Marine Policy 94 (2018) 150–157

Contents lists available at ScienceDirect

Marine Policy

journal homepage: www.elsevier.com/locate/marpol

Methodologies to support coastal management - A stakeholder preference and planning tool and its application

Johanna Schumacher[a,b,*], Gerald Schernewski[a,b], Malgorzata Bielecka[c], Michael I. Loizides[d], Xenia I. Loizidou[d]

[a] Leibniz-Institute for Baltic Sea Research Warnemünde, Coastal and Marine Management Group, Seestr. 15, 18119 Rostock, Germany
[b] Klaipeda University, Marine Research Institute, Herkus Mantas str. 84, 92294 Klaipeda, Lithuania
[c] Institute of Hydro-Engineering Polish Academy of Sciences, Department of Coastal Engineering and Dynamics, Koscierska 7, 80-328 Gdansk, Poland
[d] ISOTECH Ltd. Environmental Research and Consultancy, Larnaka Ave and 1 Kalliopis str, 2102 Nicosia, Cyprus

ARTICLE INFO

Keywords:
Stakeholder involvement
Decision-support tool
Sustainable development
Awareness rising
Coastal management
System approach framework

ABSTRACT

Stakeholder involvement plays a crucial role within Integrated Coastal Management (ICM) and is considered beneficial for gaining trust and knowledge and reducing conflicts. Nevertheless, disagreement and opposition among stakeholders and lack of manager experiences in participatory approaches have caused delays in ICM processes. A major challenge is to systematically guide target oriented discussions of heterogenic groups in order to reach consensus decisions based on sustainability objectives. Hence, this research aims to provide a stakeholder preference and planning tool that can be used to support participatory processes. For this, the DeCyDe-4-Sustainability methodology was tested and built upon. Seventeen applications with coastal experts, graduate students and stakeholders of ICM initiatives were carried out, which showed how the methodology can be adjusted and used for guiding stakeholder discussions systematically and generating a common understanding, for raising awareness about sustainability and evaluating concrete measures using success criteria. With a sound preparation, adaptation to local needs and combination with an indicator-based evaluation, the methodology can be applied to guide stakeholder involvement processes within ICM. The System Approach Framework (SAF) with its stepwise approach from the issue identification to the implementation of a solution and evaluation of success was found to serve as a suitable frame. Hereby, the modified stakeholder preference and planning tool can guide discussions from generating a general view of an area and problems therein, down to the selection and evaluation of concrete measures to tackle the problem and its effects on a larger level and contribution to a sustainable coastal development.

1. Introduction

Participation of stakeholders and the general public plays a crucial role in environmental decision-making and is a major principle within Maritime Spatial Planning (MSP) and Integrated Coastal Management (ICM). The importance of stakeholder involvement for a sustainable development of coastal and marine areas is widely acknowledged and considered to be beneficial for gaining local knowledge, providing a learning process and avoiding conflicts and establishing trust among stakeholders [1–3]. Thereby, it contributes to a more sustainable coastal development.

Even though many good practice examples of stakeholder involvement within coastal management have been documented [e.g. 4], a study by Støttrup et al. [5], in which established ICM case studies within the Baltic Sea Region were re-analysed, shows that lacking or insufficiently developed stakeholder involvement processes are still a major concern and often lead to one-sectoral solutions. Especially the omission of stakeholder and institutional mappings in the initiation phase, which often led to imbalanced stakeholder groups, was identified as a major cause. For instance, formal participation procedures as required within environmental impact assessments have caused major public outcries and delayed the process from the identification of a problem to the implementation of a solution by many years [6,7].

Once all stakeholders have been successfully identified and included in the engagement process, a remaining challenge is to systematically guide target-oriented discussions of heterogenic groups. Hence, it needs to be ensured that stakeholder groups and discussions are balanced and not dominated by single stakeholders or groups. Skilled facilitators with a deep understanding of ICM would be needed in this respect. However, European ICM practice shows that this task is often carried out by

* Corresponding author at: Leibniz-Institute for Baltic Sea Research Warnemünde, Coastal and Marine Management Group, Seestr. 15, 18119 Rostock, Germany.
E-mail address: johanna.schumacher@io-warnemuende.de (J. Schumacher).

https://doi.org/10.1016/j.marpol.2018.05.017
Received 10 October 2017; Received in revised form 9 May 2018; Accepted 9 May 2018

moderators who lack the thematic background or by people from diverse backgrounds including authority representatives, NGOs and scientists, who are not trained in involvement processes and facilitation. Consequently, to ensure a guided and efficient involvement of stakeholders, supporting tools that can guide stakeholder discussions systematically, are needed.

Decision support tools are popular in this respect and numerous tools which include stakeholder involvement have been developed [cf. 8] and applied to a variety of coastal management issues such as fisheries management [1,9], marine aquaculture [10] and management of marine protected areas [11]. Despite this, their application in ICM and MSP practice is low and often does not go beyond the lifetime of the projects in which they were developed. Identified reasons include limited functionality and ease of use as well as lack of financial resources [5,12]. Thus, user-friendly and freely available tools for stakeholder involvement, which can be applied with little technical skills and are general enough to be applicable in various contexts, are needed.

The DeCyDe-4-Sustainability decision support methodology developed within the project SUSTAIN by Isotech Ltd. provides a good basis to serve this demand. It is freely available and consists of an indicator-based sustainability self-assessment [cf. 13,14] and a facilitated weighting method, which allows stakeholders to determine the relative importance of sustainability pillars and underlying coastal issues and adapt the indicator assessment to local specificities. This allows coastal municipalities to assess their sustainability performance with the aim of improving the management of coastal zones [15,16].

The translation of the European ICZM principles into practice has been a major challenge [17,18]. To overcome this, the System Approach Framework (SAF) provides guidelines that help practitioners and managers to go through the full ICM cycle in a systematic and stepwise approach and shorten the duration from the identification of a problem to the implementation of an adaptive measure [5,6,18]. It integrates environmental, social and economic aspects and has stakeholder involvement as a major component throughout all SAF steps.

Consequently, the aim of this research is to provide a stakeholder preference and planning tool that can be easily applied by practitioners to support the ICM process within SAF. For this, the specific objectives are: (i) to test the DeCyDe-4-Sustainability methodology's potential to systematically guide stakeholder discussions and evaluate its efficiency, transparency and reproducibility, (ii) to evaluate its practical benefits and potential as an awareness raising and training tool, and (iii) to show how it can be broadened to serve as a stakeholder involvement tool to assess stakeholder preferences and evaluate measures within ICM. Finally, it is shown how it can be used in connection with an indicator-based assessment as a supporting tool within different SAF steps.

2. Methodology & study sites

2.1. DeCyDe-4-sustainability method and toolbox

The Interreg IVC project SUSTAIN aimed at promoting sustainable development in coastal areas and creating an easily applicable policy tool for authorities and communities [16]. As such, the DeCyDe-4-Sustainability Method and Toolbox was developed by Isotech Ltd. Cyprus to integrate scientific knowledge with local data and experiences to measure the state of sustainability within a municipality or region. DeCyDe-4-Sustainability was based on the DeCyDe-4 methodology and toolbox - an adaptable, site- and case- specific decision-support method developed by ISOTECH ltd to assist policy- and decision-makers to make informed and justifiable decisions on issues relating to sustainable development [19–21]. DeCyDe-4 is a practical method that can be implemented to give a “number” to a problem or an issue, i.e. to have a measure, to understand the size or the scale of a state/condition, especially in cases where everything is subjective or difficult to quantify. It was created in response to a real need to provide decision-makers with a tool that would minimise bias and arbitrariness in the way decisions are taken by public officials, particularly when it regards issues where they lack knowledge and expertise. It is a spreadsheet oriented method which offers a framework that supports the decision makers and the stakeholders to understand and justify the main issues that are involved in the process of decision and the trade-offs between different decision alternatives. At the same time, it gives them the chance for genuine participation, i.e. to incorporate their views, evaluations and perspectives in the process.

DeCyDe-4-Sustainability assesses sustainability across the four pillars ‘Economics,’ ‘Environmental Quality,’ ‘Social Well-being’ and ‘Governance,’ which are further subdivided into 22 underlying issues. The toolbox consists of an indicator application, which can be used by municipalities to self-assess their state of sustainability [cf. 14] and a facilitated weighting exercise, in which stakeholders can determine the relative importance of the pillars and underlying issues. Thereby, weights are calculated and the indicator system can be adjusted to local specificities. Both parts are provided in a user-friendly spreadsheet format.

The weighting exercise takes place during well structured, facilitated workshops, with the participation of decision-makers and key stakeholders. The weighting is based on the Analytic Hierarchy Process (AHP) for which pairwise comparisons of different parameters are made based on stakeholders’ judgement [22]. As illustrated in Fig. 1, all

	Economics		Environmental Quality		Social Well Being		Governance		weight coef
	score		score		score		score		
Economics	1.00	0.55	3	0.50	7	0.70	3	0.25	**0.50**
Environmental Quality	1/3	0.18	1.00	0.17	1	0.10	1	0.08	**0.13**
Social Well Being	1/7	0.08	1	0.17	1.00	0.10	7	0.58	**0.23**
Governance	1/3	0.18	1	0.17	1	0.10	1.00	0.08	**0.13**
Total	1.81		6.00		10.00		12.00		1.00
Total check	1.00		1.00		1.00		1.00		

Legend for the weighting matrix

Criteria Y		COMPARED TO			Criteria X	IS
less important ←				→ more important		
much	more	slightly	equal	slightly	more	much
1/7	1/5	1/3	1	3	5	7

1. Compare two parameters at a time and and insert a score based on their relative importance (see legend)

2. After all comparisons are made scores entered into all white cells the weight coefficients for all parameters are automatically calculated

Fig. 1. Excerpt of DeCyDe-4-Sustainability scoring matrix for comparisons on the sustainability pillar level.