D7.3A Peer-review summary document describing lessons learnt and recommendations

Pegaso Project
People for Ecosystem based Governance in Assessing Sustainable development of Ocean and coast

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Acronyms and abbreviations

A
ABNJ: Areas Beyond National Jurisdiction
AG: Advisory Group on the Development of Common Methodologies for ICZM

B
BBN: Bayesian Belief Networks
BSC-PS: Black Sea Commission Permanent Secretariat

C
CA: Consortium Agreement
CASES: Collaborative Application SitES
CBD: Convention on Biological Diversity
COASTGAP: Coastal Governance and Adaptation Policies in the Mediterranean
COP: Conference of Parties (to the Barcelona Convention)
CPC: The Champion Participatory Coordinator
CZM: Coastal Zone Management

D
D: Deliverable
DG ENV: Directorate-General of Environment
DG MARE: Directorate-General for Maritime Affairs and Fisheries
DG Regio: Directorate-General for Regional and Urban Policy
DIEC: The Data and Information exchange Coordinator.
DoW: Description of Work.
DPSIR: Drivers Pressures State Impact Response

E
EC: European Commission.
EcAp: Ecosystem Approach
EEA: European Environmental Agency
ENPI-SEIS: Shared Environmental System across Europe
EnvirogGRIDS: Building Capacity for a Black Sea Catchment Observation and Assessment System supporting Sustainable Development
EUC: End-Users Committee
EuropeAid: Directorate-General for Development and Cooperation

F
FACECOAST: Face the challenge of climate change in the med coastal zones Cluster
FAO: Food and Agriculture Organization of the United Nations
FP7: Seventh Framework Programme.

G
GA: Grant Agreement.
GAs: General Assembly
GEF: Global Environmental Facility
GES: Good Environmental Status
GIS: Geographical Information System

H
H2020: Horizon 2020
HCEFLCD: Al Hoceïma National Park
HCMR: Hellenic Centre for Marine Research

I
ICM: Integrated Coastal Management
ICZM: Integrated Coastal Zone Management
ICZMSP: Integrated Coastal Zone Management Plan of the Nile Delta
IMO: International Maritime Organization
IMP: Integrated Management Policy
IOC: International Oceanographic Commission
IRA: Integrated Regional Assessment

IUCN: International Union for Conservation of Nature

J
JPOI: Johannesburg Plan of Implementation

L
LEAC: Land and Ecosystems ACcounting

M
M12: Month twelve
MAP: Mediterranean Action Plan
MAREMED: MAritime REgions cooperation for the MEDiterranean
MDGs: Millennium Development Goals
MEDINA: Marine Ecosystem Dynamics and Indicators for North Africa
MEDWET: Mediterranean Wetlands Initiative
MPAs: Marine Protected Areas
MSFD: Marine Strategy Framework Directive
MSP: Maritime Spatial Planning
MSSD: Mediterranean Strategy for Sustainable Development

N
NFPs: National Focal Points
NGOs: Non-Governmental Organisations

O
OGC: Open Geospatial Consortium

P
PAP: Priority Actions Programme
PERSEUS: Policy-oriented marine Environmental Research for the Southern European Seas
PES: Payment for Ecosystem Services
PLC: PEGASO Land Cover
PM: Person month
PO: Project Officer

R
RAC: Regional Activity Centre
RAMSAR: The Ramsar Convention of Wetlands
RSCs: Regional Sea Conventions

S
SAP: Black Sea Strategic Action Plan
SC: Steering Committee.
SDI: Spatial Data Infrastructure
SEAC: Sea ecosystem accounting
SHAPE: Shaping an Holistic Approach to Protect the Adriatic Environment between coast and sea
SMDGs: State Millennium Development Goals
SPA: Special Protected Area
SPINCAM: Southeast Pacific data and information network in support to integrated coastal area management

T
ToR: Terms of Reference (ToR).

U
UAB: Universitat Autònoma de Barcelona (Autonomous University of Barcelona - Spain)
UN: United Nations
UNDP: United Nations Development Programme
UNEP: United Nations Environment Programme
UNCLOS: United Nations Convention on the Law of the Sea
UNOTT: University of Nottingham (United Kingdom)
UfM: Union for the Mediterranean
UPO: Universidad Pablo de Olavide de Sevilla (Pablo de Olavide University of Sevilla - Spain)

V
VIC: Virtual Meeting.
VIC02: 2nd Pegaso Virtual Meeting.

W
WMIIE: Western Mediterranean Impact Index on the coastal and marine Ecosystems
WMS: Web Map Service
WP: Work Package

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1. Introduction

1.1. Purpose and scope of the report

This report aims at showing and enhancing the added value of PEGASO though the specificity of the work done as well as through main lessons learned.

PEGASO can be considered as a laboratory for the implementation of the Protocol and therefore for the implementation of ICZM, PEGASO has focused on the ICZM process. The concrete results has served this process, addressed to achieve the two main bjectives of PEGASO: bridging science and decisión making and supporting the ICZM Protocol implementation in the Mediterranean and the setting up of similar policies in the Blak Sea. This is very important because the reflection done on the process can be applied to other situations and cases (issue of replicability and sustainability). PEGASO has identified a number of important tools and mechanisms to be put in place for a proper ICZM implementation:

1. The ICZM Governance Platform
2. Impuls of a collaborative work amongst all stake holders
3. Tools for policy objectives assessment and actions plan setting
4. Scales: local and regional
5. Data sharing mechanisms
6. Capacity building aimed at learning to work together to implement ICZM

PEGASO was successful in delivering important scientific results, but also in **strengthening existing networks in the Mediterranean and Black Sea**, as well as to create new institutional ties.

One of the main characteristics of PEGASO was to work at the **interface between science and policy** providing opportunities for scientists, practioners, and decision-makers in the field of Integrated Coastal Zone Management (ICZM) for dialogues and debates. Responding to both objectives, the **PEGASO ICZM Governance Platform** has been at the heart of the PEGASO work.

PEGASO promoted a **trans-disciplinary and trans-cultural approach by exploring different ways of knowledge production where all stakeholders were involved**. This has proven to be instrumental when providing scientific and technical support, not only in the implementation of existing policies, especially the **ICZM Protocol for the Mediterranean Sea**, but also in the definition of new ones.

The strength of the PEGASO consortium was to be made of different typologies of institutions, intergovernmental, scientific, international, national and local, with the same common vision, answering the needs of the stakehoders (UNEP/MAP, sub-regions, countries, regions, municipalities, NGOs and other Mediterranean networks, economic sectors (e.g. gisheries, aquaculture, tourism, urban planning, protected areas, etc), **aiming at a practical and useful collaborative work across different scales**, in an **ecosystem-based framework.**

This collaborative work has allowed the making of a **stocktake**, not only in the countries where PEGASO had partners, but also in all the riparian countries of the Mediterranean and the Black Sea. This has been possible thanks to the motivation and efforts of the National Focal Points of the ICZM Protocole and their national institutions.

PEGASO has also developed a number of **assessment tools**. These tools were trying to fill some existing gaps and in particular those related to the assessment of cumulative impacts on natural habitats deriving from multiple sources of pressures, and those related to the need of aggregated different sources of data to produce information useful to support decision-making. The tools, procuded along a co-work within the ICZM Governance platform, allows to understand on the one hand the present situation through ex-ante analysis (to bring collective awareness and responses to main threats, drivers, pressures, and impacts on coastal and marine ecosystems, but also, on the other hand, to serve as a method to foresee how main threats can evolve

in envisioning and foresights exercises, building most probable scenarios, with a **co-construction of a common future**, what should be the main planning and management priorities to be takled in a collaborative way.

Again, the PEGASO ICZM governance platform has been key to support and encourage this communication, building of a shared knowledge and collaborative working.

PEGASO has shown, through the development of the **Spatial Data Infrastructure (SDI),** the potential of data and information sharing, through a technical network made of a number of geo-nodes (partners and stakeholders' institutions) that impulse harmonization of data, interoperability and data sharing, using a common viewer. All tools and other relevant data are embedded in this SDI, which is accessible at the PEGASO web. The building of an interactive atlas for the Mediterranean and the Black Sea has also been produced as a result of the SDI construction process.

Furthermore, PEGASO has made efforts to **establish and strengthen durable mechanisms for networking and capacity development so as to promote knowledge transfer and dissemination (N-S; S-N; N-N and S**). Special effort has been done for the South and the Eastern Mediterranean and for the Black Sea countries that are extremely motivated and would like to see the PEGASO project continuing, to support their ICZM needs.

Over the lifespan of PEGASO, the project has mobilised in a successful collaborative-work around a thousand of Mediterranean and Black Sea scientists and stakeholders, both at regional and at CASE levels. PEGASO ends up as an innovative and creative project, which has provided exploratory ways to stakeholders to share common knowledge with scientists.

This practice has given a new know-how on exchanging data and speaking together among scientists, decision makers, national and local managers, making these different professional spheres collaborating in a common direction. Demands to continue PEGASO work and spirit from stakeholders are very high. This continuous interaction has created a social energy in PEGASO. The human aspect, the relation amongst people, motivated to learn from each other, has boosted a creative human, transdisciplinary and transcultural unforgettable experience that has reinforced friendship, confidence and cooperation linkages, named by its partners the PEGASO family. All these PEGASO products, process and spirit have been recognised and this social energy especially appreciated. They should be capitalised in the post PEGASO as the most important human, technical and shared knowledge legacy of the project.

1.2 The current (and future) marine and coastal policy context

PEGASO has been conceived to support the countries in the implementation of the ICZM Protocol for the Mediterranean. It has therefore developed its outcomes and products with a view of providing a support for marine and coastal policies implementation. Therefore, it is crucial, to fully understand the importance of the ICZM Protocole as a unique and innovative policy for a Regional Sea, in the context of the whole policy frame at different scales. The policy frame is also very relevant to better understand the scope of PEGASO in an overview of the current and future marine and coastal legislation landscape.

In the last decades there has been a rise in the attention to coastal and marine issues. Since the early 1970's with the Brundtland Report and following with UNCLOS, Chapter 17 of Agenda 21 and the World Summit on Sustainable Development in Johannesburg (the Johannesburg Plan of Implementation, JPOI), major global initiatives have advanced principles, goals, timelines and targets for managing the issues facing the ocean and coasts, and the living and non-living resources therein.

Problems, for example, include the fact that very little of the world's ocean is monitored or protected; coastal habitats continue to be lost or degraded; the majority of global fish stocks are under pressure; invasive species are expanding; hypoxic zones are increasing; the ocean is acidifying; sea level is rising. Technological advances and the impact of climate change, as well as increased intensification of human development have also driven major increases in the nature, and scale of challenges facing ocean and coastal areas.

Ocean services are being subjected to human activity that is having a measurable impact in reducing ocean productivity. A reduction can also be attributed to global climate warming that is increasing ocean stratification and reducing nutrient mixing, thereby reducing the natural productivity services that can lead to significantly diminished food security from fisheries, particularly in the warmer latitudes around the globe (IOC/UNESCO, IMO, FAO, UNDP (2011): *A Blueprint for Ocean and Coastal Sustainability*, IOC/UNESCO, Paris).
In this context a number of initiatives have been launched or are being launched at the global, regional and national level.

1.2.1 The proposal for a stand-alone Sustainable Development Goal (SDG) for Ocean and Coast

The ocean was given marginal priority in the Millennium Development Goals (MDGs), despite significant contributions to the three dimensions of sustainable development. However, in 2012 Member States of the UN recognised the importance of sustainable development and management of the ocean and seas in order to achieve international development goals. One of the main outcomes of the Rio+20 Conference was the agreement by member States to launch a process to develop a set of SMDGs, to build upon the MDGs and converge with the post-2015 development agenda. It was decided to establish an "inclusive and transparent intergovernmental process open to all stakeholders, with a view to developing global sustainable development goals to be agreed by the General Assembly".

Currently this stakeholders' debate has finished and a proposal for a stand-alone ocean SDG is under discussion. Major issues included in the proposals for the SDG on ocean and coast include ensuring a healthy and productive marine environment, building resilient coastal communities through mitigation and adaptation strategies, engaging in integrated and multi-level ocean governance; establish a representative network of Marine Protected Areas (MPAs) covering 20-30% of the ocean's area also in Areas Beyond National Jurisdiction (ABNJ).

This final issue is in line with the so-called Aichi Target of the Convention on Biological Diversity (CBD) which states that:
By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

1.2.2 ICZM Protocol for the Mediterranean

The ICZM Protocol was signed in January 2008 after a consultation process started in 2001 by the Contracting Parties of the Barcelona Convention that had realized that no real progress could be achieved in the field of ICZM without a legally binding regional instrument. The ICZM Protocol is a unique legal instrument that has been considered an example to follow also in other regions of the world to promote sustainable development in coastal areas. The ICZM Protocol entered into force on 24 March 2011 and the EU has also ratified it, becoming therefore part of the "acquis communautaire".

The Action Plan for the implementation of the ICZM Protocol 2012-2019 was adopted on the occasion of the Conference of Parties (COP) 17, held in Paris from 8 to 10 February 2012. The core purposes and objectives of this Action Plan are to implement the Protocol based on country-based planning and regional co-ordination, namely:

- Support the effective implementation of the ICZM Protocol at regional, national and local levels including through a Common Regional Framework for ICZM;
- Strengthen the capacities of Contracting Parties to implement the Protocol and use in an effective manner ICZM policies, instruments, tools and processes; and
- Promote the ICZM Protocol and its implementation within the region, and promote it globally by developing synergies with relevant Conventions and Agreements.

Priority Actions Programme/Regional Activity Centre (PAP/RAC) is the UNEP-MAP centre in charge of coordinating the implementation of the ICZM Protocol.

1.2.3 EU Integrated Marine Policy

The Integrated European Maritime Policy was launched in October 2007 and is the vehicle which will deliver the maritime element of the European Commission's Strategic Objectives for the period 2005-2009. This integrated and innovative policy was developed as a result of a year-long consultation exercise, following the launch of the discussion document "Towards a future Maritime Policy for the Union: European vision for the Oceans and Sea – The EU Maritime Green Paper" in June 2006. The policy encompasses all elements of marine activity and provides for a holistic and integrated approach to address economic and sustainable development on a European Union wide basis.
The policy covers a wide spectrum of issues related to sustainable development including:

- marine transport;
- the competitiveness of marine businesses;
- employment in the marine sectors;
- scientific research; and
- protection of the marine environment.

The IMP covers the following cross-cutting policies:

- Blue growth
  - Blue Growth is the long term strategy to support sustainable growth in the marine and maritime sectors as a whole. It recognises that seas and oceans are drivers for the European economy with great potential for innovation and growth
- Marine data and knowledge
  - Marine Knowledge 2020 brings together marine data from different sources with the aim of:
    - Helping industry, public authorities and researchers find the data and make more effective use of them to develop new products and services.
    - Improving our understanding of how the seas behave.
- Maritime spatial planning
  - Competition for maritime space – for renewable energy equipment, aquaculture and other growth areas – has highlighted the need for efficient management, to avoid potential conflict and create synergies between different activities
- Integrated maritime surveillance
  - Integrated Maritime Surveillance is about providing authorities interested or active in maritime surveillance with ways to exchange information and data. Sharing data will make surveillance cheaper and more effective.
- Sea basin strategies
  - The Baltic Sea, Black Sea, Mediterranean Sea, North Sea, the Atlantic and the Arctic Ocean – each sea region is unique and merits a tailor-made strategy. The maritime policy promotes growth and development strategies that exploit the strengths and address the weaknesses of each large sea region in the EU: from the Arctic's climate change to the Atlantic's renewable energy potential, to problems of sea and ocean pollution, to maritime safety.

1.2.4 EU Marine Strategy Framework Directive

The European Union's (2008/56/EC) Marine Strategy Framework Directive (MSFD) was adopted on 17 June 2008, and came into force on 15 July 2008. It was due to be transposed into national legislation by 15 July 2010 and is the environmental pillar of the European Union's Integrated Maritime Policy.

The Marine Directive aims to protect more effectively the marine environment across Europe by achieving and maintaining Good Environmental Status (GES) of the EU marine waters by 2020 and by protecting the resource base upon which marine-related economic and social activities depend. To achieve these objectives the

Directive establishes European marine regions (the Baltic Sea, the North East Atlantic, the Mediterranean and the Black Sea) on the basis of geographical and environmental criteria.

The Directive defines Good Environmental Status (GES) as: "The environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive". To help Member States interpret what GES means in practice, the Directive sets eleven qualitative descriptors which describe what the environment will look like when GES has been achieved:

- Biodiversity is maintained
- Non-indigenous species do not adversely alter the ecosystem
- The population of commercial fish species is healthy
- Elements of food webs ensure long-term abundance and reproduction
- Eutrophication is minimized
- The sea floor integrity ensures functioning of the ecosystem
- Permanent alteration of hydrographical conditions does not adversely affect the ecosystem
- Concentrations of contaminants give no effects
- Contaminants in seafood are below safe levels
- Marine litter does not cause harm
- Introduction of energy (including underwater noise) does not adversely affect the ecosystem

Each Member State is required to develop a Marine Strategy for its marine waters and to use the existing Regional Sea Conventions. The Strategy is in coordination with other countries (EU and non EU Countries within a marine region or subregion). Marine Strategies shall apply an ecosystem-based approach to the management of human activities, ensuring that the collective pressure of such activities is kept within levels compatible with the achievement of good environmental status and that the capacity of marine ecosystems to respond to human-induced changes is not compromised, while enabling the sustainable use of marine goods and services by present and future generations.

1.2.5 Proposal for a Marine Spatial Planning and Integrated Coastal Management (ICM) EU Directive

In 2013 the European Commission published the text of a Proposal for a Directive establishing a framework for maritime spatial planning and integrated coastal management. The text of the Proposal Directive states that:
The main purpose of the proposed directive is to promote the sustainable growth of maritime and coastal activities and the sustainable use of coastal and marine resources by establishing a framework for the effective implementation of maritime spatial planning in EU waters and integrated coastal management in the coastal areas of Member States.

Due to some issues raised by EU Member States a further consultation has started on the future of this directive. In particular a trilogue process among the European Commission, the European Parliament and the European Council was set up. A positive outcome of the informal trilogue on the draft for a Framework Directive for Maritime Spatial Planning was obtained at the beginning of March 2014.

1.3 PEGASO and the EU interest in the Mediterranean

PEGASO objectives are fully on line with the EC interests in the Mediterranean. The European Commission is one of the parties that signed the ICZM Protocol in Madrid on 21 January 2008, together with 15 countries of the Mediterranean Sea. This makes the ICZM Protocol a Mediterranean policy instrument, decided amongs Mediterranean countries. Therefore, the ICZM Protocol is promoting not ony the dialogue but also collaborative practices for an integrated management of the coast and the sea, based on the ecosystem Approach (EcAp) in the whole Mediterranean basin (see PEGASO DL2.1a and DL2.1b, already summited).

The ICZM Protocol is an excellent instrument to inform and share with the Mediterranean non-European countries the relevant EU policies related to the Water Framework Directive, the Integrated Marine Policy (IMP),

including MSFD and MSP. Climate change, risk vulnerability and adaptation are also crosscutting issues included into the ICZM Protocol.

Several countries are now preparing their ICZM National strategies. Guidelines for National ICZM Strategies have been drafted by PAP/RAC and they are being tested in two countries: Algeria and Montenegro. The Algerian one is at an advanced stage, the diagnostic phase was concluded and Algeria is now working on its ICZM national strategy itself. In Montenegro, the process has started in a closed link to CAMP Montenegro, which includes the preparation of a coastal plan. The experience gained with these two strategies will allow PAP/RAC to finalise the Guidelines for other Mediterranean countries (see PAP/RAC Progress Report 2012-2013). The Mediterranean coastal community, since the official entry into force of the ICZM Protocol, is increasingly in need of specific ICZM-MSP tailored products.

2. The Pegaso project (February 2010-January 2014): Aims, efforts and main achievements

The PEGASO project (2010-2014) had a twofold objective:

-Support the implementation of the Protocol on Integrated Coastal Zone Management in the Mediterranean (ICZM Protocol) and explore similar policies in the Black Sea region;

-Build bridges between science (knowledge) and decision- and policy-making (governance) or, more precisely, make possible scientifically founded decisions connected with local knowledge and the experiences of field practitioners and stakeholders.

The project has focused its efforts on these main outcomes: (1) the PEGASO experience for running an operational ICZM Governance Platform for the Mediterranean and the Black Sea (including guidelines and basic rules), (2) technical aspects such as the PEGASO web site, intranet, and the marine and coastal wiki to support the daily work of the PEGASO ICZM Governance Platform; (3) the PEGASO tools and methods, oriented to the construction of a common knowledge and a co-working experience, implemented in the ten PEGASO Collaboration Application Sites (CASES), in the Maghreb sub-region and at regional sea level, with the support of the relevant capacity building programme; (4) the Spatial Data Infrastructure network (SDI), with partners institutions as geo-nodes of the network, and the construction of an interactive atlas for the Mediterranean and the Black Sea. This Infrastructure has re-enforced the PEGASO ICZM human governance platform, allowing sharing of data across all members; (5) Capacity building programme and strategy, including 'polimedia' videos; participatory events and dissemination activities.

2.1 The PEGASO ICZM Governance Platform

2.1.1 The PEGASO ICZM Governance Platform

It was at the heart of the project and aimed at facilitating communication, dialogue and networking amongst its various members, which included project partners such as scientific institutions and international organisations and scientists (consortium); project end-users recruited from national and international institutions and organisations (End User Committee); and local stakeholders involved in ten "collaborative application sites" (CASES). This was achieved through a process of co-working and learning from each other, sharing knowledge and expertise, and testing innovative tools created under the project.

The National Focal Points (NFPs) of the ICZM Protocol have asked to be part of the PEGASO ICZM Governance Platform at the end of the first year of the project (September 2011), when they participated in the design of the questionnaire for the country stocktaking to evaluate the country preparedness to implement the ICZM Protocol. The Black sea countries have also participated in this successful exercise. It has been agreed at the UNEP-MAP COP 17 in Paris (February 2012) that the PEGASO stocktaking will be used as the template

for the ICZM Protocol mandatory reporting by the countries, and its content will serve as the baseline for evaluation of ICZM progress.

The consortium was composed of international and regional institutions, local and regional authorities, research institutes, universities, economic players, and NGOs. This network has been extended much further, through the connections of each partner to include a multitude of formal and informal connections.

Some of the organisations involved in the PEGASO consortium are already cooperating on other projects and running their own networks. Due to its open and flexible approach, the PEGASO ICZM Governance Platform has been since the beginning considered as a hub for initiatives such as: the RAMSAR Convention of Wetlands, the Mediterranean Wetlands Initiative (MEDWET) or the Adriatic-Ionian Commission. It has also attracted and established synergies with many other coastal and marine initiatives, in the first place those in which one or more PEGASO partners were actively involved: UNEP/GEF MedPartnership and ClimVar projects, IPA Adriatic SHAPE project, MAREMED project, the Bologna Charter 2012, FACECOAST cluster and the COASTGAP EUMed project to the aim of organising a regional network and its articulation to the ICZM Governance platform and include the regions as geonodes in the PEGASO SDI, the FP7 MEDINA and PERSEUS projects.

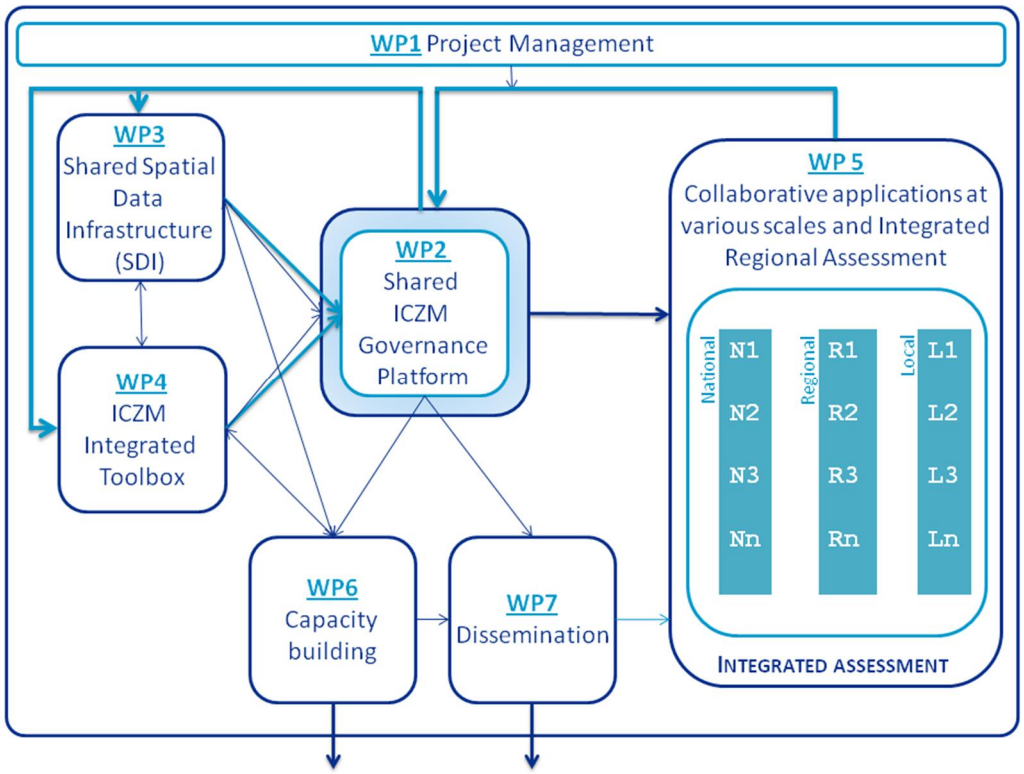

Figure 1: The ICZM Governance Platform at the heart of the PEGASO project

In addition to the "official" members of the platform, all "ICZM addicts", "coast-lovers", and people that want to get involved in making our coastal zones resilient, healthy, productive and attractive, are invited to join the PEGASO team and contribute through their knowledge and experience.

The ICZM Governance Platform primarily consisted of people, comprising approximately 150 persons working in the organisations involved in the project, a panel of renowned Mediterranean stakeholders (End User Committee) *representing international organisations, national and regional authorities and several key sectors of the economy (e.g. tourism, aquaculture), members of the Black Sea Commission and approximately 800 people involved in the 10 CASES* and in the Maghreb region (led by Algeria).

Figure 2: The 10 Collaborative Application Sites, the PEGASO CASES

Collaborative Application Sites, the PEGASO CASES

The 10 Collaborative Application SitES (CASES)
1: Al Hoceima (Morocco) - 2. Bouches du Rhone (France) - 3 North Adriatic (Italy) - 4 Aegean Islands (Greece)- 5: Dalyan-Köycegiz (Turkey) 6 North Lebanon Costal Zone (Lebanon) 7: Nile Delta (Egypt) 8 Danube Delta (Romania) 9: Sevastopol bay (Ukraine) 10 Guria Coastal Region (Georgia).

The CASES: The CASES have reinforced the idea that the implementation of the Protocol is a priority. They have worked as real laboratory where implementing ICZM and the PEGASO work. They have shown their potential to become the "bottom-up component" of the project.

To facilitate the work of the ICZM Governance Platform, the building of a shared knowledge has been one of the main PEGASO effort for building an ICZM conceptual framework, as well as a PEGASO tool box that includes innovative products such as relevant indicators linked to the ICZM Protocol, land cover maps for the whole Mediterranean and Black sea riparian areas at different dates, land and ecosystem accounts focused on urban trends and the evolution of natural capital at the coast and at sea, with the production of a Cumulative impact mapping for the Western Mediterranean, scenario and foresight participative methods, economic valuation, etc.

All the PEGASO products have been co-produced with the end users, at regional level and in the CASES, to be useful to the implementation of the ICZM Protocol and to give food for thoughts, PEGASO has acted as a think tank to make the ICZM Governance Platform working. The use of the tools (e.g. Land and sea uses, indicators, foresight exercises, etc) to describe the present state of environment, with maps and statistics in a very user-friendly way, has rendered possible a social reflexion on the main present and future threats, their main drivers, and how shared decisions should be made to manage these hot issues. The participative process allowed co-working on main responses to be given at different scales, and the co-construction of the future wanted.

2.1.2 A conceptual framework for ICZM

The partners' diversity in the PEGASO consortium allowed for an extensive survey to compile information from all the countries bordering the Mediterranean and Black Seas, and to explore new forms of trans disciplinary thinking and working required to face the challenges of coastal sustainability.
The PEGASO partners produced a general compilation and comparison of sustainable development approaches. Subsequently, they highlighted the common sustainable development concepts and frameworks between several strategies, protocols, directives, etc. Particular attention was paid to build a common understanding of the scope and intention of the ICZM Protocol, and its relationship to other contemporary policy initiatives regarding the coastal, marine and maritime realms.

The collected and analysed elements were organised in a set of innovative, clear and synthetic tables, easy to read yet covering the overall strategic vision developed.

The Conceptual Framework document describes the principles on which ICZM is based and its relationship to other conceptual frameworks such as sustainable development, the ecosystem approach, ecosystem services and integrated water and river basin management. The relations between ICZM and MSP are also analysed. It also describes the development of policy based on ICZM in the Mediterranean and the current status of these ideas in the Black Sea.

The aim of this Conceptual Framework has been to set out the background to the ICZM PEGASO Governance Platform that is a key outcome of the PEGASO project. It is suggested that the Platform must be seen as a forum that enables experience to be exchanged between practitioners and researchers at regional, national and local scales. It must also serve as a vehicle by which the institutional changes necessary for the successful implementation of ICZM can be encouraged.

2.1.3 The stocktaking activity: Legal, institutional, and organisational frameworks for ICZM in the Mediterranean and Black Sea countries

One of the main tasks of PEGASO's shared ICZM Platform was to carry out a benchmark assessment of the current state of ICZM in Mediterranean and Black Sea countries, as required by Article 16 of the ICZM Protocol for the Mediterranean. In September 2010, the Black Sea Commission Permanent Secretariat (BSC-PS) agreed to adopt this approach for the Black Sea basin. Stocktaking for ICZM was then carried out in a comparable way for both the Mediterranean and the Black Sea countries, with a review of current ICZM-related legislative, institutional, policy and financial frameworks.

A draft questionnaire was prepared by PAP/RAC (Priority Action Programme/Regional Activity Centre) and involved broad consultation, including a workshop with National Focal Points (NFPs) for the ICZM Protocol in the Mediterranean, held in Portoroz, Slovenia, in September 2010. The Mediterranean NFPs subsequently validated the Mediterranean questionnaire, whilst the Advisory Group (AG) on the Development of Common Methodologies for ICZM validated the questionnaire on behalf of the Black Sea Commission, also in September 2010.

In the Mediterranean, the stocktaking made an important contribution to the Barcelona Convention system in terms of providing initial guidance on drafting the official UNEP/MAP reporting format for the ICZM Protocol and a baseline for measuring progress in implementing the Protocol.
Early results of the stocktaking were also instrumental in informing the action plan for the implementation of the ICZM Protocol for 2012-2019, which was officially adopted by the 17th Ordinary Meeting of the Contracting Parties to the Barcelona Convention (COP 17) in 2012.

For the Black Sea, the ICZM AG members advised using the regional stocktaking synthesis report as the basis for the ICZM part of the report on the implementation of the Black Sea Strategic Action Plan (SAP), due in 2014-2015.

As a proposed follow up actions, during COP 17 the Contracting Parties decided to update the data gathered through the stocktaking questionnaire bi-annually. Therefore, this report on the stocktaking is the baseline for measuring future progress in the implementation of the ICZM Protocol.

2.2 PEGASO assessment tools and methods

The PEGASO project sought to achieve "the proactive and adaptive management of coastal zones, which encourages all interested parties to work together on specific coastal issues, and provides the appropriate institutional, legal and societal setting that enables horizontal and vertical coordination as a guarantee that the most appropriate solutions will be adopted for the managed areas" (Breton and Skaricic, 2013). Members of the ICZM Governance Platform, "with their different interests and their need for sharing ideas, exchanging good practices and discussing how to translate ICZM Protocol articles into action, find their best expression through collaboration, in a cross-boundary setting, with common objectives and similar methods" (Ibid).
The ICZM Governance Platform can be considered both as a network and as a tool. Moreover, it has produced in a collaborative way the following S&T tools for assessing the sustainability of coastal and marine ecosystems:

2.2.1 PEGASO indicators

A core set of indicators to assess the progress of the ICZM process as well as the state of the coast, following the different articles of the ICZM Protocol has been produced. Indicator factsheets have also been designed and completed with the necessary data at regional scale and in different CASES at sub regional or local scales, evaluating when needed the data gaps (WP4).

The PEGASO set of ICZM indicators do not only serves as a descriptive, but also analytical tool for the understanding of the coastal system, being it a region (the Mediterranean or the Black Sea), a country or a local coastal area. The challenge is to perform an integrated assessment, or to develop a storyline, also at the level of the indicator assessment, both qualitative and quantitative. To achieve this, cross-linkages between indicators are proposed: between Indicators of Sustainable Development and Indicators of Governance, between Driver, State, Pressure, Impact and Response indicators, cross-cutting issues, themes and sectoral objectives. Particular attention needs to be paid to the cause-effect relationships – and to the processes that define these relationships at the scale at which the analysis is conducted.

Figure 3: List of PEGASO indicators factsheets

2.2.2 Ecosystem accounting for the coast and the sea

A framework for multi-scale ecosystem accounting in the Mediterranean and Black Sea basins was produced in PEGASO. This task consisted of three sub-tasks, namely Land and Ecosystem Accounts (LEAC), Sea Ecosystem Accounts (SEAC), and the Western Mediterranean Impact Index on Ecosystems (WMIIE). These three components contributed towards a holistic vision of the changes in the quality and quantity of the stocks and flows in the coastal zone and the pressures that drive them.

The three sub-tasks focused on developing methods that can be used by end-users and stakeholders to quantify changes in coastal ecosystems. The concept and methods of LEAC was extended to the entire Mediterranean and Black Sea basins for two time periods. A cumulative pressure index for the Western Mediterranean was produced, to develop and test a method for sea ecosystem accounting.

A key achievement of this task was the production of the PEGASO first prototype land cover map for the coastal zone of the Mediterranean and Black Sea basins. Another significant result was the construction of a complementary framework for sea ecosystem accounting using seascape ecology techniques. Finally, a cumulative pressure index was created for the Western Mediterranean Sea. Training videos presenting the concepts and explaining the method and results were produced for all three components. UNOTT and UAB teams have done this work.

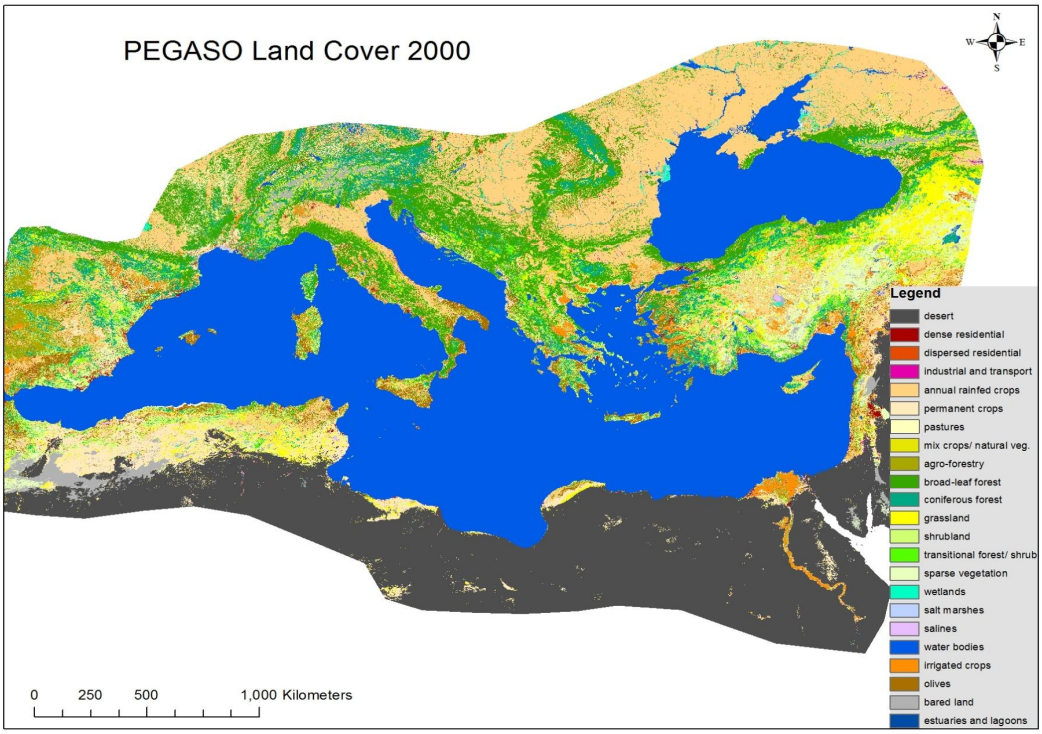

Figure 4: PEGASO first prototype land cover map for the Mediterranean and Black Sea basins

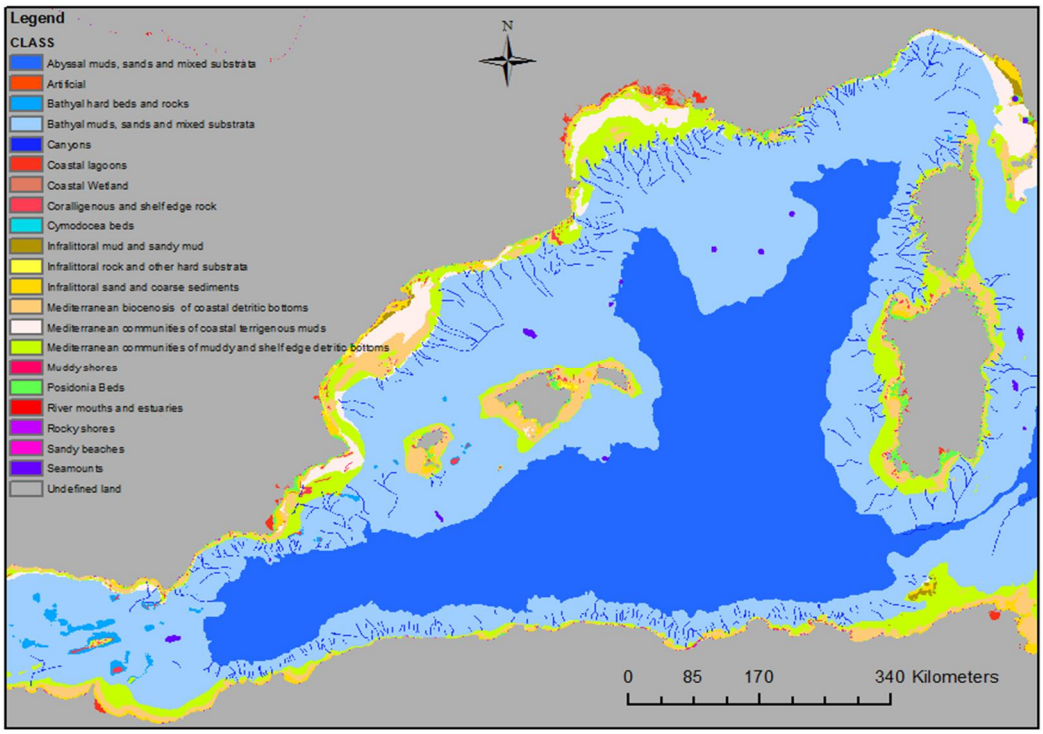

Figure 5: Example of the ecosystem mapping for the Western Mediterranean

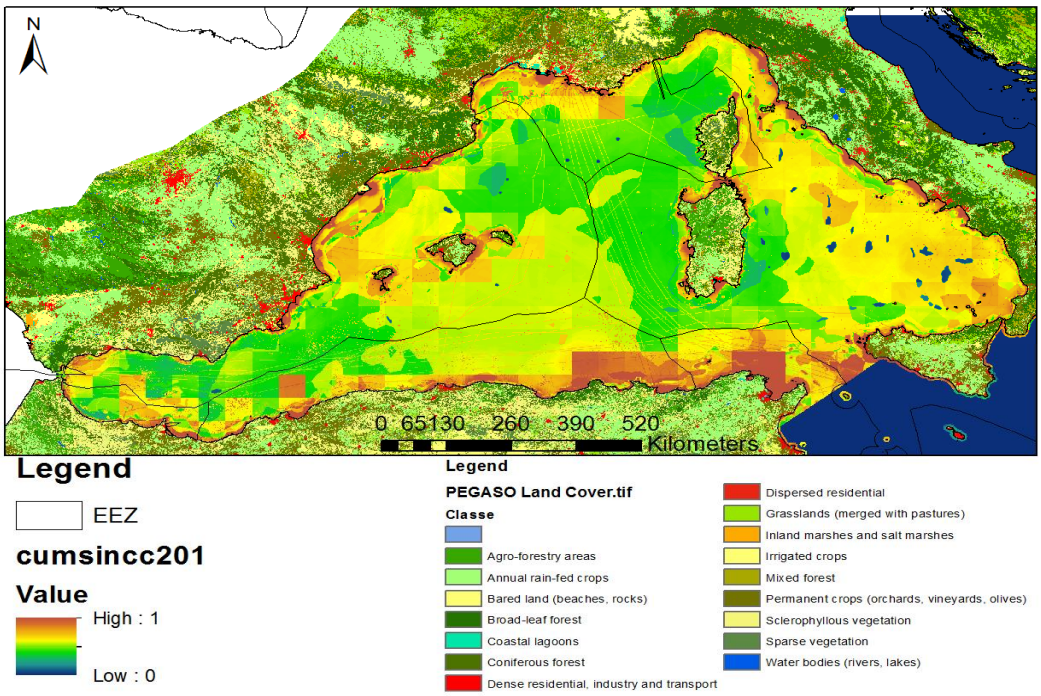

Figure 6: Western Mediterranean Impact Index on Ecosystems, WMIIE

2.2.3 Participatory methods, scenarios, envisioning and foresights exercises

PEGASO provided valuable lessons about the role of science and the need for a multidisciplinary and multicultural science, which can better work in collaboration with decision-makers and practitioners, in order to bridge the gap between science and policy. This integrated vision is necessary to build ICZM goals into an ecosystem-based framework, linking land and marine environments. It is not an easy process as it requires a change in the way scientist and decision-maker communities are organised. Indicators for assessing 'good science' should change, requiring not only peer review, but also the evaluation of its usefulness by decision-makers and end-users. The roles of PEGASO end-users and the co-working process have helped conceive this way of building common knowledge that includes useful scientific knowledge, but also traditional knowledge and field expertise, etc.

Figure 7: Building BBNs at the Rabat Workshop, Day 2 (Photos: Glòria Salgado)

The PEGASO project organised three 'Envisioning Workshops': for the Mediterranean in November 2012 in Arles (France), for Black Sea countries in December 2012 in Istanbul (Turkey), and finally for both basins during the 3rd General Meeting in March 2013 in Rabat (Morocco). These participatory workshops were designed to allow members of the ICZM Governance Platform to discuss the barriers and opportunities facing those affected by the implementation of ICZM, and to better understand how PEGASO data and tools can be used in an integrated way.

BBN was also used at national level to capture the vision of 150 stakeholders and high government officers on the urban trends along the Lebanese coast and search for possible agreed responses (June 2013-January 2014). It was also applied in a local site, the Dalian protected area, in Turkey. Focus has been placed on how to stop the degradation of natural capital and enhance it (October 2013-January 2014).

2.3 Spatial Data Infrastructure (SDI) and interactive atlas for the Mediterranean and the Black Sea

Creation of a shared SDI to support access to data and information in an attractive web portal, building local geonodes in several institutions to share interoperable data (WP3); the network of local 'geonodes' built under WP3. Together with the SDI, they provide for the management and exchange of harmonised data.

Sharing results with stakeholders and end users at different spatial scales has been a major objective of the PEGASO project. The rationale behind the development of the PEGASO Spatial Data Infrastructure (SDI) was to construct the tool by drawing on existing SDIs developed by project participants (for instance Vlaams Instituut voor de Zee) and EnviroGRIDS) and to support the creation of new geonodes to expand online data sharing and allow access to coastal zone management indicators.

This connected infrastructure for sharing spatial data based on ICZM principles was developed in several stages. First, capacity-building activities were established to support the construction of a functional network of geonodes; then the existing geonodes were connected in and access was provided to data from core institutions such as the European Environment Agency; and finally local/regional or national geonodes were developed jointly where requested by stakeholders.

The creation of the PEGASO SDI was a collaborative project that required every partner institution to contribute either by developing a local geonode or by providing the results of indicator calculations.

The SDI is a practical online tool that acts as a central repository for geographical information on coastal features and issues. Since partners understand the benefits of SDI, they are more willing to share data and contribute datasets, which are easily accessible through the web portal.

The PEGASO SDI has three main components: a map viewer, map services and a spatial catalogue. This infrastructure has been created at the Autonomous University of Barcelona (UAB) within PEGASO working package WP3 led by Pablo Olavide University (UPO), Seville.

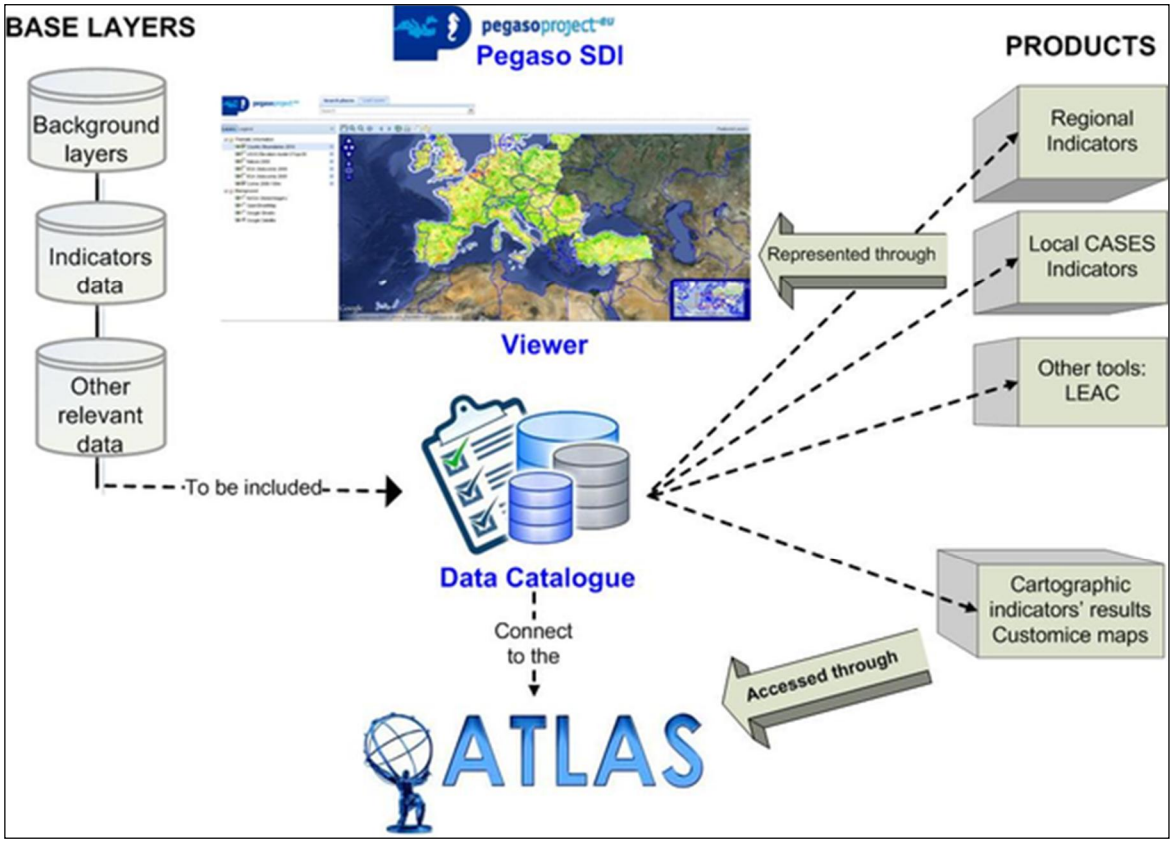

Figure 8: Implementation of the PEGASO Spatial Data Infrastructure (SDI)

"*Every provider of geoinformation has to provide [geonodes] using an Internet geoservice. This can be achieved by using a Web Map Server [WMS], with Standard connections based on OGC [Open Geospatial Consortium] specifications. These services will allow users to access visualise or download geoinformation via a WMS Client (under conditions defined by the provider). A provider can have one or more Web Map Servers, each containing several Services. The different services have to be described by the corresponding Services Metadata, which will be published in a Web Catalogue. Every geoinformation provider has to be considered a "node" within the network of Web Map Servers which form a particular SDI [Spatial Data Infrastructure]*".

http://www.coastalwiki.org/coastalwiki/Geonode;
http://www.pegasoproject.eu/index.php?option=com_content&view=article&id=11&Itemid=25).

All PEGASO tools and data used to produce them are embedded into the SDI and can be viewed through the atlas. All information is fully accessible through the PEGASO website.

2.4 The Integrated Regional Assessment (IRA): the results of the participatory work of the PEGASO ICZM Governance Platform to assess through all PEGASO products the main threats and expected responses in the Mediterranean and the Black Sea

The Integrated Regional Assessment' (IRA) is one of the project's key final products (Deliverable D5.2). During the 2013 COASTDAY celebration in Rimini (Italy), hosted by the Regional Minister for Land and Coastal Protection of Emilia-Romagna, two PEGASO meetings were organised: the workshop with end-users on Integrated Regional Assessment (22-23 September) and the meeting with PAP/RAC NFPs during which several project products were presented and discussed: i.e. the Conceptual Framework for ICZM, set of PEGASO indicators, SDI and ICZM Governance Platform.

Pegaso IRA Report has produced a policy-oriented blueprint for guiding future directions in scientific research, policy-making, and socio-economic activities related to the ICZM Protocol in the Mediterranean, and that can be applied to processes in Black Sea countries. With constantly evolving feedback of improved decision-making, rigorous scientific data, and sustainability of natural capital, refinements to marine and coastal assessments will strengthen governance of these valuable ecosystems.

3. Lessons learned, and main PEGASO added value

Main lessons learned expressed by PEGASO CASES, PEGASO partners and end users are a good indicator of the social energy that has passed across the PEGASO ICZM Governance platform.

3.1 Lessons learned with the ICZM Governance Platform

3.1.1 Governance and collaborative work

The overall PEGASO process was based on the principles of scientists, stakeholder and end-user participation, motivation and commitment in order to work in collaboration together and decide on the best options for adaptive management.

The PEGASO ICZM Governance Platform has enabled scientist and end-user communities to share knowledge, data and information, case studies, local experiences, good practices, insights and policy recommendations, in order to build a common understanding of the issues and institutional perspectives affecting coastal zones in the two regional seas. It is the human legacy of PEGASO.

The concept of ICZM happens to be very alive in contemporary debates about sustainable development and as a policy instrument. Recent developments have not undermined the principles on which ICZM is based, but rather suggest that there is a need to find new ways to ensure that the thinking it engenders feeds into the wider policy initiatives that concern sustainable development, ecosystem based approach, balanced economic growth and social cohesion. The ICZM principles discussed are necessary rather than sufficient conditions to determine the 'co-construction' of an integrated and adaptive management approach to coastal zone issues. Pegaso has been creating *opportunities* to establish and promote good and inclusive governance, which is a fundamental part of what ICZM is trying to achieve.

Figure 9: Bridging two pillars of ICZM, knowledge and governance, for efficient decision-making

"*Coastal zones are complex systems where environmental, social and economic issues are inextricably entangled. Each case is both a unique issue and part of a more general problem, and decision-makers cannot rely on "off-the-shelf" solutions.* (…)

Discussions about ICZM are still generally held in high level forums with only national representatives, but a significant part of ICZM projects is implemented at local level, and many sectoral stakeholders, who are potential end-users, are not represented in these forums and cannot express their needs and views. I expect PEGASO to become an operational and informal forum where all potential actors of ICZM at all levels can meet and communicate, share problems and responses, and formulate common questions for scientists" (Christophe Le Visage, End User Committee, Interview, May 2010).

What about collective expertise?

"*Collaboration and co-working between researchers and stakeholders leads to collective and cross-cutting expertise. Collective expertise prevents some experts and scientists from being too forward in others' fields. Participatory exercises* (e.g. What if…?) *based on collective expertise prevent decision-makers – who have often made their decisions before receiving scientific advice – from relying on disagreements between scientists in order to denigrate scientifically-founded advice.* (…)

Freelance consultants, engineering firms or other bodies/organisations could/should have a specific interface (go-between) *role in order to strengthen dialogue between scientists and decision-makers. This role needs to develop specific skills in order to adapt scientific information to make it suitable for decision-makers. 'Scientific language' has to be simplified in order to submit clear messages to decision-makers. Most members of the End User Committee could play this role of interface between scientists and decision-makers who are interested in ICZM*" (Christophe Le Visage, End User Committee, Interview, March 2013).

3.1.2 Lessons learned from the CASES

A) Al-Hoceima CASE (Morroco):

Managers of the Al Hoceima National Park (HCEFLCD) were very responsive and strongly appreciated the 2 ecological indicators developed in the CASE

Meetings with local stakeholders helped networking, updating data, exchanging information and raising issues for discussion.

Participation ensured that stakeholders are formally and early involved in the ICZM process, which improved local “ownership” of ICZM principles.

The role of NGOs participation emerged as an important dimension of coastal management.

Managers of the Al Hoceima National Park (HCEFLCD) were very responsive and strongly appreciated the 2 ecological indicators developed in the CASE.

Participation is much more effective when the tools (indicators, etc.) are simple and easily understood by all stakeholders.

B) Cyclades islands CASE, Greece

-A better understanding of the position of the stakeholders: it has been our understanding as well as the stakeholder opinions as they were gathered through interviews of focal groups that several of them are neglected in the process of coastal zone management by the administration. The focal group meetings aided to create a foundation for a better participation process in the future.

-Better understanding and description of the ICZM context in insular areas: HCMR team did not have precious experience in ICZM of insular areas before Pegaso. The results from the focal group meetings enabled the team to recreate the cause-effect net diagram and the DPSIR diagram in insular areas, all presented in the final report.

-As a participatory process in itself, ICZM requires collaboration between the various stakeholders in order to build a common and sustainable vision of a given coastal area.

-Our findings suggest that there are stakeholders and key individuals within the ICZM process, which have officially declared that, they are neglected and marginalised from the process. It is therefore our understanding that the ICZM process is running based on the ‘top-down’ principle instead of both directions within a frame of equality, respect and transparency.

-Some stakeholders (for example, fishermen) have never before been contacted by someone.

-The principle of “de-compartmentalisation” allows stepping out of sectorial issues for taking a systemic and transversal overview of the issues. Following this principle, a stakeholder platform brings together, around the same (virtual) table, different stakeholders from the public sector (State, local authorities, public agencies), private companies, scientist community, voluntary sector and civil society, supranational organizations and donors). The only certain issue is that ICZM process requires that the participation process needs to be rebuild even if this will delay the national/regional/local ICZM process. The Ministry of Environment, Energy and Climate Change in its forthcoming national ICZM plan should introduce the institution of the 'coastal forum' then ICZM planning will be on its right tracks in accordance to the protocol.

C) Sebastopol CASE, Ukraine

-Stakeholders participation can and will be successful, if the ICZM Protocol is in force, the ICZM Platform is in place, the ICZM process is supported, ICZM tools are available, and scientists are welcome

Main achievements:

-Scientific support, which is one of the components of ICZM, assumes participation of various specialists and utilization of various data depending on a specific task. The major disadvantage of traditional sources of data (atlases and data base), is the need to address various specialists. We have designed the system (http://wiki.iczm.org.ua/en/index.php/Download_the_latest_version_of_the_atlas) incorporating digital atlas and GIS features, but also allowing interaction with data and application of different ICZM tools. The major of these tools are indexes. While interaction with data makes possible to construct different maps, which have not been preloaded, tools make possible to analyze data. The current version of the system incorporates a number of indexes chosen within the frame of the Pegaso project for environmental assessment.

The web-portal (http://wiki.iczm.org.ua/en/index.php/Main_Page) and a standalone CD version of a GIS-type tool for the Sevastopol Bay (http://wiki.iczm.org.ua/en/index.php/Download_the_latest_version_of_the_atlas) have been updated to incorporate additionally recovered information on the marine environment. Additional data in regard to local environmental assessment have been also achieved from our stakeholders.

-We have evaluated the ways to incorporate scenarios tool to our CD version of a GIS-type tool for the Sebastopol Bay. Additional information of currents in the Sevastopol Bay has been incorporated in the CD version of a GIS-type tool for the Sebastopol Bay in line with the software tool for its evaluation. Additionally, we have incorporated information on possible consequences of the sea level changes for the coastal zone of the Sevastopol Bay.

One of the most important parts of our work has been addressed to interaction with stakeholders in regard to evaluation of our results. As an outcome of our interaction, stakeholders (when they feel that our work and results are important) have issued letters of endorsement (http://wiki.iczm.org.ua/en/index.php/Dissemination).

One of the most important results of our work is established strong ties with local and national stakeholders, their practical involvement in discussions of ICZM issues, Pegaso tools and platform, their participation in several Pegaso meetings and trainings.

D) Köycegiz-Dalyan SPA CASE, Turkey

-Effective and comprehensive participation is not an easily achievable target in a society where authority sharing and collective decision making are not inherent in culture.

-Consensus at all three stakeholders meetings was that increasing public awareness and participation is crucial in achieving successful management of Köycegiz-Dalyan SPA. However, stakeholder meetings revealed the typical constraint in terms of authority vs. interest relation where the ones having authority for decision making do not show enough interest for participation.

-The interest of local and regional media on management of the Köycegiz-Dalyan SPA is at high levels.

Main achievements:

-Assessment of the status of most important ICZM issues of the SPA by compiling and analysing the data and information available.

-Real-time monitoring the boat traffic in Dalyan Channel by using video recording and analysis of the traffic intensity. This data and information is obtained for the first time (since March 2012).

-GIS Applications for changes in the natural system and housing development in rural areas.

-Climate change impacts and assessment of flooding risk in different sea level rise scenarios due to sea level rise

-Building awareness among stakeholders about ICZM and facilitating participation in ICZM.Scenario building by implementing Bayesian Belief Network (BBN) for Koycegiz-Dalyan CASE with the theme of Preserving and Enhancing Natural Capital.

E) North Lebanon CASE, Lebanon

-It is crucial to Promote stakeholders' awareness. These are some suggestions:

- They should be informed regularly about sustainable coastal development.
- Quality of coordination, collection, and communication of information as well as data exchange between stakeholders.
- Promotion for capacity building programs for ICZM.Dissemination of coastal management practices (guidelines, directives, codes of practice, etc.).

-CZM challenges and is willing to invest time and effort.

-All stakeholders had the chance to meet with each other and discuss common issues.

-MRCZM-IOE-UOB team gained a better understanding of social, economic and environmental situations of the target area.

-Multidisciplinarity and different cultural and social backgrounds of stakeholders promoted intercultural and fostered the management skills of the MRCZM-IOE-UOB team.

Main achievements:

-Calculation of indicators

- Area of built-up space in the coastal zone
- Coastal erosion and coastal instability
- Value added per sector
- Number of enterprises

-BBN model for "Controlling artificialization"

-Coastal Forum concept

F) Nile Delta CASE, Egypt

- Identified the key issues (pressure) experienced by the Nile Delta.
- Compilation of development plans and programs in the Nile Delta.
- Analysis and evaluation of plans and programs and identify conflicts between different stakeholders and local authorities.
- Development of policies proposed to implement the ICZM development plan in the Nile Delta

Main achievements:

-Proposed Integrated Coastal Zone Management Plan of the Nile Delta (ICZMP). The structure of the proposed ICZMP Plan are inspired by the ICZM Protocol and the National ICZM Strategy and based on the specific needs of the study area and the contribution of local Stakeholders. Also, the structure of the ICZMP Plan establishes three different levels: Strategic Objectives, Activities, and Actions. The objectives are based on the objectives of the National ICZM Strategy to ensure the vertical coherence and coordination between national and regional policies.

G) North Adriatic CASE, Italy

In order to avoid misunderstanding regarding the effective level of involvement needed, it is necessary to

clearly define and plan, since the preliminary phase of the research activities, the objectives of the participatory process.

The involvement of key stakeholders is essential in order to raise awareness and share information regarding coastal issues. However the selection of the best methods to be implemented should be chosen carefully by the responsible for the participatory process, in order to maximize efficiency and effectiveness.

Main achievements:

The main results of the North Adriatic CASE trace the objectives of the 4 sub CASES through which the CASE was developed:

- Development of a Decision Support System for climate change risk assessment for the coastal area of the Veneto and Friuli Venezia Giulia regions.
- Development of a forecasting model prototype for the coastal bathing water quality.
- Analysis of the link between Marine Protected Areas and ICZM in the North Adriatic (Italy, Slovenia and Croatia).
- Analysis of ICZM implementation at the Italian subnational level in the North Adriatic (Marche Emilia Romagna, Veneto and Friuli Venezia Giulia Regions).

3.1.3 General lessons learned

Expressed by PEGASO CASES, PEGASO partners and end users are a good indicator of the social energy that has passed across the PEGASO ICZM Governance platform.

PEGASO legacy is important, and takes into account:

-The human legacy, the PEGASO people with its motivation, spirit of collaboration and social energy, the PEGASO family.

-The technical legacy (website, coastal and marine wiki, intranet and virtual forums) that has supported the daily exchanges and collaborative work of the PEGASO ICZM Governance platform.

-The common knowledge legacy: PEGASO tools and methods, to build a common knowledge for a collaborative work. Tools and methods, as well as other relevant data and information, are embedded into the spatial data Infrastructure (SDI) and its network of geo nodes for data exchange and data sharing, and the production of the Atlas for the Mediterranean and the Black Sea.

-The strategy of the PEGASO capacity building programme is strongly focused towards learning by doing, supporting the ICZM concept and the collaborative work of the PEGASO ICZM Platform, training for getting capacity to test the PEGASO tools and to use them, to be able to develop indicators, participative methods, etc in every places, preparing people to be trainers of their colleagues, having capacity and autonomy to conduct by themselves an ICZM full process.

-Preparing the future of PEGASO is an important issue to keep the project legacies alive after the end of the project. The PEGASO business Plan makes a number of proposals and recommendations for sustaining the ICZM Governance Platform, as well as the main PEGASO products and spirit.

3.1.4 Lessons learned for the stocktake exercise

Comments and recommendations of the National Focal Points provide a guide as to the use of this stock-take and any subsequent iteration:

- The results of the stock-take should be considered as a tool for ICZM practitioners.

- The questionnaire is a benchmark and a “reality check” for the implementation of the ICZM Protocol, giving indications at the level of engagement and at the actual level of support in different Articles of the ICZM Protocol implementation.

- In future iterations of the stock-take there is a need for further clarification and interpretation of a limited

number of questions. Moreover, various comments emphasised the need to pay more attention to climate change as a crosscutting issue for ICZM.

There is considerable potential for regional cooperation in the implementation of the Protocol Articles, by sharing best practice, innovation, experience and methodologies. This stock-take points out some good examples that can serve as models, templates, or simply an inspiration to others.

Potential impact and use of final results: In the Mediterranean, the stock-take resulted in an important contribution to the Barcelona Convention system in terms of providing:

The initial guidance for the preparation of the UNEP/MAP official reporting format for the ICZM Protocol.
A baseline for measuring the progress made with regard to the ICZM Protocol implementation.

Moreover, the early results of the stock-take have informed the Action Plan for the implementation of the ICZM Protocol in 2012-2019, officially adopted by the 17th Ordinary Meeting of the Contracting Parties to the Barcelona Convention.

In the Black Sea, the AG ICZM members advised the use of the regional stock-taking synthesis report as the basis for the ICZM part of the Report on the Implementation of the Black Sea Strategic Action Plan (SAP), which is due in 2014-2015. It seems also logical to consider the next update of the regional ICZM implementation audits by performing periodic stock-taking prior to ministerial meetings as part of the Black Sea SAP reporting (convened on a 5-yearly basis).

Proposed follow up actions: During the 17th Ordinary Meeting of the Contracting Parties to the Barcelona Convention, held in Paris, France, on 8-10 February 2012, the Contracting Parties decided to update bi-annually the data provided through the stock-taking questionnaire. This report on the stock-take is therefore considered as a reference base for measuring future progress in the implementation of the ICZM Protocol.

3.2 Lessons learned with the PEGASO tools and methods

3.2.1 Lessons learned for indicators

After the completion of the methodological factsheets, the CASES coordinators were requested to verify the possibility of calculating and applying the indicators at a local level or spatial scale. This collaboration has also led to the definition of the CASES contribution to the Integrated Regional Assessment. Moreover, two meetings were organized with the partners in charge of the development of the Spatial Data Infrastructure (SDI) in order to define the appropriate format for indicators calculation results in order to be properly visualised on the SDI. Furthermore, in terms of capacity building, two workshops were organized in Algeria to discuss about a set of indicators for the Maghreb countries (Algeria, Morocco and Tunisia), and one workshop in Georgia for the application of indicators in the Black Sea. Finally, the Pegaso indicators approach was presented during meetings of the Southeast Pacific data and information network in support to integrated coastal area management (SPINCAM) project, which built on the Pegaso findings and experiences.

Main Results Achieved: The work done in the context of Pegaso helped reviewing the current approaches related to indicators for ICZM and filling some of the gaps in terms methodologies and data collection and sharing. 15 methodological factsheets were compiled and are now available not only for Pegaso partners but for a wider community interested in ICZM. Pegaso Indicators have been used at different scales and in different contexts and have proven to be a useful tool for analysis and for dissemination of results. The collaboration between the SDI developers and the CASES colleagues have helped in understanding the potential and the usefulness of sharing data in a harmonised and standardised fashion. The dissemination activities have also shown the potential of the work done in Pegaso for application in other geographical contexts.

Lessons Learned: The main message is that in order to promote a truly integrated approach it should be avoided to measure the achievements of coastal management plans and programmes by using sectorial

indicators taken in isolation. Indicators should be used in an assessment framework, e.g. the Drivers, Pressures, State, Impact and Responses (DPSIR) in order to provide information about where we are in meeting policy and management goals and objectives. Important implications related to how the spatial and statistical data are managed and acquired will have to be carefully analysed and proposed to the relevant institutions and authorities.

Scientific Impact: The Pegaso set of ICZM indicators should not only serve as a descriptive but also analytical tool for the understanding of the coastal system, being it a region (the Mediterranean or the Black Sea), a country or a local coastal area. The challenge is to perform an integrated assessment, or to develop a storyline, also at the level of the indicator assessment, both qualitative and quantitative. To achieve this, cross-linkages between indicators are proposed: between Indicators of Sustainable Development and Indicators of Governance, between Driver, State, Pressure, Impact and Response indicators, cross-cutting issues, themes and sectoral objectives. Particular attention needs to be paid to the cause-effect relationships – and to the processes that define these relationships at the scale at which the analysis is conducted.

Proposed Follow-up Action: Having tested either the methodology or the application in a number of contexts, next steps could be related to the development of other methodological factsheets for other types of indicators in order to fill the gaps in terms of issues (e.g. climate change, natural risks, fisheries). To promote the use of these indicators in some others projects or regional assessments such as H2020 on the depollution of the Mediterranean sea, the related ENP-SEIS projects on data sharing and UNEP-MAP projects (ECAP, MSSD)

Societal and Economic Impact: According to the famous Lord Kelvin's quote 'you can't manage what you can't measure' (Lord Kelvin). Therefore, most international guidelines for ICZM call for the use of indicators to monitor the state of the coastal zones and assess the performance of ICZM efforts. A structured approach to ICZM calls for indicators to measure progress in, and effects of, ICZM policies. Initiating, monitoring or evaluating an ICZM process requires a set of governance, environmental, and socio-economic indicators that should relate to the specific management issues that triggered the initiation of the ICZM process, such as multiple conflicts, ecological degradation, community interest or the need for implementing a specific legislation. The purpose of using indicators in ICZM processes includes monitoring key characteristics of coastal and marine ecosystems against desired conditions, evaluating coastal management options, tracking progress and effectiveness of implemented measures and actions, and helping providing, and helping communicating relevant information to decision-makers.

3.2.2 Lessons learned with PEGASO Land Cover and the LEAC/SEAC exercise

A framework for multi-scale ecosystem accounting in the Mediterranean and Black Sea basins was produced in Task 4.2. This task consisted of three sub-tasks, namely Land and Ecosystem Accounts (LEAC), Sea Ecosystem Accounts (SEAC), and the Western Mediterranean Impact Index on Ecosystems (WMIIE). These three components contributed towards a holistic vision of the changes in the quality and quantity of the stocks and flows in the coastal zone and the pressures that drive them. The UNOTT team, together with the UAB, extended the concept and methods of LEAC to the entire Mediterranean and Black Sea basins for two time periods. The main activities of the UAB team were to produce a cumulative pressure index for the Western Mediterranean and to develop and test a method for sea ecosystem accounting.

Another significant result was the construction of a complementary framework for sea ecosystem accounting using seascape ecology techniques. Finally, a cumulative pressure index was created for the Western Mediterranean Sea. Training videos presenting the concepts and explaining the method and results were produced for all three components.

One of the **main lessons learned** is that the PEGASO land cover (PLC) will need more detailed validation work in the post-PEGASO phase, using high resolution remote sensing data in the areas with potential errors and local expert knowledge to have a final updated and high quality data set for the two basins. Once the methodology is consolidated, it will be easy to repeat the exercise every 2 or 5 years.

A shortcoming of SEAC was the lack of time-series data to create a full ecosystem account. This lack of data limited the testing of the tool to a single snapshot of the current stocks and flows. The time-consuming nature of

an expert survey was a significant lesson learned for the Western Mediterranean Impact Index on Ecosystems (WMIIE).

Scientific impact: While the concept of ecosystem accounting has been around for the past three decades, this is the first demonstration of extending the LEAC methodology to non-European areas. Similarly, ecosystem accounts for the coast and sea had not be produced for the Mediterranean and Black Sea and the creation of seascape baseline accounts in Task 4.2 are an exciting first step towards better management of natural resources. Preliminary results from Task 4.2 have been presented at various international conferences and publication of these results in scientific journals in underway.

Societal and economical impact: Ecosystem accounts quantify the consequences of how society and the economy utilize natural resources. Understanding the causes and results of changes in the environment will enable society to make better decisions. While physical ecosystem accounts were produced in the final deliverable, monetary accounts can also be created to justify land management decisions and to include externalities in markets through the payment for ecosystem services (PES).

Proposed follow-up actions: The availability of benthic habitat maps was the main limiting factor for producing sea ecosystem accounts and extending the impact index beyond the Western Mediterranean. As this data becomes available, so it can be used to test SEAC and WMIIE beyond the initial study.

3.2.3 Lessons learned with participatory methods and foresigh exercises

Foresights exercises were conduced in Egypt (December 2013) amongst high-level officers and scientists with the aim of defining best scenarios for the sustainability of the great lakes of the Nile Delta at the face of huge threats (e.g. Sea Level Rise, shrinking of the lake surfaces because of illegal appropriation of parts of the lakes for aquaculture, new planned dam in Sudan with effects on the water and sediment discharges on the Delta, and higher salination trends expected, the population factors, etc. It was the first time they could have a dialogue together. The successful results brought the opportunity to design with the Egyptian scientists and stakeholders, a EuropeAid proposition, which is presently building up.

Feedback provided by members of the End User Committee about the PEGASO Regional Meeting held in Rabat (Morocco) in March 2013 illustrates the usefulness of such an approach. The “What if…?” exercise, based on Bayesian Belief Network (BBN) methods, conducted in Rabat was highly appreciated because it brought together local stakeholders and scientists from the PEGASO CASES, researchers and experts from the PEGASO consortium and members of the End User Committee. It was recognised that such a ‘collective expertise’ has much more impact on decision-makers and on the decision-making process than the simple juxtaposition of opinions and expert judgements from their specific fields.

"Co-working sessions" with scientists and end users of the PEGASO project

During a 2-day meeting held in Rimini (Italy) on 22-23 September 2013, directly before Mediterranean Coast Day organised by PAP/RAC, “co-working sessions” with PEGASO partners and end-users aimed to bring together active members of the PEGASO EUC to discuss the preliminary results of the IRA, with particular reference to the indicators calculated at local (CASES) and regional levels, and to develop insight into policy responses and guidelines to implement ICZM in the Mediterranean and Black Sea.

Discussion focused on main threats for the Mediterranean and Black Sea and how these threats impact the coastal zone. The presentation of several (methodology and results) tools informed a discussion on policy instruments to respond to the main issues identified and governance aspects. A reflection on the proposed methodology and the usefulness of the ‘PEGASO integrated toolbox’ to support decision-making for ICZM has been developed, in line with one of the main PEGASO principles, which is to work in a collaborative and participatory manner. Final discussion was linked to the preparation of the PEGASO Closing General Meeting (Antalya, Turkey, 14-17 January 2014) and explored possible ways of sustaining the ICZM Governance Platform after the end of the project (February 2014).

According to Pablo Ávila Zaragozá (Andalucía, Spain), the PEGASO IRA should provide: (i) tools for a more efficient and effective decision-making process; (ii) an overview of the current situation in which key issues related to the uses, land use, affections to the environment, and trends are identified; (iii) a set of indicators to visualise trends and aspects to be redirected for the implementation of the ICZM Protocol.

"*The PEGASO IRA will be used by many different end-users, with skills in many different domains* (…), *so an effort should be made to adapt to the different needs and interpretations.* (…) *Another aspect to take into account at regional scale is the differences between EU countries and North African and non-EU countries in sharing regulatory standards and rules concerning ICZM* (…). *The PEGASO IRA could be an excellent tool to identify and assess these differences in order to reduce them* (…)" (Ibid, Interview, April 2013).

Mihail Costache (Romania) gave the following feedback about the PEGASO IRA: "*The PEGASO IRA provides a tool for a more effective decision-making process and better understanding of the impact of human activities on coastal ecosystems. The PEGASO IRA could be used by many different end-users, from different domains* (…). *The regional nature of the IRA should be also stressed for the identification and assessment of differences between EU and non-EU countries – in terms of the legal aspects of ICZM and other issues concerning coastal zones"* (Interview, May 2013).

Christophe Le Visage (France) was particularly interested in the relationship between IRA and the evaluation of integrated policies: "*IRA seems very close to evaluation in many ways: a "policy-oriented assessment" must be very close to "policy evaluation". Evaluation is a difficult challenge for integrated policies, at all stages: Ex-ante, when it comes to try and forecast the effects of the planned actions; during the policy cycle, and; Ex-post, after a policy cycle has been completed, when the outcomes and results are compared to the vision and initial objectives, before revision (of the policy actions, or objectives, if they proved unrealistic).* (…) *If IRA can produce integrated assessment and indicators related to integrated policies, it will indeed contribute to bridging the gap between scientists and decision-makers, and more generally between knowledge and decision*" (Ibid).

The PEGASO work has highlighted some of the main concerns regarding marine and coastal ecosystem. These ecosystems provide valuable natural capital for the economy of the Mediterranean and Black Sea regions. However it is evident that goods and services are being yielded unsustainably in some areas, with irreversible detriment to the health of ecosystems. Of particular concern are land-based pressures associated with densely populated areas where urbanisation is unbalanced. In order to optimally profit from the wealth of natural capital, there must be a better balance of activities in marine and coastal zones. There needs to be an ecosystem-based approach to science and governance, using integrative tools, such as Marine Spatial Planning, SDI, Land and Ecosystem Accounting, CIM/WMIIE, Indicators, Indices, and scenarios.

3.2.4 Lessons learned with the capacity building

This collaborative work and the construction of a shared knowledge have been the focus of the PEGASO capacity building program, whose strategy was oriented to "learning by doing" and also "training trainers". So that the conditions for launching or continuing an ICZM process can follow and reproduce in each municipality, region and country, understanding the need for cross boundary actions when needed and the need of dialogue across institutions and scales.

"*I believe PEGASO is the "fuel" to the "engine" that keeps ICZM implementation running. EU policies and UNEP/MAP protocols take a long time to be implemented. PEGASO provides tools for decision-making, not only to accelerate the process, but to ensure that decisions are made on the basis of real data and up-to-date information. The decision-making process is more effective and sustainable under these conditions*" (Pablo Ávila Zaragozá, End User Committee, Interview, March 2013).

According to Mihail Costache (Romania, Ministry of the Environment and Climate Changes), Member of the PEGASO End User Committee, this project for coastal managers and ICZM practitioners has the following added value: it provides tools for decision-makers based on the data and information acquired through stakeholder participation; integrates the capacity for setting up a participatory approach for coastal zone management supported by high quality of information and data; and promotes tools and methods that could be extended across coastal areas.

4. The post-PEGASO: The road that lies ahead….

4.1 There is a growing demand for PEGASO products

- By the Med countries (responding to the ICZM Protocol, and its further developments).

- By relevant Mediterranean institutions:

- UNEP-MAP (to answer the need of actions for its 7 Protocols and articulate them in a consistant way, to support the UNEP-MAP work on EcAp, etc.).
- To support the work of UNEP-MAP in the Medpartnership (Climate change variability, water issues, etc.).
- The UfM (Union for the Mediterranean): supporting the Neighborood actions of UpM in the South and East Mediterranean, supporting ENPI H2020, and supporting further work on IMP for the South…)

- By EU institutions:

- DG ENV and DG MARE: collaborating with them on the links between ICZM and MSP, support to the IMP in Europe and beyond, supportive work for feeding the draft new Directive on ICM/MSP, etc.
- DG Regio: supporting the program “stepping into the sea” and the ecosystem mapping for MSP, helping in the design of the Highways of the sea to implement them lowering their impacts on coastal and marine ecosystems.
- EuropeAid (DG Cooperation): look how blue growth can contribute to lecal development in an ethic and sustainable way.

4.2 The sprawl of relevant knowledge and its socialised ownership

The around 1.000 participants in the PEGASO process have felt that PEGASO was a motivated project, that bring to them relevant and useful results for implementation, that allow them to make ICZM real applications. All of them want to continue the PEGASO vibrant process of communication, exchange and co-working. PEGASO is considered as very unique by PEGASO end users and the whole Governance platform.

4.3 Gaps and urgent tasks to be done in the post PEGASO period

- Quality ensurance of PEGASO products and a systematic validation, specially the spatial products (Indicators, LEAC/SEAC which are the basis for a comparative map, reproductable at different times with same and transparent methodology.

- Updating of products when needed (for ensuring quality of current products and for producing their timely new versions.

- Continuation of the process of collaborative work and share of data, with priority on demand exists (Black Sea, Adriatic Commission, Magreb supported by Algeria, Greece, and the Nile Delta in Egypt).

- Ensuring sustainability of the ICZM Governance Platform, adapting and enlarging it to a Mediterranean multiscale platform of stakeholders, analysing how other relevant networks working in the Mediterranean and the Black Sea could collaborate in it, offering a discussion platform to better integrate the protection and management of ecosytems (aiming at a Good Ecosystem Status) into the economic sectors, that should

collaborate to the maintenance and restoration of our coastal/marine natural capital. We need still many other collaborators such as IUCN, MEDPAN, Small Islands, MEDWET/RAMSAR, economic sectors such as fisheries, aquaculture, agriculture, planning, water management, etc. So the role, function and overall organisation (regional, sub regional, national, local) should be discussed amongs all in priority. Citizen should also be involved, especially those already active, e.g. local networks of observers of the coast and the sea, schools professors that educate for sustainability, diving association than clean the plastic bags at sea, etc.

5. Conclusions

PEGASO has made a huge effort to really work in a pluridisciplinary, multicultural and multiscale (in space and time) approaches, supporting a renewed concep of ICZM, strongly embedded into the Ecosystem based framework which allows focusing on the ecosystems and their services to local populations. Ecosystem therefore is considered in its broad sense, linking all catchments, coastal land and their territorial seas (ICZM Protocol) but also the offshore and deep sea. This concept has fully included the discussion about the European Integrated Marine Policies and the links between ICZM and Marine Spatial Planning (MSP).

Policy led, PEGASO has strongly supported the implementation of the ICZM Protocol and all its Articles in the renewed ecosystem based ICZM/MSP concept. This enlargement to the sea and marine waters, ecosystems and uses, is also recognised in the ICZM Protocol, which has in many ways anticipated or simply supportes EU policies such as MSFD and MSP, conveying them to the non EU countries of the Mediterranean and the Black Sea. This bridging of policies is extremely important to ensure common monitoring and common bases for assessment. PEGASO with the production, for the first time, of a land cover map for the whole Mediterranean and Black Sea Basin at two dates (2000-2011) has made a pioneer work, eventhough this first prototype has still to be fully comparative. As a link between coast and sea, PEGASO produced also for the first time at this scale (the West Mediteranean) a Cumulative impact index on coastal and marine ecosystems.

Only tools of this type, which covers a sub region (only because of lack odf data for covering the whole Med and BS) or the Mediterranean and Black Sea basins in full, will allow understanding main trends and current threats in a very comprehensive way. Moreover, PEGASO has opened nice experiences using existing scenario and foresight methods. It has adapted them to the Mediterrean and Black Sea and has tested them at different scales (regional, national and local) with the most relevant stakeholders in each workshop.

PEGASO can be considered an ambitious policy-oriented project, which is innovative and perhaps even pioneering due to the many aspects described below:

PEGASO has supported the most recent Protocol adopted by the Contracting Parties to the Barcelona Convention - the ICZM Protocol for the Mediterranean, and helped Black Sea countries to explore possibility and opportunity of developing similar instruments;

PEGASO has worked both in the Northern and Southern shores of the Mediterranean basin, and also in the Eastern part of the region, including the Black Sea basin. The project has taken into account differences between countries and regions, in terms of scientific background, ICZM experiences and instruments and the culture and governance framework in general;

PEGASO has built an ICZM Governance Platform, which brings together scientists, decision-makers, end-users and any stakeholders, working at different levels, from regional to sub-regional, national, and local. Time scales were also considered in “envisioning” exercises to better understand the existing socio-ecological system and how it will evolve, which new threats are expected to emerge, and how and to what extent drivers can be managed in the land and marine parts of coastal zones;

PEGASO has developed several tools within a ‘toolbox’ that was collaboratively built, tested and applied in ten pilot sites (CASES). A core set of ICZM indicators was defined to address the specific requirements of Article

27 of the ICZM Protocol, in order to “define coastal management indicators“, and “establish and maintain up-to-date assessments of the use and management of coastal zones”;

PEGASO has built a Spatial Data Infrastructure (SDI), which complies with Open Geospatial Consortium (OGC) standards and the INSPIRE Directive. It has contributed to interactive information sharing, ensuring that spatial data was well organised and standardised;

PEGASO has considered CASES not to be simple ‘case studies’, but instead ‘open laboratories’ where scientists and stakeholders have worked together to reach a common vision and understanding (communication and interaction, taking into account stakeholder needs and expectations regarding useful tools to run the ICZM process);

PEGASO has developed cross-cutting views between CASES that are very different, unique, and complex with regard to several aspects such as policy framework, types of ecosystem (wetlands and deltas, islands, urban vs. natural areas, protected areas), geographical scales, and levels of socio-economic development. The platform has supported the publishing of information and discussions and virtual conferences on various tools and methodologies, including indicators, scenarios, Geographic Information Systems (GIS), Land and Environmental ACcounting (LEAC), cumulative impact mapping, socio-economic assessments, participatory methods, and prospective exercises.

The ICZM Governance Platform aimed to contribute to a shared understanding for a more desirable and sustainable future in the two basins. The platform sought to help the implementation of future policies under the Barcelona Convention and Bucharest Convention, and also contribute to real transformation within governance structures, which is a long-term requirement of these two Regional Sea Conventions (RSCs).

Cooperation between the two regional seas was an important part of the PEGASO project and ICZM Governance Platform itself. By improving collaboration with the RSCs, the scientific community could better take into account policy needs, especially at regional level. The cross-regional approach took into account a variety of scales, from basins (regional) to pilot studies (subnational/local).

Therefore, the ICZM Governance Platform can be considered both a tool and network to be fed into by partners and a limited number of external users, but with the intention and perspective of becoming a publicly available platform and an ICZM infrastructure for the Mediterranean and Black Sea, including stakeholders from countries, regions, municipalities, economic sectors, NGOs, etc.

All these participatory process, reflexion and results from tools and methods have been oriented towards the making of a collaborative assessment, the PEGASO IRA.

Over the lifespan of PEGASO, the project has mobilised in a successful collaborative-work around a thousand of Mediterranean and Black Sea scientists and stakeholders, both at regional and at CASE levels. PEGASO ends up as an innovative and creative project, which has provided exploratory ways to stakeholders to share common knowledge with scientists. This practice has given a new know-how on exchanging data and speaking together among scientists, decision makers, national and local managers, making these different professional spheres collaborating in a common direction. Demands to continue PEGASO work and spirit from stakeholders are very high. This continuous interaction has created a social energy in PEGASO. The human aspect, the relation between people, motivated to learn from each other, has boosted a creative human, transdisciplinary and transcultural unforgettable experience that has reinforced friendship, confidence and cooperation linkages, named by its partners the PEGASO family. All these PEGASO products, process and spirit have been recognised and this social energy especially appreciated. They are the main lessons learned in PEGASO.