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IMPROVING COMMUNICATION BETWEEN FISHERIES MANAGERS AND RESEARCHERS

Report on MariFish Task 1.10

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Summary

This report presents the findings of a study of communication issues in marine fisheries science commissioned by the MariFish ERA-Net. MariFish brings together the major European national funders of marine fisheries research whose aim, through this study, has been to establish how fisheries managers communicate their evidence needs to researchers and advisers, and how research results and advice are conveyed back to them. Consequently, elements of good practice have been identified and are presented in this report.

The main part of the study comprised 'paired' interviews with researchers and fisheries managers in six countries represented in MariFish. The information from the interviews was augmented by a literature review and a questionnaire sent to MariFish member organizations.

With regard to **establishing evidence needs** the study highlighted the importance of close interactions between the research institute and the fisheries managers, building understanding and trust, and being based on an effective 'system' rather than being unduly reliant on individual personalities. The Ministry responsible for fisheries management needs to have sufficient in-house scientific capacity to be an intelligent customer for research and advice, and should develop a long-term strategic plan for research with the research institute, the fishing industry and other stakeholders. This plan needs to achieve an appropriate balance between basic and applied science, advice and monitoring activities. Appropriate weight should be given to both scientific quality and to the relevance and utility of research in deciding on which proposals to fund, and in evaluating the performance of research institutes and individuals.

Communication of research results and advice requires channels to be chosen according to the issue and the audience, and that communication activities are adequately resourced. Detailed technical reports should be augmented with non-technical summaries and updates, interpreting the results in the context of the issues of concern to the audience. Research reports should be made readily available on web sites and easily retrievable: all stakeholders engaged in an issue should have access to good quality information. Face-to-face interactions are also important allowing testing and debate of research results.

The provision of advice is a key mechanism for the transfer of research results and should capture the tacit knowledge of the researchers. Advisers act as interpreters, playing a central role in bridging between the research and policy communities and requiring a distinctive set of skills. A systematic approach should be taken to developing staff to be effective as advisers, and career paths and rewards should be attractive when compared to focusing entirely on research.

The media will play an important role in communications with wider audiences. Good relationships should be cultivated which will be helpful when controversies arise and media interest is at its highest.

1. Introduction

MariFish brings together the major European national funders of marine fisheries research to form an effective, working partnership (www.MariFish.net). An overall aim for MariFish is to strengthen the links between European marine fisheries science and fisheries management. Effective communication between fisheries science and management should play an important part in strengthening these links. A study has therefore been carried out (task 1.10 of the MariFish programme) to examine current communication practices and to consider how they may be improved. This report summarises the findings of that study.

When considering communication there are a number of differences between managers and scientists that might influence the effectiveness of communication. Fishery managers tend to come from different work backgrounds to scientists (policy as opposed to science), have different priorities (solving policy problems versus scientific investigation), and possibly have different academic disciplines (arts based versus science based). Also scientists tend to be specialists whilst managers are generalists. A consequence of these differences is that the two groups are likely to communicate in different ways. Yet good communication between the two groups is extremely important.

As the "purchasers" or "customers" of research, fishery managers need to be able to communicate their "evidence" needs to researchers, the "contractors". Equally researchers need to communicate results of their research to the customers. At both the input (questions asked) and output (results delivery) parts of the cycle communication needs to be clear and understandable. A significant investment is made by the MariFish partners in research (in excess of €100m per annum) and the research evidence produced must be appropriate and understandable. It is clearly important therefore that communication is effective, in both directions, and that methods of delivery are "fit for purpose".

The study has been led by MariFish Partner 1 (Defra) and has looked critically at the effectiveness of the two way communication between fisheries managers and scientists. In particular, two specific aspects of the delivery cycle have been examined:

- how do managers communicate fisheries management questions to the researchers and advisers - that is their need for evidence; and
- how do researchers and advisors communicate the research results and advice back to fisheries managers and wider audiences - that is the evidence delivery.

Consequently, consideration has been given to how communication can be improved between researchers and advisors on the one hand, and fisheries managers on the other.

2. Approach

The main part of the study comprised 'paired' interviews in six countries represented in MariFish (Denmark, France, Greece, Norway, Spain, and the UK). In each case, researchers and advisers were interviewed first using a semi-structured approach based on questions reproduced in table 1. This was then followed up by interviewing their customers, the fisheries managers, using the questions reproduced in table 2. The first part of the interviews with the fisheries managers was concerned with testing the understanding developed from the interviews with the corresponding researchers/advisers. With one exception, all the interviews were carried out by Dr John Holmes (the consultant for the study) and Dr John Lock (the coordinator of MariFish). In all, 20 people were interviewed: their contribution to the study is gratefully acknowledged.

The findings of the interviews for each of the six countries are summarised in annexes 2 to 7. In each case, drafts of the write-ups presented in the annexes were provided for comment to the interviewees.

In addition to the interviews carried out with researchers and fisheries managers, the Chair of a Regional Advisory Council (Sam Lambourn, North Western Waters RAC) was interviewed to get a view from the fishing industry. Also for those MariFish member countries where interviews were not carried out, an electronic questionnaire was used to seek views on the two key questions set out in section 1 above. The results from the questionnaire and from the interview with the Chair of the Regional Advisory Council are summarised in annex 8.

A short literature review was conducted to enable the findings from the interviews and questionnaire to be interpreted in the context of relevant previous studies of research communication. The literature review is presented in annex 1 (together with a bibliography) and summarised in the next section.

3. Literature Review

A strong message of the literature reviewed was the need for a close interaction between scientists and the 'customers' of research and advice in **establishing evidence needs and setting research questions.** Where other stakeholders have a legitimate interest in the issues being addressed, they too should be involved in the question setting process. Customers should continue to interact closely with the scientists through the research and evidence gathering process to ensure that their needs continue to be accurately reflected in the work being undertaken.

An important objective of these interactions is to build mutual trust, and relationships that last beyond the particular study. However, such interactions and relationship building should not compromise research impartiality and independence.

In respect of scientists and fisheries managers, one paper points to a divergence of role identities and expectations which can lead to a breakdown of communication and cooperation. Scientists and fisheries managers may prioritise different aspects of advice: for example, scientists tend to put greater emphasis on the credibility of advice, fisheries managers on its salience. The paper concludes that scientists and fisheries managers must consequently work harder on ways to meet each other's needs and should enhance two-way communication in order to foster understanding and cooperation.

With regard to the **communication of advice and research results,** several reports point to the need for greater weight to be put on the dissemination and synthesis of research results. The potential diversity of users should be recognised, and results presented in ways that will be understandable from their perspectives. Jargon should be avoided. The reviewed reports point to the need on the one hand, for short communications focusing on key messages, and on the other, for full accounts, explaining assumptions, methods, uncertainties etc.

Customers for the research and advice will weigh the information according to their previous knowledge and experience, and in relation to their current views on the issues addressed. A sense of ownership will help adoption of the results.

Dissemination activities should aim to make use of multiple channels of communication – formal and informal. Routes and mechanisms for bringing research results to the attention of users include:

- recognising the availability of information as a first step, better electronic, web-based databases of project reports;
- training, networks and person-embodied knowledge;
- face-to-face meetings enabling users to question researchers;
- policy briefs and science cafes;
- the media; and
- "hands-on" involvement of users in the final research project stages, testing prototypes of databases and models through simulation exercises etc.

In a society in which scientific expertise and the scientific underpinning of decisions is increasingly challenged, ensuring due process in the development, use and communication of science is a key dimension of stakeholder engagement. Openness and taking a proactive approach to communication are important factors. Stakeholder engagement should be seen as extending traditional approaches for assessing scientific quality.

Stakeholders need to be made aware of what information is available and how it may be obtained. Scientific information should be translated into suitable forms that respond to the needs of the diversity of potential audiences. Care needs to be taken in disseminating non-definitive, controversial or alternative views to the public. Interpreters and intermediary organisations, networks and workshops can play an important role in facilitating interaction between experts, policy makers and the public.

4. Findings

Working from the information presented in annexes 2 to 8, this section draws together the main findings from the interviews and questionnaire, relating them to the messages emerging from the literature review where appropriate. Recognising the central role in the study played by the six pairs of interviews, the section first gives an overview of the research institutes and ministries in which interviews were conducted. It then presents the findings on establishing evidence needs and communicating research results and advice.

For all six countries visited the science – fisheries management 'pairing' comprised the main publicly funded research institute concerned with fisheries management on the science side, and with one exception (Norway) the Ministry responsible for fisheries management on the other. In each case the Ministry is responsible for development of national strategies and policy for marine fisheries, for national input to EU and international policy development and negotiations, and for national management of EU structural programmes for the fishing industry. In Norway the customer interviewed sits within the Directorate of Fisheries which supports the development and implementation of marine fisheries policy on behalf of the Ministry of Fisheries and Coastal Affairs, to which it reports.

While there is a close relationship between the research institute and the Ministry responsible for fisheries management in all six countries visited, the formal reporting relationships and funding arrangements vary. Arguably, the closest coupling is in the UK where the research institute (CEFAS) is an executive agency of the Ministry (Defra), which provides around 80% of the institute's funding. Conversely, in Denmark and Spain recent initiatives have moved the research institute away from the Ministry responsible for fisheries management. In Spain the research institute (IEO) was moved from the Ministry of Agriculture, Fisheries and Food and it is now attached to the Ministry of Education and Science. In Denmark the research institute (DTU Aqua) was under the umbrella of the Ministry of Food, Agriculture and Fisheries and is now part of the Danish Technical University.

Similarly, there are significant variations in the sources of funding for the research institutes. While 'typically' the Ministry responsible for fisheries management provide 30 to 60% of the funding, in France for example the main governmental funder is the Ministry for Research. In all cases EU programmes are an important source of funding for the research institutes. Much of this funding is won in competition and is used to augment Government funds in carrying out research projects.

A factor in the decisions in each country on reporting relationships and funding arrangements is the desire to ensure that the research institute is effective in supporting the relevant Ministry responsible for fisheries on the one hand, but is (and is seen to be) independent and driven by a requirement to do top quality science on the other.

For all six research institutes their formal remit includes the carrying out of research and provision of advice on fisheries management in support of their national government. That role includes representing their countries on international committees and working groups, e.g. ICES, ICAT etc. However, they also have a wider role to carry out research on other issues such as ocean science and environment. The main focus of the research institutes is the natural sciences, but some have a limited number of staff concerned with socio-economic issues.

A significant characteristic of the research institutes is their longevity – some have been in existence for around 100 years. Along with this comes long-standing relationships with the Ministry responsible for fisheries management. This is mirrored at the level of individuals: in most cases key staff in the research institute and the Ministry have worked with each other over many years. High levels of trust and mutual understanding have therefore been built up which is an important factor underpinning the effective communication of evidence needs, advice and research results. While this is a strength there is also a recognition that therein lies a vulnerability if key staff move on. Some interviews therefore touched on a concern to ensure good succession planning and to have in place a ‘system’ whose effective operation is not dependent on individual personalities.

Establishing evidence needs

Irrespective of the reporting relationships and funding arrangement discussed above, the main ‘customer’ for the research and advice is in all cases the Ministry responsible for fisheries management. Other Ministries may also act as customers, for example on environmental issues, but this is a relatively minor component of the overall programme. While in several cases the Research / Science Ministry provides a significant proportion of the funding, its interest is generally in the quality rather than the content of the science. Regional administrations within countries also act as customers for the research and advice on issues specific to their locality.

The fishing industry is a major customer for research and advice, generally on near-term issues of stock assessments, management plans and fishing gear. In a more or less formal way, responding to the needs of the fishing industry is part of the role of the research institutes. The fishing industry rarely funds research and one or two research institutes indicated that they are reluctant to accept funding from the fishing industry in case it might be seen to compromise their independence. Several examples were given of schemes to support partnership projects between the fishing industry and the research institutes: funding may be provided from national budgets or from the European Commission fisheries fund. Generally their aim is to involve fishermen in co-commissioning research and to build relationships between fishermen and the research community. The value of such schemes in building understanding between the two communities was stressed in the interview with Sam Lambourn, Chair of the North Western Waters Regional Advisory Council.

In all six countries decisions on specific evidence needs are taken within the framework of multi-year strategies, plans or agreements which may describe arrangements for the management, supervision and communication of the research institute’s work and indicate at a fairly high level the priority areas for research and advice. An annual planning process involving the research institute and the Ministry responsible for fisheries management is then the mechanism generally used to agree budgets and the particular items of work which will be carried out.

A distinctive characteristic of the approach taken to establishing evidence needs and research projects in all six countries is the leading role played by staff in the research institutes. It is they who typically propose what research projects are carried out in response to a broadly expressed statement of needs from the Ministry. They may also have a part in drafting the statement of needs in conjunction with the Ministry. The degree to which the initiative lies with the research institute depends on the kind of evidence that is required: for more basic research the Ministries rely heavily on the research institutes to propose what should be done, whereas they may be more specific about their requirements for more near-term, applied research and for monitoring and advisory activities.

Several factors contribute to this situation:

- through their day-to-day interactions with staff in the Ministry and their involvement in international working groups, staff in the research institutes can develop a good appreciation of the needs for evidence of fisheries managers;
- the long-standing relationships, and high levels of trust and familiarity that result, give fisheries managers confidence that research institute staff are able to anticipate their needs;
- the Ministry does not typically have staff with the level of scientific expertise needed to specify research projects; and
- the interest of fisheries managers in research frequently lies in it providing the underpinning knowledge and expertise so that research institute staff can provide advice when called upon, rather than in the research results per se.

Reflecting on the findings of the literature review, the importance of building trust and long-term relationships is evident in the interviews carried out in this study. In contrast, a more hands-off approach is generally taken to setting research questions and overseeing the research work than is suggested in the literature. The factors listed above go some way to explaining this difference.

An important overall requirement on the institutes' research programmes is that they do generate the knowledge and experience needed to be able to respond effectively to requests for advice from fisheries managers when they arise. Achieving this match often relies on research institute staff being involved in both research and advisory activities and therefore being able to provide the necessary read-across between the two.

The processes of deciding upon the institutes' research programmes generally follow an annual cycle and are iterative. An initial draft programme is typically developed by the research institute in response to an expression of needs by the Ministry. It is then refined and developed in more detail (to the level of individual projects) through review of successive drafts, meetings and dialogue more generally. Such interactions take place between the research institute and the fisheries managers, but also within the research institute where staff may be called upon to make, and comment upon, proposals. The experience of the research institutes is that they may well get good feedback from fisheries managers on aspects of the programme which relate directly to their current concerns, but they are less likely to do so where the research is about longer-term knowledge and capacity building.

During the development of the research programme, stakeholders may be invited to make an input on their interests. For example in the UK, in the major review of the Cefas programme for Defra carried out in 2006, a meeting was held with key stakeholders (fishermen and conservationists) once an outline programme had been developed (but before it was so well developed that it would be seen as a fait accompli). Also, the research programme may be submitted to a programme board for assessment and endorsement. For example in Spain, IEO's framework programme is reviewed by its Council Board which comprises high-level officials from the concerned ministries, the regional administrations, public and regional research institutions, and the private sector.

In some countries, for example Greece, competitive calls constitute an important funding mechanism. In such cases, research institute staff are often called upon to make project proposals, and the research programme consequently emerges from a more bottom-up process. More generally, the research institutes respond to calls made by their national research councils and ministries, and to the calls made by the EU Framework Programmes. Success in these calls provides an important augmentation of funding, enabling specific research projects to be carried out. Research projects funded in this way tend to be more basic and longer-term research: selection criteria are concerned more with the quality of the science rather than its policy relevance.

The processes by which requests for advice are made reflect various levels of formality. In some countries some requests for advice can be rather formal, following pre-defined channels (for example in Spain there is a requirement in law for the Ministry to seek comments from the IEO on new regulations relating to fisheries management). Generally, the issues will have been discussed between the research institute and the Ministry before the formal request is made. Less formal requests for advice may be made by e-mail or telephone, but a number of research institutes indicated that they are trying to bring some increased discipline to the way such requests are made. The close, on-going interactions between the research institutes and Ministries means that requests for advice are generally formulated in ways that are understood and can be answered.

The fishing industry may pose questions directly to the research institutes or via the relevant Ministry. As indicated above, responding to the fishing industry's needs is a part of the role of the research institutes. For example in Norway a forum has been established enabling relaxed discussion between the fishing industry, fisheries managers and the research institute, and which provides a mechanism for the fishing industry to have its say on the institute's research programme.

In several countries there are initiatives to fund collaborative work between the fishing industry and the research institutes. For example, in the UK the Fisheries Science Partnership was established by Defra in 2003 to build relationships between fishermen and scientists, involving fishermen in the co-commissioning of science. It provides an opportunity for the fishing industry to test existing fisheries science, to examine fisheries industry concerns, and to supplement and complement ICES fisheries science to address any limitations identified.

A number of ongoing issues were identified in respect of the identification of evidence needs. A commonly encountered problem is to get good-quality engagement with fisheries managers on longer term and more strategic research questions: fisheries managers face many day-to-day pressures and hence do not have time to think about longer-term needs. The formation of a strategic planning group was suggested, looking at future scenarios and horizon scanning for major threats.

More generally, the value of a strategic research plan was emphasised, helping to provide better anticipation of research needs and to avoid being stuck in a fire-fighting mode. Similarly there is benefit from long-term fisheries management plans (as have been developed, for example, in Norway and the UK), providing a context for the development of research strategies and facilitating the identification of knowledge gaps in a cross-cutting and interdisciplinary way.

With the exception of Defra in the UK, ministries responsible for fisheries management have a rather limited scientific capacity in-house. A number of ministries suggested that they might usefully build a small in-house team of scientists to act as intelligent customers for research, monitoring and advice and to provide a bridge between the policy and research communities.

Where reporting or funding arrangements result in a strong role for the research ministry, scientific quality as judged by academic peers may be emphasised at the expense of policy relevance and utility. Similarly, evaluation of the organisation and the career progression of individuals may depend unduly on their publication record, rather than on the value of reports and advice to fisheries managers. Nonetheless, involvement in high-quality cutting-edge research provides an important underpinning of advice, and is necessary to attract and retain good-quality scientists. An appropriate balance therefore needs to be struck between basic and applied research, which needs to be reflected in the evaluation of individuals and the organisation.

Communicating research results and advice

Consistently with the findings of the literature review, the interviews and questionnaire responses pointed to the need for communication channels to be chosen according to the issue and the audience: it is important to use the right communication pathway.

Research projects may generate a detailed technical report, but more typically fisheries managers are interested in short summaries which provide an interpretation of the research for policy. Such reports are generally made available on the research institute's web site: increasingly, electronic transfer of reports as PDF's is preferred to distribution of hard copies. More generally, web sites are viewed as an important mechanism for reaching a wider audience and are regularly used as a preferred source of information by stakeholders. It is therefore important to keep them up-to-date and provide information in a form which is understandable to stakeholders.

Research institutes may generate annual reports on their research programmes, but some concerns were expressed that if these are too detailed they may be of limited value. In some cases, short update reports are prepared for fisheries managers on significant developments relating to current policy issues. In the UK, the Fisheries Science Unit in Defra prepares a note on the implications for policy of research projects on their completion.

Papers in peer reviewed journals are seen as the prime mechanism for communicating with scientific audiences. Papers to international working groups and conferences are also important ways of communicating with other scientists working on fisheries management issues. Articles in magazines and journals read by fishermen are considered to be an effective way of communicating with the fishing industry. Some of the research institutes also publish their own magazine whose audience includes the fishing industry and fisheries managers at national and regional levels.

The value of face-to-face interactions was stressed. Researchers may be asked to brief fisheries managers on their results and to be involved in workshops to discuss particular issues. Generally the experience is that focused workshops concentrating on a limited number of issues work better than big annual meetings which try to cover the whole of the research programme. Also, informal day-to-day interactions can be an effective mechanism for transferring knowledge. This works particularly well when the fisheries managers and researchers are located close to each other facilitating such interactions.

With regard to communicating with the fishing industry, presentations to their meetings may be helpful. Also workshops on particular issues or to present research results are valuable in enabling feedback and discussion. It is useful to get a first-hand appreciation of the fishing industry's view of the research and of the issues which are important to them. From the literature review, this exposure may be regarded as an extension of the quality assurance process. A strength of the research institutes is being able to talk to fishermen in language that they can understand.

Communication with a wider range of stakeholders and the general public is seen to be increasingly important. The media (TV, radio and the press) may provide the channel for communication with these wider audiences, and some research institutes have specialist staff to prepare press releases, develop media contacts etc. Unfortunately, the media tends to become involved when there is public controversy which is not the best environment in which to explain sometimes complex scientific issues. One example (in Greece) was given of the use of DVDs to communicate research results to a student audience.

The provision of advice is a key mechanism for the transfer of knowledge to the fisheries managers. It is the tacit knowledge of research institute staff, built on the basis of their involvement in the research and in the policy making and regulatory processes, which is of most value. The advice may be in the form of a written note, a face-to-face briefing or a telephone conversation depending on the urgency, scope and level of formality.

The advice requested may typically be to evaluate the potential consequences of fisheries management options or to analyse a particular situation. The research institutes expressed some reluctance about making specific proposals or recommendations on policy options as this may compromise their independence and restrict the Ministry's room for manoeuvre. From the work of Clark et al summarised in the literature review, there is a strong emphasis on the legitimacy of the advice alongside its saliency and credibility.

A specialist team may be responsible for the coordination of advice but generally individuals are both researchers and advisers. The advisory role is one of interpretation and requires an understanding of the workings of the Ministry and also of the research institute. Advisers must be able to explain the science clearly to policymakers and fishermen. Their skills are in short supply and some interviewees talked about the need for a more systematic approach to developing staff as advisers. There needs to be incentives for staff to follow this route which should be rewarded and recognised equally with scientific excellence. Secondments between the ministry and research institutes were suggested as a good way of building the necessary experience.

The quality assurance of the advice is a concern of the research institutes and mechanisms are in place to ensure that there are no mistakes, that the advice answers the question and is understandable, and that it is consistent with advice provided to others. In some cases a review group has been established to take on the quality assurance role. The research institutes set out to provide advice which is helpful and constructive but without compromising the science.

5. Conclusions on good practice

As expected, there are some significant variations between the MariFish member organisations participating in this study in their approaches to communicating evidence needs, research results and advice. However, there are also many similarities and some consistent pointers towards good practice which are summarised here in respect of establishing research needs and communicating research results and advice.

Establishing evidence needs

1. It is important to build good relationships and trust between the research institute and the fisheries managers, based on close interactions and a good understanding of each other's issues and needs. However, care should be taken that the effectiveness of arrangements is not unduly reliant on individual personalities: there is a need for an effective ‘system’ and for succession planning.
2. Arrangements need to ensure that the research programme develops the knowledge and capacity that will be needed to underpin advice in the future, and that there is an appropriate balance between basic and applied science, advice and monitoring activities.
3. The Ministry responsible for fisheries management needs to have sufficient in-house scientific capacity to be an intelligent customer for research and advice, and to engage effectively with the research institute on longer-term research needs as well as more immediate needs for support and advice.
4. A long-term strategic plan for research should be worked up between the research institute, relevant ministries, the fishing industry and other stakeholders to provide a framework for decisions on research projects and to avoid being stuck in a fire-fighting mode.
5. Appropriate weight should be given to both scientific quality and to the relevance and utility of research in deciding on which proposals to fund, and in evaluating the performance of research institutes and individuals.
6. Involvement of the fishing industry and other stakeholders in identifying evidence needs will help to ensure the relevance of research, enable shared ownership of research outcomes, and ground the research in realities. Additionally, it may be helpful at an appropriate stage in programme development for proposals to be reviewed by an independent panel which includes stakeholders and external scientists.
7. Funding research partnerships between the fishing industry and research institutes has been shown to be valuable in creating better understanding and collaboration between the research and fishing communities, and can create a sense of shared ownership of the results by both parties. This may help to overcome historical disagreements on sensitive issues such as stock assessments and the evaluation of fisheries management options.

Communicating research results and advice

1. The channels used to communicate research and advice need to be chosen according to the issue and the audience. Sufficient time and resources should be allocated to communications activities.
2. While detailed technical reports may be needed to provide a record of research results and, in some cases, to support management decisions, short summaries written for the non-specialist and interpreting the research in the context of the policy issue are particularly valuable. Compared to the norm for scientific publications, for fisheries managers and fishermen the emphasis should be on the research results and their implications rather than how the research has been carried out.
3. Peer reviewed papers in good quality journals are the accepted mechanism for communicating with the science community and are needed to maintain the scientific credibility of the research institute. Relevant trade journals and magazines are appropriate channels for communicating research results to the fishing industry.
4. Web sites are a first port of call for those looking for information and should be kept up-to-date and easy-to-use by the various stakeholders that use them. Research reports should be made readily available on web sites and easily retrievable: all stakeholders engaged in an issue should have access to good quality information.
5. Short update reports on topical issues and focused workshops are valuable to both fisheries managers and the fishing industry. Face-to-face interactions provide an important opportunity to allow testing and debate of research results.
6. The provision of advice is a key mechanism for the transfer of research results and should capture the tacit knowledge of the researchers. Quality assurance mechanisms (including peer review) should be in place ensuring the credibility, saliency and legitimacy of the advice.
7. Advisers act as interpreters, playing a key role in bridging between the research and policy communities and requiring a distinctive set of skills. A systematic approach should be taken to developing staff to be effective as advisers, and career paths and rewards should be attractive when compared to focusing entirely on research.
8. The media will play an important role in communications with wider audiences. Good relationships should be cultivated which will be helpful when controversies arise and media interest is at its highest. It may be appropriate to be proactive in releasing results and information to the press.

Table 1: Interview questions for the researcher

Part 1: The present system. How the need for evidence – the management question - is communicated from the customer to the contractor.

Q1. Who is the customer (fisheries manager) that asks the management question and commissions you to undertake research?

Q2. Broadly, how do you reach an understanding as to what the customer needs are for research evidence? Please explain what methods are used by the manager to establish what is required.

Q3. Taking a typical project or area of research, construct a diagram which summarises the process which leads up to the agreed research question, highlighting where you become involved, and explaining who else is involved in the process.

Part 2: The future. How could we improve on the present process of communicating what the evidence needs are?

Q4. What are the strengths and weaknesses of the typical process described in Q3?

Q5. Describe what would be your ideal process for reaching agreement on what the management question is?

Q6. What other suggestions do you have for improving the dialogue between managers and researchers on evidence needs?

Part 3: Communicating the research results

Q7: How are the results of the research communicated to the customer?

Q8. How are the results of research communicated to a wider audience of stakeholders, particularly the fishing industry?

Table 2: Interview questions for the fisheries manager

Part 1: How the management question is developed and communicated to the researcher (contractor).

Set out the results of the interview held with the contractor. Go through the flow chart and the suggested strengths and weaknesses of the current communication process, as illustrated by the typical project or research area. Discuss suggestions made by the researcher for improving on this and any other improvements that can be made. Agree what should go into ‘good practice’ guidance for communicating evidence needs to the contractor.

Part 2: Delivering the evidence

Q1. Broadly, what is the present process that researchers use for communicating the research answer – the research evidence - to you?

Q2. Taking a typical project or research area, construct a diagram which summarises the process which leads to the delivery of results to you, highlighting how you are involved.

Q3. What do you consider are the strengths and weaknesses of this typical process of communicating the evidence? For example is the significance of the results for fisheries management made clear; is the uncertainty of the results explained; is the language understandable? Are the research results translated into a form that is useful to you?

Q4. Describe what would be your ideal process for receiving the research answer from your contractor.

Q5. What other suggestions do you have for improving the dialogue between scientists and managers when it comes to delivering the evidence?

Part 3: Communicating research results to wider stakeholders, particularly fishermen

Q5. How are results transmitted to a wider audience? (Go through the documentation provided by the researcher and discuss how appropriate it is as a means of communicating with wider stakeholders.)

Annex 1: Literature review

A component of the study, reported in this annex and summarised in the main text, has been a short literature review to ensure that the study is informed by the results of previous studies and thinking on research communication. Short summaries are provided in this annex of relevant points made in key papers and reports, collated against two heading: “Establishing the need for research and advice” and “Communicating advice and research results”. A reference listing of the papers and reports reviewed is provided at the end of the annex.

Establishing the need for research and advice

Carden and Neilson 2002 consider the experience of staff working to ensure research uptake in public policy-making in an international development context and point to the importance of interaction between researchers and policy makers during the design of the research, dissemination, and the research process itself, and of building relationships between researchers and decision makers that last beyond the research project.

Delaney and Hastie (2007) point to the divergence of role identities and expectations between scientists and fisheries managers resulting from different cultural understandings and institutional constraints. These conflicting role identities cause considerable frustration for both scientists and fisheries managers, and can result in a breakdown of communication and cooperation. Scientists and fisheries managers may prioritise different aspects of advice: for example, scientists tend to put greater emphasis on the credibility of advice, fisheries managers on its salience. It is concluded that scientists and fisheries managers must work harder on ways to meet each other's needs and should enhance two-way communication in order to foster understanding and cooperation.

Eckley 2001 reports on a workshop held by the European Environment Agency and the Global Environment Assessment research programme of Harvard University (and therefore drawing on the work of Clark discussed elsewhere in this review) on the design of effective environmental assessments. The workshop concluded that participation of users in the planning stages (the “first 5 metres” using the analogy of a 100m race), and through iterative communication with the researchers throughout the assessment process, will improve the likelihood that the assessment will produce results which are salient to them, and hence enhance its salience (see Clark for attributes of salience, credibility and legitimacy). Participation should be “substantive”, not “sitting and listening”. However, participation of users who have clearly defined interests in the assessment’s outcome can risk harming its credibility.

Furman, Kivimaa et al 2006 recommends that different stakeholders should be involved in scoping a research programme at an early stage, for example, through stakeholder seminars or consultations. The involvement of industry is important in programmes that generate industry-relevant or policy-relevant results. NGOs could also be included. The involvement of different stakeholders adds transparency.

Holmes and Savgard (2008) conclude that if research is to be used in policy-making and environmental management, users should be involved throughout the planning and execution stages to ensure the continuing coherence of the research questions and the answers that are needed. The dissemination and implementation of research needs to be properly thought through at the planning stage, and adequate resources and time allocated in project budgets and schedules.

Nutley, Davies et al 2002 draws lessons from a review of experience of using social science in policy making across UK Government departments. In respect of issues associated with planning and management they conclude that better, ongoing interaction is needed between researchers and practitioners throughout the process of research, from the definition of the problem to the application of the findings. This is not cheap or organisationally straightforward and issues of independence and impartiality need to be addressed. They also conclude that "pushing" evidence out is not enough: there is also a need to develop the "pull" for evidence from potential users.

Scott 2000 reviews previous work on research results dissemination, and in particular work by Huberman, and points to the advantages of an interactive style of working where researchers and practitioners jointly define and elaborate research strategies, and where there is "sustained interactivity".

Scott, Holmes et al 2005 summarise the findings of a survey of 100 people working at the science-policy interface in environmental ministries across Europe and in the European Commission. The survey points to the need for researchers to interact with users and stakeholders to identify the right questions to address and to enhance communication. An important outcome of the dialogue between researchers and users is the development of trust. Close linkages, long-standing relationships and trust are vital components if science is to be recognised and utilised by policy makers. However, care must be taken not to undermine the independence of the research. Also, it was recognised that policy makers can find it difficult to articulate their research needs over the medium (2-5 years) and long term.

Scott, Holmes et al 2005b report on the Science Meets Policy workshop held in London in November 2005, which emphasised the need for constant interaction between researchers and users from the start of the research process, including the identification of research questions. Such interaction should be a requirement of funders in the design of research projects, who should provide funding and time for engagement. Where research is intended to inform policy, project selection criteria should include criteria relating to policy relevance, timeliness and usefulness, reflecting a broader notion of quality than scientific excellence.

Wren 2002 reports on an action research project for the Canadian Government to consider how to achieve a stronger integration of the science and policy functions. The starting point for the project was a recognition that scientists and policy makers frequently misunderstand each others' processes, arising in part from the fact that they traditionally connect around end-products (scientific information or finalised policies), and not during the process of setting questions and setting priorities. He concludes that to achieve stronger integration means moving on from the metaphor of a "relay race" – a scientist completes a piece of work and then passes it off to a policy person to run the next leg of the race – to that of a rugby team – scientists and policy analysts run the field together, supporting each other as they go, and achieving goals as a united team.

Communicating advice and research results

Bradshaw and Borchers 2000 point to the science-policy gap as arising from differences in confidence in a given scientific finding between the scientific community and policy makers / society. The way in which uncertainty is treated is key to closing this gap, and requires more efforts to be directed to communication to policy makers and the public. Also, uncertainty needs to be treated in the policy arena as it is in scientific circles: as information for hypothesis building, experimentation and decision making.

Brown 1992 identifies three conditions for useful interactions between researchers and policy makers:

- clear presentation of research material;
- a sense of ownership among policy makers of the results of the research; and
- the need for a suitable forum for communication.

Chuenpagdee and Bundy (2006) analysed 200 papers presented at the Fourth World Fisheries Congress and concluded that communication of scientific research findings, particularly to the general public, was notably absent and emphasised as one of the key challenges in achieving sustainability and in reconciling fisheries with conservation.

Clark, Mitchell et al. 2002 consider how institutions mediate the impacts of scientific assessments on global environmental affairs and concludes that the most influential assessments are those that are perceived by a broad range of actors as having three attributes:

- **Saliency:** whether an actor perceives the assessment to be addressing questions relevant to their policy or behavioural choices;
- **Credibility**: whether an actor perceives the assessment's arguments to meet standards of scientific plausibility and technical adequacy; and
- **Legitimacy:** whether an actor perceives the assessment as unbiased and meeting standards of political fairness.

There are trade-offs between these attributes: efforts to bolster one may be at the expense of another. Also, their relative importance changes as an issue develops. Institutions shape the influence of assessments by shaping the trade-offs between the attributes.

Corten 1996 in seeking to explain a widening gap between fisheries biology and fisheries management points to a lack of direct communication between the researchers and fisheries managers. Consequently the researchers are not always aware of the practical problems that exist at management level and this may result in advice that is of little use from a management point of view. He also points to the lack of incentives for researchers to engage with the policy process as their promotion prospects depend on the number of papers published and on the amount of contract money he or she has acquired for the research institute, not on their performance in their advisory role.

Eckley 2001 continues the analogy of the 100m race, and concludes that participation of users in the last 5 metres can be critical to saliency too. This may include participation in simulation exercises, in querying database systems, or using models. For reports, it may mean making authors available for making presentations and answering questions.

European Commission 2001 points to the increasing challenges to scientific expertise, and indicates that lack of transparency in the way expertise is selected, used and diffused undermines the legitimacy of the policy process. It concludes that much more needs to be done to improve the interactions between expertise, policy making and public debate and focuses on the concept of "democratising expertise" which concerns ensuring "due process" in the way in which expertise is developed, used and communicated. It is about extending the traditional approaches for assessing quality.

The report points to the need to translate information into suitable forms (eg synthesis documents) for democratic institutions and the general public to ensure that they have access to relevant and useable knowledge, while avoiding information overload. Also, the role of the mass media is important, and improved communication is needed between the media, experts and policy makers.

It concludes that a proactive communication strategy, taking account of the diversity of target audiences, should be implemented, aimed at informing stakeholders of what is accessible and how. Simplistic "black and white" messages should not be provided. Rather, the strategy should ensure that uncertainties and controversies are made explicit. A balance needs to be struck in respect of making available information that has not yet been quality assured, and information made available setting out the "track record" explaining how evidence was produced and used. Intermediary platforms or organisations are considered to be useful in facilitating interactions between experts, policy makers and the public. They may be "intermediary institutions" (eg the Danish Board of Technology or the Rathenau Insitute in the Netherlands) or can be virtual platforms such as networks, workshops or journals.

European Commission 2002 recognises the controversy frequently associated with the use of science in policy making, and the need to ensure that stakeholders and the public at large are convinced that decisions are sound. It points to the need to ensure that the process followed is sound, not just the policy outcome, and establishes guidelines on the use of expertise in the Commission (with a view that they should, over time, form the basis of a common approach for all institutions and member states).

It describes three general principles of quality, openness and effectiveness. With regard to openness, transparency is considered a key precondition for more accountability for all involved. It requires a strategy for proactive communication, in which the scientific advice is made understandable to non-specialists. Scientific advice and underpinning documents should be made available to the public as quickly as possible. Nonetheless, the level of openness should be tailored in proportion to the task in hand.

Experts should clearly highlight the evidence upon which they base their advice, as well as any persisting uncertainty and divergent views. The status of documents should be made clear, and it may be appropriate to publish for comment advice in provisional form. On sensitive issues, informed and structured debate should be facilitated between policy makers, experts and stakeholders.

European Commission 2003 examines exploitation and dissemination of research results from 34 Framework Programme 4 and Framework Programme 5 projects and concludes:

- That while dissemination is promised in project proposals it is mostly passive and not pro-active. Researchers often have limited interest in dissemination outside of the academic world.
- Initiatives are needed to link research projects more directly to potential clients in the Commission and national ministries.
- Dissemination starts with availability and better electronic, web-based databases of project reports are needed.
- A European Research Paper series is needed which reduces the time-span to publication, is inexpensive to access, and provides a platform for a first publication of research results.
- Increased exploitation would result from dissemination being organised as part of the research projects themselves.

Faulkner 1995 concludes that to improve knowledge flows from public sector research, the number of communication channels should be increased rather than the number of formal linkages. This is because knowledge use tends to be “bitty” and through coalescence, and hence cannot be planned at the micro level – instead one has to set up suitable structures and cultures. The model is one of “dating agencies” rather than “marriage brokers”.

Furman, Kivimaa et al 2006 consider that indispensable features related to dissemination include a communications or dissemination plan for the programme and/or projects, information in popular and professional language in addition to scientific reporting, the reporting obligations of the management team to be continued after the programme, and a budget allocated for stakeholder communication on project and programme levels. These elements can be facilitated by allocating time for identifying relevant stakeholders, ensuring the presence of high-level officials in workshops and seminars, having stakeholders present on programme boards or steering groups, and marketing the research programme and its projects in different stakeholder events and forums. It can also be useful to assign specific people to translate research results for general use.

Green 2006 indicates that, despite many initiatives over recent years, Europe's performance in disseminating its research results through the mass media is poor and the European media are largely dominated by North American research news. He considers that the role of media liaison staff - the press officers and information officers who day by day ensure that the work of the organisation gets accurate and appropriate coverage in the media - is not given sufficient priority. Consistent, planned and professional media relations are not a common characteristic of the European Research Area.

Holmes 2005 reports on a survey in the UK of 70 people working at the science-policy interface to identify barriers to the better use of science in environmental policy making and regulation. The survey points to the translation role from research to policy inputs as key, but under-resourced, and where the necessary skills are in short supply. It also identifies the communication of uncertainty in a way which is useful to policy makers but true to science as an important challenge, and where there is a need for an enlightened view shared between policy makers and scientists of the provisional nature of scientific knowledge.

Holmes and Savgard (2008) conclude, on the basis of an extensive study of environmental ministries and regulators in Europe, that in communicating research results the channel and content need to be tailored to the audience: one size does not fit all. An understanding of the audience should be developed, preferably through interactions during the research phase, so that messages can be conveyed in a way that is readily assimilated. In an age of information overload, succinct messages in clear language are required. Wherever possible, an opportunity should be provided for face-to-face interaction between researchers and users so that issues of interpretation can be resolved.

Koolstra, Bos et al (2006) compare the merits of television and the Internet for communicating science to the general public. Based on empirical studies conducted in Europe they argue that television should still be regarded as the more important medium for science communication, because:

- people use television more frequently than the Internet;
- television is more effective in transferring messages to the public than the Internet; and
- people have more trust in television than in the internet as a reliable information source.

People who intentionally search for scientific information use the Internet frequently and the medium offers many possibilities to find a broad scope of background scientific information. A big advantage of the Internet is that looking for information can be done at any time of the day. But a disadvantage, also recognised by Internet users, is that much of the information on the Internet is of dubious quality and reliability.

Television is an important medium to initiate and stimulate interest in science, because it may expose people to scientific information in an unintentional way. Once television gets people interested in science, they may explore other means of information exchange such as the Internet.

Lievrouw 1992 proposes four characteristics of scientific fields that practice effective communication:

- they have a clear statement of goals;
- their members communicate frequently and across institutional boundaries;
- their main “problem” relates clearly to other more familiar issues that are of interest to key audiences; and
- their members popularise their principle messages and findings.

Nutley, Davies et al 2002 in drawing lessons from a review of experience of using social science in policy making across UK Government departments conclude that promulgation of individual research findings may be less appropriate than distilling and sharing pre-digested research summaries. Multiple channels of communication – horizontal as well as vertical networks – may need to be developed in parallel.

Recommendations for research commissioners for improving dissemination are identified as:

- time research to deliver solutions at the right time to specific questions facing practitioners and policy-makers;
- ensure relevance to current policy agenda;
- allocate dedicated dissemination and development resources within research funding;
- include a clear dissemination strategy at the outset;
- involve professional researchers in the commissioning process;
- involve service users in the research process; and
- commission research reviews to synthesise and evaluate research.

Pinholster and O'Malley (2006) report on an online survey of over a thousand reporters and public information officers conducted in 2006 by EurekAlert!, the science-news Web service of the American Association for the Advancement of Science. The survey revealed that reporters' concerns are to learn about breaking science-news stories before the information reaches either competitors or the public. Beyond these usual news-reporting concerns, however, finding researchers capable of explaining science in an understandable fashion was the task most frequently cited by reporters as challenging. Obtaining photographs or other multimedia materials to help convey complex scientific content, and judging the trustworthiness of research or researchers, followed as the reporters' biggest challenges.

The reporters indicated that the top issues affecting public trust in science are:

- research findings being "hyped" or overstated by press officers, reporters, funders or researchers;
- ambiguous findings or scientific uncertainty; and
- the intersection of science with values, morality or politics.

The reporters indicated that their top peeve is press officers or researchers who respond too slowly to media queries. Press officers indicated that researchers should "talk up the research" but avoid hyping results.

Quevauviller 2005 points to current problems in relation to research to support implementation of the Water Framework Directive as a lack of transfer mechanisms to policy makers and stakeholders – relevant information therefore stays in the specialised technical community – and communication difficulties linked to the different jargon in different communities.

Rayner, Lach et al. 2005 consider the experience of the uptake of research information (climate forecasts) by water resource managers in the USA and concludes that if new information indicates a departure from past experience and established procedures then the users (the water resource managers) tend to formulate negative perceptions of information reliability that hinder its acceptance. Externally generated information is unlikely to be influential in an organisation's decision making unless it is incorporated in internal reporting in a fashion that renders its origins almost invisible to its ultimate users. Integration of new information into the decision making process is a challenge of articulating the information within an organisation's frameworks of meanings and collective action, not merely a problem of removing exogenous barriers to information. Translators, whether in-house or employed as external consultants, play a key role in getting information into organisational decision processes.

Scott 2000 reviews previous work on research dissemination and identifies training, networks and person-embodied knowledge (often tacit or uncodified) as important, in addition to transmission through documents. The mass dissemination of information is costly and ineffective in transferring knowledge that can actually help improve policies. Policy makers do not generally actively seek knowledge – research knowledge "must be expressed, communicated, channelled, explained or otherwise distributed to policy-makers if it is to affect policy decisions".

He concludes that the user community is not uniform – many different sorts of users seek to use research in different ways and for different purposes - and users are not passive targets, they will weigh new information against the constructs and experiences they have built up throughout their lives.

He also describes the experience of research dissemination by the UK Global Environmental Change Programme (a programme funded by the Economic and Social Research Council) which drew the following conclusions on good research dissemination:

- look at the subject from the audience's perspective, not the researchers;
- assume that most readers are not specialists in the area;
- identify the key messages, concentrate on them and don't be afraid to repeat them;
- keep documents short for rapid reading and repetition;
- ensure the use of clear language;
- make the most of each product;
- be opportunistic, particularly with the media; and
- emphasise appropriate messages for different audiences.

Scott, Holmes et al 2005 conclude that while dissemination is sometimes criticised as being based on an unrealistic notion of knowledge creation, diffusion and uptake, there is still an important role for dissemination. The accessibility of knowledge can be enhanced through various kinds of meetings and publications/websites, and the careful use of the mass media. These activities take time and resources and need to be built into research plans (for example the UK's Government Department for International Development requires research projects to allocate 10% of the funding to communication with non-academic partners).

Scott, Holmes et al 2005b report on the Science Meets Policy workshop held in London in November 2005, which concluded that research should not just be published in the form of academic papers. New forms of communication for research need to include: policy briefs from policy-relevant research projects, the use of science cafes, and work with media specialists. Better databases, which are easily searchable and written in plain English, are needed to ensure that scientific knowledge is more readily available to policy makers.

Woolgar 2004 considers the uptake of knowledge from social science research, and reviews three models for the process whereby new ideas are adopted:

- The best ideas will in the end be adopted and there is no need for marketing.
- While the intrinsic properties of the ideas are important they may need some promotion or "assisted passage" to ensure their adoption. The process of dissemination concerns an unchanging idea which needs to be presented to a stable and identifiable audience in terms that that they can relate to.

- The ideas themselves are constituted through the processes of their origin, genesis, take up, interpretation and use. The nature and perceived value of the ideas emerges through processes of interaction between producers and users.

He argues that this last model is the more accurate description of the complex and messy processes of "real-life" dissemination and uptake.

Wren 2002 points to the inherent difficulties of relaying technical information to the policy community in a form that will convey the important knowledge without oversimplifying the science. A particular challenge is conveying scientific uncertainty. Scientists are frequently not adept in this translation role and may need assistance in communicating their knowledge (as may policy makers in interpreting it).

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Annex 2: Denmark

1. Introduction

In Denmark, interviews were conducted on the 5th and 6th March 2008 as follows:

- Dr Eskild Kirkegaard, National Institute of Aquatic Resources, Technical University of Denmark
- Mr Ole Poulson, Head of Division, Ministry of Food, Agriculture and Fisheries

2. National Institute of Aquatic Resources

The National Institute of Aquatic Resources (DTU Aqua) was, until the end of 2007, the Danish Institute of Fisheries Research. Its website is: http://www.dfu.dtu.dk/English.aspx . The Institute was established over 100 years ago and has a long tradition of providing fisheries advice to the Danish Government: this remains its main task. Until 1995 the Institute was a department within the Ministry of Fisheries, but then became an independent research institute under the umbrella of the Ministry of Food, Agriculture and Fisheries.

At the beginning of 2007 the Institute was merged with the Danish Technical University (together with several other government research institutes) as part of a national initiative to focus research at key universities, creating a critical mass able to compete effectively on the international stage. The re-positioning of the research institutes at ‘arms-length’ from government helps to emphasise the independence of their research and advice. The Institute is no longer under the umbrella of the Ministry of Food, Agriculture and Fisheries. This has potentially significant implications for it relationship with the Ministry which are discussed later in this report.

The overall aim for the Technical University of Denmark is that it “will be a broadly founded, top technical university with a business approach and where research goes hand-in-hand with education, innovation and the assistance of public authorities”. Providing support and advice to government is an important aim for the University, sitting alongside and having equal status to, its missions for research, teaching and innovation. Each of these four ‘pillars’ of the University has a director.

The Institute employs approximately 285 people and has an annual budget of around €30 million. It carries out fisheries research with the aim of giving advice on the sustainable utilisation of the living marine and freshwater resources within four main areas:

- sustainable commercial fisheries;
- the development of sustainable aquaculture;
- the optimal utilisation of Danish fisheries resources for healthy and safe products; and
- sustainable recreational fisheries.

The Institute provides advisory services to the Danish Ministry of Food, Agriculture and Fisheries, other public authorities, international organisations, the fishing industry, and other stakeholders. The staff of the Institute also contribute to teaching at Danish universities. The Institute's Vision is to sustain the quality of its research while enhancing its applicability. To achieve this Vision requires that its research is of high international standard, its advisory services are relevant and practical, and its communication with users is open and comprehensible.

The Institute consists of eight departments: four research departments, a department of IT and engineering, a department of administration, and a secretariat for the director. The four research departments are:

- marine fisheries;
- marine ecology and aquaculture;
- inland fisheries; and
- seafood research.

The interviews focused on the work of the department of marine fisheries which employs around 65 staff and whose main work areas include:

- the management of fish stocks and fisheries;
- fish stocks and fisheries - status and forecasts;
- marine ecosystems - status and forecasts; and
- fisheries technologies - selective fishing.

3. Establishing the needs for evidence

The customers

The Ministry of Food, Agriculture and Fisheries provides around one third of the overall funding of the Institute: approximately €10 million annually. It is consequently the main funder and the main customer. Ole Poulson heads the division in the Ministry responsible for this funding and is responsible for ensuring that it secures the required support from the Institute. The Ministry's funding is primarily for short-term and applied research and advice. It also includes survey work, compilation and synthesis of existing knowledge to answer specific questions arising from political and policy process, and assistance to the Ministry in making decisions at the political level.

When the Institute was merged with the Technical University of Denmark, the funding was left with the Ministry. There is therefore now a need for a contract between the university and Ministry defining what will be provided for the funding. There is an agreement on funding levels over five years, but no guarantees.

It is an official policy of the Ministry that there should be good cooperation between fishermen and the Institute's scientists, and that the Institute should respond to the needs of the fishing industry. In this sense, fishermen and the fishing industry are therefore customers of the

Institute's research, survey and advisory work, but they do not fund it. There are, however, a number of partnership projects between the Institute and the fishing industry which are paid for from public money and the European Commission's fisheries fund (for example observer schemes and spatial distribution of cod). They are funded separately from the contract with the Ministry.

There is currently a push from the University to increase the levels of support and services provided to the Ministry of Environment.

The remainder of the Institute’s funding is won competitively from EU funding schemes and from Danish research funds administered by the Research Councils. Some of this funding is used to augment the funding of research projects supported by the Ministry. This co-funding more or less doubles the value of research in which the Ministry has a direct stake.

Communicating the research needs

The governance arrangements for the Institute reflect a progressive move away from direct control by the Ministry (when it was a department within the Ministry), to a separate research institute with a governing body and a signed agreement with the Ministry, to the present arrangement where it is completely independent and delivering services under a new kind of contract. There is an overarching framework contract between the University and the Ministry, within which one of the individual contracts is for fisheries research, survey and advice. The contract covers research, survey and advice in five areas:

- commercial fisheries
- aquaculture
- food processing
- freshwater fisheries
- monitoring of fish stocks.

The contract is drawn up annually and is a document of around 25 pages. It describes:

- the supervision arrangements: comprising an overall steering group and dialogue groups overseeing day-to-day issues in specific areas;
- arrangements for communication and publication (with the Ministry and more generally) of the advice, research and survey results;
- the key topics on which research should focus (for commercial fisheries these are marine modelling, population dynamics, coastal zone management, fisheries technology, and fisheries management plans);
- for each topic, the priorities for the coming year and a specification of what should be delivered.

The document expresses the Ministry's needs fairly broadly and it lies with the Institute to decide on, and plan for the specific activities and projects which will secure the delivery of the agreed outputs. The contract does not specify how much of the budget should be spent on particular activities: detailed planning within the Institute addresses this. There are inevitably some fire-fighting activities that crop up during the course of the year, and the Ministry may ask the Institute to carry out support activities and to provide advice at short notice. Consequent adjustments to the programme are discussed and agreed at progress meetings held every six to eight weeks.

The first draft of the document is generated by Eskild Kirkegaard on the basis of his awareness of the Ministry's needs for support and also of the information needs of the fishing industry. He is uniquely well-placed to do this given that he and his team of eight people act as mediators and coordinators of the support and advice provided by the Institute to the Ministry. He, and other staff from the Institute, are involved in meetings within the Ministry and internationally, and represent Denmark in international scientific bodies such as ICES. They therefore have a good awareness of both the policy and scientific issues. The Institute also has many interactions with the fishing industry and fishermen which provides a good appreciation of their needs.

This approach also relies on the close relationships and trust built up over many years by key staff in the Ministry and the Institute. Also, the Ministry does not have similarly qualified staff and is therefore reliant on the Institute to take the first step in making proposals for the programme.

A substantial proportion of the work programme is a continuation of activities from previous years. The planning process does not therefore need to start from scratch each year and can build on what has been done previously. Before the draft proposal is submitted to the Ministry it is circulated for input and comment within the Institute: each of the 20 or so scientific sections therefore have the opportunity to make an input. Typically, the set of proposals contained in the first draft will reflect a funding level higher than is available. The Ministry therefore has to select which projects should go ahead and which should not. Also, through the ongoing dialogue with the Institute in the regular progress meetings, the Ministry will indicate its key priorities and needs for deliverables.

Once the Ministry has had a chance to consider the first draft, staff from the Ministry and Institute meet to discuss and revise it. Through further dialogue and iteration, the Ministry and Institute arrived at an agreed document. This process is carried out over the period December through January (the planning year coincides with the calendar year). Detailed planning within the Institute follows on from agreement of the contract.

The expressed experience of the Institute is that they readily get clear feedback from the Ministry on their needs in areas such as commercial fisheries where there are close and regular interactions with the Institute, but it may not be so easy in other areas, for example recreational fishing, where there are not such close interactions.

Over the last two planning rounds, since the Institute was incorporated in the university, the Ministry has tended to be more specific about what the Institute should do in the funded programme. The Ministry is concerned to maintain adequate control of the programme in the new arm's length arrangements. Whereas historically the Ministry generally assumed that the institute would know what they wanted, there is now more of a customer-contractor relationship developing.

The Institute is also drawing up a five-year strategic plan within the University's planning system which provides a strategic view of how it intends to develop in respect of the four pillars of the universities mission: research, teaching, innovation and support to government.

Many of the activities funded by the Ministry are short-term: for example to deliver advice, to set up a monitoring system. It does also include some research projects with a three to four year timescale. For longer-term research, the Institute responds to competitive calls issued by the Danish Research Councils. The Research Councils fund long-term basic research: the calls are very open, funding the best ideas. Research Councils also fund more applied and directed calls, but it is still the quality of the science rather than its policy relevance which determines which projects are funded. The Research Councils have a steering group on food (fisheries science is a part of this) on which the Institute has a seat and is therefore able to influence the scope and content of the calls.

Improving the present arrangements

The current informality of interactions between the Ministry and the Institute, and of the way in which agreement is reached on research and information needs, is both a strength and weakness. It is a strength in that it generally works well as it is founded on close and strong relationships built up over many years. But it is a weakness in that the effectiveness of current arrangements is vulnerable to the departure of key staff, and there can be a lack of transparency in the programme budgeting. The continuing evolution of arrangements may appropriately lead to a more formalised approach.

The Institute can sometimes find it difficult to get the Ministry to identify its strategic needs and expressed the desire for more engagement and feedback from the Ministry. It is recognised that staff in the Ministry are overburdened and have to focus on immediate issues to the exclusion of considering their longer term needs for science. There would be some merit of having a small team of staff in the Ministry dedicated to managing the Institute’s programme of research, survey and advisory work and to providing a bridge between the Institute's scientists and the Ministry's policy people. Given the value such a team could add to the programme, it could represent an appropriate investment of a part of the research budget. However, to date, the Minister has considered that present arrangements are working sufficiently well.

4. Communicating the research results

The Institute provides technical reports on research projects when requested to do so by the Ministry. These are typically short reports of three or four pages but may be up to 20 pages. If a technical report is produced it is made available on the website. Rather more substantial reports are generated by projects supported by EU funds, but these reports are not generally sent to Ole Poulson’s Directorate.

More usually, the Ministry is looking for advice on particular questions which draws on the body of knowledge generated by the research carried out by the Institute. An example of a typical request is for the Institute to provide a short report on the benefits to cod populations of introducing a closed area of sea between Denmark and Sweden, in order to support the Ministry in its negotiations with the Swedish government.

Requests for advice may be made at the regular progress meetings between the Institute and the Ministry or by telephone or e-mail. Eskild Kirkegaard's team coordinates the advisory process, fielding the questions to the relevant experts and ensuring the quality of the responses. His team act as 'interpreters' and make sure that the advice is what the Institute wants to say, that it responds appropriately to the question that has been asked, and that it is understandable. They always go back to the individual expert to agree any changes to the wording of the advice.

Scientists can develop their career in the Institute to become more senior scientists or to act as senior advisers. In that latter role they are still expected to do research (which is generally applied research) but will spend a significant proportion of their time providing advice, attending meetings with the Ministry, and sitting on national and international working groups. An important part of their job is to understand the workings of the Ministry as well as the science of the Institute. However, being able to explain science clearly to policy makers, politicians and fishermen is a skill which rather few scientists have.

Advice may be requested on a wide range of issues. The advice is usually provided in the form of a short note: a large number of these are generated each year. The note summarises the available information that is relevant to the question and what the science says about the issue. It will rarely make specific proposals or recommendations because the Institute is aware that the Ministry may need some flexibility and room for manoeuvre in its use of the advice. The Institute is careful not to be seen as a political player and is sensitive to the reactions of the fishing industry.

However, the form of the advice does depend on the question. For example, the Ministry may ask the Institute to compile information on the selectivity of different kinds of fishing gear. In this case, the Institute would summarise the pros and cons of available gear options, and may make recommendations on what would work best for particular fish in particular locations.

It is important that the advice is seen as being from the Institute and independent from the Ministry: this positioning may be helpful to the Ministry in negotiations with other parties. The Institute never gets instructions from the Ministry on what should go into the advice or any requests for changes to the advice. The Institute aims to provide advice which is helpful and constructive but never compromises on the science.

The Ministry may ask for a particular expert to come in and brief them on a one-to-one basis. This may be at an administrative level, or from time to time the minister may request a briefing. Institute staff may also be asked to participate in internal and external meetings as advisers because the Ministry does not have its own scientists. Sometimes they may be asked to take the lead in such meetings, for example on the working groups for the data collection regulation.

Institute staff represent Denmark in ICES working groups, and the Institute communicates the outputs of these working groups to both the fishing industry and to the political level. It is preferred that the outputs are communicated to the political level in advance of being communicated to the fishing industry but this is not always possible. Coordination of press releases between the Ministry, the Institute and ICES can sometimes be problematic. A current initiative is to develop a website that will present the advice from ICES together with information on fish stocks in a user-friendly way. This website will be aimed at the fishing industry and the general public.

More generally, the Institute has close relationships with the fishing industry and is keen to maintain their trust and assistance. Communication with the fishing industry and fishermen is therefore a high priority, and the Institute gives careful thought to the best way to present results to them. One communication channel is that the Institute organises seminars on particular issues, for example on marine protected areas, to which representatives of the fishing industry, the inspectorate's and the Ministry are invited. The initiative for such seminars may come from the Institute or from the Ministry.

Communications with the general public are considered to be important and the Institute actively promotes articles on the TV, radio and in printed media. There are specialist staff in the Institute and in the University who prepare press releases and make contact with the media when there are interesting results to publicise.

The publication of peer reviewed papers is encouraged and this is the main channel of communication with the scientific community. Figure 2 summarises the main mechanisms for communicating research results to key stakeholders.

Figure 1: Identifying research needs

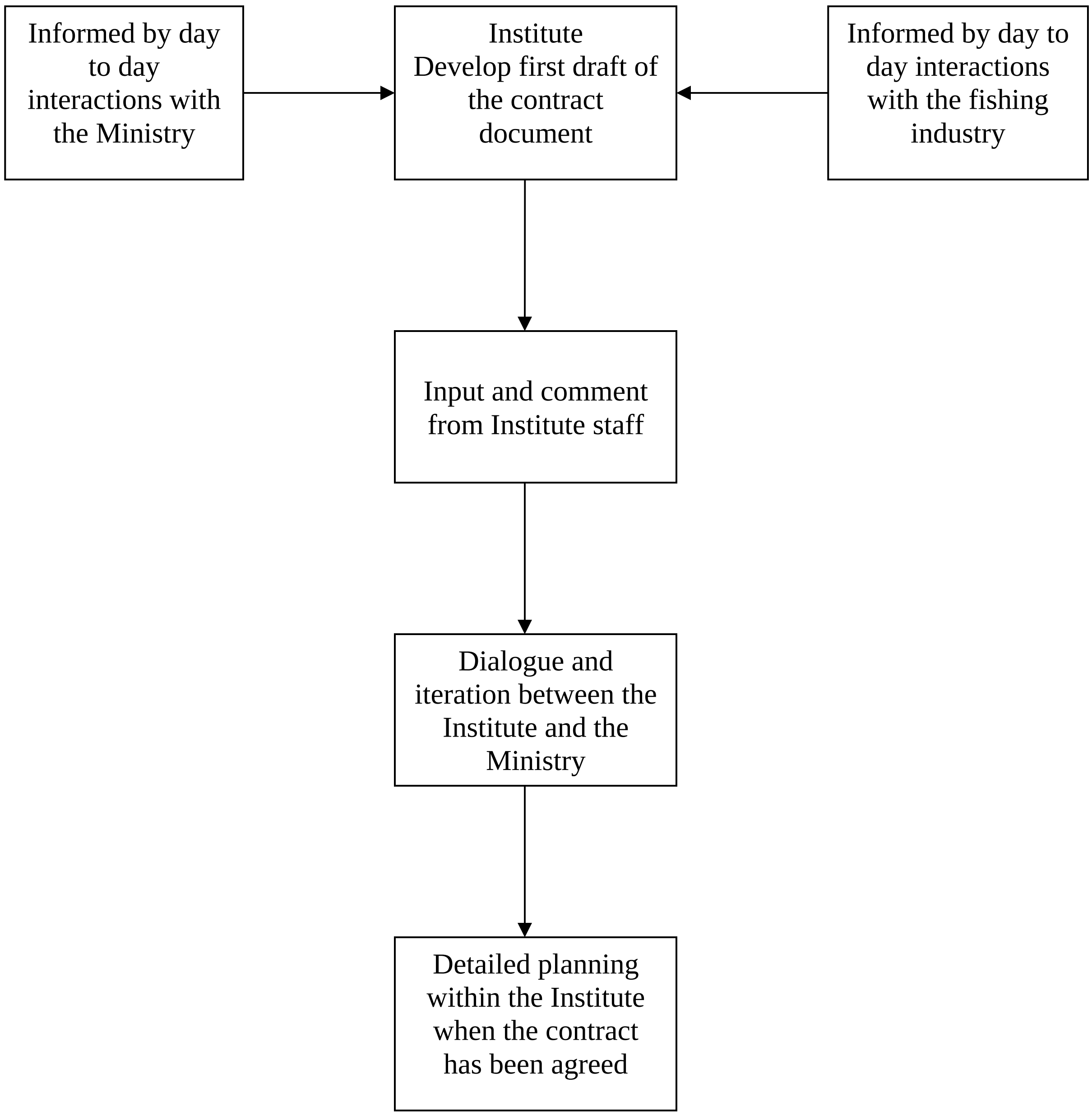
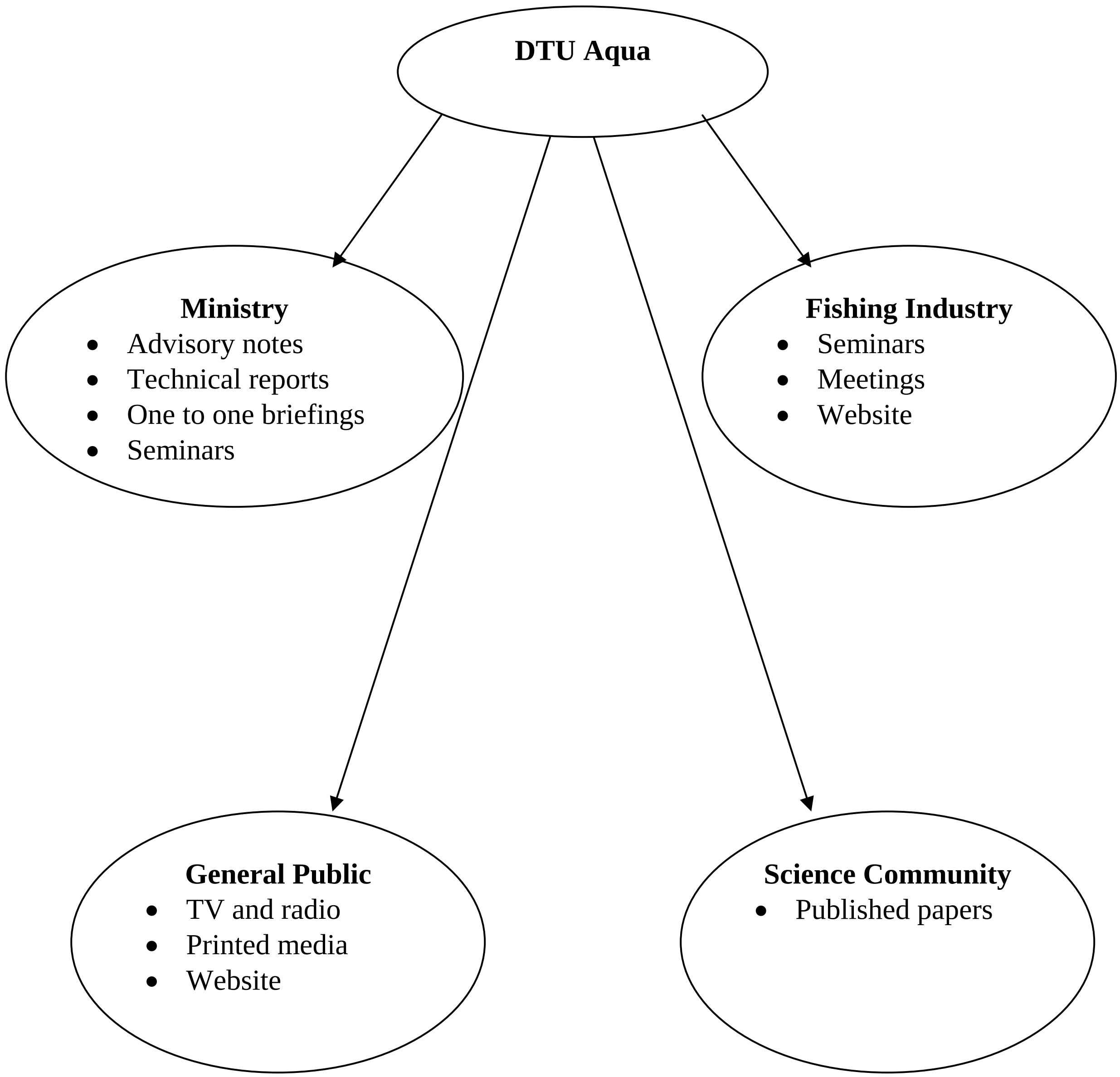


Figure 2: Important mechanisms for communicating research results to key stakeholders



Annex 3: France

1. Introduction

In France, interviews were conducted:

- on 4th April 2008 in Lorient with Dr Alain Biseau, Team Leader, Fishery Assessment and Advice, Ifremer;
- on 6th May 2008 in Paris with Dr Francois Gauthiez, Deputy Director of Marine Fisheries, Ministry of Agriculture and Fisheries; and
- on 7th May 2008 in Paris with Dr Maurice Heral, Director of Programmes and Strategy, Ifremer.

2. Ifremer

Ifremer (French Research Institute for Exploitation of the Sea) was founded by a government order in 1984. It is classified as an EPIC (public industrial and commercial body) under the joint supervision of the Ministers for Research, Agriculture and Fisheries, Infrastructure and Transport, and Ecology and Sustainable Development.

Ifremer's mission is to conduct and promote basic and applied research, expert assessment reports and action for technological and industrial development intended to:

- identify, evaluate and enhance marine resources and enable their sustainable exploitation;
- improve methods of monitoring, forecasting trends, protecting and enhancing the marine and coastal environments; and
- encourage the economic development of maritime activities.

It has five centres, staff based at 26 sites and runs seven vessels. It has 1385 salaried employees (of which around 150 work on fisheries related issues) and its budget in 2008 is €153 million. Around 40% of the budget is for research, 20% for monitoring and the provision of research, and the remainder for maintaining the fleet of research vessels. Ifremer's work is organised in six main themes:

- large facilities for oceanography
- monitoring, use and enhancement of coastal seas
- monitoring and optimising aquaculture resources
- fishery resources, sustainable exploitation and utilisation (the focus of this study)
- exploration, knowledge and exploitation of ocean floors and their biodiversity
- ocean circulation and ecosystems, mechanisms, trends and forecasting.

A4-year contract is agreed with the sponsoring ministries: the current contract runs from 2005 to 2008.

3. Establishing the needs for evidence

The Customers

The Research Ministry provides the major part of the funding for Ifremer and is the main ‘customer’ for its research programme. It is concerned more with ensuring the quality of the research carried out by Ifremer, rather than with specifying in any detail the research to be carried out.

The main customer for monitoring and advice on fisheries is the Ministry of Agriculture and Fisheries. It is responsible for fisheries policy in France: both for negotiations in the EU and internationally, and for policy on fisheries within France's own jurisdiction. The Fisheries Directorate within the Ministry has 60 staff, of which 35 are concerned with fisheries and 25 with aquaculture. The Ministry of Agriculture and Fisheries contributes to (but does not pay all of) the cost of monitoring and advice provision. This contribution is increasing. An important element of its policy support role, is the involvement of Ifremer staff in international working groups and committees.

The fishing industry is also a customer for Ifremer’s work and may come to them directly with questions, or issues may be raised in the first instance with the Ministry. Also, NGOs may sometimes raise issues directly with Ifremer or via a Ministry.

Communicating the Research Needs

The four-year contract between Ifremer and the ministries provides the framework for its research, monitoring and advisory activities. The contract for the period 2009 to 2013 is currently being negotiated. A key decision of the negotiation is the distribution of budget between the different activities. The overall trend is for more of the budget to be spent on monitoring and advisory activities.

The contract defines the research programme at a high level. For each of the six themes it identifies up to three topics each of which is described with just a sentence or two. The initiative on proposals for the research programme lies with the scientists at Ifremer. Over a period of around six months the Ifremer scientists carry out a foresight exercise to develop an inventory of what would be the priorities for the science programme in an ideal scenario where budget and manpower constraints are relaxed. Which of these priorities can be included in the programme then depends on the outcome of negotiations regarding the overall level of Ifremer’s budget and how it is divided between the different activities.

This foresight exercise is informed by analysis of the research programmes of other research institutes, the work of international committees such as ICES, and any available documents reviewing future research issues. Meetings to discuss research needs are held over the six-month period: Francois Gauthiez, the main customer at the Ministry of Agriculture and Fisheries for Ifremer's monitoring and advisory activities on fisheries attended one of these meetings.

In arriving at a view on priorities for Ifremer's research, consideration is given to where Ifremer has a leading position on the science. Ifremer has a freer rein to decide on priorities for more basic research (for example how to take an ecosystem based approach) than it does for research in direct support of stock assessments: here the needs of the Ministry of Agriculture and Fisheries are more closely specified.

In the current exercise to establish the research programme for the four-year contract from 2009 to 2013, the Ministry of Agriculture and Fisheries will express its global needs for research to underpin Ifremer's monitoring and advisory work over the period. This will be at a high level but will indicate, for example, that research will be required on fisheries modelling for stock assessment, on gear technology to decrease impact on ecosystems, techniques for artificial reefs etc. The Ministry of Agriculture and Fisheries does not have a formal process to arrive at this statement of needs. Rather, it is arrived at through a series of internal meetings and informal talks with Ifremer prior to preparation of a formal statement.

80% of the funding of the research carried out by Ifremer is provided by the Research Ministry. Most of the rest comes from research projects won principally in open competitions in the EU Framework Programmes. The four-year contract specifies that Ifremer will take an active role in the Framework Programmes and in the European Research Area more generally. In practice, funding from the Framework Programmes is important in enabling specific research projects to be carried out. Proposals to the Framework Programmes have to fit within Ifremer's strategy and must be approved by the Director of Programmes and Strategy (Maurice Heral).

The four-year contract also states the sponsoring Ministries' requirements for Ifremer to provide advice and expertise. Again, this is at a rather high level setting out three objectives for Ifremer's provision of advice and expertise:

- to provide the public, regional, national and European authorities with Expert Opinions (responses to official consultations) the accuracy of which is guaranteed by Ifremer;
- to provide joint expertise in support of the preparation of official documents, particularly European texts, which have regulatory consequences; and
- to participate in maintaining scientific and technical monitoring on behalf of the authorities, drawing up collective expert reports in support of public policy and to backup national representatives in European groups and international negotiations.

The Ministry of Agriculture and Fisheries funds part of the costs of Ifremer's monitoring and advisory work (the Research Ministry funding covers the remainder). This funding amounted to €1 million in 2007 but it is intended that it will be increased to €3 million per annum in future. This will provide the Ministry of Agriculture and Fisheries with more control over this work. An annual contract is prepared to specify this support activity.

There is a meeting at the start of each year between Ifremer and staff from the Fisheries Directorate (Francois Gauthiez and his team) to discuss the Ministry of Agriculture and Fisheries priorities for advisory work and Ifremer's participation in international meetings. This meeting agrees the baseline schedule for the year, but in practice flexibility is needed as things come up unexpectedly, a recent example being a proposal by the European Commission to close the anchovy fishery in the Bay of Biscay. Ifremer's advisory work for the Ministry comprises three main elements:

- an annual cycle of anticipated meetings (ICES etc) requiring Ifremer representation;
- around 10 formal written questions each year; and
- around 20 to 30 informal requests for advice each year.

Ifremer has a small team of economists who work on fisheries issues, so the questions may relate to economic impacts as well as to issues concerning the natural sciences.

The formal, written questions are increasingly the route taken in Ministry requests to Ifremer for advice. This is helpful in making Ifremer's advisory work more visible. Such written questions come from a senior person in the Ministry to the president of Ifremer. In parallel, a copy is also passed to the head of Ifremer's advisory group (Alain Biseau) so that work can begin in anticipation of the request making its way through the official channel. Typically, the question will have been discussed by staff in the Ministry and Ifremer prior to the request being made. This ensures that the Ministry and Ifremer have a shared understanding of the issue. Timescales for responses vary but are typically around two to three months. A substantial amount of work may be required to provide a response.

Informal requests for advice arise in a more ad hoc way. Requests may be made by e-mail or by telephone, or issues may emerge from meetings between the Ministry and Ifremer. The good relationship and close contacts between the Ministry and Ifremer mean that questions are usually formulated in a way that is understood and can be answered. If there is any ambiguity it is easy to ask for clarification. Questions may relate to national or international issues. Questions relating to national issues may come from the Regional Fisheries Administration's (for example an issue regarding the scallops fishery in Brest).

The Ministries of Agriculture and Fisheries and of Research do not generally specify that research projects should be carried out on specific issues. Nevertheless, it is important to ensure that Ifremer's research programme develops the knowledge and expertise needed to underpin its advisory role. The Ministry of Agriculture and Fisheries does not have a procedure to ensure that the right research is being done to underpin future advice giving. Rather, it considers it to be Ifremer's responsibility to develop research programmes which anticipate the questions and expertise that will be needed. Mechanisms within Ifremer to achieve this include:

- there is one person in Ifremer who is responsible for both fisheries research and fisheries advice: his planning meetings involve both research and advisory people;
- most of the people providing advice are also involved in research and hence are aware of advisory needs in developing research proposals; and
- the wide range of day-to-day contacts between Ifremer and the Ministry enable the anticipation of upcoming advisory needs.

The fishing industry asks a lot of questions either directly or through the Ministry of Agriculture and Fisheries or through the Regional Fisheries Administrations. There are a lot of contacts between Ifremer and the fishing industry, with meetings at local, regional and national levels. Relationships are better now than they were historically. The Ministry may look to Ifremer to build a shared view with the fishing industry on a sensitive topic. When a new regulation is being prepared, typically by the European Commission, (for example a management plan for hake or cod) there is a lot of discussion between the fishing industry, Ifremer and the Ministry.

However, Ifremer generally avoids being funded by the fishing industry to ensure that it maintains its independence. Nonetheless, there may occasionally be a small contract to help the fishing industry on a particular technical issue, for example the implementation of new devices. An example of a successful cooperation between the fishing industry and Ifremer was the development of a proposal to the European Commission for a closed zone for cod in the Celtic Sea. This was initiated by the fishing industry in Brittany in cooperation with specialists in Ifremer. Ifremer carried out simulations of the impact on fish stocks and then talked to the Ministry, who in turn involved the Irish and English governments.

A diagrammatic representation of the process of deciding on Ifremer's research and advisory work is given in figure 1.

Issues associated with current arrangements

The main criterion for the evaluation of Ifremer's work by the Ministry of Research (its main funder) is the quality of its science. A key measure of this quality at an organisational and individual level is the publication record - in particular, papers in peer reviewed journals. Reports prepared for the Ministry of Agriculture and Fisheries (for example the atlas of fisheries for each region), and advisory work more generally, count for little in this evaluation.

The Ministry of Agriculture and Fisheries expressed a concern that this has contributed to a drift over recent years of Ifremer staff away from advisory roles and towards more fundamental research. The view was expressed that in evaluating Ifremer staff advisory work should be recognised and rewarded at the same level as publication in peer reviewed journals. While there are a limited number of Ifremer staff who have a good awareness of the management issues, and are consequently able to respond effectively to requests for advice, more are needed. An exacerbating factor is that any increases in overall staffing levels at Ifremer require a decision in Parliament, so it is not just a question of providing additional funding for such people.

Development of people to be effective in advisory roles would be assisted if they spent some time on secondment in the Ministry of Agriculture and Fisheries (it would also help to improve communications if there were also secondments in the other direction). What is required is to develop people in Ifremer who are familiar with the problems in the Ministry, and people in the Ministry who are aware of the issues in Ifremer. Another approach is to identify young people who will pursue a career in government administration and to enable them to undertake a PhD at Ifremer or another appropriate research Institute. The experience and understanding that they consequently develop will stand them in good stead in an administrative career in fisheries management.

A comparison was made with the situation of fisheries management in the European Commission. Here many people come from a research background and they are consequently very familiar with the concepts and the vocabulary. Staff in the Ministry of Agriculture and Fisheries need the same level of training and skills if they are to negotiate effectively at a European level.

The present arrangement works in large part because of a special situation that has developed in respect of key staff at the Ministry and Ifremer. In particular, Alain Biseau (responsible for Ifremer's advisory work) and Francois Gauthiez (the main customer at the Ministry) share a research background at Ifremer and have worked with each other for many years. Looking to the future, it is considered that there is a good case to strengthen the scientific and technical capacity within the Ministry to act as intelligent customers for Ifremer's research and advisory work. A small team of such people could take a more active role in steering Ifremer's research and would mean that there is less reliance on a fortuitous set of circumstances regarding individuals' background and skills.

4. Communicating the research results

Ifremer meets with its sponsoring Ministries every three months, reporting on progress and its main results, and providing an opportunity for the staff representing the Ministries to ask questions. There is also a meeting each month with the Ministry of Agriculture and Fisheries where the focus is primarily on stock assessment and advisory issues rather than on research results. A report is provided on a quarterly basis to the Head of the Directorate of Fisheries in the Ministry of Agriculture and Fisheries.

Answers to the formal requests for advice from the Ministry of Agriculture and Fisheries are provided in written form: they may be anything from two to a hundred pages long depending on the question. Responses to the more informal request for advice may be through a short note, an e-mail or a telephone call. An example would be a request for a simulation of the impacts of a new management measure for a particular fish stock, in which case the response may be a short note containing one or two tables. Face-to-face briefings are also given, which may sometimes also include representatives of the fishing industry.

A review group has been established within Ifremer to examine the advice to ensure that there are no mistakes, the flavour is okay, and it is harmonised with other items of advice. While this is time-consuming it has been a useful development.

Requests for advice may typically concern, for example, an explanation of the advice provided by an international body (eg ICES) or an evaluation of the likely impact of a proposed international measure at the national level. While Ifremer may sometimes evaluate the potential consequences of proposed policy options, they are reluctant to propose options to achieve a particular policy goal. More typically, they are asked to analyse a particular situation.

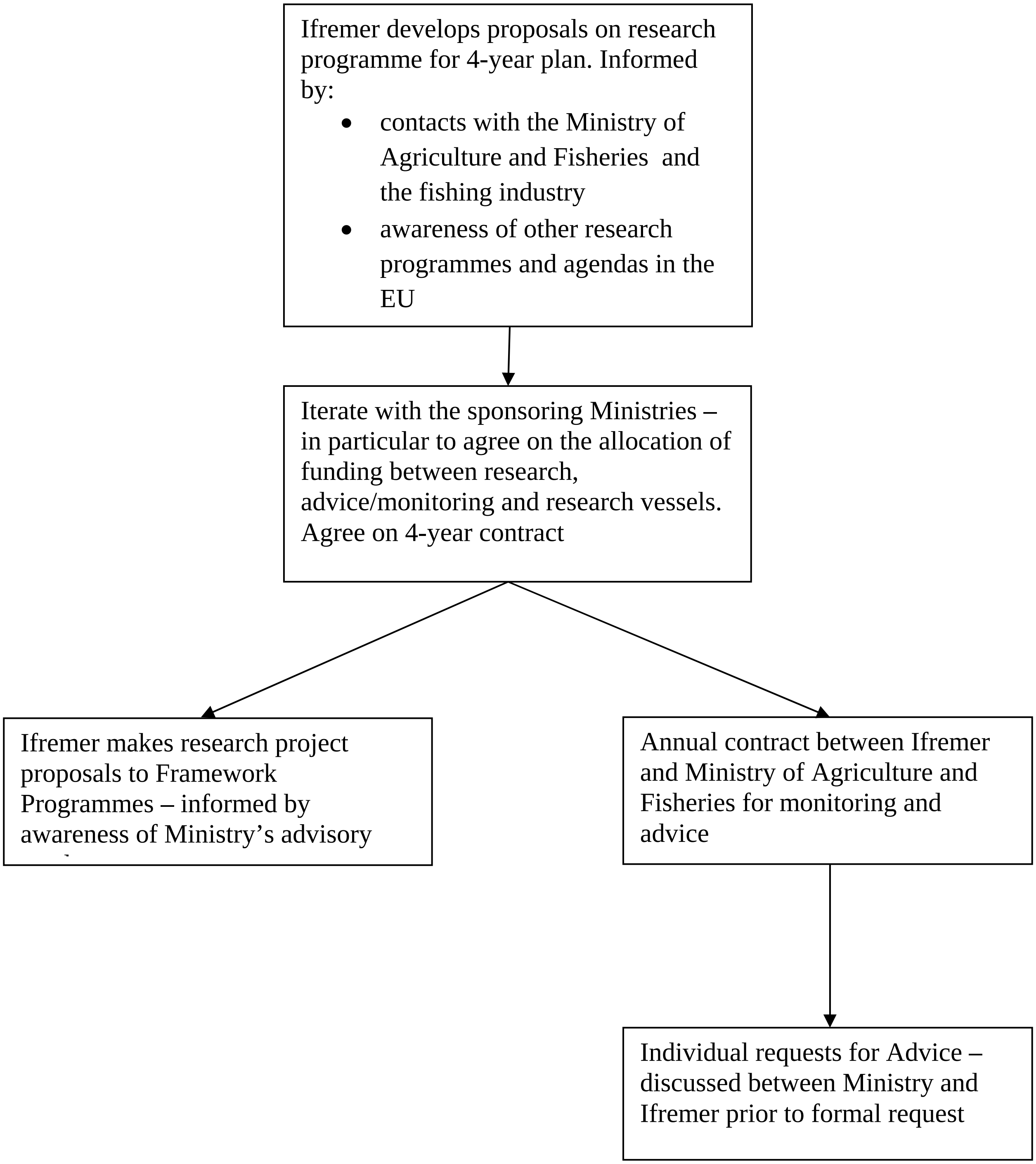
With regard to Ifremer's involvement in international committees, staff members write a short note on their return from a meeting which is sent to the Ministry of Agriculture and Fisheries to ensure that Francois Gauthiez and his team are kept informed on how things are going. They also pass relevant documents considered at the meetings to the Ministry. Ifremer prepares a condensed synthesis of ICES stock information. It was suggested that they might usefully do more, providing an interpretation of ICES advice for France which also folds in the additional information that Ifremer holds on fish stocks.

There is rather little discussion between Ifremer and the Ministry of the results of research projects. This is partly due to habit, and partly because Ministry staff are too involved in day-to-day crisis management. An annual meeting bringing together research and policy staff has been attempted but has proved to be of rather limited value. Smaller and more focused meetings may be more productive. It was suggested that an annual report summarising the results of fisheries research for the Ministry could be a helpful development.

With regard to the fishing industry, the Ministry of Agriculture and Fisheries made an agreement with them three years ago to provide them with greater transparency of the national and international processes leading to decisions on fishing quotas etc. Ifremer meet with representatives of the fishing industry after ICES meetings, explaining to them why ICES arrived at its advice. This is done at a national and regional level. Ifremer also provide a translation of the ICES advice into French. Technical brochures aimed at fishermen are also produced. The Ministry indicated that there would be value in Ifremer taking more of role with the fishing industry, particularly working with them at a local level.

Ifremer also communicates with stakeholders and the public more generally. The Ifremer website is an important channel of communication and they try to ensure that it is kept up-to-date, and is a valuable source of information on fish stocks etc for journalists and the public. They can then make contact with staff in Ifremer if they want to ask follow-up questions. The media are typically only interested if there is controversy, for example arising from international negotiations on quotas etc. This is not an easy context in which to present Ifremer’s work. The Ministry considered that more could usefully be done to inform the general public about fisheries issues in France.

Figure 1: Identifying research and advisory needs



Annex 4: Greece

1. Introduction

In Greece, interviews were conducted on the 4th and 5th February 2008 as follows:

- Dr. Alexis Conides, Institute for Marine Biological Resources, Hellenic Centre for Marine Research; and
- Mr George Giannakopoulos, Director of Department D of the Management Authority of the Fisheries Structural Fund, Ministry of Agriculture, Development and Food.

2. Hellenic Centre for Marine Research

The Hellenic Centre for Marine Research (HCMR) comprises 5 Institutes of: Marine Biological Resources, Oceanography, Inland Waters, Aquaculture, and Marine Biology and Genetics. It was established by the Presidential Decree 164 in 2003 combining two former research institutes (whose origins date back 1912): the National Centre for Marine Research and the Institute of Marine Biology of Crete. HCMR employs 500 staff, of whom around 200 are researchers.

The Institute for Marine Biological Resources (IMBR) was appointed as the Greek Centre for Excellence in 2000. The Institute is headquartered in Agios Kosmas (Hellinikon, Athens) with a regional office in Iraklion, Crete. The aim of the Institute is to provide fundamental and advanced science and advice in the field of fisheries and coastal area management in support of national and E.U. policies for fisheries and coastal area management. The strategy for the development of the Institute is based on the following axes:

- to conduct research and development in the fields of fisheries and coastal zone management;
- to design and deliver technical assistance programmes as well as training and dissemination, focusing on the Mediterranean region;
- to assist the development of international efforts on fisheries and coastal area management; and
- to promote close collaboration with the other Institutes and research laboratories of the H.C.M.R. in complementing research disciplines.

The Institute of Marine Biological Resources conducts research in the fisheries sector focused on supporting national fisheries policy which is required to be in accordance with the Common Fisheries Policy of the E.U. In particular, IMBR focuses its research and development activities on assessment of the fisheries resources of Greece, their sustainable management based on holistic management models, and the management of coastal zones, where fisheries are among the major human economic activities. The research and development plan was based on the following factors:

- the experience gained by the research laboratories of the Institutes during recent years;
- the present socio-economic and research priorities of Greece on the public and private sector levels; and
- international trends, as they are expressed through research and development goals set by the EU and other donors (such as NATO) in various scientific disciplines.

The IMBR – on which this study focused – employs 55 people. The skills base of the Institute includes socio-economics as well as natural sciences. Research in the Institute is organised in three basic, and interlocking, ‘directions’: management of fisheries resources, fisheries and environment, and coastal area management. The main funders of IMBR are the Ministry of Agriculture, Fisheries and Food (around €3 million per annum) and the Ministry of Development (around €2 million per annum). Most of the research income is gained competitively in open tenders.

There is one other fisheries research centre in Greece: the Fisheries Research Institute of the National Agricultural Research Foundation based in Northern Greece. There is good collaboration between the two research institutes.

3. Establishing the need for evidence

The customers

Policy makers in the two Ministries who provide most of the research funding - the Ministry of Agriculture, Development and Food and the Ministry of Development – are the main customers for the research of the IMBR. Many of the needs for research of the Ministry of Agriculture, Development and Food originate in the Common Fisheries Policy. A particular driver is the Structural Programme for Fisheries which requires scientific studies to support the development of measures for Greece and to inform regulatory decisions on particular issues. The underpinning scientific studies for such measures and actions are generally provided to the European Commission to enable them to release funds. The Commission is therefore a customer of the research in this sense, and also as a funder of jointly funded research through the Framework Programmes

A key aim of the research funded by the Ministry of Development is to develop stronger links between the IMBR and the private sector. A requirement of projects is that there should be a private sector partner who is consequently also an important customer for the research.

There are some 17500 artisanal fishermen in Greece. This structural feature, combined with the absence of management schemes for the Mediterranean such as TACs and quotas, limits the interest of the fishing industry in research outputs. However, fishermen will, from time to time, persuade a Ministry to fund research on a particular topical issue, in which case they become active customers for the research.

Communicating the research needs

The research funded by the two Ministries covers similar areas, generally related to environmental and ecological issues, but has a different orientation in each case:

- for the Ministry of Agriculture, Development and Food it is to provide the knowledge they need to establish appropriate measures and to make regulatory decisions; and
- for the Ministry of Development, it is to support industrially-oriented projects which develop better collaboration between the research community and the private sector, and meet the needs of the private sector for information.

The two Ministries maintain contact with each other to avoid duplication of research. This includes sharing their annual reports on their research programmes so that each Ministry is aware of what the other has funded.

Much of the research funded by both Ministries originates in open calls for proposals in which the objectives and requirements are stated rather broadly. A committee comprising relevant experts is involved in the selection process for research projects. It is then for researchers (who may be from the two fisheries research institutes or from universities) to make proposals for research on particular issues which fall within the scope of the call. If the call is made by the Ministry of Development then it is a prerequisite that the researchers develop proposals jointly with partners from the private sector.

When a call is made, it is for individual researchers in IMBR to consider whether it matches their expertise and to decide on whether to make a proposal. Proposals are reviewed by the Institute's Director but it is rare that he will stop a proposal being submitted. Research staff at IMBR are aware of the policy issues and information needs of fishermen in their area and are motivated to make proposals which fill gaps in the knowledge that is needed. Their awareness comes from regular contacts with staff in the Ministries and with the fishing industry, and from their participation in committees and working groups at a national and EU level.

The committee of experts referred to above advises on which proposals should be funded. Selection criteria relate to the quality of the science and relevance of proposed outputs. But consideration is also given to the breadth of coverage of research funding across the relevant research groups in Greece.

In addition to the rather broadly specified open calls described above, the Ministry of Agriculture, Development and Food may also make calls for specific pieces of work to support policy making and regulation. Increasingly, such calls are driven by the Structural Programme for Fisheries which is administered by the Management Authority of the Fisheries Structural Fund: part of the Ministry of Agriculture, Development and Food. The latest programme was agreed in December 2007 and covers the period 2007-2013. The Programme is funded by the European Commission (75%) and Greek Government (25%) and has a total budget of 274m euros. A number of sub-committees were established to inform the development of the programme: the sub-committee concerned with measures relating to fisheries included staff from IMBR as well as from the Ministry.

In order to implement the programme, scientific studies are needed to inform particular decisions and the development of measures. Examples include:

- the development of decommissioning plans for fishing vessels: information is needed to justify decisions on how many vessels of which type and in which locations should be decommissioned;
- decisions to impose a temporary stop to fishing in a particular area due to environmental or contamination problems: information may be needed quickly to justify the decision to stop fishing (and subsequently to re-start it), and to provide estimates of lost income by the affected fishermen to inform compensation decisions;
- the permitting of aquaculture: information is needed on potential environmental impacts and the carrying capacity of candidate locations; and
- the development of technical measures for fisheries in the Mediterranean: information needs include the identification and mapping of biotopes that need protection.

Prioritisation of scientific studies is driven mainly by the deadlines set by the European Commission to use the funds (the final deadline for use of funds from the current programme being 2015).

The method of funding these more tightly specified projects depends on the cost of the project. According to Greek legislation, three types of procedure are allowed:

- up to €90,000 the Ministry may go directly to a research institute, university or private company to commission the study. This type of project typically arises when information is needed quickly;
- from €90,000 to €130,000 a small scale call is required. The funding decision is made by a small committee and at least three proposals are required; and
- above €130,000 a full open call for proposals is required which can be time-consuming, and problems have arisen where unsuccessful bidders have legally challenged the decision.

The process for establishing the research requirements starts with a document from the Management Authority stating their needs. For small contracts let directly with IMBR, the relevant researcher prepares a proposal of some six pages which is iterated with the Management Authority until agreed. This document then provides the basis for a contract for the scientific study. The document includes the following:

- a general overview;
- the objectives of the study;
- the activities to be carried out by the contractor;
- a description of how the research will be carried out including methods and materials needed;
- a project plan and timetable;
- deliverables and how the results will be communicated; and
- the project budget.

When a project proposal has been agreed a committee is established within the Management Authority which oversee the contract, and which receives and approves the deliverables and authorises the payments. The committee is typically comprised of staff from the Ministry (many of whom have relevant technical training) but may occasionally include an expert invited from outside. The committee will usually comment on draft deliverables to ensure that they provide the information needed always in accordance with the contract. Figure 1 illustrates the process for this kind of “single tender” action and also for the open calls.

A significant component of the work carried out by IMBR for the Ministry of Agriculture, Development and Food is the annual surveys to provide the fisheries data to the European Commission to meet the requirements of regulations 1543 and 1639. The annual cost of this work is around €2 million.

IMBR also participates as a partner in a number of projects funded by the EC Framework Programmes.

Improving the present arrangements

It was suggested that a strategic plan for fisheries research in Greece could usefully be developed. This would enable research needs to be anticipated and research priorities to be more clearly established. Such a plan should also provide for continuity of funding so that, for example, monitoring programmes could be maintained to provide much-needed time series data. The fishing industry would need to be involved in the development of the plan so that their needs are appropriately represented.

4. Communicating the research results

For the policy customers the best form to present the research results depends on the kind of research and question being asked. Typically, they need both a detailed report and a summary interpreting the research for policy. The detail is required to provide justification for important policy decisions such as the decommissioning of fishing vessels. For the scientific studies underpinning particular policy decisions the needs for information and analysis may be rather precise. For example, if a temporary stop has been placed on a fishery, the scientific study must generate precise data on the duration of the cessation and the consequent loss of income to the fishermen.

Reports are usually made available on the Ministry's website and also, in whole or in part, on IMBR’s website or other public sites (Geocities etc.). Requests for reports are generally fulfilled by electronic versions on CDs rather than through printed copies.

An important mechanism for communicating the results which is sometimes used is to hold a workshop over one or two days for customers and stakeholders in the research project. This provides for a “public defence” of the work. All those with a potential interest in the research are invited, for example fishermen, the national Ministry, local authorities, the mayor, general public etc. PowerPoint presentations are made describing the research, but most importantly the opportunity is provided for challenge and discussion of the results and conclusions. Such discussion can be quite lively but it is valuable for all parties to listen to each other and to gain an understanding of their points of view. Proceedings of the workshops are prepared and distributed to participants and other interested bodies including the European Commission.

A particular example was a research project on karamote prawn fisheries in the coastal zone of Amvrakikos Gulf, Western Greece. A one-day workshop was held at a local town in which presentations were made on the research, but there were also speeches by local fishermen. Participants in the workshop included the coast guard, mayor, fishermen, the public and students from local universities and technical educational institutes. The consequence discussion was at times quite aggressive but all issues were addressed. It is important that opinions can be given openly otherwise they stay within the boundaries of the organisations and constituencies.

For some projects a DVD is produced which may be aimed at K-12 levels, high school pupils and university level students, or may be used to communicate the research and its relevance to policy to the fishermen.

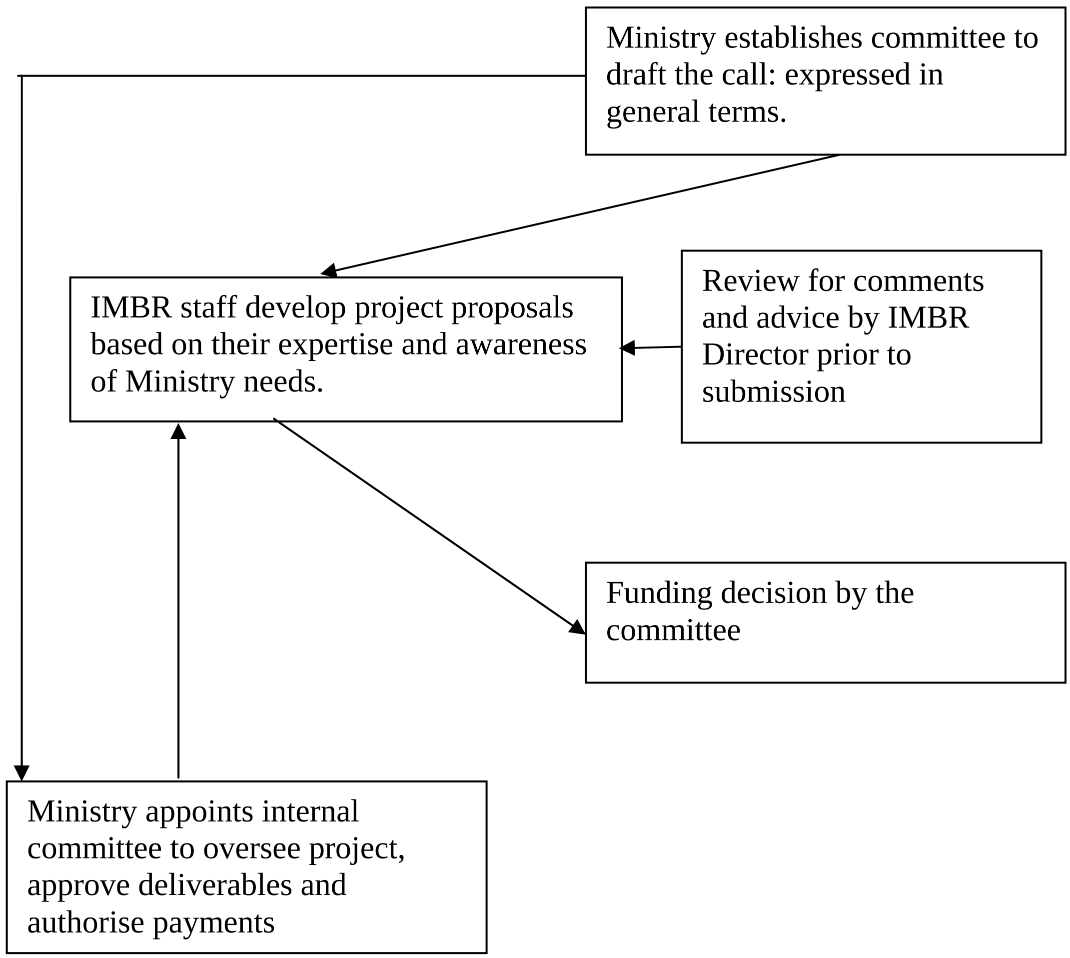
Publication of peer reviewed papers in high impact journals is an important mechanism for communicating their research to the scientific community. They are judged as individual researchers, and as an organisation, on the number and quality of such publications.

Research staff at IMBR are also asked informally to provide advice to the Ministry so this is also a route for the communication and interpretation of the research.

Figure 2 illustrates important communication channels with different groups.

Figure 1: Identifying research needs

For open calls:



Single tenders:

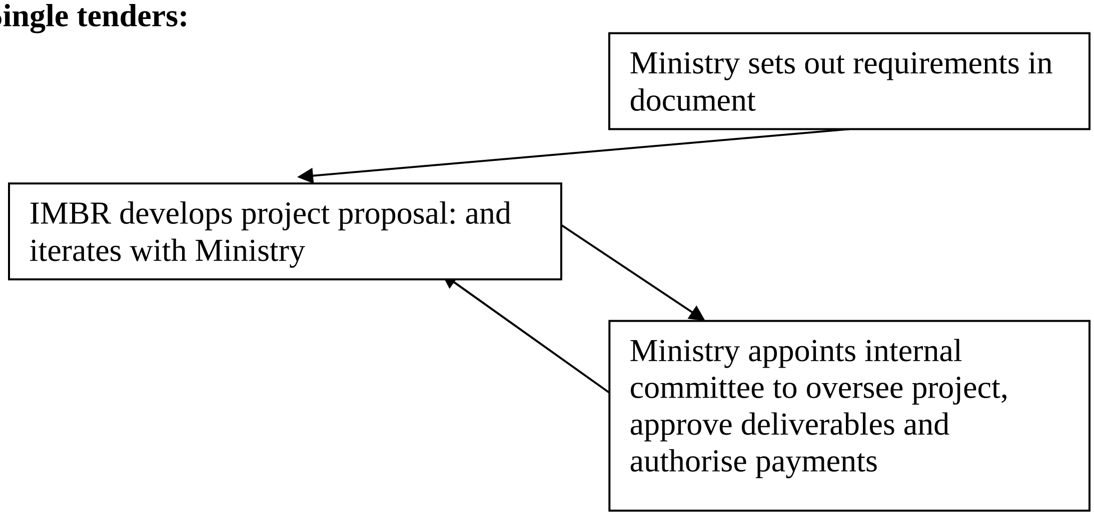
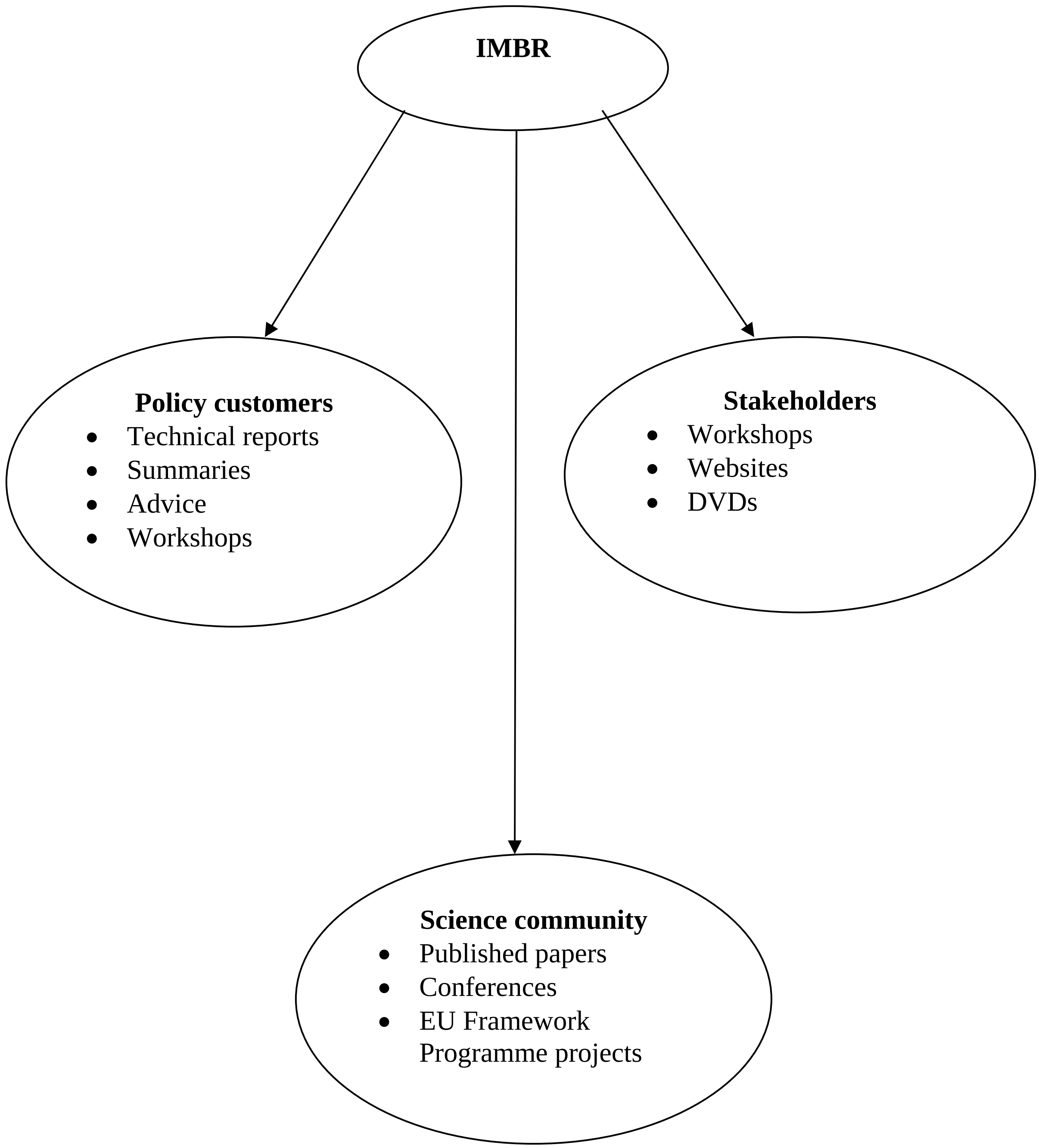


Figure 2: Important mechanisms for communicating research results to key stakeholders



Annex 5: Norway

1. Introduction

In Norway the study focused on the **Institute of Marine Research** and the **Directorate of Fisheries.** Both organisations report to the Ministry of Fisheries and Coastal Affairs. Interviews were conducted on the 9th and 10th October 2007 with:

- Dr Ole Misund, Director for Programmes, Institute of Marine Research
- Dr Per Sandberg, Director, Statistics Department, Directorate of Fisheries

2. The Institute of Marine Research

The Institute of Marine Research (IMR) employs around 700 staff and is Norway's largest centre of marine science (see: www.imr.no/english/main). Its annual budget is around €90 million, of which just over half is provided by the Ministry of Fisheries and Coastal Affairs. Other major sources of funding are the Norwegian Research Council and the European Commission. The Institute's main task is to provide advice to Norwegian authorities on aquaculture and the ecosystems of the Barents Sea, the Norwegian Sea, the North Sea and the Norwegian coastal zone. The aim of the research and management advice provided by IMR is to ensure that Norway's marine resources are harvested in a sustainable way.

The Institute's headquarters are in Bergen, but important activities are also carried out at four other land-based locations and on its five research vessels. The Institute’s scientific staff are organised in 19 interdisciplinary research groups, the Department of Research Support and the Centre of Development Cooperation in Fisheries. Research projects and the provision of advice are undertaken within 10 research programmes: four of which relate to the ecosystems of the Barents Sea, Norwegian Sea, North Sea and coastal zone; the remaining being aquaculture, climate-fish, oil-fish, ecosystems and populations dynamics, biological mechanisms, and MARAENO, a programme on seabed mapping. The Institute concentrates on the natural sciences and does not employ economists and social scientists.

3. The Directorate of Fisheries

The Directorate of Fisheries (see: www.fiskeridir.no/fiskeridir/english) employs around 450 people, of whom around 170 are based in the Directorate's head office in Bergen (a short walk from IMR’s headquarters); the remainder are based in the Directorate’s seven regional offices. The Directorate is concerned with the management of marine resources and aquaculture and its roles are to:

- support the policy-making process through provision of analyses, statistics and advice, and through work on legislation and regulations;
- carry out management tasks to implement political decisions, process applications and appeals, and conduct monitoring and control; and
- work in partnership with trade and industry, the research community and other public services and share its knowledge with various stakeholders and the general public.

The head office is organised into three main operational departments - for resource management, aquaculture and coast, and statistics - together with supporting departments for administrative affairs, corporate communications and information technology. The Directorate was founded some 105 years ago and until the late 1980s included the Institute of Marine Research as one of its departments. The Institute was devolved as a separate body as a result of the recommendation of a government commission that it should be independent.

4. Establishing the need for evidence

The customers

The main funder of the Institute's research programme is the Ministry of Fisheries and Coastal Affairs who are consequently its main customer. The Directorate of Fisheries, as a sister body under the umbrella of the Ministry, is also an important customer for its research. A more integrated approach to the management of "coastal affairs" means that other ministries, for example of environmental affairs, oil and energy, and foreign affairs, also have an interest in the Institute's research. The fisheries industry is an important customer as increasingly are others, for example the oil and gas industry.

Communications with the Ministry: the planning process

The nine-month annual science planning and budgeting round involving the Institute, Ministry and Directorate is summarised in figure 1. Much of the impetus for developing proposals for both the research and monitoring programmes comes from the Institute, informed by its staff's appreciation of the Ministry's and Directorate's needs developed through close interactions over many years. The Ministry gives an overall steer, indicating what issues it requires the Institute to address and the ways in which it will be looking to the Institute to provide support and advice. In a formal sense, it provides this steer in a one-page summary of overall priorities in the budget White Paper in October, and in the letter of intent (which runs to some 30 pages) issued to the Institute in December.

The letter of intent specifies the main directions for the Institute's science programme for the coming year along with its budget, strategy, the structure of its science programme, its cooperation with other bodies, and the Ministry's need for support (for example in international negotiations) and advice. It may specify specific tasks (examples being a requirement to establish population numbers of hooded seals in the western isles, or to carry out particular ocean mapping exercises), but more usually indicates required areas of research at a fairly high level. It is left to the Institute to develop the projects that make up the programmes. The timing of the letter of intent just before the start of the planning year is both a strength - the national budget has been set and it can be informed by the meetings of the relevant international bodies (for example ICES) which take place in the autumn, and a weakness - it means that project level planning has to be carried out in advance of its receipt and adds a degree of uncertainty to the planning process.

The 'formal' planning process takes place between the Institute and the Ministry. However, in parallel with the formal process, there are many informal interactions at different levels, including dialogue between research scientists in the Institute and policy advisers in the Ministry. Typically, staff at the Ministry are not natural scientists, and hence they cannot generally specify in detail what research should be carried out at the project level. Also, the current project structure is arguably too detailed and can be an obstacle to more productive dialogue on research needs. However, effective dialogue between researchers and Ministry staff is important so that the Ministry's broader perspective is appropriately reflected in the Institute's programme and project proposals. The Ministry's staff includes economists, social sciences and lawyers: disciplines not represented in the Institute's staff.

Communications with the Directorate

Informal interactions between the Institute and the Directorate continue through the planning process to ensure that the Directorate's needs are reflected in the programmes and projects. Whereas the Ministry's interests tend to be strategic -what to do - the Directorate's interests tend to be more tactical - how to do it. The Directorate may therefore seek to specify its interests at the project level. An example would be: we have a problem with discards, can we develop more selective gear?

The Directorate will also influence the letter of intent through its interactions with the Ministry. A key strength of the interaction between the Institute and the Directorate is their close physical proximity, and the good dialogue and development of relationships which that proximity facilitates. Staff at the Institute are keen to be involved with the Directorate in addressing the real-life management problems.

Communications with the fishing industry

It is important also that the Institute is aware of, and responds to, the needs of the fisheries industry. A forum was therefore established some 10 years ago which provides for relaxed discussion between the fishing industry and the Ministry, Directorate and Institute on a range of issues associated with the management of marine resources. The forum meets twice a year and provides the opportunity, amongst other things, for the fisheries industry to have its say on the Institute's research programme. Meetings are held in the early spring prior to the start of the planning process, and in November when the budget has been set and the Ministry has indicated what the research priorities should be.

Meetings are 'off the record' which means that people can speak freely rather than feel that they have to defend established positions. They are held over two days which means that the 15 or so people attending can have a good social interaction in the evening. Research questions posed by the fishing industry tend to be rather narrowly focused on particular current issues and particular fish stocks. It is hoped in future that discussions may enable more strategic needs to be identified.

The role of the Norwegian Research Council

The Ministry also funds research on fisheries issues through the Norwegian Research Council which has research programmes on the sea and coast and on aquaculture. This is generally more basic research than is funded directly with the Institute. The Institute is encouraged to respond to calls by the Research Council for research proposals, as success in such open competitions is a good indicator of the quality of the Institute's science and scientists as judged by their academic peers. However, the Institute can sometimes lose out in such competitions because its research proposals are considered by academic peers to be too management oriented (and hence should be funded directly by the Ministry). A more positive feature is that the discretion allowed to the Institute in developing research at the project level enables it to develop lines of research which may be worked up as project proposals to the Research Council. Consequently, some projects may be part-funded by the Ministry and partly by the Research Council.

Some general communication issues

A generic tension between the Institute, Ministry and Directorate is that staff in the Ministry and Directorate may tend to focus on their short-term needs, while scientists generally have a longer term outlook. It is therefore important that the research goes forward on a broad front creating the capability to answer specific questions when they arise. Nonetheless, it is recognised that there is scope for improving the process of defining the research questions relating to more strategic issues, for example climate change impacts, understanding the ecosystem etc. A strategic planning group looking at future scenarios and horizon scanning for major threats might usefully be established. But it can be genuinely difficult to anticipate the particular management issues, and consequently questions, that will arise. When they do, it may be best for the researchers and managers to sit down and work up the answer together.

Management plans developed for the Barents and Norwegian Seas represent a new way of thinking in which the development and impacts of relevant industries are projected over a period of 20 years or so. The process of developing these plans enables knowledge gaps to be identified in a more cross cutting and interdisciplinary way, and provides for a more robust approach to identifying research needs.

The point was made that there is a weakness in the European Commission process in that that there is no direct link between the regulatory regime and the research. For example if the regulatory regime identifies the need for a cod recovery plan, there is no direct way of commissioning research to fill any gaps. In fact the same problem exists in ICES which has no funds but comes up with priorities for research. This is handled better in Norway since the letter of intent takes into account international meetings, for example with the Russians over management of the Barents Sea.

More generally, there is a need for better collaboration between nations: an issue which MariFish is tackling.

5. Communicating the research results

Important mechanisms for communicating the Institute's research results are summarised in figure 2 for some key stakeholders.

Research reports

The Institute publishes a report in October each year summarising the results of its research projects. This report is 300 to 400 pages long and its main audiences are staff in the Ministry, Directorate, and Research Council. Until now, the report has been structured according to the Institute's research groups. But in future it will be structured according to the Institute's research programmes, reflecting the transition from a hierarchical to a matrix organisation. The report is written in Norwegian but includes summary text boxes in English. Some feedback from the Ministry suggests that staff can find it difficult to get an overall picture of the Institute's research from the report and its implications for policy due to the large number of research projects - several hundred - that it describes. The Institute is considering reducing the number of projects and developing overall performance indicators, for example of science quality and international participation.

The Institute also publishes a major report each year describing the state of the ecosystems in the Barents, Norwegian and North Seas. Again, this report is written in Norwegian (and in language that non-specialists can understand) with English summaries and text boxes. The Institute does not produce separate reports for the research projects funded by the Ministry. However, it does for research sponsored by other funders. In the case of the Research Council a report is produced for them which is available electronically on the Research Council's website.

Support and advice

For both the Ministry and the Directorate the most important mechanism for transferring the knowledge arising from the Institute's research is not so much the reporting of individual research projects, but the ability to call on Institute staff to provide support and advice to their management, policy-making and international negotiation activities. So it is the tacit knowledge of the Institute staff, built on the basis of their involvement in the research and in the policy-making and regulatory processes, which is of most value.

It is essential that the Institute's research is recognised as being excellent by peers nationally and internationally so that the advice given by the Institute is accepted as having authority and credibility. Institute staff are closely involved in national processes to develop policy and decide on quotas, and in international scientific discussions (for example at ICES) and negotiations. Associated activities may include, for example, drafting text for policy, legislation and regulation, and sitting at the table with Ministry or Directorate staff at, for example, Fisheries Commission meetings.

Institute staff may be drawn into activities that go beyond science and be asked their views on what is “the right thing to do” on the basis of their understanding of the science and their experience arising from their interactions with the fishing industry and the policy and regulatory processes. Also, they may be asked to explore scenarios and management options to support the Ministry in its policy making. This may result in a tension with the formal advice provided through the ICES. More generally, there is a tension between being close enough to the policy and regulatory processes to provide focused and informed support and advice on the one hand,

and being sufficiently independent (and to be seen as such) to have a free voice grounded in objective science on the other.

The Institute’s board has an important role in managing this tension and ensuring that the Ministry cannot tell the Institute what to tell them. It is also an important part of Ole Misund’s role as Director for Programmes to oversee the quality of the Institute's advice and to ensure its visibility. A further approach to managing this tension is to have different staff involved in the formal advisory process through ICES to those involved in the day-to-day support of the Ministry's and Directorate's policy-making and regulation.

Communications with the Directorate

The Directorate tends to take more of an interest in the research results at a project level than does the Ministry. So research reports may feed directly, for example, into the Directorate's technical measures. It is more interested in the stock assessment and ‘routine’ work than in the more forward-looking research on, for example, ecosystems, climate change, multi-species modelling etc. It can be difficult for the Directorate to act on such research if it is not embodied in the formal advisory process on stock assessment. This difficulty derives in part from the fact that Norway's policies and actions on marine fisheries must be developed within the context of international negotiations and agreements.

The Directorate stressed the value of the transfer of knowledge through the informal and day-to-day interactions between Institute and Directorate staff. Such contacts include a weekly lunchtime session in the Institute's canteen at which researchers present their results. The Institute's internet site is used routinely by Directorate staff to get information on particular topics. Institute and Directorate staff may also work in partnership on a particular research project co-producing the results.

Communications with the fishing industry

An important audience for the Institute's research is the Norwegian fishing industry and Institute staff spend a lot of time communicating directly with them. Institute staff make presentations to meetings of fishermen across Norway, and are participants and presenters at their annual meetings which may involve up to 500 people. A particular strength of the Institute is that it is good at explaining its science in terms that fishermen can understand. An important output of these interactions is a first-hand appreciation of what fishermen consider to be the important issues and their reactions to the research and its interpretation. Their responses may sometimes be critical, but there is an underlying respect for the Institute and its staff.

Communications with other stakeholders

With regard to communication with Norwegian Society and stakeholders more generally, marine fisheries and their issues tend not to be as visible as they were say 50 years ago. However, there are new stakeholders who do take an active interest, for example environmentalists, NGOs, and the oil and gas industry. These stakeholders bring new perspectives on what should be priorities and how things should be managed, and there are still a lot of misunderstandings with them. New platforms are needed to enable more effective communication. The use of language can be a problem, for example the term “safe biological limits” used by ICES is prone to different interpretations. Also, it can be difficult to convey the levels of risk and uncertainty associated with particular scientific findings.

Figure 1: Communicating the evidence needs: the Institute's annual research programme planning process

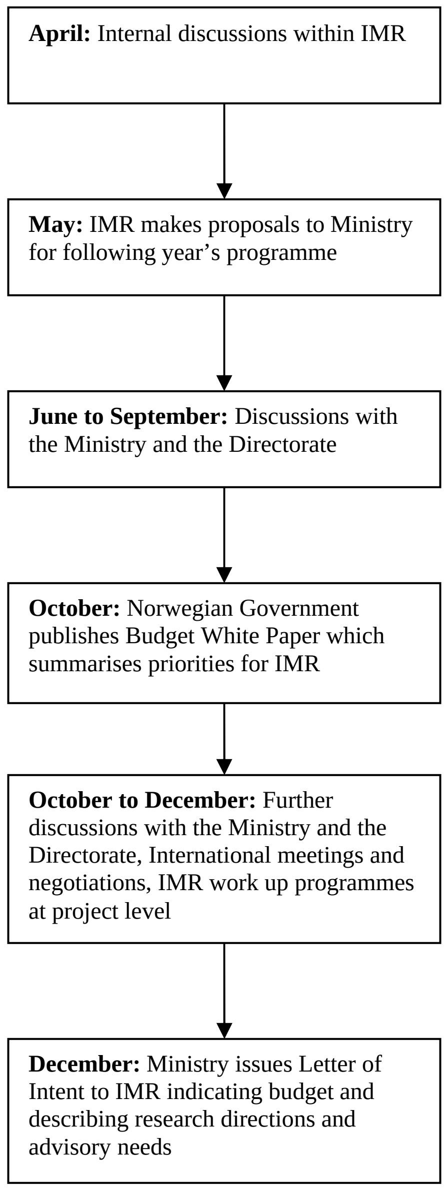
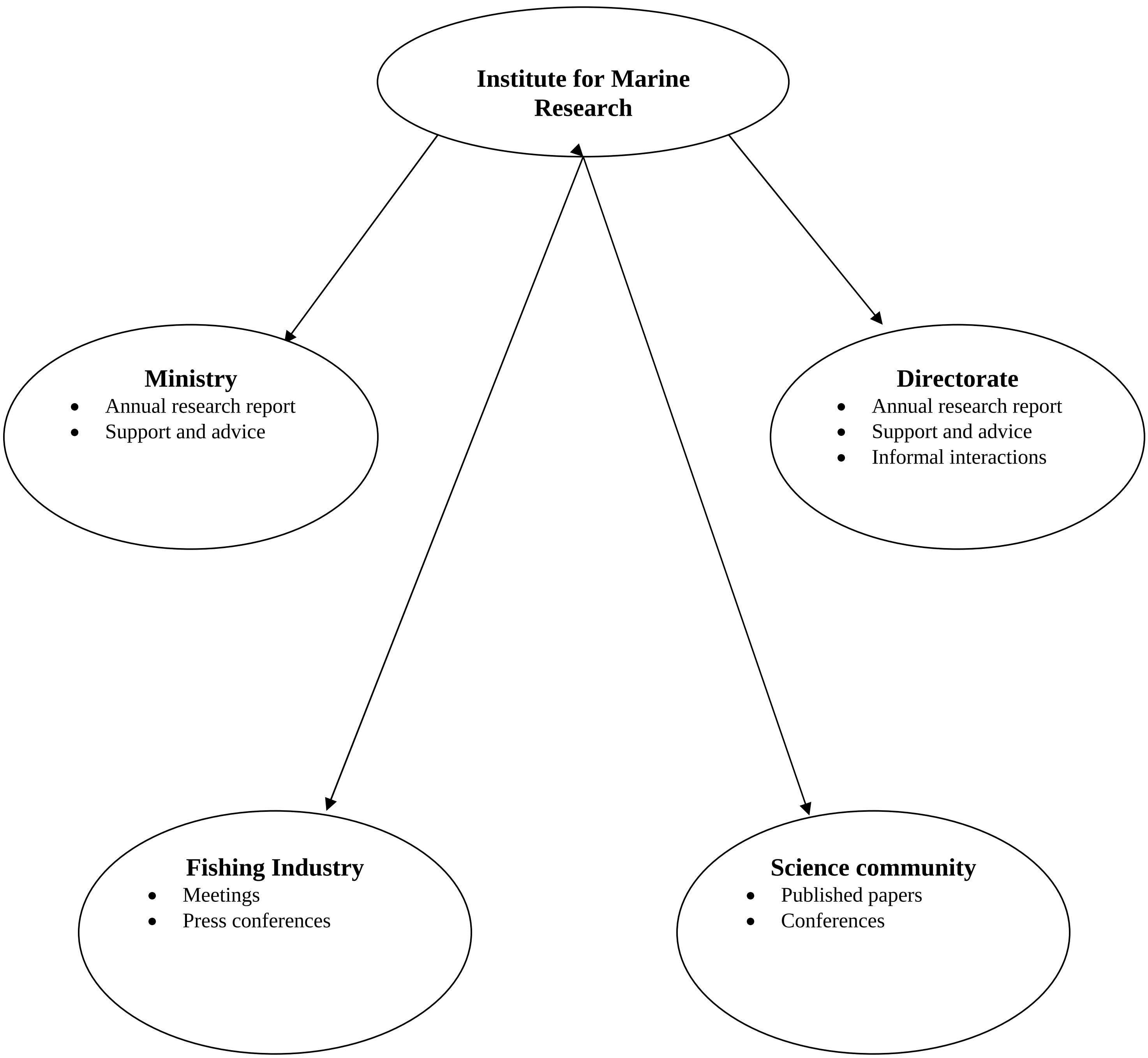


Figure 2: Important mechanisms for communicating the Institute's research results to some key stakeholders.



Annex 6: Spain

1. Introduction

In Spain the study focused on the **Spanish Institute of Oceanography** and the **Ministry of Agriculture, Fisheries and Food**. Meetings were held on the 6th and 7th November 2007 with:

- Mrs Concepcion Sanchez Trujillano, General Deputy Director, European Union Affairs, Marine Fisheries General Secretariat, Ministry of Agriculture, Fisheries and Food
- Mrs Pilar Pereda, Head of the Fisheries Department, Spanish Institute of Oceanography, Head Office – Madrid
- Mr Cristobal Suanzes Leenhardt, External Expert for International Projects, Fisheries Department, Spanish Institute of Oceanography, Head Office – Madrid
- Dr Juan Antonio Caminas, Director, Oceanographic Centre of Malaga, Spanish Institute of Oceanography
- Dr Jorge Baro Dominguez, Head of the Evaluation Programme of Mediterranean Fisheries, Oceanographic Centre of Malaga, Spanish Institute of Oceanography.

2. The Spanish Institute of Oceanography

The Spanish Institute of Oceanography (IEO – see: www.ieo.es) was created in 1914 and is now an autonomous organisation attached to the Ministry of Education and Science (MEC). It is classified as a "Public Research Organisation". The IEO is the Spanish government's research and consultancy body in the field of its fisheries industry policy.

The Institute's research concerns living marine resources in general, problems associated with oceanography, pollution of the marine environment, and aquaculture. Its research programmes are designed to provide the basis for its advisory function to the Spanish government and to the regional administrations. The IEO represents the Spanish government in international oceanographic and fisheries organisations and commissions.

The Institute has a head office based in Madrid comprising the General Director and his staff, eight regional centres of which the Oceanographic Centre of Malaga is one and has its own vessels (6) through which it carries out surveys and studies. The Institute as a whole has around 600 staff of which 75% are devoted to research or research support work. Around 50 staff work in the Oceanographic Centre of Malaga. A "structural budget" of around €40 million is provided annually by the government . This budget funds the structural maintenance of the Institute (i.e. staff costs, materials, general maintenance, investments and overheads) and its own research programme. Additionally, the IEO is commissioned to carry out work on a project funded basis.

3. The Ministry of Agriculture, Fisheries and Food

The Ministry of Agriculture, Fisheries and Food (MAPA), and within it the Secretariat General for Marine Fisheries, is responsible for the Spanish fisheries policy and for the National Strategic Plan for fisheries. It funds research through its own direct allocation – primarily EU funds (IFOP and FEP) - and has its own vessels through which it carries out surveys and studies along with the IEO and/or other institutions. Until 2000 when it was transferred to the Ministry of Education and Science, the IEO was attached to MAPA.

The Marine Fisheries Act passed in 2001 requires that the IEO addresses the objectives of the government's fishing industry policy, provides advice as requested by MAPA, and may represent MAPA at international scientific forums connected with oceanography and fisheries, in coordination with the Ministry of Foreign Affairs. The act set up through a Royal decree in 2003 an inter-ministerial commission between the MEC and MAPA comprising high-level officials of the IEO and Secretariat General for Marine Fisheries (SGPM) with the role of planning, coordinating and monitoring interactions between the IEO and MAPA. The main outcome of this inter-ministerial commission was a formal framework agreement signed in 2005 for the regulation of the collaboration in marine fisheries research. Under this framework agreement, several formal agreements on specific topics have been signed.

4. Establishing the need for evidence

The study explored six key mechanisms whereby the needs for research, surveys and advice are established:

- the IEO's own research programme;
- calls for proposals under the National Plan for Scientific Research, Development and Technological Innovation;
- pilot actions funded by the European Commission's Fisheries Fund;
- surveys undertaken within the European Commission's data collection regulations and other surveys;
- requests for advice by the Ministry of Agriculture Fisheries and Food; and
- projects funded by the regional administrations.

These six mechanisms are described in the following paragraphs.

The IEO research programme

As indicated above, funding for the IEO research programme is received from the government. The overall aim of the programme is to generate the knowledge and information that provides the basis for IEO's advisory role. Individual projects may be concerned with research, monitoring and fish stock assessment. The IEO maintains a broadly based research programme with the intention that it will enable them to answer the questions when they come along.

A Scientific Advisory Committee, comprising high-level IEO experts, develops a Research Framework Programme for a period of four years (the most recent programme covers the period 2002 to 2005). The programme establishes broad priorities and guidelines and is informed by the National Plan for Scientific Research, Development and Technological Innovation, government priorities and international initiatives (for example the European Union, ICES, Inter-governmental Oceanographic Commission etc.).

The proposed Framework Programme is sent for assessment and endorsement to the IEO´s Council Board (which comprises high level officials from MAPA, MEC, the regional administrations, public and regional research institutions, and the private sector). The Council Board is a mechanism to enable the needs of fisheries managers (at national and regional levels) and of stakeholders to influence the direction and priorities of IEO's research.

Subsequently, within the IEO, an annual call for proposals is made to the Institute's own research staff. The Research Framework Programme is a document of some 10 to 12 pages which provides guidance on priorities at quite a high level, and therefore leaves plenty of room for discretion in deciding which projects to fund. The initiative for making proposals lies with the Institute's research staff who may liaise informally with fisheries managers in developing proposals. Proposals are assessed by relevant IEO researchers and heads of departments and programmes. Decisions on which proposals to fund are made at IEO's head office by the Deputy Research Director on the basis of an assessment of relevance, fit to priorities and the professional background of the researcher. The overall process of establishing the research programme and projects is illustrated in Figure 1.

Calls for proposals under the National Plan

The Ministry of Education and Science is responsible for the development of the National Plan for Scientific Research, Development and Technological Innovation which covers a four-year period. Marine fisheries research is included within the plan under two general programmes: agro-food resources and technology (which includes a sub-programme on 'conservation of genetic resources of agro-food interest') and environmental sciences and technology (which includes a sub-programme on 'marine science and technology'). The IEO has relatively little influence on the development of the National Plan.

Under the plan, competitive calls for proposals are made every year: any public or private institution or company may make submissions (typically proposals come from universities and research institutes). Generally, the calls are specified at a fairly high level but may focus on a specific issue of national interest, for example recovery from the oil spill on the Galician coast some years ago. The IEO therefore has a substantial degree of freedom to decide what projects to propose. Project selection is on the basis of scientific quality and fulfilment of priority guidelines, and involves a peer review assessment process. Projects funded under the National Plan are typically for more basic research and usually for a 3 year period of time.

Pilot actions funded by the European Commission's Fisheries Fund

MAPA manages the European Commission Fisheries Fund allocated to Spain and makes a call for proposals from the fishing industry twice a year. Individuals and organisations within the fishing industry make proposals which often concern fish stock surveys or technical issues, for example the selectivity of nets. Typically, the fishermen will speak to their contacts in the IEO to discuss what they have in mind and to get inputs from the Institute to help them develop their proposals.

On receipt of the responses to a call, MAPA sends the proposals to the IEO for review. Project selection is carried out in a joint meeting between the Ministry and the Institute. There are formal criteria for the selection process concerning relevance and scientific interest (Council Regulation 2792/1999). Once approved, potentially with modifications to respond to Ministry comments, the IEO and the fishermen prepare a detailed specification and scientific monitoring plan for the project. The budget for the project is given to the fishermen to undertake the agreed work for the project. The overall process is depicted in Figure 2.

The ideas for the projects therefore come from the fishermen, but the IEO is closely involved in translating the idea into a practical research project.

Surveys undertaken within the European Commission's data collection regulations and other surveys

The European Commission specifies what information is to be collected in the annual surveys. Data requirements increase year-on-year and include requirements for information on things like discards, economics and environmental aspects as well as fish stocks. However, budgets (received from the European Commission and channelled through MAPA to the IEO) have not kept up with the increasing workload. Regular meetings are held between MAPA and the IEO to decide on, and programme, the surveys (which may be routine or one-offs).

The IEO also collects information through other surveys not driven by the Commission´s data collection regulations. These are historical succession surveys carried out annually and other one-offs requested by MAPA.

Requests for advice by the Ministry of Agriculture Fisheries and Food

The MAPA (SGPM) and MEC (IEO) signed in 2005 a formal Framework Agreement valid until 2009 to define the rules of collaboration on marine fisheries research between both entities. Under these framework agreements, several formal specific agreements on specific topics have been signed.

If MAPA introduces a new regulation they are required by law to seek comments on the draft from the IEO. The IEO have 10 days to respond on receipt of the draft. Typically, there is no discussion between the IEO and MAPA prior to receipt of the draft, but there may be if the regulation is of sufficient importance.

MAPA also makes many requests to IEO for advice. Since the transfer of the IEO from MAPA to the MEC, the process for requesting advice has become more formalised (it is illustrated in Figure 3). Requests are made in writing (transmitted by fax or e-mail) to the IEO head office in Madrid. The requests typically take the form of a short paper describing the current situation, the justification of the need for advice and a final question. There is quite often a need for an iteration to clarify the request or to establish a more technically feasible or realistic question. Sometimes a meeting may be convened to discuss the request for advice.

The formal process of making and responding to the request for advice can be quite slow given that the request must pass through the general director, to the under director for research, to the head of the relevant fisheries department, to the head of the relevant unit and potentially to particular members of the scientific team. This may not be consistent with the fast-pace of policy life and the fisheries manager may take a shortcut and contact the specialist directly. However, this is not encouraged by the IEO.

Problems have not generally been experienced in establishing a proper dividing line between scientific advice and management decision-making: scientists and managers have a good understanding of their roles. This is often helped by the fact that the fisheries managers and the scientists have known each other for a long time, and often researchers progress in their carriers to become managers over time.

Projects funded by the regional administrations

The regional administrations of Spain are also important customers for IEO's eight centres. The Oceanographic Centre of Malaga meets with fisheries managers of the Andalucian administration two or three times a year to discuss the problems that the fisheries managers have. There is a co-operation agreement for the Institute to study the status of the fisheries stocks managed by the Andalucian administration.

The problems presented by the Administration to the Institute very often originate with the fishermen who have identified a problem and raised it with the fisheries managers. Typically, the Administration describes the problem and the Institute develops the ideas on how to address it, leading to a project proposal by the Institute to the fisheries managers. It may take up to six months of discussions before a contract to do the research project is agreed. Fisheries biologists in the Administration are frequently involved in elaborating the project, whereas the fishermen themselves are rarely involved directly.

Some general communications issues

Despite the move of the IEO from MAPA to the MEC, there remain many links at different levels between staff at IEO and MAPA. They include meetings two or three times a week between the IEO senior staff and senior staff from the Ministry, and meetings at a technical level to discuss particular issues. Close links over many years help staff at the IEO to anticipate the needs and questions of the Ministry. Staff from the IEO and MAPA frequently travel together to meetings as fishery commissions and Regional Fishery Organizations, both within Spain and internationally, and this is a good opportunity to get to know each other.

However, difficulties arise due to the limitations on staff resources in both the Ministry and the Institute given the wide range of challenges facing the Spanish fishing industry. The Institute often finds itself in the role of firefighter. Clearer frameworks and a more systematic approach to anticipating issues would help. Over the last two years MAPA has led an initiative to prepare a White Paper on fisheries which will be published shortly. It will set out a new framework and overall policy for fisheries in Spain over a period of five years. The IEO has worked closely with the Ministry in preparing the White Paper.

Since the Institute moved to the MEC more emphasis has been placed on scientific excellence and publications in peer reviewed journals. These tend to count for more in career progression for IEO staff than providing support and advice to MAPA. Such support and advice needs to be better rewarded if the IEO is to maximise its value in supporting marine fisheries in Spain.

Staff at the Institute have regular contacts with the fishing industry and are therefore uniquely placed to appreciate their problems. Until two years ago they had an annual meeting with the fishing industry in the Mediterranean which also involved staff from MAPA and the regional administrations. The meeting provided a good forum for discussion of problems.

5. Communicating the research results

IEO's approaches to communicating the research results are presented according to the six mechanisms described in the previous section:

The IEO research programme:
The main communication channels for the dissemination of the results from projects and surveys are published scientific papers and publication of the results in the scientific committees and working groups of the international fisheries organizations attended such as ICCAT, GFCM, ICES, CCAMLR, NAFO, NEAFC, CETOI, etc.

Occasionally the results from the projects and the work of the scientific committees are presented directly to the fisheries managers and/or the industry. This may be in response to a request or as a result of IEO's own decision, depending on the relevance of the topic.

Calls for proposals under the National Plan: the most important communication channel for projects funded by the National Plan for Scientific Research, Development and Technological Innovation is good quality scientific papers published in peer reviewed international journals. Progress reports and summaries of project results are also prepared for the MEC as the funder of the projects. Results from these projects are not presented directly to fisheries managers but they may well be presented at meetings of the working groups and scientific committees of international bodies such as ICCAT, GFCM and ICES where MAPA and the regional administrations may be represented.

Pilot actions funded by the European Commission's Fisheries Fund: a report is prepared of the results of each project which is sent to MAPA via IEO's head office. MAPA forward the report to the representatives of the European Commission for auditing purposes and to the fishing industry who have been involved in the project. These reports present the technical detail as well as overall conclusions, but can be understood by the fishermen who are the main audience for the outputs of these projects. The IEO will often meet with the fishermen who have an interest in the project to explain the results. Fisheries managers may well also be interested in outputs of these projects.

Surveys undertaken within the European Commission's data collection regulations: the main route for the reporting of these surveys is the working groups of the relevant international bodies (ICCAT, ICES and GFCM). They inform the development of advice by the working groups which is channelled through the relevant science advisory committee to the European Commission. Fisheries managers in MAPA and the regional administrations may question the IEO on the results of the surveys and the consequent advice from the international bodies.

Requests for advice by the Ministry of Agriculture Fisheries and Food: the IEO comments on draft regulations developed by MAPA and responds on a very regular basis to requests for advice. Fisheries managers look to the IEO to present reports which interpret the science for them and give clear advice. Where results and conclusions are uncertain, fisheries managers may press the IEO to be more definite and may pose supplementary questions to get better resolution. MAPA wants to see the underpinning technical detail and how it leads to the conclusions. A meeting may well be called for the IEO to present the results of a project or to discuss its advice on a particular issue. Following the relevant scientific committees and working groups the IEO (representing the national and regional fisheries administration) presents and clarifies the results to the fishery sector.

Projects funded by the regional administrations: six monthly progress reports are made and a technical report is prepared at the end of the project. The IEO will usually brief the regional fisheries managers on the results of the projects and may also present the results in international fora.

Other communication channels and audiences

Communication of research results to the fishing industry is an important aspect of the IEO's work. Articles in specialised fisheries publications (for example, Pesca Internacional and Industrias Pesqueras) play a significant role in communicating with the fishing industry.

The IEO also publishes on a regular bases its own scientific bulletin (technical journal with scientific results - www.ieo.es/publicaciones/boletin.html) and a Magazine (la Revista del IEO - www.ieo.es/revista.html) which has a distribution of 2000 copies. Periodically, there are releases of other publications, for example technical reports, doctoral theses or revised cartography oriented to the fishing industry, fisheries managers, the scientific community and the general public (see www.ieo.es/publicaciones/publicaciones). The IEO's web pages are also very useful means of communication.

The IEO has contacts with environmental groups, often developed through personal relationships. Generally, the IEO has good collaborations with these groups but there may occasionally be surprises when an environmental group makes an unexpected proposal.
The IEO participates in some of the new EU RACs (Regional Advisory Councils) which encourage participation by the fisheries sector in the formulation and management of the common fisheries policy (CFP).

Occasionally, research and survey results may relate to an issue of high public concern. Television, radio and press articles in newspapers may then be appropriate channels of communication.

Some issues relating to the communication of results

The view was expressed that the IEO's communications could be further improved with fisheries managers and with the fishing industry (links are currently rather better with the larger-scale fishing industry than with artisnal fishermen). A more structured framework for communications with fisheries managers would help.

Generally, not enough time and resource is built into projects for communication. Also, insufficient credit is given in personal evaluation and career development to providing good advice and communication with fisheries managers and the fishing industry.

Figure 4 summarises the main communication mechanisms to key stakeholders.

Figure 1: The process of establishing the IEO research programme

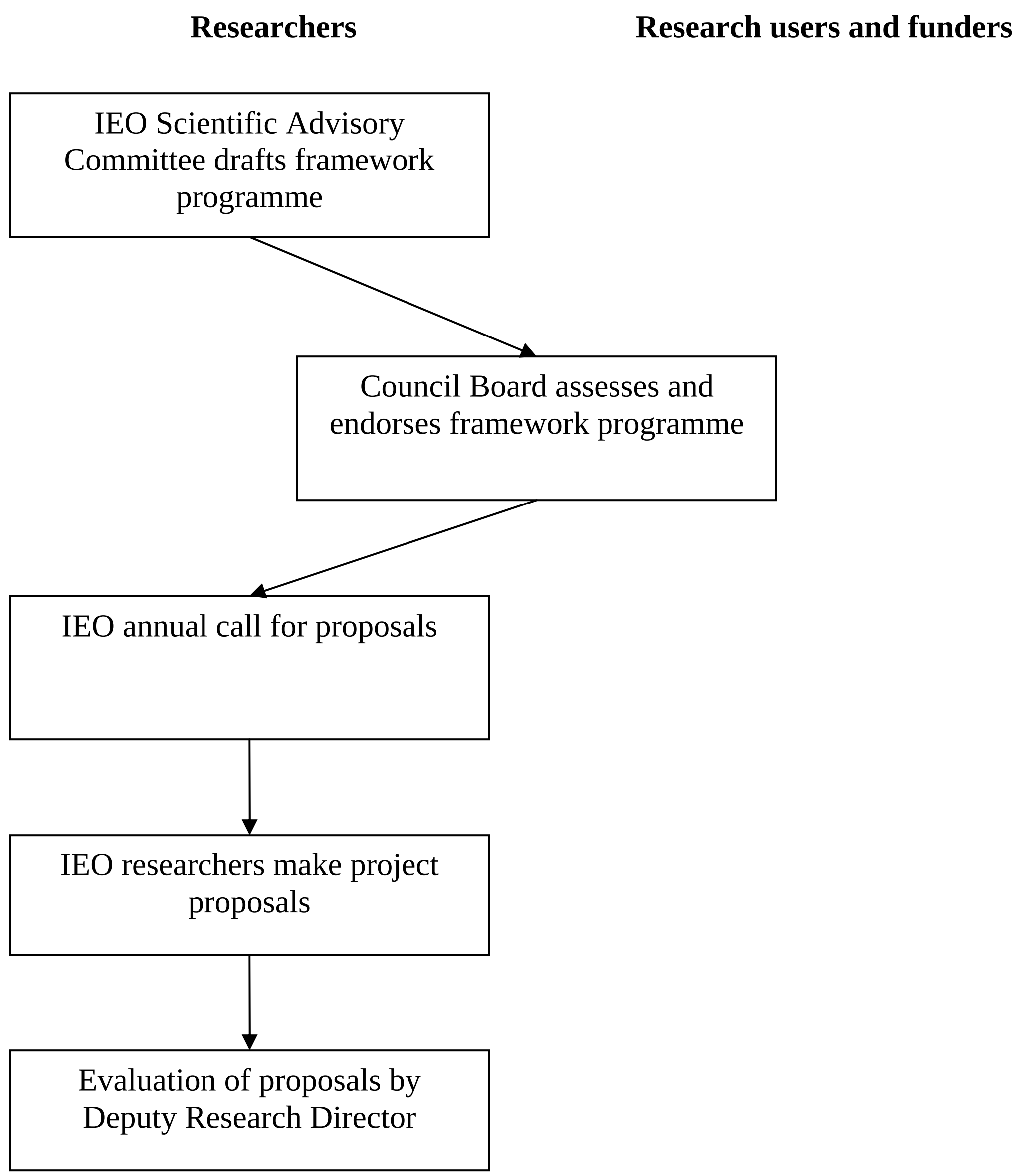


Figure 2: The process of establishing projects funded by the European Commission's Fisheries Fund

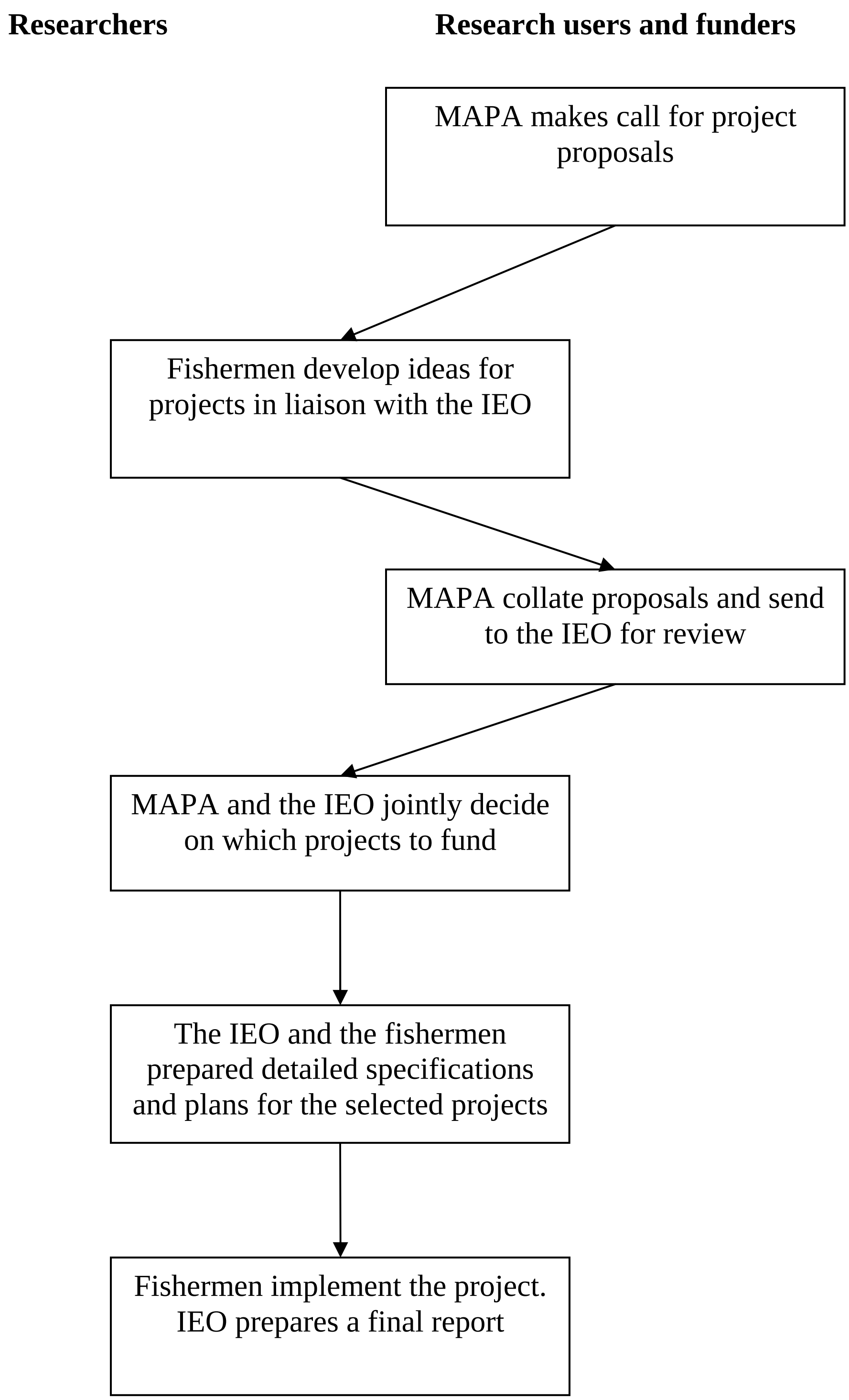


Figure 3: The process of MAPA seeking advice from the IEO

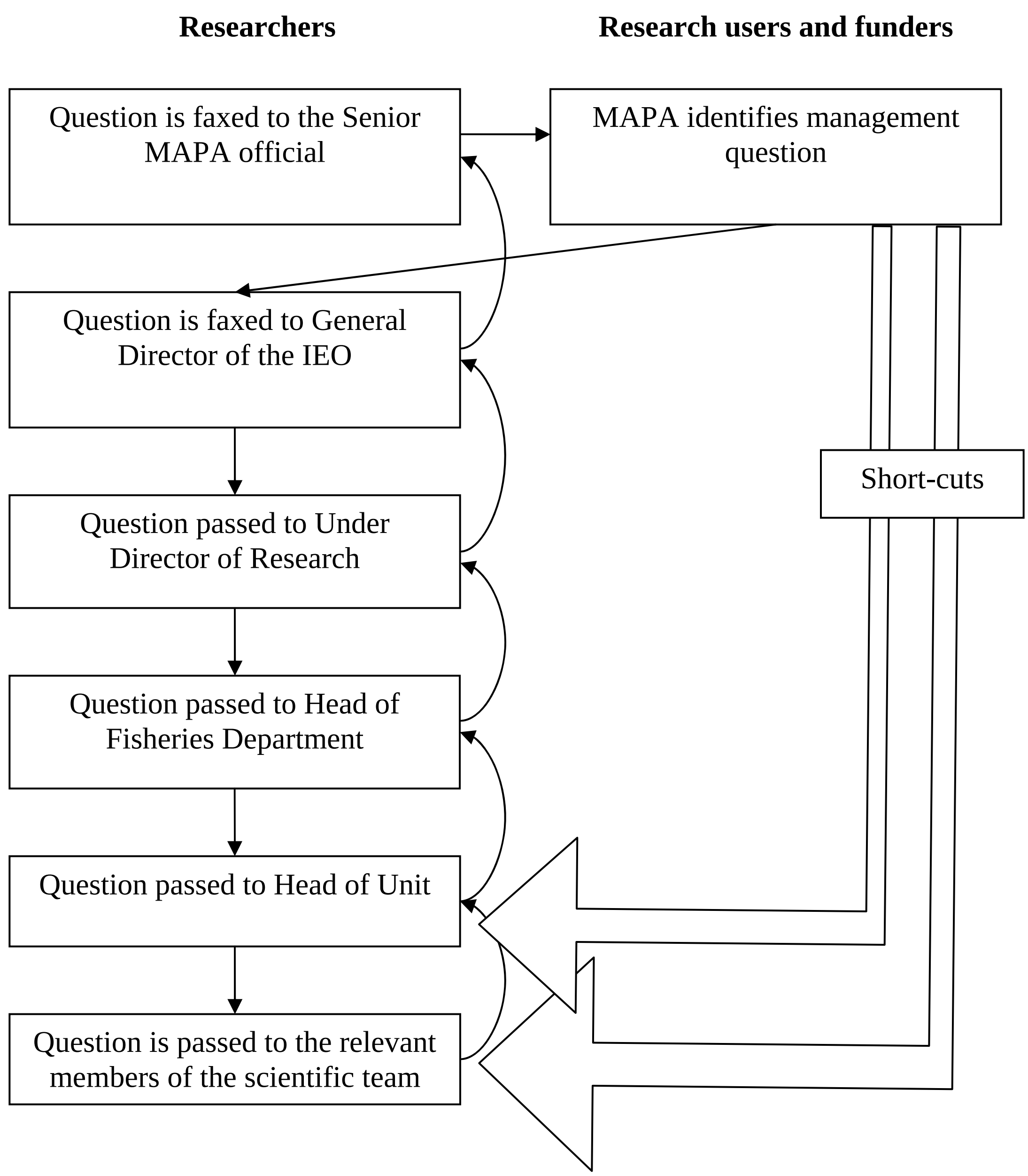
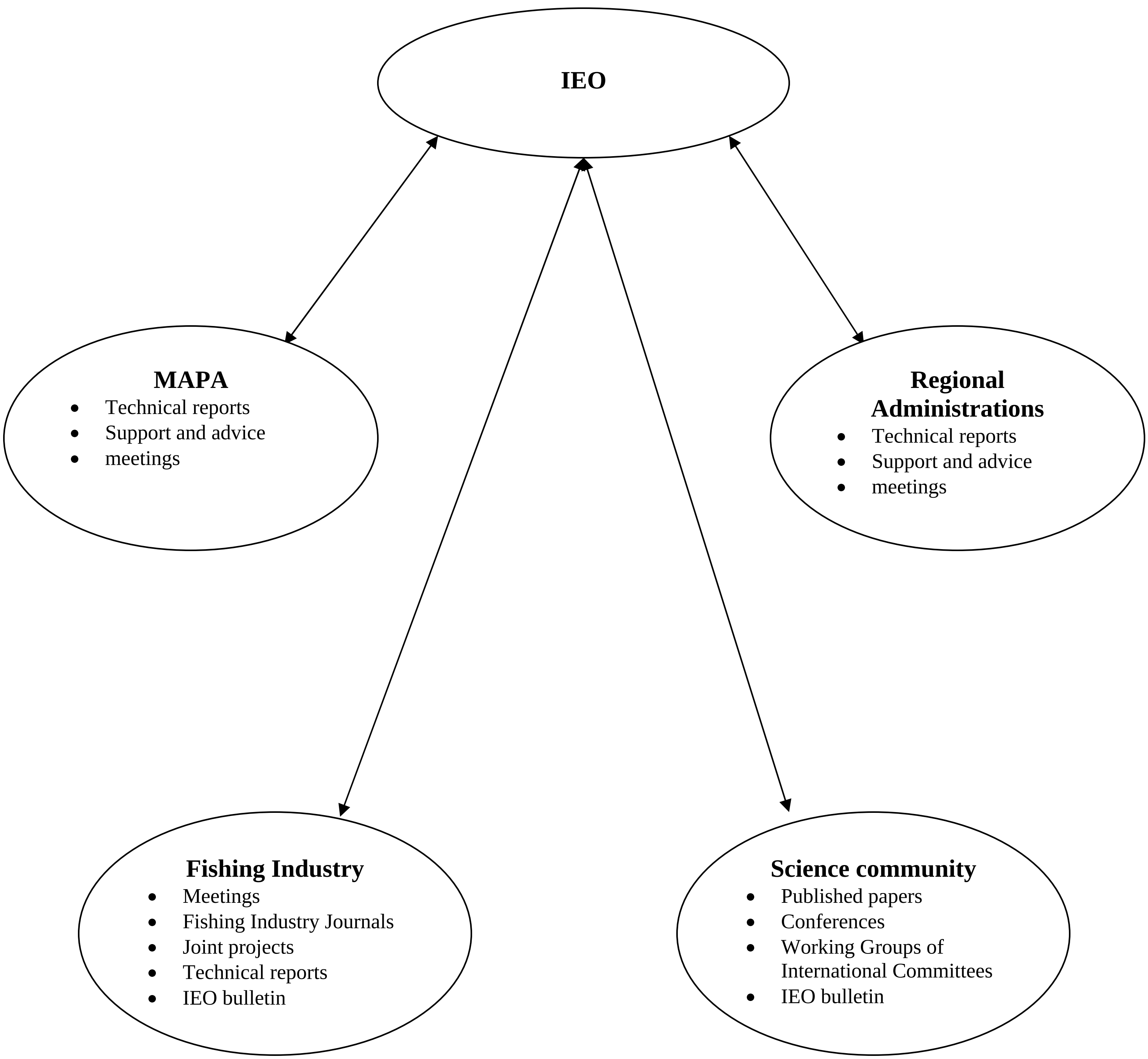


Figure 4: Important mechanisms for communicating the IEO's research results to some key stakeholders.



Annex 7: UK

Introduction

In the UK the study focused on the **Centre for Environment, Fisheries and Aquaculture Science (Cefas)** and the Marine and Fisheries Directorate of the **Department for Environment, Food and Rural Affairs (Defra).** Interviews were carried out at Cefas on 3 December 2007 with:

- Dr Julian Addison, Senior Shellfish Advisor
- Dr Simon Jennings, Science Leader, Environment and Ecosystems Division
- Dr Andrew Payne, International Fisheries Consultant and Editor-in-Chief: ICES Journal of Marine Science
- Mr Ted Potter, Head of Fisheries Resource Management Group, and Science Leader, Fisheries Division.

And at Defra on 21 January 2008 with:

- Mr Lindsay Harris, Head of Sea Fisheries Conservation Division
- Dr John Lock, Head of Fisheries Science Unit.

The Centre for Environment, Fisheries and Aquaculture Science

Cefas is a scientific research and advisory centre working in fisheries management, environmental protection and aquaculture (www.cefas.co.uk). It is an Executive Agency of Defra. Originally founded over 100 years ago, it employs over 500 staff at three specialist laboratories in the UK. Its primary purpose is to provide high-quality science in support of UK government departments to conserve and enhance the aquatic environment, promote rational management of the UK's natural resources, and protect the public from aquatic contaminants. Marine Fisheries scientific research is conducted under the three themes of Fisheries, Environment and Ecosystems, and Organism Health.

The annual budget of Cefas is around €58 million of which Defra provides nearly 80%. An agreement has recently been signed with Defra to sustain funding at around €40 million per annum over a 10-year period. Income from other sources is increasing: important customers include other government departments and agencies, the European Commission, industrial and commercial organisations, international bodies and local authorities.

The Department for Environment, Food and Rural Affairs

Defra is a UK Government department. Within it, the Marine and Fisheries Directorate are responsible for the development and implementation of policy relating to the marine and aquatic environments (http://www.defra.gov.uk/marine/index.htm). The Directorate's overall objective is to deliver “clean, safe, healthy, productive and biologically diverse oceans and seas”. It is structured in five policy divisions: sea fisheries conservation, fishing industry management, marine environment, marine and freshwater biodiversity, and marine legislation.

The study focused on the Sea Fisheries Conservation Division which funds four areas of marine fisheries scientific work:

- The Sustainable Marine Fisheries research programme: to support the better protection and management of marine resources;
- Fisheries Science Partnership projects: involving fishermen working with scientists;
- Fisheries Challenge Fund projects: supporting research proposed by stakeholders; and
- Fish stock monitoring and assessments: providing annual information on stocks.

Cefas is the main body used to deliver this work. This study is concerned with the first three areas. The Marine and Fisheries Directorate, more generally, also funds other marine research programmes at Cefas (contributing to the 40m euros annual funding referred to in the previous section): on marine environment, fish health and diadromous species.

Establishing the need for evidence

The Customers

For the Sustainable Marine Fisheries research programme the main customer is the Marine and Fisheries Directorate in Defra (www.defra.gov.uk/marine/index.htm), and in particular the Head of the Sea Fisheries Conservation Division, Lindsay Harris. The Fisheries Science Unit (headed by John Lock) within the Directorate acts on behalf of the policy customers in managing the research programme.

Many of the projects within the programme have match funding from the European Commission Framework Programmes: the European Commission can therefore be considered a customer for such projects. The fishing industry is also a customer for the research, particularly for those projects of practical relevance such as studies of fishing gear. To date, most of the involvement has been from fishermen and their representative bodies, rather than from organisations further downstream in the food industry. An additional set of customers are the 12 Sea Fisheries Committees based around the coast of England and Wales who have delegated responsibility for managing the near-shore fisheries (out to 6 miles).

The Fisheries Science Partnership and Fisheries Challenge Fund have been established specifically to meet the needs of fishermen and other stakeholders, and to involve them directly in the research projects.

The Sustainable Marine Fisheries Research Programme

The Sustainable Marine Fisheries research programme has an annual budget of €4 million. A major review of the programme was carried out in 2006. The review, led by the Sea Fisheries Conservation Division and managed by the Fisheries Science Unit, was carried out jointly with Cefas. It established three topics for the programme: figure 1 summarises the structure, objectives and customer purpose of the topics.

Policy makers in the Sea Fisheries Conservation Division played a key role in determining the topics on the basis of their awareness of current and long-term policy issues and of Defra's strategy more generally. However, Cefas staff made important inputs on the basis of their understanding of the science and their awareness of Defra needs. Defra's strategy for the marine environment "Safeguarding our seas" (http://www.defra.gov.uk/environment/water/marine/uk/stewardship/index.htm) and its Evidence and Innovation Strategy (http://www.defra.gov.uk/science/how/strategy.htm) were also important starting points for the review.

Once the topics had been established, Cefas made proposals at a project level suggesting options to Defra for what might be done within each topic. These option proposals were initially described at a fairly high level - around 20 lines of text for each proposal: more detailed proposals were then developed by Cefas for the projects preferred by Defra. A meeting was held with key stakeholders – fishermen and conservationists – and independent scientists to discuss the outline of the programme to get feedback on what work the stakeholders considered to be priorities. This feedback helped to shape the programme. The timing of this meeting had to achieve a balance between having a reasonably well developed proposition that could be commented on, but which was not so far developed that it would be seen as a fait accompli.

Lindsay Harris, as the principal policy customer, had a clear view going into the process of what policy questions he wanted to focus on. Hence developing a high-level summary of these needs for the meeting with Cefas staff which kicked-off the process was not difficult. More challenging was the development of the right scientific questions at the project level: providing for worthwhile and high quality research which is well-focused on resolving the policy issues.

The programme that has consequently been established contains some 20 projects, each lasting three to five years and typically costing €.5 million to €1.5 million.

The programme and its component projects are reviewed at the annual monitoring review meeting held in July. Some flexibility is built into projects over their three to five-year durations so that they may be tuned to the evolving needs of the policy customers. It may also be the case that initial results, for example tests on fishing gear, point to the need for changes to the subsequent activities within a project. The review meeting therefore provides for the discussion necessary to tune the research questions to the evolving needs of the policy customers.

While project-specific meetings may sometimes be held between the annual monitoring review meetings, this is not typically the case. Defra is moving to a "lighter touch" approach to its project management, giving more freedom to the scientists, and relying on Cefas to tell Defra if there are any problems. The aim is to get the project right at the start and then let them get on with it.

As projects are completed or new money becomes available, headroom may develop to allow for new project proposals. Figure 2 depicts the annual planning cycle for such proposals. An initial step is a meeting between Fisheries Science Unit and the policy customer (Lindsay Harris as Head of Sea Fisheries Conservation Division) to consider what scope there is for commissioning new research and which policy issues should take priority. The Fisheries Science Unit then commissions pre-project proposals from Cefas.

The process and the ideas are driven fairly strongly by Cefas given their understanding of the scientific issues and of what can be done. Many Cefas researchers and advisers are in regular contact with Defra policy staff and therefore generally have a good appreciation of policy issues and needs. By the time questions come up in formal meetings, it is likely that they have already been worked up through informal discussions between staff in Cefas and Defra.

In September 2006 Defra set up a new stakeholder group - The Marine Fisheries Science Advisory Group (MFSAG) - to advise it on priorities for the research programme. The interests of scientists, the fishing industry, consumers, recreational anglers, conservation and environmental organisations are represented in the group. The intention is that the group will meet once or twice a year (it has met twice so far).

The Fisheries Science Unit plays an important role acting as intermediaries between the policy customers and the Cefas researchers. The unit has close contacts with both the policy makers and researchers and is therefore able to facilitate interactions and to provide an important challenge function. It is also able to provide a valuable additional view in the development of research questions. The unit may front discussions with researchers on behalf of the policy makers, or discussions may be held directly between researchers and policy makers.

Both Cefas and Defra interact with the fishing industry at various levels. Fishermen may have important knowledge to contribute to the development of research questions, for example in respect of understanding about what works and what does not in respect of fishing technologies and strategies. Their input is essential on the socio-economic dimensions of fisheries management issues. They may also be able to make useful contributions to research on ecosystem behaviour, for example through their experience of where fish are to be found etc.

An un-stated aim of the programme and project planning processes is to ensure that Cefas develops and maintains the skills and capacities needed to answer policy questions when they arise. It is important therefore that the discipline of delivering against milestones is not achieved at the expense of such capacity development.

Whilst Cefas is Defra's main contractor, approximately 15 to 20% of the R&D budget is placed with other research institutes, including universities. To encourage wider participation in fisheries research Defra, together with the Natural Environment Research Council and the devolved administrations in Scotland and Northern Ireland developed in 2007 a jointly funded €3.5 million research programme titled "Sustainable Marine Bio-resources". This programme is funding university research teams to undertake strategic research relevant to fisheries management.

Fisheries Science Partnership and Challenge Fund

The Fisheries Science Partnership was established by Defra in 2003 to build relationships between fishers and scientists, involving fishers in the co-commissioning of science. Funding is provided at a level of €1.3 million per year. It provides an opportunity for the fishing industry to test existing fisheries science, to examine fisheries industry concerns, to supplement and complement ICES fisheries science to address any limitations identified, and to bring the partnership approach into the mainstream of fisheries science and management.

A steering group consisting of stakeholders plus representatives of Cefas and Defra consider proposals for new work from throughout the industry and other interested parties, as well as the continuation of appropriate time-series surveys. To assist this process, initial industry ideas for projects are developed into full proposals in collaboration with Cefas scientists, before submission to the steering group for consideration.

Defra has allocated €400,000 annually to the Fisheries Challenge Fund for projects to improve fisheries management and to enable fishermen and other interested parties to get involved in fisheries research.

Communicating research needs: some ongoing issues

In recent years there has been an increasing emphasis in Cefas on providing advice and short term support to Defra, and more generally on income generation and developing Cefas as a business. Concerns were expressed that this should not be at the expense of more strategic research and of the quality of Cefas research as judged by scientific peers (on which Cefas is evaluated, and which is important to the underpinning of Defra policy-making). Cefas has a distinctive role to play vis a vis universities and consultancies, and its ability to attract and retain staff depends on maintaining a programme of strategic, innovative and high-quality science. The formulation of research questions and projects, and the overall balance of the research programme, need to take these considerations into account.

The ability of Cefas to anticipate Defra research needs and to take a proactive role in framing research questions and project proposals, relies on its regular and day-to-day interactions with Defra on policy issues. Similarly, its ability to provide well founded policy advice rests on a first-hand familiarity with the research programme and the knowledge it generates. This cross-fertilisation works best when Cefas staff are involved in both research and advisory capacities. Disconnects may occur when those roles are separated.

It is felt that there is more scope for feedback on project proposals and research questions from stakeholders. The Marine Fisheries Science Advisory Group may help to fill this gap as its role is developed.

Communicating the research results

To the policy customers

The main mechanisms for communicating the interim and final results of research projects to the policy customers in the Sea Fisheries Conservation Division are as follows:

- Annual reports on work progress against milestones (submitted to Defra by the end of March) which are followed up at the annual monitoring meeting in July with presentations by the project managers. This annual meeting now tends to focus on the projects of particular topical interest to allow sufficient time for in-depth discussion between the researchers and policy customers.
- Developments and outputs of individual projects which are perceived to be of potential interest to policy makers are collated periodically through the year and issued as a short update report to policy customers in Defra.
- A formal report (typically around 20 pages and which goes out to international peer review) is prepared on completion of a project and a presentation made at the annual monitoring meeting in July. A detailed technical report is not usually prepared except for survey work where it is important to have a record of the data. Rather, reliance is placed on the publication of peer reviewed papers to disseminate the research results. Typically, a well-funded project will generate around 10 published papers.
- Where a research project is particularly relevant to a topical policy issue, a "snapshot meeting" may be convened at Defra in which the researchers present interim or final results to the interested policy people.
- At the end of research project, the Fisheries Science Unit prepares a file note for policy makers on the likely impact of the research on policy issues.

As new knowledge is assimilated it is incorporated into the advice given by Cefas to Defra. A key, and well-fulfilled, role for Cefas is to respond on short timescales to questions posed by the policy division, for example as a result of a Parliamentary Question. With respect to the provision of advice more generally, an interim step may be required in that the new knowledge and understanding may first need to be reflected in the models that provide the basis for the advice. This may involve discussions at an international level, for example through ICES, which by its very nature can introduce significant time lags.

The research in each topic undergoes a formal evaluation every three or four years. External evaluators review each project against established criteria. A two-day meeting is held at which researchers present findings to policy makers, evaluators and Fisheries Science Unit staff. The implications for policy are debated and consideration given to future research needs.

It is considered that there is no one best way to communicate the results of the research programme to the policy customers. A mix of face-to-face interactions and written material is needed. Reports are useful in providing a written record of the research and enabling wide dissemination of the information. But there is still a tendency for reports to focus too much on what has been done, at the expense of an explanation of what has been found and what it may mean for policy.

It is important to the policy customers to be informed of significant new findings as projects progress: the pace of the policy world is such that they cannot afford to wait until the end of the research projects before being told the results. And they need to be aware of the latest thinking and understanding when involved in discussions and negotiations nationally and internationally.

To the science community

Peer reviewed papers are recognised as an important output of research projects and are a key mechanism for communicating with the science community. The preparation of a paper is frequently a project milestone, and peer reviewed publications comprise an important evaluation criterion for projects. While Defra appreciates the value of peer reviewed papers in demonstrating the quality of the science which underpins its policy-making, the main impetus for publication comes from Cefas (which runs “paper of the week” and “paper of the year” competitions for its staff). Nonetheless, it can be difficult for research staff to find time to write papers given their project commitments.

Participation in international and ICES working groups, EU networks, and attending workshops and conferences are also important means of communicating the research to the scientific community.

To stakeholders more generally

The subjects covered by the research programme are important to the public – that is why they are being funded – therefore Defra is putting more effort into making information available to a wider audience. This includes encouraging Cefas staff to write short summaries of research results in plain English which can be published in appropriate magazines and media.

Cefas is putting increased emphasis on improving its communications and promoting open access to information. More use is being made of publication to Web-based systems to allow access by all stakeholders. Also, project reports are placed on the Defra website.

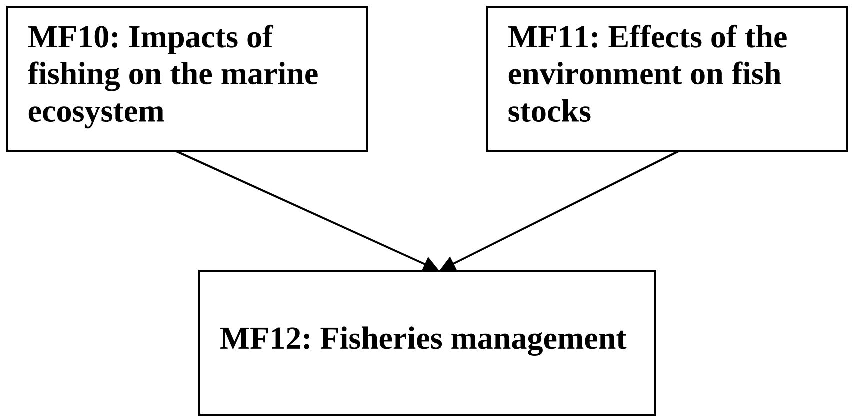
Channels used for communicating research results to stakeholders include:

- The newly introduced Defra Yearbook (which has been well received) providing one-page summaries aimed at the fishing industry and the more general audience for completed research projects;
- articles in the Fishing News magazine, which is widely read by people working in the fishing industry;
- presentation of project summaries to the Marine Fisheries Science Advisory Group;
- presentations to interested audiences; and
- TV, radio and newspapers on issues of topical interest.

Figure 3 summarises the main communication mechanisms for key stakeholders.

Figure 1: The Sustainable Marine Fisheries Research Programme

Overall Structure – 3 themes:



MF10: Impacts of fishing on the marine environment

Summary objective: to understand the effects of fishing on the wider marine ecosystem, including vulnerable species and habitats. Develop suitable mitigating measures, including discard reduction.	**Key customer purpose**: to adopt an ecosystem-based approach to management which achieves sustainability of the fisheries, fish stocks and the environment.

MF11: Effects of the environment on fish stocks

Summary objective: to understand how environmental variability and climate change affect fisheries productivity, at relevant spatial and temporal scales.	**Key customer purpose**: to ensure that management measures take account of short-term and long-term environmental changes, through an understanding of how biological processes and the environment help determine stock size.

MF12: Fisheries management

Summary objective: to provide the tools for better fisheries management including improved understanding of the status of stocks, and biological and fisheries interactions.	**Key customer purpose**: to support strategic and tactical fisheries management decisions including the development of management plans, the adoption of technical measures, and assessing novel approaches to management.

Figure 2: The Sustainable Marine Fisheries Research Programme annual planning cycle

February/March: Defra Fisheries Policy & Fisheries Science Unit agree priority areas for research, based on available budget & guided by 3-4 yearly topic reviews

March: CEFAS staff draft project proposals

July: CEFAS present proposals to Defra policy customers at annual monitoring review – proposals selected/modified on basis of discussion

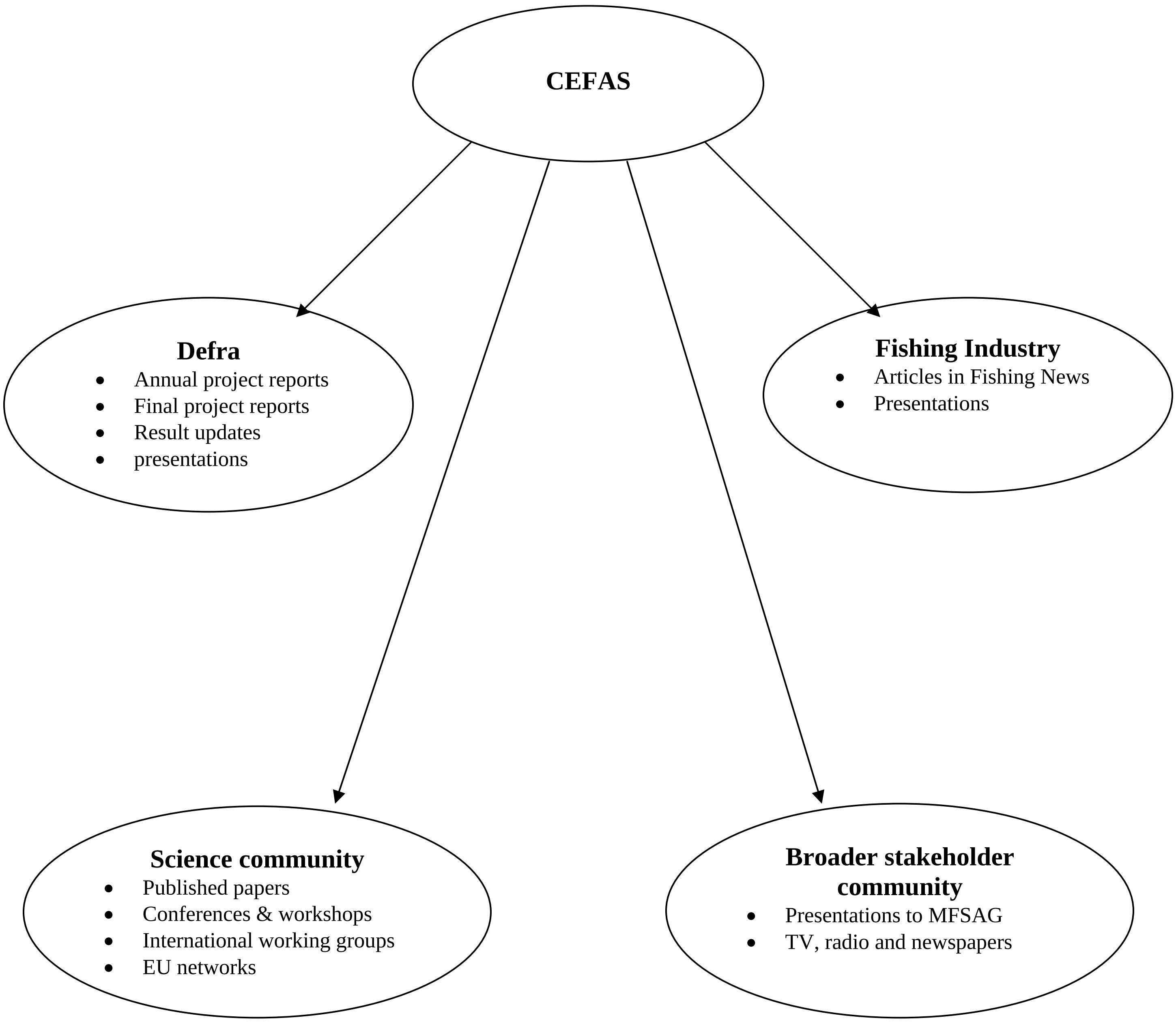
September: Defra puts proposals to Marine Fisheries Science Advisory Group (MFSAG) to obtain views of other experts and of stakeholders

December: CEFAS develops fully costed project proposals taking account of MFSAG comments and submits to Fisheries Science Unit

January/February: Fisheries Science Unit submits proposals for peer review by external evaluators

March: CEFAS finalises proposals – contracts signed with Defra

Figure 3: Important mechanisms for communicating research results to key stakeholders



Annex 8: Responses to questionnaire and Regional Advisory Council interview

This annex summarises the responses to the questionnaires sent to MariFish member organisations in countries where interviews were not carried out, and also reports on the interview held with Sam Lambourn, Chair of the North Western Waters Regional Advisory Council.

Questionnaire responses

In order to provide an opportunity for all to contribute to the study, a short questionnaire was sent to those member countries where interviews were not carried out. It posed two questions:

- In your experience, what are the most effective ways for researchers and fisheries managers to establish the research questions, and why?
- In your experience what are the best ways of communicating research results a) to fisheries managers and b) to other stakeholders such as the fishing industry, and why?

Responses were received from the following organisations:

- The Federal Research Institute for Rural Areas, Forestry and Fisheries, Germany
- The Research Council for Environment, Agricultural Sciences and Spatial Planning, Sweden
- Rannis, the Icelandic Centre for Research, Iceland

With regard to **establishing the research questions**, all three respondents pointed to the importance of taking a collaborative approach. The Swedish Research Council pointed to the benefits of writing research strategies in collaboration. Hearings or workshops may be used to identify research topics, but in their experience there is a risk that researchers promote their own subjects in such exercises. The Swedish Research Council also has experience of running calls for proposals in which both researchers and research users are required to participate. In this case the calls are typically quite broad and it is for the project proposers to identify the specific research topic.

The response from Iceland indicated that, in their experience, the most effective way to establish the research questions is for researchers and fisheries managers to develop them in close cooperation with stakeholders in the fishing industry. By taking this approach the researchers and fisheries managers have a better knowledge of the operational needs of the industry and can focus on the current problems facing the industry. However, the response indicates that not all research falls within this applied category, basic research is also very important. Working group meetings involving researchers and fisheries managers are needed in order to establish mutual understanding between the two groups. Misunderstandings on goals often occur, especially among the fisheries managers, if they are left out of the reasoning process for particular research topics.

The German response pointed to the importance of ministerial offices and research laboratories being located close to each other. Also, sufficient staff should be available on both sides to enable frequent meetings and to guarantee the necessary depth of knowledge of the prevailing scientific and political questions. This enables research questions to be developed in mutual cooperation. So rather than research questions being developed in a top-down way through a formal planning meeting, they are generated through the everyday discussions and interactions (i.e. a bottom-up approach).

With regard to **communicating the research results** the Swedish response indicated that fisheries managers and stakeholders may usefully be involved in the research programme and in research projects. This helps to ensure that relevant questions are addressed, and increases the chances that the results are used. In each research programme and research project there should be a project leader (researcher), an implementation leader (a fisheries manager), and an advisory group consisting of a number of fisheries managers. There should be continuous communication between the two leaders and the advisory group.

The response from Iceland pointed to the benefit of educating fisheries managers so that they understand research results better. Also, researchers and fisheries managers should meet and discuss the results on a regular basis. This ensures that a common understanding is developed of the research questions and results. It is important for researchers and fisheries managers to meet with stakeholders and present results to them in plain language, but also to make more and better use of the media. This is helpful as it can enable fishermen to get a better knowledge of their resources, and means they are more likely to be responsible in their fishing activities resulting in more sustainable fishing and less discards.

The German response indicated that communications should be kept simple, the number of problems to be solved should be limited, options should be presented, and responsibilities should be aligned for problem solution.

Interview with Sam Lambourn

John Lock and John Holmes interviewed Sam Lambourn, Chair of the North Western Waters Regional Advisory Council (NWWRAC) on 3rd June 2008. The NWWRAC was established by the European Commission in September 2005 as one of 7 Regional Advisory Councils (www.nwwrac.org). Its aim is to bring together stakeholders to advise the Commission on matters of fisheries management in the North Western Waters. The RAC meets around 12 times a year.

Sam Lambourn explained that the RAC takes an evidence based approach to giving advice to the Commission and it therefore cannot function without a strong scientific input. The first thing that RAC members want to know when asked to provide advice is the scientific baseline. The RACs have a memorandum of understanding with ICES to enable their provision of scientific advice. Requests to ICES are channelled through the Commission.

Given the nature of the advice they are asked to provide, and the interests of RAC members (around two thirds are from the fishing industry), the science that they need is applied and usually near-term. Typical questions would be the estimation of impacts on discards of changing mesh size or the consequences for fish stocks and fishing capacity of proposed management plans. While some RAC members may be interested in more basic and longer-term science, for example the impacts of climate change, the time pressures on the RAC to provide advice, generally on a timescale of weeks, are such that there has been little scope to get involved in such questions.

An issue of increasing interest to the RAC is the potential additional value that could be derived from data collection by fishermen. At present, this is an under-utilised resource and the scientists have not yet provided a clear view on what information would be most useful to integrate with their own stock assessment studies in order to maximise confidence in the evaluations. An important benefit of such closer involvement of fishermen in data collection would be their ownership of the evaluations, so avoiding the stand-offs between the fishing industry and science community that have sometimes arisen in the past.

It can be difficult to know what studies have been done in other countries and what evidence there is elsewhere. For example, there has been a successful fisheries-science partnership initiative in the UK, and it has only come to light recently that there are similar schemes elsewhere which have also generated valuable information. It would be very valuable to have some kind of database that provides information on who is doing what. At present, relevant work may well have been done but it cannot be found. The development of such a database would require a level of collaboration between EU member states that is still developing.

The fisheries-science partnership initiative (funded by Defra) in the UK has been very valuable in enabling scientists and fishermen to understand each other and to overcome positions that historically were sometimes antagonistic. The fishing industry and scientists need to share a view on fish stocks otherwise there is no foundation for the development of an approach to fisheries management that all parties can sign up to. By enabling fishermen and scientists to work collaboratively, the fisheries-science partnership initiative has provided valuable ground-truthing to the scientists on the one hand, and a better appreciation for the fishermen of the difficulties facing the scientists on the other. Being able to talk across the galley table about key issues such as fish stocks is very powerful in enabling the two communities to come together. There has been a sea-change in the last five years in the attitudes of fishermen and scientists towards each other.

An important area in which more progress is needed is on environmental impacts. It has so far not been impossible to get agreement on what the targets should be - what constitutes a good environment - and how environmental quality can be measured. Neither the environmentalists nor the scientists have yet come up with a satisfactory answer. Given that management measures intended to improve environmental quality can have significant impact on the fishing industry, this is an important issue that needs to be progressed.

Generally, the RAC has found that the communication of evidence to them by the scientists has been good. Always though there is the problem of insufficient time given the timescales on which the Commission typically seeks the RAC’s advice. As well as receiving a detailed technical report it is often very helpful for the scientists to come to the RAC meeting to explain the science and to give an opportunity for questions and answers. Their experience has been that the calibre of the scientists is good and that they have been very open and constructive.

Communication of uncertainties has moved on enormously in the last few years. Historically there had sometimes been some reluctance in the scientific community to admit just how shaky some of the science was. They are now much more open about it and there is the opportunity for a constructive dialogue between the science and fishing communities on how confidence can be improved

The RAC has been successful in providing a forum where scientific issues can be kicked around in a positive way. While the news from the scientists on, for example, fish stocks may not be good, there is now a better level of respect from both sides on the integrity of each other's views. It is also helpful to be able to access scientists from other member states.

Author information

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