

2. The sustainability challenge: an analysis of prerequisites for an integrated coastal zone management in the Netherlands

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Abstract

This project aimed to develop multidisciplinary knowledge for a more sustainable and integrated coastal zone management by reflecting on existing forms of coastal governance and knowledge use. A review of coastal governance on different levels as well as a review of the usefulness of decision support system for coastal management has resulted in a list of conditions that have to be fulfilled in order to enhance the changes for a more successful integrated coastal zone management. This set of prerequisites was used to structure action research on the development of integrated coastal zone projects in Bulgaria. The project has also resulted in the development and testing of QUASTA, a computer-based tool that can be used in structuring societal debates by visualizing the relations between stakeholder ideas. The Quasta tool is among others tested in a project in which explorative scenarios for the future of Netherlands coastal zone were elaborated.

i. Problem

Coastal zones are multifunctional areas. In the Netherlands coastal zone, both economic functions (shipping, tourism, bulb growth, fisheries, and drinking water extraction in the dunes) as well as ecological functions (wetlands of international importance) can be found. Dunes not only have an ecological value, but – on together with the dikes - are of major importance in protecting the low-laying hinterland against flooding. Moreover, many parts of the coastal zone have important cultural functions as well.

The sustainable development of the coastal zone asks for an integrated management, a coherent territorial approach of policy problems and different interests. Such an integrated approach, that aims to optimise the economic, ecological, social and cultural well-being of the coastal area and its (future) users, also has the ambition to respect natural processes and dynamics and to take into account the limits (carrying capacity) natural processes set. In practice this means that several levels of decision-making, several policy sectors and a large number of stakeholders are involved in integrated coastal zone management. Integrated coastal zone management can be considered a multilevel, a multi-sector and a multi-actor governance process, in which knowledge plays a key role. Scientists do provide this knowledge, but there has been a growing recognition that other stakeholders have relevant knowledge as well about sustainable coastal development. Dialogues between these groups are important in order to stimulate learning processes.

ii. Aim

This project aimed to develop multidisciplinary knowledge for a more sustainable and integrated coastal zone management in the Netherlands. More specifically we wanted to get insight in the functioning of governance networks and in the way knowledge was used in coastal decision-making. By conducting document analysis, by interviewing key informants and by organizing focus group sessions, insight in the functioning of governance networks and in knowledge use was gained. Following this a list of prerequisites for a successful integrated coastal zone management has been developed.

Furthermore we had the ambition to explore new methodological pathways to address knowledge-related problems. This ambition is realized by developing and testing the Quasta-tool.

iii. Results

Characteristics and functioning of governance networks

Governance networks dealing with the coastal zone area appeared to be multilevel, multi-sector and multi-actor (Dieperink et al., 2003). Policies have been made both on the European, the national and the regional level. We first focused on the steering capacities on the European level. Effective governance requires a clear conceptualization of the required activities of the actors that have to take action. Moreover these actors have to accept the requirements as legitimate.

Our research revealed that on the European level both the intergovernmental Council of Europe and the supranational European Union have been involved in the process of developing a regime for integrated coastal zone management (ICZM) since 1970 (Benoît-Rohmer and Klebes, 2005; Commission of the European Communities, 1995 and 2000; Council of the European Communities, 2002). The Council of Europe consist of a Parliamentary Assembly and a Congress on Local and Regional Affairs with respectively a consultative and an advisory status. Decision-making powers are only vested in the Committee of (Foreign Affairs) Ministers of the Member States. The European Union also has a ministerial Council, but this European Council can only make decisions based on the initiatives of the Commission and in cooperation with the European Parliament. Both institutions have produced an ICZM regime by issuing principles, norms and rules aiming at a more integrated coastal zone management. Although both regimes have unique features, their contents mainly overlap. In principle the EU has more steering capacities as it is able to issue legally binding regulations. However, so far both organisations have only issued legally non binding Recommendations and Policy Documents addressing national governments (although the Council documents also address coastal developers and engineers). Both organisations conceptualize integrated coastal zone management by issuing guiding principles instead of more concrete obligations. The 2002 Recommendation of the European Parliament and Council on ICZM (Council of the European Communities, 2002) recommends member states' coastal policy makers to work from a broad "holistic" perspective (thematic and geographic); to have a long term perspective; to use adaptive management (responding to new information and conditions) during a gradual process; to reflect on local specificity while solving problems; to work with natural processes; to use participatory planning to involve all relevant stakeholders; to support and involve all relevant administrative bodies; and to combine instruments to ensure coherence. The EU further stimulates Member States to develop a strategic ICZM approach by suggesting general procedural steps to be taken. Moreover

the EU has funds (LIFE, INTERREG) to stimulate ICZM in practice. As both regimes appear to overlap or complement each other, the existence of two regimes on ICZM is neither curse nor blessing.

The existence of two ICZM regimes might be confusing, but this appeared not too problematic for Member States as our research also made clear that Dutch coastal governance practice was hardly influenced by EU ICZM-policies (Dieperink and Steyn, 2005). Formally the Netherlands implemented the EU Recommendation on Integrated Coastal Zone management in time, but 'the' Dutch national strategy appeared to be very abstract and fragmented and could only be identified after analysing and combining different policy documents like the Third Coastal Policy Document and the National Spatial Strategy (Ministerie van Verkeer en Waterstaat, 2000 and Ministeries van VROM, LNV, VenW en EZ, 2006), that don't address both land and seaside at the same time. As a result the division of tasks and responsibilities within and between different coastal governance networks remained unclear. Further assessment of the practical application of the eight above mentioned principles of integrated coastal zone management in five regional coastal zone projects (the "Memorandum Integrated Coastal Zone Management West Zeeland Flanders, the Project Integral Vision Delta waters", the 'Integrated development of the South Holland coast' and the 'Duinzoom Plan Den Helder / Zijpe' and the "Management plan for the island Rottum" in the Wadden Sea) revealed that in most projects the principles were addressed, although not explicitly. The involved actors were barely aware of the existence of the EU recommendation and the principles played only an implicit role during the policy process.

The analysis of the European regimes and the implementation of the EU-regime in the Netherlands made clear that governance networks on different levels operated too a large degree independent from each other. Therefore we decided that prerequisites for an ICZM had better be sought following an in-depth analysis on the project level. In order to define a priori prerequisites to structure this research a literature review concerning integrated policy making was done to be followed by an assessment of the Zeeland Weak Chains Projects (Voskamp, 2006; Voskamp and Dieperink, 2006). These projects aim to reinforce weak points in the coastal defence structure but also to improve spatial qualities of the coastal areas. The assessment revealed that most of theoretically relevant success conditions for an integrated approach were present (like an appropriate institutional structure, a good understanding of the area, an adequate process development). In the early phases of the projects actors involved showed enough political will and support for an integrated approach. In the end, however, the Public Works Department, the initiator of the project was only willing to pay for measures directly improving coastal defence. Additional financing had to be provided by other actors.

In order to enhance the societal relevance of our research we decided to further specify the prerequisites found by an additional literature review. This list of 15 conditions found was tested and refined in action research on the development and evaluation of 4 integrated coastal zone projects in Bulgaria (Dieperink et al., 2010; MyCoast, 2010).

Knowledge management: sources, models and policy relevance

For getting more insight in the use of knowledge we first have identified the extent to which existing Decision Support Systems (DSSs) specifically designed for ICZM were helpful in meeting sustainability challenges (Van Kouwen et al., 2008a). These systems are aimed at making relevant knowledge about biophysical or socio-economic processes interactively accessible for

decision-makers. A number of knowledge- and process-related challenges were identified for ICZM, which resulted in a set of required DSS functionalities that might be helpful in meeting these challenges. Next we identified which of these functionalities have been incorporated into existing DSSs. We discovered that many functionalities were not or only rarely offered by these existing tools. As none of the investigated tools combined all functionalities, there appeared to be a dichotomy between policy-oriented problem structuring tools and research-oriented impact assessment tools. In this respect, the tools did not bridge the gap between research and policy-making, but appeared to be rather part of the problem.

The second part of the research aimed at exploring possibilities for a new type of computer-based tool (Van Kouwen, 2007; Van Kouwen et al., 2008b; Van Kouwen et al., 2008c). The formalism of Qualitative Probabilistic Networks (QPNs) was designed in the 1990s and can be used to analyse diagrams based on cause-and-effect relationships. These diagrams, known as Cognitive Maps, have nodes representing variables and arrows representing causal relationships between these variables. Three properties jointly distinguish the formalism of QPNs from other methods for analysing Cognitive Maps. Firstly, the analysis is purely qualitative, allowing analysis of a Cognitive Map without any quantitative information. Secondly, contradictory influences on a variable will always be detected and highlighted as ambiguity, indicating that quantitative information is necessary for drawing unambiguous conclusions. Thirdly, QPNs allow forward and backward reasoning, which, graphically speaking, means that the direction of reasoning is in the direction of arrows, as well as in the opposite direction. This means that the technique can be used for both predicting and explaining. This has offered a practical starting point for an interactive problem structuring tool that can facilitate dialogues relevant to sustainability challenges.

This tool, called *Quasta*, was evaluated in four workshops in which various sustainability issues were discussed. During one of the workshops, part of the project Sustainable living in the Dutch coastal zone, four scenarios for a future coastal zone were explored (Van der Vlies et al., 2007). The scenarios differed with respect to the degree of concentration of economic values in the lower parts of the Netherlands and in the basic societal attitude towards the sea (control or manage). In these workshops, a facilitator invited stakeholders to put forward their issues, which were linked to each other after a short discussion. *Quasta* was used to visualize the argumentations of the stakeholders (see Fig. D-2.1).

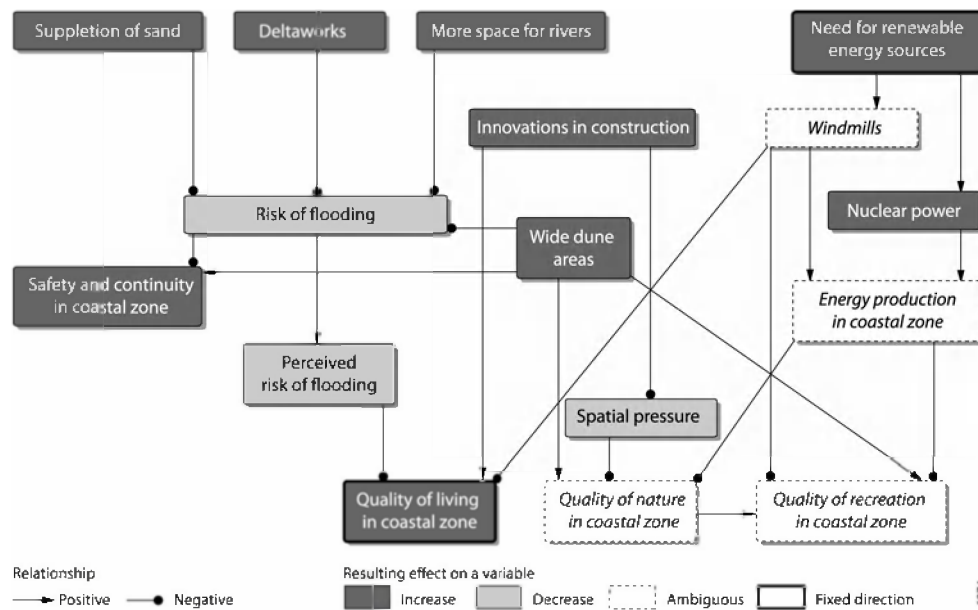


Fig. D-2.1. Example of a scenario analysis with Quasta

After the workshops the following four hypotheses were empirically tested (van Kouwen et al., 2009): Quasta (1) helps stakeholders to become aware of causal relationships; (2) helps in exploring possible scenarios; (3) identifies the need for further (quantitative) knowledge and; (4) has a low threshold for non-technicians. It was concluded that Quasta exhibits each of these four characteristics. However, there were a number of factors that may have affected the success of applying Quasta. Nevertheless, the results are positive thus far as the workshop participants came up with a number of additional arguments supporting the usefulness of the tool.

Compared to the existing DSS tools aimed at problem structuring, Quasta has some advantages (Van Kouwen et al., 2009). It can be used for backward reasoning (“backcasting”) and in theory it can deal with uncertainty by linking it to analytical models, although an active linkage has not been tested in practice. The most important result is that Quasta is considered a useful tool for improving problem structuring; the tool helps to map out the ideas and knowledge of policy-makers, researchers and stakeholders in an explicit manner. As such, it offers a structured approach to start the process of jointly identifying a problem. Based on the results of the initial problem structuring step, the need for further (in-depth) knowledge can be clarified. By working this way, the tool promotes the generation of knowledge that will address the specific problems identified. Moreover, the Quasta tool is a flexible instrument; as soon as there are new insights and problem perceptions, the Cognitive Map can be adjusted, new scenarios can be explored, and the resulting need for further knowledge can be identified. During the workshops, Quasta acted as a ‘mirror’ for the arguments of the workshop participants. While the tool allows stakeholders to visualise the logical implications of their arguments, it often occurred that the outcomes of Quasta’s scenario exploration did not entirely match the participants’ expectations. A possible explanation for this is that, in these cases, the diagram was not consistent with the perceived problem structure; but this did allow the inconsistencies to be traced and corrected. The other possibility is that, after tracing the reasons for Quasta’s outcomes, the analysis makes sense to the participants after all. In these cases, the tool has facilitated a learning moment by making participants aware of relationships that they did not see beforehand. This is also indicated by the

workshop evaluations, in which participants confirmed that the computer analysis made them aware of causal relationships. In both cases, Quasta improved communication and contributed to a better utilisation of knowledge.

iv. Conclusions

Our research has resulted in 15 prerequisites for an integrated coastal zone management:

- 1) Important stakeholders must perceive a situation as undesirable; there should be a shared sense of urgency in society to improve the quality of a coastal area;
- 2) Those stakeholders who are absolutely indispensable in making strategic decisions and implementing policies are willing to participate;
- 3) Stakeholders with similar backgrounds and representing similar interest should be organized and speak with one voice;
- 4) Stakeholders should (be able to) respect each other's opinions and commitment;
- 5) Stakeholders have insight in mutual interdependencies and take major dependency relations between public and private actors into account;
- 6) Stakeholders should be able to incorporate new knowledge and views;
- 7) Stakeholders have a clear image of the role they have to play;
- 8) Participants must be willing to negotiate with each other: they must have enough scope to defend their own interests, but are also willing to consider new ideas and solutions;
- 9) Participants should have flexible mandates from their constituencies and the representatives should have authority within their stakeholders' community;
- 10) The process should be transparent (at least within the stakeholders' community) and clearly documented;
- 11) Intermediate and small step results should be emphasised to show the added value of the approach and act as a catalyst for next steps;
- 12) The results are accepted in formal political decision-making processes;
- 13) Process results can be formalised using existing legal instruments;
- 14) Personal and financial means are made available to organize and to participate in the process; stakeholders are willing and capable to organize or host meetings, to put forward discussion topics and time schedules;
- 15) Apart from the politically responsible initiator a dedicated neutral and skilled process manager should be present who organizes the entire process in such a way that participants are kept at the table, remain interested and learning.

The research also showed that Quasta can help to improve the use of knowledge in coastal zone management. However, it is not clear yet if it will do so in the future, as the role of Quasta has yet to be tested in 'real' decision-making processes. Further development and more applications are required to investigate its potential role in these processes. Nevertheless, the results of our

research indicate that the Quasta approach provides some added value in comparison to existing methodologies. Later applications of Quasta in other projects like a stakeholder discussion about climate change adaptation in the Rotterdam port area confirm this (Quasta, 2010).

v. Recommendations

Policy makers who develop future ICZM-projects should be aware of the prerequisites that enhance the successes of their projects and to consider the possibilities of the Quasta-approach. Although Quasta has been developed during this research, it has a much wider application for problem exploration and policy development in multi-stakeholder settings as it can speed up problem analysis.

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