



Contract no: 044192

IBEFish
Interaction between Environment and Fisheries – a Challenge to Management

Specific Support Action
Sustainable Management of Europe's Natural Resources

Publishable Activity Report

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1. Project execution



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Introduction

IBEFish had two major objectives: 1) to share the results and theoretical understandings gained in past projects with regard to the ecosystem approach in fisheries management, with a special focus on the role of participation in integrated management of the interaction between environment and fisheries; and 2) to make practical recommendations for improving fisheries management towards an ecosystem-based approach especially emphasising the need for an enhanced knowledge-base, legitimacy and trust-building in the management.

The main objectives were achieved with the help of two primary tasks. The first was to synthesise the results of projects on interactions between environment and fisheries by focusing on the roles and challenges of participation in integrated management. The synthesis of case studies used a framework for evaluating participatory decision making. This task was accomplished by a review of projects and producing a special issue in the journal Marine Policy.

The second task was the dissemination. For scientific dissemination the main activities was the special issue, a workshop organized by the project and active participation in scientific conferences already during the project. In addition, the findings are disseminated to decision-makers and stakeholders by a policy brief and via press.

All IBEFish partners contributed to the activities. The partners were:

Partic. No	Participant name	Participant short name	Country
1	Research Programme for Environmental Policy, Finnish Environment Institute	SYKE	Finland
2	Innovative Fisheries Management Research Centre of Aalborg University (formerly: Institute for Fisheries Management and Coastal Community Development)	IFM	Denmark
3	Human Ecology Section, University of Gothenburg	UGOT	Sweden
4	Division of Social Sciences, UFZ Centre for Environmental Research	UFZ	Germany
5	School of Geography, Politics and Sociology, University of Newcastle upon Tyne	UNEW	United Kingdom

In the project's kick-off meeting the project partners discussed and developed a methodological approach to analyse participation in natural resource management. The framework that was used in the project was applied from a previous work by UFZ participants (Wittmer et al. 2006). The criteria of the framework focus on the way in which knowledge on natural systems enters the process, on institutional, legal and political legitimacy; on trust building and social dynamics; and on costs of decision processes.

Information management	<ul style="list-style-type: none"> Elucidating and integrating different types of information Anticipating outcome of management and governance structure Coping with uncertainty and complexity
Legitimacy	<ul style="list-style-type: none"> Legal compatibility Accountability Inclusion/representation Transparency of rules and assumptions to in- and outsiders
Social dynamics	<ul style="list-style-type: none"> Respect/relationship Agency/empowerment Changing behaviour, changing perspectives/learning Facilitating convergence or illustrating diversity Policy uptake
Costs	<ul style="list-style-type: none"> Cost-effectiveness Costs of the method Decision failure costs

A long list of different criteria are needed, because an aggregated measure of "efficiency" or "performance" of participation does not help to better understand participation in integrated fisheries management. One aggregated measure is problematic, because the participatory processes produce more than one outcome. For instance, the actual management decision and a changed relationship between actors are two types of consequences that cannot be aggregated onto a single scale. In addition, due to context-specific features the relevance of the different criteria varies accordingly.

The IBEFish analytical frame is not referring to a single, normative model of ideal process for fisheries decision-making. Furthermore, the grouping of criteria into four themes is not exclusive and therefore it is in itself a bit problematic, but this is not an obstacle to the intended purpose of the frame, i.e. **to orient the analysis of cases according to aspects which have elsewhere been identified as critical to similar processes of participation.** The IBEFish frame highlights different aspects by which participatory processes, mechanisms, arrangements, arenas, etc. may be characterized irrespective of their precise settings. The framework is discussed in more details in Varjopuro *et al.* (2008).

Below the project activities and end results are briefly described. The results are presented more thoroughly in the special issue "Interaction between environment and fisheries – the role of stakeholder participation" prepared for the journal *Marine Policy*. The special issue will be published in 2008, but the articles are already available on-line on the journals website (www.sciencedirect.com/science/journal/0308597X) in the "Articles in press" section.

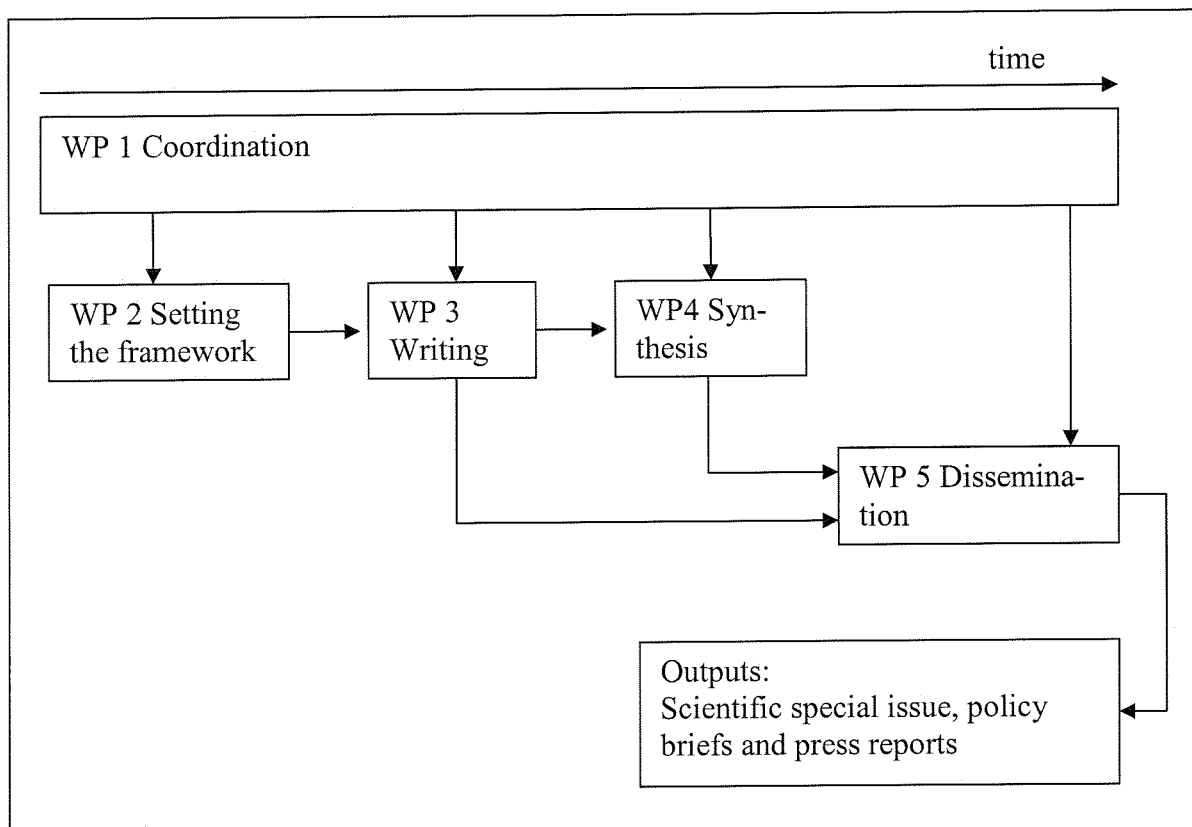


Figure 1. Diagram of the IBEFish project

Review of EU funded projects

The project was based on previous or on-going European research on the interactions between environment and fisheries. In the project we focused on the theme of participation in managing the interactions and that was also the basis for the review. For the review a group of EU funded projects were selected. These were:

EFEP	European fisheries ecosystem plan
EFIMAS	Operational evaluation tools for fisheries management options
KNOWFISH	Knowledge base for fisheries management
INDECO	Developing indicators of environmental performance of the CFP
BIOMEX	Assessment of biomass export from MPAs
EMPAFISH	European MPAs as tools for fisheries management and conservation
COST-IMPACT	Costing the impact of Demersal fishing on marine ecosystem process and biodiversity
DEGREE	Development of fishing gears with reduced effects on the environment
FRAP	Framework for biodiversity action plans
NECESSITY	Nephrops and cetacean species selection information and technology
PROTECT	MPAs as a tool for ecosystem conservation and fisheries management
REDUCE	Reduction of adverse environmental impact of demersal trawls
PKFM	Policy and knowledge in fisheries management
SAFMAMS	Scientific advice for fisheries management and multiple scales
MOFISH	Multiple objectives in the management of EU fisheries
RESPONSIBLE	Sharing responsibilities in fisheries management
COMMIT	Creation of multi-annual management plans for commitment
RESPONSE	Response of benthic communities and sediment to different regimes of fishing disturbance
IMPRESS	Interactions between the marine environment, predators and prey
DISCBIRD	Effects of changes in fishery discard rates on seabird communities
MAFCONS	Managing fisheries to conserve groundfish and benthic invertebrate species diversity
TECTAC	Technical developments and tactical adaptations of important EU fleets

In the first phase the review analysed the role of participation in the projects. The second phase was writing of articles to the special issue. These articles and their synthesis explored more deeply the roles and challenges of participation in an integrated management of interaction between the environment and fisheries.

The review was based on the project documents and/or on interviews of persons who had coordinated the projects or participated in them. Furthermore, the IBEFish partners themselves 'represented' many of the projects on the list and thus we could incorporate the findings and experiences gained.

Participation in research projects

For looking at participation in the reviewed projects three possible roles were outlined:

- Utilization of participation, which means that project had involved stakeholders, managers and/or policy makers in one way or another
- Analysis of participation, which means that the project had studied the topic of participation relationship of
- Experimentation with participation, which means that the project had involved stakeholders, managers and/or policy makers in the project to test and develop methods of participation

A vast majority of the projects have utilized participation. A common way of involving the stakeholders is in different sorts of advisory boards. Even more common is to organize stakeholder conferences where preliminary or final results are presented. In some of the reviewed projects (DEGREE, NECESSITY, REDUCE) that dealt with technical solutions to mitigate ecosystem effects of fisheries, the fishermen's participation in the project was necessary, both in order to use vessels for testing as well as to ensure the product's feasibility for the industry.

In sum, the knowledge production practices in Europe are opening up to wider participation. However, a lot of progress needs to be done. One issue is the range of participation. Often the participation is partial. Some projects had found difficulties in getting either the environmentalists or fishermen involved and some interviewed coordinators indicated that it is simply impossible to get the both represented in the same projects.

Another problem that the projects have faced has been the knowledge differences and different ways of communicating. Fishermen and scientists, for instance, use very different language and knowledge base. The problem may be in the communication and that can be eased by continued interactions that allow mutual learning. It was also mentioned in the interviews that sometimes fishermen do not want to disclose the information they have of the fishing ground because knowledge is a competitive strength. It is thus important to guarantee some degree of confidentiality as well as to clearly explain how the information will be used.

A more difficult problem to solve is the different ways of understanding of the ecosystems. This problem is also related to scale differences: typically the science's perspective is wider than the resource users'. The scale issue is important for information management in the natural resource management. How to effectively take local scale rich information to higher levels without losing its relevance?

The research projects that aimed to develop measures to mitigate fisheries' impacts on marine environment have witnessed the difficulties in combining the competitive objectives of environmental protection and the industry. The industry is facing severe economic problems and for it the question is 'survival of fisheries' as phrased in one interview. At the same time even more restrictions should be put on the industry to meet the environmental objectives that many of these projects explicitly endorsed. This discrepancy in the societal objectives has important repercussions of the ecosystem approach to fisheries that tries to find a balanced approach. The question boils down to ensuring short-time objective of the survival of fisheries and the long-term objective of environmental protection.

The topic of environmental vs. fisheries interests is also related to dissemination of research findings. In the interviews it was mentioned that fishermen are sometimes reluctant to take part in research projects, because of their earlier bad experiences. A too common experience of fishermen is that the scientists welcome the data that fishermen can provide to the projects, but what is done with the data is unclear. Then, after a considerable time, the scientist may come with results that propose

more restrictions on fisheries without really explaining understandably to fishers how the data was used and how the conclusions were drawn. In other words, scientific practices become a black box that often operates – from the industry's perspective – against the industry. More transparency of the projects and focus on dissemination are needed to avoid science becoming a black-box.

An important question posed was also that is it really worth participating in the research projects? The present trend is to get stakeholders involved in research projects to make the science more policy-relevant. However, this is not unproblematic, since the research projects are not policy processes although they some times appear as 'quasi policy processes' according to one of the interviewees. At the same time the stakeholders may be involved in real policy processes and are reluctant to reveal their information or their arguments in the participation forums of research projects. This may be the reason why some of the reviewed projects were disappointed with the contribution of stakeholders.

Furthermore the phenomenon of 'participation fatigue' was mentioned in a few interviews. Today as the participation and consultations have become a normal procedure, creating a situation, in which organisations and policy-makers are invited to increasingly numerous processes. The representatives have to prioritise between different events to choose the processes that will provide avenues for agency. And if their earlier experiences of research projects are not very good, they may choose not to participate in research projects. Therefore, research projects should provide attractive, but still realistic options for the stakeholders. An important way to increase the attractiveness of research projects is to involve the key stakeholders already in the planning phase. By involving the stakeholders, research projects can better incorporate or at least become aware of the research questions relevant for the stakeholders. Involvement of stakeholders can be actual participation in planning, but a proper stakeholder analysis can also help to get the information needed. Even though research projects may very seriously aim to find policy-relevant results, in their approach to stakeholders the projects should be realistic and direct: the stakeholders are invited to projects to improve the policy-relevance of the projects, not to influence directly the policies.

Linkages between stakeholder participation and ecosystem approach in research projects

The paper by Tim Gray and Jenny Hatchard (Gray and Hatchard 2008) written for the special issue in Marine Policy reviewed the projects by focusing on the relationship between stakeholder participation (SP) and the ecosystem approach to fisheries management (EBAFM). In theory the relationship may have five theoretical interpretations. These are: 1) that they are logically linked; 2) they are ethically linked; 3) they are instrumentally linked; 4) they are complementarily linked; and 5) they are antagonistically linked.

- SP and EBAFM are *logically linked* when the ecosystem-based approach to fisheries management requires stakeholder participation; and stakeholder participation in fisheries governance requires an ecosystem approach.
- SP and EBAFM are *ethically linked* when the moral value judgments that are incorporated within EBAFM ought to be made by a broad array of stakeholders.
- When it is seen that SP enhances EBAFM, and EBAFM enhances SP, SP and EBAFM are *instrumentally linked*.
- SP and EBAFM have a *complementary relationship* when they are seen as separate principles that independently work to improve fisheries governance. In other words, they pull in the same direction, but they are not interdependent.
- The fifth interpretation is negative, that SP and EBAFM are *antagonistically related* – i.e. they are in conflict with each other.

The table below illustrates the findings presented thoroughly in the paper. The table shows that the interconnections between the logical, ethical, instrumental and complementary interpretations as exemplified in the seventeen projects where SP was linked with EBAFM. In twelve projects, only one type of the linkages was observed – ten of which displayed an instrumental link and two a complementary connection; in four projects, two types of linkage appeared, which were ethical-instrumental and instrumental-complementary; and, in only one project (EFEP), three types of link-

age occurred – logical-ethical-instrumental. This relatively small number of multi-link usages ties in with the findings of the literature review, where we found only a few attempts to yoke together more than one linkage. It also turned out that the antagonistic relationship between SP and EBAFM could not be detected. In five of the projects the links could not be recognised.

PROJECT	LOGICAL	ETHICAL	INSTRUMENTAL	COMPLEMENTARY
EFEP				
EFIMAS				
INDECO				
KNOWFISH				
BIOMEX				
SAFMAMS				
EMPAFISH				
COST-IMPACT				
PROTECT				
FRAP				
DEGREE				
NECESSITY				
REDUCE				
PKFM				
MOFISH				
RESPONSIBLE				
COMMIT				
RESPONSE	N/A			
IMPRESS	N/A			
DISCBIRD	N/A			
MAFCONS	N/A			
TECTAC	N/A			

Writing of articles

All partners took part in writing one or more papers to the special issue. In addition, persons not working in the project contributed to three papers of the special issue (papers 3, 8 and 9 in the table of papers below). The draft papers (Deliverable 2) were ready in early June 2007 and the final papers (D6) were submitted to Marine Policy in August 2007. The table below summarises the findings of the papers in relation to ecosystem-based approach to fisheries management (EBAFM).

Authors	Titles	Message for EBAFM
Riku Varjopuro, Tim S. Gray, Jenny Hatchard, Felix Rauschmayer and Heidi Wittmer	Introduction: Interaction between environment and fisheries – the role of stakeholder participation	<ul style="list-style-type: none"> ▪ Introduction to Ecosystem approach to fisheries management (EBAFM) ▪ Introduction to the theme "participation" ▪ Introduction to the IBEFish analytical framework
Tim S Gray and Jenny Hatchard	A complicated relationship. Stakeholder participation and the ecosystem-based approach to fisheries management	<ul style="list-style-type: none"> ▪ The relationship between stakeholder participation and EBAFM is most commonly instrumental in character: ecosystem-based management benefits from stakeholder participation in terms of knowledge; practical roles played by stakeholders; and added legitimacy
Knut H. Mikalsen and Svein Jentoft	Participatory practices in fisheries across Europe: making stakeholders more responsible	<ul style="list-style-type: none"> ▪ Institutions tend to change slowly while policies and instruments shift easier with the problem of the day. ▪ Institutional set-up in each country has its idiosyncratic evolution/history ▪ A generic blueprint for Europe for arranging participation is not possible – participation need to be built according to the institutional set-up (that will be changed with new practices of participation) slow process
Felix Rauschmayer, Heidi Wittmer, Augustin Berghöfer	Institutional challenges for resolving conflicts between fisheries and endangered species conservation	<ul style="list-style-type: none"> ▪ Shows also that the institutional set-up on the European level has been slow to react to a shift of policy needs ▪ Efforts to implement the Ecosystem Approach can draw valuable lessons from experiences of environmental conflict resolution. Two challenges to implement EBAFM: 1) need of a comprehensive mandate; and 2) How can the momentum for sustained processes of collaboration be maintained?
Ditte Degenbol and Doug Wilson	Spatial Planning on the North Sea: A Case of Cross-Scale Linkages	<ul style="list-style-type: none"> ▪ The present interest for marine spatial planning (MPAs and zoning of activities) means that the fisheries need to find their place on the map and defend it although the process of mapping is contradictory to spatial flexibility of fishing operations and unwillingness to reveal strategically valuable information that fishers hold. ▪ Cross-scale linkages are required in marine management and seem to be able to develop on their own when stakeholders are given ability and authority to negotiate with one another. Governmental roles at all levels seem to be one of facilitation. When institutions and resources are in place to allow all the concerned parties a voice they are able to structure the discussion to respond to needs at the appropriate scale levels.
Karl Bruckmeier and Christina Høj Larsen	Swedish coastal fisheries – from conflict mitigation to participatory management	<ul style="list-style-type: none"> ▪ Improvement of conflict and resource management in a shift towards EBAFM requires procedural and temporal perspectives that are absent from conflict mitigation or fisheries management in general. There is a need for long processes of developing new institutions for resource management under the conditions of highly complex systems where management develops through cooperation, learning, and experimentation.

<p>Riku Varjopuro</p>	<p>Addressing multiple goals of ecosystem approach through deliberation and technology development</p>	<ul style="list-style-type: none"> ▪ Stakeholder processes with focus on regional consensus and higher level policy-advocacy can create forums for joint regional activities, while technology development projects directly address the fishing practices. Important is to find processes that can approach both the policy aspects and fishing practices. In implementation of concrete, geographically limited EBAFM processes technology-focused deliberative processes can provide possibilities for integrating policy aspects and fishing practices.
<p>Katia Frangoudes, Begoña Marugán-Pintos, José J. Pascual-Fernandez</p>	<p>From open access to co-governance and conservation: the case of women shellfish collectors in Galicia (Spain)</p>	<ul style="list-style-type: none"> ▪ Shows that existing institutional set-up provides conditions and opportunities for participation of new groups in fisheries decision making. At the same time the paper manifest that it is possible to change the set-up – although the process is slow and requires conscious attention and support from the officials. ▪ Capacity building is necessary ▪ Collaboration of local fishers and scientists to improve information management and to gain legitimacy
<p>Gudrun Pollack, Augustin Berghöfer and Uta Berghöfer</p>	<p>Fishing for social realities – challenges to sustainable fisheries management in the Cape Horn Biosphere Reserve</p>	<ul style="list-style-type: none"> ▪ External management models such as marine tenure, which grants local fishers’ organizations the right to exclusively use an area of the sea floor under the premise that extraction is carried out according to a site-specific management plan. are not suited to make Cape Horn fisheries sustainable. Instead, efforts should be dedicated to a process of continued stakeholder collaboration for the development of site-specific management structures. ▪ Shows that local actors can be trapped by a problematic resource depletion situation and would need support by authorities. The paper discusses the difficulties raised by lack of official will/capacity/resources for sustainable resource management. ▪ Concludes that the biosphere reserve approach is a platform for integrating resource use and conservation needs.
<p>Augustin Berghöfer, Heidi Wittmer and Felix Rauschmayer</p>	<p>Stakeholder Participation in Ecosystem-Based Approaches to Fisheries Management: A Synthesis from European Research Projects</p>	<ul style="list-style-type: none"> ▪ Synthesised the papers. Results are presented below

Dissemination of results

Dissemination activities started quite early in the project. The first event took place in May 2007 in Copenhagen where several IBEFish partners (IFM, UNEW, UFZ and SYKE) attended the ICES's Working Group for Fisheries Systems (WGFS). The meeting focused on two themes: A) The widening of the remit of policy in this sphere to marine, rather than fisheries, policy; and B) the increased access of stakeholders to the policy process. Both themes were highly relevant for the IBEFish project and the partners' contribution to the meeting was valuable. The report is available online (<http://www.ices.dk/reports/RMC/2007/WGFS/wgfs07.pdf>).

The IBEFish project organized a workshop that was hosted by UFZ in Leipzig, May 31st to June 1st, 2007. The workshop was based on presentation of the draft papers prepared in WP3. There were altogether 15 participants to the workshop that was very successful in guiding the discussions towards policy-relevant messages from the work done in the IBEFish. The workshop contributed to finalizing of the papers and to the policy brief. In addition to the IBEFish workshop, 12 presentations were given in 7 scientific conferences by IBEFish partners.

More policy-oriented and general dissemination was based on three elements: a website, a policy brief and press releases. The IBEFish website was launched in the summer of 2007 by SYKE. A 16 page policy brief containing the main findings and policy-relevant recommendations was prepared and distributed to relevant actors in Europe and even outside Europe. All contractors contributed to the policy brief, although UFZ was the leading partner for it. Press releases were also prepared and launched.

The IBEFish's results: a summary

The project's larger frame of reference is the on-going discussion on the management of the interactions between the environment and fisheries. There is a renown need for finding a balance in the interactions between environment and fisheries. Ecosystem effects of fishing can be severely damaging, and several direct and indirect effects have been detected (Gislason et al. 2000 and European Commission 2001¹). Interaction occurs also in the other direction when environmental changes affect fish stocks or when protected species (such as cormorants or seals) cause economic losses to fisheries. In recent years, the need to incorporate environmental requirements into fisheries management - the ecosystem approach in managing living aquatic resources - has been endorsed in many international agreements (e.g. FAO Codes of Conduct for responsible fisheries, UN Law of the Sea as well as the Convention of Biological Diversity). The European Union has taken an active role in promoting this approach.

Sinclair et al. (2001) note that traditional fisheries management regimes cannot handle the new tasks and the ecosystem-based management requires new governance approaches. Implementing an ecosystem-approach to fisheries management is a difficult task. It has to handle more complex problems than traditional fisheries management and has to be based on a multi-disciplinary approach. (Richardson 2000; Sinclair et al. 2001). Finding a sustainable balance in the interaction between environment and fisheries is a complex management and policy problem that requires enlargement of the established fisheries management regime. An extension of the management regime is necessary for two purposes. First, finding solutions to such a complex management challenge requires inclusion of many types of expertise. In other words, the knowledge base must be enlarged. Second, when management deals with two large policy areas, namely fisheries and environmental protection (including nature conservation), a need to include a number of relevant stakeholders increases. Therefore, the key to achieving a balanced management lies in a more inclusive and integrated form of research and management.

IBEFish took the two needs of an enlarged fisheries management regime as a starting point and explored their theoretical and practical implications **with a special focus on the role of participation in integrated management of the interaction between environment and fisheries**. Furthermore,

¹ COM(2001)143 final: "Elements of a Strategy for the Integration of Environmental Protection Requirements into the Common Fisheries Policy"

IBEFish addressed the difficulties facing participation in a management of multi-scale problems (Rauschmayer and Behrens 2006).

There is a growing literature on evaluating of public participation in environmental decision-making. Evaluation of participatory and analytical processes can be based on several criteria (Renn et al. 1995; Moore 1996; Webler et al. 2001). IBEFish adapted a set of criteria developed for process-oriented evaluation of combined participatory and analytical approaches (Wittmer et al. 2006) which focuses on institutional, legal and ethical legitimacy; trust building and social dynamics (Schusler et al. 2003); costs of decision process; and the way in which knowledge on natural systems enters the process (Pullin et al. 2004).

The conclusions of the synthesis paper of the special issue (Berghöfer et al. 2008) can be used here to illustrate the IBEFish findings. The paper concludes that institutional innovation is required for implementing ecosystem-based approach to fisheries management (EBAFM), and that such innovation can best be achieved by engaging in a delicate process of societal decision-making. By means of the IBEFish analytical frame (see above) we examined findings from recent European research on participation in fisheries management at different jurisdictional levels, six important lessons can be drawn regarding the institutional innovation towards EBAFM:

- (1) With regard to information management: EBAFM has very high demands on information. Current approaches to the knowledge base are inadequate from the perspectives of both accuracy and facilitating effective political decision making. This seems particularly valid for how uncertainty is being addressed. Furthermore, the integration of different knowledges requires their transformation into new knowledge formats. This takes time and puts special emphasis on the attention dedicated to the framing and reframing of an issue. The framing has impacts on what kind of knowledge is considered, which options are conceivable, and which stakeholders are included. To transcend dichotomised framings of the type eco-centrism vs. anthropocentrism, prolonged deliberations among stakeholders seem necessary.
- (2) With regard to legitimacy: In most cases EBAFM does not yet have the legal backing required for the continued, close collaboration of a wide range of (non-)governmental actors. EBAFM requires joint deliberation, planning and decision-making. The governmental coordination of mere stakeholder consultations does not suffice to bring EBAFM about. If participation within fisheries management is to mean more than a form of secondary legitimation to government and its policies, then the devolution of governing powers to participatory arenas is necessary. This comes along with increased needs for matching policies in a decentralised system. Trends to enlarge and systematize consultative mechanisms at high jurisdictions do not suffice.
- (3) With regard to social dynamics: Participation in fisheries management and policies often takes place in ill-defined arenas. It is often unclear, to participants and to outsiders, whether policy uptake of the decision advice can be expected. The limited scope for agency of non-governmental participants jeopardizes meaningful collaboration of user groups and (sub-)national NGOs. This is opposed to the very idea of EBAFM. Another significant issue is trust: trust here refers to the need to collectively gain confidence in the process, to progressively build social capital and not simply to sympathize with other individuals or organisations. An important pre-requisite is the liberty of representatives to engage in meaningful debate beyond bargaining predetermined positions.
- (4) With regard to costs: Specification of costs is difficult, as EBAFM comprises concerns for, and coordination among, different uses of the sea, e.g. conservation. Costs of current management regimes are considerable, in theory EBAFM holds the potential to reduce these costs as it combines management regimes of different marine uses. A stronger focus is also required on the just distribution of incurred costs among stakeholders.

We identify two more issues transcending the four categories of the IBEFish frame:

(5) Questions of scale: The spatial dimension is a recurrent challenge to participatory fisheries management (Wilson 2005). Addressing EBAFM on a rather high jurisdictional level, such as the North Sea RAC, allows addressing the North Sea as a macro-system, but this is of limited value for at least two reasons: the appropriate uptake of local issues, and the handling of the diversity and complexity of the social and ecological systems involved. Spatial planning, i.e. delimiting spaces for specific uses, can help structure the issues, but it is limited by spill-over effects and the mobility of fish stocks. A nested hierarchy of jurisdictions as proposed by Symes and Pope (2000) needs to be flexible so that countries can determine appropriate governance structures and levels according to the issue at stake and their own institutional configuration and political traditions.

(6) Cross-sector integration: In EBAFM, fisheries management cannot be addressed in isolation any more. EBAFM has to function practically as cross-sector resource management in which it is matched with other resource uses, similar to ICZM. Here lies the challenge for management concepts, where “adaptive management” suggests itself as the most appropriate form of ‘muddling-through’ in the face of complexity and change.

The last two issues illustrate that European fisheries act in a multi-level system, in a combination of cross-sector and multi-level governance. It is no surprise, therefore, that both authorities competent to regulate, and actors having a stake in these issues, are situated in different sectors and on different levels. This implies that information flows, legitimacy, social dynamics and costs are also spread across sectors and jurisdictions.

The way forward should be marked by attempts to further build up experience in stakeholder participation at, and across, all jurisdictional levels. It is in this practical work and in the empirical research on fisheries governance that know-how will mature and institutional innovation will materialize.

Dissemination and use

Dissemination activities that included the special issue in Marine Policy, scientific presentations in conferences, press releases and the policy brief that summarises the project's policy-relevant messages are described above. The policy brief also is the main output to enhance the use of the project's results.

The project's website includes information on and material from the project and helps to disseminate the results also after the project's end. In 2008 Marine Policy will publish the special issue "Interaction between environment and fisheries – the role of stakeholder participation".

IBEFish website: www.environment.fi/syke/ibefish

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