition for an international regime of water to exist, would be that patterns of local management are consistent the ones with the others, in regards to the quantity and quality requirements of water at the global level.

Transboundary Ecosystem Services identification and assessment : Preliminary results of field studies on the Scheldt (France, Belgium, The Netherlands)

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Research project Riparia stresses the importance of riparian areas, which are transitional semi terrestrial areas that are regularly influenced by fresh water, extending from the edges of water bodies to the edges of upland communities (Naiman et al., 2005). Riparian areas can contribute to cooperation between countries in the management of natural resources and ecosystems. Research project Riparia includes the river Scheldt, which has its source in the north of France and runs through western Belgium and the south-western part of the Netherlands towards the North Sea. Hence, the river Scheldt can be called a transboundary river (Muelig, 2012).
For France, the main important concerns regarding the Scheldt river basin include water quality, groundwater resources and economic development of the region. The interests of the Flemish are the water availability and water quality, the ecological development of the water system and the accessibility of Antwerp harbour. For the Netherlands it is important to keep the unique character of the estuary of the Scheldt, e.g. improvement of water quality, bird-breeding sites, sediment quality and keeping the water gradient. Recreation is also of interest. Therefore, policy of safety against flooding and calamities from ships with dangerous loads is important. Further interests include industry and keeping Rotterdam's position as international harbour (Ruijgh-van der Ploeg and Verhallen, 2002).

River Scheldt complexity and regime

The Scheldt is 355 km from St Quentin (F) to Flushing (NL), out of which the 160 km from Ghent are the tidal Scheldt. A rainfed river, extremes are large, necessitating a lot of diversion works to level flood peaks yet guarantee minimum flow for shipping, Some 60% is diverted before Ghent, most of it to the Ghent-Terneuzen channel.
The area from Ghent to around Antwerp is densely populated and industrialised, much of it also canalised. The Dutch part is much quieter, with tidal flats and saltmarshes creating a varied ecosystem. The highly complex morphology of the estuary means interventions have large and unpredictable effects

Relations on the river Scheldt focus especially on the tidal area (estuary). Belgium and the Netherlands have had a troublesome history over the shared estuary of the river Scheldt, ably described in Meijerink (1999). While navigation was the main bone of contention for centuries, the negotiation arena was widened and ´greened´ with the launching of Belgian project and the downstream Netherlands resorting to linkage politics - river deepening, water quality, water allocation. Scheldt water is not treated in Belgium and the Scheldt has oscillated between hypoxia and anoxia.
The agreement first reached would put all costs and nuisance on Wallonia, where storage reservoirs were to be built. In 1993 an agreement was reached on the whole package and water quality started to improve.
The highly complex morphology of the estuary means interventions have large and unpredictable effects, inciting environmental conservationist NGOs to resist channel deepening interventions.

From 1998 on, joint efforts, both NGO and governmental, to arrive at a joint vision led to a Dutch-Belgian covenant in 2005, with plans to strengthen ecological connections between the Netherlands and Belgium, and make space for the river by depoldering as compensation for environmental damage of deepening the fareway in a site of special scenic interest (SSSI). Local Dutch (citizen and agricultural) protest, incited by the trauma of flooding in 1953, was successfully upscaled led to diplomatic incidents between the Netherlands and Flanders recently. The decentralisation of the Belgian state has given prominence and authority to regions.
This is relevant as there is a lot of practical day-to-day cooperation between the bordering regions. Now that the dispute over inundating the neighbouring Hedwige polder has for the moment been settled, the political space may open up for cooperation on ecological services.
Along the Scheldt River the research project Riparia has appointed several hotspot areas that are of environmental importance Het Verdronken Land van Saeftinghe, the Condé-Pomeroeul canal and the chabaud Latour site.
Saeftinghe is pronounced as a nature reserve area and includes transboundary ecosystem services. Managing these services is complex, various stakes play a role which makes decision making challenging. Decision making involves political, social, environmental and economic drivers which gives this case a certain complexity.

The two other case studies concern transboundary riparian services between Belgium and France. In this case, we are interested in transboundary river management. A focus on a section of the Scheldt River that runs in France and whose pollution policies may affect the Belgium part of the River has been chosen. Indeed, when national policy implement more environmental protection, then, the benefits drawn from this policy may spread far beyond the targeted area. Hence, in our approach, focusing on such a section of the River may allow to consider situations where downstream countries benefit from another's efforts to protect the environment; and hence, might think interesting to foster cooperation between the two (or more, here three with the Netherlands) countries.

Methodology

We aim at comparing the way ES are identified and represented in our two cases. In France, The focus will be more related to pollution from the industrial past of the northern region and its flow downstream (Condé-Pommeroeul canal). But not only, since this research project concentrates on ecosystem services, a focus point could relate to transport issues in northern Europe (multimodal transport systems using water ways), or recreational activities for local populations and tourism (as an entry point for civil society involvement in local environmental issues related to the River Scheldt) (Chabaud-Latour site).

The first step is to identify and represent ES. Firstly a literature review will be done about the question of identification and evaluation (Leslie and al. 2012). Secondly we will discuss the possibility to assess ES through quantification rather than evaluation.
We then aim at building a methodology which considers a stakeholders perspective rather than a service and utility centered point of view.
Our data will come from interviews with involved parties on the questions which ecosystem services the area delivers and which are considered to be of vital importance. These will be mapped using GIS, providing an overview of the various points of views, and showing the various stakes and interests. We will then compare the different values or assessment principles engaged about ES.

Addressing Trans-boundary Spatial Subsidies in Ecosystem Services: Mexico-U.S. Institutional Innovations for the Colorado River Delta

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Major rivers of every continent have been dammed or diverted for human use, and river delta ecosystems typically subsist on «incidental» and inadequate water flows ? diminishing these ecosystems (Jolly et al. 2008) and the multiple services they provide (Zedler & Kercher 2005). River deltas are particularly vulnerable to the cascading effects of water diversions and choices made by upstream decision makers and nations.

We examine institutional innovations to respond to spatial subsidies in ecosystem services provided by river deltas, drawing upon our extensive research in the Colorado River Delta. We propose new incentive mechanisms to address spatial subsidies and financially support provision of trans-boundary ecosystem services (Lopez-Hoffman et al, 2009). The concept of spatial subsidies linked to migratory species moving across jurisdictions was developed by Semmens et al. 2011 and Lopez-Hoffman et al, 2013.

The Colorado River originates?and diversions from it largely occur?in the U.S. However, its delta lies in Mexico. In both nations, water is allocated from the river primarily to support agriculture, with little water specifically allocated to environmental needs (Zamora & Flessa 2009). The Delta provides ecosystem services to both the U.S. and Mexico in the form of the cultural services, such as recreation and ecotourism; provisioning services, such as fish, food, and fiber; and supporting services, such as wildlife habitat (Millennium Ecoystem Assessment 2003). Just as the water supplies to the Delta are incidental, the resulting ecosystem services are incidental (not secure in the future) without dedicated water sources (López-Hoffman et al. 2009a, 2010). Adding urgency are the severe hydrological effects of changing climate on this region. Climate change is magnifying historical variations in annual and seasonal water supplies and exposing the region to more severe drought and devastating floods (Christensen & Lettenmaier 2007; Ray et al. 2008; Zamora & Flessa 2009).

To sustain the Colorado River Delta and its ecosystem services through dedicated water allocations, Mexico and the U.S. must grapple across national boundaries with multiple «wicked » political, economic, and social questions (Conklin, 2005). Our paper focuses upon institutional innovations to secure water for the Colorado River Delta. We examine new incentive mechanisms to balance water needs, and innovative approaches to link ecosystem-service provision to economic incentives and trans-boundary governance. Clarifying relationships among governance, water allocation decisions, and the provisioning of ecosystem services is an essential step toward developing more effective models of adaptive water governance. While we analyze one of the most intensively «plumbed» and utilized river systems in the world, our approach is applicable to other complex trans-boundary ecosystems.

Our paper identifies beneficiaries of delta ecosystem services and develops incentive-based approaches to link support for ecosystem services production in the Colorado River Delta with beneficiaries of services in the United States and Mexico. We analyze the types of benefits received, and examine incentive pathways for each group to contribute financially to providing water to sustain Delta ecosystem services. Well-designed funding mechanisms can transform incidental ecosystem services from the Delta into ecosystem services supported by dedicated water supplies. Incentive mechanisms are urgently needed to address the pressing problem worldwide of «incidental spatial subsidies» in which some regions provide seasonal habitat for migratory species which contribute benefits to other regions. Through careful incentive mechanisms, «incidental spatial subsidies» are transformed to «contractual ecosystem service flows». These mechanisms require innovations in bi-national governance and policies.

Incentive-based mechanisms to facilitate provision of ecosystem services fall into several broad categories: cap-and-trade, direct payments to resource users and managers, and voluntary self-regulating agreements among resource users and communities (Kinzig et al. 2011). All three types of mechanisms are applicable and addressed in our paper. For instance, water banks and habitat banking are cap-and-trade type mechanisms, payments to farmers to reduce irrigation consumptive use fall under the direct payments category, and habitat provision on private and public lands bridges the second and third categories. We hypothesize that all three mechanism types can be mutually reinforcing in supporting delta ecosystem services (Colby 2000). Transnational water banks and habitat banking are consistent with recent institutional innovations between Mexico and the U.S.

Our paper focuses upon four beneficiary groups and types of value: (1) cost savings to the United States for legally mandated endangered species protection, (2) cost savings to developers for habitat banking in Mexico, (3) cost savings to US water users from supporting water conservation practices in Mexico and (4) benefits to nature-based recreationists who visit the Delta. Each of these are discussed in turn below.

Multiple laws compel the U.S. to protect native species and their habitat affected by Colorado River water diversions in the U.S. Many public agencies are working to recover species and their habitat. We hypothesize that the U.S. can experience cost savings by more effectively accomplishing habitat restoration in the Mexico portion of the LCR Basin, as compared to current activities attempting to restore habitat in the U.S. portion of the LCR. We believe these savings are obtainable for the following reasons: a) lower labor costs in Mexico for restoration activities, and b) lower land costs in Mexico, including the opportunity cost of dedicating lands to habitat rather than using it for alternative commercial purposes. In Mexico, a consortium of U.S. and Mexico-based NGOs already has begun engaging in riparian restoration in the Rio Hardy (Zamora-Arroyo et al. 2008). We propose a methodology to assess costs savings to the United States of restoration in Mexico, and to compare the value of habitat restoration in the United States and Mexico.

Developers in the United States, our second beneficiary group, likely would be willing to pay for habitat banking in Mexico. If bi-national policies are altered to allow this, this would be a valuable mechanism to meet mitigation requirements for new land uses and developments activities in the United States. Because there are no current mechanisms in place to allow for cross-border habitat banking, we propose public innovations and criteria that could allow some habitat impacts in Arizona and Southern California and southern Nevada to be compensated by habitat restoration and protection in Mexico.

Water users in the U.S. are our third beneficiary category. Large urban water providers are urgently seeking additional supplies to improve supply reliability under the projected negative impacts of climate change. A new bi-national agreement allows for payments from U.S. water districts to agricultural water users in Mexico in order to support improved water management and conservation. Water savings thus produced can be credited to U.S. water districts for this use, under an innovative bi-national water banking system.

Recreationists who visit the Delta for birdwatching, hunting and other activities that rely upon habitat preservation in the Delta ecosystem are our fourth category. We summarize recent findings measuring willingness to pay by these groups and recommend payment mechanisms to effectively support the services valued by these beneficiaries.

Analysing the Patterns of collaboration in ?Ecological Economics? by Means of Social Network Analysis (SNA)

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Following NEWMAN (2004) co-authorship networks depict on the one hand the scientific community as a social network per se and on the other hand they represent a knowledge map of a scientific field. Therefore they provide clues about the internal cohesion of the scientific field and contain valuable information about key-authors, who are of high structural relevance. These aspects are of special interest as the methods and approaches used in the inter- and transdisciplinary field of Ecological Economics are heterogeneous.
The aim of this bibliometric study, was to analyze the coauthorship network of the Journal ? Ecological Economics« by means of social network analyses. The nodes in such networks represent authors, and two authors are connected by a line if they have coauthored one or more papers together. We use ?Pajek« (© Batagelj & Mrvar, 1996-2011), a program for the analysis and visualization of large networks, to conduct this study.
The bibliographic data was collected from the ?ISI Web of Knowledge«. All articles, which were published in the scientific journal «Ecological Economics« in the period from 1994 ? 2009, were used to create a co-authorship network consisting of 3319 authors.
The macrostructure of the network reveals that 808 of all authors build up a giant component, which can be interpreted as the ?core« of authors. This large component displays a clear centrum-periphery structure, which is a typical phenomenon of scientific collaboration networks (MUTSCHKE, 2004; JANSEN, 2006). Furthermore the most central authors were identified by the means of three important network-analytical measures, namely degree-, betweenness- and closeness-centrality.
This analysis revealed that one of the two founders and the chief editor of the Journal represent the most central author according to the three centrality measures. Additionally, by the means of a time slice analysis, it has been shown that the identified most central authors played a major role in the development and establishment of the co-authorship network. This can also be seen as a main step forward to the establishment of the scientific discipline Ecological Economics. Further key findings show that authors, who have the same institutional background, are more likely to collaborate several times with each other. This leads to the establishment of geographical respectively institutional clusters of authors within the giant main component.

De Nooy, W., Mrvar, A. & Batagelj, V. (2005): Exploratory Social Network Analysis with Pajek; Cambridge University Press; New York; 334 S.
Jansen, D., (2006): Einführung in die Netzwerkanalyse: Grundlagen, Methoden, Forschungsbeispiele; 3. Überarbeitete Aufl.; Wiesbaden 2006: VS Verlag für Sozialwissenschaften/GWV Fachverlage GmbH, 312 S.
Mutschke, P. (2004): Autorennetzwerke: Netzwerkanalyse als Mehrwertdienst für Informationssysteme; in: Bekavec, B., Herget, J., Rittberger, M. (Hg): Informationen zwischen Kultur und Marktwirtschaft. Proceedings des 9. Internationalen Symposiums für Informationswissenschaften (ISI 2004), Chur, 6.-8. Oktober 2004. Kostanz: UVK Verlagsgesellschaft GmbH 2004. S. 141-162;
Newman M. E. J. (2004): Coauthorship networks and patterns of scientific collaboration; In: PNAS Vol. 101, 5200-5205

Ecological economics: transdisciplinarity in question. A social network analysis of co-publications

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Short Abstract:
This presentation analyzes the evolution of transdisciplinarity within the community of ecological economics. Using underexploited data until now, we used the methodology of the social network analysis to study the evolution of the network of co-publications in the journal «Ecological Economics». After having describing the global characterization of the networks during 4 periods, the role of authors that have key positions (central or intermediate) in the co-publications' network of each periodis assessed regarding their background and career-path. Results suggest that the ecological economics community is more scattered and that actors having key position do not centralize or intermediate for transdisciplinarity. Reasons may be that the editorial choices prioritize other criteria over transdisciplinarity, or that more and more authors define themselves as «ecological economists».

Long Abstract:
Background
According to Ropke (2004), the journal Ecological Economics is the primary institution designed by the pioneers of the ecological economics movement in order to structure the community. Among others, an important reasons for creating this movement, was to fill a gap in the scientific knowledge: nor ecology, neither economics provided methods, theories or political recommendations to understand and properly address the ecological crisis that became obvious in the 70's. In the early papers published by the journal, the need for transdisciplinary work was put to the fore (e.g.Noorgard, 1989).
Since then many analysis of the extent to which Ecological Economics actually promote transdisciplinarity were conducted. Studies mostly concluded that the journal remains dominated by economists (Costanza and King, 1999; Luzadis et al., 2010). Likewise, Kastenhofer et al. noted that between 2000 and 2009, Ecological Economics published a «high proportion of purely quantitative studies with a rather reductionist scope» (Kastenhofer, 2011: 842). Citation analyzes also suggest that Ecological Economics share references with well-established environmental economics journals (Ma and Stern, 2006).

Objectives
In this respect, our purpose will be, (i) to analyze the various conceptions of transdisciplinarity, and (ii) to use a relevant method in (iii) assessing the extent to which Ecological Economics actually displayed and promoted transdisciplinarity over time, by connecting researchers coming from different disciplines.
However, the papers concerned with assessing transdisciplinarity within Ecological Economics face two kinds of problems. The first one deals with the definition of transdisciplinarity ? including distinctions between cross-disciplinarity, interdisciplinarity and pluridisciplinarity. According to Costanza et al (1991), it can be defined as an «approach [that] views the problem as a whole, rather than as intellectual turf to be divided up, and views the boundaries of the intellectual and scape as porous and changing» (Costanza et al, 1991, Chapter 3).

Methods and data
Closely related to the former problem, the second one concerns the ways in which trandisciplinarity can actually been measured or assessed, using which kind of data? In their process of measurement, Luzadis et al. (2010), found that «the appropriate unit of analysis to

determine the presence or absence of these elements was the collective rather than individual paper level» (Luzadis et al., 2010: 4). This collective dimension is fundamental for transdisciplinarity. Hence, we propose to assess it through a network analysis of coauthors publications (i.e. authors cooperating in writing and publishing a paper in the journal).
To assess the ways in which transdisciplinary have evolved, we look for article published by a minimum of two authors in Ecological Economics between 1991 and 2011. In order to propose a dynamic analysis of the network, we have distinguished five periods: 1991-1995; 1996-2000; 2001-2005; 2006-2008; and 2009-2011. The data used are the name of authors writing together the same article. These data come from the Web of Science® online database.
The method we will use will follow two steps. First, we will conduct a social network analysis of co-authors and identify the authors who have central positions in the network. We will distinguish the two classical measure of centrality inside network analysis literature : the centrality of degree measuring the number of co-publications of an author, and the centrality if intermediarity measuring the role of intermediary of one author inside the network. Second, we will focus on these central authors of Ecological Economics and analyze their background and career-path from their online resume. Telling oneself is relevant because not only it translates the actual career of individuals, but it also refers to the ways in which one sees itself and the image it want to reflect.

Expected results
The preliminary results suggest:
- That the community is getting more and more scattered. In our opinion, the reason for this is that (i) the number of article published per years has increased over time, and (ii) the ranking of the journal has increased over the years, attracting more and more authors unrelated to the community of ecological economics.
- That less and less authors from different disciplines and background are cooperating in transdisciplinary works. This may question the editorial choices in regard to the primary objectives of the community.
- Yet, the study of disciplines and career-paths of key authors suggest that more and more authors playing key roles define themselves as «ecological economists».
We conclude evoking the possibility that transdisciplinarity has evolved from a collective level to an individual level, and that ecological economy becomes an interdisciplinary field of research.

Ecological economics and the role of participation within Ecological Economics ? a comparison via network analysis of keywords

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Ecological economics (EE), like other proponents of post-normal science, contributes to the social, normative and political spheres in many ways. Ecological economists use qualitative methodologies and speak to stakeholders, relevant actors and the concerned public; they investigate and report on societally relevant issues and thereby contribute to processes of problem framing and world making; they speak up as experts and are listened to as authoritative voices and watch dogs; their institutions are entrusted with specific societal functions and roles and, lately, ecological economists increasingly engage in organising deliberative and participatory processes.

Whereas in other academic fields like science and technology studies or technology assessment, a critical appraisal of these ways of interacting with society has already begun, it is still lacking within ecological economics (cf. Kastenhofer et al. 2011). By performing a network analysis of keywords of the field's main publication organ (Ecological Economics) we want to shed light on the status of deliberative and participatory processes within ecological economics research from a bibliometric point of view. The nodes in such networks represent keywords; two keywords are connected by an edge if they are both named for one or more papers. Thus the relationship between two keywords has a certain value, depending on the number of times that two keywords were co-mentioned. We compare the resulting networks of all keywords, focussing especially on those of ?deliberation' and ?participation' for all publications in Ecological Economics within the years 1994-2009. Thus we aim at providing a reflexive view on the methodological trends which evolved during the analysed time period in the context of participatory approaches.

The overall network of keywords for the whole inter-discipline Ecological Economics shows several thematic clusters, which are mainly connected through the keyword «environmental». The networks of ?partcipation' and ?deliberation' show a relatively high internal cohesion, pointing at the fact that both topics do not represent thematically isolated clusters. Keywords such as «participation» or «stakeholder» etc. appear relatively seldom and therefore aren`t part of the discursive core of Ecological Economics publications. This may be interpreted as a hint to a thematic gap in the field. Yet, the overall Ecological Economics keyword network proves to be quite consistent with the mission-statement of the journal.

Kastenhofer, K., Bechtold, U., & Wilfing, H. (2011). Sustaining sustainability science: The role of established inter-disciplines. Ecological Economics 70, 835-843.

The second generation of Ecological Economics: how far has the apple fallen from the tree?

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Short Abstract:
This paper questions the drift away from the epistemic foundations of ecological economics ? i. e. the balance between economics, social, and natural sciences. The factor analysis we used to compare the content of 12 180 abstracts of papers published in interdisciplinary, economic, and ecological journals suggests that between 1994 and 2011, Ecological Economics is getting closer to economic journals. Then we used a textual method of analysis (Alceste) on the 2 628 abstracts of papers published in Ecological Economics during this period, in order to reveal semantic changes over time. Results showed that during the period concerned, ecological economics were based on the same epistemic common denominators. However some differences were identified in the ways these aspects were addressed over time, explaining the drift toward economics. We present the case against such a merger and conclude by emphasizing the need for to put this issue up for discussion within the community.
Long Abstract:
Background
Since the start of ecological economics, pluralism has always been a fundamental feature of the community. Pluralism has been put to the fore as a normative requisite, in particular on the ground of transdisciplinarity (Costanza, et al., 1997, Norgaard, 1989). Pluralism also refers to the plurality of points of views and perspectives brought by the various researchers involved in the early history of ecological economics (Røpke, 2004, 2005). Hence, ecological economists have long considered pluralism has a positive feature of the community (van den Bergh, 2001). However, recent work suggests that in fact, very little is shared by ecological economists and that the community lacks of common foundations (Spash, 2012).
Objectives
This paper explores a third path by suggesting that the ecological economics is no longer grounded on pluralism, but that the community is under the growing influence of neoclassical economics, which may lead to a new foundation for a second generation of ecological economics. We argue that this trend is damaging for the community and more broadly for the production of useful knowledge in regard to sustainable development. In this regards, the purpose of the paper is twofold: first, we examine the editorial choices of Ecological Economics and compare them to the ones made in interdisciplinary, economic, and ecological journals; second, we focus on the contents of the abstracts of articles published in Ecological Economics and analyze the evolution of the epistemic grounds of the journal through time.
Method and Data
The work conducted here is innovative because it deals with data that, until now, have not been exploited in such a comprehensive way. Indeed, we have been able to process all the abstracts (12 180 in total) of articles published by five journals between 1994 and 2011. The five journals were selected in order to assess the evolution of Ecological Economics. Additionally to this journal, we selected an interdisciplinary journal (Journal of Environmental Management), a journal in the field of ecology (Ecological Modeling), and two economics journals (Journal of Environmental Economics and Management, and American Journal of Agricultural Economics). All journals are comparable in terms of Impact Factor (between 2.5 and 3.5), and all types of journals are comparable in terms of number of articles published per years (with the exception of Ecological Modeling where the frequency of publication is twice higher than in the other journals).
The method we use is mostly derived from multivariate data analysis applied to texts (Lebart and Salem, 1994):
- First, we conducted factor analyses on the abstract of papers published in the five selected journals for each one of the 18 years considered. For the two first axes of the factor analyses, results show that (i) the pattern of position of journals does not evolve much during the period,

(ii) except for Ecological Economics which is close to the Journal of Environmental Management in 1994, while in 2011, Ecological Economics is closer to the Journal of Environmental Economics and Management, and to the American Journal of Agricultural Economics.

- Second, we assessed the content of each journal through an analysis of resemblance, which is a network of the words frequently associated the ones with the others, on the whole period. The graphs show that the word «Model» is central to three journals (Ecological Modeling, Journal of Environmental Economics and Management, and American Journal of Agricultural Economics). The network pattern of words is more scattered in the Journal of Environmental Management. Finally, Ecological Economics presents a network polarized between two words: « Economics» and «Environment».
- Third, we processed the abstracts of papers published solely in Ecological Economics through a textual method of analysis: Alceste (Reinert, 2003). Alceste makes it possible to process completely all the data and ensures that results are reproducible. It results in a classification of the abstracts' words into ?»lexical worlds", that is to say, in classes composed of words considered to be semantically close. For each year, the classification is compared to the classification of the previous years to assess how the epistemic foundations of ecological economics have evolved, in a way that brings them closer to the neoclassical economics publications.

Discussion

Our purpose is to investigate the current epistemic foundations of ecological economics, analyze how they have changed over time, and assess their epistemic consistency through a textual analysis of abstracts published in the journal. Our results show that the cognitive basis of ecological economics has changed over time and is getting closer to neoclassical economics. In the discussion section, we first examine both endogen and hexogen factors influencing the editorial choices (respectively changes in the editorial board on the one hand, and the scientific rise of the journal and historical trends on the other hand). As these factors cannot explain the drift, we further look into the ways in which ecological economics is getting closer to neoclassical economics. We present three cases that illustrate this drift: the increasing use of economic formalism, the shallow «normal science» perspective, and the monetary valuation. Each element is linked to the others in a system of thinking that makes it difficult to separately question. Finally, mobilizing approaches of coordination grounded on cognitive proximity, we express our concerns in what is wrong with ecological economics drifting toward neoclassical economics.

Conclusion

Using an innovative textual data treatment, my aim was to question the drift away from the epistemic foundations of ecological economics between 1994 and 2011. In reading our answer to the eponym question posed in this article, one might conclude that the apple has not fallen so far from the ecological economics tree. However, the issue is not how far from the tree the apple has fallen, but the fact it has fallen at all. The results of my analysis revealed a collective trend. My opinion is that this trend is damaging for ecological economics. At the least, considering the original aims of ecological economists, we believe this trend should be acknowledged by ecological economists. Ideally, the community should debate whether or not there are commonly accepted reasons for the drift towards neoclassical economics and whether anything should be undertaken to halt it.

Exploring coherence between degrowth proposals: a systems thinking analysis

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Summary:
This contribution presents results from an exploratory study aimed to create an holistic understanding of degrowth proposals, investigating critical feedback loops, complementarities and coherence between those propositions. In early 2011, we conducted a participatory modeling workshop to build causal loop diagrams describing the feedback effects of degrowth proposals in economic, social and ecological sub-systems. At the ESEE 2011 conference we extended the dialogue and exploration of interrelationships between degrowth proposals by developing a compatibility matrix to identify the possible synergies between several of these policies. In this session, we report on the follow-up results from these experiences and advance on the definition of plausible degrowth scenarios. This introductory presentation will set the background for the interactive part of the special session, where participants are expected to engage in a critical analysis of integrated policy scenarios for sustainable degrowth.

Abstract:
In this paper we will set the background for the proposed special session on «Building coherent degrowth proposals». The introductory presentation of the current findings of our exploratory study will subsequently give way to the interactive part of the session, where attendants are expected to engage in a critical analysis of degrowth proposals.
We start by explaining the rationale for this contribution. Departing from the results of degrowth proposals «bullet points» achieved at the Second Conference on Economic Degrowth for Ecological Sustainability and Social Equity held in Barcelona in 2010, we aimed to stimulate an holistic understanding, investigating critical feedback loops, complementarities and coherence between those propositions. In our research we intended to:
- Define variables from the results of the working groups;
- Understand the links between the working groups' results;
- Identify leverage points for future interventions;
- Build coherence and identify possible synergies and contradictions between proposals;
- Develop plausible future scenarios for degrowth.

We started by organizing a one-day participative workshop in Barcelona, which took place in 4th April 2011. Fifteen participants from Research & Degrowth and the Universitat Autònoma de Barcelona attended this session, collaborating in the development of qualitative models, also called causal loop diagrams. Based on a group model building approach, the workshop was facilitated to promote elicitation of knowledge and exchange of perspectives among participants. Each working group started with the identification of a ?problem variable' placed at the centre of a diagram, after which causes and consequences were added. In the first round of the mapping exercise the focus was set on the conceptualization of issues without the inclusion of degrowth proposals. Subsequently, participants added those propositions in each of the maps and established connections and feedback loops. An interactive version of the three causal diagrams that were achieved is available at http://degrowthpedia.org/. We subsequently analysed the feedbacks and leverage points in each sector diagram (ecological, economic, social), addressing the questions: i) Which feedback loops are at the root of economic growth problems?; Ii) Which feedback loops perpetuate impacts arising from these problems?; Iii) Which are the leverage points for intervention?; iv) How may degrowth proposals create a systemic change leading to social equality and ecological sustainability?.
Following-up on the workshop results, we organized a session at the 9th Conference of the European Society for Ecological Economics, which took place in June 2011 in Istanbul. The session was attended by around 20 participants who have worked on a pairwise comparison between a set of degrowth proposals, namely: 1) House sharing; 2) Work sharing; 3) Establishment of resource sanctuaries, leaving ?resources on the ground'; 4) Moratoria on large infrastructures; 5) Restrictions to advertising; 6) Limits to international trade; 7) Full-reserve banking; 8) Localised cooperatives; 9) Establishment of max-min income levels. In this session, the main

cause-effect links and positive reinforcing loops between proposals were outlined in a compatibility matrix. Proposals that reinforce one another (e.g. resource sanctuaries and moratoria on large infrastructures) show high leverage potential and should be implemented in close articulation.

In order to integrate insights from the two previously described experiences, we created a draft set of six plausible future ?degrowth pathways', each describing a high-level roadmap that includes critical elements of the proposals and insights from the causal maps and compatibility matrix. For example, if one asks «What if the idea of degrowth is introduced in education?» a possible pathway could unfold as follows:

- Short-term conditions: Introducing new pedagogies, education oriented toward self-determination, promoting inter-generational knowledge-sharing;
- Mid-term effects: Increasing sharing and cooperation; decreasing will of accumulation;
- Ultimate ends: Social equality; reduced conflicts and poverty; society living in harmony with nature;
- Leverage points and synergies: participative democracy increases deliberative capacity and creates holistic spaces of education;
- System risks, uncertainties and side-effects to avoid: Prevalence of utilitarian view and hegemonic status quo, dominance of «will of accumulation» feedback loop.

The results from this study are work in progress, and further developments are sought after at the Special Session proposed for the ESEE 2013 conference. The results achieved so far offer a promising starting point for deliberating outside the mind-set of reductionist proposals. Following an holistic approach, we aim to encourage an open-minded debate around sets of interlinked degrowth proposals and overcome possible sources of policy resistance.

Environmental conflicts management in the ?post-consensual' age: (re)visiting Participatory Multi-Criteria Approaches (PMCA) as agonistic platforms

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Summary:
In this paper, we analyze the extent to which several Participatory Multi-Criteria Approaches (PMCA) currently applied by Ecological Economists look for: (1) solving/cultivating environmental conflicts; (2) building a consensus among social actors/making irreducible pluralism explicit. We suggest that consensual solutions may easily imply theoretical biases and empirical shortcomings (i.e. increasing power asymmetries, hiding latent stakes, mixing real consensus and factual compromises, etc.). The paper encompasses four main sections: (i) a (re) definition of environmental conflicts; (ii) a (provocative) reflection on conflicts' attributes; (iii) a comparative study of several PMCA through the scope of pluralism; and (iv) several proposals for (re)visiting PMCA as agonistic platforms. From a methodological point of view, the paper based upon an extensive literature review and in-depth interviews with academics using PMCA. (please, see the attached PDF file for the long abstract)

PARTICIPATORY MULTI-CRITERIA ASSESSMENT AS 'OPENING UP' VS. 'CLOSING DOWN' OF POLICY DISCOURSES: A CASE OF OLD-GROWTH FOREST CONFLICT IN FINNISH UPPER LAPLAND

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Summary

Multi-Criteria Analysis (MCA) is a powerful policy appraisal tool but as Stirling (2006) has suggested, it can be used both for opening up and closing down policy discourses. Our analysis of MCA in addressing a conflict between state forestry and indigenous Sámi reindeer herding in Upper Lapland, Finland, illustrates MCA's potential in promoting open discussion about policy alternatives and their consequences, and also its limitations in highly controversial policy processes. The MCA process was helpful in addressing the problem situation that was formulated in terms of two competing livelihoods, forestry and reindeer herding, but unhelpful when the problem situation was formulated in terms of ethical principle, in this case indigenous Sámi people struggle for land rights.

Abstract

Introduction

MCA is a powerful policy appraisal tool but as Stirling (2006) has suggested, it can be used both for opening up and closing down policy discourses. Used in the latter mode, the aim is to cut through the messy and conflict-prone diversity of views and deliver a unitary and prescriptive advice. Used in the former mode, the aim is to reveal to wider policy discourses the framing assumptions and to deliver plural and conditional advice on the preferability of alternative courses of actions (Stirling 2006, 101).

Drawing on the distinction between 'opening-up' vs. 'closing-down' modes of MCA, we analyze the experiences from participatory MCA that was employed to a conflict between forestry and reindeer herding in Upper Lapland, Finland. The core of the conflict is loggings in old growth forests by the Forest and Park Service, which manages state-owned forests. Due to extensive loggings in state-owned forests in the 1950s and 1960s, and the slow growth of semi-arctic forests, the remaining economically viable logging potential in Upper Lapland is in over 140-year-old forest. These same forests are also important winter pastures for reindeer, which depend on tree-hanging lichens, abundant in old-growth forests, during the crucial winter month when ground lichen is covered by thick snow and ice. Most of the reindeer herders are indigenous Sámi people, which adds an ethno-political aspect to the conflict.

At the time of carrying out the study, from May 2008 till December 2008, the conflict was still unresolved. However, by the end of 2010, the Forest and Park Service announced that it had finally reached an agreement with Reindeer Herding Cooperatives. Key winter pastures were set aside from loggings for 20 years.

The MCA process

We used Multi-Attribute Value Theory (MAVT), in which the problem is constructed into a form of a value tree (Figure 1). The criteria were designed to cover the ecological, economic and socio-cultural aspects of the debate. The alternatives that were evaluated against each criterion covered all logging scenarios that had been put forward in the public debate, ranging from 300 000 m3/

year to 30 000 m3/year. The value tree was constructed jointly with the researchers and key stakeholder organization representatives.

To elicit the criteria weights, and also to examine the initial scores,15 interactive decision analysis interviews with representatives of key stakeholder organizations were carried out in October 2008. The interviewee's preferences were entered into the MCA model with decision analysis software called Web-HIPRE (Mustajoki and Hämäläinen, 2000; http://www.hipre.hut.fi), which also provided a visual interface to analyse the results together with the interviewee. The MCA process is described in more detail in Mustajoki et al 2011.

The output of the analysis is presented in Figure 2. The 15 interviews resulted in an equal number of preference models, which were grouped into three clusters according to the preference order of alternatives.

Conclusions

Most importantly, the MCA process helped to incorporate the key framing assumptions by the reindeer herding and forestry actors into the analysis. In contradistinction with the previous analyses, which had focused almost exclusively on quantitative information on the consequences of logging restrictions to the forestry sector?Euros and person years?the MCA brought the ecological, social and cultural aspects of the debate on an equal footing with the economic ones (Figure 2). In doing so, the analysis illuminated the diversity of viewpoints bearing on the Upper Lapland resource management conflict.

The MCA also helped to "interrogate uncertainties" in impact evaluations. The rigorous approach in which each alternative is evaluated with respect to each criterion exposed the gaps in knowledge concerning the impacts of logging practices to reindeer herding employment and profitability. This requirement for systematic analysis in MCA can bring to light unexamined questions and hence control attempts to select to attention some research questions at the expense of others.

With respect to the negotiated outcome between the State Forest and Part Service and Reindeer Herding Cooperatives, the most important outcome on the MCA was to show that there is no single best solution; therefore, compromise oriented negotiations are the only feasible alternative in the face of the irreducible plurality of values and interests (see van der Hove 2006).

The main danger of MCA to close down policy processes is to hide the scoring process and let the participants to focus only on the weighing stage. To counter this problem, we made a conscious effort to open up the information base by presenting the impact evaluations clearly and drawing the interviewees' attention to the uncertainties and the most controversial issues in the underlying analyses, data and sources. We also allowed the interviewees to give their own evaluations in cases where they contested the impact evaluations by the research team. However, we think that it would have been more fruitful to address the uncertainties earlier in the process and engage the stakeholders also in the scoring process. Therefore, we suggest that in addition to joint problem formulation and criteria and option selection, MCA should entail a joint fact finding process to determine the performance scores used in the model.

The Upper Lapland case study also illustrated clearly the limitations of MCA methods in situations where question of right and wrong?or duties and virtues (Wenstop 2005)?are at issue. The MCA process was helpful in addressing the conflict between two different sources of livelihood, forestry and reindeer herding, in the local context, but it did not lend itself well to address the Sami quest for land rights. Due to the varied ability of MCA to address fundamental issues of ethical principle, we argue that MCA experts should exercise caution when considering its application to such situations.

References

Mustajoki, J., Saarikoski, H., Marttunen, M., Ahtikoski, A., Hallikainen, V., Helle, T., Hyppönen, M., Jokinen, M., Naskali, A., Tuulentie, S., Varmola, M., Vatanen, E., Ylisirniö, A.-L., 2011. Use of decision analysis interviews to support the sustainable use of the forests in Finnish Upper Lapland. Journal of Environmental Management 92, 1550-1563.

Mustajoki, J., Hämäläinen, R.P., Marttunen M. 2004. Participatory multicriteria decision analysis with Web-HIPRE: A case of lake regulation policy. Environmental Modelling and Software 19, 537-547.

Stirling, A. 2006. Analysis, participation and power. Justification and closure in participatory multi-criteria analysis. Land Use Policy 23, 95-107.

van der Hove, S. 2006. Between consensus and compromise. Acknowledging the negotiation dimension in participatory approaches. Land Use Policy 23, 10-17.

Wenstop, F. 2005. Mindsets, rationality and emotion in multi-criteria decision analysis. Journal of Multi-Criteria Decision Analysis 13, 161-172.

Deliberating Beyond Evidence: Lessons from Integrated Assessment Modeling

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Through the construction of future scenarios that cannot deliver in terms of predictive capacity, Integrated Assesment Modeling (IAM) is still not clarified enough for its contribution to sustainable development. This paper explains the reasons for this disconnect in terms of the inability to deliberate about future ?beyond evidence', that is, beyond a justificatory logic in which the capacity to judge and validate commitments is linked to the capacity to produce evidence, hence anticipated justification, of their outcomes. This inability will be traced in terms of the epistemology of IAM relying on a specific combination between welfare economics based on the ethics of optimization and a positivistic vision of science. Once established the limits of this combination, the epistemology of IAM will be used to propose a new mode of decision-making based on the a methodology of «reverse engineering» in which scenarios will serve promoting the comparison between fictions of the future in order to allow judging on the plausibility and legitimacy of present commitments.

Liberation Methodology: reflecting on performances of post-normal science

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Summary:
The aim of this paper is to try and make some sense out of the increasing variety of performances of post-normal science that can be observed in applied contexts of transdisciplinary research, including, for example, Resilience Science; the IPCC and the Dutch School of Transition Management. Three performance types are discussed in the paper: simulative; chaotic and liberative. Based on a review of several examples of each performance type (which are not anchored one to one with the three case examples), it is argued that failure to formally address the democratic quality of performances of post-normal science may place the empirical rigour of the resulting knowledge and, more importantly, inevitably jeopardizes the democratic project of late-modern societies, generally.
Abstract:
The concept 'post-normal science,' has achieved a certain maturity and a degree of mainstream recognition in recent years. Thanks to this, it is now possible to distinguish between a variety of 'types of performance,' or, if you will, applications, of the concept. The aim of this paper is to try and make some sense of that variety by conducting some normal science on the study object post-normal science. It is presumed here that what is termed, for the sake of the paper, ?post-normal performance' is an empirical phenomenon that may be performed under this label but which need not be (Farrell, 2011). The criterion applied for interpreting a process as a performance of post-normal science is that it be transdisciplinary, which, for the purposes of this paper is taken to mean: (1) employing knowledge from multiple scientific disciplines in an integrative manner and (2) doing so in an explicitly political performance context, with political aims and outcomes explicitly informing both research design and ontology. In this paper three basic types of performance are identified, based on collected empirical data concerning the predominant methods and methodologies employed in three internationally know and regarded transdisciplinary science approaches: Resilience Science; the IPCC and the Dutch School of Transition Management. Three performance types are identified, which, it should be noted, are not linked one-to-one with these three approaches but rather distributed across them: simulative ? the concept of democratising expertise and the practice of extended peer review serve mainly a symbolic role, giving results and recommendations a venire of participation and politically correct ethic while analytical logic, ontology and data continue to be selected mainly by scientific members of the performance community; chaotic - scientists and non-scientist are achieving substantive collaboration at the level of analytical logic, ontology and data specification but without profound reflection on the democratic rigour of the performance, i.e. the performance community is failing to confront questions regarding the legitimacy of participant selection, discursive freedom and constraints in the extended peer review discussion forums and the political authority of selected scientific and non-scientific participants to speak; and liberation methodology - where the democratisation half of the post-normal science concept is given the same degree of formal methodological attention as is the production of knowledge half and the taking of decisions regarding analytical logic, ontology and data specification is treated as a complex, socio/scientific/political process that requires both facilitation and democratic critique. Each performance type is evaluated in terms of (1) the scientific rigor of the results ? as measured through reference to effectiveness of implementation, predictive reliability and conventional peer-review status (i.e. impact factor of publications, number of citation, etc.) and (2) in terms of its democratic rigor ? as measured against conventional democratic theory criteria, such as legitimacy; accountability and democratic designation of right to rule. Based on a systematic review of several examples of each performance type, it is argued that failure to formally address the democratic qualities of performances of post-normal science ? i.e. simulative and chaotic performances ? creates two worrisome scenarios that should be of concern both to the general body politic and to practitioners of transdisciplinary research ? rigorous but unaccountable, political engaged scientific knowledge production, which has consequent impacts but is not controlled by the body politic and ontological narrow, myopic scientific knowledge production,

that is neither rigorous nor accountable. The political and ecological implications of these types of performances are considered briefly. It is then proposed that performances of liberation methodology, by their step of formalising the democratic aspect of the extended peer-review process, lose a degree of scientific rigour but gain, in the balance an exposure to democratic accountability that, on the one hand, improves their capacity to avoid errors of omission, i.e. improving their robustness against Type II error, and on the other can be advanced, halted and redirected by the body politic. This final point is of particular importance in light of increasing political pressure to ?do something' about climate change, which can be understood to be giving new force to once discarded propositions that the only possible way out of the environmental crisis might be an eco-dictatorship. The paper closes with a two pronged case for pursuing liberation methodology: (1) because it could produce more robust empirical results that prove more useful than current models and projections and (2) because if an eco-dictatorship is the only way to stop the destruction being wrought in the present period of the anthropocene, then the system is not worth saving.*

Farrell, K.N. (2011). "Snow White and the Wicked Problems of the West: A Look at the Lines Between Empirical Description and Normative Prescription."Science Technology and Human Values36(3):307-333.

*the author wishes to note a debt to Herwig Unnerstall for helping to crystallise this vague trepidation into a succinct assertion

Sustainable Consumption in Capability Perspective: An Empirical Analysis

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Being a leading paradigm for the definition and analysis of well-being, the capability approach (henceforth CA) seems to lend itself naturally for framing sustainable development (henceforth SD) that has been linked closely to the notion of well-being by the Brundtland definition. The CA defines well-being in terms of the beings and doings (the functionings) a person achieves and her capability to choose among different combinations of such functionings. Hence, the focus of the CA is on individuals, their options and choices. This paper sets out to elaborate on the choice situation of sustainable consumption and to combine the CA with behavioral models used in environmental psychology (e.g. Theory of Planned Behavior). The empirical part of the paper analyzes the relations between different predictors and intentions for pro-environmental behavior (PEB) on the basis of data derived from the German Socio-Economic Panel. The analysis aims to provide insights about motivations and barriers of the German population for PEB and to identify whether perception of individual and collective agency translate into PEB.

Time-use survey data and new metrics of household consumption

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Time use surveys are representative quantitative surveys that document the time use of individuals and national populations in regular, currently 10 year, intervals. They exist since 1960's and cover most industrialized counties. The collection of such data series has paralleled the rise of the discipline of household economists who argue that monetary consumption can be viewed as input for the productive activities of households. Following this thought household economics has sought to allocate monetary expenditure, the purchase of goods and services to various household activities such cooking, cleaning, travelling etc. Accordingly, notions such ?goods intensity of household activities' (Juster et al 1981), ?labour intensity of household activities' (Gershuny 1987), and ?energy intensity of household activities' (Jalas 2002) have been derived.
In this paper we use time survey data and the concepts of household economics to model the metabolism of household consumption. The following four data items are combined to produce the total energy consumption of direct and indirect household activities:
1) Time Use data. Time use surveys are based on representative samples. The data in use in this study was collected in the years 1977-78, 1987-88, 1999-2000, 2009-10. In the most recent study it involves 4410 individuals, aged above 10, reporting the course of altogether 7480 individual days. These diaries record the activity of the respondent in 10 minutes interval for a 24 hour period according to a classification scheme of 146 different activities.
2) Household Budget Survey data. We utilize the surveys from 1985, 1990, 1998 and 2006. The year 2006 one-period cross-section data consists of 4007 households.
3) Input-output table of Finnish economy and the derived energy intensities of final consumption expenditure in 2009.
4) Direct energy use of households based on based on electricity consumption of activities, transportation, and (hot) water use. Transportation figures are based on the national passenger transport surveys on 1998 and 2010.
Critical steps in the analysis include the matching of expenditure data and time use data. After compiling this metadata, we perform a decomposition analysis of the changes in the embedded and direct energy consumption of Finnish household starting from 1978 to 2009. Relevant questions include whether increases in total energy consumption are due to a changes in activity patterns, in the energy intensity of activities [MJ/h] or in the demographic change in the Finnish population. We also include a technology factor in the analysis thus allowing that the energy intensity of goods and services [MJ/?] also changes in the time period.
The total household energy consumption including both the direct use energy carriers and the embedded energy increased from 160TWh in 1985 to 250TWH in 2006. A baseline decomposition analysis of this change results in a positive factor for population, household type (change towards smaller household size) and particularly for the intensity factor measuring the use of energy per unit of time in particular activities. Patterns of time use have change towards less consuming activities, but as the overall growth figure indicates, this contribution is outweighted by increases in other factors. Most significant increase in intensity has taken place in phone conversations that currently require far more monetary inputs and consequent embedded energy consumption per unit of time than in the base year of the model. Of all activities personal hygiene shows most significant reduction of intensity over the whole period of time.
The proposed analysis expands the realm of research on sustainable consumption both in terms of the coverage of analysis and the question that can be asked. We argue, following Jonathan Gershuny, that changes in consumption can be better understood if we also pay attention to the informal activities of households. Critical questions can be thus levied: How does capitalist push for increased production and consumption fit into everyday life? How do people manage or come to consume all the outputs of industrial production? On the other hand, how could the initiatives on sustainable living make use of low-intensity activities. What is the scope and potential effect

of popular slow-ideologies?
We also make notice of the power of calculation and indicators. The calculation we perform relates time to used resources. It thereby argues that time as such is form of ultimate utility and counters the overwhelming economization and instrumentalization of everyday life. Overall, we suggest that a focus on the relationship between time and consumed resources offers venue for critical thinking in field of ecological economics.

References:
Gershuny, J. (1987). Time Use and the Dynamics of the Service Sector.The Service Industry Journal7(4): 56-72.
Jalas, M. (2002). A time use perspective on the materials intensity of consumption.Ecological Economics41: 109-123.
Juster, F. T., Courant, P. N. & Dow, G. K. (1981). The Theory and Measurement of Well-Being: A Suggested Framework for Accounting and Analysis. In: Juster, F., T. & Land,K., C. (eds). Social Accounting Systems: essays on the state of the art. New York: Academic Press, pp. 23-94.

Heterogeneity in the solar powered consumer electronics market: A discrete choice experiments study

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Solar powered consumer electronics are a likely starting point for organic photovoltaics' (OPV) market development. Still, consumers' willingness to adopt a product depends on how they value it. Therefore, a discrete choice experiments (DCEs) study is presented to find out how Flemish (northern part of Belgium) consumers value solar cell characteristics for solar powered consumer electronics. We contribute to literature by incorporating heterogeneity into our modelling efforts and by identifying the model that has the highest model fit. The random parameter logit (RPL) model with interactions is found to provide a better fit than the latent class (LC) and conditional logit model for our choice data. Consequently, the individual level, assumed by the RPL model, explains heterogeneity better than the segment level, used by the LC model. Furthermore, all mean main effects exhibited the expected sign. Accordingly, we advise OPV scientists to aspire higher efficiencies and longer lifetimes while retaining lower cost, better esthetics, and higher integratability as opposed to its substitute technologies.

A Poor Man's Version of Green Consumerism: Understanding Weak and Strong Ethical and Sustainable Consumer Behavior

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Inspired by the distinction between strong and weak sustainable consumption governance, we propose that it would also be helpful to make the same distinction from an actor and individual consumption perspective. Our empirical and theoretical data suggest that weak ethical sustainable consumer behavior merely functions as a means for buying a green identity and social status. This discourse largely sees that environmental and social problems can be addressed through acting in the role as consumers buying green products. The strong ethical and sustainable consumer behavior discourse, on the other hand, sees the aggregate level of consumption as the overarching problem and tries to minimize consumption, while also placing more weight on acting democratically as citizens for achieving sustainability.

Biodiversity within the green economy: Identifying current knowledge gaps

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Biological diversity plays a key role for ecosystem functioning and the provision of ecosystem goods and services that are important to human wellbeing (1). Lately the concept of a «Green Economy» has gathered momentum and was a major theme of the 2012 United Nations Conference on Sustainable Development (Rio+20). The preservation of ecosystem services and the halt of biodiversity loss are identified as key pillars of the green economy (2).
Yet, there is still no clear understanding of how biodiversity fits within a green economy. In the current green economy debate biodiversity's role is rarely acknowledged for economic sectors other than agriculture, forestry, fisheries and tourism (2). Furthermore when this happens, biodiversity features more as a buzzword than as a concrete and tangible component of the green economy. Even though, the importance of biodiversity to human wellbeing was re-affirmed during Rio+20 (3), there are several unresolved and interrelated questions at the interface of green economy and biodiversity.
This paper will be the introduction of the special session on «Biodiversity within the Green Economy». Its aim is to set the stage for the special session by identifying and discussing the four main overarching knowledge gaps at the confluence of biodiversity and the green economy.

Understand biodiversity's role in all sectors with green-economic potential
Findings from a number of recent initiatives such as the Millennium Ecosystem Assessment (MA), TEEB and UK National Ecosystem Assessment (UN-NEA) have shown the significant contribution of biodiversity and the ecosystem services it provides on human wellbeing (1,4-5). Through such studies it has been relatively well established how biodiversity can contribute to economic sectors such as agriculture, fisheries, forestry and tourism. However, we still lack a good understanding of how biodiversity contributes to other economically important activities such as transport, manufacturing and renewable energy. We also need to better understand how activities that elevate the green-economic potential of certain economic sectors can affect negatively biodiversity and thus the green-economic potential of other sectors. Finally we need to establish which of these «green-economic trade-offs» (and under what circumstances) can be acceptable and how should they be considered in green-economy policies and green accounting schemes for firms, regions or even nations.

Biodiversity conservation beyond protected areas
Biodiversity conservation efforts have traditionally focused on protected areas. Yet, the vast majority of people that will benefit from green growth live in non-protected or semi-protected areas that host significant biodiversity (6). Transitioning to a green economy will bring forward an ever-increasing need to conserve biodiversity beyond protected areas.
There has been a gradual recognition of the human wellbeing benefits that mixed-use landscapes in non-protected areas can offer. For example, different socio-ecological production landscapes and seascapes (SEPLS), cultural landscapes and green infrastructure projects have been shown to improve aspects of human wellbeing by maintain the flows of ecosystem services provided by biodiversity (7-8). Policy schemes such as payment for ecosystem services (PES) and REDD+ are also being set in place for promoting biodiversity conservation beyond protected areas.
However, how can we measure biodiversity, and particularly economically important biodiversity, beyond protected areas? How to target priority non-protected areas for conservation and upon what factors, i.e. ecological value, ecosystem services provision, actual biodiversity-related income generation, potential biodiversity-related income generation or some other variable. How to choose the most appropriate among the diverse financial, policy and technological conservation approaches that can reduce human pressure in non-protected areas? These are only some of the most pressing unanswered questions on how to promote effective biodiversity conservation in non-protected areas.

Develop appropriate tools for the private sector

The private sector has been identified as an important player for the transition towards a green economy (2). Several national submissions to the Rio+20 process have confirmed the willingness of governments to work alongside the private sector in order to facilitate such transitions (9). As a major user of biological resources and biodiversity-derived services, the private sector has been regularly required to account properly for and increase the efficiency of this use. Additionally, the private sector has been «asked» to contribute actively to biodiversity-related green economy policies such as those promoting the creation of biodiversity and ecosystem services (BES) markets or biodiversity offsetting schemes (2).

Behind such calls for meaningful involvement there is usually the underlying assumption that there are (or can be easily developed) fit-for-purpose assessment/accounting tools and trading platforms that can facilitate the private sector's involvement. First of all there is a large gap in the availability of tools that can be used to assess multiple ecosystem services in a rapid and robust manner. Current ecosystem services assessment tools require huge amounts of detailed data input and specialized knowledge (10). Furthermore even though there are some cases of existing or emerging markets for different BES classes (2), there is a lack of an international, transparent trading platform for multiple ecosystem services (11).

Transform biodiversity governance

If biodiversity is indeed acknowledged as a key component of the green economy then conservation efforts become relevant to institutions that oversee activities with green-economic potential (e.g. transport, energy, agriculture) that were not previously involved in biodiversity conservation issues. This might lead to problems of either multiple compliance efforts through various independent institutions or at the other extreme, non-address of key conservation issues as it is difficult to understand under which institution's jurisdiction it falls under. Such institutional fragmentation can potentially take a toll on green-economic transitions mediated through biodiversity conservation.

We should assess how institutions (international, national, local) must be transformed in order to allow for the effective conservation of biodiversity while at the same time facilitating green-economic transitions. More importantly we should identify ways in order to orchestrate decision making across spatial scales and across economic sectors that did not previously have a vested interested in biodiversity conservation, particularly in view of green economic trade-offs.

Way forward

Concerted effort between academics, practitioners, the private sector and policy-makers is needed to understand, acknowledge and safeguard the role of biodiversity within the green economy. Academics and practitioners should aim to provide clear empirical evidence about the mechanisms through which biodiversity conservation (particularly beyond protected areas) can be an agent of green-economic transitions. The development of appropriate targets, indicators and assessment tools at the interface of biodiversity and the green economy cannot be overemphasized. On the governance side it is important to identify institutional gaps in order to ensure that biodiversity conservation issues become integral to the green economy debate while avoiding institutional overlapping.

If we fail to properly acknowledge the role of biodiversity within the so-called green-economy, we run the risk of transitioning to an economic system that is green only in name. An important first step will be to move away from the current rhetoric that uses biodiversity as a buzzword and find concrete ways to assess biodiversity's contributions to the economy as well as to meaningfully integrate biodiversity concerns in green-economy policies.

References

[1] MA, 2005. Millennium Ecosystem Assessment: Current State and Trends Assessment. Island Press, Washington DC.

[2] UNEP, 2011. Towards a green-economy: pathways to sustainable development and poverty eradication. United Nations Environmental Programme (UNEP), Nairobi.

[3] Thiaw, I., Munang, R., 2012. Rio+20 outcomes recognize the value of biodiversity and ecosystems: Implications for global, regional and national policy. Ecosystem Services 1, 121-122.

[4] TEEB, 2010. The Economics of Ecosystems and Biodiversity: Ecological and Economic Foundations. Earthscan, London

[5] UK NEA, 2011. The UK National Ecosystem Assessment Technical Report. UNEP-WCMC, Cambridge.

[6] Rands, M.R.W. et al., 2010. Biodiversity conservation: challenges beyond 2010. Science 329,

1298-1303.
[7] Gu, H., Subramanian, S.M., 2012. Socio-ecological Production Landscapes: Relevance to the Green Economy Agenda. UNU-IAS, Yokohama.
[8] Mazza L., et al. 2011. Green Infrastructure Implementation and Efficiency. Institute for European Environmental Policy (IEEP), Brussels and London.
[9] UN-CSD, 2012. Contribution by the European Union and its Member States. UN Conference on Sustainable Development (UN-CSD), New York.
[10] BSR, 2011. New Business Decision: Making Aids in an Era of Complexity, Scrutiny, and Uncertainty: Tools for Identifying, Assessing, and Valuing Ecosystem Services. BSR, San Francisco.
[11] Madsen, B., Caroll, N., Kandy, D., Bennett, G., 2011. 2011 Update: State of Biodiversity Markets. Forest Trends, Washington DC.

From bioprospecting to payment for ecosystem services: market and conservation in the economy of promises.

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This paper starts from the premise that at the Rio+20 Summit, history has repeated itself and that the same expectations raised by bioprospecting 20 years ago are now attached to the market-based instruments associated with conservation policies (Payments for environmental services, REDD mechanisms, biodiversity offsets,...). The promise that market mechanisms are best suited to reach biodiversity conservation goals has been renewed. Building on Polanyian definition of fictitious commodities and on the idea of the ?economy of promises' (developed by P.B. Joly in relation to biotechnologies and nanotechnologies), we argue that beyond their ideological foundations, market mechanisms require complex institutional arrangements that are often irrelevant and ineffective in reaching their environmental objectives. These various market-based or market-like arrangements rely on the reasserted promise of a synergy between market and conservation rather than on actual market mechanisms. They are supposedly meant as conservation tools. However, they rather foster the development of a market for consulting and economic expertise in conservation issues, the growth and perpetuation of which depend on the renewal of this promise, in the form of changing institutional arrangements and mechanisms.

Ce chapitre part du constat que semblait se rejouer à Rio+20 à propos des instruments de marché mobilisés dans le secteur de la conservation (Paiements pour Services Environnementaux et notamment mécanismes REDD) ce qui s?était joué à Rio à propos de la bioprospection 20 ans avant : à savoir la promesse que les mécanismes de marché sont les mieux à même de réaliser les objectifs de conservation de la biodiversité. Or, en reprenant l'idée « d'économie de la promesse » (avancée par Pierre-Benoit Joly à propos du secteur des biotechnologies et des nanotechnologies) et en l'adaptant à l'innovation institutionnelle, on veut montrer que, au-delà de leurs fondements idéologiques, ces mécanismes de marché nécessitent des arrangements institutionnels très lourds à mettre en oeuvre et qu'ils sont souvent complètement inefficaces par rapport aux objectifs environnementaux annoncés. Ces différents dispositifs de marché reposent donc sur une économie de la promesse permanente (celle de la synergie entre marché et conservation) beaucoup plus que sur de réels mécanismes de marché. Beaucoup plus qu'un marché de la conservation, ils alimentent le marché du travail des experts économiques de la conservation dont la reproduction et la croissance reposent sur le nécessaire renouvellement, sous la forme de dispositifs différents, de cette promesse.

Uncovering the hidden trade-offs of biodiversity in the Green Economy

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Uncovering the hidden trade-offs of biodiversity in the Green Economy
Several recent initiatives such as the Millennium Ecosystem Assessment (MA), The Economics of Ecosystems and Biodiversity (TEEB) and the UK National Ecosystem Assessment (UN-NEA) have confirmed the significant contribution of biodiversity on human economy (1-3). This growing realization that biodiversity and human wellbeing are inextricably linked has influenced the adoption of national and international policies for the conservation of biodiversity.
Lately the concept of a «Green Economy» has gained significant attention, becoming a theme of the 2012 United Nations Conference on Sustainable Development (Rio+20). In this process it was identified that the preservation of ecosystem services and the halt of biodiversity loss are key pillars of the green economy (4-5).
UNEP's recent report on the Green Economy is to date the most comprehensive initiative for identifying pathways to sustainable development across the various economic sectors (4). This report has highlights how «greening» certain economic sectors can become an engine of growth, providing decent jobs and income. Investing in natural capital is seen as an important avenue for greening economic sectors that depend significantly on biodiversity (e.g. agriculture, forestry and fisheries). Still, the contribution of biodiversity has been under-appreciated for economic sectors such as manufacturing, transport and renewable energy.
Yet, it is well known that biodiversity contributes directly to several industries falling within the manufacturing sector. For example, humans have developed several commercial varieties and breeds of the major food and fibre species that contain a high level of genetic diversity (1). These varieties are an important input to the food, textile and chemical industries. Biodiversity can also provide genetic resources to the pharmaceutical and cosmetics industries with hundreds of different drugs derived from natural products (6-7). Furthermore, biodiversity can act as an inspiration for creating novel technologies as is the case of biomimicry (1).
On the other hand the manufacturing, transport and renewable energy sectors can have substantial negative impacts on biodiversity. For example, manufacturing and transport have been associated with the emission of numerous pollutants that can affect ecosystem health and contribute to the loss of biodiversity.
In some instances, activities that enhance the green economic potential of some economic sectors can affect negatively biodiversity and thus the green-economic potential of other sectors. One such example is the case of biofuels. While biofuels can have a positive green-economic effect for the transport sector (4), certain biofuel practices can be destructive for biodiversity and the ecosystem services it provides (8). In this sense biofuels can reduce the green-economic potential of other sectors such as agriculture, forestry and tourism (9). Similar points have been made and for the renewable energy sector (10). Determining such «green-economic» trade-offs is crucial for understanding the role of biodiversity within a green economy framework, and the economic benefits that its conservation can provide.
From this starting point, the paper examines the links between biodiversity and three key economic sectors with green-economic potential: manufacturing, transport and renewable energy. First, we identify how biodiversity contributes to these sectors. Then we employ the six drivers of biodiversity loss articulated in the MA framework to analyse how different processes within the three sectors affect biodiversity. Through this exercise we assemble a matrix of the biodiversity impacts of the three sectors as a first step for identifying the «green-economic trade-offs » associated with the sectors. The paper concludes by offering suggestions how these impacts can be remedied and how biodiversity conservation can improve the productivity, and thus the green-economic potential, of these sectors.
[1] MA, 2005. Millennium Ecosystem Assessment: Current State and Trends Assessment. Island Press, Washington DC.
[2] TEEB, 2010. The Economics of Ecosystems and Biodiversity: Ecological and Economic Foundations. Earthscan, London.

[3] UK NEA, 2011. The UK National Ecosystem Assessment Technical Report. UNEP-WCMC, Cambridge.
[4] Thiaw, I., Munang, R., 2012. Rio+20 outcomes recognize the value of biodiversity and ecosystems: Implications for global, regional and national policy. Ecosystem Services 1, 121-122.
[5] UNEP, 2011. Towards a green-economy: pathways to sustainable development and poverty eradication. United Nations Environmental Programme (UNEP), Nairobi.
[6] Zhu, F., Qin, C., Tao, L., Liu, X., Shi, Z., Ma, X., Jia, J., Tan, Y., Cui, C., Lin, J., Tan, C., Jiang, Y., Chen, Y., 2011. Clustered patterns of species origins of nature-derived drugs and clues for future bioprospecting. Proceedings of the National Academy of Sciences of the USA 108, 12943-12948.
[7] Li J.W., Vederas, J.C., 2009. Drug discovery and natural products: End of an era or an endless frontier? Science 325, 161?165
[8] Gasparatos, A., Stromberg, P., Takeuchi, K., 2011. Biofuels, ecosystem services and human wellbeing: Putting biofuels in the ecosystem services narrative. Agriculture Ecosystems and Environment 142, 111-128.
[9] Gasparatos, A., Lee, L.Y., von Maltitz, G., Mathai, M.V., Puppim de Oliveira, Willis, K.J., 2012. Biofuels in Africa: Impacts on ecosystem services, biodiversity and human wellbeing. UNU-IAS, Yokohama.
[10] Jackson, A.L.R., 2011. Renewable energy vs. biodiversity: Policy conflicts and the future of nature conservation. Global Environmental Change 21, 1195-1208.

Entrepreneurial attitudes and organizational costs in the supply of biomasses energy

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The production of energy by biomasses provides several opportunities for the growth of the farms and enhancing sustainability. The potential contribution of the agricultural sector is expected to be important, in terms of private income and of sustainability. The production of energy from biomasses entails economic, environmental and social dimensions (Ciccarese et al., 2004). Environmental policies recognize the function of the biomasses as substitute of fossil energy sources (Marland and Schlamadinger, 1997; Hall, 1998; Hall and Scarse,1998; Tustin, 2000). The issues related have been approached according to different perspectives, spanning from the impacts upon the climate change (Schlamadinger et al., 1997 Boman and Turnbull, 1997; Matthews and Robertson, 2001) to the effects of the economic systems (e.g. Marinelli, 1980a, 1980b; Merlo, 1991; North East State Foresters Association, 2007) and market trends (e.g. Zhu et al., 1999)

The study take into consideration two dimensions of the complexity of energy production by biomasses. The first dimension is connected to the fact that private, public and common pool resources are employed in the process and are among its outcomes. The second dimension concerns with the territorial distribution of the biomasses. While the variety of the classes of resources engaged requires to adopt a corresponding variety of institutions in building up the governance of the activities, the territorial distribution posits specific issues related to historical evolution and cultural influences. In this context, the paper aims at investigating the role of individual attitudes towards the investment behaviour in the field of the supply of energy by biomasses.

The Douglas North's perspective suggests that cultural constructs have a prominent role in the dynamics of the economic systems via the institutional dimensions and the collective action framed by policy. Beliefs are cognitive bases of the attitudes. Attitude is an evaluative state that intervenes between a class of stimuli (e.g. sensorial characteristics, products, system of thoughts etc.) and a class of evaluative response. Scholars paid attention to attitude in empirical context on the consumers' side, while there a limited number of study on production' side. Provided their relations with the beliefs, the role of attitudes on the investment in the field of energy supply from agricultural biomasses provides a central key analytical tool. To our knowledge, this field is unexplored or just tentatively investigated, while there is a lack of a comprehensive analytical understanding. The variety of the nature of the goods an resources engaged require to integrate coherent forms of governance, appropriate for private, public and common goods. Issues related to polycentricity (Ostrom V., 1999; Ostrom E., 2010) and co-production (Ostrom E., 2008) come thus to the light. The Theory of Reasoned Action considers the intention to perform (or not to perform) a behaviour as the immediate determinant of the action. In turn the intention is influenced by the attitude towards the behaviour, which entails the perception of social pressure toward the behaviour. The two determinants of intentions may have a different influence. Further development take into account the perceived behavioural control which represents the non-motivational factors that determine the ability to perform a given behaviour. A positive attitude promote the adoption of a technology, whereas a negative one reduces the probability that the technology will be adopted. Such a theoretical framework provides the analytical bases to investigate the attitudes to invest in the production of energy by biomasses and the related behaviours.

The paper is divided into two parts. First we elaborate the analytical framework. We namely draw the analytical role of the beliefs from the Douglas North (2005) theoretical view and investigate some implications of the relationship between beliefs, behaviours and public representations (Aoki, 2011), included policy intervention. We contend that the Theory of Reasoned Action may provide the basis for an empirical investigation of the energy producers

behaviours. Results from a survey are presented which concern the analysis of firms involved in the production of energy by biomasses in several Italian areas. A data analysis is carried out to identify the role of the attitudes in determining the investments in this field of activities and their relationship with the organizational choice.

Matter-dependent production functions for economic modelling of firms

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Summary
Environmental economic models often integrate economic parameters such as labour and capital with physical parameters such as energy, emissions or materials. These models show both market behaviour and effects on the environment. A central instrument is the particular production function that relates inputs to outputs. However, the characteristic behaviour of matter and energy is subject to different constraints than the behaviour of labour and capital. Very few economic production functions take that difference into account.
This project develops a new economic production function for micro-economic modelling, based on a maximum installed capacity of transformation. Following economic and physical constraints of production functions, an algebraic form is derived. It is tested with a case-study. Secondly the modelling behaviour is compared to a standard function.

Abstract

Quantitative economic analysis develops models to help the understanding of markets and firms, their evolution through time and their impact on society and on the biosphere. Environmental economic models address a specific challenge : the integration of economic parameters such as labour and capital together with physical parameters such as energy flows, emissions, raw materials and waste streams. These physical flows determine partly the economic performance of the firm but also its ecological impact. The integrated environmental economic models can then indicate market behaviour and the corresponding effects on the environment. It is particularly important to integrate both economic and physical parameters when modelling firms where matter and energy are important production factors in itself. This is for instance the case for manufacturing firms and agro-industrial sectors. In these sectors the cost shares of the matter and energy inputs are highly significant for the total turnover of the company, and the efficiency of transformation is crucial for the profitability of the firm.

A central instrument in many models is the particular production function that relates inputs to outputs. Many economic production functions can integrate economic and physical parameters. They allow input factors such as energy or matter in different forms. But the characteristic behaviour of matter and energy is subject to different constraints than the behaviour of labour and capital. Very few economic production functions take that difference into account. As a response to this, Kümmel developed the Linex function, based on physical constraints for matter and energy (Kümmel, 1982; Kümmel et al., 1985). The importance of this distinction was illustrated in macro-economic analysis, where results indicate an large influence of the growth rate of energy inputs on the growth rate of national economies (Ayres and Warr, 2005). Other production functions did not yield the same results. Recently, Stresing et al. (2008) showed that the dependence of national production on energy inputs is much larger when considering the specific character of the energy input than with a standard Cobb-Douglas production function and a general output elasticity of about 5%. However the same Linex function is not always suitable for micro-economic models. Saunders (2008) has indicated that the Linex production function is not concave in labour, which can result in unintended deviations when using the function for modelling purposes. And apart from the Linex function, few other economic production functions exist that integrate both physical and economic constraints for micro-economic analysis.

This project develops a new economic production function adapted for micro-economic modelling taking matter and energy into account. The current paper proposes a production function, based on a maximum installed capacity of transformation. A firm is modelled as a matter and energy-transforming entity. When the maximal transformation capacity is reached, the output is no longer constrained by energy and matter inputs, but by the labour and capital inputs only. The paper details the different conditions that need to be respected. These stem from general assumptions of economic theory and physical constraints of matter and energy transformation. The function is then derived in the most clear and simple form, based on an

exponential expression. The contraints defined above are imposed to determine the exact algebraic form of the function.

The constraints leave several degrees of freedom, and this leads to the definition of a group of production functions rather than a single one-size-fits-all solution. The form is non-linear, which might already induce difficulties for practical modelling. So searching a mathematically clear form is important for the practical application of the result. The full algebraic form is derived for the second exponential form, where a maximal simplicity is pursued to allow flexible modelling. However, we show that too simplified forms imply unnecessary constraints. For instance, requiring constant elasticity of scale results in a function with a elasticity of scale per definition defined by the exponent of energy alone, which is unacceptable. We propose a more general form, while ensuring a constant elasticity of substitution between capital and labour.

The usefulness of the new production function is controlled by a case-study. The function is fitted to the data of group industrialised dairy farms. The data detail both capital and labour inputs, and aggregated energy and matter inputs. For these firms the efficient transformation of organic matter is essential in the economic production. The fit is compared to the Cobb-Douglas function. The regression yields similar results. In a second step, the market conditions are changed, and the model responds. We define first the optimal cost shares, and determine the maximum profit after a market shock, when the firms are subjected to keep the same cash-flow. The forecasted profits by Cobb-Douglas and the EMod function are the same, but the ways of obtaining this profit are very different. The market shock forces the companies to change all three cost shares simultaneously in case of the EMod function. This corresponds better to the practical behaviour of firms adapting their production strategy.

Ayres, R.U., Warr, B., 2005. Accounting for growth: the role of physical work. Struct. Change Econ. Dynam. 16, 181-209.

Kümmel, R., 1982. The impact of energy on industrial growth. Energy 7, 189-203.

Kümmel, R., Strassl, W., Gossner, A., Eichhorn, W., 1985. Technical progress and energy dependent production functions. Journal of Economics 45, 285-311.

Saunders, H.D., 2008. Fuel conserving (and using) production functions. Energy Economics 30, 2184-2235.

Stresing, R., Lindenberger, D., Kümmel, R., 2008. Cointegration of output, capital, labor, and energy. The European Physical Journal B-Condensed Matter and Complex Systems 66, 279-287.

Synchronising the environmental management objectives of New Zealand's key export industries: A common pool resource approach

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The integrity of New Zealand's natural environment has long provided the basis for marketing campaigns that promote the country's export industries internationally. However, in recent years the intensification of key industries has led to the degradation of the natural environment and the country is now at a critical turning point. Existing legislation provides a sufficient framework for protection of the natural environment, yet the overarching pursuit of sustained economic growth threatens to undermine the efficacy of policy mechanisms designed to ensure the long term sustainability of the nation's environmental attributes. Leading export industries - tourism and dairy farming - vie for prominence amongst environmental management agendas and the country's current governance model provides limited scope for synchronising the objectives of the respective stakeholder groups.

This paper examines the New Zealand environmental management conundrum from a common pool resource perspective and demonstrates how a commons governance approach has the potential to provide enduring economic and environmental sustainability to both the tourism and dairy sectors.

According to the conceptual approach presented in this paper thebackground elementsof the New Zealand tourism industry constitute the same variables as those upon which the country'sclean green image,100% Pureand100% Pure Youbrands are founded. Numerous export industries (including dairy) derive marketing leverage from these branding concepts.

The background elements of tourism (BTE) whether natural, socio cultural or manmade (Jafari, 1974) for example an outstanding natural landscape, popular festival or remarkable city, can be considered common pool resources (CPR) or open access services that are non excludable and subject to rivalry (Blanco, Rey-Maquieira, & Lozano, 2009; Briassoulis, 2002; Common & Stagl, 2005; Healy, 1994). Thus, the environment, BTE's and the infrastructure which supports both tourism, export commodities (such as dairy products) and local communities constitute a ?commons'. In regards to tourism in the New Zealand context, the commons is, in effect, the tourism product (Briassoulis, 2002). Viewed in this manner, the indivisible components epitomize congestible goods with fluid boundaries(ibid)and therefore both New Zealand's natural environment and the marketing derived from it can be considered a common pool resource. Any actions that have a detrimental effect upon the natural environment adversely affect theNew Zealand environmental commons.

The central argument underpinning the policy aspect of this paper is that without actuation of the cross-sectoral compromise and collaboration required for effective commons governance, the current growth orientated trajectory will eventually undermine both industries, eroding the international competitive advantage that has facilitated the success of each sector historically. Much of that success has been leveraged upon the validity of New Zealand'sclean green image,100% Pureand100% Pure Youbrands, affirmations that have been criticised by some international media in recent years. Stakeholder groups representing sub sectors of both industries publicly recognise the importance of theclean green image,100% Pureand100% Pure Youbrands and have expressed a desire for the legitimacy of the ?New Zealand environmental branding' to be retained via appropriate environmental management practices.

Preserving the essential environmental elements that constitute the commodities traded via the brands will require multi agency coordination. This research demonstrates that a common pool resource approach provides a necessary framework for such collaboration and that the conditions required for effective commons governance prevail in the New Zealand context. Drawing upon the work of Dietz, Ostrom et al. (2006), the research examines how the variables of industry scale, population size and associated social densities, resource monitoring regimes, rates of technology, resource and land use change, regulation and monitoring procedures have the

potential to facilitate a pragmatic transition to an ecologically sustainable market structure. Effecting a transition towards a common pool resource regime and management structure requires the adoption of a strong approach to sustainability amongst key institutions. The principals of ? organisational change for sustainability', (Benn, Dunphy, & Griffiths, 2006) are examined in relation to each sector and the overarching positioning of each respective industry is assessed in this context. The potential for adaptation and change is discussed in relation to the importance of environmental integrity and associated branding to New Zealand's export economy.

Benn, S., Dunphy, D., & Griffiths, A. (2006). Enabling change for corporate sustainability: an integrated perspective.Australasian Journal of Environmental Management, 13(3), 156-165.
Blanco, E., Rey-Maquieira, J., & Lozano, J. (2009). Economic incentives for tourism firms to undertake voluntary environmental management.Tourism Management, 30(1), 112-122.
Briassoulis, H. (2002). Sustainable tourism and the question of the commons.Annals of Tourism Research, 29(4), 1065-1085.
Common, M., & Stagl, S. (2005).Ecological Economics - An Introduction: Cambridge University Press.
Dietz, T., Ostrom, E., & Stern, P. C. (2006). The Struggle to Govern the Commons. In J. Pretty (Ed.),Environment, Vol. 4: Institutions, Processes and Policies for the Environment(pp. 140 - 155). London: Sage.
Healy, R. G. (1994). The "common pool" problem in tourism landscapes.Annals of Tourism Research, 21(3), 596-611.
Jafari, J. (1974). The components and nature of tourism: The tourism market basket of goods and services.Annals of Tourism Research, 1(3), 73-89.

Professional ethos and environmental attitudes. A French survey on engineers' ecoskepticism

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In this communication, we highlight the singularity of the engineers' environmental attitude in comparison with other professional groups and the very low variation within the professional group. Our research is based on an extensive survey conducted in 2011 by the French association of graduate engineers with 39 000 professionals, among whom 27 000 answered to an optional part of the survey - which we designed - dealing with social, ethical and professional values. In the present communication, we analyze the answers given by the engineers to questions relating to environmental issues, and particularly on the items which constitute the New Ecological Paradigm of Callon, Dunlap and Van Liere. Comparisons with other professional groups were made thanks to the European Values Survey conducted in 2008.

The degradation of landscapes by steam-powered industrial technology emerged as a social concern from the nineteenth century and soon, the first national-scale environmental laws were voted. But, it took a century long for environment protection to become a global issue. New words needed to be coined, likeÖkologiein 1866 by German zoologist Haeckel and ecosystem in 1935 by English botanist Tansley, the principles of ecology had to develop and the science of ecology to emerge as a distinct discipline. Ecological thought and environment concern expanded in the twentieth century and the first global initiative appeared in the 1970th with the UN's first major conference on international environmental issues.
Since the 1987 Brundtland Report, a new concept was proposed and widely accepted to combine in a single expression developmental issues and environmental issues: «sustainable development ». Proposed by experts and defined as a development which «ensure[s] that it meets the need of the present generation without compromising the ability of future nations to meet their own needs », it popularized at the 1992 Earth Summit and disseminated rapidly among the laypeople. Since the turn of the twenty first century, companies, and especially multinational corporations, have been considered as unavoidable actors of sustainable development. It is also widely accepted that engineering is highly concerned by the issue and that engineers can play a key role in delivering sustainability. Although the definitions of the engineering profession and of the engineers differ from a country to another, there is sufficient commonality to assess that their profession is directly concerned by the issues and challenges of sustainable development. While some surveys have been made to determine the level of knowledge of engineering students about sustainable development, there is no information about the engineers' attitude once they are far from university.
In this communication, we will focus on the attitude of French professional engineers towards sustainable development, and primarily towards one of its component, the environmental issues. Our research is based on an extensive survey conducted in 2011 by the French association of graduate engineers (IESF) with 39 000 professional engineers, among whom 27 000 answered to an optional part of the survey dealing with social, ethical and professional values. In this communication, we analyze the answers given by the engineers to questions relating to environmental issues, and particularly on the items which constitute the New Ecological Paradigm of Callon, Dunlap and Van Liere. The questionnaire was distributed online by IESF. The data were analyzed with SPSS.

Our first finding, which confirms our first research hypothesis, is that the graduate engineers' attitude towards environmental issues differs profoundly from the one of the average French people, which we know from to the European value survey. Their attitude is also very different from those of business managers and executives, also different from those of other master's degree graduate. Our second finding is that although the engineers' demography has changed since a few decades, small evolution seems to appear in the professional's attitude. This finding is rather counter-intuitive. Indeed, our second hypothesis was that the rejuvenation and the feminization of the population, as well as the diversification of the access conditions into engineering schools had led to an evolution of the profession's ethos. On the contrary, the engineers' attitudes seem to depend more on their professional position and education than on individual traits. While the younger generation seems a little bit more pro-environment than the seniors, female do not differ significantly from their colleagues.

References

Albrecht, D. , Bultena, G., Hoiberg, E., & Nowak, P. (1982). The new environmental paradigm scale.Journal of Environmental Education, 13, 39-42.
Bomke W. (2003). Engineering as a Profession,inChristensen S. H., Delahousse B.Profession Culture and Communication. Herning (Denmark): Institute of Business Administration and Technology Press, 133-149.
Bouffartigue, P., Gadéa C. (1997). Les ingénieurs français. Spécificité nationale et dynamiques récentes d'un groupe professionnel.Revue Française de Sociologie, 2, 301-326.
Brancher, D. (1982).L'environnement et la formation des ingénieurs. Paris : Presses de l'UNESCO.
Bréchon, P., Galland, O., dir. 2010.L'individualisation des valeurs. Paris: Armand Colin.
Brundtland, G. H. (1987).Our Common Future, Oxford: Oxford University Press.
Carson, R. (1962).Silent Spring. Boston: Houghton Mifflin.
Catton, W. R. Jr. (1983). Need for a New Paradigm.Sociological Perspectives, 1: 3-15.
Catton, W. R. Jr., Dunlap, R. (1978). Environnemental Sociology : A New Paradigm.The American Sociologist, 13: 41-49.
Darsch, C., Longuet L., dir. (2011b).Observatoire des ingénieurs. Enquête 2011. Paris: Ingénieurs et scientifiques de France.
Darsch, C., Longuet, L., dir. (2011a).Ingénieurs 2011. 22e enquête d'Ingénieurs et Scientifiques de France (CNISF). Paris : Ingénieurs et scientifiques de France.
Didier, C., (2008a).Penser l'éthique des ingénieurs. Paris: Presses universitaires de France.
Didier, C., (2008b).Les ingénieurs et l'éthique. Paris : Lavoisier.
Downey, G. L., Lucena J. (1995). Engineering Studies. inJasanoff, S., Markle, E. G., Petersen, J.C., Pinch, T., dir. Handbook of Science andTechnology Studies, Thousand Oaks, CA: Sage Publications: 167-88.
Dunlap, R. E., Van Liere, K. D. (1978). The ?New Environmental Paradigm'.Journal ofEnvironmental Education. 9:10-19.
Ferrand, A., (2011).Appartenances multiples, Opinion plurielle. Villeneuve d'Ascq: Presses Universitaires du Septentrion.
Hervieu, B., Léger, D. (1983).Des communautés pour les temps difficiles.Néo-ruraux ou nouveaux moines. Paris : Centurion.
Hopkins, C. (2012).Twenty Years of Education for Sustainable Development,Journal of Education for Sustainable Development, 6 (1): 1-4.
Inghelart, R., Abramson P.R. (1995).Value Change in Global Perspective. University of Michigan Press
Meadows D.H. (1972).. **New York: Universe Books Mitcham, C. (2009). A historico-ethical perspective on engineering education: From use and convenience to policy engagement."Engineering Studies. 1 (1): 35-53Nicolaou, I., Conlon, E., (2012). What do final year Engineering Students Know About Sustainable Development? European Journal of Engineering Education. Organisation des Nations Unis. (2002). Rapport du Sommet mondial pour le développement durable. Johannesburg : ONU.Rémond, R., Percheron, A., dir. (1991). Age et politique, Paris: Economica.Riffault, H., dir. (1994). Les valeurs des Français. Paris : Presses universitaires de France.Rivière, C. (1978). L'analyse dynamique en sociologie. Paris : Presses universitaires de France.Tiles Mary, (2009). Technology and the environment. in Berg Olsen, J. K., Pedersen, S. A., Hendricks, V. F. A Companion to the Philosophy of Technology. Wiley Blackwell, 235-247.Wach, M., Hammer B. (2003). La structure des valeurs est-elle universelle. Genèse et validation du modèle compréhensif de Schwartz, Paris : l'Harmattan.**

Energy and efficiency as sources for economic growth: a co-evolutionary perspective

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This paper applies a framework based on the co-evolution of ecosystems, technologies, institutions, business strategies and user practices (Foxon, 2011) to analyse the positive feedbacks between the availability of energy sources and their conversion efficiency to useful work, and the role of useful work as an input to economic development, in the context of the need for a sustainable, low carbon transition. This seeks to combine insights from socio-technical transitions approaches that emphasise the roles of institutions, actors and networks in stimulating transitions, with those from socio-ecological approaches that emphasise the material and energy reliance of modern industrial economies.

Recent work (Ayres and Warr, 2009; D. Stern, 2011) has shown that the increasing availability of cheaper and higher quality forms of energy inputs, and the efficiency of their conversion to useful work, have played a key role in driving economic growth in industrialised and emerging economies. This builds on the work of economic historians, who argued that the availability of cheap coal in relation to high labour costs in the UK in the 18th Century stimulated R&D and investment in the development of steam engines that helped to drive the industrial revolution (Allen, 2009), and socio-ecological theorists, who argued that this transition represents a step change in systems of production and consumption (Haberl et al., 2011). This paper examines this issue from a co-evolutionary perspective, in the context of likely future rises in energy input costs resulting from ?peak oil' and the necessary substitution to low-carbon energy sources to mitigate climate change. Co-evolutionary analyses of economic growth have argued that a process of co-evolution of technologies, institutions and related business strategies has driven the wide availability and reduction in costs of goods and services that have significantly enhanced human welfare (Nelson, 2005; Beinhocker, 2007). Co-evolutionary analysis also demonstrates how increasing returns to adoption have led to the lock-in of economic systems based on high carbon energy inputs (Unruh, 2000), and could provide a useful framework for analysing a transition to a sustainable low carbon economy (Foxon, 2011).

In this paper, we argue that an increase in energy input costs, due to declining availability of cheap oil and the need to switch to low-carbon alternatives, will have profound economic impacts that are not captured in neo-classical economic analyses, as these analyses neglect the role of energy as a factor of production. A co-evolutionary perspective suggests that cheap energy has been both a cause and consequence of economic growth, through positive feedbacks or virtuous cycles between decreases in energy input costs and increases in economic activity. This suggests ways forward for better understanding the relations between higher cost energy inputs and economic development in a low-carbon transition.

This has important implications for a low-carbon transition, as many of the renewable energy inputs that are needed to substitute for fossil fuels inputs appear to be of lower quality, at least in terms of their power densities in relation to land area. The intelligent use of renewables in relation to land area, for example, by using cellulosical biomass to minimise competition with food sources, and using urban roof spaces for PV, would appear to be crucial. Further R&D and commercial demonstration of a range of renewable technologies will be needed to stimulate conversion efficiency improvements and price reductions.

However, this approach also demonstrates the difficulty of quantifying the contribution of energy inputs to economic output. It would appear that robust measures are needed both of conversion of energy (exergy) inputs to useful work outputs, as Ayres and Warr (2009) have done, and of the quality of different energy (exergy) inputs. Only by developing and applying such useful measures will we be able to better understand the contribution of energy inputs to past economic growth, and the implications of a transition to low-carbon sources of energy on future economic growth.

References

Allen, R (2009),The British Industrial Revolution in Global Perspective, Cambridge University

Press, Cambridge.
Ayres, R. U. and B. Warr (2009). The economic growth engine: How energy and work drive material prosperity. Cheltenham, UK and Northhampton MA, US, Edward Elgar.
Beinhocker, E (2006),The Origin of Wealth: Evolution, Complexity and the Radical Remaking of Economics, Random House, London.
Foxon, T J (2011), ?A co-evolutionary framework for analysing transition pathways to a sustainable low carbon economy',Ecological Economics70, 2258-2267.
Haberl, H. et al. (2011), ?A sociometabolic transition towards sustainability? Challenges for another Great Transformation',Sustainable Development19, 1-14.
Nelson, R (2005),Technology, Institutions and Economic Growth, Harvard University Press, Cambridge MA.
Stern, D. I. (2011). "The role of energy in economic growth." Annals of the New York Academy of Sciences 1219(1): 26-51.
Unruh, G C (2000), ?Understanding carbon lock in',Energy Policy28, 817-830.

Development and dematerialization: an analysis of time-series trends across countries

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The environmental consequences of international economic growth and development have led to increasingly high profile academic and policy debates, with some protagonists calling for a transition to a «green economy» (UNEP 2011), and others for a complete change in focus away from economic growth (Jackson 2009). Economic activity inevitably entails the use of natural resources, but the scale depends on the structure and technical efficiency of economic processes. As a result, many industrialized countries have instituted policies encouraging such decoupling, for instance by setting targets decreasing the material intensity of economic activity (CEC 2005; Takiguchi and Takemoto 2008; EC 2011). It is thus important to understand the history and past trends of material and energy dependency of economies, as well as to distinguish carefully between the development trajectories of countries which are still emerging as industrialized countries, and those which have long completed their industrial transition.

Once a country has attained a high level of economic and industrial development, some theories state that a combination of factors could lead to the absolute dematerialization and decarbonization of the economy. These phenomena could be expected to lead to an « Environmental Kuznets Curve» or EKC, where environmental impacts first grow, then decrease with income, in the shape of an inverted-U. Past studies have found strong evidence for EKC behavior for certain categories of pollutants, which tend to have in common that their impacts are local and immediate, while their abatement is technically straightforward and low cost (Stern 2004; Smith and Ezzati 2005). Since materials and energy use, along with carbon emissions, do not fit this characterization, there is no reason to believe that they should be subject to the EKC phenomenon. Past studies have found mixed evidence for an EKC for materials (Seppälä, Haukioja et al. 2001; Canas, Ferrao et al. 2003; Bringezu, Schutz et al. 2004). The EKC studies for carbon are too numerous to cite, but also show mixed evidence, along with methodological (Stern 2010) and accounting issues related to trade (Rothman 1998).

In this work, we analyze material consumption and carbon emissions from both developing and industrialized countries over almost four decades (1970 ? 2005) to identify commonalities and divergences in economic dependency on environmental resources, and offer robust conclusions concerning the potential for absolute decoupling of economic activities from environmental resources.

We first apply cluster analysis to differentiate between groups of countries and their material and economic development. These clusters can be used to characterize broad categories of industrialized and developing countries. We then quantify the material and economic coupling of each country in turn, finding further evidence for diversity in the material/economic trajectories of countries, with evidence of strong coupling and decoupling seen in both developing and industrialized countries. We conduct tests for relative and absolute decoupling of the economy from material use, and compare these with similar tests for decoupling from carbon emissions, both for single countries and country groupings using panel analysis. We show that, over the longer term, emerging and developing countries tend to have significantly larger material-economic coupling than mature industrialized economies (although this effect may be enhanced by trade patterns), but that the contrary is true for short-term coupling. Moreover, we find evidence that absolute dematerialization of mature countries likely implies limits to economic growth rates, while the successful industrialization of developing countries inevitably requires a strong material component. Alternative development priorities are thus urgently needed both for mature and emerging economies: reducing absolute consumption levels for the former, and avoiding the

trap of resource-intensive economic and human development for the latter.

References:

UNEP (2011). Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication, www.unep.org/greeneconomy.

Jackson, T. (2009).Prosperity without growth: economics for a finite planet, Routledge.

CEC (2005). Thematic strategy on the sustainable use of natural resources (Communication and Annexes). Brussels, Commission of the European Communities (CEC), COM (2005) 670 final, SEC 1684.

Takiguchi, H. and K. Takemoto (2008). "Japanese 3R Policies Based on Material Flow Analysis." Journal of Industrial Ecology**12**(5-6): 792-798.

EC (2011). A resource-efficient Europe ? Flagship initiative under the Europe 2020 Strategy. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Brussels, European Commission.

Stern, D. I. (2004). "The Rise and Fall of the Environmental Kuznets Curve."World Development**32**(8): 1419-1439.

Smith, K. R. and M. Ezzati (2005). "How Environmental Health Risks Change with Development: The Epidemiologic and Environmental Risk Transitions Revisited."Annual Review of Environment and Resources**30**: 291-333.

Seppälä, T., T. Haukioja and J. Kaivo-oja (2001). "The EKC Hypothesis Does not Hold for Direct Material Flows: Environmental Kuznets Curve Hypothesis Tests for Direct Material Flows in Five Industrial Countries."Population and Environment**23**(2): 217-238.

Canas, A., P. Ferrao and P. Conceicao (2003). "A new environmental Kuznets curve? Relationships between direct material input and income per capita: evidence from industrial countries."Ecological Economics**46**(2): 217-229.

Bringezu, S., H. Schutz, S. Steger and J. Baudisch (2004). "International comparison of resource use and its relation to economic growth: The development of total material requirement, direct material inputs and hidden flows and the structure of TMR."Ecological Economics**51**(1-2): 97-124.

Stern, D. (2010). "Between estimates of the emissions-income elasticity."Ecological Economics**69**(11): 2173-2182.

Rothman, D. S. (1998). "Environmental Kuznets Curves - Real Progress or Passing the Buck? A Case for Consumption-Based Approaches."Ecological Economics**25**(2): 177-194.

Whole system perspectives of energy technologies: combining life-cycle analysis modelling with ecosystem service approaches

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Summary
Decisions in the UK related to climate change mitigation policy will have a global effect on ecosystem services. To advance our understanding of how deployment of UK energy technologies places demands on global ecosystem services, this paper presents a framework linking multi-regional input-output life-cycle analysis with ecosystem service approaches. Results for several energy technologies are presented the implications for UK climate policy discussed.
Abstract
Electrification and decarbonisation are at the forefront of the UK's climate change mitigation policy outlined in the UK government Carbon Plan (2011). This will involve a large infrastructural shift from the current energy system to the anticipated low carbon one, and will be limited by technical constraints, resource availability, fossil fuel and carbon costs, international policies, energy demand and so forth. The development of alternatives to current, principally non-renewable energy sources in the transition towards a low-carbon society will put pressure on the environment. Achieving a sustainable balance of resource use in terms of providing water, food and energy to support a growing world population, while at the same time protecting the very environment we depend on, is a major challenge in the 21st century. Environmental assessments of low carbon infrastructure requirements have largely been limited to greenhouse gas emissions, with limited assessment of the wider impact on ecosystem services.
The Millennium Ecosystem Assessment categorises ecosystem services, the outputs of which people derive benefits from, into four categories: supporting services such as nutrient and water cycling which underpin all other ecosystem services; regulating services including climate control and flood defence; provisioning services which are the goods people obtain such as food, water and timber; and cultural services such as recreational and aesthetic values. Ecosystem services are not confined to local impacts where the energy is generated, but are subject to global impacts where feedstock and other materials, for example for construction, are sourced and processed. An increase in international trade means distances between production and consumption locations are growing and their global nature means pressures are dispersed, creating a large and distant web of suppliers. Impacts on ecosystem services will be experienced in the country of extraction, manufacture and assembly in order to meet energy service demands in the UK.
A global framework for quantifying the ecosystem service impacts of UK low carbon energy provision is devised. This combines lifecycle assessment (LCA) methods, which capture the resource inputs and environmental impacts at every stage in the lifecycle of a process or product, with an ecosystem approach. Bottom-up ecosystem services data is integrated with a top-down global multi-region input-output database tracing commodity flows between 57 sectors across 130 countries and regions to the point of final consumption. The global and sector level dataset maps global supply chains and traces raw commodities obtained from ecosystem services through various levels of processing across several countries to link ecosystem impacts to final consumption in the UK. The impact on ecosystem services of a range of energy technologies will be explored including wind, bioenergy, gas, nuclear, oil and biofuels.
Some analyses of ecosystem services, trade and consumption in developed countries has been carried out. This has centred on ecosystems that can be quantified and integrated with relative ease to global life-cycle models, such as greenhouse gas emissions, endangered species and deforestation. However, other impacts are more difficult to quantify and have not been considered in such a comprehensive global analysis. This research aims to integrate impacts that have so far presented difficulties due to their more qualitative nature. Some will be implemented semi-quantitatively on a scale of small to large impact, and others such as some cultural services can only be assessed qualitatively, indicating a likely positive or negative effect.
The research will contribute to the development of a framework for the valuation of changes to

ecosystem services resulting from the deployment of different energy technologies. The framework will be used to identify and quantify the location of and ecosystem service impacts of imports and trade flows of commodities required for the UK's low carbon energy infrastructure. The outputs can be used to identify high impact commodities and supply chain hotspots, compare the impact of different technologies, map the scale and locality of impacts, and so forth. It will also aid understanding of the importance of international trade as a driver of ecosystem services depreciation.

Economic growth versus material use ? is there an actual decoupling? Re-estimating the global material intensity for 1900-2009

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Extended Abstract

Contemporary debates concerning the decoupling of economic growth from energy-material use provide empirical evidence for a transition to an era of at least relatively dematerialized economic production. Evidently, economic output is becoming progressively less dependent on material input flows. These de-link between energy-material use and economic growth called decoupling effect; decoupling is, in fact, two distinct effects (Bringezu et al., 2003):

- decoupling between resources use and economic growth and,

- decoupling between resources use and environmental impacts.

In present article, we will firmly examine the first decoupling category; nevertheless our empirical results may also provide indirect implications concerning the second decoupling category as well.

From the early attempt of Ayres and Kneese (1969) to measure material flows, until recent official use of the Economy-Wide Material Flow Analysis (or Accounting) concept (EUROSTAT, 2001), various indicators have been developed in order to monitor and assess the decoupling of economic growth from material resources, in the global level (Krausmann et al., 2009; UNEP, 2011), and partially for a country or among countries (Bringezu et al., 2003; Krausmann et al., 2011). Material intensity mainly measured in current literature by estimating Material flow/GDP indicators. Indeed, those ratios estimate the material quantity required for producing one unit of GDP (kg/US dollars). In this context, the gross domestic product (GDP) index dominates in relevant literature of measuring (de-)coupling of material inputs from economic growth.

Furthermore, post industrial societies seem to be in a transition towards a growing service sector economy. Moreover, it seems that technological progress allowed for more efficient use of natural resources. Evidently, production processes are reconfigured and reengineered; goods and services are redesigned; lighter materials substitute crucial metal ores. Consequently, observed shift of developed countries to an emerging service sector economy in tandem with technological advance may feed optimism on further dematerialization of economic process. Evidently, Material flow/GDP indicators sufficiently reflect the technological advance, the substitutions among material types and the transition trends to a service sector economy, providing evidence for global material intensity decline from at least early 1950s (Krausmann et al. 2009).

Nevertheless, we argue that the Material flow/GDP material intensity indicators prevailing in current literature on decoupling effect fail to depict certain physical properties of economic production. Main assumption of present research will be that the satisfaction of human needs and preferences requires «real world» goods that inevitably have certain physical dimensions; this results in the physical dimensionality of economic production. The use of GDP index, as an abstraction of aggregate monetary units, fails to account for the real material requirements of aggregate good and services. In this context, no matter how accurately and meticulously the material flows traced and accounted, whenever compared to GDP, substantial information of the properties of real world economic process vanishes from estimates. If we accept the verity that economic goods production incorporates certain physical dimensions and, hence, the material base required for this production, may convey empirical results into different estimations and prospects of decoupling effect. Yet, the queries remain imperative; is current economic growth

actually delinked from material intensity? Is our production process becoming less dependent on material resources? Just how far new technological efficiencies and the shift to a service sector economy can ease the burden of natural resources scarcity? What should be the prospects of future material decoupling trends?

Within our main assumption, that the saturation of human needs requires goods with certain physical dimensions, we will propose new material intensity indicators as an improvement of Material/GDP ratio which currently dominates the contemporary literature. Forthcoming research aspires to estimate indicators which approximate, to some extend, the dimensionality of economic production. In this context, the empirical results of the proposed indicators might be less « optimistic» for future potential of decoupling material consumption from economic growth at the global aggregate level. The methodological framework-concept of our approach on production dimensionality has been published on ENERGY journal (Bithas and Kalimeris, 2012) and, therefore, current paper could be seen as an empirical extension of this recent study.

In synopsis, present study aim at re-estimating the decoupling effect between total material consumption and economic growth at the global aggregate and disaggregate level for a broad time-period (1900-2009). We will aggregate as global material flows: Fossil fuels; Biomass; Ores; Industrial and Construction Minerals. We will further re-estimate material intensity among the components of aggregate material use as well. Annual data of non fuel materials will be drawn from Krausmann et al. (2009), one of the most significant recent studies on global decoupling estimation. Total material flows are expressed in 1000 metric tons per year (1000 t/yr). Data on GDP and population will be drawn from Maddison (2008); the GDP is measured in million 1990 International Geary-Khamis dollars and population is expressed in million persons.

The paper will be organized as follows: an abstract Section; A brief introduction Section on MFA methodology; A Section that will review the relevant literature on decoupling effect and material intensity; A Section with the methodological framework of economic production dimensionality; A data overview section; The analysis and results section, of the re-estimated decoupling effect in both global aggregate and disaggregate level of total material flows; and finally a section of further discussion of the overall concluding remarks.

Key-references

Bithas and Kalimeris. 2012. Re-estimating the decoupling effect: Is there an actual transition towards a less energy-intensive economy? Energy (Elsevier) xx (x): xx-xx

Bringezu, S., H. Schütz, and S. Moll. 2003. Rationale for and interpretation of economy-wide materials flow analysis and derived indicators. Journal of Industrial Ecology 7(2): 43?64.

Ayres, R.U.,Allen V. Kneese.1969. Production, Consumption, and Externalities. The American Economic Review, 59(3): 282-97.

Eurostat. 2001. Economy-wide material flow accounts and derived indicators. A methodological guide. Luxembourg: Eurostat, European Commission, Office for Official Publications of the European Communities.

Krausmann, Fridolin, Simone Gingrich, Nina Eisenmenger, Karl-Heinz Erb, Helmut Haberl, and Marina Fischer-Kowalski. 2009. Growth in global materials use, GDP and population during the 20th century. Ecological Economics 68(10):2696-2705.

UNEP. 2011. Decoupling natural resource use and environmental impacts from economic growth. A Report of the Working Group on Decoupling to the International Resource Panel. Fischer-Kowalski M, Swilling M, von Weizsäcker EU, Ren Y, Moriguchi Y, Crane W, Krausmann, F., Eisenmenger, N., Giljum, S., Hennicke, P., Romero Lankao, P., Siriban Manalang, A. United Nations Environment Programme.

Krausmann, Fridolin, Simone Gingrich and Reza Nourbakhch-Sabet. 2011. The metabolic transition in Japan. A Material Flow Account for the period from 1878 to 2005. Journal of Industrial Ecology 15(6):877-892.

Maddison, A., 2008. Historical Statistics for the World Economy: 1?2008 AD.Maddison, Angus.

Statistics on World Population, GDP and per capita GDP, 1-2008 AD. Accessed in June 2011. Available at: http://www.ggdc.net/MADDISON/oriindex.htm.Maddison

Assessing the critical material constraints on low carbon infrastructure transitions

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This paper assesses the potential for material criticality to constrain the roll out of low carbon technologies, and presents a case study of decarbonisation of a city region in the UK, demonstrating the change in scale of critical materials required.

Emissions reductions of the scale required to meet the challenging targets set by international and national bodies will require rapid, systemic change including extensive refurbishment and replacement of infrastructure systems and unprecedented roll out of low carbon technologies. Many technologies required to make this systemic change exist today, but often rely on critical materials and components at risk of supply disruption and which are difficult to substitute (US Department of Energy 2011).

Previous research has identified factors that contribute to material criticality, as well as the groups of materials that might be considered to be critical to specific low carbon technologies (for example European Commission 2010; Graedel et al 2012). Less work has been done to determine the vulnerability of entire infrastructure systems, and by consequence the economies that rely upon these, to these critical materials and components, or to analyse how this vulnerability might change over time.

Our research fills this gap by examining the material dependency of entire infrastructure systems. It has three unique features: infrastructure focus and scale, with resulting implications in the magnitude of material dependency changes; dynamic analysis, for scenario-specific and time-resolved results; modelling framework based on a hierarchical representation of technologies, components and materials, to account for their interconnectedness.

This paper is concerned with the assessment of risk of constraints from critical materials that is introduced as a result of the extensive refurbishment and replacement of current infrastructure systems, and unprecedented roll out of low carbon energy technologies. The scope and purpose of this assessment differs substantially from that of previous assessments, which attempt to quantify the criticality of a material in a particular geographic or business context. Instead, we assess whether the disruption in supply of a group of materials could constrain a particular societal goal ? in this case the transition to low carbon infrastructure.

This has three implications for our approach to assessing vulnerability to material criticality: it requires us to assess the combined potential for constraint of a range of material required for low carbon technologies (many materials for one use rather than one material for many uses); it requires us to assess the change in constraints on a particular goal during the transition towards that goal, rather than the quantification of criticality of a particular material at a particular point in time; the effects of any disruption are specifically concerned with ability to achieve goal of low carbon transition.

We use a stocks and flows model to forecast demand for potentially critical materials from a pre-defined scenario of infrastructure roll-out (in this case the technologies required to decarbonise the UK energy system). The assessment of risk of constraints from critical materials determines whether disruptions in the supply of these critical materials could constrain this infrastructure roll out and whether this constraint could prevent achievement of the overall goal (of transition to a low carbon society). Our assessment of the risk of material constraints contains two principal

indices:
Supply chain disruption potential, which quantifies the likelihood that the production of a material, or group of materials will be disrupted. Exposure to disruption, which quantifies the effect of disruption on the goal in question.
Importantly, both indices are produced as a forecasted time-series, supporting dynamic analysis of material constraints. When combined, the two indices provide an assessment of the risk that material criticality poses to low carbon transition.
The supply chain disruption potential index has been created to represent the likelihood that access to a particular material could be restricted as a result of an imbalance between production and requirements, geo-politics or environmental constraints. This part of the assessment is specific to a particular material but only considers disruption at the point of production.
The exposure to disruption index has been created to assess the effects of supply chain disruption on the realisation of a particular goal, in this case the transition to a low carbon infrastructure. It includes the sensitivity of the goal to a particular technology with material constraints and the sensitivity of the goal to rises in material prices (which is one of the principal economic effects of perceived scarcity and supply chain disruption).
The approach to analysis of risks of constraints from critical materials developed in this article, integrated with the stocks and flows modelling, represents initial steps towards developing a systematic framework for analysing the future material constraints on infrastructure transitions. It is hoped that such a framework will ultimately become a key ecological economics tool, implemented in infrastructure planning processes.
This paper will briefly describe the assessment framework developed for analysis of analysis of risks of constraints from critical materials to infrastructure transitions. More importantly it will demonstrate its application to the decarbonisation of a city region in the UK. It will be used, in combination with stocks and flows modelling to quantify material requirements, to identify the potential critical material constraints to this transition. The paper will then discuss the potential responses to such constraints, including the challenges of technology substitution and the implications for economic growth.
References:
European Commission (EC) (2010) Critical raw materials for the EU: Report of the Ad-hoc Working Group on defining critical raw materials. EC
Graedel, T. E., Barr, R., Chandler, C., Chase, T., Choi, J., Christoffersen, L., Friedlander, E., et al. (2012). Methodology of Metal Criticality Determination.Environmental Science & Technology,46, 1063-1070.
US Department of Energy (2011) Critical Materials Strategy

Towards a better understanding of environmental conflicts in Turkey: A mapping exercise

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Since 1990s, Turkey has witnessed a growing number of environmental conflicts. The substantial rise in environmental problems in Turkey is well linked with the widespread adoption of neoliberal economic reforms in the country, parallel with international developments (Adaman and Arsel, 2005). While the size of the economy has more than doubled in the last twenty years, the urbanization level rose from 60% to 75% and the population increased by 32 percent (TUIK, 2012)?all putting an immense pressure over the ecological system of Turkey, a country with globally critical natural and biological reserves. The corresponding reaction in civil society has mainly manifested itself as environmental justice movements at local and national scales. Over the past two decades, complaints against current or potential impacts from natural resource extraction, land use change, energy production and pollution have been very common and involved local communities at grassroots levels as well as national and international civil society organisations (Arsel, 2005; Adaman et al, 2009; Avc? et al.2010; Ertor-Akyazi et al., 2012)

At this junction, this paper aims at exploring the remarkable spectrum of environmental conflicts and resistance movements in Turkey based on a field study undertaken as part of the EJOLT map of environmental injustices. This is done by analysing 45 well-known cases in Turkey, as described by local activists and scholars. While 17 of the reported cases focus on water conflicts (e.g. access to water, dam construction, wetlands), seven are about mining activities, eight relate to industrial activities and infrastructure projects and six address energy production (e.g. coal, nuclear) Other cases involve conflicts referring to waste disposal, land use change and biodiversity loss. More than half of the reported cases occurred in rural settings and the rest mainly have both urban and rural characters. Most of the cases under discussion involve rather medium intensity of conflict while few cases led to strong reactions. The analysis also includes cases where the conflict is currently dormant but potentially there.

The selection of the cases was made without an aim for statistical representation but to illustrate critical issues in environmental conflicts in Turkey. Despite its limitations, the compilation of these cases provides a basic, yet arguably very important step toward informing public debate in Turkey over the distribution of risks, burdens and benefits, the claims of local communities expressed in different valuation languages within the development and environment nexus. The presence of a highly modernist state ideology as well as an unquestioned commitment to rapid economic growth combined with the absence of a deliberative planning process and a democratic scientific culture in the country seem to be the main sources of tension in all of these cases.

The analysis also gives us insights about the main actors involved in resistance movements, their corresponding mobilisation strategies and constraints. In the case of Turkey, the actors mostly include local communities, in particular, villagers, farmers, and women, and the initiatives they have created in response to the threat of their health and livelihoods, and to a great extent national environmental justice organizations (EJOs), and professional chambers and unions. Again, an overview of the justice movements discussed here indicates that together with the standard awareness and signature campaigns, objections to Environmental Impact Assessments and judicial activism via filing court cases are the most common means in the struggle, but experiences of EJOs so far put doubts even in the effectiveness of legal procedures in Turkey.

While the analysis shows well the commonalities in the cases reported, it also underlines that the challenge remains for the environmental movement in Turkey to link local movements with each other and with an overarching national movement capable of robust and sustained action and turn these conflicts into forces for environmental sustainability. It is hoped that this mapping exercise will increase the visibility of environmental justice struggles in a rapidly growing and globalising Turkey, help activists in networking and knowledge sharing and accessing scientific research that is relevant to them and that can support their arguments.

Social metabolism and Resource extraction conflicts in Madagascar

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Madagascar, a biodiversity hotspot and a country rich in natural resources, is also one of the poorest countries in the world with 77% of the population living below the poverty line (World Bank, 2011). Since 2000, public authorities have decided to open the country to large development projects in order to reduce poverty. Those projects are mainly focused on the extraction of natural resources. The most coveted resources are currently precious woods, onshore and offshore oil, tar sands, ores such as nickel, cobalt, iron and ilmenite, rare earths, gas, fisheries, etc. These "large extractive projects" which mainly involve multinationals and foreign private companies, usually in joint ventures with the Malagasy government, are mostly the source of various conflicts.

This article using the framework and methodology of the European project "Environmental Justice Organization, Liabilities and Trade" (EJOLT) funded by the European Commission (FP7 Project 2011-2015), analyses the ecological distribution conflicts and the environmental injustices caused by extractive projects in Madagascar. The authors propose a viewing of the economics of natural resources in Madagascar, through its social metabolism.

The aim of the paper is to provide a framework for the economics of natural resources in Madagascar, in terms of energy and material flows. In other words, it is to see the flows that supply national and international economic activities. The World Bank and most development agencies emphasize the need for Madagascar to exploit its natural resources to facilitate its development. However, despite increased investments and ever-increasing contracts for natural resources extraction, there are emerging issues of injustice expressed by local stakeholders, scientists, environmental justice groups, the environmental civil society, citizens and some of the Malagasy political class. Not only are controversies on issues of environmental injustice, unfair benefit sharing rules, lack of governance and corruption, but they are also on the country's food sovereignty.

Ultimately, the authors propose to link the concept of social metabolism in Madagascar, In particular the material and energy flows, with the issues of environmental justice.

Ecological debt through the eyes of social metabolism: the impact of a regional economy on the global environment

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Abstract
Globalization of the world economy has increased the material and energy flows around the planet, raising the pressure over natural resources and the communities that depend on them. Historically, Northern industrialized countries have been responsible for major pressures over diverse ecosystems within and outside their boundaries. The concept of ecological debt explains this unequal exchange between industrialized countries and resource rich countries in the Global South. This article explores the ecological debt of the Basque Country by combining the analysis of its social metabolism, the related socio-ecological impacts of Basque imports and other economic activities outside its boundaries and three illustrative case-studies in Latin-America, West Africa and Southeast Asia. Through the combination of quantitative and qualitative methods, we connect production and consumption patterns to extraction impacts for global commodity chains, in order to highlight current environmental injustices. This narrative bridges the gap between the local and the global, creating a useful approach for both policy making and education.

Background
Human well-being has a great dependency on surrounding ecosystems and the multiple goods and services they provide (TEEB, 2009). Biodiverse ecosystems have a greater capacity to adapt to a changing environment and therefore, greater capacity to self-maintain and regenerate overtime (MEA, 2005). Nevertheless, data suggests that the lost of biodiversity (Worm et al, 2010) and the depletion of natural resources (Pauly et al, 2007) grow inexorably while commitments to tackle with this lost have not been fulfilled (CBD, 2010).
All countries and societies do not share the same responsibility in current global socio-ecological crisis, as they have impacted in an unequal manner over the environment and the biodiversity. Historically, Northern industrialized or enriched countries have been responsible for mayor pressures over diverse ecosystems and their biodiversity within and outside their boundaries. Nowadays, the pattern of northern industrialized or enriched countries is also followed by emerging economies in other parts of the world (e.g. China or Brazil), which are increasing the pressure over the environment and the communities that depend on them (Muradian, Walter and Martinez-Allier et al., 2012). In this context of globalisation, it becomes critical to analyse the impact of different economies on the global environment in order to better understand the link between multiple patterns of consumption and production and the related socio-ecological impacts at multiple scales.

Objective
The primary goal of this article is to explore the ecological debt of the Basque Country as an example of the responsibility of industrialized Northern economies towards the global environment. This article links the current consumption and production patterns of the Basque economy, historically beneficiated from raw materials and energy resources coming from the Global South, to the socio-ecological impacts suffered in other regions in order to assess its corresponding ecological debt.
Methodology
To achieve this objective the research has been structured in three differentiated parts that combine both quantitative and qualitative approaches to the issue at hand:
a) In the first part, we look at the detailed analysis of the social metabolism of the Basque economy developed by Arto (2009) to determine which are the sectors with the greatest impacts on the global environment. We analyse the statistical data on imports in order to identify the quantity and origin of the materials and energy that the Basque economy requires. This preliminary approach is complemented with the analysis of the Direct Foreign Investment of the Basque economy and the Development Aid Programs of the Basque government, which, besides being non energy and resource intensive within its boundaries (and therefore fall outside our previous analysis), have significant socio-ecological impacts in other parts of the world.

b) In the second part of our research, once identified the material and energy requirements of the Basque economy and their source, we take a closer look to the diverse socio-ecological impacts that are derived from such economic activity, in those countries that are the target of our investments and the origin of the material and energy we consume. More precisely we look at the socio-ecological impacts of the Basque imports of (i) gas and oil, (ii) agrofuels, (iii) minerals, (iv) wood and other forest products, (v) food, (vi) fishing activities, (vii) direct foreign investment and (viii) Basque development aid programs all over the world. This part is based on a detailed literature review of the multiple impacts derived from the above mentioned activities.
c) In a third step, we develop three case studies on selected activities that stand out in the previous analysis because of different factors. Firstly, we study the socio-environmental damages of oil-palm plantations in Indonesia due to actual promotion of agro-fuels by European and Basque governments and because the 96% of Basque imports of oil palm come from this country. Secondly, we research the ecological impacts of tin mining in Bolivia, since 70% of tin imported in Spain comes to the Basque Country and a great part of that tin is extracted in Bolivia. Thirdly, we analyse the impacts of tuna industrial fishing in Western Indic Ocean because 70% of the fish catches by the Basque fleet are tuna and 60% of them are fished in the Indic Ocean.
The study cases were developed by three researchers between June and October 2011 in Borneo and Sumatra (Indonesia), Huanuni in Oruro (Bolivia), and the coasts of Kenya and Seychelles. The field-work consisted on in-depth interviews to key social actors (e.g. indigenous communities, farmers, fishers, NGOs, representatives from regional and national authorities, labor unions and social and environmental movements, among others), direct observation of related social events, in-situ evaluation of impacts and a continued literature and media review.

Some Results

The study of the Basque social metabolism shows that only 17% of its total material requirements are obtained within the region while 83% comes from the rest of the world. Below we expose just some examples of these imports and the related extraction impacts.
The imports of oil and gas constitute more than 90% of Basque energy consumption. This gas and oil comes from Russia, Iran, Mexico, Nigeria, Trinidad and Tobago or Argelia where the extraction of these resources has derived in deforestation, habitat destruction, acid rain, water pollution and the emission of big amounts of CO2 and other toxic gases, implying serious damages for surrounding communities.
We identify an exponential increase of agro-fuels due to the opening of several «biofuel» plants in the Basque Country. Just in 2010, more than 35.000 tons of palm oil were imported and 96% of them came from Indonesia. In this Southeast Asian country, farmer and indigenous communities are systematically displaced, some of the most biodiverse ecosystems are threatened with irreversible damages for many endemic species and greenhouse gas emissions reach unprecedent levels due to primary forest destruction. Labor slavery for the most vulnerable groups, including women and children, is another consequence of this expansion.
In the Basque Country, the imports of tin, nickel and aluminum stand out because of their volume and related impacts. Since 1997, the imports of nickel keep growing, reaching in 2006 its maximum with 10.797 tons (30% of the Spanish imports). This nickel comes mainly from Russia, from cities such as Norilsk (among the 10 most contaminated cities in the world), which releases 4 million tons of copper, led, arsenic or selenium to the atmosphere. There is no tree in 48 km due to acid rain and life expectancy is below 46 years.
In 2010, the Basque country also imported 66.000 tons of aluminum, coming from Mozambique (40.34%), Russia (37.3%), Venezuela (8.27 %), South Africa (1.56%) and Brazil (1.04%). The transformation of aluminum requires huge amounts of energy (2% of global energy consumption, according to Worldwatch Institute). This energy demand is leading to the construction of many hydroelectric dams, causing numerous socio-environmental conflicts.
Another important source of ecological debt for the Basque Country is the import of tin, which accounts for 70% of the Spanish imports. This tin is mainly extracted in the Global South, in countries like: Bolivia, Peru, Malaysia, Thailand and Indonesia. The field work in Bolivia showed the ecological degradation of many watersheds because of mining activities and the subsequent health impacts for their inhabitants. One of the most remarkable example is Huanuni tin mine, declared in environmental emergency by Morales government.

Inclusive Capital and Human Development: Integrating Human and Natural Capitals

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Previous empirical studies have shown that human and natural capitals are among the determinants of economic growth. The previous literatures may not allow us to understand how the human and natural capitals affect the human welfare as they mostly do not consider what follows the economic production process. A measure of human welfare explored here is the level of satisfaction of basic human needs following a man's consumption of goods and services produced through the economic production process. Previous literatures also consider human and natural capitals individually, which does not allow us to understand how the abundance of inclusive capital (human plus natural capital) that forms the productive base of the economy contributes to promoting human development. The purpose of this paper is to find how the inclusive capital affects the levels of human development, and to identify the conditions that promote the human development, thereby contribute to achieving sustainability. Cross-country regression analysis is used for analysing the effect of inclusive capital on the level of human developments, and how this relationship depends on other relevant factors, which are institutional quality and trade openness. Main outcomes are the following: high accumulation of inclusive capital improves the levels of human development, and the effect of one standard deviation increase in inclusive capital abundance on the level of human development can be as high as 9.83 (on the scale of 0 (worst) ? 50 (best)) at average trade openness; and this relationship depends on trade openness. The other results are that: the resource curse (the negative effect of natural resource dependence on economic growth) holds in the context of human development; and open trade and high institutional qualities promote the human development. To contribute to achieving sustainability through promoting the human development, some important conditions are to (1) have abundant inclusive capital that forms the production base of the economy and ultimately influence the level of human development, and (2) promote open trade.

Capabilities and needs ? combining approaches to contribute to sustainability

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Several approaches try to specify the unclear object of sustainable development: what is to be sustained? In this paper, we examine the differences and complementarities of Manfred Max-Neef's Human-scale Development Approach (HSDA) and Amartya Sen's version of the Capability Approach (CA). We aim to show that a combination could be a useful basis for local sustainability initiatives that clearly respond to the challenge of inter- and intragenerational justice.

Needs is a term used by the Brundtland Commission as well as by the HDSA , but with different meanings. Based in humanistic psychology, the HSDA relate needs to an anthropological conception of humans: Each human needs freedom, affection, subsistence, etc. While early foundations of humanistic psychology installed a hierarchy of needs, such as the needs pyramid of Maslow, Max-Neef and other contemporaneous scholars of the needs-based approach leave the question of which need is more important than another to the subjects. Furthermore, the aim of HSDA is to create a framework for empowering local communities to design their development. The CA has been developed by Sen also as a response to paternalistic basic-needs approaches, to mono-dimensional economic approaches and in contrast to Rawl's theory of justice. It shifts the perspective away from utility or income or individual rights towards functionings and capabilities in the evaluation of well-being. So it stipulates that the metrics of human development are capabilities as opportunities to lead life one has reason to value. With this, the CA puts high emphasis on freedom instead of resources (such as money, goods, and services) or of achievements followed by mental states (such as happiness or utility). Some authors have proposed to integrate CA and HSDA in view of sustainable development (SD), without specifying how this should be done, though. Admittedly the argument of e.g. Constanza et al. (2010) about linking HSDA, CA, quality of life, and SD lacks concretion and also Rauschmayer et al. (2011) remain callow in their way of linking the same concepts.

Our paper aims to shed some more light on differences and complementarities of CA and HSDA in the discussion on SD. We argue that a combination of Amartya Sen´s CA and Manfred Max-Neef´s HSDA can substantiate sustainability in a way that is academically more robust than the HSDA and closer to local self-empowerment processes than the CA. As both approaches differ in premises and purpose, such combination should be grounded on a thorough analysis of the relevant differences. In our analysis we compare the similarities and differences of CA and HSDA by establishing criteria of the dimensions' multidimensionality, understanding of humans as well as means and ends. We state that the approaches are rather complementary than contradictory to each other. Our purpose is to show that a link to SD requires both: (a) a conceptual link to justice and (b) conceptual framings that allow normatively inspired processes to evaluate, design, and implement sustainability transitions on the ground.

First we analyze both approaches on their respective anthropological premises and the wider normative frame of using the approach (sketched above) and discern important similarities and disparities. Based on this analysis, we secondly carve out major SD-relevant flaws present in each approach and discuss ways how a combination of both approaches may overcome these flaws. We start from the argument that linking SD to quality of life offers a concrete and positive approach towards intergenerational justice. Although the ideals of sustainable development and of both approaches seem close, they differ profoundly with respect to the unit of evaluation: SD is about ensuring well-being for generations, for a nation and the world. In contrast, the CA and HSDA focus on individual well-being and provide a definition thereof. Since the criterion of sustainability points to problems beyond the scope of life of one individual, the usual reflex is to relegate the responsibility for SD to society as a whole. Combining the CA and HSDA may offer one way to reconcile the individual and the social perspective on sustaining life on earth by pointing to the social nature of human beings. Third, we focus on the practicality of the

approaches. With regard to the premises, the CA easily leads to local applications that fall short of the theoretical rigour present in Sen's conception. Sen states that neither capabilities nor functionings can be reduced to one dimension nor aggregated and conversed into one measure. He views a list of relevant functionings as «possibly infinite» and does not recommend any predetermined version of a list. With his approach he does not generally object to listing functionings, but objects against «fixing ¼ a cemented list of capabilities» (Sen 2004: 78). We argue that the rather fuzzy definition of capabilities in Sen's CA contributes to a lack of specificity implementing the CA. Integrating Max-Neef?s understanding of humans might lead to more practicality in political decision processes «on the ground». This understanding implies the specific conception of human needs and the distinction between needs and satisfiers as a central concept in the HSDA. The idea of the combination is to use needs as dimensions of the evaluative space for capabilities and functionings alike. While needs remain abstract ? and herewith build a common ground for identification amongst people ? satisfiers refer to concrete strategies how to meet needs. Max-Neef describes needs as few, finite and classifiable and they remain the same in all cultures and in all historical periods. «What changes, both over time and through cultures, is the way or the means by which the needs are satisfied (Max-Neef 1992: 199-200)». The downside (from a CA perspective) is the decrease in importance of individual freedom which, in HSDA, is one need amongst others, but not the central normative term of reference.

With regard to the normative frame, a combined perspective can give the HSDA a stronger normative framing for temporal or spatial policy assessments, including ideas on justice. As the HSDA has been formulated very much from a perspective of a «barefoot economist», wider normative reflections are missing. These are very present in the discussions around the CA.

We close the paper by resuming how a combination of both approaches might strengthen sustainability research.

Understanding a nature-related conflict from a capability perspective

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Abstract
Using the basic concepts of the capability approach, we analyse a conflict around nature conservation in Leipzig, Germany. This analysis has a twofold aim: (1) to better understand the conflict at hand, i.e. why a state agency turned to felling thousands of old trees in a highly popular urban nature protection area; and (2) to explore the advantages and limitations of using the capability approach for a nature-related conflict involving collective actors. Our analysis of the actors' positions and interplay along the lines of the capability approach gives insight into the conflict from a freedoms perspective, which would probably be faded out within a different theoretical framework. This analysis employs a (counterfactual) vision of collective actors as individuals, since the capability approach is still rather poorly equipped to deal with collective actors. In general, the capability approach proved helpful in analysing the conflict by providing a freedom-agency lens to examine the matter; however, our analysis had to go beyond the ? traditional' framework of capability generation in certain aspects which are not explicitly present in the capabilities framework.

1. IntroductionThe winter of 2010-2011 saw extensive tree clearance in the German state of Saxony: alone in the city of Leipzig around 6,500 trees were cut down, following a decree of the responsible ministry. Concerned with the danger of floods, the state dam authority set down to secure dyke stability by eliminating all trees and bushes on the dykes. The argument behind was that «in principle, all trees and bushes on and along dykes pose danger to their stability» (SMUL: 3).

The action, however, was largely criticised by parts of the city population and environmental NGOs. One NGO even brought the case to court, claiming that the clearance measures had not been necessary and that alternative approaches would have served better for the purpose of flood protection. In the public debates, the following arguments could often be heard: «The city administration could have been more active and prevented the tree clearance», «The NGOs were not able to participate in deciding on the clearance measures», «The dam administration could not involve NGOs because of the emergency situation and the need to act quickly», etc.

All these statements hint at the importance of the actors' freedoms and agency to take certain actions prior to, during or after the tree clearance measures, beyond their legal and organisational obligations. (For example, the city administration could have interfered and prohibited tree cuttings within the city boundaries (it had this opportunity, from a legal perspective), but it did not do so, while the NGOs could have been included in the decision-making process (in general they are granted the legal right to participate in environmental decision-making), but this did not happen.) Against this background, we intend to conceptually analyse the situation from the perspective of the capability approach (CA), which is centred on the concept of freedom (as the freedom to live a life one has reason to value). Furthermore, Sen's CA incorporates a differentiation between well-being and agency, which offers an important conceptual tool for exploring the situation around the tree clearance as will be shown below.

Using the CA, we follow the growing number of its applications on the political and research arenas worldwide. For instance, CA ideas provided foundation for the Human Development Index and further indicators based upon it, and has been used to measure overall societal progress in different countries as well as to design and assess policies and programmes to deal with poverty eradication and reducing inequality based on age, race or gender (see, e.g., Leßmann 2012). It has also been used to develop participatory projects in these areas, though frequently in a methodologically loose way (XX in Deneulin). Global assessments have applied CA-based ideas as well: One could argue that the Millennium Ecosystem Assessment at least takes account of the CA when it defines one of the five well-being constituents as «the freedom of choice and

action ? opportunity to be able to achieve what an individual values doing and being» (MA 2005: XX).

Despite the fact that the CA has already established itself on the global agenda, further empirical application is required to enhance its relevance in the political realm. If the CA is to gain political importance on a broad basis, e.g. to become an instrument for weighing tradeoffs between various policy options, it has to be tested for its «suitability» to address politically relevant issues. In line with this requirement, we intend to check to what extent the CA can be conceptually applicable and helpful for analysing and understanding a nature-related ? and inherently political ? conflict.

To our knowledge, the CA has not yet been used widely to analyse conflicts around the use and preservation of nature, although these often represent issues of high relevance both from a societal and a political point of view. Using the CA in an environmental setting is in tune with the growing number of calls for a more elaborated inclusion of the natural environment in the CA (e.g., Polishchuk and Rauschmayer 2012, Schultz in print).

To examine the case, we have to change the traditional unit of analysis of the CA: whereas it is usually applied to evaluate individuals' well-being, an examination of collective actors is required here, including the city and federal state administrations, the state dam administration, the city council and the environmental NGOs. Regular citizens were certainly involved in the conflict as well, e.g., by participating in the protests or directing individual requests to the officials. However, we confine our analysis to collective actors as major players in the conflict since this corresponds to our goal of identifying the political potential of the CA (rather than evaluating how the tree clearance affected the well-being of the urban population.)

We approach the task by «reconstructing» the tree clearance conflict in CA terms, i.e., via the categories of goods and services, conversion factors, capabilities, achieved functionings and agency, which in our case pertain to collective actors rather than individuals. Having identified how the different categories are «formed» in the conflict, we examine how these are interconnected (e.g. how one actor's agency affects another one's capabilities). Further, we analyse to what extent the CA allows for such a conceptual reconstruction and assess the conceptual power of the CA for understanding the case. Finally, we elaborate on the identified benefits and limitations of a capability perspective and point to the existing conceptual gaps.

Towards a Typology of Poverty-Environment Indicators

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According to an accepted formula, the poor are too poor to be "green". Relationship between poverty and the environment are obviously complex (see for example, and among many others, Duraiappah 1998, Pearce 2005). Poverty can certainly be a factor in environmental degradation, but environmental degradation also acts back on the standard of living. Health is a good example. As Lvovsky (2001) underlined, up to 20% of the problems of diseases affecting developing countries may be associated with environmental risks[1]. This proportion is even higher in the African continent. However, most developing countries have taken into account only recently and tentatively environment in their development plan[2]. Bojo and Reddy (2003), from a study of poverty reduction strategy papers in 50 countries, highlight for example that the integration of environmental concerns was made very unevenly in different countries, and that in all cases taking into account the environment remained relatively weak.
In order to have a better understanding of the relationship between poverty and the environment and to promote the consideration of environment in poverty and for development, in 2007, the United Nations Programme for the Environment jointly with the United Nations Programme for Development, launched the Poverty and Environment Initiative. The progress report of this initiative, in 2009 (UNEP-UNDP 2010), indicates that 22 countries are now stakeholders in this initiative and started thinking to better integrate environmental issues in poverty policies[3]. This initiative builds on the conceptual framework of the capability approach developed by Nobel Laureate A. Sen (xml:namespace prefix = st1 ns = "urn:schemas-microsoft-com:office:smarttags" />1992, in particular).
As part of this initiative, a series of country studies has been carried out with the aim to propose a set of indicators of the linkages between poverty and the environment, e.g. Tanzania (Horberry et al. 2005) , Rwanda (Bakwatsa and Ntabana, 2007), Mali (Dicko and N'Dah, 2008), Mauritania (Ballet, 2009) among others. However, also relevant are the indicators used in these country studies, they appear as an indefinite list rather than elements of operationalization of the conceptual framework that underpins this initiative.xml:namespace prefix = o ns = "urn:schemas-microsoft-com:office:office" />
This article aims to strengthen the current thinking on poverty-environment linkages by providing an operationalization of the capability approach in this field which also allows the definition of public policies. To do this, we propose a typology of indicators of poverty-environment linkages that could permit to include lists of indicators per country. The interest of such a typology is threefold. It allows on one hand to better understand the relationship between poverty and environment in defining general categories of relationships. It allows, on the other hand, to let aside the impression of heterogeneity due to the current lists of indicators. Finally, it allows to having a better design for public policy in this area.
In the first section, after recalling the foundations of the capability approach, we present its adaptation in the context of the Poverty-Environment Initiative, and these limits. In a second section, after briefly discussed some of the limitations of country studies, we revisit the methodology of indicators. In the third section, we then propose a typology of indicators to operationalize the capability approach and give consistency to further studies on the links between poverty and environment.

References

Ballet J. (2009), Indicateurs combines pauvreté et environnement en Mauritanie, rapport pour l'UNEP Nairobi et PANE Nouakchott.
Bakwatsa C.T. et xml:namespace prefix = st2 ns = "urn:schemas:contacts" />Ntabana I. (2007), Poverty-Environment Indicators and Strategy for Monitoring them within the framework of the EDPRS, Report for UNEP Nairobi.

Bojo J. et Reddy R.C. (2003), Status and Evolution of Environmental priorities in the Poverty Reduction Strategies. An Assessment of Fifty Poverty Reduction Strategy Papers, Environmental Economics Series Paper n°93, Environment Department, World Bank, Washington D.C.
Chaboud C., Froger G., Méral Ph. (2009), « L'expérimentation du développement durable à Madagascar : réalités et difficultés »,Mondes en développement, vol. 37, n°48, pp. 47-66.
Duraiappah A.K. (2002),Poverty and Ecosystems: A Conceptual Framework, UNEP Division of Policy and Law paper, Nairobi.
Duraiappah A.K. (1998), «Poverty and Environmental degradation: A review and Analysis of the Nexus»,World Development, 26(12): 2169-2179.
Horberry J., Sosovele H., Shechambo F., Liwenga E., Kangalawe R., Smith D., et Shah N. (2005), The Development of Indicators of Poverty-Environment Linkages, Report for UNEP, Nairobi and Vice President's Office, United Republic of Tanzania.
Lvovsky K. (2001), Health and Environment. Environmental Strategy papers n°1, Environment Department, World Bank, Washington D.C.
N'Dah E. et Dicko D.A. (2008),Identification des indicateurs d'environnement et de pauvreté dans le cadre stratégique pour la réduction de la pauvreté, les stratégies sectorielles et les plans de développement local au Mali, Rapport pour l'UNEP, Bamako et Nairobi.
Pearce D. W. (2005), Investing in environmental wealth for poverty reduction, Paper prepared on behalf of Poverty-Environment Partnership (PEP) of UNDP, UNEP, IIED, IUCN and WRI.
PEP (2008) (Poverty-Environment Partnership), Poverty, Health & Environment. Placing Environmental Health on Countries'Development Agendas, Joint Agency Paper 2008.
Sen A.K. (1992),Inequality Reexamined, Oxford, Oxford University Press.
UNDP (2002),Linking Participatory Research, Dialogue and Action, Poverty and Environment Initiative. Partnerships to Fight Poverty and Sustain the Environment. A Global Capacity Development Network on Poverty and Environment, New York.
UNDP-UNEP (2010), Scaling-up the UNDP-UNEP Poverty-Environment Initiative, Annual Progress Report 2009, Nairobi, Kenya.

[1] A general presentation of this issue can be found in a Poverty-Environment Partnership publication, PEP (2008).
[2] Nevertheless a great number of countries have taken into account environmental issues through National Environmental Action Plan. But development issues are often relegated to a second level (see Chaboud et al., 2009 for the case of Madagascar).
[3] On 22 pays, 10 are in Africa (Kenya, Mali, Mauritania, Mozambique, Rwanda, Tanzania, Uganda, Botswana, Burkina-Faso, Malawi), 8 in Asia (Bhutan, Laos, Vietnam, Bangladesh, Nepal, Philippines, Thailand, Timor), 2 in Europe (Kyrgyzstan and Tajikistan) and 2 in South America and the Caribbean (Uruguay and Dominican Republic).

The dynamics of energy and mobility demand

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This talk begins by considering different methods of conceptualising the demand for energy and mobility. The suggestion that such demand is an outcome of changing social practices underlines the significance of linking social and historical research to that which deals with the provision and management of energy and mobility systems. A focus on what energy is used for in contemporary society ? that is, of which practices is energy consumption a part ? forces us to think differently about long term energy ?needs' and how they might be established and changed. I will outline different lines of research designed in response to this agenda.

Authors Index

Agarwal, Bina....349
Aguilar-González, Bernardo....328
Akiyama, Tomohiro....655
Alcott, Blake....63
Alijani, S.....185
Allaire, Gilles....558
Altenburg, Corinna....25
Amblard, Laurence....58, 60
Anastasios, Papafragou....472
Andersen, Bente....375
Anderson , Kevin....118
Andriambelona, Annyssa....58
Angeon, Valérie....276
Antona, Martine....494
Antunes, Paula....10, 87, 363, 367
Araujo, Roberto....226
Arfaoui, Nabila....515
Arlinghaus, Robert....556
Arsel, Murat....142
Arto, Iñaki....653
Asara, Viviana....104
Aslaksen, Iulie....307
Aslam, Uzma....243
Aubert, Pierre-Marie....479
Aydin, Cem Iskender....651
Aydin, Erdal....486
Ayres, Robert....461
Ballet, Jerome....164, 660
Balázs, Bálint....150, 161, 218, 448
Bandyopadhyay, Sumana....504
Banovac, Ksenija....548
Baranzini, Andrea....123
Barbara, Mihók....37
Barbier, Marc....400
Barcena, Inaki....653
Bardsley, Nicholas....133, 279, 472
Barles, Sabine....549
Baron, Catherine....115

Barrett, John 644
Baró, Francesc 569
Bassino, Jean-Pascal 540
Bastin, Georges 29
Bauler, Tom 463, 562
Baumgärtner, Stefan 44, 48, 572
Bechtold, Ulrike 609
Beckenbach, Frank 70
Becker, Christian 44
Beckmann, Volker 556
Bela, Györgyi 150, 390
Belin, Jean 468
Beltrán, María 257, 343
Berger, Lars 281
Berger-Douce, Sandrine 330
Berglund, Eeva 451
Bergmann, Matthias 537
Berland, Nicolas 315
Berman, Rachel 26
Bermejo, Roberto 653
Bernardino, João 456
Bernardo, Giovanni 141, 529
Berta, Nathalie 253
Bertaux, Nancy 146
Bidaud, Cécile 346
Bieling, Claudia 41
Bigras, Pascal 551
Bithas, Kostas 646
Biénabe, Estelle 558
Blanco, Ester 60
Bleys, Brent 35
Bloemmen, Marjolijn 27
Blond, Nadège 24
Blouin, Manuel 110
Blundo Canto, Genowefa 170
Bobulescu, Roxana 27
Bodorkós, Barbara 150
Boidin, Bruno 542

Boisvert, Valérie 28, 256, 629
Boitier, Baptiste 66
Bojovic, Dragana 180
Bolognesi, Thomas 54
Bommel, Pierre 494
Bonsirven, Marilyne 335
Borie, Maud 237
Bouamrane, Meriem 228
Bousquet, Francois 227
Bows, Alice 186, 263
Braat, Leon 19
Brand, Ulrich 97
Brink, Ben Ten 304
Brodhag, Christian 330
Bromley, Daniel W. 1
Brondizio, Eduardo 226
Brouillat, Eric 515
Brounen, Dirk 486
Brouwer, Roy 84, 216
Brullot, Sabrina 379
Bryce, Rosalind 209
Buchs, Arnaud 54
Buchs, Milena 472
Buclet, Nicolas 465
Bugter, Rob 19
Busca, Didier 316
Busch, Jonathan 649
Busse, Stephan 387
Bélis-Bergouignan, Marie-Claude 250
Cabello, Joanna 173
Cabrera Serrenho, André 461
Callens, Stephane 266
Callot, Philippe 370
Calvet, Coralie 586, 587
Camara, Mamoudou 564
Cammelli, Federico 494
Capari, Leo 606, 609
Capron, Michel 2

Carattini, Stefano 123
Cardenas, Juan-Camillo 227
Care, Nicolas 7
Caridade, Annelise 544
Carnoye, Leslie 350, 602
Caron, Armelle 276
Cassiers, Isabelle 29
Castillo, Daniel 227
Cavé, Jérémie 436
Cazals, Clarisse 377
Ceddia, Graziano 133
Ceddia, Michele 279
Centemeri, Laura 589
Centgraf, Salina 656
Chaparro, Lydia 569
Chassagnon, Virgile 513
Chervier, Colas 425
Cheval, Hélène 177
Chicaiza, Gloria 160
Chiengkul, Prapimphan 437
Chilvers, Jason 319
Christie, Mike 205
Church, Andrew 205
Chèze, Benoît 443
Clavier, Pierre 500
Clemente, Pedro 10, 87
Coelho, Ricardo 173, 254
Colby, Bonnie 604
Collart Dutilleul, François 540
Conde, Marta 160
Constans, Michèle 357
Coolsaet, Brendan 50
Corbera, Esteve 499
Cordier, Mateo 139
Coudel, Emilie 494, 500
Courrent, Jean-Marie 335
Curran, Michael 240
D'alessandro, Simone 114, 529

D'alisa, Giacomo 114, 156
Da Cunha, Charlotte 413
Daedlow, Katrin 556
Dale, Gareth 230
David N., Barton 9, 310
Davidsdottir, Brynhildur 431, 432
Davies, Althea 209
Davies, Tammy 211
Dawkins, Elena 186
Dawkins, Ellie 263
Dawson, David 649
De Freitas Silgueiro, Vinicius 216
De Schepper, Ellen 624
Debourdeau, Ariane 463, 562
Debref, Romain 113, 510
Decouzon, Cyril 43, 602
Dedeurwaerdere, Tom 277
Del Arco Zúñiga, Pablo 216
Del Bene, Daniela 191
Del Corso, Jean-Pierre 357, 388
Demaria, Federico 156
Depret, Marc Hubert 245
Didier, Christelle 638
Ding, Helen 277
Dittmer, Kristofer 75
Dobrowolski, Sébastien 8
Dobson, Andrew 3
Doll, Christopher 630
Dominati, Estelle 431, 433
Domingos, Tiago 125, 461
Domptail, Stephanie 341
Douai, Ali 117, 468
Doudnikoff, Marjorie 382
Douguet, Jean-Marc 127, 297, 652
Druelle Korn, Clotilde 5
Drupp, Moritz 572
Drut, Marion 91
Du Tertre, Christian 92

Dubois, Maarten 580
Duhalde, Michel 477
Dupras, Jérôme 551
Duro, Juan Antonio 296
Dutilly, Céline 83
Economakis, George 171
Eigner, Amanda 341
Eisenack, Klaus 381
Eisenmenger, Nina 112, 344
Elie, Luc 65
Emanuele, Campiglio 141
Emerton, Lucy 538
Engelen, Bart 354
Erb, Karl-Heinz 214
Ertor, Irmak 651
Ertor-Akyazi, Pinar 651
Eskola, Jaana 625
Etzold, Jonathan 387
Ezzine De Blas, Driss 83
Fabók, Veronika 218
Farley, Joshua 77
Farrell, Katharine 619
Favereau, Olivier 407
Fazey, Ioan 205, 211
Fernandez, Edgar 540
Ferraz Da Fonseca, Igor 51
Ferreira Dos Santos, Rui 9
Ferreira, Joice 494
Ferru, Marie 245
Fetzel, Tamara 214
Figureau, Anne-Gaëlle 138
Fimbel E.,, Eric 410
Finka, Maros 221
Finnoff, David 203
Fischer-Kowalski, Marina 339
Fisher, Janet 275
Flipo, Fabrice 567
Florence, Eduardo 216

Flores, Abelino 83
Florin, Popa 152
Folcher, Pauline 368
Foxon, Timothy 640
Foyer, Jean 28, 629
Framstad, Erik 307
Frank, Karin 212
Friend, Anthony 149
Froger, Geraldine 660
Froger, Géraldine 427
Fuchs, Daniela 474
Galappaththi, Eranga 435
Gallai, Nicola 357, 574
Galliano, Danielle 516
Garmendia, Eneko 653
Garnier, Estelle 510
Garnåsjordet, Per Arild 304, 307, 392
Gasparatos, Alexandros 440, 626, 630
Gaudieux, Aurelie 169
Gautherat, Emmanuelle 253
Gautier, Arnaud 330
Gawel, Erik 212
Gebara, Maria 85
Geisendorf, Sylvie 119
Getzner, Michael 259, 642
Gherib, Jouhaina 335
Giergiczny, Marek 166
Gierlinger, Sylvia 344
Gilbertson, Tamra 173
Gill, Bernhard 33, 79
Gingrich, Simone 344
Girard, Bernard 409
Glotzbach, Stefanie 44
Gnassou, Josiane 266
Gobert, Julie 379
Gomez-Y-Paloma, Sergio 133, 279
Gough, Clair 263, 386
Gradwohl, Markus 214

Grasman, Johan 438
Grieg-Gran, Maryanne 85
Griewald, Yuliana 658
Grillot, Aude 332
Grimsrud, Kristine 395
Grin, John 363, 367
Gucciardi, Gianluca 453, 483
Guevara-Sanginés, Alejandro 83
Guimond, Benjamin 245
Gun, Ozgur 31, 253
Guyader, Olivier 361, 477
Guéneau, Stéphane 406
Gébert, Judit 37
Géraldine, Froger 346
Gómez Baggethun, Erik 17
Gómez-Baggethun, Erik 235, 398, 569
Górriz, Elena 242
Götter, Johanna 163
Haapanen, Liisa 232
Hagedorn, Konrad 281
Hamdouch, Abdelillah 548
Hammer, Monica 124
Hanger, Susanne 51
Hargreaves, Tom 318, 320
Harribey, Jean-Marie 117
Harribey, Jean^marie 74
Hausknost, Daniel 99
Hayashi, Takashi 285
Hellweg, Stefanie 240
Hendrickson, Cary 499
Heong, K. 127
Hernandez Montes De Oca, Paola 419
Hielscher, Sabine 318
Hjerppe, Turo 56
Hockley, Neal 205
Holtsmark, Bjart 392
Holzemer, Laurence 470
Honkela, Nina 451, 454

Howlett, Michael 526
Hoyos, Davd 653
Hrabanski, Marie 258
Huber, Amelie 597
Hukkinen, Janne 154, 446
Hukkinen, Janne I. 451, 454
Hédoin, Cyril 113
Hüttel, Silke 281
Ingulfsvann, Are 466
Irvine, Katherine 205, 207
Ishihara, Hiroe 116
Jackson, Tim 521
Jahn, Thomas 537
Jakobsen, Ove 466
Jalas, Mikko 622
James, Patrick 472
Jancsovszka-Puskás, Paulina 448
Janssen, Marco 227
Jany-Catrice, Florence 520
Jean-François, Le Coq 346
Joachain, Hélène 490
Johansen, Thomas 287
Johnston, Robyn 505
Jones-Walters, Lawrence 15
Jonsdottir, Eydis 432
Jorda-Capdevila, Dídac 40
Jordão, Carolina 85
Julliard, Romain 177
Juntunen, Jouni 622
Jurczak, Malgorzata 237
Jørgensen, Michael 375
Kalimeris, Panos 646
Kallis, Giorgos 458
Kalóczkai, Agnes 37, 218
Kalóczkai, ágnes 167
Kanchanaroek, Yingluk 554
Kane, Idrissa 416
Kaptan, Serkan 283

Karadzic, Vanja 363, 367
Karsenty, Alain 327
Karyotis, Catherine 185, 410
Kastenhofer, Karen 609
Keil, Florian 537
Kelemen, Eszter 37, 167, 218
Kenter, Jasper 205, 211
Kephaliacos, Charilaos 357, 388
Kermagoret, Charlène 184
Kimmich, Christian 82
Kiryushkina, Elena 491
Király, Gábor 161
Klassert, Christian 212
Klopfert, Frederic 490
Kluvankova-Oravska, Tatiana 220, 221, 223
Koellner, Thomas 237
Kohlheb, Norbert 448
Kohrs, Bertchen 160
Kovács, Eszter 37, 167, 218
Kovács-Krasznai, Eszter 218
Krause, Torsten 17
Krausmann, Fridolin 339, 344, 642
Kronenberg, Jakub 107, 166
Kruglianskas, Isak 544
Köves, Alexandra 161
La Torre, Maura 412
Labarthe, Pierre 251
Lagière, Rachel 361
Lago, Rosa 653
Laihonen, Maarit 491
Lamarche, Thomas 94
Lancesseur, Nicolas 66
Langemeyer, Johannes 569
Lapeyre, Renaud 497, 593
Lara, Jose-Alberto 83
Larabi, Zidane 361
Larade, Arnaud 276
Laurans, Yann 401

Lavaud, Sébastien....468
Lazaric, Nathalie....468
Le Bas, Christian....514
Le Coq, Jean-Francois....423, 429
Le Grand, Christelle....361
Le Guel, Fabrice....468
Le Moigne, Jean-Louis....228
Le Tourneay, Francois-Michel....226
Le Velly, Gwenole....83
Le, Nhu Tu-Yen....27
Leah, Temper....191
Lehtonen, Markku....298, 440
Leimona, Beiria....497
Lemeilleur, Sylvaine....583
Leménager, Tiphaine....401
Lessmann, Ortrud....621, 656
Levidow, Les....487, 507
Levrel, Harold....136, 184, 347, 477, 587, 591
Levy, Rachel....607
Li, Jia....655
Liberat, Nicolas....245
Lienhoop, Nele....84
Lima, Guilherme....85
Lizin, Sebastien....624
Llored, Jean-Pierre....508
Loft, Lasse....535
Longhurst, Noel....319, 464
Lopes, Rita....350, 352
Lopez-Ferber, Miguel....110
Lopez-Hoffman, Laura....604
Lutter, Stephan....540
Lux, Alexandra....537
Luzzati, Tommaso....453, 483
Maaß, Kerstin....199
Macher, Claire....361
Mackay, Alec....433
Maes, Dries....634
Maganda, Carmen....600

Magnin, Eric 69
Mahzouni, Arian 525
Maillefert, Muriel 43, 110, 600, 602
Maizière, Pierre-Alexandre 427
Malwe, Claire 540
Mander, Sarah 263, 386
Manthey, Michael 387
Mantxo, Martin 653
Marangi, Tyler 63
Marcone, Oceane 576
Marechal, Kevin 470
Margóczi, Katalin 37
Martinez Boysselle, Jacqueline 517
Martinez-Alier, Joan 191, 652
Martino, Gaetano 632
Martins, Helena 125
Martiskainen, Mari 318
Marttunen, Mika 615
Masson, Eric 602
Masson, Torsten 621
Mathe, Syndhia 364
Mathevet, Raphaël 237
Matutinovic, Igor 229
Mauerhofer, Volker 272, 560
Maurel, Pierre 12
May, Peter 9, 85, 216
Mayer, Andreas 344
Mayrand, Karel 551
Mcdermott, Shana 203
Mcdonald, Jane 304
Mckim, Laura 195, 636
Mclachlan, Carly 263
Meadway, James 141
Mearman, Andrew 460
Mehring, Marion 537
Mencet Yelboga, Nisa 445
Menestrey Schwieger, Diego 135
Menzel, Susanne 261

Merchez, Luc 540
Merino-Saum, Albert 614
Merlin-Brogniart, Céline 43
Mermet, Laurent 404
Merzéréaud, Mathieu 361
Meya, Jasper 572
Meyer, Claas 321
Mihashi, Rina 655
Milanesi, Julien 372
Milicic, Vesna 222
Missemer, Antoine 73
Mock, Mirijam 474
Moellendorf, Darrel 121
Mongruel, Rémi 347, 576
Montginoul, Marielle 138
Morardet, Sylvie 505
Morehouse, Barbara 599
Morin, Lise 361
Munck Af Rosenschöld, Johan 454
Munz, Jan 572
Muraca, Barbara 95
Muradian, Roldan 348
Murgue, Clément 201, 505
Mustajoki, Jyri 615
Muñoz-Piña, Carlos 83
Málovics, György 37, 150
Méral, Philippe 346
Münch, Angela 274
Münzner, Franziska 387
N'dao, Youssoupha 583
Nadel, Simon 516
Napoleone, Claude 587
Naredo, José Manuel 235
Navegantes, Livia 494
Neang, Malyne 425
Negrutiu, Ioan 540
Neudert, Regina 163, 387
Neuteleers, Stijn 354

Nguyen, Geneviève 388
Nicolas, Béfort 511
Nicolaus, Kristin 323
Nicolle, Sandra 312
Nieddu, Martino 373
Nierling, Linda 566
Nikolic, Marija 412
Nonet, Guénola 585
Nybø, Signe 307
Nystad, øystein 466
O'brien, Liz 205, 207
O'keefe, Laura 263, 386
O'neill, Daniel 531
Ohlund, Erika 124
Oliveira, Celma 500
Oltra, Vanessa 468
Omann, Ines 474
Orozco, Luis 516
Orsini, Marco 483
Ozkaynak, Begum 651
Paavola, Jouni 26
Paloniemi, Riikka 11
Pampanini, Rossella 632
Paneque, Pilar 257
Papalexiou, George 171
Papyrakis, Elissaios 89
Paradas, Agnès 334
Pataki, György 37, 150, 161, 167, 218, 448
Pechan, Anna 381
Pellegrini, Lorenzo 142
Pesche, Denis 346, 423
Petit, Olivier 115, 599, 600, 602
Petridis, Panos 182
Pfriem, Reinhard 70
Pigeon, Patrick 24
Piketty, Marie-Gabrielle 494
Pinard, Michelle 211
Pinto, Rute 10, 87

Pirard, Romain 497
Pirgmaier, Elke 68
Pitseys, John 50
Plank, Leonhard 259
Plant, Roel 12
Plante, Steve 413
Pletnev, Dmitri 578
Plichon, Romain 190
Plieninger, Tobias 41
Plumecocq, Gael 600, 607, 610
Plumridge, Anthony 460
Polishchuk, Yuliana 129
Poussing, Nicolas 514
Primmer, Eeva 11
Prokofieva, Irina 242
Puetz, Marco 261
Pump, Judit 448
Purnell, Phil 649
Quaas, Martin F. 48, 572
Quenault, Béatrice 24, 422
Quinn, Claire 26
Quist, Jaco 562
Quétier, Fabien 587
Raeva, Dragomira 160
Ragnarsdottir, Kristin 432
Raharinirina, Vahinala 652
Randrianalijaona, Mahefasoa 164
Randrianarison, Henintsoa 163
Rauschmayer, Felix 144, 474, 562, 656, 658
Ravenscroft, Neil 205
Rayner, Jeremy 526
Redpath, Steve 209
Reed, Mark 205, 211
Regnery, Baptiste 587
Reichardt, Kristin 522
Remig, Moritz 70
Rendon, Olivia 108
Renou, Yvan 54

Revell, Ruairi 649
Revéret, Jean-Pierre 551
Rey-Valette, Hélène 364
Ribas, Thais 10, 87
Richter, Andries 438
Riekkola, Marja-Liisa 451
Rinaudo, Jean-Daniel 138
Ring, Irene 9, 237
Robert, Isabelle 410
Robins-King, Joanna 211
Robinson, David 431
Roca, Jordi 123
Rode, Julian 17, 538
Rodhain, Florence 585
Rodríguez-Labajos, Beatriz 40, 160, 595
Roeder, Mirjam 263
Roelich, Katy 649
Rogge, Karoline 522
Roggero, Matteo 21
Romagny, Bruno 115
Roman, Philippe 46
Rommel, Jens 199
Ruf, François 583
Rusch, Graciela 9
Rushby, Thomas 472
Ryan, Mandy 211
Røpke, Inge 528
Saarikoski, Heli 615
Sablayrolles, Philippe 500
Saenz-Segura, Fernando 429
Saint-Jean, Maider 515
Sajjad, Sajjad 24
Salles, Jean-Michel 540, 574
Salthe, S. N. 229
Sandbrook, Chris 275
Santos, Rui 10, 87, 237
Sayan, Ramazan 178
Sayin, Cengiz 445

Saysel, Ali Kerem 283
Scemama, Pierre 136
Schaffartzik, Anke 112, 344
Schaffer, Axel 121
Schandl, Heinz 642
Schleyer, Christian 41
Schlüter, Achim 269
Schmidt, Tiina 457
Schneider, Cécile 500
Schneider, François 612
Schomers, Sarah 325
Schröter-Schlaack, Christoph 237
Schubert, Johannes 33, 79
Schäpke, Niko 144, 562
Scott, Kate 644
Sedlacek, Sabine 133, 279
Segrestin, Blanche 408
Sekulova, Filka 533, 612
Sergent, Arnaud 377
Settele, Josef 127
Seyfang, Gill 318, 464
Sharma, Abhinav 265
Shioya, Mari 224
Shove, Elizabeth 662
Sievers-Glotzbach, Stefanie 48
Similä, Jukka 11
Singleton, Richie 195, 636
Sirina, Natalia 439
Skarpaas, Olav 307
Smith, Adrian 318
Smith, Graham 472
Smith, Pete 644
Snethlage, Mark 15
Sousa, Tânia 461
Spangenberg, Joachim 127
Spash, Clive 71, 147
Spence, Martine 335
Spiric, Jovanka 180

Stecker, Rebecca 381
Steinberger, Julia 640, 642, 649
Steyaert, Patrick 400
Stirling, Andrew 302
Stromberg, Per 440
Strunz, Sebastian 384
Stumpf, Klara 44, 51
Sullivan, Caroline 502
Sun, William 411
Sébastien, Léa 32
Séhier, Clément 546
Söderbaum, Peter 101
Tainio, Anna 11
Talin, Kristoff 638
Tapio, Petri 232
Taravella, Romain 481
Tchuisseu, Rivellie 251
Teixeira, Aurora 198
Teixeira, Ricardo 125
Teixido-Figueras, Jordi 296
Terradas, Jaume 569
Theesfeld, Insa 41
Thiel, Andreas 21, 60
Thiry, Géraldine 32, 36
Thornley, Patricia 263
Thrän, Daniela 212
Touchelay, Beatrice 4
Touili, Nabil 417
Udovc, Andrej 222, 223
Uhlaner, Lorraine 332
Unai, Pascual 116
Urkidi, Leire 653
Vaissière, Anne-Charlotte 591
Valada, Tatiana 125
Van Den Hove, Sybille 301
Van Griethuysen, Pascal 72
Van Passel, Steven 624, 634
Vandevelde, Jean-Christophe 256

Vasseur, Liette 413
Vatn, Arild 303
Vecchione, Elisa 618
Velázquez, Esther 343
Veronika, Fabók 167
Vidal, Marion 316
Videira, Nuno 352, 612
Villamayor Tomas, Sergio 60
Vira, Bhaskar 275
Vitari, Claudio 27
Vivien, Franck-Dominique 31, 373
Vogt, Nathan 226
Von Slobbe, Erik 600
Vranken, Liesbet 624
Väisänen, Sari 56
Wallbridge, Rebecca 472
Walter, Mariana 160, 595
Warner, Jeroen 599, 600, 602
Warr, Benjamin 461
Weber De Morais, Gabriela 269
Wenzlaff, Ferdinand 82
Werquin, Thomas 190
West, Jim 642
Wiedenhofer, Dominik 112, 339
Wiederholt, Ruscena 109
Wilen, Kristoffer 457, 625
Wilfing, Harald 606, 609
Willis, Katherine 626
Wilson, Charlie 320
Wittmer, Heidi 538
Wood, Ruth 186, 263
Woodman, Nicholas 472
Wunder, Sven 587
Wächter, Petra 193
Wätzold, Frank 163
Xavier, Galiegue 248
Yamamoto, Mitasu 285
Yarime, Masaru 655

Yoeu, Asikin 425
Yánez, Ivonne 160
Zabala, Aiora 188, 502
Zafra Calvo, Noelia 560
Zagamé, Paul 66
Zak, Denise 259
Zander, Kerstin 176
Zgavec, Dubravka 222
Zikos, Dimitrios 60
Zografos, Christos 159
Zurek, Karolina 124
özkaynak, Begüm 160

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