



Project no: 013639

Project acronym: SAFMAMS

Project Title: Scientific Advice for Fisheries Management at Multiple Scales

Instrument: Specific Support Action

Thematic Priority: Science and Society

Final activity report

Period covered: 15 April 2005 - 14 April 2008

Date of preparation: 15 May 2008

Start date of project: 15 April 2005

Duration: 36 months

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Innovative Fisheries management
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The SAFMAMS project has over the period from April 2005 to April 2008 drawn on insights from existing research projects and management processes on the most useful forms of scientific advice for marine environmental management with the aim to communicate those insights to scientists and decision-makers. The outputs of the project constitute an outline of the various forms that such advice can take and a description of the circumstances under which these various forms are the most useful and cost effective. The project has thereby made an important contribution to developing practical mechanisms to improve the ways that scientific advice is communicated to decision-makers and to strengthening the use of science to support policy in the European Union.

Objectives and Strategy

SAFMAMS involved three basic tasks. First, we collated information relevant to the forms that scientific advice can and should take from research projects focussed on fisheries management. Second, we interacted with nine sets of stakeholders involved in fisheries management decision-making at various scales to help us sharpen the practical lessons from what we gathered from the research results. Third, we reported on the stakeholder interaction efforts for use in fisheries as well as carried these lessons from fisheries to the broader marine management community, including various levels of government, user groups and marine conservation NGOs, through networking and dissemination activities. This part of the project has helped address the disconnection that currently exists between fisheries and broader issues in marine environmental policies.

By “forms of advice” we mean kinds of information, not the content. Scientific advice can be short term or long term. It can be focussed either on natural systems or on human impacts. Advice to managers can take many forms and meeting our objective required us to define and classify these forms. It is hardly sufficient, however, to suggest that scientists simply use the ‘best form’ to communicate clearly their findings. In policy contexts, the forms of advice must be legally clear, treat user groups consistently, and otherwise meet political and legal as well as scientific goals.

The Common Fisheries Policy (CFP) is perhaps the most science-dependent common policy framework in the European Union. Its objective is the sustainable exploitation and equitable distribution of a natural resource which is constantly changing in complex ways in response to human influence as well as natural factors. This means that Commission’s fisheries managers (DG Fisheries and Maritime Affairs) are in perpetual need of accurate assessments of the state of the fish stocks. The system that produces this advice is a complex one. At its centre is the International Council for the Exploration of the Sea (ICES), an intergovernmental research organisation that coordinates research activities in the fisheries laboratories of the ICES Member States. ICES brings together the work of these national laboratories and, through over 100 expert groups mainly staffed by scientists from the national laboratories, prepares official scientific advice for the Commission. The forms that this advice takes are currently undergoing reform and this activity is considered a very high priority by DG Fisheries and Maritime Affairs.

Both stakeholder involvement and excellent science are critical to fisheries. Fisheries management in Europe (as well as the rest of the World) has not been successful. European fisheries management has, following the Commission’s Green Paper on the Future of the Common Fisheries Policy, not facilitated sustainable exploitation of fisheries resources and will need to be changed if it is to do so. The Green Paper further argues that stakeholders do not feel sufficiently involved in some important aspects of the policy such as, for example, the elaboration of scientific advice and the adoption of technical measures. A critical part of the Commission’s response to this situation has been to create Regional Advisory Councils (RAC) that facilitate stakeholder involvement in management at a sub-European level where two or more member states share a particular body of water.

SAFMAMS followed two basic strategies. The first strategy assumed that the geographical scale of the environmental management problem is the most critical variable that will determine the best forms of advice. There are several scientific, political and institutional reasons for this. The two most important reasons are perhaps a) that the larger the scale the higher is natural variability within this scale and therefore scientists must rely on aggregated means and variances to create a representative picture of the condition of the natural systems, and b) the larger the scale the more social interests and political jurisdictions that are involved in the management decision-making. We worked with seven groups of managers and stakeholders operating on different scales: a) one group was people involved in the production of scientific advice for the European Commission by ICES, as well as the managers utilising this advice in DG Fisheries and Maritime Affairs; b) three groups were people involved in three different RACs; and c) three groups were people involved with three sub-national, coastal fisheries management programmes.

The second strategy assumed that this work focussed on fisheries management could both offer and gain insights from the broader marine management community. This assumption is a reasonable one because fisheries and aquaculture are the single largest class of anthropomorphic impacts on the marine environment. Currently there is a divorce between advice provided for fisheries management and advice provided in relation to protection of the environment. A greater degree of cross-sector coordination is necessary. Our strategy involved the formation of a cross-scale network of European groups and institutions that are central to the management of Northern European fisheries and the broader marine environment. This included regional governments as well as marine conservation NGOs, both those involved in fisheries and other forms of marine environmental management. The purpose of this network was to: evaluate the applicability of the work on forms of advice that we had done in fisheries to broader questions of marine management; to identify where further research could improve the communication and effective use of sound scientific advice; and to disseminate the work in practical forms.

Project Outputs

As described above, SAFMAMS involved three basic tasks: collating information, interacting with stakeholders, and carrying lessons from fisheries to the broader marine management community. The main output of the first task was review reports, the main outputs of the second task were a number of workshops, and the main outputs of the final task were a database, a larger workshop, a book, best practice reports and policy briefs.



Tjärnö, Koster-Värderöfjord area, Sweden: Location of workshop on Local Fisheries and Marine Environmental Management

TASK 1

To complete the task 1 three review reports were prepared:

For the report on the *Role of Science in Cooperative Fisheries Management* some 188 research projects were analysed to understand their implications for local marine management; and relevant literature on the subject was studied. Various stakeholders in the three sub-national study-areas were interviewed to understand the use of scientific advice in local marine co-management. The interviews gave valuable insights to what types of advice are needed at a local level, and what kinds of problems are

encountered in local co-management. The review report reflects types of scientific advice produced within research projects, as well as local experiences and needs.

The second review report, *Science and Stakeholder Involvement in the Production of Management Advice*, focussed on stakeholder involvement in the preparation of scientific advice with special emphasis on the shared seas level and the RACs. The report points to the difficulties which arise when scientific advice on public management issues is provided by organisations which are embedded too deeply within the management structure. The new RACs have been established under the CFP to provide sound, evidence-based advice on the management of fisheries. Integrating the views of scientists and stakeholders is critical to their functioning but initial experience has been that the main source of expert advice within the CFP continues to come from organisations which do not yet include stakeholders as participants.

The third review report related to the international level, *Scientific Advice and International Management Regimes*. The report contains a review of research about the use of science in support of policy in international contexts. Its purpose is to review the use of scientific advice by international environmental management regimes in hopes of identifying lessons that will be of use to the European Union as it seeks to manage European fisheries under the CFP. More than 100 journal article, monographs and reports were reviewed, many of which reported on empirical research on what determines the effective uptake of science into policy. The main focus of this work was the variables of credibility, legitimacy and salience.

The reviews have contributed significantly to the understanding of how scientific advice operates at different scales and they enabled the SAFMAMS team to go well-informed into the process of arranging workshops on forms of scientific advice.

TASK 2

To complete task 2, nine workshops were held, and one publicly available report produced. Four workshops were held at the sub-national level, three were held at the shared seas level, and two were held at the EU level.

The first workshop at the sub-national level, *Koster-Väderöfjord* in Sweden, took place on 23 March 2007. It involved 10 participants from a range of fields and responsibilities. On 27 March 2007, the next sub-national workshop regarding *Pärnu Bay* fisheries was held in Pärnu, Estonia. The workshop was attended by over 20 stakeholders from the following fields: fishermen, fishing industry, fisheries administration (incl. inspection), scientific community, nature conservation interests and local authorities. The third and final sub-national workshop was held in the *Wash*, UK on 15 May 2007. This was attended by 10 people.

At the three local workshops, the use of science in local fisheries management was discussed. The workshops also touched upon issues such as conflicts arising between nature conservation and user interests, and how to fulfil both needs. All three workshops reported that there often exist misunderstanding and scepticism between scientists and fishermen, often as a result of lack of communication or different use of language. At the Pärnu Bay workshop, as an example, it was stated that scientific communication and outreach to the wider public needs to improve, that mutual misunderstandings and poor communication are often caused by differences in the language used by various stakeholder groups, and essentially, in the development of the resource management system, an integrated approach involving all relevant scientific disciplines (i.e., natural, economic and social sciences) is essentially needed meaning in the current situation that involvement of socio-economic sciences and use more socio-economic data is vital for taking proper fish stock management decisions. At all three local workshops a wish to exchange experiences with other local co-management areas was expressed.

Therefore, a workshop on *Local Fisheries and Marine Environmental Management* was arranged in Sweden. The aim of the workshop was to enable stakeholders from the three SAFMAMS local level case-study areas to meet and discuss their experiences, covering aspects such as co-management of resources, data collection, management structures, as well as the set up of

environmental protection. The workshop included presentations and discussions, as well as opportunities to visit vessels, a fish auction and research facilities. This two-day workshop, which had approximately 25 participants and took place on the 4th to 5th March 2008, fed into several reports and has helped create contacts between stakeholders across the three affected areas.

At the shared sea level workshops were arranged with the three RACs to gain insights for the report on *Best Practices for Provision of Scientific Advice at the Shared Seas Level* (see under task 3). The first workshop was held with the *Pelagic RAC* on 6 February 2007. Almost 40 members of the RAC participated in this workshop. The second RAC workshop, with a more targeted list of participants, was held with a sub-group under the *North Sea RAC* on 20 March 2007. Ten RAC members participated in this meeting. In May 2007 the last workshop with a RAC was held in Poland with the *Baltic RAC*. This workshop was attended by over 20 people.

Two workshops were set-up at the EU level. One workshop focussed mainly on the relationship between ICES and the EU. The other workshop focussed more on the role of the fishing industry *vis-à-vis* research and management. As for the first, an *EU level workshop* was held at DG Fisheries and Maritime Affairs in Brussels on 20 March 2007. This workshop was attended by approximately 15 participants external to SAFMAMS, incl. industry stakeholders, scientists and decision-makers and managers. The other workshop was entitled *ICES Reversing the Burden of Proof Workshop*. At this workshop approximately 15 high-ranking and experienced invited researchers, policy-makers and stakeholders met over two days in March 2008 at ICES in Copenhagen to discuss the possibility of reversing the burden of proof in fisheries management: in other words giving the industry a larger say in management in exchange for taking a larger responsibility in documenting the sustainability of the fisheries. This workshop resulted in the production of a report: *Reversing the Burden of Proof for Fisheries Management - Managing commercial fisheries within sustainable limits*. The report discusses what 'reversing the burden of proof' actually means, how 'reversing the burden of proof' could be implemented, and what the possible implications of this implementation could be. The report is to be considered as a contribution to further discussions about possible ways to improve the fisheries management.

The workshops carried out under task 2 spread awareness about the project as well as provided invaluable input to the reports and policy briefs to be produced under task 3. Importantly, it was also possible to design the workshop agendas in a way so that they have supported ongoing activities and priorities among the workshop participants. As an example the workshop with the Pelagic RAC was designed so that besides delivering the data needed for the SAFMAMS project it facilitated the ongoing work towards a long-term management plan for horse mackerel, something that was appreciated by the Pelagic RAC.

TASK 3

Task 3 involved the production of one book, creation of an online database, writing two policy briefs and four best practice reports, and arranging one large workshop.

The main event under task 3 was the two-day *Marine Environmental Management Workshop* held in Gothenburg 10 to 11 December 2007. The workshop was attended by approximately 30 people, incl. researchers, stakeholders and policy-makers. The workshop featured a number of presentations and group work sessions all with the aim of 1) presenting the results of the studies at local, regional and EU levels, 2) discussing the most useful forms of scientific advice for wider marine environmental management and what lessons may be learned from scientific advice for fisheries management, and 3) receiving suggestions from participants on useful forms of advice for wider marine environmental management and research priorities.

A lasting contribution of SAFMAMS is the online database with information on groups involved with fisheries and marine environmental management in the North Sea and the Baltic Sea: *Catalogue of Marine Environmental Management Efforts in Northern Europe* (available at

www.fishsec.org/organisations.asp). The database includes government agencies from municipal to national level, intergovernmental organizations, environmental NGOs, and user groups. The online database is a useful tool for anyone wishing to identify entities involved with fisheries and marine environmental management in the North Sea and the Baltic Sea.

The single largest written output of SAFMAMS, *The Paradoxes of Transparency: Scientific Institutions and the Ecosystem Approach to Fisheries Management in Europe*, is a book directed towards scientists and scholars. The book contains an in-depth analysis of the problem of forms of scientific advice for marine environmental policy and management and the circumstances that determine what the most effective forms for such advice should be. The main focus of the book is how fisheries scientists in Europe are responding to demands for knowledge to support more holistic approaches to fisheries management.

The report on *Best Practice for Provision of Scientific Advice to Sub-National Fisheries Management* is based on information from the *Review of the role of science in cooperative fisheries management*, the initial interviews in the local case-study areas, and the proposals from the three sub-national workshops (the Wash in the United Kingdom, Pärnu Bay in Estonia and Koster-Väderöfjorden in Sweden) on the most useful forms of scientific advice for the different local management situations. The report on *Best Practices for Provision of Scientific Advice at the Shared Seas Level* has been finalised based on the *Review of Science and Stakeholder Involvement in the Production of Management Advice* and the three workshops held with the RACs. Specifically, the lessons from studying the process towards a long-term management plan for Western Horse Mackerel within the Pelagic RAC have been gathered in its own report: *Participatory Modelling: Developing a Long-Term Management Plan for Western Horse Mackerel within the Pelagic RAC*. Finally, the report on *Best Practices for Provision of Scientific Advice at the European Community Level* reviews the use of scientific advice by international environmental management regimes and identifies lessons that will be of use to the Common Fisheries Policy.

The *Policy Brief on Forms of Fisheries Management Advice* reports mainly on lessons from the EU and RAC level workshops, the ICES Reversing the Burden of Proof Workshop and the discussion of science from the report on *Scientific Advice and International Management Regimes*. The *Policy Brief on forms of Practical Scientific Advice for Marine Environmental Management* reports from the Marine Environmental Management Workshop, the local level case-study workshops and the workshop on Local Fisheries and Marine Environmental Management. It includes information about research priorities that have emerged from the workshops. The policy briefs are short, easily accessible documents aimed at giving stakeholders and policy-makers relevant practical advice.

During its lifetime SAFMAMS has made an important contribution to developing practical mechanisms to improve the ways that scientific advice is communicated to decision-makers and to strengthening the use of science to support policy in the European Union. At the shared seas level, the North Sea RAC produced a paper suggesting that ICES should work more closely with the RACs to improve fish stock assessments; it was increasingly apparent that there were flaws in the assessments which could only be corrected by closer collaboration between scientists and fishers. A small scientific sub-group, funded through the SAFMAMS project, subsequently met to consider this issue and recommended joint data workshops with ICES to improve data quality. In parallel, as a result of pressures from DG Fisheries and Maritime Affairs and from the newly-established RACs as well as the scientific community, ICES embarked upon a major reform of its advisory structure. The reform has led to a new structure which has taken account of some of the suggestions emerging from the SAFMAMS project; most notably the introduction of data compilation workshops involving stakeholders as suggested in the SAFMAMS review of *Science and Stakeholder Involvement in the Production of Management Advice*.

Future Impact

The project website, www.ifm.dk/safmams, has continuously been updated to inform interested parties of the progress of the work and will continue to be accessible after the project has ended. The website is not a large, 'glossy' website; it is in fact rather simple. What makes the SAFMAMS website stand out from many comparable project websites is the transparency that it offers in relation to the SAFMAMS project. Naturally, it is possible to access basic information about the project as well as all deliverables. However, it is also possible to download agendas and information material from all the workshops as well as interview guides and other material. This gives the interested observer rich opportunities to gain insight in the work undertaken within SAFMAMS.

A number of other outputs and impacts, including dissemination activities, will continue to emerge from SAFMAMS. The list here represents a selection of those:

- a) The report on lessons from studying the process towards a long-term management plan for Western Horse Mackerel within the Pelagic RAC, *Participatory Modelling: Developing a Long-Term Management Plan for Western Horse Mackerel within the Pelagic RAC*, will be turned into a journal article to maximise the impact of the research.
- b) Within the RACs, discussions are continuing into the wider role which can be played by stakeholders in the provision of advice on fisheries management, informed by the outputs from the SAFMAMS project. It is already evident that wider stakeholder participation is yielding solid and lasting results, with the RACs themselves organising major conferences on *Cod Recovery, Control & Compliance*, and *Offshore Marine Protected Area* during 2007 and 2008. These conferences have subsequently influenced Commission policy.
- c) Transformation of the Pärnu Bay local workshop report into an article to be published in the local fisheries newsletter.
- d) Based on the *ICES Reversing the Burden of Proof Workshop* and the report: *Reversing the Burden of Proof for Fisheries Management - Managing commercial fisheries within sustainable limits* a presentation will be held at the Profet Policy meeting in Copenhagen 23-24 June 2008. There are also plans to condense the report in to a 'popular' article to be published in some of the fisheries organisations' newsletters/journals.

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