

MEASURING SUSTAINABILITY

Alan Pickaver¹, Maria Ferreira¹, Margarida Nunes², Xenia I.Loizidou³ and Michael I. Loizides³

¹ Coastal & Marine Union (EUCC)
P.O. Box 11232, 2301 EE, Leiden, The Netherlands
E-mail: a.pickaver@eucc.net; m.ferreira@eucc.net

² Agência Portuguesa do Ambiente, I.P., Administração da Região Hidrográfica do Tejo,
9001:2008 pela APCER, Av. Almirante Gago Coutinho, 30 - 1049 - 066 Lisboa
E-mail: margarida.nunes@arhtejo.pt

³ ISOTECH Ltd Research and Consultancy
P.O. Box 14161, 2154 Nicosia, Cyprus, www.isotech.com.cy
E-mail: xenia@isotech.com.cy, michael@isotech.com.cy

SUMMARY

Increasingly, humankind is attempting to move towards a sustainable future. Unfortunately, communities do not have a means of adequately measuring whether it is reaching that goal or not. This paper sets out an indicator-based methodology which would allow a numerical value to be attributed to the efforts of Authorities to determine if they were reaching their strategic sustainability goals. It was developed in the ERDF-funded INTERREG IVC project SUSTAIN.

This goal was achieved by the selection of relevant, scoreable indicators that had available data. Indicators were chosen to cover 22 distinct Issues within the four recognisable pillars of sustainability i.e. Governance, Economics, Environmental Quality and Social Well-being. Innovation was introduced through the use of a checklist for Governance, as opposed to traditional indicators which are notoriously difficult to measure, and the combination of a set of Core Indicators together with Optional Indicators to reflect local needs and specificities.

Data for the relevant indicators is fed into a newly developed policy tool, DeCyDe. This is a user-friendly, spreadsheet tool which serves as a self-assessment to determine, numerically, whether an authority is moving towards a sustainable end-point. It is done through highly participatory workshops where discussion about the Issues, Indicators and data is as important as the numerical value obtained.

The only problems to this approach, common to any methodology based upon indicators, are the time needed to find the relevant data and the sometimes lack of data. However, whilst nothing can be done about the former problem, the latter is minimised since DeCyDe is flexible and robust enough to cope with less-than-perfect or absent data.

Together, the Sustain Indicator Set and DeCyDe tool constitute a friendly to use rapid implementation, self-assessment tool. It respects the time limitations of policy-makers and other stakeholders.

A Methodological Framework

Sustainability is more of a generalised concept than a fundamental truth. It does not have defined parameters that can be scientifically determined. Neither is it constant but continuously changing. Indicators that are applied to determine sustainability today rarely take this into account and, paradoxically, use data that has been precisely measured. Many of the indicators are very specific and many measure parameters which are beyond the sphere of influence of regional/local authorities. A pre-requisite for any determination at local or regional Authority level, is a framework in which the Indicators and their scoring can be placed. This framework, by necessity, needs to be based in policy and in implementable instruments e.g. legislation. Therefore, a step-wise methodological process has been developed which takes us from the starting point to the expected end

point in a logical and cyclical manner. The framework incorporates the European strategic goals for sustainable development and integrated coastal zone management, as well as the most relevant issues in those domains. Having agreed strategic goals and targets, policy-makers can measure the relevant indicators from various data-bases. The framework explicitly addresses the selection criteria for indicators and has allowed the analysis of international, national and local indicators in order for the SUSTAIN indicators to be chosen by a group of involved stakeholders.

The SUSTAIN Sustainable Development Indicator Set

The Indicator Set has been deliberately based on indicators that are already in common usage and ones that, according to EU legislation, should be regularly monitored. New indicators, although possibly more relevant to sustainability have not been introduced if there is no data-base from which to measure them.

SUSTAIN offers two sets of Indicators differing from the more traditional approach of applying a fixed, standard indicator set. One of the sets, the CORE indicators, should be used by all Authorities seeking to measure their level of sustainability. They are considered to cover essential aspects of sustainability. They can be used with a number of OPTIONAL indicators which reflect local/regional specificities. They have been robustly selected using criteria such as relevance to sustainability, availability of data and their ability to be scored.

These indicators represent the four pillars of sustainability i.e. governance, environment, economics and social well-being. In order to show their relevance to sustainability the different indicators have been grouped into a number of Issues. In total there are **22 key, core Issues** broken down as follows:

Governance	5 issues
Economics	4 issues
Environmental Quality	8 issues
Social-Wellbeing	5 issues

a. The Governance Issues and indicators

These indicators are used to measure the consistent management, cohesive policies, guidance, processes and decisions for the wise use of the coast. Traditionally, indicators to measure governance have proven to be very difficult to define. Therefore, SUSTAIN has used a new approach which poses a series of grouped questions (each regarded as an indicator) which require only a positive or negative response (with a don't know' option). They have been structured into 5 groups of indicators:

- i. Policies/ strategies for sustainability
- ii. Monitoring tools for sustainability
- iii. Human resources/capacity building
- iv. Implementation of good management practices
- v. Stakeholder involvement/public participation.

b. Economic performance Issues and indicators

These indicators have been chosen to show whether a vigorous and sustainable coastal economy is being promoted and supported. Four key, Core Issues have been identified which are deemed to be important for the economic contribution of sustainability in coastal zones:

- i. Economic Opportunity
- ii. Fisheries and Aquaculture
- iii. Land Use
- iv. Tourism
- v. Transportation

A further three Optional Issues have been identified:

- vi. Economic Performance (1 optional indicator)

- vii. Energy & Climate Change (1 optional indicator)
- viii. Fisheries and Aquaculture (1 optional indicator).

c. Environmental Quality performance Issues and Indicators

These indicators have been selected to demonstrate the availability of sustainable environmental practices and the way they are promoted. Eight core issues have been identified as important in a Pan-European context. They are:

- i. Air Pollution
- ii. Biodiversity and Natural Resources Management
- iii. Change at the coast
- iv. Energy & Climate Change
- v. Land Use
- vi. Public Health and Safety
- vii. Waste Management
- viii. Water resources and Pollution

Further one Optional Issues have been identified:

- ix. Fisheries and Aquaculture (1 optional indicator).

d. Social Well-being performance Issues and indicators

The indicators for social well-being have been chosen to promote social unity and durability. Five core issues have been selected, being:

- i. Demography
- ii. Equity
- iii. Education and training
- iv. Local and cultural Identity
- v. Public Health and Safety

Applying the DeCyDe scoring methodology

DeCyDe is a practical method that can be implemented to give a numerical value to an individual indicator. It is also an approach which is in line with the trend of public policies to move from a purely conceptual and theoretical view to a more pragmatic approach, based upon observed data. It incorporates principles from multi-criteria analysis, from public policy approaches, from vocational training structures and basic logic principles. It is spreadsheet-oriented. DeCyDe is structured in three preparatory, self-contained and inter-related steps and a final stage where the actual decision-support work is done. The preparatory steps are self-contained because they can be used per se, each step giving specific results. They are interrelated since when put together they lead to the final stage, where the decision is supported, based on facts and data and not to perception and intuition. DeCyDe has been built specifically, and dedicated, for each core and optional Sustain indicator. Determining the values of each indicator actually forms the baseline work. The information provides a set of essential data that is needed in order to guarantee the unbiased character of the results of the decision process. The scoring of each indicator is achieved through a given ranges of values. The "scoring through ranges" approach converts state-of-the-coast indicators into sustainability indicators. This is because the score attributed immediately gives a reference value and relevance instead of just a snap-shot single figure which stands for nothing but itself. The value of each indicator when found is simply entered into the relevant cell in the spreadsheet and the score attributed. As each score is entered, the overall scores alter automatically. The issues and the pillars under which the indicators fall are then organised in matrices (based on the concept of comparing couples). When the various weighting for the Issues and Pillars are entered into the relevant cells, the spreadsheet automatically calculates the overall score of all the indicators used. This is given as a single numerical value. When these three steps have been completed, the spreadsheet tool can be operated further: DeCyDe allows decision makers to predict how the existing situation can be changed if, for example, they want to change the score of one or more Issues. That means that they can easily predict what will happen should they invest resources to support the change of score and thus the range, of a given indicator e.g. by increasing resources in waste management recycling by moving them from aquaculture production. Alternatively, they

can forecast what will happen if they change the importance among the four main pillars e.g. putting more resources into Economics and less in Environmental Quality through a change in their policy.

References

- DeLone and McLean "Information Systems success. The question for the dependent variable", *Information Systems Res.* 3(1), 1992
- F.J. Andre M.Al. Cardenete Carlos Romero "Designing Public Policies", Springer 2010
- Nunes M, Ramos T, Ferreira JC, Mascarenhas A (2012). Desenvolvimento de uma Ferramenta de Avaliação da Sustentabilidade para Municípios Costeiros Europeus. 11º Congresso da Água, Porto. APRH.
- X. I. Loizidou and M. I. Loizides, "Environmental Issues and Social Perception as an Inherent Part of Coastal Erosion Management – Case Studies from Cyprus". *Proceedings of MEDCOAST 2007* (p.991-1002), Alexandria, Egypt.
- X.I. Loizidou, "Public participation in practice: statements and case studies", (invited speaker) proceedings (CD-rom) of the ENCORA WORKSHOP THEME 2: PUBLIC PARTICIPATION within the framework of the LITTORAL 08 Conference, Venice 25-28 November 2008.