

Newcastle University e-prints

Date deposited: 12th August 2010

Version of file: Author, final

Peer Review Status: Peer reviewed

Citation for published item:

Gray TS, Hatchard JL. [A complicated relationship: Stakeholder participation and the ecosystem-based approach to fisheries management](#). *Marine Policy* 2008,**32** 2 158-168.

Further information on publisher website:

<http://www.elsevier.com/>

Publishers copyright statement:

This paper was originally published by Elsevier, 2008 and can be seen from the URL below (with permissions):

<http://dx.doi.org/10.1016/j.marpol.2007.09.002>

Always use the definitive version when citing.

Use Policy:

The full-text may be used and/or reproduced and given to third parties in any format or medium, without prior permission or charge, for personal research or study, educational, or not for profit purposes provided that:

- A full bibliographic reference is made to the original source
- A link is made to the metadata record in Newcastle E-prints
- The full text is not changed in any way.

The full-text must not be sold in any format or medium without the formal permission of the copyright holders.

Robinson Library, University of Newcastle upon Tyne, Newcastle upon Tyne.

NE1 7RU.

Tel. 0191 222 6000

Bed-fellows or fellow-travellers?

The relationship between stakeholder participation and the ecosystem-based approach to fisheries management

Tim Gray

School of Geography, Politics & Sociology, Newcastle University, NE1 7RU, UK, t.s.gray@ncl.ac.uk, +44 1912227528

Jenny Hatchard

JH Fishery Management Services, 7 (2F2) Polwarth Crescent, Edinburgh, EH11 1HP, jennyhatchard@inbox.com, +44 7790034792

Abstract

The relationship between stakeholder participation (SP) and the ecosystem-based approach to fisheries management (EBAFM) is often taken for granted, but is actually very complicated. The literature reveals five possible interpretations of this relationship: that they are 1) logically linked; 2) ethically linked; 3) instrumentally linked; 4) complementarily linked; and 5) antagonistically linked. We examine these five formulations in the light of recent research on interactions between fisheries and their environment, on the basis of which we conclude that the SP/EBAFM relationship manifests itself as predominantly instrumental in character. Within this mutually beneficial, but uneven, relationship, ecosystem-based management benefits particularly from stakeholder participation in terms of knowledge; practical roles played by stakeholders; and added legitimacy. Complementary and ethical links between ecosystem-based management and stakeholder participation are less common but, respectively, command pragmatic and moral force. Logical links do exist, but mainly at the conceptual level, while there is very little evidence that SP and EBAFM are mutual antagonists.

Abbreviated Article Title: Bed-fellows or fellow-travellers?

Key words: Ecosystem, Participation, Stakeholder, Fisheries, Management

Introduction

The authors of this paper were involved in facilitating stakeholder participation in the European-funded European Fisheries Ecosystem Plan (EFEP) project. The purpose of the project was to develop a Fisheries Ecosystem Plan for the North Sea, critical to which was an iterative process of stakeholder engagement [1]. This paper is the result of further deliberation on this issue, taking into account the experiences of other European projects which have touched on the ecosystem-based approach to fisheries management (EBAFM), on the one hand, and stakeholder participation (SP), on the other.

The terms ‘stakeholder participation’ and ‘ecosystem-based approach to fisheries management’ are ambiguous. SP means involvement in making political decisions by members of the public who have a stake in the outcomes of those decisions. Questions raised by SP include the following [2]. First, why is SP justified? Is it a right; or is it to improve the quality of decision-making; or to confer legitimacy on the decisions reached; or to ensure compliance with those decisions? Second, what is the aim of SP? Is it to reach consensus; or to reach the right decision [3]? Third, who are the stakeholders? The general public or people with a pecuniary interest or an ideational/emotional/ethical interest in decisions [4]? Fourth, what constitutes participation? Being kept informed; or being consulted; or being represented; or being present; or having a vote in decision-making meetings [5]?

EBAFM incorporates the idea that fisheries management should not be confined to the goal of maximising sustainable yield (MSY) of targeted fish stocks, but be expanded to the goal of protecting the health of the whole ecosystem, with all its species of fish, sea mammals and benthic organisms, together with their natural habitats [6]. Questions raised by EBAFM include the following [7]. First, is its objective to preserve the existing ecosystem, or to restore an earlier or pristine ecosystem [8]? Second, does it seek to manage change, or to adapt to change [9]? Third, does it set out to protect every species, or only those species deemed necessary to maintain

ecosystem health or integrity? Fourth, is humanity included in its list of species to be protected? And, fifth, is EBAFM's overall aim anthropocentric (sustainable development) or ecocentric (conservation) [10, 11].

These two prominent elements of contemporary fisheries governance (SP and EBAFM) are of comparatively recent origin. In the past, European fisheries governance – in the form of the Common Fisheries Policy (CFP) – has been characterised by a hierarchical system of command and control, where stakeholder participation was confined to very limited forms of consultation [12], and by a focus on single species management [13]. However, as Valdimarsson and Metzner [14] point out, “There are probably few, if any, examples of top-down fisheries management that can deliver the sophistication that EAF management requires.” Responding to this challenge, emphasis has been placed on engaging stakeholders more fully in fisheries decision-making processes [12,15], for example, as a result of the 2002 CFP reform [16, 17], while also replacing the single species approach with a holistic approach to fisheries management [18]. Each of these developments is expected to play an important part in improving the quality of fisheries governance, which has been severely criticised for its failure to maintain sustainable levels of fish stocks and to preserve the health of the marine ecosystem [19].

A common assumption is that SP and EBAFM are natural bedfellows and, indeed, the two appear together too often for the connection to be ignored [20]. But this linkage has been contested. In this paper, we first describe five theoretical interpretations of the relationship between SP and EBAFM. 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. Second, we explore the validity of these interpretations in the light of experiences of European fisheries research projects aimed at developing EBAFM in European waters. EFEP is one of these projects, and a further 21 have been examined. The third section of the paper provides a discussion of the relationships between the five interpretations, and asks: which of them, or combinations of them, are likely to be most effective for achieving EBAFM, on the one hand, and improved SP, on the other? Finally, we conclude with some implications of our findings for fisheries management policy. As will become clear, we make use of the IBEFish evaluation criteria – information management; legitimacy; social dynamics; and costs – in our assessment of the above interpretations.

Theory: Five interpretations of the relationship between stakeholder participation (SP) and ecosystem-based management (EBAFM)

We have identified five theoretical interpretations of the relationship between stakeholder participation (SP) and the ecosystem-based approach to fisheries management (EBAFM). These are derived from the available literature on this subject. In rank order of closeness (the closest first) they are: 1) logical link; 2) ethical link; 3) instrumental link; 4) complementary link; and 5) antagonistic link. In this section we describe these interpretations. Figure 1 provides a visual picture of these relationships.

A logical relationship

SP and EBAFM are logically linked. In this understanding of the relationship between the two, the ecosystem-based approach to fisheries management requires stakeholder participation; and stakeholder participation in fisheries governance requires an ecosystem approach. The definition of each concept entails the other, and so they are logically inseparable. Support in the literature for the view that EBAFM logically entails SP comes from Frid et al. [21, 22], who see the ecosystem approach as “inherently participatory”; from Sherman [23] who asserts that EBAFM is “centred around...participative processes”; and from de la Mare [6], who claims that “Some of the doubts about ecosystem-based management arise from trying to address it from a top-down perspective”. This is partly because stakeholders are themselves defined as elements of the ecosystem. It is also because EBAFM is defined in such a way as to imply democratic control over the marine environment [24]. As Degenbol [25] points out: “the inclusion of ecosystem considerations in fisheries management implies...[that] a multiplicity of new stakeholders, interests and objectives must be accommodated in the management institutions” [cf. 2].

Support in the literature for the converse view, that SP logically entails EBAFM, comes from Symes [15], who points out that the EU's Regional Advisory Councils (RACs) provide a good example of stakeholders currently included in fisheries management participatory practices and institutions who represent a broad church of interests, from resource users to conservationists and from onshore sectors to community groups. Such broad participation – going beyond the level of SP in co-management regimes [4] – inevitably widens the scope of issues being addressed in fisheries management to include ecological impacts. Stakeholder participation therefore demands an ecosystem approach.

An ethical relationship

SP and EBAFM are ethically linked. On this view, the moral value judgments that are incorporated within EBAFM ought to be made by “a broad array of stakeholders” [5], because the sea is a public resource, and we are all entitled to participate in determining how public resources are managed and what uses they are put to [26]. Frid [27], for example, highlights the need to find ways to achieve “society’s goals for the marine ecosystem”, making it clear that it is for society to set ecological objectives. SP confers legitimacy on EBAFM. This ethically-based interpretation of the relationship between stakeholder participation and EBAFM is supported, also, by Laffoley et al. [28] who perceive the seas as a common resource in which all of society has a legitimate interest, and, therefore, that “Stakeholders should be involved at an early stage when options are open and their input can make a real difference”; by Richardson [29], who considers that ecological impacts of human activities should be at a level which is “considered acceptable to society”; by Defra [30] who regard the choice of “ecosystem components” as “a critical area of stakeholder engagement”; by Degnbol [25] who sees society as having a crucial role in decisions regarding ecological objectives: “such decisions cannot be made on a natural science basis alone and could only be produced by a negotiation process between stakeholders which would require conflicts to be reconciled and the necessary compromises to be made”; and by Hall and Mainprize [31], who argue that “opening a dialogue about ecosystem issues with all stakeholders...is essential for the successful implementation of an ecosystem-based approach...perhaps the most important discussion of all must be about what constitutes a desirable or an undesirable state for an ecosystem and how one weighs the importance of the various attributes.”

However, it is important to recognise that the ethical link between SP and EBAFM is not unique to ecosystem-based management approaches. Participation is regarded as ethically essential to fisheries governance in general, and user groups have a history of strong engagement via co-management mechanisms and institutions; while the FAO [24] have identified an ethical link between stakeholder participation and single species fisheries management. Thus, EBAFM essentially extends this ethical link to a wider range of stakeholders [5].

Conversely, EBAFM imposes an ethical duty on stakeholders to act as stewards of the sea. More accurately, it extends the existing obligation of stakeholders to safeguard the future of target stocks, to an additional obligation to protect the future of non-target species and natural habitats.

An instrumental relationship

SP and EBAFM are instrumentally linked. On this view, SP enhances EBAFM, and EBAFM enhances SP. SP ensures that EBAFM has the opportunity to draw on the widest possible range of expertise: “knowledge for dealing with social-ecological systems dynamics is dispersed among individuals and organisations in society and requires social networks that span multiple levels in order for actors to draw on dispersed sources of information” [32]. Local and traditional environmental knowledge is important [19, 33], and can help to manage the uncertainty inherent in the ecosystem approach [25, 28]. Also, EBAFM benefits from a shared consensus on objectives achieved via SP [21, 22, 28, 34]. This is because, “Without wide public support and participation, governments may be unable to generate political support to undertake pragmatic restoration projects” [35], or to achieve long-term public commitment to them [18].

For its part, EBAFM enhances SP by widening stakeholder access to the decision-making process, thereby empowering stakeholders [36]. Also, stakeholders improve their understanding

of the marine ecosystem by being involved in EBAFM [37]. And, as Larsen et al [38] put it, “knowledge on local ecosystem conditions is needed to achieve local co-management”.

However, we note that the primary and immediate benefits within the instrumental interpretation of the relationship between SP and EBAFM are likely to be felt by the latter rather than the former.

A complementary relationship

The fourth theoretical interpretation of the relationship between SP and EBAFM is that they are complementarily linked. On this view, SP and EBAFM are separate principles that independently work to improve fisheries governance: “Participation is a desirable tool but not integral to an ecosystem approach which has a scientific core” [7]. They pull in the same direction rather than in opposite directions – there is no contradiction or tension between them – but they are not interdependent. Good governance of fisheries requires both EBAFM and SP.

This relationship is demonstrated very clearly by the 2002 CFP Reform, which includes both EBAFM and SP [15, 26], but does not link the two together per se. Similarly, the Irish Government’s strategic plan for its marine sector aims at “Increased dialogue between fishermen and scientists...as well as a ‘complete ecosystem approach’” [39].

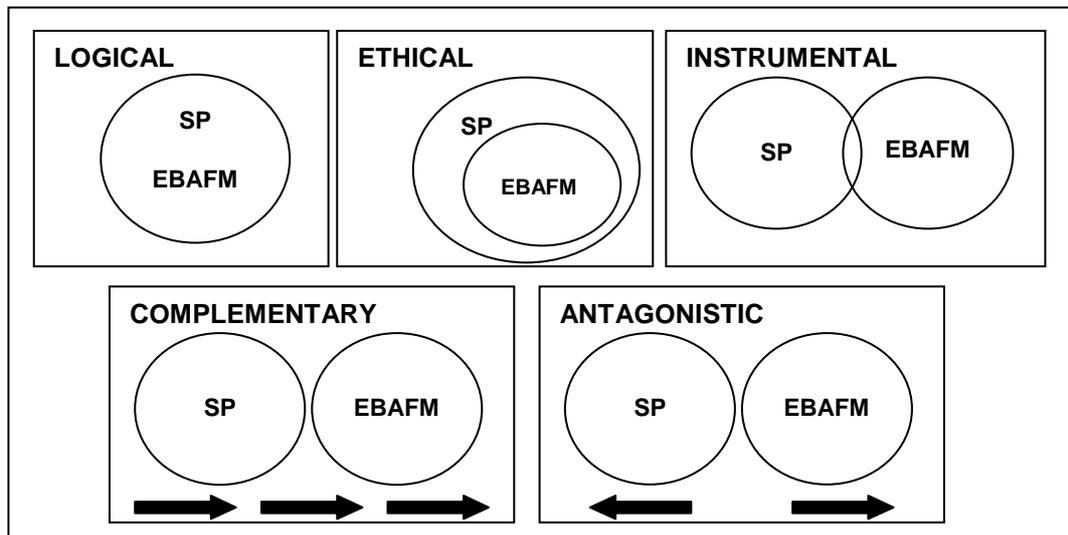
An antagonistic relationship

Finally, the fifth interpretation is negative, that SP and EBAFM are antagonistically related – i.e. they are in conflict with each other. This rejectionist interpretation argues that SP undermines EBAFM. For example, Grafton et al. [40] claim that the participative approach allows special interests to block conservation measures: “voluntary participation in the regulatory process leads to over-representation by industry members with extreme preferences...[sacrificing] long-term conservation for short-run economic considerations.” Moreover, the high cost of participation (in terms of time and logistical resources) drains funds that could be better used to implement EBAFM.

Conclusion to the theory

In figure 1, we depict these five theoretical interpretations of the relationship between SP and EBAFM visually, showing how the logical link maps the two concepts onto one another; the ethical link places EBAFM within the wider realm of SP; the instrumental link finds EBAFM and SP interrelated and mutually beneficial; the complementary link locates the two side-by-side, but not in tension with each other; and the antagonistic link portrays them as mutually exclusive alternatives.

Figure 1 – Five theoretical relationships between SP and EBAFM



Our preliminary evaluation of the five theoretical relationships is that:

- 1) The logical linkage is too strong: it is not convincing to argue that SP and EBAFM are so tightly bound together that the one cannot exist without the other. It is not inconceivable or self-contradictory to imagine SP functioning without EBAFM or to imagine EBAFM existing without SP.
- 2) The ethical linkage is an essential part of a credible explanation of the relationship between SP and EBAFM: stakeholders have both a right to decide how the marine environment is used, and a duty to do so responsibly.
- 3) The instrumental linkage is also an essential part of a credible explanation of the relationship between SP and EBAFM: SP is almost always needed to ensure the success of EBAFM; and EBAFM almost always enhances SP.
- 4) The complementary link is too weak: SP and EBAFM are not merely parallel or independent principles, but interlinked.
- 5) The antagonistic link is too extreme. While it is true that there is a danger of special interests obstructing EBAFM, the danger of excluding SP altogether is a greater threat to EBAFM.

In the next section, we test these theoretical interpretations in the context of the experiences of research projects which have incorporated both SP and EBAFM.

Practice: European research projects involving EBAFM and SP

In this section, we examine a number of European projects which relate to the interactions between fisheries and their environment, to test the five formulations of the relationship between SP and EBAFM. The projects range from social science explorations of management institutions to natural science projects, with multi-disciplinary projects in between. Although very few of them explicitly tackle the relationship between SP and EBAFM, all the projects referred to in this paper do touch on the relationship in some way, and offer us scope to better understand the varied perceptions of this critical relationship within the European fisheries research community. The evidence is divided in two sub-sections: first, we examine the case of the EFEP project, which addresses issues pertinent to this paper most directly; second, we explore the rationales and outputs of other projects with relevance to the relationship between SP and EBAFM. An overview of the findings, and a full list of projects, is provided in Table 1.

Table 1 –5th and 6th Framework projects' interpretations of the SP-EBAFM relationship

PROJECT ACRONYM	PROJECT FULL TITLE	SP-EBAFM RELATIONSHIP
EFEP	European fisheries ecosystem plan	Logical/Ethical/ Instrumental
SAFMAMS	Scientific advice for fisheries management and multiple scales	Logical/ Instrumental
EFIMAS	Operational evaluation tools for fisheries management options	Logical/Ethical/ Instrumental
KNOWFISH	Knowledge base for fisheries management	Ethical/ Instrumental
BIOMEX	Assessment of biomass export from MPAs	Instrumental
EMPAFISH	European MPAs as tools for fisheries management and conservation	Instrumental
COST-IMPACT	Costing the impact of Demersal fishing on marine ecosystem process and biodiversity	Instrumental
PROTECT	MPAs as a tool for ecosystem conservation and fisheries management	Instrumental
FRAP	Framework for biodiversity action plans	Instrumental
REDUCE	Reduction of adverse environmental impact of demersal trawls	Instrumental

PKFM	Policy and knowledge in fisheries management	Instrumental
MOFISH	Multiple objectives in the management of EU fisheries	Instrumental/ Complementary
RESPONSIBLE	Sharing responsibilities in fisheries management	Complementary
COMMIT	Creation of multi-annual management plans for commitment	Complementary
RESPONSE	Response of benthic communities and sediment to different regimes of fishing disturbance	N/A
IMPRESS	Interactions between the marine environment, predators and prey	N/A
INDECO	Developing indicators of environmental performance of the CFP	N/A
NECESSITY	Nephrops and cetacean species selection information and technology	N/A
DEGREE	Development of fishing gears with reduced effects on the environment	N/A
DISCBIRD	Effects of changes in fishery discard rates on seabird communities	N/A
MAFCONS	Managing fisheries to conserve groundfish and benthic invertebrate species diversity	N/A
TECTAC	Technical developments and tactical adaptations of important EU fleets	N/A

The EFEP Project: European Fisheries Ecosystem Plan

EFEP is the only project among those we looked at to have explicitly sought an ecosystem-based approach to fisheries management: other projects involve research into various aspects of fisheries management that could form part of an ecosystem approach. In terms of project rationale, EFEP adopted the logical interpretation of the link between EBM and SP. Describing the fisheries ecosystem plan approach as “inherently participatory”, the project was based on the understanding that “Ecosystem-based management...considers all the components of the ecosystem...and their interactions. This includes an appreciation of the natural ecosystem dynamics AND it explicitly recognises that man is part of the system and seeks to include stakeholders in setting management goals” [41].

Reflecting this rationale methodologically, EFEP was an interdisciplinary project, which incorporated stakeholder participation from the beginning, including both individuals and groups with either a dependency on, or an interest in, North Sea fisheries: fishers, onshore sectors, managers, scientists and environmentalists [42]. Participation took the form of an iterative process of stakeholder engagement [1], which included two extensive rounds of stakeholder consultation [42, 43], in addition to newsletters, a public website, correspondence with stakeholders and a stakeholder-based steering committee.

The stakeholder consultations, which formed the main part of SP within the project, used semi-structured interview techniques to first gather North Sea stakeholders’ views about the health of fish stocks and the ecosystem and regarding acceptable and effective fisheries management mechanisms [42]. These views were then communicated to ecosystem modellers within the research team, who used them to identify and test management scenarios for meeting ecosystem goals for fisheries management. This process was followed by a second stakeholder consultation, which sought feedback from stakeholders regarding the acceptability, legitimacy and likely effectiveness of modelled outcomes of the management scenarios they had helped to construct [43]. This feedback was again communicated to the ecosystem modellers to enable further scenarios to be run, or amendments to be made to existing scenarios. The resulting FEP “shows

the management methods which are most acceptable to stakeholders and how they can be used in combination to achieve the goal of sustainable fishing within a sustainable ecosystem” [43].

The project’s conclusions [41, 44] reflected both ethical and instrumental interpretations of the relationship between EBAFM and SP. With regard to ethics, “Everybody has a right to a say in setting the objectives for management and a key element of the FEP process is agreeing on a common set of mutually achievable objectives.” There should be a comprehensive framework featuring a process of stakeholder consultation, resulting in stakeholder agreement on objectives, methods, implementation, monitoring (including the use of fisheries-science partnerships), review and evaluation (both of which entail a stakeholder component). This practical recommendation was underpinned by the understanding that: “It is the responsibility of society as a whole to ensure that the fisheries are made sustainable in both biological and societal terms.”

With regard to instrumentalism, EFEP [41] concluded that “Stakeholders can help to assess the state of the ecosystem by supplying local knowledge and information to managers and scientists.” This speaks to the gains to be had from SP by EBAFM in terms of widening the knowledge base of fisheries management. In addition, EFEP found that stakeholders are also very useful for problem-identification, prioritisation of objectives and providing detailed technical advice. Conversely, EFEP also concluded that SP has something to gain from EBAFM, because: “A FEP empowers stakeholders by providing them with information to make decisions and a framework in which to achieve agreement.”

In our view, EFEP, while employing the language of a logical link, is more convincing in showing the ethical and instrumental connections between SP and EBAFM. In other words, it does not prove that SP and EBAFM are necessarily connected, but it does demonstrate that the two concepts are ethically and instrumentally linked. We will return to this issue in the discussion section of the paper. First, the implications of the rationales and outputs of the other research projects for our understanding of the relationship between SP and EBAFM will be considered.

Other Projects

Logical relationship

Wilson and Pascoe [45] of the EFIMAS project exemplified the logical link, in that they regarded as a *sine qua non* of adaptive management that it incorporated a variety of stakeholder interests. Hawkins [46], of the SAFMAMS project, implied a logical link, stating that “the new ecosystem-based approach, involving a broader range of stakeholders, could become increasingly complicated”.

Ethical relationship

Some implicit references to an ethical relationship can be found within the projects. Several projects incorporate some degree of stakeholder participation - BIOMEX, COST-IMPACT, DEGREE, EFIMAS, FRAP, KNOWFISH, MOFISH, PROTECT, SAFMAMS – suggesting a commitment to participatory mechanisms as important in fisheries research, and thereby in fisheries management too. One of these projects, EFIMAS, which aimed at developing a framework within which economic, ecological and social impacts of management scenarios for particular goals could be assessed, included an evaluative work-package to consult with a broad array of European, national and local stakeholders regarding the utility of that framework. This illustrated the ethical interpretation of the role that SP should have in fisheries management systems, a commitment made by three other projects that did not have an active stakeholder component in their research methodology – INDECO, COMMIT, EMPAFISH. However, these commitments to SP indicated an ethical relationship between SP and fisheries management in general, of which EBAFM is one mode.

Instrumental relationship

An instrumental relationship between SP and EBAFM was implied by some project findings. For the most part, examples referred to the benefits that can accrue to EBAFM from SP. Larsen et al.

[38] maintained that: “No change toward sustainable marine resource use can be carried out without the direct and open cooperation with stakeholders at all levels.” These benefits relate to four sorts of contribution: knowledge; practical roles; engagement; and adaptive management.

First, with regard to knowledge, SP can facilitate improved ecological, technical and socio-economic knowledge. van Hoof et al. [47] stated that: “The pursuit of sustainable fisheries requires sensitivity to and intelligence on wider ecosystem interactions, and so the involvement of environmental interests in some capacity is especially important.” Resource users were regarded by SAFMAMS as holding ecological knowledge and unique access to that knowledge [46]. KNOWFISH held that local ecological knowledge (LEK) could be used to inform fisheries management and that some degree of interaction with stakeholders was necessary to access that knowledge [48]. PKFM found that “Fishers assert that considering their experience-based knowledge of fish, the fishery and the ecosystem would improve the knowledge base of the management process” [49]. REDUCE supported the view that stakeholder participation can contribute technical knowledge: Linnane et al. [50] stated that gear design “should involve consultation with the fishing industry in order to avail of the practical knowledge and experience on offer.” As a result, a better picture of the ecosystem could be built up. PKFM reported that, “Given the inherent uncertainty of the marine world and its far-reaching consequences for an ecosystem-based approach to fisheries management”, working with stakeholders can facilitate the building of “an accurate common picture of the marine environment” [49].

Second, stakeholders can play practical roles in the development and management of policy instruments. MOFISH invited stakeholders to propose economic, political and ecological fisheries management objectives [51], while FRAP found that such participatory processes can “create decision options, such as new or adapted policy instruments”, which may have lower costs [52]. Monitoring programmes can be best implemented by cooperation between stakeholders and managers (PROTECT) [53], perhaps via fishery-science partnerships (SAFMAMS) [38]. Projects working on analysis and evaluation tools have found stakeholder and manager involvement to be useful: for example, COST-IMPACT’s cost-benefit analysis tool [54] and EFIMAS’s scenario-evaluation framework [55]. Further, according to PKFM, stakeholders are increasingly regarded as having a role to play in the formal scientific advisory process: “A growing group feels that advice needs to be produced in a much more interactive manner with managers and other stakeholders” [49].

Another practical role for SP is in conflict management. FRAP found that stakeholders can help to manage the conflict provoked by interactions between ecosystem components and fisheries, under such circumstances as ecological or human change. SP “can create or support positive social dynamics between stakeholders and public administration” [52]. EMPAPISH also stressed the value of conflict resolution: “...local communities have to be effectively involved in their [MPAs’] management;...public participation and awareness are essential if proper management is to be implemented and...[participation] is probably the only way to prevent and solve conflicts of interest” [56].

Third, engagement by stakeholders in EBAFM is helpful because, as Rauschmayer [52], of FRAP, explained, participatory processes can endow decisions with “higher legitimacy and, thus, with higher acceptance”. PROTECT stated that stakeholder acceptability was critical to the viability of MPAs [53]. Indeed, achieving consensus on management objectives was regarded as “the major challenge for the implementation of an ecosystem approach within fisheries management” [57]. KNOWFISH found that in case studies which featured co-management systems, “more knowledgeable people making decisions create greater legitimacy than an abstract representation of various putative categories of stakeholders” [48].

Fourth, SP is necessary to contribute to adaptive management, which is an essential feature of many conceptions of EBAFM. Explaining that participatory systems are more adaptive than are command-and-control regimes, Wilson and Pascoe [45], of the EFIMAS project stated that “it is hard to imagine how a management system could be truly adaptive to changing environments without a broad base of participation providing that system with information of different types.”

The instrumental relationship from the opposite direction – that SP benefits from EBAFM – was evident in a recommendation from a variety of projects that stakeholder participation should be

broadened to accommodate the needs of EBAFM, particularly with regard to knowledge requirements and setting balanced objectives, suggesting that SP may become more substantive under EBAFM than under other management systems. As well as offering participatory opportunities in the form of monitoring and research programmes, EBAFM also presented the opportunity to participate in priority-setting in local management [38].

Complementary relationship

Evidence of the complementary relationship between SP and EBAFM was presented by the RESPONSIBLE, SAMAMS, MOFISH and COMMIT projects, where EBAFM and SP were considered to sit alongside one another to contribute to a common goal. RESPONSIBLE [47] referred to the 'Triple P' framework, of Planet, Profit and People, employed by the World Bank, which included economic, social (including participative opportunities) and ecological components of sustainability. RESPONSIBLE and SAFMAMS cited this goal as "sustainability", and three of RESPONSIBLE's six case studies, which are country-based – France, Denmark and Scotland) – endorsed the complementary interpretation [47]. MOFISH [58] stated that there were a range of objectives in fisheries management which juxtaposed ecosystem and environmental concerns with participative objectives relating to conflict reduction and management. The COMMIT project asserted a complementary relationship between ecosystem management (in the form of "long-term planning for sustainable development of fish stocks") and participation (in the form of "commitment from fisheries managers and the fishing industry") [59].

Antagonistic relationship

We found no evidence in any of the projects to support the view that SP was antagonistic to EBAFM.

Table 1 provides an overview of the understandings of the relationship between EBAFM and SP used and reported by the twenty two projects we have investigated. What is apparent is that, although there is evidence of four of the five interpretations within the projects, the instrumental link between SP and EBAFM is dominant across the range of projects with findings relevant to this paper. In all but two cases, these projects displayed some element of an instrumental interpretation of the SP-EBAFM relationship. In the discussion section below, we explore what this predominance of instrumentalism means for our overall understanding of the SP-EBAFM relationship.

Discussion of results

Having outlined five alternative theoretical interpretations of the relationship between SP and EBAFM – logical, ethical, instrumental, complementary and antagonistic – and examined evidence from a range of European research projects which touch on ecological and participatory aspects of fisheries management, we now discuss the implications of that evidence for our understanding of the relationship between these two key concepts. First, we revisit our understanding of the five interpretations in the light of the projects. Second, we review the interconnections between the five interpretations that the projects have revealed.. Third, in the context of the IBEFish framework for participatory characteristics – information management, legitimacy, social dynamics and costs – we consider what lessons these findings have for the implementation of EBAFM in practice and for SP as a mode of fisheries governance.

Revisiting the five links

The preceding section provided evidence of some support for four of the five interpretations of the relationship between SP and EBAFM. However, the strength of that support varied considerably between the four interpretations. The logical interpretation, which constructs EBAFM and SP as entailing each other, was endorsed by the EFEP, SAFMAMS and EFIMAS projects. Moreover, although three projects constitute a small proportion of the total number of projects (22), they gave it more support than we found in the theoretical literature, or that we ourselves felt was intellectually justified.

The ethical interpretation, which sees EBAFM as being morally bound, along with alternative management systems, to incorporate the views of society, was present in the EFEP, EFIMAS and KNOWFISH projects. However, (by contrast to the logical link), while the literature presents a very convincing argument of the importance of the ethical link, it was of lesser importance in the research projects. Nevertheless, in our view, this finding should not be interpreted as undermining the moral force of the ethical link and it should not be disregarded from consideration in policy-making, because it is likely to assume greater importance in the future.

The instrumental interpretation, which perceives EAFBM and SP as mutually beneficial, predominated within the projects – featuring in twelve of the fourteen that drew a link between SP and EBAFM. This finding ties in with our review of the literature, where there was more evidence of instrumental arguments than arguments for any other interpretation of the SP-EBAFM relationship, and we found those arguments to be very convincing.

Moreover, as in the literature, so in the projects, one side of the instrumental relationship was more heavily weighted than the other: in the fourteen projects, EBAFM benefited far more from SP than SP benefited from EBAFM. EBAFM gained from SP in terms of stakeholder knowledge; stakeholder performance of practical roles; stakeholder engagement; and stakeholder contributions to adaptive management. In contrast, the projects confined the gains to SP to a widening of stakeholder participation under EBAFM, due to greater knowledge demands and the need for a balance of ecological, social and economic objectives. However, we predict that EBAFM will, in the long-term, entail a strengthening of democratic decision-making in fisheries management, thereby balancing the benefits more evenly between SP and EBAFM. Figure 2 illustrates the instrumental relationship between SP and EBAFM based on our findings.

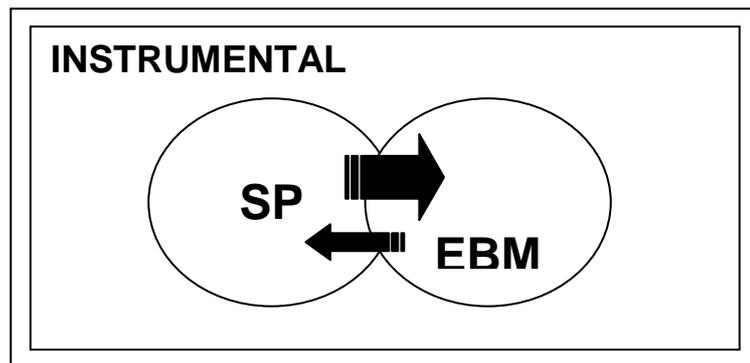


Figure 2 – A redrawing of the instrumental relationship

The instrumental benefits for EBAFM of SP reflect the four characteristics of participation in fisheries management, which form the IBEFish analytical framework. EBAFM gains, first, in terms of knowledge or information – technical, ecological and socio-economic. Second, this management approach benefits from the take-up of practical roles – such as research, monitoring and management – by stakeholders. Third, EBM also benefits from the added systemic stability – in terms of legitimacy, acceptance and improved social dynamics, such as effective conflict management – that is brought by having stakeholders involved in the management system. Finally, while SP may require high commitment and the devotion of significant capacity by stakeholders, which has inherent costs, SP may also reduce costs by producing more effective measures and improving compliance.

The complementary interpretation, which regards the two concepts as working in parallel to contribute to a common goal, was endorsed by COMMIT, MOFISH and RESPONSIBLE, highlighting sustainability as a common aim. It appears from these projects that the complementary link was more important than is given credit for in the literature.

The antagonistic interpretation, which holds that SP is an obstacle to EBAFM, was not illustrated by any of the projects, and so does not figure in the next section. However, there remains a theoretical danger that extremism by any stakeholder group could derail progress towards EBAFM.

Interconnections between the four links

In Table 2, we can see the interconnections between the logical, ethical, instrumental and complementary interpretations as exemplified in the fourteen projects where SP was linked with EBAFM. In nine projects, only one type of the linkages was observed – seven of which displayed an instrumental link and two a complementary connection; in three projects, two types of linkage appeared, which were logical-instrumental, ethical-instrumental and instrumental-complementary; and, in two projects (EFEP and EFIMAS), three types of linkage 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.

Where there was more than one understanding of the SP-EBAFM relationship present in a project, instrumentality was always a feature. Moreover, all the examples of logical and ethical links, and one of the three examples of complementary links, were also tied to an instrumental interpretation. This reinforces our finding of the greatest importance of the instrumental link, compared to the four alternative interpretations. Indeed, the instrumental connection between SP and EBAFM was by far the most frequent common denominator in the projects.

Table 2 – How are the alternative interpretations connected?

PROJECT	LOGICAL	ETHICAL	INSTRUMENTAL	COMPLEMENTARY
EFEP				
EFIMAS				
SAFMAMS				
KNOWFISH				
BIOMEX				
EMPAFISH				
COST-IMPACT				
PROTECT				
FRAP				
REDUCE				
PKFM				
MOFISH				
RESPONSIBLE				
COMMIT				

Lessons learned

We have derived five key lessons for the implementation of EBAFM and SP in fisheries governance from this discussion of both the theoretical literature and the practical projects.

1. Policy-makers can draw comfort from the fact that the strongest argument for linking SP to EBAFM was instrumental in character, because this is the easiest argument to defend. If stakeholders can be persuaded that SP can have an impact on EBAFM, improving both the quality of fisheries management and the benefits to them – for example, empowering them by ensuring that they have a say – then stakeholders will be more likely to engage in EBAFM.
2. Policy-makers should pay attention to the ethical linkage because, although it did not figure so strongly in the projects as it did in the literature, it represents the intellectually powerful argument that society has a moral right to a say in how marine resources are managed, and this argument could become increasingly important as the public takes a greater interest in fisheries and marine issues. The flipside of this argument is that stakeholders have a duty to exercise that moral right responsibly for the general interest, rather than irresponsibly, to serve their own interests [4]. The rights of SP are matched by the duties of SP.

3. Even if they adopt the more limited complementary view of the linkage between SP and EBAFM, policy-makers can capitalise on the added value provided by employing both EBAFM and SP in fisheries management policy. Each of these approaches within fisheries management can contribute to the achievement of the broader goal of the sustainable exploitation of marine resources.
4. Although the logical link is more of a conceptual, than a substantive, claim, nevertheless it resonates strongly with some features of the EBAFM discourse.
5. Finally, the fact that the antagonistic interpretation did not feature in any of the projects, suggests that in the minds of practitioners, the danger of conflict between SP and EBAFM is more theoretical than real.

Conclusion

In conclusion, we have found that these two parallel developments in European Fisheries management – SP and EBAFM – are linked in unexpectedly complex ways. The most important link in the theoretical literature, as well as in the 22 projects, and in our own evaluation, is the instrumental relationship – i.e. that each benefits from the other. Although, at present, EBAFM benefits more from SP than vice versa, we suspect that the tide is turning, and that in coming years, EBAFM will significantly extend the reach of democratic culture into the marine environment. The next most important linkage, in our view, is the ethical relationship, which is not reflected as strongly in the projects as in the literature, but which we are sure will become increasingly prominent as the notion of environmental stewardship takes deeper root in fisheries governance. Our original view of the complementary relationship as too weak, has given way to awareness of its importance in the mutual contributions of SP and EBAFM to sustainability. Our initial evaluation of the logical link as purely conceptual has also been revised in the light of the findings of the projects that it serves an important rhetorical function. As for the antagonistic interpretation, its absence from the projects strengthens the linkage between SP and EBAFM, reinforcing the message that if policy makers want EBAFM, they must encourage SP.

Nevertheless, our analysis has led us to the view that we should be cautious about the pace with which EBAFM is introduced, with or without SP endorsement. The danger of moving too fast is twofold. First, there is a risk of stakeholder alienation: participatory processes are delicate, and can easily be undermined by precipitant or extremist decisions. Second, there is a risk of unintended consequences: our understanding of the complexity of the marine ecosystem is at such an early stage that rash measures could cause unexpected damage. Incrementalism (the tortoise strategy) is likely to prove more beneficial than fundamentalism (the hare strategy) to both SP and EBAFM in the long run.

References

- [1] Hatchard, J. Engaging stakeholder preferences through deliberative democracy in North Sea fisheries governance. 45-64 in Gray TS (ed.). *Participation in fisheries governance*. Dordrecht: Springer; 2005.
- [2] Degnbol P, Carlberg A, Ellingsen H, Tonder M, Varjopuro R and Wilson D. *Integrating Fisheries and Environmental Policies: Nordic Experiences*. Copenhagen: Report for The Nordic Council of Ministers' Nordic Strategy for the Environment and Fisheries; 2003.
- [3] Peterson MN, Peterson MJ and Peterson TR. Conservation and the myth of consensus. *Conservation Biology* 2005; 19(3): 762-767.
- [4] Mikalsen KH and Jentoft S. From user-groups to stakeholders? The public interest in fisheries management. *Marine Policy* 2001; 25: 281-292.
- [5] EPAP [Ecosystem Principles Advisory Panel]. *Ecosystem-based fishery management: A report to Congress*. Washington DC: US Department of Commerce; 1999.
- [6] de la Mare WK. Marine ecosystem-based management as a hierarchical control system. *Marine Policy* 2005; 29: 57-68.
- [7] Counsell D. *Ecosystem-based approaches to fishery management – Analysis of responses from consultees*. Edinburgh: Scottish Natural Heritage; 2004.
- [8] Pitcher TJ and Pauly D. *Rebuilding ecosystems, not sustainability, as the proper goal of fishery management*. In Pitcher TJ, Hart PJB and Pauly D (eds). *Reinventing fisheries management*. London: Kluwer; 1998.

- [9] Walker B and Salt D. Resilience thinking: sustaining ecosystems and people in a changing world. Washington: Island Press; 2006.
- [10] Stanley TR. Ecosystem management and the arrogance of humanism. *Conservation Biology* 1995; 9(2): 255-262.
- [11] Tudela S and Short K. Paradigm shifts, gaps, inertia, and political agendas in ecosystem-based fisheries management. *Marine Ecology Progress Series* 2005. 300: 282-286.
- [12] Gray TS (ed.). Participation in fisheries governance. Dordrecht: Springer; 2005.
- [13] Holden M. The Common Fisheries Policy: origin, evaluation and future. Oxford: Fishing News Books, Blackwell Scientific Publications Ltd; 1994.
- [14] Valdimarsson G and Metzner R. Aligning incentives for a successful ecosystem approach to fisheries management. *Marine Ecology Progress Series* 2005; 300: 286-291.
- [15] Symes D. Regionalisation of fisheries governance: an empty vessel or a cornucopia of opportunity? 85-102 in Gray TS (ed.) Participation in fisheries governance. Dordrecht: Springer; 2005.
- [16] Gray T and Hatchard J. The 2002 reform of the Common Fisheries Policy's system of governance: rhetoric or reality? *Marine Policy* 2003; 27: 545-554.
- [17] Hatchard J and Gray T. Stakeholders and the reform of the European Union's Common Fisheries Policy: the institutionalisation of a consultation culture? *MAST* 2003; 2(2): 5-20.
- [18] O'Boyle R and Jamieson G. Observations on the implementation of ecosystem-based management: experiences on Canada's east and west coasts. *Fisheries Research* 2006; 79: 1-12.
- [19] Pitcher TJ. Fisheries managed to rebuild ecosystems? Reconstructing the past to salvage the future. *Ecological Applications* 2001; 11(2): 601-617.
- [20] Gislason H, Sinclair M, Sainsbury K and O'Boyle R. Symposium overview: incorporating ecosystem objectives within fisheries management. *ICES Journal of Marine Science* 2000; 57: 468-475.
- [21] Frid CLJ, Paramor OAL and Scott CL. Ecosystem-based fisheries management: progress in the NE Atlantic. *Marine Policy* 2005; 29: 461-469.
- [22] Frid CLJ, Paramor OAL and Scott CL. Ecosystem-based management of fisheries: is science limiting? *ICES Journal of Marine Science* 2006; 63: 1567-1572.
- [23] Sherman K. Suitability of the large marine ecosystem concept. *Fisheries Research* 2003. 64: 197-204.
- [24] FAO [Food and Agriculture Organisation]. Towards ecosystem-based fisheries management. 393-403 in Sinclair M and Valdimarsson G (eds.). *Responsible fisheries in the marine ecosystem*. Oxford: CABI Publishing and Rome: FAO; 2003.
- [25] Degenbol P. The ecosystem approach and fisheries management institutions: the noble art of addressing complexity and uncertainty with all onboard and on a budget. *IIFET Paper* 2002; no. 171
- [26] Coffey C. What role for public participation in fisheries governance? 27-44 in Gray TS (ed.). Participation in fisheries governance, Dordrecht: Springer; 2005.
- [27] Frid, C. The role of marine science in participatory fisheries governance. 231-247 in Gray TS (ed.). Participation in fisheries governance. Dordrecht: Springer; 2005.
- [28] Laffoley D, Maltby E, Vincent MA, Mee L, Dunn E, Gilliland P, Hamer JP, Mortimer D, Pound D. The ecosystem approach: coherent actions for marine and coastal environments. Peterborough: English Nature; 2004.
- [29] Richardson, K. Integrating environment and fisheries management objectives in the ICES Area: reflections of a past ACFM chair. *ICES Journal of Marine Science* 2000; 57: 766-770.
- [30] Defra [Department for Environment, Food and Rural Affairs]. Review of Marine Nature Conservation: Working group report to government. London: Defra; 2004.
- [31] Hall SJ and Mainprize B. Towards ecosystem-based fisheries management. *Fish and Fisheries* 2004; 5: 1-20.
- [32] Galaz V, Olsson P, Hahn T, Folke C and Svedin U. The problem of fit among biophysical systems, environmental regimes and broader governance systems: insights and emerging challenges. In Young, OR, King, LA and Schroeder, H (Eds). *Institutions and Environmental Change: Principal Findings, Applications, and Research Frontiers*. MIT Press; forthcoming.
- [33] Pitcher TJ. Ecosystem goals can invigorate fisheries management, help dispute resolution and encourage public support. *Fish and Fisheries* 2000; 1: 99-103.
- [34] Keough HL and Blahna DJ. Achieving integrative, collaborative ecosystem management. *Conservation Biology* 2006; 20(5): 1373-1382.
- [35] Clewell AF and Aronson J. Motivations for the restoration of ecosystems. *Conservation Biology* 2006; 20(2): 420-428.

- [36] Granek EF and Brown MA. Co-management approach to marine conservation in Moheli, Comoros Islands. *Conservation Biology* 2005; 19(6): 1724-1732.
- [37] Sainsbury KJ, Punt AE, Smith ADM. Design of operational management strategies for achieving fishery ecosystem objectives. *ICES Journal of Marine Science* 2000. 57: 731-741.
- [38] Larsen CH, Ojaveer H, Knapman P, Sporrang N. Review of the role of science in cooperative fisheries management. Hirtshals: IFM for SAFMAMS; 2006.
- [39] MCMNR [Ministry for Communications, Marine and Natural Resources]. Sea change – a marine knowledge, research and innovation strategy for Ireland (2007-2013). Press Release; 2007.
- [40] Grafton RQ, Arnason R, Bjorndal T, Campbell D, Campbell HF, Clark CW, Connor R, Dupont DP, Hanneson R, Hilborn R, Kirkley JE, Kompas T, Lane DE, Munro GR, Pascoe S, Squires D, Steinshamn SI, Turriss BR, Weninger Q. Incentive-based approaches to sustainable fisheries. *Canadian Journal of Fisheries and Aquatic Sciences* 2006; 63: 699-710
- [41] EFEP [European Fisheries Ecosystem Plan]. The North Sea fisheries ecosystem plan. Newcastle upon Tyne: Newcastle University for EFEP; 2004.
- [42] Hatchard JL, Gray TS, Mikalsen KM. European fisheries ecosystem plan: stakeholder consultation. Newcastle upon Tyne: Newcastle University for EFEP; 2003.
- [43] Hatchard JL, Gray TS, Mikalsen KM, Brookfield K. European fisheries ecosystem plan: second stakeholder consultation. In Paramor OAL, Scott CL and Frid CLJ (eds.). *European fisheries ecosystem plan: producing a fisheries ecosystem plan*. Newcastle upon Tyne: Newcastle University for EFEP; 2004.
- [44] Paramor OAL, Scott CL and Frid CLJ (eds). *European fisheries ecosystem plan: producing a fisheries ecosystem plan*. Newcastle upon Tyne: Newcastle University for EFEP; 2004.
- [45] Wilson DC and Pascoe S. Delivering complex scientific advice to multiple stakeholders. 329-353 in Motos L and Wilson DC (eds). *The knowledge base for fisheries management*. Amsterdam: Elsevier; 2006.
- [46] Hawkins AD. Review of science and stakeholder involvement in the production of advice on fisheries management. Aberdeen: Loughine Ltd. for SAFMAMS; 2007.
- [47] van Hoof L, Hoefnagel E, van der Schans JW, Nielsen JR, Christensen A-S, Sverdrup-Jensen S, Delaney A, Jentoft S, Mikalsen K, Karlsen GR, Bodiguel C, Cantanzano J, Suarez de Vivero, JL, Alba IM, Domínguez SF, Rommel D. *Sharing Responsibilities in Fisheries Management*. The Hague: LEI for RESPONSIBLE; 2005.
- [48] Wilson DC, Raakjær J, Degnbol P. Local ecological knowledge and practical fisheries management in the tropics: a policy brief. *Marine Policy* 2006; 30: 794–801.
- [49] Schwach V, Bailly D, Christensen A-S, Delaney AE, Degnbol P, van Densen WLT, Holm P, McLay HA, Nielsen KN, Pastoors MA, Reeves SA and Wilson DC. Policy and knowledge in fisheries management: a policy brief. *ICES Journal of Marine Science* 2007; 64: 798-803.
- [50] Linnane A, Ball B, Munday B, van Marlen B, Bergman M, Fonteyne R. A review of potential techniques to reduce the environmental impact of demersal trawls. *Irish Fisheries Investigations (New Series)* 2000; 7.
- [51] Nielsen JR and Mathiesen C. Stakeholder preferences for Danish fisheries management of sand eel and Norway pout. *Fisheries Research* 2006; 77: 92–101.
- [52] Rauschmayer F. Designing participatory decision-strategies. 74-79 in Klenke R, Ring I, Henle K, Neßhöver C, Rauschmayer F, Jepsen N and Kranz A (eds.). *Generic framework for reconciliation action plans*. Leipzig: FRAP; 2006.
- [53] Diekmann R and St John M. MPA monitoring strategies. 91-101 in PROTECT. *Review of marine protected areas as a tool for ecosystem conservation and fisheries management*. Denmark: DiFRES; 2006.
- [54] Plymouth Marine Laboratory. Cost impact project newsletter. Plymouth: Plymouth Marine Laboratory; no date.
- [55] Hatchard JL and Stead S. The EFIMAS modelling framework: focus groups discussions in northeast England. Newcastle upon Tyne: Newcastle University for EFIMAS; 2006.
- [56] Alban F, Appéré G and Boncoeur J. *Economic Analysis of Marine Protected Areas: A Literature Review*. EMPAFISH Booklet 3: Brittany; 2006.
- [57] Tserpes G, Peristeraki P, Nielsen JR. Ecological side-effects of fishing from the fisheries management perspective. 267-294 in Motos L and Wilson DC (eds). *The Knowledge Base for Fisheries Management*. Amsterdam: Elsevier; 2006.
- [58] Mardle S, Pascoe S, Boncoeur J, Le Gallic B, Garcia-Hoyo JJ, Herrero I, Jimenez-Toribio R, Cortes C, Padilla N, Nielsen JR and Mathiesen C. Objectives of fisheries management: case studies from the UK, France, Spain and Denmark. *Marine Policy* 2002; 26: 415-428.

[59] CEFAS [Centre for Environment, Fisheries and Aquaculture Science]. Long-term planning for sustainable fisheries management. CEFAS Insight 2004; 6: 1.