Science for Environment Policy

New approach to identify indicators for local-level ICZM

Researchers have proposed a new approach to identifying sustainability indicators for Integrated Coastal Zone Management (ICZM). It consists of three steps: identify the most important factors in ICZM for coastal stakeholders, model relationships between these factors, and analyse these factors to identify the most relevant for use as indicators.

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1. See:
www.un.org/esa/dsd/agenda21

2 Développement durable des Côtes Européennes (DEDUCE) was co-financed by the European Commission and the participating regions, in the framework of Interreg IIIC South. See: www.deduce.eu

Integrated Coastal Zone Management (ICZM) aims to integrate different policies applicable in coatal areas across sectors in order to preserve coastal resources. Intensive stakeholder engagement is one of the key principles to make such integration succesful. The UN's Agenda 21[1] has explicitly recommended the use of indicators to monitor the state and progress of ICZM implementation, but most indicators tend to be broad and general. These are useful when comparing the state of ICZM implementation in different regions, but more specific problem-orientated indicators are needed at a local scale. This requires a holistic systems approach that combines the perspectives of the appropriate stakeholders and the effects on use of resources of the different activities in coastal areas.

The study proposes a new methodological framework to identify suitable sustainability indicators for ICZM. It consists of three steps:

1. **The Exploration of the System**, which identifies coastal stakeholders using the 'Hydra' approach. This approach identifies a preliminary list of stakeholders who are then asked to identify further stakeholders. As an example, it was used in Spain's initiative to promote ICZM. Environmental offices for coastal districts were first identified as stakeholder sand a shortlist of actors in each province was drawn up. These recommended stakeholders were asked to complete the list with missing stakeholders who were then also asked to suggest more stakeholders. This process continued until no more actors appeared on the lists, resulting in 600 stakeholders representing public administrations, research organisations, the business sector and NGOs. Once all stakeholders are identified, they need to be asked to identify their main issues and areas of concern for ICZM.

2. **The Modelling of the System** is a stakeholder-based approach to identify the causal relationships between the issues and factors identified by stakeholders during Step 1. This uses matrices in which the stakeholders indicate the interactions between the issues. For example, in the ICZM plan for a region of Egypt, a list of issues was created from workshops and surveys with representatives from local, national and regional administrations, as well as academic experts. The matrices identified the most important issues as coastal protection, agriculture, climate change, urban expansion and beach erosion.

3. **The Analysis of the System** consists of principal component analysis (PCA), a type of statistical analysis, to determine relevant factors that could be used as indicators of sustainability in ICZM. In the DEDUCE project[2], a working group identified 27 EU coastal sustainability indicators based on seven goals. To take the first goal as an example, the control of further development of the undeveloped coast, the PCA identified three suitable indicators. These were: the number of road transits, the percentage of built-up land in the first kilometre from coastline, and the number of road moorings.

The researchers used three separate case studies to illustrate each of the three steps and propose further research is needed to investigate how the whole method could be applied to one case study. They also suggest that alternatives to the proposed methods, including the Hydra approach and PCA, should be tested.