



Training Showcase:

The Portuguese Sea and Atmosphere Institute: A case of stakeholder engagement in marine research

Catalão Alves, Carlos

Ciencia Viva – National Agency for Scientific and Technological Culture

calves@cienciaviva.pt

Universidade Nova de Lisboa (UNL)

carlos.catalao@fcsh.unl.pt



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 612393

www.rri-tools.eu

Document description

Document Name	Training Showcase: The Portuguese Sea and Atmosphere Institute: A case of stakeholder engagement in marine research
Document ID	D3.2 part of / D4.1 part of
Revision	Final for T3.2 Edited by Mandy Bailey
Revision Date	24-06-2016
Author(s)	Carlos Catalão Alves
Additional Contributions	Gonçalo Praça, Martin Good
Acknowledgements	A number of researchers from IPMA were interviewed. We thank them for their time and contribution for this learning showcase.
Note	This Showcase is designed for training purposes.

Document description.....	2
1 Introduction.....	4
2 A Framework for Stakeholder Engagement in Research	5
2.1 The Research Institution – IPMA	5
2.2 The Research Project: Benchmarking for data-limited fishery systems	5
2.3 A Framework for Stakeholder Participation	8
2.4 Stakeholder communication and interaction	15
2.5 A final consensus.....	21
3 IPMA stakeholder engagement from an RRI perspective	22
3.1 Reflection on the process criteria	22
3.2 Using this showcase: issues raised for RRI	26
3.3 Learning outcomes of this showcase	27
3.4 Adapting this showcase	29
3.5 Further use of this showcase.....	29
3.6 Limitations of this showcase	29
4 Workshop Training Exercise.....	30
4.1 The Workshop script – A Summary.....	30
4.2 Pre-workshop reading	32
4.3 Introduction: Plenary briefing	32
4.4 Exercise 1: Parallel Stakeholder Group Meetings	34
4.5 Exercise 2: Multi-stakeholder Meeting – Plenary session	35
4.6 Exercise 3: Consensus and Priorities	36
4.7 Evaluation	37
5 Useful resources.....	38
Appendix 1: Paper published in PNAS December 2015	39

1 Introduction

This learning showcase presents an overview of the state of the art methodology used by marine scientists at IPMA, the Portuguese Sea and Atmosphere Institute, I. P., to involve stakeholders in marine research.

Central to this research case is broad and ongoing interaction with stakeholders—industry, policymakers, researchers, and civil society organisations with a role in marine conservation. Stakeholder involvement at all stages of the research, from agenda setting to follow-up, helps to ensure that the IPMA research programme responds to relevant and important issues, that it delivers service products that are accessible and user-friendly, and that ultimately the most effective implementation actions are set in place.

This review is intended to identify promising approaches that have learning potential for Responsible Research and Innovation (RRI). Based on this specific IPMA research case, on fishery system benchmarking, we describe the interaction methods used for meaningful stakeholder engagement, as well as the practical issues, challenges, and opportunities of this research participatory model.

2 A Framework for Stakeholder Engagement in Research

2.1 The Research Institution – IPMA

The Portuguese Sea and Atmosphere Institute, I. P. (IPMA, IP), is a public institution, part of the indirect administration of the State, endowed with administrative and financial autonomy, and its own property. Continuing responsibility for it is with the Ministry of Sea, under the supervision and guardianship of the respective minister.

The IPMA is the state laboratory whose mission is to promote and coordinate scientific research, technological development, innovation, and service on the seas and in the atmosphere, ensuring the implementation of national strategies and policies within their areas of expertise, thus contributing to economic and social development.

Within its responsibilities for the national areas of atmosphere and sea, IPMA has focused its research efforts on projects designed to deliver direct applications that will result in progressive improvement of information available to its users in both commercial and public service, and in particular, actions to support sustainability, involving humans, resources, and ecosystems.

2.2 The Research Project: Benchmarking for data-limited fishery systems

It is difficult to expect fishers to deliver data about their catch for scientific purposes: this was one of the issues on the table at an IPMA's stakeholder meeting, on 12 December 2015. Participants discussed progress to date on a set of proposed collaborative solutions, published a year previously, in *Fisheries Research*, a peer-reviewed journal in the field.

Ivone Figueiredo, a senior marine researcher, explained at the meeting: "Fishing is a key source of data in fishery science". But she does not subscribe the idea that fishers are always uncooperative in terms of data for scientific use. In her view, this might depend on how engaged they are, how aware they are of the importance of research and innovation in their particular field, and how critical these are for the sustainability of their way of living.

One can hardly imagine a more conflicted area than fishing – both the literature and the media frequently report examples. Too many competing interests are at stake: those of the fishers, struggling to keep their livelihoods; those of the industry, which seeks to maintain its revenues; those of the scientists, who depend on reliable data; those of the government agencies, who want to enforce the rule of Law; those of all of us, (including them), whose overriding need is for a sustainable planet to live in.

In spite of these so often contradictory stances, a calm atmosphere fills the room that December day. This is no surprise, however, as this is an ongoing dialogue between knowledge derived from formal science and local fishers' knowledge – two different scales, two different worldviews, but considerable common ground.

Many of those around the table are co-authors of a research paper published in 2015. Not all of them are researchers. Some are scientists, working at IPMA; some are managers, from *Artesanalpesca*, representing most of the fishing vessels catching black scabbardfish in Atlantic waters; some are government officers, representing DGRM, the department responsible for the management of marine resources. They form a working group focusing on the solutions to address key sustainability threats to the fishery system. The fact that they have participated actively in this research, as co-authors, speaks volumes about the nature of stakeholder engagement and may offer a few useful lessons for Responsible Research and Innovation. Let us try to set them out.

How did it all start?

We have to go back two years to see it all unfold. From Summer 2013 to March 2014, a six month-long programme of stakeholder engagement formed part of a study entitled *Benchmarking for data-limited fishery systems to support collaborative focus on solutions*, published in *Fisheries Research* later that year.

Yorgos Stratoudakis, a researcher, had been involved in an initiative from the Marine Stewardship Council (MSC), designed to set standards for sustainable fishing and develop action plans for their implementation. In his own words, “the MSC is very open to criticism

as well as to suggestions that will improve their standards, and that is why stakeholder consultation is part of their practice”.

Initially Yorgos had in mind the lamprey, a delicacy on the menu of many fish lovers, but also a species with significant data deficiencies. So, he turned also to the scabbardfish in order to have two cases studies with contrasting levels of information; and in this case he determined to build on the experience of a colleague, Ivone Figueiredo, who had been working closely with fishers for quite a long time. The point here is one of transparency – from her researcher stance, it is paramount to be open about the whole purpose of data collection: “When we actively engage stakeholders in research, particularly those whose livelihood is at stake, we must be absolutely clear and show them that we are not trying to control or restrict their fishery, but rather seeking to understand it better”.

Why?

The overall goal of the project, Yorgor says, “is to improve the fishery public management system, but also to address a specific problem that jeopardises the image of black scabbardfish fishing, namely the threat that it poses to deep-water sharks”.

Indeed, as pointed out in their paper (Yorgor *et al.*, 2015), research and innovation in this field requires an approach that is no longer limited to the assessment of single-species. The impact on other species as well as on the natural environment where the fishery operates must also be factored into the equation. And in the case of the deep-water longline fishery targeting the scabbardfish, other species are also caught in the operation, including deep-water sharks. Until 2005, this by-catch represented, on average, 15% of the landed weight. By 2010, following a number of restrictive measures, the European Union established a total prohibition of deep-water shark landings. As a consequence, the identification and reporting of the catch of deep-water sharks was dramatically undermined, not because the sharks were *not* being caught but because the fishers became resistant to reporting a forbidden by-catch that was not their target and no longer had any commercial value. Moreover, their rejection back to the sea also increased.

The complexity of the problem at hand could only be addressed by involving the main interested parties: researchers, fishery practitioners, and policymakers. So a small operational group of stakeholders was put in place, with a clear agenda.

First, to discuss each performance indicator in the scabbardfish fishery system, assess their concrete score and behaviour, and identify the practical causes of poor performance. To achieve that purpose the group followed standards required by the Marine Stewardship Council, the international authority in the sector, with various performance indicators.

Second, to design a plan of action for each performance indicator. The group followed a standard problem-solving pathway: problem definition, problem decomposition, and solution creation, applying a *GUT* priority matrix, a quality tool often used in industry to support decision making processes.

The Research Purpose

“Managers, scientists and fishery representatives were invited to interact within a facilitated environment with the aim of improving understanding of main problems in the system and of negotiating solutions meaningful to all participants (...) Specific proposals for action were iteratively developed within the group and evaluated in terms of perceived cost and scope for action.”

Stratoudakis, Y. et al, 2014

2.3 A Framework for Stakeholder Participation

The case for stakeholder engagement cannot be argued from matters of general principle – it is a situated, contextualised, process that is fully grounded in each specific case. It does not have a ‘blueprint formula’ that can be applied everywhere. The concept is too broad and dependent on diverse organisational forms and local circumstances. What works for the fisheries sector may not apply to agriculture or health without relevant adaptation. Fishery research is characterised by a deep interaction with marine resources, where both economic and social issues have a clear influence. Stakeholder engagement in fisheries research and

management has already a long tradition. The focus of that engagement was for a long time the management of stock and species, but it has been shifting in the sense of including conservation and ecosystem-based management.

As Stratoudakis and colleagues (2015) point out, integrated assessment of marine resources must include consideration of the natural environment where the fishery operates, the institutional arrangements of the management system, and, in some cases, the social and economic consequences of fishing.

There is, of course, common ground, particularly when principles of democracy, transparency, accountability and sustainability are at stake, and these are best viewed as attributes of successful participative models in research and innovation.

The focus is not so much on participatory decision making or regulatory ruling as on seeking collaborative solutions, purposes, and judgement. It is not about power-sharing, because all stakeholders retain their autonomy and accountability to the organisations they represent; it is therefore about trust building and collective decision making – the outputs were collectively decided at parity between groups. Hence the critical importance of sound methods of stakeholder engagement.

Table 1: Key stakeholders in the case

General Stakeholders	Stakeholders in Fishery
Policymaking	Ministry of Agriculture and Marine Department of Marine Resources Ministry of Science and Technology
Research	Data scientists Marine biologists
Industry	Fishery representatives and managers
Citizens	Citizens' environmental organisations Consumers organisations

Trust matters

Yorgos could not be more assertive about the importance of trust building in matters of stakeholder engagement: “It was not the project that created the relationships, the relationships created the project”.

Ivone reinforces his argument, by explaining that the choice of the stakeholders did not follow a formal and planned procedure; it emerged from a long history of trust, built on previous cooperation in other areas and projects, sometimes even on a personal basis.

“It wouldn’t have worked otherwise”, Yorgos says. “Besides, these stakeholders represent their own organisations, the sector, ministry departments, ONGs. They wouldn’t feel free to express their own views and experience if they were afraid that these views would later be played against them or against those they represent. They know that it would never happen here, because they trust us”, he explains.

The point brought up by Yorgos is of utmost importance, for it applies all along the blurred line that separates representativeness from individual opinions: Sometimes people are

speaking their own minds, sometimes they are speaking on behalf of those they represent. In a research project, where truth matters more than individual interests (however legitimate), stakeholder engagement must confine itself strictly to negotiation between equal, interested parties. Anything else would render it useless for research purposes.

Referring to the general relation with fishers, Ivone wittily sums it up: “We agree amongst ourselves that we do not always have to tell the whole truth, as long as we never lie”. As far as the stakeholders meetings were concerned, people were expected to provide all information on the issues brought up by the performance indicators.

But would this not raise issues of accountability? Yorgos comes to the rescue with the strongest of arguments – the research paper itself. All those involved are accountable for what they say and stand for, or they wouldn’t have signed the study. “One of the main advantages of having stakeholders as authors of a published paper is accountability; it is almost like signing a contract”, he says.

The stakeholders’ interaction group

- A fisheries scientist with practice in group coordination and honest brokering, who acted as the facilitator of the interaction.
- The manager of a producer organisation that represents the black scabbardfish fishery fleet.
- A manager from the national fisheries administration, a governmental body.
- Three fisheries scientists with research interests in deep-water sharks and BSF.
- A fisheries scientist with long experience in fisheries stock assessment.

Motivations for stakeholder engagement

The identification of the right stakeholders requires a precise assessment of their interests and concerns, for the effectiveness of the engagement relies strongly on the link between their ‘stakes’ and the concrete purposes of the project.

To understand the rationale underpinning the IPMA scientists' interaction with stakeholders it is crucial to bear in mind that IPMA is a state laboratory. In this case fisheries research has the effective role of giving support to administration and management. This implies a clear responsibility towards all the stakeholders operating in the field, with a strong commitment to economic and social development, as well as an active role in terms of environment and sustainability.

From the outset, IPMA's motivation for stakeholder engagement was based on the need to:

- Gather stakeholders within a network that is built on research-based knowledge for fishery management.
- Bring in the stakeholders' experience-based knowledge.
- Build common ground for long-term planning and a more inclusive decision making process.

A knowledge tension

Our dialogue with Yorgos, Ivone, and Teresa is quite revealing about the differences between formal science and locally constructed knowledge, as is found in all fishing communities. After all, fishing is one of the oldest means of survival for humankind, considerably predating agriculture or formal science. It requires extensive knowledge about different species, their numbers, movements, habitat, and behaviour.

Ivone has many stories about the mistrustful attitude of some fishers towards her research-based knowledge. Sometimes they contradict her, and argue that their own knowledge is more reliable, to which Ivone often replies: "OK, show me the evidence! I need the evidence".

Sometimes the dispute gets as far the media. Last summer, in August 2015, when severe restrictions were set for catches of sardine, a most popular fish in the country, national TV showed senior representatives of the sector complaining about the validity of the scientific data in which the prohibition was based on.

This tension about knowledge is only one of the lines of animosity that all too often characterise the fishery sector. The most effective way to solve them is through longstanding, personal, and direct dialogue between all the interested parties, particularly operators (the fishers), regulators (the policy makers) and experts (the fishery scientists) – and that is exactly what this case is about.

Risk and uncertainty

There is another key motivation for stakeholder engagement identified in this research, one that is directly linked to the very nature of the object of study, which involves too many variables, based on too insufficient adequate data – hence the title of the study: *data-limited fishery systems*.

Data-limited fisheries are precisely the ones that tend to be overfished due to the imprecision of estimates and assessment. That poses a serious threat to the sustainability of the world's fish stocks, and to more than 260 million people whose livelihoods depend on those stocks.

The [SNAP](#) working group provides some quite alarming figures about this threat. (SNAP is a Clinton Global Initiative, joining the Nature Conservancy, the Wildlife Conservation Society and the NCEAS.) Fishery has seen an 80% growth since 1988, particularly in the developing world, “where the majority of these stocks are data-limited, unassessed, poorly managed, and far more likely to be overfished”.

The project rationale for stakeholder engagement

“Whatever the fishery system under scrutiny, any rigorous integrated assessment methodology faces data deficiencies at some stage of its evaluation process (Fletcher and Bianchi, 2014).

The situation is exacerbated in data-limited fisheries often present in regions of high ecological value and elevated conservation risk (Worm and Branch, 2012). To cope

with such deficiencies, methods have been developed to adopt risk-based frameworks under low or variable levels of information (Fletcher, 2005; Astles et al., 2006; Patrick et al., 2010).

In these cases, stakeholder participation is a central feature, critical to expanding the range of inputs during the identification and rating of risks and to increasing the understanding and uptake of results.”

Stratoudakis, Y. et al, 2015

Why is stakeholder engagement crucial to address these global challenges?

As fishery scientists, Yorgos and colleagues work on a regular basis with fishing communities, fishery practitioners, marine conservationist groups, and regulatory authorities. They are perfectly aware of the role that these stakeholders can play to collectively address these data limitations and to design alternative management solutions. This is the basis of the main argument for stakeholder engagement in this research, Yorgos explains, as follows.

Ensuring the sustainability of fishery systems requires rational and effective solutions. This is particularly difficult in the case of data-limited systems. Without an integrated assessment of the stocks and the wider implications (ecological, social and economic), there is not enough information to justify and guide appropriate action. In areas where the data is limited the level of uncertainty rises, as do the risks associated with the activity.

“We are dealing with issues of high variability and little consensus”, he says, “Stakeholder engagement brings added value to address the risk and uncertainty involved in these matters, by adding a whole spectrum of non-formal knowledge from those who face the realities of the sea on a daily basis, to our research-based knowledge. Their knowledge, experience, and judgement are invaluable, especially in cases where data are limited.”

Involving stakeholders in an effective way requires structured and ongoing communication strategies to operate throughout the entire research project, and these work best with a small, highly knowledgeable, and engaged team. We will see in the next section how it worked in this case.

2.4 Stakeholder communication and interaction

Table 2 shows the two-year long process of stakeholder communication, including the interaction workshops that form the basis of the published paper, in Appendix 1. We strongly recommend that all stakeholders in this activity should read it, to gain a full appreciation of the interaction techniques used by Yorgos in his role of stakeholder group facilitator.

However, our focus here is on the 3rd plenary meeting, in December 2015, after the article was published, when the project reached the monitoring phase (see Table 5), and where we were present as observers.

The Multi-Stakeholder Plenary Meeting

This was a full day meeting with an extensive agenda. In Yorgos' words: "It was the start of a new phase, and one which had not been fully anticipated in 2013 at the start of the project".

It is significant that the number of stakeholders was considerably expanded, beyond the initial group who co-authored the original research paper, to include more representation from wider civil society. The new members were:

- A representative of a consortium of organisations concerned with marine conservation, which proved particularly relevant for the discussion.
- Researchers and policy makers from the archipelagos of Madeira and Azores were who participated via web-based communication.
- A university professor with long experience in fishery science.
- An IPMA colleague with experience from other fisheries management systems (NAFO and NEAFC).

Eleven participants were present in the room, plus two online participations, and two observers from Ciencia Viva.

Table 2: Phases and methods of stakeholder interaction

Communication	Interaction
Summer 2013 INDIVIDUAL INTERACTION	Identification and invitation of each stakeholder. Exchange of information, about the research and the scope of the activity
Sept 2013 1 st PLENARY MEETING Benchmarking workshop	Full day interactive session: <ul style="list-style-type: none"> • Discussion of each Performance Indicator. • Initial problem analysis.
Out 2013 – Feb 2014 BILATERAL MEETINGS	Discussion of the causes of poor performance against standards Building consensus on specific solution pathways
March 2014 2 st PLENARY MEETING Assessment workshop	Full day interactive session: <ul style="list-style-type: none"> • Review of assessment methodologies. • Cost assessment of actions and solutions. • Discussion of individual scores. • Collective scores for each Performance Indicator.
March-Jun 2014 RESEARCH PAPER	Co-authoring of the research paper
Out 2014 – Nov 2015 Online contacts	Individual monitoring of actions and performance.
Dec 2015 3 st PLENARY MEETING Progress Assessment	Group assessment of the progress of proposed solution for each performance indicator Review of assessment and action pathways

Purpose of the meeting:

- to carry out a multi-stakeholder analysis of the way the performance indicators have evolved since the publication of the article.
- to evaluate how the proposed consequent actions had been implemented.
- to evaluate whether the wider group of stakeholders viewed the problem the same way as the initial, more restricted group.

A total of 23 issues and actions were analysed (see Table 3 of the article, in Appendix 1, for a full description).

Fishery impacts on oceanic sharks

Our current focus is on the impact of scabbardfish fishing operations on widely distributed deep-water sharks, and particularly the assessment of the impacts on shark populations.

There is currently a landing interdiction applying to these species across the North East Atlantic. A strong case has emerged for the introduction of maximum precautionary measures by the European Union because of:

- The absence of reliable indicators about their abundance, habitat hotspots and migrations.
- Their vulnerability to fishing exploitation.
- The absence of high-quality data on total catches.
- A lack of reporting (possibly deliberate underreporting) of shark catches.

The goal, agreed by all the participants, is to propose measures to tackle this threat to shark conservation *without totally closing down the catching of black scabbardfish*, because of the major economic and social consequences that would have. The short-term priority must be to reduce number of sharks caught until there is reliable scientific information that can permit an acceptable minimum level of by-catch, replacing the current ban.

The demand for scientific data

One of the scientists studying the effects of the ban on shark catches around the archipelago of Madeira draws attention to reports describing its negative impact on fishing communities in the region. Despite this the interdiction has remained in place, and explains how “it is not likely to be removed, unless we have reliable scientific knowledge about the whole situation”.

The representatives of the Portuguese continental deep-water longline fleet point out that: “because of the interdiction all data are lost. And with zero data we are left with zero knowledge of what is happening to the shark population.”

One of the scientists who sailed with some of the commercial vessels to observe and analyse the situation reports that had been able to identify sectors with significant overlap of scabbardfish and sharks. She then suggests that this could justify setting up areas closed to the fisheries.

Here is the argument:

From the discussions in the meeting it became clear that the problem is that these observation projects are expensive, and therefore limited and insufficient. In future we need to provide robust evidence based on further research. For the time being, we could make a start by defining the areas where catching scabbardfish should be forbidden due to the high concentration of deep-water sharks. The justification for this is that, we cannot completely ban the capture of scabbardfish, but at least commercial fleets should avoid areas of high shark concentration, and we must come up with the effective awareness raising campaigns within the fishing communities and wider society.

At this critical point in the discussion, the scientists ask the representatives of government agencies to suggest the best mechanisms for introducing areas closed for fishery: should this be achieved through ‘gentlemen’s agreements’ or perhaps some kind of memorandum of understanding.

This poses a dilemma for the government agency stakeholders because there are not many options available as long as the overall interdiction of sharks catching is in place. Defining a minimum shark catch (by-catch) would require the total ban to be lifted, and there can be no closed areas where it does not apply – besides, as an EU member, Portugal could not unilaterally adopt initiatives against European legislation.

Hence the other recommendation rose at meeting: The Portuguese government should draw a proposal to the European Commission to study the lift of the current total ban.

The stance of marine conservationists

The representatives of marine conservationist groups acknowledge the fact that commercial fishing remains one of the key sources of the data required to understand the issues at stake. So they propose a solution based on the concept of a ‘sentinel fishery’, a non-commercial programme of fishing, with a minimal catch, designed only for data collection purposes, with comprehensive documentation of the capture. Would this provide a potential compromise option? One of the scientists observes: “I see we are all going in the same direction”!

The conservationists favour these ‘pro-active’ measures, as they would offer the EU and national agencies a concrete proposal emerging from a multi-stakeholder process.

The group agree that this is a viable pathway. It is attractive for the scabbardfish fishers because they have no interest in fishing areas with high concentrations of sharks, which they see as ‘plague areas’ that have no commercial interest for them. Sharks are not caught deliberately; it happens purely by chance, as unintended by-catch.

The fishers’ representatives make it clear that if the point is to protect the sharks, the idea of setting restricted areas would be far more effective than the blanket ban. A key argument is that, because of the current legislation, the rejection of the sharks back to the sea is inevitable, and when that happens all information gets lost.

This practice does not serve the interests of any of the stakeholders including the EU, which has been struggling to put an end to it.

Seeking alternatives

Everybody seems to agree that a full interdiction in itself is not enough to solve the problem, because the sharks are caught anyway as unintended by-catch.

One of the scientists suggested that another alternative would be to have a scientific observer in each vessel. This could result in a more effective use of the data; in the few cases where scientific observation has been carried out, the data analysis has so far only been used for scientific and advice purposes. But if it could be used as a control mechanism it would be far more effective than the blanket interdiction.

The stakeholders from Madeira (participating via the web) have examples of scientists on board vessels, but point out that this option requires substantial resources, and they have not been able to get sufficient funding for their programmes. They are in favour of the ideas being put on the table; for them these appear as very positive steps towards the minimisation of the environmental impact of fishing whilst, at the same time, addressing the social and economic impact of the restrictions.

Another scientist asks the marine conservationists whether they have access to data being gathered by other national departments and European agencies. They reply that it is very difficult to access that information. It has been asked for, that data certainly exists, but it has been gathered for purposes other than fishing management and is not currently available. Someday, they hope, those data will be fully released, because they are potentially invaluable for multiple potential applications.

2.5 A final consensus

The conclusion of this agenda item is the achievement of a final consensus. All stakeholders agree to work on a collaborative proposal, aiming to provide policymakers with strong scientific arguments to reshape current policies by introducing a very small permitted by-catch, up to a maximum of 5%, for monitoring and data gathering purposes, combined with setting up areas closed for these fisheries where full interdiction still applies.

Simply put, the overall rationale is as follows:

Through multi-stakeholder collaboration, particularly with the fishing sector, it is possible to put in place a system that delivers sustainable catches of the scabbardfish without negative impact on the sharks. All agree that, currently, no one knows what is really happening, because there is no follow-up, and the practice of returning dead sharks to the sea may be far more extensive than previously thought, since there is no one monitoring it. If just a small percentage of the catch is landed and can be properly researched, the results will provide a far more reliable rationale for effective decision making.

3 IPMA stakeholder engagement from an RRI perspective

3.1 Reflection on the process criteria

The IPMA's Benchmarking for data-limited fishery system is a research project designed to address a critical aspect in the sustainable use of marine resources, one that is strongly linked to the very nature of its object, which involves too many variables, based on too insufficient adequate data. It achieves this purpose through regular interaction with fishing communities, fishery practitioners, marine conservationist groups, and regulatory authorities.

The systematic use of stakeholder engagement in marine research renders this case particularly useful for training purposes in matters of Responsible Research and Innovation. The case presented in Sections 2 and 3 will, therefore, be used as the scenario for a training workshop addressing key issues identified and characterised by the RRI Tools project, particularly those related to process criteria that lead to RRI.

Diversity and inclusion

This pair of process criteria – diversity and inclusion – requires the engagement of a wide range of stakeholders in all the stages of research. As earlier mentioned, this particular case involves stakeholders right from the early stages of the study up to its dissemination stages, including both the publication of the research paper and the subsequent phases of assessment and monitoring of results, all through a two-year long process of stakeholder communication.

The rationale put forward by the RRI Tools project in its *Policy Brief* proposes two main reasons for stakeholder engagement: one is the overall democratic argument for a wider public participation in the advancement of science and technology, the other is the call for a broader and more diverse source of views, ideas, and expertise. Without losing sight of the former, this learning showcase puts its accent on the latter. Fishery research is highly dependent on extensive interactions with marine resources, where both the natural environment where fishing operates and the economic and social consequences of fishing

must be taken into account – and this is, actually, the main reason why stakeholder engagement has such a long tradition in fishery research.

However, as far as data-limited systems are concerned, the case for stakeholder engagement is even more pertinent, because the absence of extensive and adequate data increases the level of uncertainty and the risk associated with fishing activities. On the other hand, the fact that these data deficiencies are often present in regions of high ecological value and elevated conservation risk renders stakeholder participation virtually irreplaceable. As argued in the *research paper in the Appendix*, stakeholder engagement adds a wide range of non-formal and situated knowledge – brought by fishers and managers – to the body of research-based knowledge that underpins the assessment of data-limited systems.

Openness and transparency

The *RRI Tools Policy Brief* presents openness and transparency as key factors to boost the publics' trust in science. Yet the pair has to go hand-in-hand, for openness alone is not enough to ensure trust: information has to be made clear to all stakeholders in ways that not only make sense to them but are meaningful for their day-to-day life and needs – this is where transparency comes in.

In this case trust is the result of a longstanding history of interaction, added by a non-hierarchical dialogue that is based on a shared meaning of themes and language. As mentioned in Section 2, it was the pre-existing relationship that created the project, not the other way around. The stakeholders involved in the project were not formally invited as a result of an abstract stakeholder mapping. They were not invited because of their representativeness of specific stakeholder groups; and, without disregarding the interests of their own group, they are expected to voice their minds and individual opinions, rather than those of the institutions they belong to.

The key learning outcome in this case is, therefore, the awareness of the paramount importance of trust building for sound methods of stakeholder engagement. Openness and

transparency here mean that stakeholders have to retain both their autonomy and their accountability for the organisations they represent. The purpose of the interaction is not one of normative decision making or regulatory ruling (there are other institutional frameworks for that), the stake here is to seek collaborative goals, judgement, and solutions.

For the above purpose, transparency and trust is best served by non-hierarchical dialogue. This was ensured by the use of innovative methods of engagement, which also constitute a noteworthy learning feature from this case. Indeed, more traditional participatory models rely heavily on a clear distinction between promoters and participants. The former determine the rules of the interaction and its outputs, whereas the latter are mainly expected to provide information, opinions, and judgement. In this case the authors propose a method that favours the co-generation of knowledge with a focus on solutions. The *research paper in the Appendix* describes in detail the application of their proposed interaction method, where the scope and rules of engagement are totally defined by the participants, involving four consecutive stages, from initial interaction scoping to solution prioritisation. The full reading of the published paper is, therefore, strongly recommended for a complete understanding of the stakeholder interaction techniques applied in this case.

Anticipation and reflection

Anticipation is as much a vision of the future as it is an understanding of how research and innovation shapes that future. To fully grasp both this anticipated vision and its driving process one needs to understand the problem, the stakes involved, the values underpinning these interests, as well as the individual and institutional procedures that shape current and future practice. Such an understanding requires constant and ongoing reflection in all stages of research and innovation.

This case provides quite a few examples of both anticipation and reflection:

Anticipate – describing and analysing the impacts of scabbardfish fishing operations on widely distributed deep-water shark populations. This does not apply only to the assessment of its implications for the conservation of marine resources or the sustainability of the wider ecological environments where fishing operates. The

concerns extend also to the economic and social consequences for the fishing communities.

Reflect – reflecting and debating the conflicting interests, motivations, and implications that shape both research and practice. Section 3, in particular, describes the different stand points and purposes of all stakeholders involved: the marine scientists, who seek reliable data (and depend heavily on fishers' reporting on catch); the government agencies, who seek to monitor the fishing operations under the current national and European regulations; the marine conservationists, who voice the overall concerns of society for the integrity of both the species and their environment; the fishers, who fight for their livelihoods and, to some extent, for the wellbeing of their families; and, finally, the fishing industry, which seeks to maintain the revenues that are key for the sustainability of the whole sector.

Responsiveness and adaptive change

In spite the diversity of their stances, all stakeholders in this case are aware of the dilemmas, areas of uncertainty, and risk that arise from the information deficiencies that characterise data-limited fishery systems. This shared awareness, together with a high level of trust amongst them and an effective use of interaction participatory methods, provides a common ground for research and action.

From the outset, it becomes clear that all the stakeholders involved are open to change, and actually adapt their routines, as long as they feel that their interests, opinions, knowledge (research-based *and* locally constructed) and expertise are brought to both the assessment of the problem and the uptake of proper action. An evidence of this attitude is the two-year long interaction, which is still ongoing, in which a series of meetings of contacts occur on a regular basis, resulting on systematic evaluation of initial proposals with a subsequent review of procedures and assessment.

3.2 Using this showcase: issues raised for RRI

Although this learning showcase was designed as part of a workshop scenario, fully described in Section 5, the issues that it raises for RRI make it suitable for use in the context of formal learning programmes, both face-to-face or online.

This concrete example of stakeholder engagement in research addresses a critical, global challenge. There is compelling evidence of how current the challenge is; it is the subject of considerable media attention, even as this showcase is being prepared.

The challenges that the research team had to face and the opportunities opened up by bringing together relevant stakeholders in a bottom-up engagement process were:

The challenges:

- Identify the right stakeholders, based on their profile, representativeness, and expertise, to focus on meaningful engagement.
- Keep and nurture a high level of trust amongst stakeholders.
- Build a common ground to account for emerging conflicts of interests.
- Bring together research-based knowledge and experience-based knowledge.
- Overcome barriers of communication among stakeholders.
- Provide longstanding and effective methods of communication and interaction.
- Engage stakeholders in all phases of the research process, from agenda setting to dissemination.

The opportunities:

- Build a knowledge-based network for research and innovation.
- Bring in the stakeholders' experience-based knowledge.
- Build a common ground for long-term planning through a more inclusive decision making process.

As recently as last Thursday (28 January 2016) a Portuguese newspaper, *O Público*, came up with an article reporting on a research paper published on 16 January 2016 from the Proceedings of the National Academy of Sciences with the participation of Portuguese researchers, entitled [*Ocean-wide tracking of pelagic sharks reveals extent of overlap with longline fishing hotspots*](#). The first sentence goes like this:

“Oceanic shark conservation is hampered by basic knowledge gaps about where sharks aggregate across population ranges and precisely where they overlap with fishers.”

Even though it applies only to surface water sharks, this article demonstrates how the stakeholders co-authoring their research paper were aware of the facts and willing to engage policymakers, fishing communities, and marine conservationists in collaborative action. This is clearly a case of research aligning its results with societal values and expectations – a key element in Responsible Research and Innovation.

3.3 Learning outcomes of this showcase

The RRI Tools project has developed an ambitious set of learning outcomes that it would like to see addressed by those training stakeholders in the principles and practice of RRI. These are set out in the RRI Tools *Learning Outcomes* document.

The proposed learning outcomes in the document are divided into outcomes for all stakeholders and stakeholder specific outcomes. Trainers should be familiar with this document, and be prepared to amend and augment it as they deliver their training and deal with particular situations. The specific outcomes from the sessions outlined in the workshop scenario described in Section 4 are summarised as:

Policy makers

- Understand their role in facilitating and building partnerships that can lead to RRI.
- Understand their role in providing leadership for RRI, including foresight and societal.

Industry

- Understand how to overcome potential contradictions between individual commercial success and societally responsible product and service development and delivery.
- Understand the importance of incorporating diverse and relevant viewpoints into innovation projects.

Education

- Understand how formal, informal, and continuing education can bring RRI to life for young and old alike.
- Understand how to incorporate RRI into the existing curricula, and to expand, and augment it where necessary.

Civil society organisations

- Understand what unique and societally insightful perspectives Civil Society Organisations can bring to the research and innovation processes.
- Understand how they can influence the business and commercial worlds to generate products and services that fit their objectives.

Research

- Understand how to embody RRI in the day-to-day processes of research projects, identifying strengths and weaknesses in what they are proposing to do or are already doing.
- Understand the importance of research teams being inclusive and diverse in their composition.
- Understand how their institution can support them in delivering research that is responsible and responsive to societal needs, including by working with civil society organisations.
- Understand how to work with industrial and commercial partners so that the values of RRI are carried forward into the development of new products and services.

3.4 Adapting this showcase

A main reason for developing the story of this benchmarking assessment of the case on data-limited fishery systems was that it was felt to have a number of key lessons to be learned from interaction methods used for meaningful stakeholder engagement, as well as the practical issues, challenges, and opportunities involved in a research participatory model.

Special attention was put in the outline of the workshop scenario described in Section 4 to avoid any specific reference to the actual case (with the exception of the box describing the problem that the stakeholders are expected to address). Trainers may, therefore, adapt this learning case by proposing a similar problem, more in tune with their local or regional requirements.

3.5 Further use of this showcase

After any workshop use of this showcase and at an appropriate point in any online training course, Sections 1 and 2 should be made available to the workshop participants and online trainees, along with the additional materials outlined in Section 5 and the appendices.

3.6 Limitations of this showcase

This case is intended only to illustrate specific aspects of stakeholder engagement in research, and is not a complete solution to how to do this. It needs to be used in conjunction with the RRI Tools *Policy Brief*, with (parts of) the *Quality Criteria*, the *Catalogue of Good RRI practices*, the *Report on the analysis of opportunities, obstacles and needs*, and relevant items in the comprehensive toolkit produced by the project.

4 Workshop Training Exercise

4.1 The Workshop script – A Summary

The stakeholder engagement case presented in Sections 2 and 3 will be used as the scenario for a training workshop involving the key stakeholder groups identified and characterised by the RRI Tools project. The workshop comprises *six stages*:

1. A pre-workshop stage

Participants will be asked to read through the *research paper in the Appendix and Section 2*, but should not have access to these during the simulation. The reading task can happen at the workshop or ahead of it.

2. Introduction

The goal of this phase is to raise participants' awareness of the importance of stakeholder engagement, particularly in cases where research and innovation may have significant impact in ecological, economic, or social terms. To achieve this the moderator will make use of the real case addressed in this learning showcase, providing an overview presentation of the case and a summary of the structure of the exercises, using a Power Point presentation such as the one provided in this showcase. By the end of the presentation participants should be able to discuss the case, the nature of its central problem and the different roles they are expected to play.

3. Parallel Stakeholder Meetings

The aim of this session is to identify positive recommendations and difficult 'sticking points' which are likely to become barriers to consensus. Participants break into 5 stakeholder groups; each one will be allocated a colour – research (red), policymaking (green), education (blue), civil society (yellow) and industry (purple). Each group must come up with 2 potentially positive inputs and 1 probable sticking point.

4. Plenary Session – The Multi-stakeholder Meeting

The aim of this phase is to stimulate debate, engagement, and negotiation; where participants should reach agreement on collaborative action to solve the problem. Each stakeholder representative will present the two constructive inputs from their stakeholder group. The moderator will use the board (or flip-charts) to make brief notes of the points, and will ask the stakeholder to explain their two points and the reasons for making them. The moderator will stimulate debate by asking the other stakeholders their opinions about these points, which may be changed and reviewed as a consequence of the discussion. The process goes on until all ten positive points have been recorded and debated by all the participants. The moderator should make sure that all participants play an active role.

5. Final Plenary Session – Priorities and Consensus

The goal of this session is to reach a level of consensus on the priority to be given to each of the points formulated in the multi-stakeholder meeting. Participants are given three stickers with the colour that was previously assigned to their stakeholder group. To avoid being influenced by overall results, participants are asked to go to the board/Flip-charts and simultaneously assign one or more stickers to the ideas that they think should be prioritised. Once this is done, the most multi-coloured ideas will indicate a good level of consensus; the greater the number of stickers, the higher the priority. The moderator will facilitate a plenary discussion by asking participants to discuss the ideas that got the most (and diverse) stickers and why.

6. Evaluation

Participants are asked to share feedback of their experience and the issues that this case raises for RRI. Each participant will write a short report about his/her experience.

Notes:

- Session timings are indicative.
- The number of parallel stakeholder group sessions will depend on participant numbers; each group should include at least two members. Where participants do

not represent genuine stakeholders, the moderator will randomly assign a stakeholder group.

- The overall workshop exercise is designed for a maximum of 30 participants, with a balanced distribution of stakeholders (3 - 6 participants each).
- Materials for the workshop include: a whiteboard and/or flip-charts; 5 sets of stickers in 5 different colours (3 stickers, of the same colour, for each participant).

4.2 Pre-workshop reading

Participants will be asked to read through the *research paper in the Appendix and Section 2*, but should not have access to these during the simulation.

4.3 Introduction: Plenary briefing

30 mins

This should be a brief session, where participants are presented with the learning showcase, as outlined in Sections 1 and 2. As the exercise is designed to put them in the roles of the different stakeholders so as to come up with arguments and recommendations that are in tune with their specific interests, they should be briefed on the real case (as described in Section 2).

The problem:

A multi-stakeholder meeting has been called by a research team from a leading institution for fishery science and management to discuss appropriate action that will improve the fishing management system. One of the key issues at stake is the negative impact of scabbardfish fishing on other species, and in particular on the oceanic deep-water shark.

The aim of the meeting is:

To agree common ground for action to ensure that fishing the scabbardfish in the North East Atlantic will not threaten oceanic shark conservation, without putting at risk the sustainability of the communities whose livelihoods depend on that fishing activity.

Notes:

- Section 3 of this learning showcase should not be disclosed before or during the workshop exercises.
- At the end of the exercises, as part of the workshop evaluation, participants may be briefed on the actual positions of the stakeholders in the real case, as described in Section 3, which only then should be distributed.

The meeting involves five stakeholder groups, as follows:

1. *Policy makers* from the Ministry of the Sea, the Department of Marine Resources and the Ministry of Science and Technology.
2. *Representatives of companies* that congregate fishers and other operators in fishery industry and commerce.
3. *Representatives of the Research community*, and in particular fishery scientists and marine biologists.
4. *Pressure and special interest groups* – e.g. marine conservationists, environmentalists and organisations representing the interests of consumers.
5. *Educators and science communicators* trying to ensure that young students and society at large are aware of the global challenges posed by the sustainable use of marine resources.

4.4 Exercise 1: Parallel Stakeholder Group Meetings

45 mins – 2 to 6 per stakeholder group

Your specific stakeholder group is meeting a *few days ahead* of the multi-stakeholder meeting, to which you have been invited to send representatives.

Your tasks are:

1. Decide on two key positive inputs can your stakeholder group make towards this goal.
2. Agree on one key sticking point that your group feels could be a deal-breaker, making it impossible to reach the agreement the multi-stakeholders meeting is hoping to achieve. NOTE: this sticking point is to be kept private within each group, and may be used in the second meeting with a view to resolving differences.



Workshop: Stakeholder Engagement in Research
I3S | University of Porto | February 2016

4.5 Exercise 2: Multi-stakeholder Meeting – Plenary session

45 min

This is the multi-stakeholder meeting called by the research team to agree on appropriate action to improve fishery management and, at the same time, tackle the impact on the conservation of the deep-water shark.

Prepared by the discussions held in their own stakeholder group – even if these did not lead to complete agreement – representatives bring their group’s positive ideas to the meeting for discussion, arguing to ensure that these are taken into consideration and revising their viewpoints in the light of arguments from other groups.



Workshop: Stakeholder Engagement in Research
I3S | University of Porto | February 2016

The aim of the multi-stakeholders meeting is to come up with a list of no more than 10 key features that the overall proposed action should contain. As far as possible these should be written down in abbreviated form.

Note – it may well be the case that this list includes items that were not included in the set of ‘positive inputs’ brought to the meeting from the stakeholder groups.

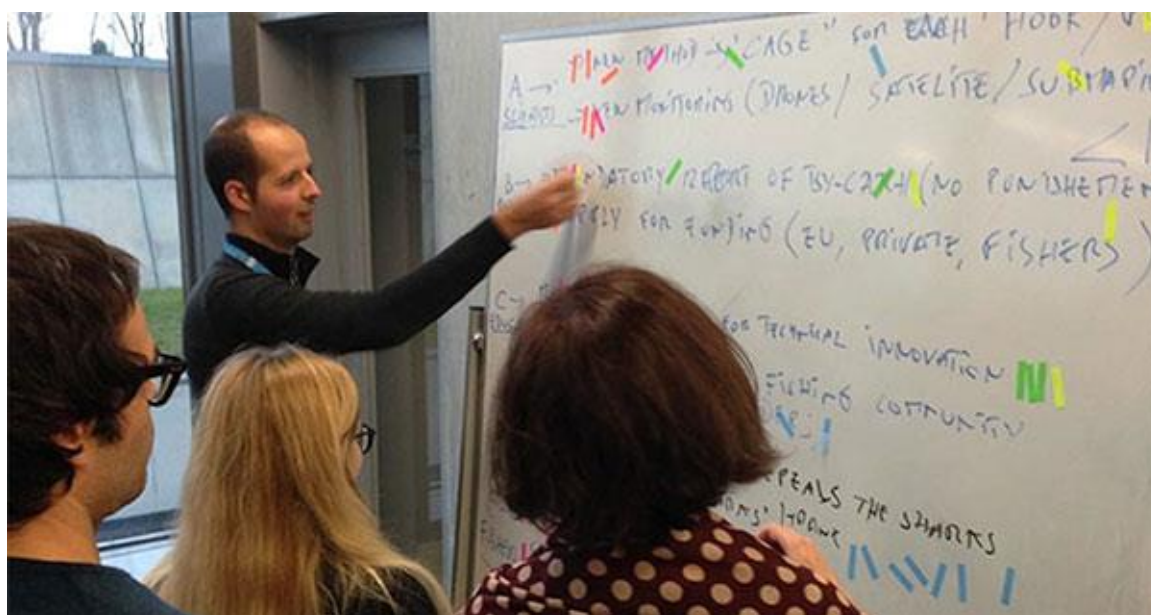
Only at the end of the meeting should stakeholder representatives reveal what their (potential) sticking point was. This will be discussed further in the next plenary session.

4.6 Exercise 3: Consensus and Priorities

30 mins

This session is designed to reveal and debate the ideas that achieved significant consensus and were given high levels of priority for action. It starts with the participants assigning/voting their preferences by distributing their group's coloured stickers.

Once all stickers are assigned, participants are asked to explain and debate the rationale of their preferences and sticking points. Facilitators should bear in mind that the discussion should be focused on raising the participants' awareness of the key importance of stakeholder engagement in research and innovation, and of the issues involved in reaching consensus and collaborative decision making.



Workshop: Stakeholder Engagement in Research
I3S | University of Porto | February 2016

4.7 Evaluation

30 mins

Participants are asked to share feedback of their experience and the issues that this case raises for RRI. Each participant will write a short report about his/her experience.

The feedback and the individual reflexive reporting should address the following main questions:

1. How easy or difficult was it to reach agreement on these key features for the common action plan?
2. Did any of the stakeholder representatives feel that their deal-breaker had been so poorly addressed that they could not sign up to the framework the meeting came up with? If so, why?
3. What other interest groups, as well as the stakeholder representatives, might usefully have been present at the meeting?
4. How easy or difficult was it for them to come up with their two positive inputs and their sticking point.
5. Were the prior discussions useful in preparing them for the multi-stakeholder meeting?
6. Did they feel that their input(s) were incorporated, and their potential sticking points dealt with fairly?
7. Did they feel that their 'stakeholder group' accurately represented the range of their members' interests?

Learning outcomes

This workshop should enable participants to consolidate their grasp of the key concept: the need for general mutual understandings between all stakeholders, and in particular to understand the role of RRI in promoting that.

5 Useful resources

- (1) RRI Tools Toolkit
- (2) RRI Tools reports referred to in Showcase
- (3) References and web links listed in showcase
- (4) Model PowerPoint presentation – draft available

Appendix 1: Paper published in PNAS December 2015

Nuno Queiroz, “Ocean-wide tracking of pelagic sharks reveals extent of overlap with longline fishing hotspots”, vol. 113 no. 6 1582–1587, doi: 10.1073/pnas.1510090113

Benchmarking for data-limited fishery systems to support collaborative focus on solutions available from: www.researchgate.net/publication/272828397_Benchmarking_for_data-limited_fishery_systems_to_support_collaborative_focus_on_solutions

Training Showcase: The Portuguese Sea and Atmosphere Institute: A case of stakeholder engagement in marine research