FIS010 - Innovation in Scottish fisheries governance
–
Stakeholder participation

A REPORT COMMISSIONED BY FIS
AND PREPARED BY

Published by: Fisheries Innovation Scotland (FIS)

This report is available at: http://www.fiscot.org.

Suggested Citation: MRAG Ltd. 2017. Innovation in Scottish fisheries governance – Stakeholder participation. A study commissioned by Fisheries Innovation Scotland (FIS) http://www.fiscot.org/ and supported by The European Maritime and Fisheries Fund and The Scottish Government.

Title: Innovation in Scottish fisheries governance – Stakeholder participation

ISBN: 978-1-911123-11-8

First published: July 2017

Innovation in Scottish fisheries governance – Stakeholder participation

Fisheries Innovation Scotland

FIS010

Final Report

May 2017

Submitted by

MRAG

MRAG Ltd is an independent fisheries and aquatic resource consulting company dedicated to the sustainable use of natural resources through sound, integrated management practices and policies.

Established in 1986, MRAG has successfully completed projects in more than 100 countries. Our in-house experts have a wide variety of technical expertise and practical experience across all aspects of aquatic resource management, policy and planning, allowing us to take a multi-disciplinary approach to every project. Our capability to service an extensive array of resource management needs is further extended through our network of associations with internationally acclaimed experts in academic institutions and private organisations worldwide.

18 Queen Street
London
W1J 5PN
United Kingdom

+44 (0) 20 7255 7755
www.mrag.co.uk
enquiry@mrag.co.uk

Project code:	GB2175
Version:	v002
Prepared by:	DS, HR, AW, WM, RA
Approved by:	RA

Table of Contents

List of Tables

List of Figures

Acronyms

AC	Advisory Council
CFP	Common Fisheries Policy
DFO	Department of Fisheries and Oceans Canada
DSG	Discard Steering Group
EMFF	European Maritime and Fisheries Fund
eNGO	Environmental Non-Government Organisation
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
FIS	Fisheries Innovation Scotland
FISA	Fishing Industry Science Alliance
FLAG	Fisheries Local Action Groups
FMAC	Fisheries Management and Conservation Group
FMC	Fisheries Management Council
ICES	International Council for the Exploration of the Sea
ICT	Information Communication Technology
IFCA	Inshore Fisheries and Conservation Authorities
IFMAC	Inshore Fisheries Management and Conservation Group
IFMP	Integrated Fisheries Management Plans
MASTS	Marine Alliance for Science and Technology Scotland
MPA	Marine Protected Area
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSP	Marine Spatial Planning
MSS	Marine Scotland Science
MSY	Maximum Sustainable Yield
NFA	The Norwegian Fishermen's Association
NGO	Non-Government Organisation
NMFS	NOAA's National Marine Fisheries Service
NMP	Scotland's National Marine Plan
OECD	Organisation for Economic Co-operation and Development
RAC	Regional Advisory Council
RBM	Rights Based Management
RIFG	Regional Inshore Fisheries Groups
RMSG	Regional Member State Group
RSPB	Royal Society for the Protection of Birds
SAMS	Scottish Association of Marine Science
SCCS	Scottish Conservation Credits Scheme
SFC	Scottish Fisheries Council
SSMO	Shetland Shellfish Management Organisation
TAC	Total Allowable Catch
UK	United Kingdom
US	United States of America
WWF	World Wide Fund for Nature

Executive Summary

There is growing desire to promote participation in resource management and the co-production of policy. The quality of the decisions made through co-management depends on the nature of the process leading to them, it is therefore important to focus on how stakeholders are represented, the manner by which they participate, and their level of engagement and satisfaction, in order to establish if successful co-management is being achieved. This study set out to initiate discussions related to Scottish fisheries governance, specifically focusing on how stakeholders are integrated into the decision-making process and how the system could adapt to face future challenges. This report describes how stakeholder groups are currently integrated, it is framed around a literature review of co-management, and supported by three case studies. Findings are synthesised in order to provide insight on issues of effective stakeholder integration and presents possible options where adaptations could be considered.

The case studies highlight the uncertainty and difficulties that can arise when policy decisions are taken with imperfect knowledge. Some authors went on to propose that uncertainty should be dealt with as a social issue rather than a technical or scientific issue. Viewing uncertainty in this manner can produce a more reflexive process, one in which research provides a focus on collaboration and transformation leading to more productive working relationships, shared responsibilities and ultimately in reduced uncertainty. An important similarity between cases of significant governance change is that they are often triggered by crises. Changes made to governance results in changes to individual roles and behaviours of stakeholders. This highlights a key paradox, in that interactions in the event of crisis can lead to innovation and change but, at the same time, when change is discussed in less immediate or concrete terms it may be less likely to occur. Therefore, crisis has the effect of focusing discussion on more concrete aspects and creates opportunities for new actors to be included, resulting in the broadening of responsibility.

The traditional systems of linear decision-making and top-down delivery of policy that the case studies describe a movement away from, is also becoming less relevant through regionalisation within the Common Fisheries Policy. Significant changes have begun to occur throughout the European Union, with the direction of change being towards broader co-management and increasing levels of engagement, leading to stronger partnership between science, industry and government. Scotland is considered to have led the way in adopting progressive and interactive systems of governance and is considered one of the world's most collaborative approaches. As such, increasingly large amounts of information, opinions and issues are fed, via the prism of Marine Scotland, to the Scottish Fisheries Minister. Although it is apparent what information is used for decision-making, precisely how this is distilled from consultations is not always clear. That is, the method for deciding what opinions or issues make their way into the final decision, and which don't, is not always demonstrable. This can result in stakeholders feeling less involved and that their opinion is not incorporated. This was highlighted to some degree, during the stakeholder engagement, which focused on individual experiences within the decision-making process and the perceived capacity of each stakeholder group to resolve these issues.

Although almost all the stakeholders consulted understood and felt engaged in the method of policy production, some felt that, in practice, engagement could be exclusive, so that the scope

for disagreement was minimised and as such reduced transparency whilst retaining the ‘participatory’ label. Further, stakeholder participation can be highly political and some groups were considered to benefit from the process more than others - powerful actors can determine the direction of debate. This power and influence can, in some cases, come from the ability of a particular sector or stakeholder group to establish consensus instead of having disparate opinions, and can also come from the nature of the process and the ways that participation manifests itself. Another key issue is that it is often the type of representation, rather than the level, which is of concern. The impact of social pressure, influence of personality and dominance of particular opinions are recurring issues for engagement.

The complexity of fisheries inevitably leads to uncertainty, especially in determining how to respond to change, and disagreement over the course of action. This can be exacerbated due to the wide-range of issues, pressures, values, interests and opinions that exist within the diverse Scottish fisheries sector and wider stakeholder groups. Managing this complexity requires flexible and adaptive approaches. Viewing uncertainty as a social issue, rather than a technical issue, in which differences are accepted rather than downplayed, suggests a focus on collaborative and reflexive processes that can support more productive working relationships as well as reduced uncertainty.

Devolution has created opportunities for greater stakeholder involvement and this has been the clear and continuous trend in Scotland. This has created the ideal platform for trialling novel and innovative solutions for stakeholder engagement – for example, increasing use of technology to enhance engagement of stakeholders in the democratic processes. In this light, this study provides five areas where adaptations to the current system could be considered, they are concerning; reflexivity; accountability; representation; inclusivity; and disagreement and uncertainty.

1 Introduction

The traditional definition of 'policy' is that it constitutes the decisions made by those with responsibility for a given policy area, such as fisheries. Policy decisions are often formal statements on a specific issue which are then implemented via bureaucracy into legislation. In this manner policy is often thought of as a linear process, or a direction of travel, that requires a host of processes - moving through agenda-setting, decision-making and finally implementation into legislation - in order to create positive change or mitigate negative impacts. However, in practice 'policy' is difficult to define and creating legislation that is accepted by all stakeholders is often problematic. Therefore, policy, beyond a single decision, consists of broad courses of actions that incorporate numerous decisions that have evolved over time, ideally, as a result of meaningful dialogue between decision-makers and relevant stakeholders.

Negative perceptions of policies have been shown to significantly and adversely influence the behavioural responses of stakeholders to these decisions[1]. There is broad agreement, including within fisheries management, that increasing dialogue - making the development of policy more inclusive and deliberative - can strengthen governance, create more positive impacts, and even begin to develop novel solutions to challenges faced by society[2,3,4]. Stakeholder participation is therefore increasingly seen as an essential part of 'good governance'[5,6] and is regarded as a characteristic of effective fisheries management[7,8]. Recent studies have highlighted the increasing need (and desire) for participatory fisheries governance approaches across the European Union (EU)[9,10]. However, fisheries already represent complex social-ecological systems and as such are characterised by uncertain and unpredictable interactions[11]. Management of such complex systems requires novel and adaptive approaches, particularly towards deliberative stakeholder engagement, able to be reactive and reflexive.

1.1 Background and Context

Stakeholder engagement often refers to the process whereby people who are important in that they can influence outcomes, or who have an interest, or 'stake', in a specific area enter into dialogue in order to incite change. This could be decision-makers, managers, academic researchers and other invested users. There is general consensus within the literature that effective engagement creates trust and transparency, and can ultimately build consensus regarding management objectives and the decisions made[12]. Insufficient, or ineffective, engagement - a lack of meaningful participation or representation in the decision-making process - can lead to reduced acceptance of policies, with negative consequences for environmental, economic and social sustainability[13]. However, sometimes in practice, engagement processes may be exclusive, so that the scope for disagreement is minimised, this may not increase trust and transparency, but retains the 'participatory' label[14].

Given the potential benefits considered to be associated with increased integration of stakeholders into management and governance, there is a growing desire to promote the 'co-production of policy' and build novel systems of fisheries governance suitable for the future policy environment. Furthermore, stakeholder engagement at local and regional levels is increasingly relevant given the move to a more regionalised Common Fisheries Policy (CFP) framework.

Much of the management of fisheries in Scotland is devolved from central UK Government. Through devolution, Scottish Ministers are responsible for the regulation of fishing around Scotland and within 12NM of Scotland's coast and the Scottish Government has the ability to take non-discriminatory conservation measures, provided that the EU has not already legislated in the area. There is a clear trend in the development of Scottish fisheries policy towards a 'co-management approach', beginning with the emergence of the Conservation Credits Scheme and Inshore Fisheries Groups, and Scotland has therefore often been considered to be at the forefront of developing and implementing innovative measures to manage its fisheries[15]. This is particularly significant given that Scottish fisheries are still largely governed from within the EU's CFP, regarded by some as "*the most top-down fisheries management system on the planet*"[16]. Furthermore, the relatively recent trend towards ecosystem-based fisheries management, has seen increased inclusion of wider-stakeholder groups such as environmental non-governmental organisations (eNGO's) and the number of stakeholders has subsequently increased[5,12]. Stakeholder groups may be those directly involved in fishing (i.e. industry and fishery-dependent communities) or have a wider interests with the marine environment (i.e. the public and NGOs).

Devolution has created opportunities for greater stakeholder involvement. Strategies that promote deliberation and adaptation are preferable, as collectively sharing knowledge and seeking agreed courses of action forms the basis for reflection, further deliberation and learning. Stakeholder interaction and the incorporation of their views into the decision-making process is, currently, largely provided for via engagement opportunities such as group meetings. Given that stakeholders rarely define the problems they face identically, they must manage tensions either through coercion or compromise; coercion occurs when dominant actors within a management system seek to impose their interpretation of an issue, compromise, is whereby arenas are established to bring stakeholders together to exchange over issues and seek agreed solutions[15]. Adaptive approaches that can identify appropriate courses of action despite uncertainty and conflicting stakeholder priorities are required and furthermore, precisely which stakeholders interact and how they interact is likely to evolve in the future, and will almost certainly begin to incorporate advances in technology.

1.2 Purpose of the Report

This report responds to the above issues regarding stakeholder engagement and the future production of Scottish fisheries policy by evaluating how stakeholder groups are currently integrated into policy development, what their perspectives of the current system are, and how governance structures may be adapted to face future challenges. This will be achieved via four overarching objectives: to provide a brief literature review of stakeholder participation and the co-production of policy (Section 2); three international case studies (Section 3); to produce an overview of the current Scottish system (Section 4); to implement an iterative stakeholder consultation process (Section 5) in order to gauge the opinions of stakeholder representatives, this also acts as a pilot for a novel form of stakeholder engagement, and; to synthesise findings (Section 6) in order to provide advice on issues for effectively integrating stakeholders into the decision-making process and present possible options for adapting the current structures.

2 Stakeholder Participation

Section Summary

- **Effective stakeholder participation** in management and policy production can have many positive effects: enhancing **compliance**, increasing the **knowledge** base on which to frame decisions and generating **novel solutions** to problems.
- **Co-management** is simply the sharing of power and responsibility. In fisheries, three types of co-management are often defined; co-management by **consultation**; co-management by **partnership**; and, co-management by **delegation**.
- The **quality of the decisions** and policy made through stakeholder participation strongly **depends on the nature of the process** leading to them.
- Modern policy production should be **flexible and innovative** to encourage new and creative ideas. For example, increasing use of **technology to enhance** engagement of stakeholders in the democratic processes.
- Groups not involved in dialogue are **effectively excluded**, while privileged groups can acquire greater influence.

Current academic literature provides a clear rationale for increased stakeholder involvement in the management of natural resources and participation in the development of policy. Amongst other things, stakeholder participation is considered; to enhance the legitimacy of policy by increasing stakeholder buy-in and compliance[17,18]; to integrate local understanding into the decision-making process, allowing a broader and potentially more detailed knowledge base for management and implementation[19] and; allows social learning which can generate useful insights and provide novel solutions to problems[20]. The potential benefits have therefore led to the widespread promotion of stakeholder participation in resource management and, in turn, stakeholder participation has been embedded across disciplines and geographical contexts, and within national and international policy[21].

2.1 Co-management of Resources and Co-production of Policy

A broad approach often referred to regarding the integration of stakeholders into the governance of natural resources is ‘co-management’; defined as a management arrangement that shares power and responsibility between government and local stakeholders[22,23]. It is almost exclusively associated with natural resource management and aims to address issues such as overexploitation or lack of compliance[24]. The ways in which stakeholders (including the government) share power and contribute to management can be diverse (e.g. evidence-gathering and knowledge-production, decision-making, policy-production and monitoring and enforcement). Co-management is therefore often viewed as a continuum, from the simple exchange of information to more collaborative forms of partnerships[25]. It is suggested that the form of co-management should be dependent upon the specific management objectives[26]. There are three broad categories of co-management arrangements within fisheries management that are often defined[9]; co-management by consultation; co-management by partnership and; co-management by delegation (Table 1). Co-management by consultation is seen throughout fisheries governance in the UK and particularly in Scotland, and increasingly co-management by partnership is being incorporated into localised decision-making.

Table 1: Typology of co-management arrangements (Santiago, 2015).

Type of co-management system	Definition
Co-management by consultation:	Where extensive formal mechanisms for consultation with resource-users and stakeholders exist, but all decisions are taken by government.
Co-management by partnership:	Where government, resource-users and stakeholders cooperate as decision-making partners in various aspects of management.
Co-management by delegation:	Where government has devolved *de facto* decision –making power to resource-users and stakeholders in various aspects of the decision-making process.

Analysis suggests that the benefits of stakeholder participation and co-management are not always empirically tested or demonstrable[27,28], and it has become evident that the quality of the decisions and policy made through stakeholder participation strongly depends on the nature of the process leading to them[21,29]. Therefore, it is perhaps more important to focus on how stakeholders are represented, the manner by which they participate, and their level of engagement and satisfaction, in order to realise successful co-management of natural resources.

Policy and decision-making processes are dynamic, with new (social, economic and environmental) challenges constantly emerging. As such, the question of optimising stakeholder participation is problematic. Aiming for continual evaluation and improvement is probably more beneficial than aiming for an abstract end point. The question of how stakeholders should be involved therefore has many feasible answers. Despite this, some key features of effective decision-making have been identified (e.g. Table 2). Stakeholder participation can be highly political and there is always the possibility that some groups will benefit from the process while others will lose[30]. Thus, a critical emerging aspect is to evaluate the approach implemented, and to reflect on the advantages and disadvantages, and to be able to respond and adapt to ensure a positive outcome for the maximum number of stakeholders.

Table 2: Features considered to lead to effective co-management (based on Reed, 2008).

Features of 'best practice' for stakeholder participation
1. Stakeholder participation must emphasise empowerment, equity, trust and learning
2. Stakeholder participation considered as early as possible and throughout the process
3. Relevant stakeholders represented systematically, but should be fluid, and imbalance highlighted and addressed
4. Clear, concrete focus for the process for improvement agreed among stakeholders
5. Methods should be selected and tailored to the decision-making context, considering the objectives, type of participants and appropriate level of engagement
6. Highly skilled, independent, facilitation is important
7. Local and scientific knowledges should be integrated
8. Participation needs to be institutionalised

In order to realise the potential of adaptive co-management in complex settings, it is necessary to have clarity concerning the intended outcomes, learning, power, and agency[14]. However, the focus of much of the practical implementation of co-management emphasises steps in implementation and focus less on discussion of roles and responses. Frameworks, guidelines, and tool kits, however useful, are not enough, and often merely aim to reduce disagreement[31].

Stakeholder participation should focus on an inclusive transformative process to generate knowledge, rather than finding optimal solutions[32,33]. Engaging in this sort of self-aware transformative process frames the kinds of questions we should be asking, and the things we should be doing[14]. The risk of not reflecting on this approach is that adaptive co-management will reinforce, rather than challenge status quo arrangements.

2.2 Approaches to Stakeholder Participation

Modern policy production should be flexible and innovative, in order to encourage new and creative ideas and approaches. This may require policy makers to consider new forms of engagement, dialogue and deliberation. A number of tools and methods, each with their own benefits and shortfalls have been identified that can facilitate participation and dialogue. Here, we introduce a number of traditional and more novel approaches, which are being incorporated within policy-production.

Questionnaires

A questionnaire is a means of eliciting specific opinions, beliefs and attitudes from a sample of stakeholders. Being remote tools they largely preclude dialogue and influence between stakeholders and are therefore 'top-down' instruments for extracting information. To be effective requires their design to be well-constructed and tested and this may be more difficult where the subjects are uncertain or where there may be different interpretations or perspectives. In such cases, iterative processes may be useful, such as the Delphi method that uses a series of consecutive questionnaires to determine the joint perceptions of a group of stakeholders. Providing feedback between each round of the questionnaire allows respondents to communicate opinions anonymously and remotely (see Section 5). Questionnaires require a considerable amount of thought during their design and testing phase, but, once constructed, can garner a wide-range of responses from potentially very large cohorts. One of their strengths is that they are easily replicable, and therefore can be used to determine differences in opinion between regions, groups or over-time. However, as the agenda is not set directly by the respondents, it only provides limited participation.

Interviews

Interviewing stakeholders is a well-known form of engagement, it can include in-person, telephone and group interviews. Interviews are generally aimed at generating ideas, eliciting feedback or gaining responses to a set of pre-determined questions. Thus there is an issue of power with the interviewer having selected the topics and questions and 'managing' the interview process. To encourage more flexibility and opportunity for the respondents to open up new areas of discussion, semi-structured interviews and even *ad-hoc* conversations can be used that allow for focused two-way communication. Conducting substantial numbers of interviews is time-consuming, and therefore are not regularly applied for stakeholder engagement, in its broadest sense. They are often used for gleaning expert opinions on specific topics.

Public engagements

Public engagement describes decision-makers listening to, developing their understanding of, and interacting with, non-specialists. Engagement with the public creates the widest possible platform for dialogue. It challenges traditional 'top-down' approaches to decision-making and can promote the alignment of the views of government, stakeholders, communities and the public, in order to frame and achieve common goals. Increasingly, policy issues cut across departments and thematic areas, and require bottom-up involvement and multiple stakeholder collaboration. Public engagement has become increasingly popular over the past few decades in these circumstances, and is routinely promoted by national and local authorities[34]. It is important to note that the term 'public' is often used loosely, and can be interchanged with 'stakeholder' or 'user'.

Coffey (2005), examined the 2002 CFP reform process for insights into how the European Commission used public engagement to achieve their aims. Although beneficial, they concluded that more innovative efforts should be used in future, particularly to engage new 'publics' ('stakeholders'). They concluded that even weak engagement efforts are important, since they offer an opportunity for a large section of society to be better informed. The challenge is to identify suitable stakeholders and representatives of other publics and then to engage them in the right way and at the necessary levels of detail. A final, and crucial, difficulty of such broad engagements is determining which opinions are translated into policy. Forming consensus on any single issue from such events is often problematic.

Deliberative dialogue

This form of discussion differs from other forms of engagement because it opens up the critical area of problem formation. In contrast to more closed forms of enquiry that assume the nature of the problem and focus on identifying the solution, deliberative dialogue aims to find the best course of action by starting with the question *what should we do?* The purpose is not necessarily to resolve issues, or gain consensus, as such, but to explore promising avenues for action and can produce collective insight and judgment reflecting the groups thinking (which may not be consensual). Deliberative dialogue (when applied appropriately) may be used to stimulate discussion which will help to explore and define complex policy issues.

Several authors have described how deliberative dialogue can lead to more effective policies[35,36]. Although Griffin (2014) argues that while some engagement appear to embody this model (e.g. Advisory Councils), they question whether a forum such as this can be meaningfully deliberative when it is expected to work within a strict policy framework[37] (e.g. the CFP). Furthermore, deliberative dialogue often requires communication to be free from constraint i.e. where only rational arguments are considered[38]. However, Advisory Councils rarely free from constraint; where the most powerful opinions (or groups) often determine what is considered 'rational'. Similarly, expert panels and other exclusive forms of deliberative dialogue may feature stakeholders with similar views. Once again, groups not involved in the deliberative dialogue at all, are effectively excluded, while privileged groups acquire greater influence. The impact of social pressures, personality influence and dominance of particular groups or sectors is a recurring issue for these approaches and a key question is how to make the deliberative process more democratic. This is beginning to be overcome using technological advances that enable remote dialogue.

Results-based management

Results-based management (RBM) is where the governing authority sets objectives and establishes a framework, with stakeholders assuming responsibility for delivering these objectives[9]. Therefore, it can be considered a goal-oriented management strategy, that reportedly overcomes 'micromanagement' of fisheries[19].

RBM has three key features; 1) public authorities define measurable requirements for resource users; 2) resource users (ideally, all stakeholders) have autonomy and flexibility in choosing how to satisfy these requirements; and 3) independent auditors evaluate the degree to which requirements are satisfied. Nielsen *et al*. (2014) highlighted the Scottish stakeholder engagement system of catch quota-management as being "RBM-inspired"[19]; which involves the management and documentation of catches including discards as opposed to management and control of landings. Thus, Scotland has initiated elements of RBM that are comparatively cutting-edge in the context of European fisheries.

Scenario-based planning

Many policy decisions are relatively limited in their temporal scope. Decisions on how to respond to future risk is complicated by long-time horizons and the uncertainty associated with the anticipated impacts. Scenario planning is an approach for aiding decision-making in complex, changeable systems. Rather than focussing on the prediction of a single future, scenario planning involves thinking about how the system might develop under a suite of plausible futures. In this way, policymakers and stakeholders can consider how system dynamics might change, and identify key uncertainties that might hinder the design and implementation of effective management policies[39].

Scenario planning has been used extensively in business and politics to develop strategies for a range of possible futures[40]. More recently, scenarios have been used in the environmental sciences to improve decision-making in complex ecosystems[41,42], to anticipate change in ecosystem services[43] and to explore strategies for sustainable development[44].

Behavioural insights

Using behavioural insights to design and implement market interventions is a well-established approach. It has been tested and used for some time in the private sector, particularly in the field of advertising, but also in governments and by regulators. Behavioural insight incorporates empirical evidence on how behaviour is influenced by context and aims to factor in behaviours and experimentation as part of regulating, to find the optimal form of government intervention. These tools are largely used to regulate the modern economy, markets and more recently healthcare.

Although, the implementation is not participatory *per se*, as part of the OECD initiative on "New Approaches to Economic Challenges", government officials, regulators, staff of international organisations and academics discussed the challenges and opportunities of applying behavioural insights to policy-making. Participants looked at behavioural approaches in the context of public sector innovation and policy delivery tools.

E-democracy

Stakeholder participation can often be constrained by the requirement for all stakeholders to travel to a single location, and can furthermore be derailed by disputes between stakeholders. E-democracy is a novel form of engagement designed to combat these issues. Although there is no single definition for 'e-Democracy', it can broadly be described as the use of advances in Information and Communication Technologies to increase and enhance engagement in democratic or decision-making processes.

Traditionally, e-democracy initiatives have been either; top-down initiatives by government, or local authorities, with the goal of lowering costs or increasing efficiency, transparency and convenience; or bottom-up initiatives by citizens at 'grassroots-level' with the aim of increasing transparency, accountability or convenience, as well as informing, educating and campaigning. E-democracy activities can be either a one-way processes, such as dissemination of information; or a two-way processes, such as opinion polls, or consultation on draft legislation. Two UK examples of e-democracy, include; 1) parliamentlive.tv[i] (top-down, one-way), a website that provides live and archived coverage of all public UK Parliament proceedings, and 2) UK Government and Parliament Petitions[ii] (bottom-up, two-way), a website that allows the public to petition about any issue. This form of engagement is only likely to increase in prevalence.

[i] http://www.parliamentlive.tv
[ii] https://petition.parliament.uk/

3 International Case Studies

Section Summary

- Policy processes are dynamic and as such **'best practices' are of limited value**
- The decision-making process must be **responsive** and **adaptive**
- In Canada, contradictions between **scientific assessment** and **fisher experience** questioned the validity of stock assessments, creating an adversarial relationship.
- Led to a **participatory approach** including government, industry and academia - greater cooperation between fishers and scientists.
- **Support from fishers** proving necessary for sustainability of policy.
- A similar **gulf between scientists and fishers** existed in Norway. Fishers responded by employing scientists to review the stock assessment.
- Although this approach had less impact on policy, it highlights issues related to policy-production and the **role of knowledge and power**.
- IFCAs are considered good examples of a deliberative approach to governance, due to the fact that; committees are **empowered**; committees are able to **make byelaws**; and they include a **wide-range of stakeholders** and are able to react the imbalances of power over time.
- Within IFCAs, essentially **no group is excluded** and **'new publics' can emerge** over time. This is vital, as there is **no prescribed balance of membership**, but must be an ongoing process, reacting to imbalances and addressing them as they arise.
- Industry, particularly the larger industries, have actively **hired scientists** to provide advice or critique assessments that determine TACs. This form of **levelling the playing field** to bring about change is often more **accessible to consolidated fisheries**, with increased **investment and industrialisation**.
- **Uncertainty considered a social issue** rather than technical - focus on **reflexive processes** in which research represents **collaboration and transformation**, leading to productive **working relationships** and **reduced uncertainty**.

Policy processes are dynamic, and as such we can expect objectives, stakeholders and social, economic and environmental conditions may all change over time. Thus it is not expected that there is an optimum equilibrium that can be achieved. In dynamic processes, 'best practice' and blueprints to be implemented are likely to prove inadequate or of limited value at best.

Within a dynamic policy process it is important that the decision-making process is both responsive, i.e. able to react to change, and adaptive, i.e. able to react in ways that enhance rather than undermine the natural and social capital that underpin the fishery and thus improve rather than limit the ability to respond to future changes.

In considering how this can be achieved in Scotland it is instructive to examine stakeholder involvement in fisheries in other countries in the context of a response to change and what has been learned from this in terms of roles and contributions that can be made to policy and

the extent to which the response can be considered adaptive. The cases selected are the response to the Atlantic cod collapse in Canada and the introduction of the discard ban in Norway. Like Scotland, these are countries with Atlantic fisheries and represent fisheries management decision-making processes in developed northern countries. There may be useful lessons to learn. Since the first two case studies focus on response to crisis, we also provide an additional case of the development of the autonomous English Inshore Fisheries and Conservation Authorities (IFCAs). This case focuses on how the roles of IFCAs changed during their evolution from Sea Fishery Committees (SFCs), from control and enforcement, to include conservation, science and stakeholder consultation. We examine their membership and the level of inclusivity of broad stakeholder and interest groups that they draw upon.

Each case study briefly describes the context, building on FIS01, and the issue that led to the policy response. This will be described in relation to stakeholder roles and perceptions. The response to the issue will then be analysed in terms of the response and drivers for the particular outcomes that resulted. The cases will then consider the response in terms of the extent to which this represents an adaptive response and whether the system, and the stakeholder roles, are likely to enhance future responsiveness. In doing so, the analysis concentrates on the following areas that relate to enhancing adaptive capacity[45]:

- The degree to which the response can be considered to utilise and building upon diverse local resources. This includes realising the potential enabling role of government in terms of aspects such as convening or providing financial support.
- Measures taken to 'level the playing field' in terms of stakeholder interactions. This includes recognising alternative views and providing a forum for deliberation and negotiation. One critical area that has emerged is that of knowledge. While it has been increasingly recognised that fishers have important time and place knowledge about fish stocks, the extent to which this is used in assessing stocks varies.
- Sharing power – beyond deliberation, the degree to which strategies are collectively agreed and ensure accountability in practice. This includes aspects such as defined stakeholder roles, agreed indicators, conflict resolution mechanisms and measures to enhance transparency e.g. signed agreements.
- Finally the degree to which stakeholders find the process fulfilling, enhancing commitment to the process and contributing to positive human relationships.

3.1.1 Canadian Cod Collapse

The focus of this case study is the collapse of the Canadian Atlantic cod fishery in the 1990s. This is one of the most prominent case studies in global fisheries of a stock collapse. The cod fishery was once one of the most productive global fisheries but saw spawning stock biomass reduced to less than one percent of its former levels[46]. The collapse of the fishery led to closures and widespread social and economic hardship.

At the time of the collapse the policy and regulatory system could be described as centralised and 'top down'. The fishery was managed in an effort to achieve state control through the state identification and allocation of harvests amongst users[47]. Power resided mainly with the Minister of Fisheries, with some power residing in the state Department of Fisheries and Oceans (DFO). In this system fishers had minimal decision-making powers and those outside the fishery none[31,47]. The nature of the decision-making structures and the 'regulator and

regulated' nature of the relationship between authorities and fishers gave rise to perverse incentives and lack of control over effort.

Canada had a strong scientific capability and a management system based on annual stock assessments that were used to derive Total Allowable Catches (TACs). This was based on a combination of assessing the stock size through modelling and the use of research surveys to provide information on fish abundance and distribution. However, with little input from fishers and increasing use of relatively sophisticated mathematical modelling approaches the risk arose of overconfidence in science and lack of acknowledgement of uncertainty[31]. The flaws with the system led in the first place to overconfident assessments and secondly to TAC setting for Atlantic cod that was insufficiently adaptive. Specific flaws that were identified within the system included:

- Sources of information for stock assessment that were faulty including: research vessel surveys that could not capture spatial diversity of the stock, discarding, technological change and commercial catch rates that were not positively correlated with stock abundance;
- An assessment process that was not precautionary, assuming that stocks were resilient, and that overestimated stock abundance;
- A quota setting process that allowed quotas to regularly exceed scientific advice;
- A harvest control rule that limited the extent of reductions in quotas but not of increases;
- A reluctance to consider within-year changes to TACs as new information emerges.

However, at the time, the dominant view of a resilient stock combined with technocratic management approach created what Charles (1997) describes as the 'illusion of certainty'[48].

At the time of the collapse the role of fishers was essentially limited to catching fish[47]. In doing so they used a variety of gears including fixed (e.g. traps, gillnets and hook and line) and mobile (trawls and seines) with differing levels of catch and effort. In particular there were differences between the larger corporate, modern, offshore fishers and smaller inshore fishers who are more connected to coastal communities (e.g. Charles, 1997), the latter who had been expressing concern and even alarm at declining catches in the years leading up to the collapse. The nature of the scientific assessment process and the catches that they were experiencing led fishers to question the validity of the stock assessments, creating a more adversarial relationship.

The collapse of the iconic cod fishery led to reflection about the attitudes of stakeholders about the fishery and how it should function, and how these were reflected in management and policy[31,47]. It was acknowledged by fishers that some were engaging in illegal activities, high-graded fish and misreported catches. Managers and policymakers were forced to consider the role of fishers in management, not least due to the alarms that the inshore fishers had been raising, and there was also a reflection on the role of the DFO in terms of their purpose and relationship with others. The collapse highlighted interests outside of the fisheries sector and the role of the state (and DFO) as serving not fisheries resource users but as ensuring the conservation and wise use of a national asset[47].

The result of the reflection on the collapse of the cod fishery was a refocusing towards co-management. Amongst the changes made were the creation of a Fisheries Resource

Conservation Council (FRCC) that included government, industry and academia and a more participatory approach to creating Conservation Harvesting Plans (CHPs). Previously fishing plans were developed by DFO with nominal industry involvement. The FRCC and DFO provide a framework within which annual CHPs are developed and the onus is placed upon each fleet segment to determine if and how it can make use of the fishing opportunities, including developing suitable management measures. The DFO then review the plan to assess whether it is likely to realise the conservation objectives before it is approved. Furthermore, there has been greater cooperation between fishers, scientists and policy-makers, for example in the form of tagging studies, closed areas and 'sentinel fisheries' to monitor stocks through low level fishing activities that are designed by scientists and implemented by fishers[48]. In the Northern Gulf new public forums have been developed in collaboration with universities, bringing together further stakeholder groups[49,50].

Analysis of adaptation and lessons learned

The crisis in the Canadian cod fishery provided an important, though unwelcome, opportunity for reflection and to question the extent that the system in place is 'fit for purpose'. While the Oceans Act[iii] highlights collaboration to achieve sustainable development, the initial situation was one in which it was assumed that fishers had little or no interest in conserving stocks and that this was a role for the regulatory authorities. This created an 'us versus them' attitude within the authorities and fishers and within fishers an incentive to try to circumvent regulations that they perceived as imposed upon them. The experience of the cod collapse led to fundamental reassessment of the situation and the assumptions that underpinned it. This led to the conclusion that support from fishers could well be a necessary pre-condition for the sustainability of the policy and management process[47].

The CHPs represent a key area of fisher involvement and have been a vehicle for innovation, for example at-sea and dockside monitoring and 'small fish protocols' to trigger temporary closures[48]. However, the form of co-management that has been pursued has been focused on sharing responsibility with sectoral interests rather than including wider communities, despite the experience Canada has had of more collaborative forms of management, such as the agreements with native peoples[47]. Under sector-based co-management the DFO engaged individually with fleet segments. Charles (1995; 1997) identifies two key drawbacks with this approach:

- That it institutionalises divisions within the fleet and identifies fishers not as members of a coastal community but as a set of individual, potentially competing, interest groups.
- It overlooks a potentially positive role in management of the wider community in which the fishers are located.

Despite some drawbacks, the process highlighted the important role of the government in responding to the crisis, establishing a process of reflection and enabling the process of change to a more inclusive management structure as well as providing financial commitment to the committees. The process that has emerged has taken steps to level the playing field, between fishers and the state at least, providing increased opportunity for fishers to provide inputs to both the stock assessments and, importantly, management measures. In these processes there is far greater acknowledgement of fishers' knowledge and the validity of this

[iii] http://laws-lois.justice.gc.ca/eng/acts/O-2.4/

knowledge. Furthermore, there is also recognition that fishers' knowledge is not limited only to the fish, but that they have some knowledge about what measures might be effective in achieving management objectives. While a good deal of the emphasis on knowledge in co-management is on the utilisation of local ecological knowledge, the CHP provides a useful forum for deliberation, creates more fulfilling roles for scientists and fishers and provides a process makes clear that fishers are also able to contribute to innovation in technical measures, monitoring and control[51,51]. Where there has been less progress, it is in the inclusion of wider interests. Fisheries provide benefits beyond those to the people directly catching the fish, particularly in rural communities that may exhibit relatively high dependence on the fisheries.

3.1.2 Norwegian Discard Ban

Marine capture fisheries have been an important resource and have long made important contributions to coastal communities in Norway. The Norwegian spring spawning herring stock represents another important example of a crisis that has led to important changes in the way a fishery is managed. The Norwegian spring spawning herring stock is the largest herring stock in the world and was at one time the largest single fish stock in the world. The herring fishery in Norway was traditionally an inshore fishery pursued by a large number of small wooden vessels. With increasing consolidation and investment in the fishery, the fishery changed and developed into an industrialised offshore fishery using a smaller number of larger vessels[52]. In the case of Norway it was not a decline but a perceived underestimate of abundance that led to fishers seeking to influence policy.

The main institutions involved in Norway's fisheries management includes The Ministry of Fisheries Coastal Affairs, The Directorate of Fisheries, and the Norwegian Fishermen's Association and the Institute of Marine Research. The Ministry of Fisheries and Coastal Affairs is the main administrative body responsible for marine issues and the adoption and implementation of fisheries legislation and regulations. The Directorate of Fisheries (DoF) is the Ministry´s advisory and executive body on matters related to fishing and aquaculture, and has the goal of promoting a profitable fishing regime through the sustainable and user-orientated management of the marine environment. The Norwegian Fishermen's Association (NFA) is the main representative of the fishing industry and are formally consulted on most matters pertaining to fisheries policy. The Institute of Marine Research undertakes research cruises and stock assessments and staff contribute to the ICES stock assessments and TAC advice.

The herring is managed using a quota system. Stock assessments undertaken by ICES annually that result in formalised TAC advice that is provided to Norway (and other clients). The ICES advice forms the basis for negotiation amongst coastal states to identify the share of the total TAC that will be allocated to each. The allocated quota forms the basis for TAC distributions within the coastal states. At the national (Norway) level the quota is distributed between fleet groups and between vessels within each group. In this process The NFA has had an important role in organising fishers and vessel owners and negotiating compromises between its members. These allocations are generally accepted[52].

As with the case of Canada, the role of fishers within this process was essentially limited to lobbying and negotiating quota shares from the national allocation and catching fish. However, in recent years there has been a reaction to the TAC recommendations with fishers

questioning the advice and the scientific basis for the assessments. Specific issues that were identified included:

- Poor quality of data for the assessments: research vessel surveys that could not capture spatial distribution and abundance of the stock and a divergence between commercial catch rates and stock abundances suggested by the assessments;
- An assessment process that was not transparent;

Dankel (2015) provides a useful overview of the recent process of assessment and TAC allocation focusing on the roles and interactions between herring fishers and the Institute for Marine Research that highlights the response to these issues.

As Dankel (2015) describes, in 2013-14 the ICES herring assessment and advice was produced. The results of the assessment were disputed by the herring fishers, who are well-organised and well financed, and an ex-institute scientist who they had hired to work with them. They reacted to the assessment and suggested that the predictions for stock size were too low and that there must be an error in the assessments and started a 'find the error' campaign. Using climate change as a justification (suggesting that the distribution of herring had increased) the pelagic industry approached the government to provide additional finances (EUR 0.5 million) for an expanded collaborative survey cruises and collected their own data. The collaboration was seen as a success by the scientists when it concluded in January 2015. The scientists then used the new data set to run the assessment models. This was done behind doors with the institute announcing that it would not be making the survey data public, and that only a relative number would be presented rather than full results, meaning that the TACs would not be adjusted. The fishers were unsurprisingly disappointed having contributed time, effort and financial resources.

In April the administrative director of the Institute confronted the unrest by dismissing criticisms of the assessments and quota advice and suggesting that scientists at the institute should concentrate on the ICES assessment and TAC setting process. By this stage there was a gulf between the scientists and the fishers. In May, responding to the way that the survey data had been used, the fishers employed a retired stock assessment scientist, who had been involved in the stock modelling, from the institute to review the stock assessment. Convinced that there were errors in the assessments fishers contributed additional money to pay for the scientist as a continuation of the 'find the error' campaign. The scientist highlighted the importance of this effort, and of working together with the institute, suggesting that there could be up to EUR 1 billion lost as a result of the error and resulting catch restrictions.

The process has influenced policy in that the Minister of Fisheries established a review committee to examine the situation in the herring fishery but would not comment on the process or on the roles of stakeholders or scientists. Using the dispute as a focus, Dankel (2016) highlights a number of issues related to science and policy and the role of knowledge and power.

Analysis of adaptation and lessons learned

Dankel (2015) through the Norwegian case highlights a structure that is not particularly adaptive. In the first instance there is a recognition that the process of undertaking assessments and providing advice is an uncertain one and one where resources available to

reduce the uncertainty are limited. While there is a willingness to collaborate between fishers and scientists the political implications of the results of doing so and the unfamiliarity of working together make this difficult in practice. The expanded survey that was part financed by industry and completed with industry involvement, was initially seen as a successful collaboration. However, the process of analysis was far less collaborative or accountable.

In part some of the challenges may be a result of tension in the dual role of the Institute (see also Findlayson 1994). The Institute is the primary provider of science about the herring stock, and its scientific status arises from the independence of the science of assessment. However it also gains its legitimacy by being part of the government structure and receives government funding. In the case of the herring, when this was challenged the response was to push the responsibility for the assessment results up to ICES, despite the Institute scientists being a key source of the ICES assessments.

Fishers in Norway have found the means to become more active in challenging the results of the stock assessments, and even the assessments themselves, and establishing a response from policy-makers. As with examples in other countries (including Canada, Namibia, Netherlands and UK), industry, particularly the larger industries, have been active in hiring stock assessment scientists to provide assessment advice or to critique the process and results of the assessments that are used to determine TACs. This is a form of levelling the playing field but one that is based more on confrontation than collaboration to bring about change.

3.1.3 English IFCAs

This case focuses on the English IFCAs that were created in response to the promotion of greater regionalisation of fisheries management under the UK Marine and coastal Access Act 2009 (hereafter 'the Act'), which came into force in November 2009. The Act aimed to ensure 'clean, healthy, safe, productive and biologically diverse oceans and seas, by putting in place better systems for delivering sustainable development of the marine and coastal environment'.

It has been previously argued that marine governance frameworks are often unnecessarily complex[53–55] and this may also be true of the UK[56], where complexity increases due to overlapping responsibilities and legislative power of the devolved administrations. The Act, to some extent, recognised and responded to the need for an updated governance framework in response to a requirement to demonstrate that fishing activities were being conducted in an environmentally responsible manner[57] and provided the opportunity to streamline and restructure[58]. However, this arguably did not occur fully, with overlapping responsibilities still existing[54] and opinions have therefore been divided as to whether changes that the Act bought about went far enough, or whether they were too extreme[59].

The Act covered seven broad areas: establishing and transferring functions to a Marine Management Organisation (MMO); creating a marine planning regime; establishing a marine licensing regime; changing marine conservation legislation and establishing marine conservation zones; making provisions for a coastal access route; updating fisheries legislation; and making changes to inshore fisheries management, in particular replacing SFCs with IFCAs.

In 2011 ten autonomous regional IFCAs were created, replacing the SFCs which had managed and controlled inshore fisheries since, at least, the 1960s. The Act provided the IFCAs with a new constitution, boundaries, funding basis and stronger regulatory powers than before. Their responsibilities were also extended and moved away from 'single issue' management to include balancing the social and economic benefits of inter-related conservation and fisheries objectives. The transition from SFCs to IFCAs has been regarded as an example of adaptive co-management, as it was a direct response to the shortfalls of the previous system[60].

Funding the IFCAs

IFCAs are funded by levy charged to their sponsoring local authorities, who have a legal duty to pay the levy. IFCA council members therefore have a right of *veto* over budget decisions. Additional revenue may be generated from fees charged (e.g. for permits) and recovered court costs from successful prosecutions. IFCAs are encouraged to supplement their income through, commercial revenue such as survey work or support for leisure activities. The power of *veto* raises interesting issues regarding the drivers behind council members' decisions, and whether IFCAs are truly a form of co-management.

Although, IFCAs have a stronger financial basis than SFCs[56], there are still concerns that lack of funding is a significant obstacle to achieving their goals[57]. Given cuts in government funding, stretching the budget to incorporate new duties and objectives is a concern for some local councillors on the IFCAs. Extensions to IFCA roles that impose further costs are often alleviated in compliance with the New Burdens doctrine. However, funding issues have caused disputes between members regarding the allocation of funding.

Analysis of adaptation and lessons learned

To reflect the broadened objectives IFCAs have a more balanced membership than the SFCs, and no single sector dominates. Furthermore, as each IFCA district is unique, there is no prescription for membership, but membership guided by general guidelines that allow IFCAs to be tailored to regional (and future) requirements.

Membership includes representatives the MMO, Environment Agency and Natural England, who each have one statutory representatives on each IFCA, and representatives of each of the local council authorities. The rest of the membership consists of general members, who are appointed by the MMO and include representatives from across the sectors within the district e.g. commercial and recreational fishers, environmental groups and marine researchers. Guidelines for general membership are very broad, with anyone with knowledge of, or interest in, regional fishing or the marine environment open for consideration[61]. Establishing the IFCAs provided an opportunity to make fisheries management more inclusive, and expanding membership intended to provide opportunity for collaboration, building of trust, information and knowledge exchange and nurture common perspectives on policy issues[60].

A key new challenge was to incorporate the diversity of stakeholders' views whilst achieving both the conservation and fishing objectives[62,63]. Although this approach was expected to foster collaboration, in the first instance, it had the potential to create conflict between conservationists and fishers. Particularly as UK fishing communities have a long, often multi-generational, history of interacting with the local sea, whereas environmentalism can be perceived as a relatively new concept[64]. IFCA members have highlighted that conflicting views

of the members, different perceptions of the approach or actions required, is sometimes an obstacles to achieving IFCA goals, but, this was expected given the increased diversity of the backgrounds of IFCA members[60].

The integration of marine conservation and fisheries objectives remains a challenge, though their incorporation is still, by and large, seen as an improvement on the SFCs, and provide opportunity for integration and communication between fisheries and conservation sectors[60]. Furthermore, a wide variety of interests should be included as conflicts of interest are considered more likely to occur if the decision-making process is conceived as a battleground between interests, rather than as a space setting the conditions for development[64]. In support of this argument, Chief Officers consider the broadened IFCA membership as an improvement and concerns they raise were due to the fact that membership is determined without input from the existing committee[60] and that this selection process could result in inappropriate members being appointed. As IFCA members are partly chosen centrally and partly determined by local councils, this is thought to reduce the IFCAs' openness and democratic character[61]. IFCAs are thus less self-determining than IFGs are, for example, but, are considered more accountable and more open to new participants[61].

Overall, IFCAs are considered to be a good example of a deliberative approach to inshore fisheries governance[61], due to the fact that; the committees are empowered and the extent of actors' authority over decision-making has increased; committees are able to make byelaws; and they include a wide-range of stakeholders - essentially no group is excluded and 'new publics' have emerged over time and are not constrained to the industries or groups initially identified[61], making it difficult for discrete groups of actors or sector representatives to dominate decision-making. This is considered a true strength of the IFCA model, although with the power to create local byelaws, IFCAs are also subject to top-down legislation and this may prove a limiting factor in their success. How much influence individual MMO appointed members have compared to those that fund it (through their councils) remains to be seen. The fact that more interest groups are involved is a positive step. However, frustration may well develop if the powers of self-organisation are restricted[60] or decisions made away from the regions in which the IFCAs operate.

3.2 Conclusions

The case studies have different starting points but similarities in the responses. In the first two cases fishers highlighted what they perceived as shortcomings in the policy process and the science that underpinned this. In challenging the process they were able to highlight the need to address uncertainties in the assessments as these have implications for the fisheries and for the livelihoods that are linked to the fisheries. In both cases the assessment scientists were tasked with making decisions about stock status with imperfect knowledge. Findlayson (1994) suggests that this places the scientists in a difficult position and it may be advantageous to consider dealing with uncertainty as a social rather than technical issue. Viewing uncertainty in this way would suggest a focus on a more reflexive process in which research can represent a focus for collaboration and transformation, leading to more productive working relationships as well as reduced uncertainty. Research can be about the whole process of human relating and questioning, the testing of ideas and the practice, review, and analysis. In the case of the reforms in English fisheries, the response was also a broadening of responsibilities and stakeholder engagement – in this case the inclusion of local and national conservation interests. This caused some initial concerns within the industry but is generally seen as an

improvement. One benefit is that the IFCAs represent an opportunity to engage between conservation and fishing interests to identify concrete local issues and have a flexible approach towards incorporating scientific and local knowledge in order to resolve them.

As the Norway case illustrates, it is important that such a process represents more than fishers as data collectors or as a source of local ecological knowledge but also involved in the process of analysing the data. Furthermore, as the Canadian case illustrates, fishers' knowledge is not limited to ecology and biology (and reducing uncertainty in assessments). Fishers can also identify measures that can meet management objectives, knowing what monitoring and control measures are likely to be effective and contributing to innovation in management and reduction of implementation uncertainty.

Similarities can be drawn with the transformation of Scottish fisheries, which over the past decade have become considered a 'global leader' in alternative fisheries management. A key contribution to the re-framing of the management system is accredited to private and public actors, and a key driver behind the change was the actors' beliefs that their industry was in crisis (2000-2003)[15]. This led towards ambitions of sustainable development, devolution and active responsibility. Industry conditions – such as collapsing fish stocks – were given social meaning by actors as they interpret these through their belief systems, however, as not all actors across the industry defined the problems identically, actors had to manage tensions, via coercion, convention and compromise[15]. Ultimately it was interpreted as a 'Scottish public' problem to be resolved. Indeed, the transformation of Scottish fisheries resulted from extensive work, in which conditions were constructed as requiring both public and private intervention and as requiring action across different scales. Resulting in new policy-making processes designed to integrate interconnections between natural and socio-economic systems.

An important similarity between the first two case studies, and many similar cases of fisheries governance change, is that they were triggered by crises. Crisis creates opportunity for change, but does change require crises?

Change in governance requires change in individual roles and behaviours that are agreed and implemented as a result of the interactions between individuals. There is a paradox in that such interactions can lead to innovation and change but, at the same time, when change is discussed in less immediate or concrete terms it may be less likely to occur. Crisis has the effect of focusing the discussion and interactions on these more concrete aspects and also creates opportunities for new actors to be included in the discussion (e.g. the scientists enlisted by industry in Canada and Norway).

Change can be an unsettling process and the interactions between individuals with their own interests and perceptions that shape these processes are not straightforward[65]. Interactions are shaped by their own understandings, by the ways in which they communicate (including understandings and misunderstandings between actors) and existing relationships and power relationships[66]. To avoid the unsettling aspects of change, the manner in which change is discussed may seek to avoid or downplay the anxiety associated with focusing on the current situation and possible next steps that include changes in roles and power. One way that this occurs by focusing on more abstract notions related to 'nirvana concepts' visioning, identifying 'best practice and performance criteria that represent attractive and useful focal points in these situations[65,67]. If the focus is on the abstract or imagined future rather than what people are

doing and why, it may be a reason why organisational structures find themselves, in practice, responding to a series of unforeseen events and why it may take a crisis to refocus the discussions.

Getting actors at the interfaces of policy, practice and science involved in collaborative research to inform policy is not straightforward but can represent a strategy that creates new spaces, and the task of working changes the quality of these relationships[68,69]. There is an important role for social scientists to facilitate these processes that are both constructed and value laden, providing a basis for inclusive transformative processes that generate knowledge and form the basis for deliberation and dialogue rather than on finding solutions or recommendations.

4 The Scottish Situation

Section Summary

- The Scottish fishing industry is **one of the largest in Europe**, and as such its continued profitability and sustainability is of paramount importance.
- The Scottish **fishing fleet is diverse**, but broadly categorised into four segments; the **pelagic** fleet; the (static) **shellfish** fleet; the **demersal whitefish** fleet, and; the ***Nephrop* trawl** fishery. Each of these segments is characterised by its own pressures and successes – some are more homogenous than others.
- Although many **roles and responsibilities** of fisheries management are **devolved** from central UK government to the Scottish government, fishing industry **largely managed under the EU CFP**.
- **Two key routes for decision-making** and policy production within the **CFP**. The first, regarding stock assessments is **relatively direct**, ICES provide the Commission with advice. The second, involves **consultations with stakeholders**, through ACs and external bodies.
- Despite the constraints that the CFP is considered to pose, Scottish fisheries management and the governance structure is considered one of the most **progressive and participatory in the world**. This has led to an industry that is **highly knowledgeable and adaptable**.
- The current Scottish situation provides numerous opportunities for engagement at various levels; national/ regional, inshore/ offshore. However, the type of engagement currently employed is relatively standardised.
- Centralised decision-making is likely to continue, the difficulty is developing policy that all actors are happy with. The **process for development** must be **clear** and **transparent**.

The fishing industry in Scotland is one of the largest in Europe and represents over 60% of all UK landings by weight. The industry supports large numbers of coastal and island communities. In 2014 approximately two thousand active vessels landed over 481,000 tonnes - an increase of 31% from the previous year - valued at over GBP 514 million[iv]. The Scottish fishing fleet is diverse, but can be broadly categorised into four key segments; the pelagic fleet, targeting schooling fish such as herring and mackerel; the shellfish (potting) fleet targeting *Nephrops*, lobster, crabs and molluscs; the demersal whitefish fleet that targets fish such as cod and haddock, and; the *Nephrop* trawl fishery. Each of these segments have their own strengths and opportunities, risks and challenges, such as variable annual quota allocations in the pelagic fleet, and reduced profitability and crewing shortages in the demersal whitefish fleet. Consequently, fleet segments, and subsectors face specific conditions and issues, which have further differed by fishery, stock, and location. However, there are also industry-wide challenges, including the implementation of the landings obligation, the rapidly changing marine environment and the status of commercial fish stocks (particularly data-poor stocks).

[iv] European Commission, 2014

Several detailed reviews of key commercial fish stocks within Scottish waters suggest that generally stocks are depleted, compared with historical records, especially when considering demersal stocks. A recent review based on internationally agreed reference points[70] reported that in 2013 of the sixty-three internationally managed stocks within Scottish waters, eleven were deemed sustainable, four overfished, five declining, three recovering and forty stocks were undefined due to a lack of data. Of the seventy-six nationally managed stocks, one quarter of these were considered overfished with exploitation rates above those that would achieve the maximum sustainable yield (MSY). There are no regular stock assessments for crabs, lobster and many other shellfish stocks, therefore the state of these is largely unknown.

4.1 Scottish Governance and Decision-making

In 1999, many roles and responsibilities of fisheries management were devolved through the UK fisheries concordat[v] from central UK government to the Scottish government. Although fisheries management had become devolved for decades the Scottish fishing industry has largely been managed under the CFP of the European Union (EU). The EU also claims responsibility for the setting of conservation policy under the Lisbon Treaty[vi]. A reformed CFP came into effect in 2014, and forms the basis of the rules under which EU fisheries are managed. The tools include; quota allocations which aim to achieve MSY, the recently implemented landing obligation to reduce discards and regionalisation for more localised and participatory management. Nonetheless, there are important areas of fisheries management where member states have control (vessel licensing, quota management, inshore fisheries and enforcement). The UK has exclusive rights to fish within 6NM of its shore. Between 6 and 12NM, fishing by non-UK vessels is restricted to those with historic rights relating to specific fisheries and specific countries. During a referendum in June 2016, the UK public voted to leave the European Union, the precise consequences of this decision are currently uncertain and as such do not form an integral part of this overview.

The process of decision-making and the production of policy within the context of the CFP, has two key routes. The first, regarding stock assessments and TAC allocations is considered relatively direct; scientific advice is provided to the European Commission (Parliament and Council) by the independent organisation ICES and recommendations are subsequently raised at the December Council meeting where the Council of Ministers (AGRIFISH) make the final decisions. Marine Scotland Science (MSS), who operate national fisheries monitoring programmes, provide Scottish fisheries specific information and expertise to ICES. Stakeholders are permitted to participate in a range of ICES activities, either as observers or full participants. The decision to accept a stakeholder is made by the chair of the meeting in consultation with the Secretariat or by the national delegate to ICES from the country of residence of the applicant. MSS also conducts research as part of the Marine Alliance for Science and Technology Scotland (MASTS), alongside the Scottish Association of Marine Science (SAMS) and various Scottish Universities, which is used both by ICES and the Scottish Government.

The second EU decision-making route involves consultations with stakeholders, through the Regional Advisory Councils (RACs) and with external bodies, proposals are subsequently

[v] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69547/pb13771-fish-concordat.pdf
[vi] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3Aai0033

submitted by the European Commission to the Council of Ministers and European Parliament for the final co-decision-making process. This route aims to incorporate technical and non-technical advice into the decision-making process. Stakeholder-led RACs were established in 2004, as part of the 2002 CFP reform, in order to provide opportunities for stakeholder engagement, consultation, and ultimately, recommendations to the Commission on aspects of the CFP. The 2013 CFP reform saw these RACs renamed Advisory Councils (ACs), despite little change to their mandate; to be consulted on the design and implementation of fisheries management tools and policies. They are intended to achieve greater regionalisation and more extensive stakeholder consultation and engagement.

The traditional linear system of decision-making involving scientific assessment, advice, regulation and implementation, and the top-down delivery of policy is becoming less appropriate in the more regionalised context of the CFP. Important changes have therefore occurred over the past few years, the direction of change being towards greater co-management; including the introduction of the Sea Fisheries Council as an industry-wide forum for policy debate, the integration of Marine Scotland and the setting up of Regional Inshore Fisheries Groups. The extent of future changes to Scotland's fisheries governance will be decided politically, particularly when resolving the question of Scotland's relationship to the UK and the EU.

Marine Scotland is responsible for controlling the activities of all fishing vessels operating within the within the Scottish Fisheries Limit – all water out to 200NM. It is also responsible for managing and controlling Scottish vessels, wherever they fish. UK vessels have exclusive rights to fish within 6NM of shore, between 6NM and 12NM fishing by non-UK vessels is restricted to those with historic rights relating to specific fisheries, beyond 12NM and up to 200NM is the Scottish Fisheries Limit. Most stocks occurring in offshore waters are subject to the EU's CFP regulations and bilateral agreements with neighbouring states such as Norway and Iceland. Fisheries within inshore waters around Scotland (<12NM) largely consist of shellfish, and are managed nationally by the Marine (Scotland) Act 2010[vii] and managed by Marine Scotland, a Directorate of the Scottish Government. Scottish Ministers are responsible for the regulation of inshore waters, they can implement conservation measures and policies, provided that the EU has not already legislated in this area. Inshore fisheries in Scotland have been regulated primarily through the Inshore Fishing (Scotland) Act 1984[viii]. Inshore fisheries are crucial to Scotland, not least as they support employment in many of Scotland's coastal communities. As a reflection of their importance, in 2015 Marine Scotland published a new Inshore Fisheries Strategy[ix] that focusses on improving the evidence base on which decisions are made, streamlining governance, promoting stakeholder participation and embedding inshore fisheries management into wider marine planning.

A number of organisations are active in the management of Scotland's inshore fisheries at a local and national level, such as; the Inshore Fisheries Management and Conservation group (IFMAC), responsible for resolving issues and developing policies; the five non-statutory Regional Inshore Fisheries Groups (RIFGs) set up to provide local fishers a role and voice in inshore fisheries management and wider marine planning developments; the Shetland Shellfish Management Organisation (SSMO) directly manages and regulates Shetland's

[vii] http://www.legislation.gov.uk/asp/2010/5/pdfs/asp_20100005_en.pdf
[viii] http://www.legislation.gov.uk/ukpga/1984/26/pdfs/ukpga_19840026_en.pdf
[ix] http://www.gov.scot/Resource/0049/00494784.pdf

inshore shellfish fisheries through a Regulating Order, giving it the powers to introduce its own regulations and control entry via license permits.

Marine Planning in Scottish waters consists of the national marine plan and regional marine plans. Published in March 2015, Scotland's National Marine Plan (NMP) covers inshore (0-12NM) and offshore waters (12-200NM). As agreed by the Scottish and UK Governments, it applies to both reserved and devolved functions. It is required to be compatible with the UK Marine Policy Statement. The Scottish Marine Regions Order 2015 came in to force on 13 May 2015, and created distinct regional units for marine planning. Within these regions, Regional Marine Plans will be developed that focus on regional circumstances and concerns. These will be developed by Marine Planning Partnerships, consisting of stakeholders that reflect marine interests in that area and issues to be dealt with. They will also incorporate existing groups; Local Authorities, Inshore Fisheries Groups, Local Coastal Partnerships and their umbrella body, the Scottish Coastal Forum. Regional marine planning powers will be delegated to the Partnerships by Scottish Ministers. These powers will not include licensing or consenting as these will remain the responsibility of consenting bodies such as Marine Scotland and Local Authorities. The first Marine Planning Partnerships cover the Clyde and Shetland Isles.

A significant proportion of the opportunities for stakeholders to engage and be involved in the process occur within the Scottish level of governance. Increasingly large amounts of information, opinions and issues are fed, via the prism of Marine Scotland, to the Scottish fisheries Minister. Although it is apparent what information is used for decision-making, precisely how this is distilled from consultations is not clear. That is, the method for deciding what opinions or issues make their way into the final decision, and which don't, is not demonstrable. However, once decisions are implemented, the feedback process of why decision are taken is considered effective. Of particular interest for the future of Scottish fisheries management will be how the relationship with both the EU and UK level opportunities alters.

Scottish fisheries governance and policy production has an increasing number of opportunities for stakeholders to engage with the process, and is often regarded as an example of good practice in stakeholder engagement and participatory 'co-management'. To convey the number of interactions of the above described system, an illustrative model of the engagement opportunities for Scottish fisheries stakeholders and the routes via which information feeds into the decision-making process and ultimately to the Scottish Fisheries Minister is presented in Figure 1.

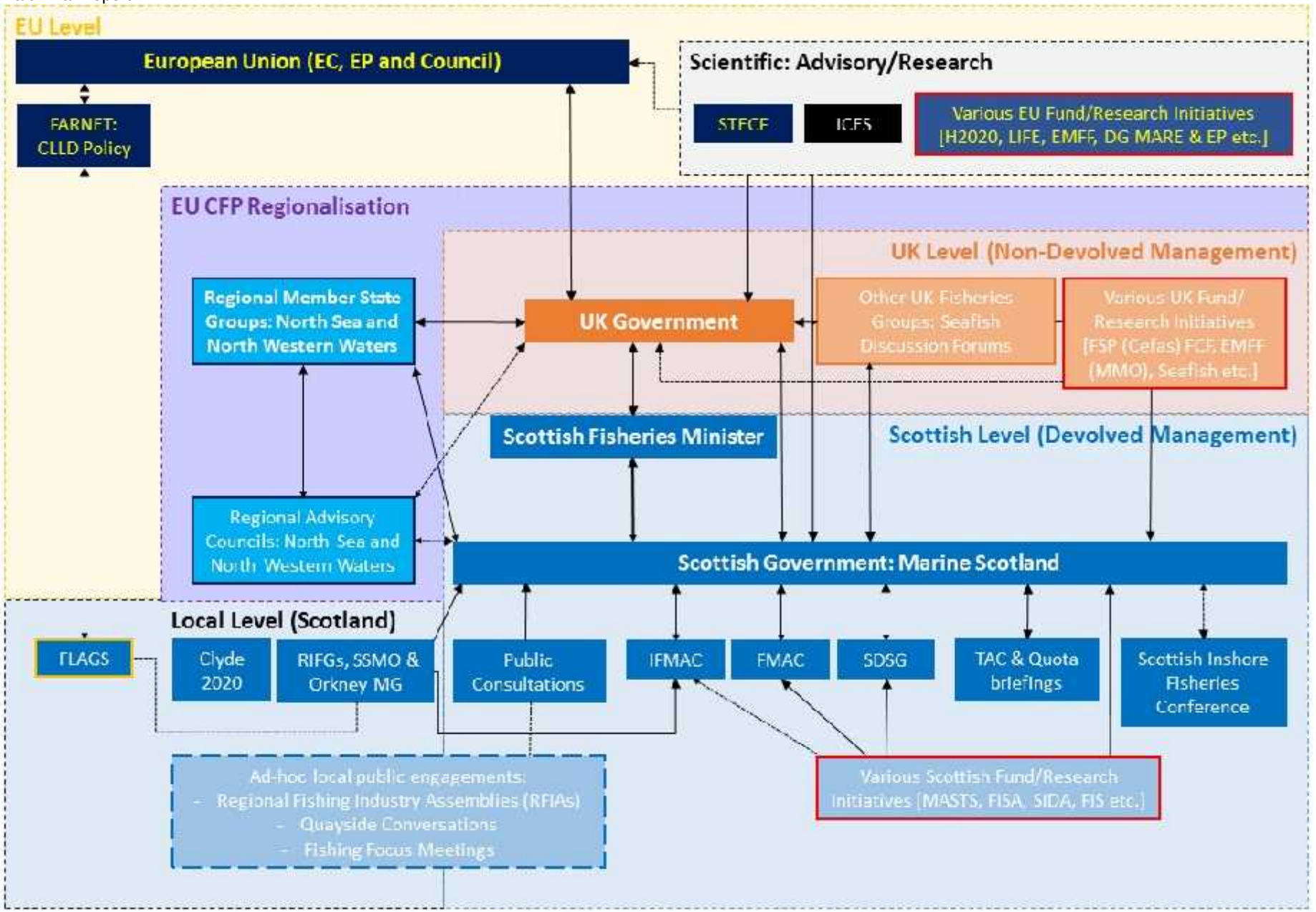

Figure 1: Illustrative model of engagement opportunities and information flows for Scottish fisheries decision-making and governance.

4.2 Stakeholder Engagement Opportunities

Over the past decade or more Scotland has led the way within the EU by adopting progressive systems of fisheries governance. The linear system of decision-making involving scientific assessment, advice, regulation and implementation, in a top-down delivery of policy has become increasingly less relevant and is gradually being replaced by opportunities and platforms that allow stakeholder involvement in the decision-making and policy development processes. Generally, the direction of change has been towards increased 'co-management', requiring close partnership between science, industry and government, thus increasing the level of engagement. All approaches have a similar objective to encourage the 'co-management' of fisheries resources and/ or the 'co-production of policy'. Here we focus on initiatives promoting interactive governance - the interaction between government and stakeholders - and describe the key engagement opportunities.

The Fisheries Management and Conservation Group

The FMAC Group was created in 2011 by the Scottish Cabinet Secretary for Rural Affairs and the Environment to replace the Scottish Fisheries Council (SFC), it is chaired by Marine Scotland and has relevant representatives from industry, producer organisations, eNGOs, and the Scottish and central Government, in line with the third feature of successful engagement (Table 2). FMAC take decisions and provide recommendations to the Scottish Government concerning the development of national polices and legislation for management and conservation of the marine environment, inshore and offshore fisheries, stocks and fishing communities. More recently the responsibility for inshore fisheries and discarding have been devolved to IFGs, IFMAC and the Scottish Discard Steering Group.

It is expected to meet quarterly to consider a decision on one or more currently important issues to the sector. Such as allocating fishing opportunities to vessels, aligning management measures with economic objectives and developing approaches to international negotiations across a range of fisheries.

Membership is weighted towards fisheries stakeholders although there are some eNGOs represented including the World Wide Fund for Nature (WWF). Marine Scotland chairs the group, determines initial membership and provides a secretary. Membership is restricted to representatives of defined stakeholder groups and changes to membership are made with the agreement of the group. Members may nominate a substitute but may not invite additional attendees, although the group may agree to invite individuals to present on specific topics. FMAC also co-manage the implementation of the Scottish Conservation Credits Scheme (SCCS; compulsory since 2009). This is premised upon recognition of mixed fishery interactions and re-problematisations of motivations of fishers' behaviour as seeking to square economic needs with responsible fishing. The SCCS has been described by the WWF as a "ground breaking example of co-management in fisheries" and "innovative and first of its kind in EU waters"[15].

FMAC displays many of the features that Reed (2008) outlined as best practice to stakeholder engagement, it puts emphasis on empowerment, equity, trust and learning. Participants are represented systematically, with the fishing industry making up approximately half of the group, producer organisations constituting about 5% and eNGO's 10%. Government agencies, local authorities and central and Scottish government constitutes the remainder.

Regional Inshore Fisheries Groups

The RIFGs are local non-statutory bodies that report directly to the Scottish Government with the aim of improving the management of Scotland's inshore fisheries (<6NM) and aim to provide 'commercial inshore fishermen a consolidated voice in wider marine management developments'[x]. The RIFGs succeeded the Inshore Fisheries Groups in 2016. Working with fishers and invested parties RIFG's develop proposals for inshore fisheries management to Marine Scotland and IFMAC, empowering the inshore fishing industry and integrating local knowledge into the wider decision-making process. There are five RIFGs (*and associated network groups): North & East Coast, Outer Hebrides, West Coast, Orkney Management Group* and Shetland Shellfish Management Organisation* (SSMO). Collectively the RIFGs are considered to be excellent forms of stakeholder engagement; SSMO is often regarded as a prime example, it manages and regulates shellfisheries within 6NM of Shetland. The SSMO influences policy through reporting to the Scottish Government and has had three of its shellfish fisheries accredited by the Marine Stewardship Council; the Velvet crab (*Necora puber*), Brown crab (*Cancer pagurus*) and the King scallop (*Pecten maximus*). This was achieved via issuing of licences and implementing restrictions and regulations beyond national management to ensure stock viability and sustainability.

Currently, Marine Scotland provides a Chairperson for the RIFGs (not the associated network groups) and administrative support services; regarded as being short-term support. RIFG's have management committee meetings on an approximately quarterly basis. The Chairperson has the responsibility of relaying and promoting the contents and provisions of the management committee approved regional Fisheries Management Plan at local or national levels, such as the IFMAC. In order to ensure widespread engagement with the local fishing industry throughout the RIFG area the Chair is 'encouraged' to hold local meetings with active fishermen and to facilitate the implementation of initiatives and partnership working with relevant agencies. Where fishing interests have a desire to discuss or implement specific local measures to improve the fishery either on a geographic or species specific basis the Chair will have the ability to convene local Working Groups. The Chair would be responsible for ensuring the RIFG are advised of all Working Group meetings and discussions.

The following representatives are invited to attend all Management Committee meetings; the fishing industry (e.g. Fishermen's Associations; commercial hand gatherers; seafood processors and distributors having commercial activities linked to the fisheries under consideration) and individual fishers to represent groups of non-affiliated fishers. Relevant marine stakeholders by invitation of Chair (e.g. Sea Angling Federation; District Salmon Fisheries Board and Fisheries Trusts; Scottish Wildlife LINK; whale and dolphin conservation interests). Project delivery partners (e.g. Seafish, Seafood Scotland, Local Government officials, FLAG project officers. Government and agency sponsored representatives (e.g. Regional Outreach Officers, SNH representatives). The RIFG management network are expected to be open for engagement by all commercial fishers, either independent or represented by Fishermen's Associations. Representation within this process is voluntary and the agenda will be set by fishers who have a stake in the fishery or fishing activity under consideration. Discussions are supported by expert advice from government bodies and agencies, eNGOs and other stakeholders also expected to contribute where appropriate, but their involvement is limited. Analysis of the attendance of the North & East Coast RIFG, shows

[x] http://www.gov.scot/Resource/0049/00498786.pdf

that the group consists of approximately 65% industry representatives, and 30% government representatives.

The Inshore Fisheries Management and Conservation group

The IFMAC group is intended to supplement the RIFG's by focusing on national inshore issues beyond the remit of the RIFGs and up to 12NM of the Scottish coast. The function of IFMAC was tailored to the inshore area as the FMAC model wasn't deemed representative or suitable enough for the complexities of inshore fisheries management – focusing primarily in offshore areas at the exclusion of the Scottish static fishing industry, specifically the shellfish (potting) sector which comprises 75% of the inshore operating fleet. Functionally, IFMAC make recommendations, often upon request, to the Scottish Government in matters pertaining to the development of national inshore policy and legislation for management and conservation of the marine environment and preserving the viability of sustainable fishing communities, stocks and businesses.

The aim of IFMAC is to ensure a viable Scottish fishing industry and the maintenance of sustainable fishing communities, seeking, where possible, to align management measures with objectives identified by the Scottish Seafood Partnership. In a similar manner to FMAC, Marine Scotland chairs the Group, provides administrative support and determines the initial membership, which may change upon agreement of the group and is subject to periodic review. IFMAC is represented by RIFGs, fishing associations representing a minimum of 10 vessels, NGOs and other interested parties, businesses and stakeholders. Central government and government agencies constitute less than 30% of the group, 30% are industry representatives, while academics and eNGOs constitute about 5% each.

Fisheries Local Action Groups

The role and function of Scotland's Fisheries Local Action Groups is to develop local support strategies that enhance the image, quality, value, cooperation and competitiveness of local fisheries and the community, with a bottom-up approach fitting to the area's needs. There are twelve local FLAGs, each comprised of members with an interest in the local industry, from trusts, harbour authorities, local councils, regional authorities, IFGs, small businesses and industry representatives i.e. fishermen's associations, producer organisations. The Scottish FLAGs were originally set up to make use of the European Fisheries Fund – FLAGs are now funded via the EMFF - for use in local level community development, through increased training opportunities, improved environmental protection, renewable energy development and improvements to tourism. The twelve FLAGs; Dumfries and Galloway, Moray, Outer Hebrides, Shetland, Angus, Argyll and Bute, East Lothian, Fife, Scottish Boarders, Aberdeenshire, Highland and South Ayrshire report to the Scottish government and the European Commission influencing local and regional policy design.

The Discard Steering Group

The Discard Steering Group has a remit to 'advise the Scottish Government on developing policies relevant to the implementation of the landing obligation'[xi]. The group reports to the government on a national level in response to the fisheries standing on the landing obligation and discard ban. The group has a wide membership, comprising of members from the Scottish

[xi] http://www.gov.scot/Topics/marine/Sea-Fisheries/discards/ScottishDiscardSteeringGroup

Government (23%), fishing associations (54%), producer organisations (8%) and eNGOs (15%), but has a relatively narrow aim, to focus on the successful implementation of the landing obligation through partnership.

Advisory Councils

The stakeholder led Regional Advisory Councils were established in 2004 as part of the 2002 CFP reform in order to provide consultation and ultimately recommendations to the Commission. Following the 2013 CFP reform, in the context of increasing regionalisation, RACs were renamed Advisory Councils (ACs). Their role is to 'bring together stakeholders from across Europe, to advise the Commission on matters of fisheries management' and provide 'advice on fisheries management in sea areas which fall under the jurisdiction of more than one Member State'[xii]. Their function is to 'increase the participation of those affected by CFP decisions', and develop 'community legislation in the form of regulation', they have been consulted on issues such as the discard reduction plans. AC members agree a yearly work plan which is approved by the European Commission. This is the implemented via Working Groups who develop advice and policy on behalf of the AC members. Working Groups are often supported by smaller Focus Groups, which develop advice on a specific topic. They are far more flexible in their approach and membership. AC's are considered to have contributed towards building "trust through dialogue" and developed "a more inclusive approach towards fisheries management"[15].

There are seven ACs covering five distinct maritime areas surrounding Europe as well as the pelagic sector and long-distance fleets. Those that are relevant to Scottish fisheries are; the North Sea AC, North-Western Waters AC, and the Pelagic AC. They both report to the European Commission and member states with an interest in the shared seas surrounding Scotland's coast. ACs members range from international stakeholders, fisheries associations, producer organisations, importers and exporters of fisheries products, and eNGOs, with member states and the European commission taking on an observer status. The member states involved include: the UK, France, the Netherlands, Sweden, Denmark, Ireland, Poland, Belgium and Spain. However, during a referendum in June 2016, the UK voted to leave the European Union, but the precise consequences of this decision are currently unclear.

Regional Member State Groups

There are two Regional Member State Groups (RMSGs) concerned with the seas around Scotland; the Scheveningen (North Sea) RMSG and the North Western Waters RMSG. The role of these groups is to set up joint recommendations in the shared sea areas of the member state groups for the implementation of discard plans for all fisheries by 2019 under the introduction of the reformed CFP's landing obligation. Scheveningen group members are Belgium, Denmark, France, Germany, the Netherlands, Sweden, and UK. North Western Waters RMSG members are Belgium, Ireland and UK.

Overview

Stakeholder engagement in fisheries management and governance is considered paramount to its success. But for engagement to be effective, it must be conducted in a manner that is approachable to the stakeholders in question. Previous projects conducted by Fisheries

[xii] http://www.gov.scot/Publications/2004/05/19427/38152

Innovations Scotland have aimed to conduct evaluations of the relative strength of these engagement opportunities, following method developed by Garrett *et al*. (2012); scoring on their reflection of issues, the level of dialogue and interaction, and their ability to generate actions. Under 'action' the criteria included 'Feedback' - detailed feedback of outcomes to stakeholders; 'Common understanding' - achievement of common understanding and share vision amongst stakeholders; and 'Practical action' - extent to which substantive action flows from agreed stakeholder initiatives.

They concluded that the highest scoring systems under 'Dialogue and Interaction' included RIFGs, SSMO and Clyde 2020. Scores for the 'Action' criteria were relatively weak, as too were scores under 'Feedback'. Overall they suggest that these systems have been much better at exploring complex issues than they are (or have been) at reaching common understanding and taking practical action. They highlight that the characteristics of the SSMO, could be considered as an example for future design or reviews of stakeholder engagements.

4.3 Stakeholder Classification

Holding numerous stakeholder engagement events, on their own, will not lead to an inclusive fisheries governance system. It is important that a balance of stakeholders participate, in order to ensure that the variety of opinions, views and understanding that exist are reflected in group discussions. In this section we provide a brief classification of the key Scottish fisheries stakeholders, we provide brief definitions of their current roles and responsibilities and perceived strengths and weakness. Stakeholder strengths and ability to feed into the policy development procedure were explored within a workshop - held at the Annual Scottish Fishing Conference 2016 - consisting representatives of key stakeholder groups (Fishers, NGO's, managers, academics, government). The discussion focused around their views on the strengths of each stakeholder group and their current influence on policy, as this section focuses on an asset-based approach, that emphasises was on exploring their strengths.

The European Commission

The European Commission is one of the main institutions of the EU and is steered by a group of twenty-eight Commissioners, who take decisions on the Commission's political and strategic direction. It is organised into policy departments (Directorates-General), who are responsible for different areas and develop, implement and manage EU policy, law and funding programmes[xiii]. Many of the fisheries in Scotland are managed directly through the EU's CFP, which has two key routes for policy production; through ICES, and through Advisory Councils. The Commission also conduct additional stakeholder consultations that aim to evaluate policy performances.

Strengths: *Power to produce cross-boundary policy; Provision of funding*

Central Government

The Central UK Government, led by the Prime Minister and supported by Cabinet, is responsible for all policy and decisions. Different departments within the government are responsible for putting policy into practice, but certain aspects such as domestic policy, are devolved to Scotland[xiv]. The decisions made by Government are then assessed and can be

[xiii] https://ec.europa.eu/info/about-european-union/organisational-structure_en
[xiv] https://www.gov.uk/government/how-government-works

challenged by Parliament through debate and investigation[xv]. The UK Government is the allocating authority for UK fish quotas and divides this between Scotland, England, Wales and Northern Ireland. The central government also works with Marine Scotland to negotiate fishing opportunities through the European Union and in other international negotiations[xvi, xvii].

Strengths: *Power to produce policy; Capacity to scan across policy issues; Enforcement of policy; Democratic authority*

Scottish Government

The Scottish Government controls and creates laws regarding matters that are devolved from Central Government, including those related to fisheries and the environment. The Scottish Parliament is separate from the Government but is the law making body for devolved matters[xviii]. Scottish Ministers have responsibility of marine planning, nature conservation, licensing and enforcement from Mean High Water Springs out to 12NM. In addition to this, responsibility is also devolved from the UK Government down to the Scottish Ministers for marine planning, nature conservation, licensing and enforcement in water adjacent to Scotland and up to 200NM[xix]. The Scottish Government also allocate the quotas for most stocks, of which the majority are issued to Fish Producer Organisations[xvi].

Marine Scotland is a Directorate of the Scottish Government and is responsible for the integrated management of Scotland's seas[xx]. On behalf of the Scottish Ministers, it has primary responsibility for marine planning, conservation and licensing from the Mean High Water Springs out to 200NM[xix].

Strengths: *Power to produce policy; Capacity to scan across policy issues; Enforcement of policy; Democratic authority*

Local Authorities

The Scottish local government consists of thirty-two Local Authorities who provide services such as education and planning and work with the Scottish Government, who provide funding and the framework for accountability and performance[xxi]. Under the Marine (Scotland) Act, Scottish Ministers are able to delegate regional planning down to the local authority level[xxii] . Each local authority is governed by a Council, who operate independently of central government and are accountable to their electorates for the provision of services[xxi]. The Local Authority, in association with other terrestrial planning authorities, are responsible for planning matters down to the Mean Low Water Springs and for marine fish farming (finfish and shellfish) where planning consent is required out to 12NM. In the intertidal zone, its authority overlaps with Marine Scotland's responsibility for the marine area[xix].

In Scotland, all of the thirty-two authorities are represented by the Convention of Scottish Local Authorities (COSLA), who act as the voice in both national and international matters. They support the Maritime Policy and EMFF whereby local communities are given the means to

[xv] https://www.parliament.uk/about/how/role/scrutiny/
[xvi] http://www.gov.scot/Topics/marine/Sea-Fisheries/management/17681
[xvii] http://www.gov.scot/Topics/marine/Sea-Fisheries
[xviii] https://beta.gov.scot/about/what-the-government-does/
[xix] http://www.gov.scot/Resource/0047/00479384.pdf
[xx] http://www.gov.scot/Topics/marine/About
[xxi] http://www.gov.scot/Topics/Government/local-government/localg
[xxii] http://jncc.defra.gov.uk/page-5263

grow and succeed and for Local Authorities to be fully involved in the design and implementation of programmes[xxiii].

Strengths: *Regional context and knowledge; Direct stakeholder engagement; Fund local projects*

Government Agencies (MSS)

Marine Scotland Science is the scientific division of Marine Scotland and helps to support the Scottish Government's plans for marine and coastal environments. Its purpose is to provide scientific, technical and economic advice and services, provide evidence to support policies, perform regulatory and enforcement activities and represent the Scottish Government at national and international meetings. It works closely with the Scottish fishing and fish farming industries, wild fish interests, renewable energy industries and other Government Departments[xxiv]. MSS data is used in national and international assessments and the scientists also collaborate with academics across the UK, other Government organisations and internationally[xxv].

Strengths: *Power to initiate policy; Enforcement of policy; Communication with stakeholders;*

Industry

Here, the fishing industry is considered in three subsectors; catching, aquaculture and processing:

Catching

The Scottish Catching Fleet is comprised of four main sectors[xxvi]:

1) *Pelagic fleet*: Comprised of a small number of profitable vessels that mainly target herring and mackerel.
2) *Whitefish (or demersal) fleet*: Targets bottom dwelling fish in two key fisheries, the roundfish fishery, largely located in the North Sea and west of Scotland, and the deeper water fisheries found to the north and west of Scotland.
3) *Nephrop Trawl Fishery*: Targeting *Nephrops*, but also catch some flatfish species.
4) *Shellfish (static gear) fleet*: Operates within the inshore water of the west and east coast, Borders, Fife and south West Scotland and target shellfish such as scallops and Nephrops.

Within Scotland there are many fishing associations which cover different segments of the industry, of which ten are represented by The Scottish Fishermen's Federation (SFF). The SFF was formed in 1973 and aims to promote and preserve the collective interests of Scotland's Fishermen's Associations. The Federation is a member of the North Sea AC and represents more than five hundred vessels, from creel boats to large pelagic trawlers. The SFF are directed by an executive committee which consists of seventeen members that meet

[xxiii] http://www.cosla.gov.uk/sites/default/files/documents/cosla_contribution_emff_proposal_uk_defra_consultation_2012.pdf
[xxiv] http://www.gov.scot/Resource/0050/00507369.pdf
[xxv] http://www.gov.scot/Topics/marine/science
[xxvi] http://www.gov.scot/Publications/2011/03/16182005/63

four times annually to discuss issues and policy. The associations which make up the SFF include[xxvii]:

1) *Anglo Scottish Fishermen's Association*: This association represents all fishermen, skippers and boat owners in the area between the Rivers Aln and Forth and is formed of an executive that meets six times a year.
2) *Clyde Fishermen's Association (CFA*): The CFA currently has sixty-five member vessels[xxviii] and represents small businesses on the Firth and adjacent shores, covering different sectors including Nephrops, scallops and fin fish and different fishing techniques. Members of the CFA pass on their views to representatives and committees and are then promoted and supported by the Executive Committee and the Executive Secretary. The CFA actively supports scientific studies and have engaged in several Marine Scotland consultations[xxviii].
3) *Fife Fishermen's Association*: Covers boats involved in prawn trawling, creel fishing and surf clam fisheries in Fife.
4) *Fishing Vessel Agents and Owners Association Scotland Ltd*: This association consists of around three-hundred and thirty vessels and not only covers the catching sector, but also different areas of the fishing industry.
5) *Mallaig and North-west Fishermen's Association Limited*: This is one of the biggest association in the UK and is run by an elected General Committee of skippers and owners and its members come from all different sectors of the industry including single operated creel boats and large offshore trawlers[xxix].
6) *Orkney Fisheries Association*: This association covers many different sectors including whitefish, prawn, scallop and creel fishing, and until recently also pelagic fishing.
7) *Scallop Association*: This is the only UK organisation that represents the interests of the catching, gear manufacture and processing sectors of the industry and is recognised by government ministers and agencies as a key establishment. The views of its members are representing at all different levels, from local to EU level and collaborates with other bodies including NGOs.
8) *Scottish Pelagic Fishermen's Association Limited (SPFA)*: This association has been established for more than 75 years and represents the Scottish pelagic fishing fleet at national and international levels. The association represents twenty-three member vessels and the main fisheries are the North-East Atlantic mackerel and horse mackerel, Northern blue whiting and North Sea, West of Scotland and Atlanto-Sandian herring, which are all fished using the pelagic trawl method. It works closely with both Scottish and UK governments, as well as the European Commission, to ensure its member's views are sufficiently represented[xxx]. The SPFA also holds a seat on the Pelagic Regional Advisory Executive Committee, which, provides the European Commission with advice on the management of pelagic fisheries[xxx].
9) *Scottish White Fish Producers Association (SWFPA):* This association is the largest in Europe representing around two-hundred vessels and covers sectors including UK

[xxvii] http://www.sff.co.uk/about-us/
[xxviii] http://www.clydefish.com/
[xxix] http://www.mnwfa.co.uk/
[xxx] http://www.scottishpelagic.co.uk/

Nephrops and whitefish. SWFPA is a member of Europeche, which is a European platform that facilities communication between European institutions and the fishing sector, by informing stakeholders of EU objectives[xxxi].

10) *Shetland Fishermen's Association*: This association is mainly a pressure group representing it member's (ca. 80) views to all levels of the Government, and is involved in discussions in the Scottish and UK Government and Parliament and also the EU. Within the association there are three sub-committees which represent pelagic, white fish and small boats and its policy is developed by an executive committee which is elected annually.

From the associations listed above pelagic and whitefish are relatively well represented by large associations. Although other sectors are covered by other associations, it appears as if small, single operators and creel fishers are represented by smaller more specific associations that operate across restricted geographical areas.

Aquaculture

Aquaculture is increasingly important in Scotland, and it is helping to support economic growth in rural and coastal communities in the north and west of the country. The industry is led by Atlantic salmon farming, with Scotland being the largest producer of salmon in the EU, however they also produce significant quantities of rainbow trout and mussels[xxxii]. In Scotland aquaculture is supported by the Ministerial Group for Sustainable Aquaculture, which helps to achieved sustainable growth targets set for the industry[xxxiii].

Processing

There are around two-hundred fish processors in Scotland, who are represented by the Scottish Seafood Association and the Scottish Food and Drink Federation[xxxiv,xxxv]. Most of the processors are concentrated in Grampian, although the Highlands and Islands also make up an important proportion of employment in the processing sector. The seafood sectors can be divided into three different product areas which includes, demersal, pelagic and shellfish[xxxv]. There are three types of processing activity which consists of:

1) *Primary processors*: involving cutting, filleting, peeling, shelling, washing etc. (the majority of Scotland processors falls under this category).
2) *Secondary processors*: involving brining, smoking, freezing, canning etc.
3) *Mixed processors*: carry out both primary and secondary activities.

Strengths: *First-hand knowledge of resources and environment; Provide research platform; Understand current issues; Localised understanding and detailed time and place knowledge; Data provision*

[xxxi] http://www.swfpa.com/about
[xxxii] http://www.gov.scot/Topics/marine/Fish-Shellfish
[xxxiii] http://www.gov.scot/Topics/marine/Fish-Shellfish/MGSA
[xxxiv] http://www.gov.scot/Topics/Business-Industry/Food-Industry/Seafood/processors
[xxxv] http://www.seafoodscotland.org/en/responsible-sourcing/overview-of-the-seafood-industry/processing.html

Producer Organisations

Producer Organisations (POs) are membership organisations that are officially recognised bodies set up by fishery or aquaculture producers[xxxvi]. There are currently ten Scottish POs recognised by Marine Scotland, each with a Board, a Chief Executive and supporting officials. Some of these PO's are represented by the European Association of Fish Producers Organisations (EAPO) which aim to provide support and advice to their members, improve relationships between European POs as well as be seen as a representative body for the fisheries sectors[xxxvii]. Examples of PO's in Scotland include the Scottish Fishermen's Organisation (SFO) whose main functions is to market their members' catches and manage fisheries subject to quotas[xxxviii], and also the North East of Scotland Fishermen's Organisation (NESFO), which aims to improve the operational environment and efficiency of its members though marketing and securing additional quotas[xxxix].

Strengths: *Local (quota) management; Broad understanding of issues; Distil opinions of industry; Single voice for members; View of wider picture outside fishing; Joined up thinking between different scales of knowledge*

Research Institutes/ Academia (Higher Education)

Research in fisheries is closely linked to policy processes and can help to improve the effectiveness of implementation and allow monitoring and evaluation. The aim of fisheries research is progressively moving towards the incorporation of social and empowerment issues, however there is still a strong focus in fisheries research[xl].

The Scottish Association of Marine Science (SAMS) is Scotland's biggest and oldest independent marine science organisation which undertakes research in the marine environment including aquaculture and marine renewables. It is a chartable company that elects a governing Council[xli].

Marine Alliance for Science and Technology for Scotland (MASTS) is a consortium of organisations that undertake activities in marine science. The research covered by MASTS is split into three thematic areas which reflects the Scottish Government's policy areas, including dynamics and properties of marine systems, productive seas and marine biodiversity, function and services. It represents a major scientific capacity in Scotland and individuals from MASTS contribute to the Science and Research Working Group established under the Ministerial Group for Sustainable Aquaculture[xlii,xliii].

Strengths: *Technical research skills; Able to engage stakeholders and facilitate dialogue; Provision of evidence; Can influence policy*

[xxxvi] http://ec.europa.eu/fisheries/cfp/market/producer_organisations_en
[xxxvii] http://www.eapo.com/index.php?page=home
[xxxviii] http://www.scottishfishermen.co.uk/history.html
[xxxix] http://www.nesfo.co.uk/
[xl] http://www.fao.org/docrep/007/y1127e/y1127e05.htm
[xli] http://www.sams.ac.uk/about-us
[xlii] http://www.masts.ac.uk/research/research-themes/
[xliii] http://www.gov.scot/Topics/marine/Fish-Shellfish/MGSA/Scienceandresearchwg

eNGOs

An eNGO is a non-profit voluntary group which is focused on environmental aspects. They aim to influence policy by informing consumers about suitability issues through mediums such as social media, campaigns and certification schemes[xliv]. In Scotland, Scottish Environment Link is a forum for Scotland's voluntary environment organisations with over thirty-five member bodies, providing an opportunity for information sharing, discussion and joint action[xlv]. eNGOs participate in different stakeholder groups in Scotland, including The FMAC Group, RIFG's, the Discard Steering Group, AC's and the FISA.

Strengths: *Ensure accountability; Expand the sustainability debate; Provide pressures (Wider social viewpoint)*

Funding Bodies and Charities

The European Maritime Fisheries Fund is a European funding scheme for the period 2014-2020, which supports fisheries, inland waters, aquaculture and maritime sectors. The UK has EUR 243 million of the programme, of which Scotland received EUR 107.7 million[xlvi]. As well as this main funding body there are also several charities within Scotland that are dedicated to fisheries, one of the most prominent being the Marine Conservation Society, which together with partners, helped bring about the Marine (Scotland) Act 2010[xlvii].

Strengths: *Support policy; Identifying gaps; Provide incentives; Facilitate collaboration*

Public

Public is defined as '*of concerning the people as a whole*'[xlviii] and engaging with the public and local fishing communities is key to the work of Marine Scotland and the Scottish Government. Several initiatives have been implemented including Regional Assemblies, Quayside Conversations and Fishing Focus as well as groups such as Regional Inshore Fisheries Groups that aim to give stakeholders, for example, commercial fisherman a stronger voice.

The public vote for Members of the Scottish Parliament (SMPs) to represent their views and make decisions on laws that have been devolved in Scotland. Once elected SMP are able to introduce a bill or amendment, speak in debates and committee meetings, highlight key issues in the media and speak to the Scottish Government[xlix].

Strengths: *Able to influence policy change (e.g. landing obligation). ;*

Media

Media can be a powerful tool in helping to bring about policy change and implementation. For example the campaign for the discard ban, involving figures such as Hugh Fearnley-Whittingstall, helped bring about a change in European Legalisation.

Strengths: *Able to highlight issues and mobilise stakeholders to create policy change (e.g. landing obligation).*

[xliv] http://ec.europa.eu/environment/integration/research/newsalert/pdf/260na1_en.pdf
[xlv] http://www.scotlink.org/
[xlvi] https://www.gov.uk/guidance/european-maritime-and-fisheries-fund-emff-before-you-apply
[xlvii] http://www.mcsuk.org/scotland
[xlviii] https://en.oxforddictionaries.com/definition/public
[xlix] http://www.parliament.scot/visitandlearn/25490.aspx

5 Stakeholder Engagement

Section Summary

- **Understanding** of the governance structure is related with **level of involvement** – engagement should therefore be as broad as possible.
- **Additional effort** is required to ensure the process is **accessible to newcomers** and those on the periphery of the system (hard to reach stakeholders).
- **Type of stakeholder representation**, not necessarily the level of representation, is sometimes an issue – are all sectors (opinions within a sector) reflected in dialogue.
- The type of representation is critical to sectors typically characterised by **heterogeneous groups and regions**; each with **unique issues and pressures**.
- Engagement opportunities may need to be **tailored to suit the target stakeholders**.
- Understood that **Government has the biggest say on decisions**, **followed closely by industry**. However, the issue of particular opinions or groups dominating the debate was highlighted, raising questions regarding the **distribution of influence**, rather than the level of influence.
- The **power and influence** of a stakeholder group of fleet segment, may not be equivalent to their level of representation.
- **Discrepancy between the opinions of Industry and NGO** representatives; while both considered themselves to be the least influential group, they considered each other to be highly influential.
- Significant appetite to be involved in **supporting** the decision-making process. However, currently, **specific stakeholder roles are not clear (understood)**.
- All respondents were keen to increase involvement with regards to generating evidence and data, **paving the way for 'science partnerships'**. 'Ownership' of data, as we saw in the case studies, leads to greater understanding and acceptance.
- The **landing obligations** believed to have been **influenced by public opinion**. With the increasing importance of social media (e-democracy) as a tool for campaigning, it is likely the **public will play an increasing role in policy decisions**.
- Communication difficulties between stakeholders are not considered to occur regularly, the **long history of engagement and co-management** was cited as a reason for this.
- **Access to engagement** is considered to be the greatest issue with the current process, both in terms of **geographic** location, availability, and matching the level of engagement with the specific abilities (needs) of the stakeholders present.
- **Online and electronic engagement** is likely to become increasingly important.

This section describes the results of a stakeholder engagement process that aimed to elucidate stakeholder perceptions regarding the current Scottish fisheries governance, their role within it and its possible future direction of travel. The approach consisted of three

elements; **individual interviews** with key stakeholders; a **workshop** with stakeholder representatives; and an **iterative questionnaire** survey with a selected panel of representatives and experts. Individual interviews were conducted on an *ad hoc* basis, and informed the literature review and compounded findings from the questionnaire.

The aim was to understand the challenges and requirements of Scottish fisheries governance in the next decade and beyond, and consequently to understand how the current system could change in order to face these challenges. Attempting to map the changes required over the next decade or more is uncertain, especially considering the recent EU referendum result. In these circumstances it is difficult to predict with certainty the course of Scottish fisheries management. We therefore focused on individual experiences in the decision-making process, the main policy issues, and the capacity of each stakeholder group to resolve these issues.

5.1 Exploratory Consultation

In order to frame the consultation phase, we first conducted a broad consultation with a number of key stakeholders, via telephone and face-to-face interviews. This initial open-ended consultation aimed to collate perspectives regarding; stakeholder roles and responsibilities; issues, limitations and challenges, and; future priority areas of research and policy development. This allowed the most pertinent pressures to be incorporated into subsequent consultation by grouping similar responses together as emerging themes[71,72]. As this exploratory phase intends to introduce opinions and perspectives into the development phase, rather than to draw conclusions from, it was not essential to receive stratified response or indeed a minimum sample size.

Open-ended consultation was followed by a workshop - held at the Annual Scottish Fishing Conference 2016 - consisting representatives of key stakeholder groups (Industry, NGO, managers, academics, government). The workshop had three foci, to review the overview of the current Scottish system of governance and policy production (Figure 1), to elucidate their views on the strengths of each stakeholder group and their current influence on policy, and to discuss in depth the perceived future policy issues in order to feed into the design of the questionnaire.

During this ‘horizon scanning’ exercise we asked stakeholders to independently list the most pressing current policy issues and those for the future. Several recurring policy issues emerged, including; the landings obligation; BREXIT and Scottish Independence; MPA’s and spatial closures; TACs and Quotas; Changing environment (fish distribution); Pollution; Increasing aquaculture (linked to Marine Spatial Planning); Disease management (particularly aquaculture); Appropriate representation for certain fleet segments; and language barriers between science and industry.

Although stakeholders believed they could play a vital role in many of the issues raised, Brexit and its implication was not one of those, rather, it was felt that stakeholders had limited influence. There is a great deal of uncertainty regarding the impact of BREXIT on UK fisheries, and as such we are unable to include it in any detail in our analysis. The Scottish Government has recently released articles outlining what it would mean for fisheries following a vote for independence. Priorities for action include:

- Discuss domestic and European priorities with the Scottish industry, including immediate issues to put on the EU Council agenda.

- Enter into negotiations with the rest of the UK and the EU to fully define fishing rights and a fair set of final quota allocations.
- Establish a formal international quota exchange function with other EU Member States to ensure we can access the additional fishing quotas necessary for our fleet.
- Ensure that the obligation to land all catches and ban discards is implemented in a practical, achievable and sensible fashion, seeking reform or removal of regulations, such as the Cod Recovery Plan, that are at odds with the landing obligation.
- Establish new mechanisms to ensure that Scottish industry levies are dedicated fully to the support and promotion of the industry in Scotland.
- Review the role and organisation of Marine Scotland, given that it is now five years since its establishment.

5.2 Iterative Stakeholder Survey

Development of the stakeholder survey was based on the 'Delphi method'[72], an iterative forecasting tool built on the assumption that group judgment is more valid than individual judgment. Governance practices have seen increasing promotion of the Delphi method as a useful technique for eliciting data from constituencies[73]. It has been previously implemented in terms of MPA governance and environmental research, primarily for issue identification or research prioritisation[11,73–75]. Further, it has been used as a tool to implement multi-stakeholder approaches for participative policy-making in developing countries; a form of the Delphi method exists[76], which specifically aims to generate strong opposing views on policy issues[72]. However, to our knowledge this is the first time Delphi has been applied to UK fisheries.

Approach

We employed anonymous group communications in order to obtain group perspectives via two rounds of questionnaires. This approach was used to develop an agreed view (consensus) or valid divergence on particular topics. Another central aim was to determine whether the Delphi method offers a useful tool for obtaining information from a range of stakeholders. We go on to explore how the method performed between the stakeholder groups and the advantages and disadvantages of the approach.

The questionnaire was based on the literature review and recurring perspectives from exploratory consultation. The scope was broad, but focused on; extent of engagement; stakeholder interaction, influence and representation; and the current and potential future policy issues. The research questions we intended to answer were:

- Does the panel fully understand the current method of policy production?
- How involved and represented do they consider their stakeholder group, and other groups, to be in the current governance system?
- How do they see their role as a stakeholder changing in the future?
- What are the key issues with regards to the current engagement process and future policy decision-making?

An invitation letter containing background information was sent to ninety-seven stakeholders and experts (Academia 13%; NGO 13%; Government 23%; Industry 50%), selected due to

their expertise and representativeness of their stakeholder group. They were contacted in order to ensure continued engagement prior to inclusion. A panel of thirty participants, defined solely by their stakeholder group responded positively. The panel was stratified and consisted; six representatives of Scottish Government; fourteen representatives of Industry; six from Academia of Research Institutes and four representatives of NGO's. It should be noted that these representatives do not necessarily represent the single view of a sector, or indeed the government. They represent individual perceptions and opinions. Stakeholders are categorised by their broad group, i.e. industry represents all three subsectors.

The questionnaire consisted of ten root questions (Table 3) with responses framed using a Likert scale (e.g. 1 to 9; 'disagree' to 'agree')[77] followed by an opportunity for participants to provide further insight or context to their response. After collecting the participants' scores from the first round, feedback on the group response for each question was included in the second round. Feedback allows stakeholders to reflect, interact anonymously and amend their response in light of the decisions of others, again we provided opportunity to include context to their response.

The survey was conducted online and via email. First round response rate was 80%, and 77% participated in the final round. The two rounds consisted of the following representatives; four from government, four from academia, twelve form industry and two NGOs. To achieve higher response rates we allowed additional time for each round and sent email reminders.

Table 3: Questions of the iterative stakeholder questionnaire.

Questionnaire Design
1. Is it clear how decisions relating to Scottish fisheries are made by policy-makers?
2. Is there sufficient feedback of why policy decisions are taken?
3. To what extent are the fishing industry involved in decision-making in Scottish fisheries?
4. For each stakeholder group, do you feel they are over- or under-represented?
5. How involved are you in the Scottish decision-making process, with regards to: õ Identifying issues for management and governance õ Consultation on policy options õ Generating evidence and data õ Provision of advice and recommendations õ Making policy decisions
6. Based on your skills and knowledge, where do you think you could contribute most to the decision-making process? õ Identifying issues for management and governance õ Consultation on policy options õ Generating evidence and data õ Provision of advice and recommendations õ Making policy decisions
7. For each of the following stakeholder groups, what level of influence on the decisions made do you feel they have? õ Government õ Industry õ Research Institutes or Academia õ NGOs õ Public
8. How do you benefit from current ‘stakeholder engagement’? õ Gain knowledge õ Hold people to account õ Influence decisions õ Understand future issues
9. Based on your involvement in the process, please rate the importance of the following issues with the current stakeholder engagement process: õ Communication difficulties between stakeholders (language used) õ Lack of technical knowledge õ Accessibility to attend õ Lack of transparency
10. The following issues will be important for the future production of policy within Scottish fisheries, over the next ten years? õ BREXIT / Scottish Independence õ Climate change õ Pollution (e.g. micro plastics) õ Marine Protected Areas õ Profitability of the sector õ Quota / TAC allocation õ Landing Obligation

5.3 Results

The following section describes the responses to the iterative questionnaire.

5.3.1 The Decision-making Process

The opening questions relate to the decision-making process, specifically regarding its clarity (Q1) and the level of feedback on how decisions are made (Q2). The overall mean response from participants was neutral, '5.3' and '5', respectively; showing neither 'strong agreement' nor 'strong disagreement' with the two statements. This is due to responses being divergent rather than no strong opinions being expressed. Less than 5% of participants responded 'neutral' across both questions (Figure 2 and Figure 3).

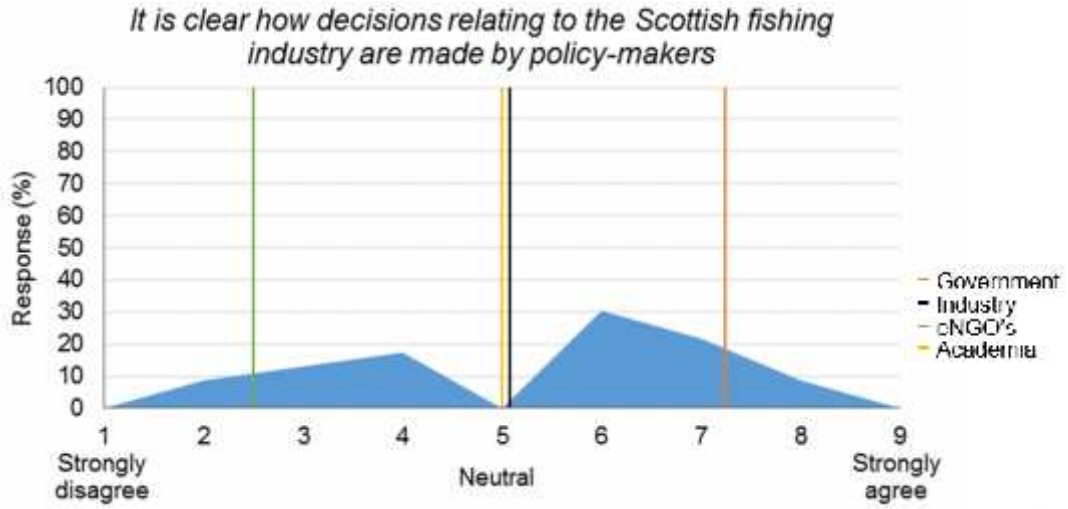

Figure 2: Distribution of all responses and means for the four stakeholder groups for Q1. Mean overall response was 5.3.

Respondents representing NGO's disagreed most strongly with the statements (mean ($\bar{x}$) = 2.5), stating that it wasn't clear how decisions were made. While Government representatives agreed most strongly ($\bar{x}$ = 7.3). Respondents offered various explanations for their responses, several caveated them by outlining that their understanding is proportional to their level of involvement in the decision-making process.

> *"It is clear … largely because I am on the inside of the process - it may be quite opaque to external stakeholders, although we do try [to] communicate and disseminate as widely as possible."* – Government rep.

Clearly for those stakeholders in leadership roles, or who have been engaged with the decision-making process for many years, the process is more easily understood.

> "*I believe the process has become more transparent over the … years that I've been working in this sector."* – NGO rep.

Representatives of Academia and Industry were divergent in their responses. Again, respondents inferred that the extent and level at which they interact with the decision-making process determines their understanding. Some stakeholders suggested that the process is much clearer at higher levels (Scottish Government) than it is with localised groups.

> *"There are complex layers relating [to the governance and management] of fishing … and quality of transparency varies significantly."* – Industry rep.

Similarly, regarding the feedback process of how and why decisions are made, NGO's were most critical ($\bar{x}$ = 2.5), and Government most positive ($\bar{x}$ = 6.5). Again, respondents considered that the level of involvement in the process, determined their understanding of feedback. However, much of the feedback process of governance is freely available online, therefore it is not a question of access to feedback. Some respondents commented that sufficient resource is required in order to digest (and understand) feedback. As with Q1, Industry and Academia were split within their stakeholder groups, and comments suggest that it is a result of the individual's degree of involvement in the process:

> *"We hold regular briefing sessions with stakeholders, as well as more informal meetings … attendance at briefings is declining - stakeholders have more information available to them online now."* – Government rep.

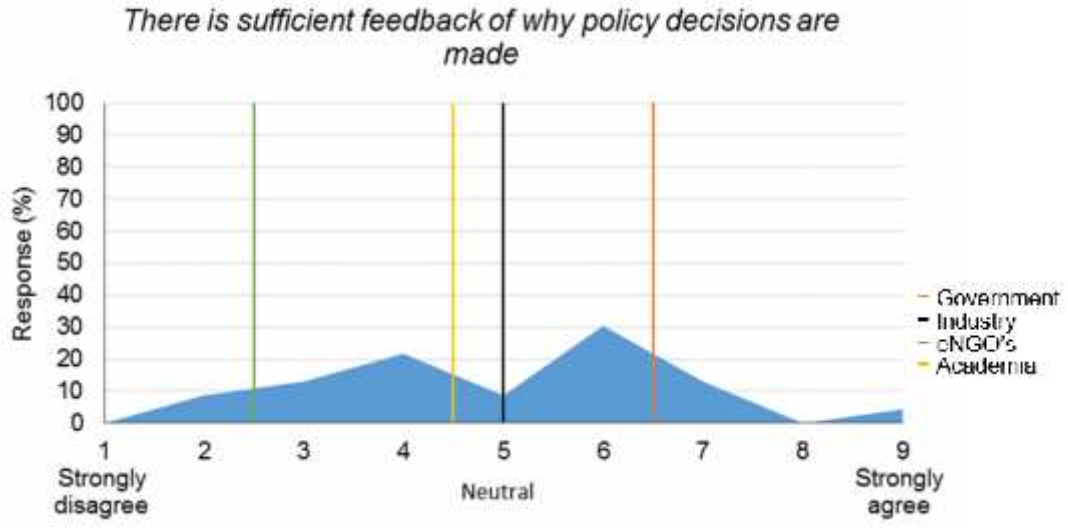

Figure 3: The distribution of responses and means for the four stakeholder groups to Q2. Mean overall response was 5.

The degree to which the decision-making process is understood by stakeholders varies both between and within groups. The level of prior engagement could create an obstacle to newcomers engaging in the process, particularly for stakeholders who are engaging at the localised level only. Additional effort is required to ensure the process is accessible to newcomers and those on the periphery of the system (hard to reach stakeholders).

5.3.2 Stakeholder Involvement

Another important set of questions relate to the current level of stakeholder involvement in fisheries management and whether they consider themselves and other stakeholder groups to be under- or over-represented in the decision-making process (Q3-Q4). There was general consensus across most respondents that Industry are fully involved in the process, with a median response of 7 (Figure 4).

> *"Very little, if anything, is decided without industry input… industry is very politically aware and have a number of ways to influence policy"* – Government rep.

Although Industry is considered to be involved, as whole, the type of representation that Industry has in the decision-making process was raised as an issue by several respondents. That is, some Industry and NGO representatives felt that certain sectors of industry were not

as closely involved in the decision-making process. This raises issues with regard to the type of representation, not necessarily the level of representation.

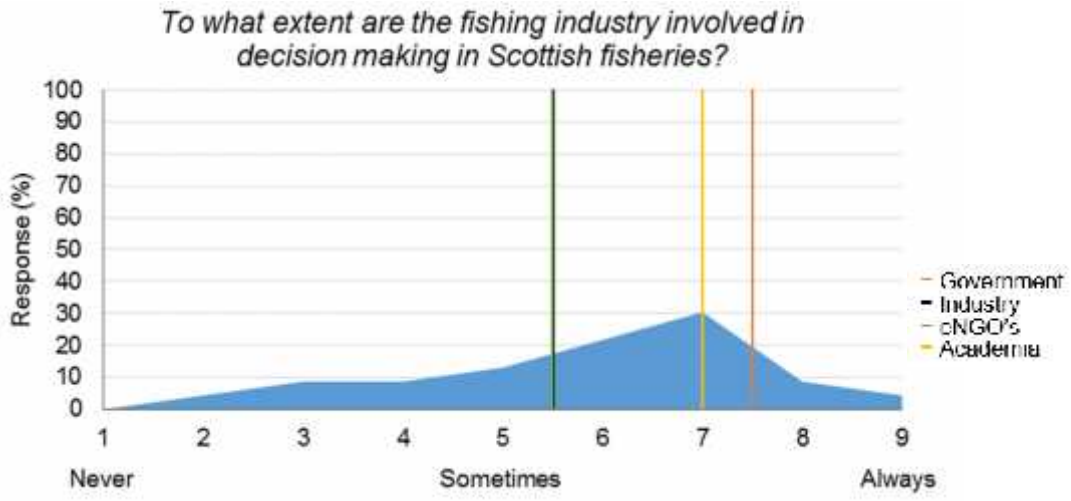

Figure 4: The distribution of responses and means for the four stakeholder groups to Q3. Mean overall response was 5.9.

> *"Industry representatives are always involved in decision-making, but … there are industry players who are not represented and certain sectors that are under-represented … at the expense of more vocal or larger sectors."* – NGO rep.

> *"Two Federations dominate representation by direct lobbying and domination of the discussion forums. Historically, small associations and individuals have little say on matters."* – Industry rep.

> *"The question is to what extent these groups represent 'the industry', and what, if any, alternative ways can fishermen be represented."* – Industry rep.

With regards to the level of representation of other stakeholder groups, many respondents considered that Government, to some extent, were over-represented in the process, with no response going below 'neutral'. Responses concerning Academia and NGO's were less conclusive, the mean responses being 4.7 and 5.5, respectively. NGO representatives considered both groups to be under-represented ($\bar{x}$ = 3.5, 3.0, respectively), while Academic representatives considered themselves to be under-represented and NGO's to be slightly below 'neutral' ($\bar{x}$ = 3.5, 4.8, respectively).

> *"I believe research has an important contribution to make to the decision-making process and I don't feel this is properly utilised."* –Research rep.

However, Industry representatives considered both Academia and NGO stakeholder groups to be over-represented in the decision-making process ($\bar{x}$ = 5.7, 6.4, respectively). Although, there was an indication from the comments of some Industry respondents, that this may only be a perceived over-representation - NGO's are considered to have greater means to attend events:

> *"Whether NGOs actual representation is greater or not may be disputed, but the perception is that they have the personnel and funds to ensure they can be visible at events and in the media."* – Industry rep.

All stakeholders were in strong agreement that the public are under-represented, or not represented at all (Figure 5), especially NGO and Government representatives ($\bar{x}$ = 1.0, 2.5, respectively).

> *"I think there is a fair balance, with the exception of the general public … they are difficult to take into account on industry specific issues, but on wider marine issues they should have a louder voice."* – Government rep.

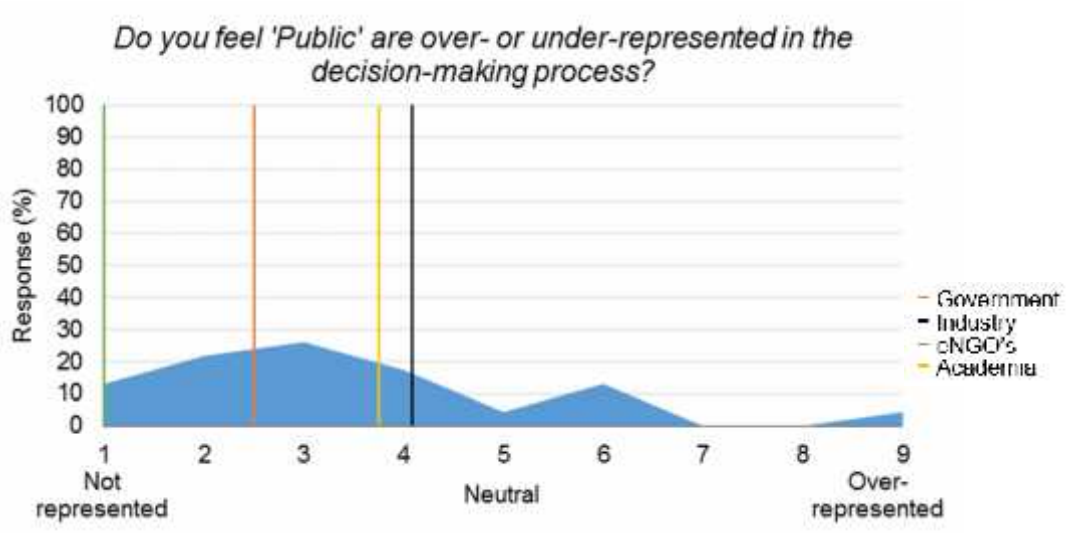

Figure 5: The distribution of responses and means for the four stakeholder groups to Q 4.5. Mean overall response was 3.4.

Drawing conclusions from this set of responses is difficult. Individual interpretations of the definition of 'representation' requires some investigation. Clearly some stakeholder groups are considered to have sufficient numbers of representatives present, but the type of representation has been highlighted as a potential issue. Especially to Industry, which is typically characterised as consisting of heterogeneous sectors and regions; each having their own unique issues, pressures and concerns.

There is also concern about the ability for some stakeholders to be represented, particularly on the national stage. With concerns regarding the perceived level of influence and power that certain sectors, or stakeholder groups have access to. This has long been an issue of diverse fishing fleets - consolidated sectors can be more easily represented. Progress in Scottish fisheries governance has certainly been towards greater representation of smaller more heterogeneous fleet segments, but clearly these concerns still exist.

5.3.3 Stakeholder Roles

The next series of questions aimed to understand stakeholder perceptions of their role in areas of the decision-making process, and if they consider that their roles could be expanded to help tackle key future policy issues (Q5-Q6).

Responses were generally quite variable and no clear consensus was found, suggesting that stakeholder roles are not entirely clear (or understood). Most stakeholder groups considered themselves to be involved in the 'Identification of issues for management and governance', except Academic representatives. With regard to 'Generating evidence and data' all stakeholder representatives felt that they are most heavily involved in this aspect, with the

mean overall response being 5.7 (Figure 6). However, the Delphi panel do not consider themselves to be directly involved in 'making decisions' ($\bar{x}$ = 2.6) (Figure 7). It is important to note here, that government representatives, are also in supporting roles within government organisations and do not necessarily represent the decision-makers.

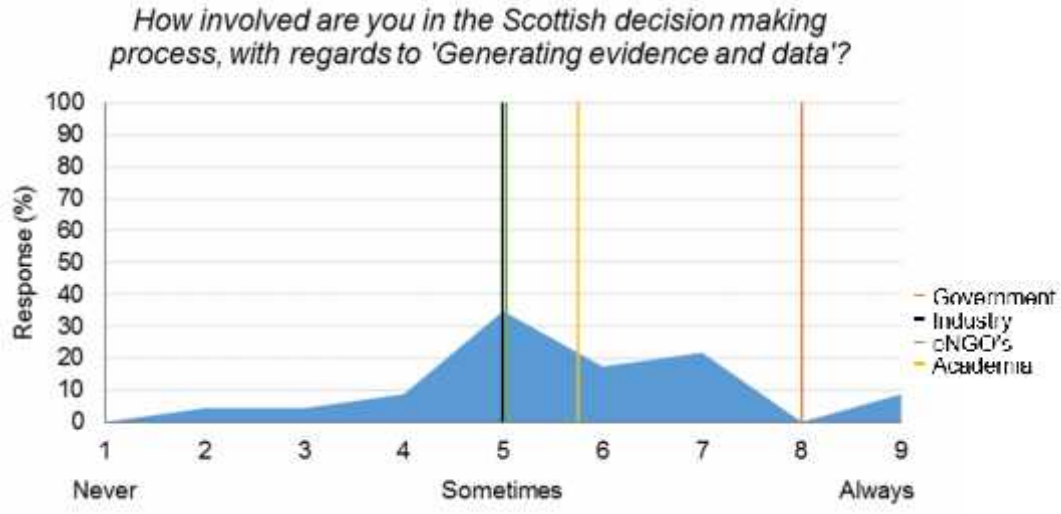

Figure 6: The distribution of responses and means for the four stakeholder groups to Q 5.3. Mean overall response was 5.7.

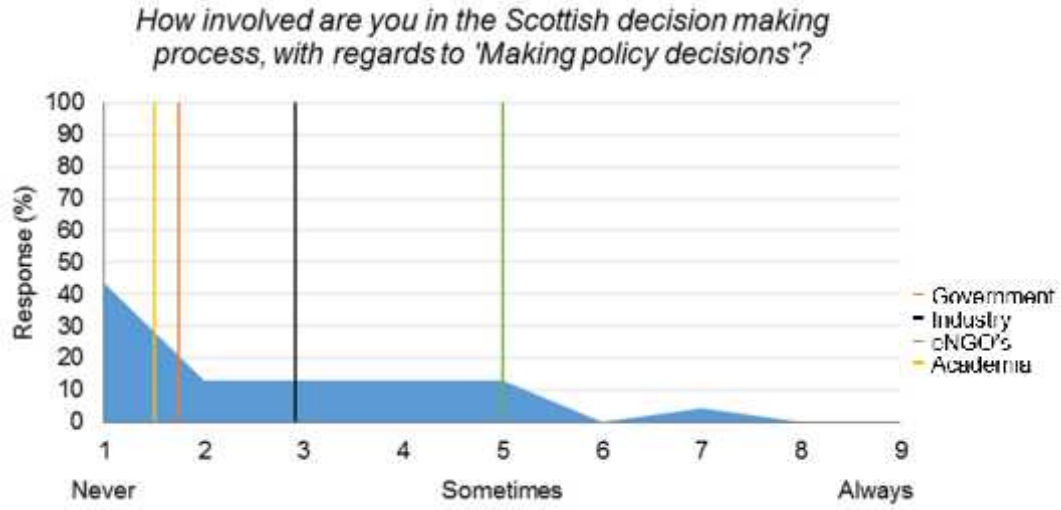

Figure 7: The distribution of responses and means for the four stakeholder groups to Q 5.5. Mean overall response was 2.6.

Stakeholders with the clearest understanding of role, were those from Academia, who only responded positively to 'Generating evidence and data', and Government, who responded positively to 'Generating evidence and data' and to 'Identifying issues for management and governance' and 'Provision of advice and recommendations'. Industry representatives responded that their greatest involvement is with regard to 'Identifying issues for management and governance'.

A subset of these questions aimed at elucidating the level of contribution that the stakeholder groups believed they could make, with regards to the same areas of the decision-making process. The majority of stakeholders were keen to use their skills and knowledge to contribute to the management of Scottish fisheries, with mean responses to

the questions being between 6.5 and 7.3, with the exception of responses to 'making policy decisions'. Clearly this highlights significant appetite of stakeholders to be involved in supporting the decision-making process.

Again, participants representing Academia and Government, were quite clear on their future roles, believing that their skills and knowledge best suit the areas that they are currently considered to be participating in. Academic representatives believed that they could increase their involvement in the 'Provision of advice and recommendations', along with all other stakeholders (Figure 8). This shows the potential usefulness of science partnerships, in which all stakeholder groups can work together to gain evidence and data in relation to specific issues. 'Ownership' of the science, as we saw in the case studies, can lead to greater understanding of management decisions, and therefore increased acceptance.

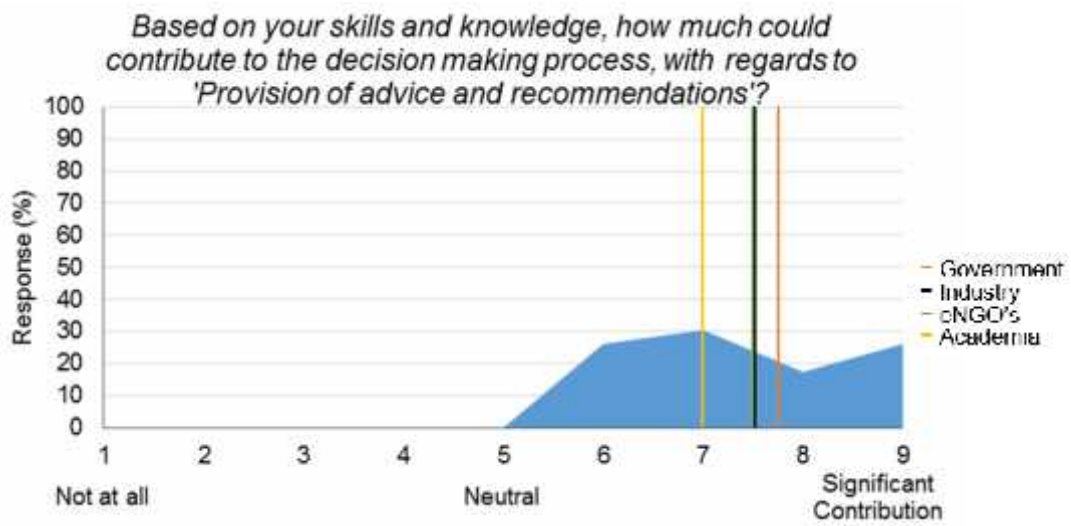

Figure 8: The distribution of responses and means for the four stakeholder groups to Q 6.4 Mean overall response was 7.4.

5.3.4 Stakeholder Influence

We then asked participants to comment on the level of influence that they perceive each of the key stakeholder groups to have within the decision-making process (Q7).

Government

All participants believed that Government have the strongest influence within the decision-making process, with no responses being below 'neutral'. All stakeholder groups, particularly Government representatives themselves but with the exception of NGO representatives, believed that they have the strongest influence out of all the stakeholders.

> *"Government has the biggest say in the decision-making process followed closely by the industry itself."* – Industry rep.

Industry

Although, overall, Industry were considered to have the second highest level of influence on the decisions that are made, there was not complete consensus (Figure 10). Responses from Academia and Industry representatives were particularly divergent on this question, hence their overall mean response is 'neutral'. It is telling that Industry responses were divergent,

meaning that some sectors do not feel they have the same level of influence as others. One respondent caveated their response with a comment the indicated that some opinions of Industry or some sectors of industry dominate the discussion, thus raising the issue of the 'spread' of influence, rather than the level of influence that industry wields.

> *"Vested interests dominate lobbying for the fishing industry [limiting] their ability to influence policy and outcomes."* – Industry rep.

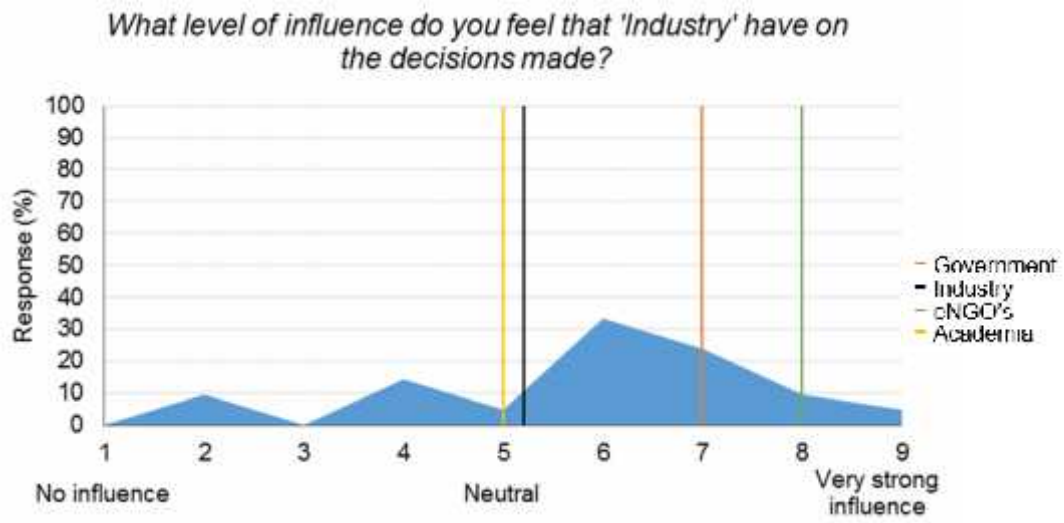

Figure 9: The distribution of responses and means for the four stakeholder groups to Q 7.2. Mean overall response was 5.9.

NGOs

The mean overall response regarding the level of influence that NGO's have, was slightly higher than that of Academia, at 5.8. Industry respondents believed, on average, that they had the second greatest level of influence over decisions ($\bar{x}$ = 6.6), while NGO representatives themselves believe that they had the least level of influence ($\bar{x}$ = 4.0) (Figure 10).

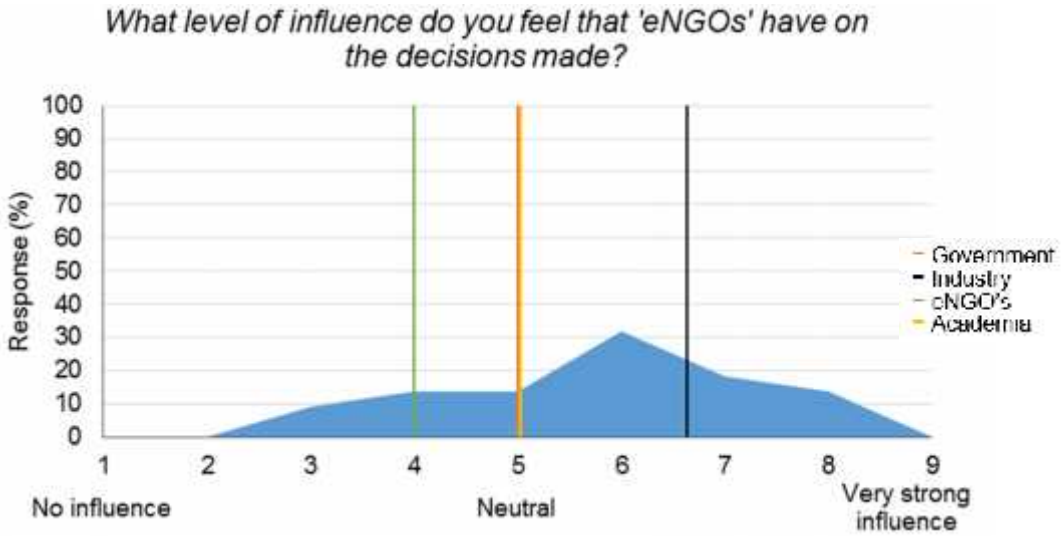

Figure 10: The distribution of responses and means for the four stakeholder groups to Q 7.4. Mean overall response was 5.8.

Clearly, there is discrepancy of opinion regarding the level of influence that each stakeholder group holds. Particularly with regard to Industry and NGO. Both groups of

respondents considered themselves, on average, to be the least influential stakeholder group, with the exception of the public. While they either considered each other to be the most influential, or slightly less influential than the government.

> *"NGOs do not understand the fishing industry and there is often a 'divide' between fishermen and the protagonists of NGOs."* – Industry rep.

Research Institutes or Academia

There was general agreement across all respondents that Research and academia, only has limited influence on the decision made, with the mean overall response being 'neutral', 5.2. However, the importance of their role was reflected in the comments of some participants.

Public

Finally, we asked participants to consider the level of influence that the public has on the decisions that are taken. Responses were spread around 'neutral', with the mean overall response being 5.8. However, several participants supplied some context to their response, much of which focused on the recent EU policy decision regarding discards, and the introduction of the landings obligation.

> *"Public influence is generally very small, except for isolated instances such as the Landing Obligation which was very much driven by public pressure."* – Government rep.

> *"There are no definitive answers here. If the public get behind a campaign (Discards or MPAs) they can have a very strong influence on government"*– Industry rep.

The publics influence over the introduction of the landing obligations, is a particularly interesting case. It is believed to have largely been influenced by media campaigns ("Fish fight"), leading to significant public pressure on Governments. With the increasing use of social media and e-democracy as tools for campaigning, it is highly likely that the public will play an increasingly important role in the production of policy across a number of policy areas. Understanding how to balance their input, with that of more direct stakeholders is problematic. However, it is important to note that media campaigns, in particular, may not represent the public as a whole. Reference to public or consumer belief, is sometimes used by NGOs and media campaigns, as representatives of 'public interest', but there is not always the evidence that consumers follow up on this 'belief' (e.g. with their purchasing choices).

5.3.5 Benefits and Issues of Current Engagement

The next series of questions focused on the benefits that each stakeholder group believed they were gaining from the current stakeholder engagement process (Q8-Q10). The prescribed benefits were based on exploratory interviews, and included; gaining knowledge, holding policy-makers to account, influencing decision-making, and ability to understand future issues.

Gaining knowledge, was considered by respondents to be the greatest benefit from the current stakeholder engagement process, with mean overall response being 6.2. Further, increasing their understanding of future issues was also rated quite high, with an overall mean responses of 5.9. However, there was less positivity regarding their ability to hold policy makers to account and in having influence over the decisions made, with mean responses being 4.1 and

4.2, respectively. Furthermore, considerable frustration with the process was evident in some of the comments supplied in support of their responses.

> *"Current engagement does not seem to take the environment into consideration enough. It is all about the economic stability... The key is fishing within the environment you are working with and to prevent over-cropping."* – Industry rep.

> *"I find 'road show' stakeholder engagements a waste of time… there is rarely true exchange of ideas as the consulters usually arrive with a formed view they are ultimately trying to gain support for."* – Industry rep.

We then asked respondents to comment on the occurrence of some of the key issues identified within the engagement process. These were; communication difficulties between stakeholders, lack of technical knowledge, inability to attend events and a lack of transparency in the process.

Communication difficulties between stakeholders was considered to not occur very often, with mean average response being 5.4 (Figure 11). This has often been cited in previous studies as a significant issue, however, the long history of engagement and the progression of 'co-management' in Scotland, has probably led to this being considered less of an issue.

> *"Communication is less of problem with the fishing sector as most policy[-makers], researchers and stakeholders have been working together for a long time and have a good understanding of the industry and each other positions and issues".* - Industry rep.

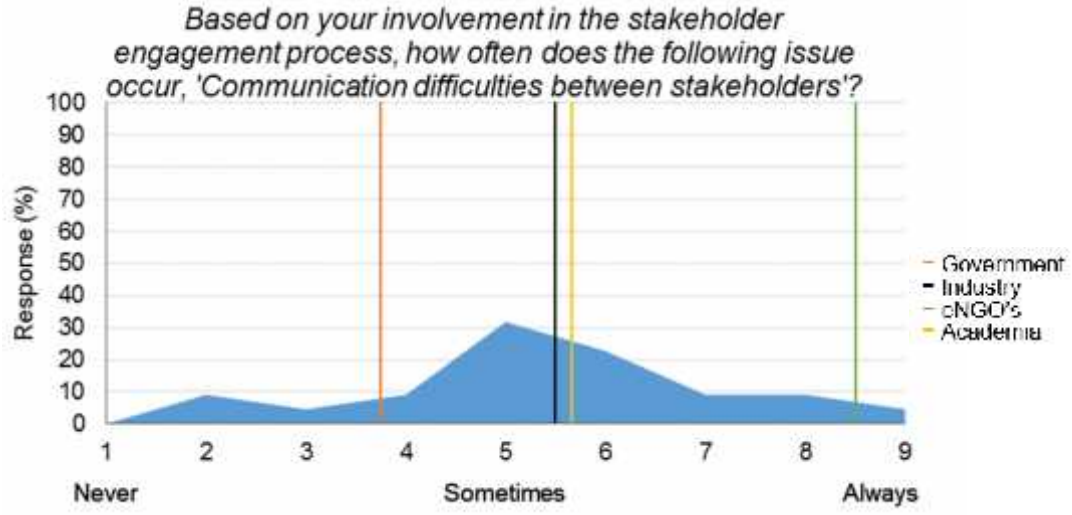

Figure 11: The distribution of responses and means for the four stakeholder groups to Q 9.1. Mean overall response was 5.4.

Communication is also linked with the issue of having a lack of technical knowledge to be able to contribute to the decision-making process. Although this was considered to be a slightly bigger issue than communication, it was generally considered not too significant, with a mean response of 5.7 (Figure 12).

> *"I would say the stakeholders we deal with are experienced and knowledgeable in the key areas of fisheries science that impact them."* – Government rep.

The most significant issue with regards to the current engagement was considered to be the accessibility of the events. The overall mean response to this question was 6.1 (Figure 13).

"*Geographical isolation… and the fact that stakeholders can often be at sea all contribute to difficulties for some stakeholders who may wish to engage"* – Industry rep.

Figure 12: The distribution of responses and means for the four stakeholder groups to Q 9.2. Mean overall response was 5.7.

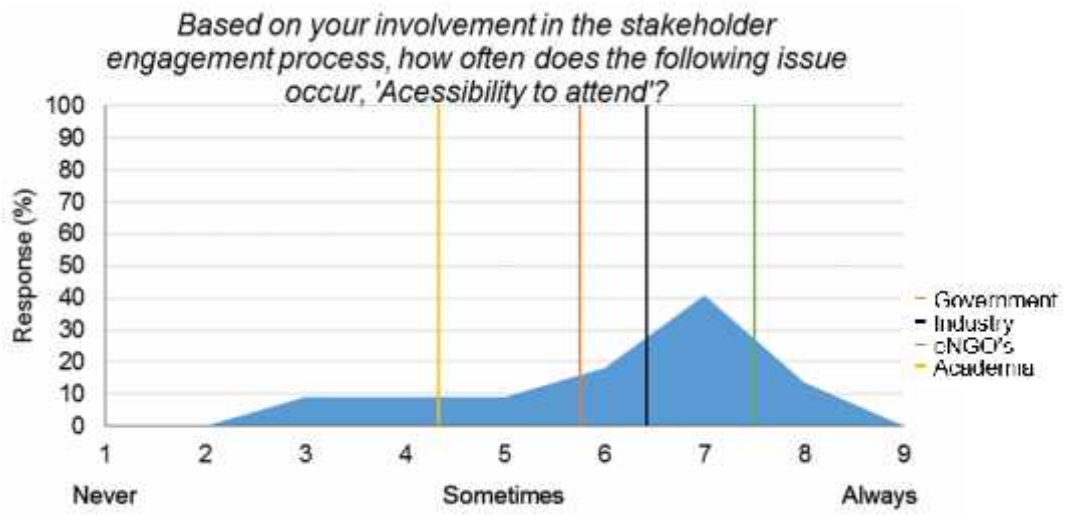

Figure 13: The distribution of responses and means for the four stakeholder groups to Q 9.3. Mean overall response was 6.1.

This was particularly an issue for NGO and Industry representatives, mean responses were 7.5 and 6.4, respectively. Some industry representatives commented that the industry is keen for more 'creative' forms of engagement to be trialled;

"Many different means need to be used to target different levels of understanding of the process of engagement. In education terms engagement has to be 'ability appropriate'… recognis[ing] that the public and stakeholders come to participation with widely varying abilities in terms of understanding". – Industry rep.

"*There needs to be ability-tailored participation… and also a wide range of participatory avenues using the platforms that most people habitually use – social media etc. … Physical attendance at meetings is not common in [industry] and indeed [fishers] are usually very reticent in these forums that are alien to them. Much more creativity and imagination is need[ed] in the means of delivering avenues for stakeholder engagement*". - Industry rep.

Finally, we asked participants to comment on the importance of some preselected policy issues for Scottish fisheries management (Table 4). BREXIT and Scottish independence was considered the most important future issue, although clearly, this issue is more of an immediate concern; this overarching issue could have potential impacts on many areas of fisheries management and indeed, on the structure and governance in place.

> *"I think Brexit is a red herring. Nothing much will change given our commitment to a wider range of conservation agreements and our need to work with partners which will include the EU"* – Government rep.

> *"BREXIT has mixed views within the fishing industry. Those representing the large offshore fleet believe that opportunities for fishing will improve … whereas the inshore sector … are less optimistic."* – Industry rep.

> *"The UK government is following an agenda of supporting big business and if this translates to fishing it will not bode well … in particular for smaller boats in the fleet who need to diversify."* – Industry rep.

Other key issues were considered to be the proliferation of Marine protected areas, and the profitability of the sector.

Table 4: Importance of future policy issues for Scottish fisheries management.

Issue	Agreement (0-9)	Rank
BREXIT / Scottish Independence	8.41	1
Marine Protected Areas	7.59	2
Profitability of the sector	7.59	2
Quota / TAC allocation	7.55	4
Landing Obligation	7.27	5
Climate change	7.05	6
Pollution (e.g. micro plastics)	6.91	7

5.3.6 Utility of Delphi

One of the aims of Delphi-like approaches is to emphasise convergences and divergences in opinion on particular issues. In this regard, the approach performed relatively well, with overall responses from 29 out of 38 of the questions being more closely aligned after only two rounds of questionnaires. A clear example of this is with regards to the question of the level of influence that 'Research and Academia' has on the decisions made.

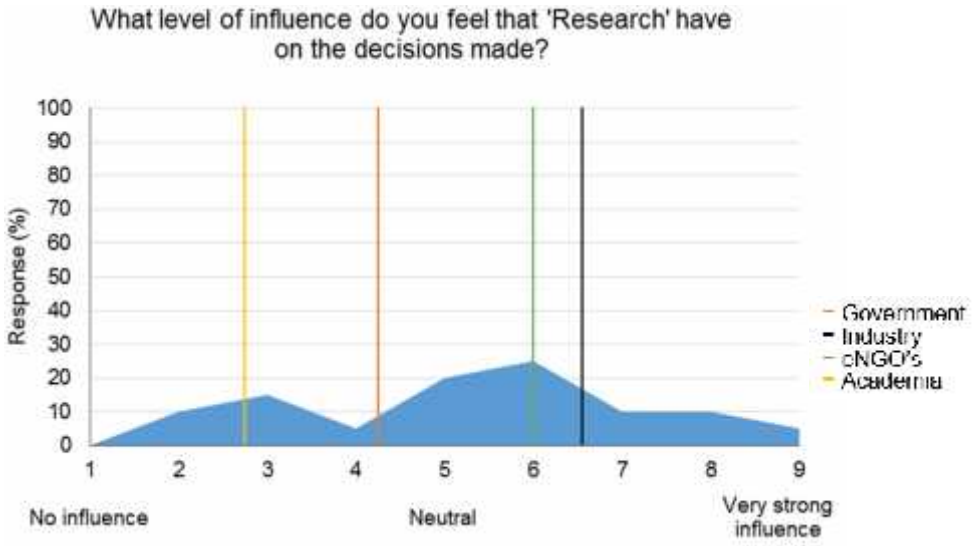

Figure 14: Responses to Q 7.3 after the first round of the survey; standard deviation of responses 2.0.

Although the mean response rate did not alter significantly, from 5.3, to 5.2, between rounds, the spread of responses was significantly different; the standard deviation of responses changing from 2.0 to 1.2.

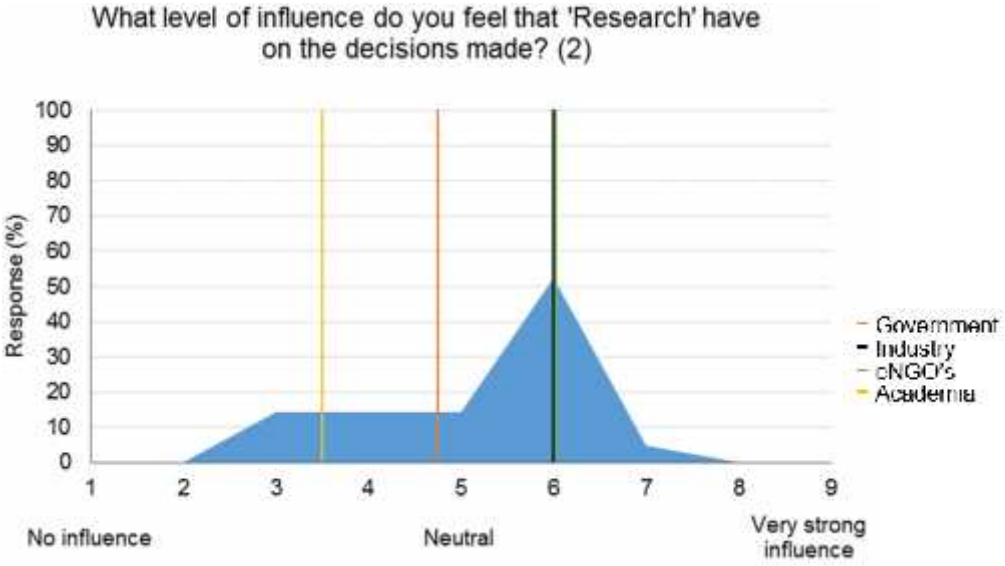

Figure 15: Responses to Q 7.3 after the second round of the survey; standard deviation of responses 1.2.

Similarly, it was able to highlight and emphasise divergences of opinion, in response to question 3, after the first round the mean response was 5.4, and again after the second round it was 5.3, both approximately ‘neutral’, with the mean opinion not changing much. However, clear divergence of opinion was seen in the second round, with no respondent submitting a ‘neutral’ response. Participants were made to question their response, and this ensured they were clear about their onions.

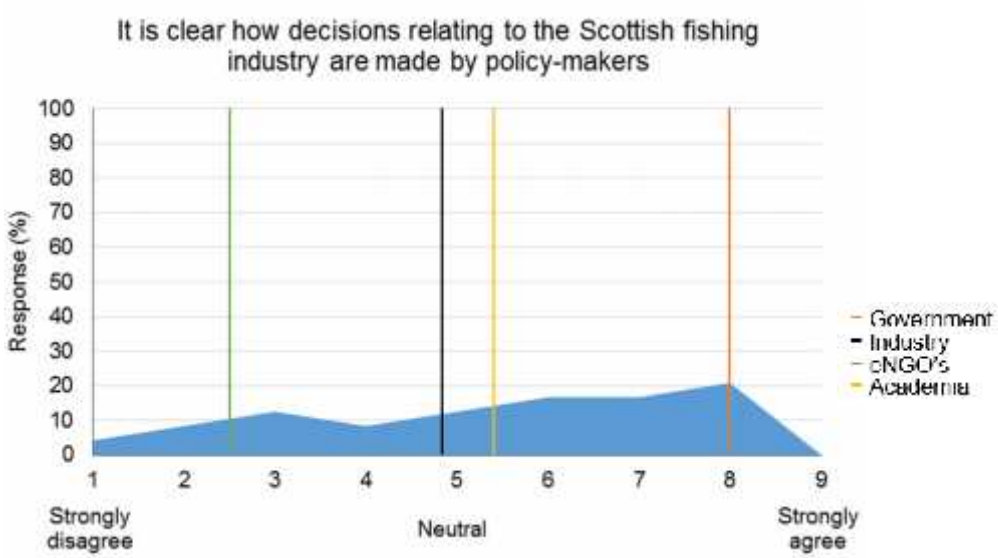

Figure 16: Responses to Q 3 after the second round of the survey.

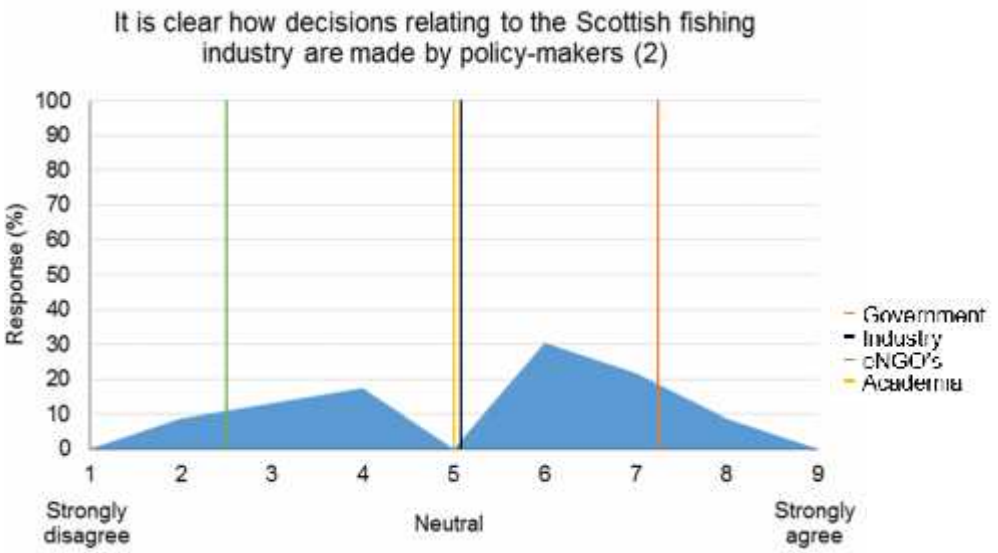

Figure 17: Responses to Q 7.3 after the second round of the survey.

Advantages and Disadvantages

We employed the Delphi method because it allows consideration of expertise of all participants equally, while allowing controlled feedback. The Delphi survey is a useful method to obtain opinions and generate ideas to achieve some sort of consensus or valid divergence.

The key advantage of the method is its remote and anonymous nature. Being able to conduct interactive surveys via the internet opens up discussion and interaction to a wider range of stakeholders than physical workshops and meetings. Free of social pressures, personality influences, and dominance of individuals, groups or sectors, anonymity allows consensus to be reached between groups that may otherwise be hostile to each other. The iterative nature of the survey allows for true differences of opinion to be tested, without bias. This is considered to permit independent thinking, and consensus is formulated gradually. Although, the elimination of extreme opinions, and a tendency to force consensus could also be considered a disadvantage, as it homogenises the potential opinions of the wider-stakeholder group.

Feedback between each round allows the user to share information and reasoning between participants, the level and type of information shared can be tailored to the type of survey and the required outcomes.

The use of a selected panel, rather than open-response has several benefits. It prevents those with the strongest opinions biasing opinion, and also a well-selected panel is considered to provide a broad analytical perspective. The panel can also be chosen for specific issues, i.e. only inviting experts of a particular field, to have targeted opinion gathering. However, this can also be considered a disadvantage, in that the opinions of a selected group of experts, while providing a strong indication of opinion, may not be representative. Again, the method should be tailored to match the purpose and intention of the approach.

An overriding advantage of this method is the flexibility it affords the user, allowing its implementation in a variety of situations or to garner a range of outputs.

Finally, a significant disadvantage is the time-consuming nature of the methodology for the researcher. Approaching, selecting and maintaining connection and interest of the participants is time consuming. Furthermore, analysing completed questionnaires and developing the questionnaire between rounds is more time consuming than a standard questionnaire. This is further complicated by the option to have open comments after each question, which while affording a great level of detail and clarity in the responses, adds to the burden of analysis. However, the various rounds are also one of the method's main advantages, opening up possibilities to include new topics, or remove those that receive instant consensus.

Although overall this approach to stakeholder consultation and forecasting is considered a powerful and flexible tool, it does not represent a complete solution to forecasting and garnering opinion. Given the resources required to form a panel, maintain their engagement and analyse responses, it cannot be used for all situations.

5.3.7 Summary

Does the panel fully understand the current method of policy production?

- Governance and policy production processes act at many levels within Scotland, the UK and the EU. This creates layers of complexity which are not easily understood, depending on the level(s) at which an individual stakeholder interacts at, or has access to.
- Participant's level of understanding of Scottish fisheries governance and the decision-making process was related to their level of engagement in the process itself. That is, the greater their level of involvement the greater their understanding.
- This has important consequences when trying to increase participation in the policy process, especially when targeting stakeholders that are currently on the fringes of the process.
- This requires engagement and feedback approaches that are targeted correctly to their expected audiences.

How involved and represented in the current governance system do participants consider themselves and other stakeholder groups to be?

- Most stakeholders considered themselves to be involved in the policy-production process, and consider their stakeholder group, and that of others, to be relatively well engaged.
- The key issue to come from this study is that it is often the type of representation, rather than the level, which is of concern, at least to some stakeholders. However, it is important to note that professional representation is considered essential as they are able to meet at short notice and can progress dialogue rapidly.
- Some sections of Industry do not feel well represented. Typically this is the more heterogeneous and disparate groups, such as inshore fishing communities, which are characterised by variable local issues. There is potential for them to become further marginalised, if government believe that they have 'buy-in' from 'buy-in' through the involvement of larger sector representatives.
- A significant issue in fisheries management throughout the world is the difficulties of collating and distilling issues from different regions and different sectors and reporting them to centralised decision-making in a coherent and balanced manner.
- Sectors that are more consolidated and commercialised, are generally more easily able to build consensus and push in the same direction, as highlighted in the case studies.
- All participants believed that the voice of the public is currently under-represented in the process. This is particularly pertinent, following the landings obligation decision, which is considered to have been driven by 'public' opinion. With the growth of social media and e-democracy, this is likely to be a more regular phenomenon. However, the true representativeness of media campaigns of the publics' views, is questionable.

How do the participants see their role as a stakeholder changing in the future?

- Most participants were keen to see their roles as stakeholders expand in the future, particularly with regards to providing advice and evidence in support of decision-making. However, deliberation and engagement is time-consuming, can be challenging, and can lead to stakeholder fatigue.
- Government and Academic representatives were quite clear on what their roles currently entail, and do not see them changing drastically in the future. However, there can be a blurring between science and advocacy[31].
- There was some uncertainty regarding the influence that each stakeholder groups wields in the current process. Clearly articulating relations between stakeholders and the decisions made is critical for a governing system.
- It is widely agreed that there is a need for better public engagement and increased transparency – something ICES has recently recognised – so that publics are presented with the information, rather than being presented with a particular viewpoint.

What are the key issues with regards to the current engagement process and future policy decision-making?

- The two most significant and recurring issues with regards to the current engagement process are the accessibility of the events and the format of much of the engagement – does the current engagement encourage deliberation?
- Many participants called for a more tailored approach to engagement and dialogue, based on the requirements of the stakeholders that are to attend, and the level at which they operate.
- Communication issues and lack of technical knowledge, were downplayed by many of the participants. This is likely to be due to the long history of engagement in Scottish fisheries, and thus most stakeholders are very knowledgeable and able to communicate within and between their groups.
- Another recurring issue is the distribution of power and influence. The type of engagement that is typically employed in Scotland, can be dominated by consolidated sectors or from single-issue groups.

6 Findings

Section Summary

- The success of co-management depends largely on the nature of the process, rather than focusing on achieving prescribed end points.
- Scotland has one of the most participatory management structures in the world. It has previously shown strong ability to react and adapt in response to crisis - creating a strong platform for developing innovative new systems for engagement.
- Change should aim to enhance flexibility and responsiveness, due to the wide-range of issues, pressures and opinions that exist within the diverse Scottish fisheries industry.
- Within a dynamic policy process it is beneficial if the decision-making process focuses on concrete issues and seeks to draw on different knowledge and perspectives to identify possible courses of action. This can be a basis for identifying novel solutions to issues.
- Adaptive approaches, where choices of action are identified while acknowledging uncertainty and conflicting opinions, should include monitoring and reflection on the outcomes. .
- Social pressure and influence of personality may be reduced via technological advances that enable remote and anonymous dialogue. However, this can also create silos of like-minded discourse, rather than foster greater inclusion.
- Ensuring greater access and integrating local understanding into the decision-making process, can allow for broader knowledge base and include those likely to be affected by decisions to a greater extent.

This study aims to initiate discussion regarding the future of Scottish fisheries governance and how the current system could respond and adapt to new challenges. This section provides a summary of the key findings and goes on to provide advice on the most pressing issues and possible options for innovation. As the success of co-management decisions depends on the nature of the process, we focus on the key issue of stakeholder representation and engagement, and the manner in which they participate, rather than focusing on prescribing methods of best practice or optimal end points.

There has been a clear and continuous trend in Scotland towards greater stakeholder participation and the governance system in place is considered one of the world's most collaborative. This creates the ideal platform for trialling novel and innovative solutions for stakeholder engagement. Fisheries represent complex social-ecological systems and as such are characterised by a combination of uncertainty about the fishery and how it responds to change and disagreement over what the 'right' course of action should be, this is exacerbated due to the wide-range of issues, pressures values, interests and opinions that exist within the diverse sectors of the Scottish fisheries industry and wider stakeholder groups as well as Scotland's relationship with UK central government and the EU (Figure 1). Management of such complex systems is therefore a governance challenge and requires flexible and adaptive approaches (i.e. able to react in ways that enhance rather than undermine natural and social

capital). This is especially the case regarding deliberative stakeholder engagement - able to acknowledge and address uncertainty to become increasingly able to respond to continually emerging challenges. Viewing uncertainty as a social rather than technical issue, in which differences (in both values and knowledge) are accepted rather than downplayed, suggests a focus on collaborative and reflexive processes that can support more productive working relationships as well as reduced uncertainty. Reflexivity can be increased by introducing formal and prescribed (self-) evaluation.

In practice, stakeholder engagement can be exclusive, so that the scope for disagreement is minimised, thus reducing transparency but retaining the 'participatory' label. Furthermore, stakeholder participation can be highly political and some groups can be considered to benefit from the process more than others i.e. powerful actors can determine what is considered 'rational' in a debate, what should be debated or how the question should be addressed. This power and influence can, in some cases, come from the ability of a particular industry sector or stakeholder group to establish consensus instead of having disparate opinions, and can also come from the nature of the process and the ways that participation manifests itself. The issue of power is an important one creating a challenge to find ways to ensure that all opinions and issues are given equal weight when fed into the decisions-making process:

> *"In recent years there is better understanding that fishing is diverse and is always a process of proceeding through points of consensus rather than railroading policy through. This is slow, but ensures that there is time for the industry to embrace change and feel comfortable with it."* – Industry rep.

The impact of social pressure, influence of personality and dominance of particular opinions or 'ways things should be done' is a recurring issue for engagement. There is a potential role for new technology to be able to enable remote and anonymous dialogue. Therefore, exploring novel forms of engagement, that aim to garner a broad range of opinions, particularly those from the fringes or who currently precluded, would be a positive direction of travel. However, this should supplement, rather than replace tradition forms of engagement and further presents a major challenge as 'new publics' have been shown to have a poorer understanding of the process in which they want to participate. Ensuring greater access and integrating local understanding into the decision-making process, can help to provide innovative solutions to problems once they have been identified.

> *"It is important … to have one's feet planted within the fishing community and to understand the dynamics of the fishing community, locally and nationally"* – Industry rep.

A significant recent development in Scottish fisheries, is the formation of regional fisheries committees (e.g. SSMO), that bring together management, operation, monitoring and representation of the industry, allowing the articulation of common issues in order to find regional solutions. This is important, considering the lack of representation stressed by some of participants in this study. Within certain subsectors there are shifting allegiances and opinions can therefore change, and the opinions expressed by a single subsector representative may not reflect the true thoughts of a diverse group of actors. Focus should also extend on in-depth evaluation of these bodies, and the best way forward for them, particularly on how they interact with wider fisheries governance.

All participants were keen to become more engaged in many aspects of fisheries management, outside their current roles. The challenge is to identify ways that they can be

more meaningfully included. This along with the lessons learned from the case studies highlights some of the potential benefits of partnerships between sciences, industry and government and organisations such as FIS are making greater use of industry based organisations. Industry, in particular the more organised sectors are becoming much more proactive in engaging with scientists to address the issues that they face (even if this means challenging the established scientific consensus).

Lessons learned from the Canadian case study show that science-industry partnerships have the potential to provide a forum for deliberation, create fulfilling roles for scientists and fishers and providing a process that enables fishers to contribute to innovation in technical measures, monitoring and control. They also contain a warning sign - scientists were aligned with the state and industry hired their own analysts. This is also currently occurring throughout the EU. The risk is that of increased confrontation, rather than collaboration. In Canada it took a crisis to bring about change because of over-confidence and entrenched positions. The result was a shift to increase dialogue and deliberation, and to include different perspectives and stakeholders to create innovation. Fisheries (and the marine environment) provide benefits beyond those to the people directly catching the fish, particularly in rural communities that may exhibit relatively high dependence on the fisheries. These perspectives should be considered when formulating solutions.

This also echoes the issues of the type of representation, and 'access' to engagement highlighted by some participants - large, industrialised and commercial sectors can 'afford' representation, they can hire the support of scientists, and thus, have more capacity to communicate and influence the decision-making process. How do we standardise this, and ensure a level-playing field?

> *"Industry representatives are always involved in decision making, but of course there are industry players who are not represented, and certain sectors that are underrepresented at the expense of other, more vocal or larger sectors*" – Industry rep.

Although public engagements are beneficial, they concluded that more innovative efforts should be used in future, particularly to engage new 'publics' ('stakeholders'). It has been well recorded that public engagements are useful for securing narrow, medium and wide participation, but all three have different objectives. Even weak participation efforts offer an opportunity for a large section of society to be better informed; medium level participation balances access to umbers with the ability to engage on more detailed issues. This may be useful as a means of accessing a wide range of views, beyond the 'core' stakeholders. Although the immediate public engaged will be limited, information may be disseminated more widely by NGOs etc. The most intensive but narrowest engagement may be organised in a way they prioritises stakeholder conflict resolution whilst accessing expert views. The challenge is to target the right stakeholders and representatives of other publics for more intensive dialogue. The challenge is to select correct people and engage them in the right way, rather than getting (or expecting) everyone to engage in the same manner and at unnecessary levels of detail.

6.1 Options for the Future

This section aims to provide themes for exploring ways to improve stakeholder participation in Scottish fisheries decision-making process. Overarching this is a focus on more reflexive

actions related to evaluation and improvement of systems, rather than identifying best practices that represent abstract, yet attractive, end points. Focus on imagined futures, rather than what people are doing and why, may be why organisational structures find themselves, in practice, responding in the event of a crisis. These options, could therefore all include aspects of the ongoing process that people can supplement or reflect upon – Are stakeholders empowered? Are processes exclusive? Is representation balanced? Do processes promote deliberation?

The following five broad themes have been identified, but are not intended to exhaustive:

Reflexivity

- Rather than focusing on single solutions, ideal models and optimisation, explore processes that aim to improve elements of the existing structures that work less well and increase the overall responsiveness to change and 'fitness for purpose' rather than reinventing systems or organisations. Could a process of self-evaluation of stakeholder engagement and contribution increase reflexivity and drive continual improvement by responding to power imbalances and stakeholder dissatisfaction?
- Crisis creates opportunity for change, but does change require crises? Can we build on current structures and seek to enhance their inherent capacity to adapt and avoid requiring the additional resource needed during unforeseen crisis events?

Accountability

- Allegiances and opinions within a stakeholder group can shift and change overtime. The opinions expressed by a representative, therefore, may not always reflect the opinions or interests of a diverse group of actors. Can representatives claim to speak for a single group? For example, how representative of the public's opinions was the media campaign FishFight? Their position is considered essential, but are their mechanisms in place to ensure they are accountable? Should there be?
- How accountable are policy-makers for the decisions that are made? Are there mechanisms in place to ensure that decision-making is transparent, that decisions are considered fair and that the process can respond to undesirable or unexpected outcomes?

Representation

- Type of representation, not necessarily the level of representation, can be an issue – are all sectors (and opinions within a sector) reflected in dialogue?
- Levelling of the playing field to bring about change is often most accessible to consolidated fisheries. Is the weight of representation fair? How should stakeholders be balanced and rebalanced?
- It is important stakeholder roles are not too restrictive and that stakeholders represent wider interests. For example, fishers should represent more than data collectors, or source of local ecological knowledge. Is there a role for coastal community representatives as well as industry?

Inclusivity

- Accessibility and ability to present evidence are not equal between or within stakeholder groups, and as such, this can impact a stakeholder's level of satisfaction. How can engagement and dialogue account for the different requirements of stakeholders?
- As technology advances it provides us with new opportunities to improve and supplement our existing systems. The use of modern technology in e-democracy and online portals has allowed more UK citizens to be engaged in politics. Can technology improve accessibility and engagement in Scottish fisheries – via the use of online forums, real-time feedback via the MSS website for example?

Disagreement and uncertainty

- Uncertainty and disagreement characterise many fisheries. However, there are positive aspects to this if this can be accepted in that the "illusion of certainty"[78] can lead to assumptions about what needs to be done. As a result, many engagement opportunities focus on building consensus, to minimise disagreement and promote certainty in order to provide more focused outputs. Often the result is unexpected outcomes. Accepting uncertainty can instead provide the opportunity for novel collaborative efforts and solutions to shared issues. Are there opportunities for novel partnerships and innovation by focusing on concrete issues facing the sector and coastal communities? Can this help reduce uncertainty and find solutions that, while not 'optimal' for any one group, are acceptable to all?

7 References

1. Marshall, N. A. Can policy perception influence social resilience to policy change? *Fish. Res.* **86,** 216–227 (2007).
2. Cochrane, K. L. Complexity in fisheries and limitations in the increasing complexity of fisheries management. *ICES J. Mar. Sci. J. Cons.* **56,** 917–926 (1999).
3. Jentoft, S. Fisheries co-management: delegating government responsibility to fishermen's organizations. *Mar. Policy* **13,** 137–154 (1989).
4. Jentoft, S. Legitimacy and disappointment in fisheries management. *Mar. Policy* **24,** 141–148 (2000).
5. Coffey, C. What role for public participation in fisheries governance? in *Participation in fisheries governance* 27–44 (Springer, 2005).
6. Song, A. M., Chuenpagdee, R. & Jentoft, S. Values, images, and principles: What they represent and how they may improve fisheries governance. *Mar. Policy* **40,** 167–175 (2013).
7. Hauge, K. H. & Wilson, D. C. *Comparative Evaluations of Innovative Fisheries Management*. (Springer, 2009).
8. Motos, L. & Wilson, D. C. *Knowledge Base for Fisheries Management, The. Developments in Aquaculture and Fisheries Science*. (Elsevier Science & Technology, 2006).
9. Santiago, J. L. *et al.* Is Europe ready for a results-based approach to fisheries management? The voice of stakeholders. *Mar. Policy* **56,** 86–97 (2015).
10. Berghöfer, A., Wittmer, H. & Rauschmayer, F. Stakeholder participation in ecosystem-based approaches to fisheries management: a synthesis from European research projects. *Mar. Policy* **32,** 243–253 (2008).
11. Plummer, R. & Armitage, D. Charting the new territory of adaptive co-management: a Delphi study. (2007).
12. Mackinson, S., Wilson, D. C., Galiay, P. & Deas, B. Engaging stakeholders in fisheries and marine research. *Mar. Policy* **35,** 18–24 (2011).
13. Pita, C., Pierce, G. J. & Theodossiou, I. Stakeholders' participation in the fisheries management decision-making process: Fishers' perceptions of participation. *Mar. Policy* **34,** 1093–1102 (2010).
14. Arthur, R., Friend, R., Marschke, M. & Goldstein, B. E. Fostering collaborative resilience through adaptive co-management: reconciling theory and practice in the management of fisheries in the Mekong region. *Collab. Resil. Mov. Crisis Oppor. MIT Press Camb. MASS USA* 255–281 (2009).
15. Carter, C. The transformation of Scottish fisheries: Sustainable interdependence from 'net to plate'. *Mar. Policy* **44,** 131–138 (2014).
16. Degnbol, D. & Wilson, D. C. Spatial planning on the North Sea: a case of cross-scale linkages. *Mar. Policy* **32,** 189–200 (2008).
17. Degnbol, P. Science and the user perspective. in *The Fisheries Co-management Experience* 31–49 (Springer, 2003).

18. Gray, T. S. *Participation in fisheries governance*. **4,** (Springer Science & Business Media, 2006).

19. Nielsen, K. are N., Holm, P. & Aschan, M. Results based management in fisheries: delegating responsibility to resource users. *Mar. Policy* **51,** 442–451 (2015).

20. van Vliet, M., Kok, K. & Veldkamp, T. Linking stakeholders and modellers in scenario studies: The use of Fuzzy Cognitive Maps as a communication and learning tool. *Futures* **42,** 1–14 (2010).

21. Reed, M. S. Stakeholder participation for environmental management: a literature review. *Biol. Conserv.* **141,** 2417–2431 (2008).

22. Berkes, F., George, P. J. & Preston, R. J. *Co-management: the evolution of the theory and practice of joint administration of living resources*. (Program for Technology Assessment in Subarctic Ontario, McMaster University, 1991).

23. Berkes, F. Commons in a multi-level world. *Int. J. Commons* **2,** 1–6 (2008).

24. Carlsson, L. & Berkes, F. Co-management: concepts and methodological implications. *J. Environ. Manage.* **75,** 65–76 (2005).

25. Pomeroy, R. S. & Berkes, F. Two to tango: the role of government in fisheries co-management. *Mar. Policy* **21,** 465–480 (1997).

26. Ostrom, E. & Gardner, R. Coping with asymmetries in the commons: Self-governing irrigation systems can work. *J. Econ. Perspect.* **7,** 93–112 (1993).

27. Gutiérrez, N. L. *et al.* Eco-Label Conveys Reliable Information on Fish Stock Health to Seafood Consumers. *PLoS ONE* **7,** e43765 (2012).

28. Linke, S. & Bruckmeier, K. Co-management in fisheries–experiences and changing approaches in Europe. *Ocean Coast. Manag.* **104,** 170–181 (2015).

29. Blaikie, P. *et al.* Knowledge in action: local knowledge as a development resource and barriers to its incorporation in natural resource research and development. *Agric. Syst.* **55,** 217–237 (1997).

30. Jentoft, S. & McCay, B. User participation in fisheries management: lessons drawn from international experiences. *Mar. Policy* **19,** 227–246 (1995).

31. Finlayson, A. C. & others. Fishing for truth: A sociological analysis of northern cod stock assessments from 1977 to 1990. (1994).

32. Ramos-Martin, J. Empiricism in ecological economics: a perspective from complex systems theory. *Ecol. Econ.* **46,** 387–398 (2003).

33. Frame, B. & Brown, J. Developing post-normal technologies for sustainability. *Ecol. Econ.* **65,** 225–241 (2008).

34. Maurer, C. & Ehlers, A. B. Aligning commitments: Public participation, international decision-making, and the environment. (2003).

35. Dryzek, J. S. & Torgerson, D. Editorial: Democracy and the policy sciences: a progress report. *Policy Sci.* **26,** 127–137 (1993).

36. Smith, G. *Deliberative democracy and the environment*. (Psychology Press, 2003).

37. Hatchard, J. L. & Gray, T. S. From RACs to advisory councils: lessons from North Sea discourse for the 2014 reform of the European Common Fisheries Policy. *Mar. Policy* **47,** 87–93 (2014).

38. Mouffe, C. Deliberative democracy or agonistic pluralism? *Soc. Res.* 745–758 (1999).

39. Davies, T. K., Mees, C. C. & Milner-Gulland, E. J. Second-guessing uncertainty: Scenario planning for management of the Indian Ocean tuna purse seine fishery. *Mar. Policy* **62,** 169–177 (2015).

40. Van der Heijden, K. Scenarios: the art of strategic conversation. (1996).

41. Bohensky, E. L., Reyers, B. & Van Jaarsveld, A. S. Future ecosystem services in a Southern African river basin: a scenario planning approach to uncertainty. *Conserv. Biol.* **20,** 1051–1061 (2006).

42. Wollenberg, E., Edmunds, D. & Buck, L. Using scenarios to make decisions about the future: anticipatory learning for the adaptive co-management of community forests. *Landsc. Urban Plan.* **47,** 65–77 (2000).

43. Peterson, G. D., Cumming, G. S. & Carpenter, S. R. Scenario planning: a tool for conservation in an uncertain world. *Conserv. Biol.* **17,** 358–366 (2003).

44. Rotmans, J. *et al.* Visions for a sustainable Europe. *Futures* **32,** 809–831 (2000).

45. Armitage, D. R. *et al.* Adaptive co-management for social–ecological complexity. *Front. Ecol. Environ.* **7,** 95–102 (2009).

46. Myers, R. A., Hutchings, J. A. & Barrowman, N. J. Why do fish stocks collapse? The example of cod in Atlantic Canada. *Ecol. Appl.* **7,** 91–106 (1997).

47. Charles, A. T. The Atlantic Canadian groundfishery: roots of a collapse. *Dalhous. LJ* **18,** 65 (1995).

48. Charles, A. T. Fisheries management in Atlantic Canada. *Ocean Coast. Manag.* **35,** 101–119 (1997).

49. Khan, A. & Chuenpagdee, R. An interactive governance and fish chain approach to fisheries rebuilding: A case study of the northern Gulf cod in eastern Canada. *Ambio* **43,** 600–613 (2014).

50. Kincaid, K. B. & Rose, G. A. Why fishers want a closed area in their fishing grounds: Exploring perceptions and attitudes to sustainable fisheries and conservation 10 years post closure in Labrador, Canada. *Mar. Policy* **46,** 84–90 (2014).

51. Edwards, C. T. & Dankel, D. J. *Management Science in Fisheries: An Introduction to Simulation-based Methods*. (Routledge, 2016).

52. Gullestad, P. *et al.* Changing attitudes 1970–2012: evolution of the Norwegian management framework to prevent overfishing and to secure long-term sustainability. *ICES J. Mar. Sci. J. Cons.* **71,** 173–182 (2014).

53. Ducrotoy, J.-P. & Elliott, M. Interrelations between science and policy-making: the North Sea example. *Mar. Pollut. Bull.* **34,** 686–701 (1997).

54. Boyes, S. J. & Elliott, M. The excessive complexity of national marine governance systems–Has this decreased in England since the introduction of the Marine and Coastal Access Act 2009? *Mar. Policy* **51,** 57–65 (2015).

55. Boyes, S., Warren, L. & Elliott, M. Institute of Estuarine & Coastal Studies (IECS) The University of Hull Cottingham Road Hull. (2003).

56. Elliott, M., Boyes, S. J. & Burdon, D. *Integrated marine management and administration for an island state—the case for a new Marine Agency for the UK*. (Pergamon, 2006).

57. Symes, D. Finding solutions: Resilience theory and Europe's Small-scale fisheries. in *Social issues in sustainable fisheries management* 23–41 (Springer, 2014).

58. Fletcher, S., Jefferson, R., Glegg, G., Rodwell, L. & Dodds, W. England's evolving marine and coastal governance framework. *Mar. Policy* **45,** 261–268 (2014).

59. Phillipson, J. & Symes, D. Recontextualising inshore fisheries: The changing face of British inshore fisheries management. *Mar. Policy* **34,** 1207–1214 (2010).

60. Rodwell, L. D., Lowther, J., Hunter, C. & Mangi, S. C. Fisheries co-management in a new era of marine policy in the UK: a preliminary assessment of stakeholder perceptions. *Mar. Policy* **45,** 279–286 (2014).

61. Pieraccini, M. & Cardwell, E. Towards deliberative and pragmatic co-management: a comparison between inshore fisheries authorities in England and Scotland. *Environ. Polit.* **25,** 729–748 (2016).

62. Rodwell, L. D. *et al.* Marine and coastal policy in the UK: Challenges and opportunities in a new era. *Mar. Policy* **45,** 251–258 (2014).

63. Appleby, T. & Jones, P. J. The marine and coastal access act—A hornets' nest? *Mar. Policy* **36,** 73–77 (2012).

64. Lowther, J. & Rodwell, L. D. IFCAs: Stakeholder Perceptions of Roles, and Legal Impact. *Environ. Law Rev.* **15,** 11–26 (2013).

65. Stacey, R. D. *Complex responsive processes in organizations: Learning and knowledge creation*. (Psychology Press, 2001).

66. Long, N. & Long, A. *Battlefields of knowledge: the interlocking of theory and practice in social research and development*. (Routledge London, 1992).

67. Molle, F. Nirvana concepts, storylines and policy models: Insights from the water sector. *Water Altern.* **1,** 131 (2008).

68. Arthur, R. I., Friend, R. M. & Marschke, M. Making adaptive co-management more than a marriage of convenience: reconciling theory and practice in the management of fisheries in the Mekong region. *Collab. Resil. Mov. Crisis Oppor.* (2011).

69. Armitage, D., Berkes, F. & Doubleday, N. *Adaptive co-management: collaboration, learning, and multi-level governance*. (UBC Press, 2010).

70. Little, A. *et al.* A REPORT COMMISSIONED BY FIS AND PREPARED BY. (2015).

71. Adler, M. & Ziglio, E. *Gazing into the oracle: The Delphi method and its application to social policy and public health*. (Jessica Kingsley Publishers, 1996).

72. Linstone, H. A. & Turoff, M. The Delphi Method. *Tech. Appl.* **53,** (2002).

73. Mehnen, N., Mose, I. & Strijker, D. The Delphi Method as a Useful Tool to Study Governance and Protected Areas? *Landsc. Res.* **38,** 607–624 (2013).

74. Rowe, G. & Wright, G. The Delphi technique as a forecasting tool: issues and analysis. *Int. J. Forecast.* **15,** 353–375 (1999).

75. Okoli, C. & Pawlowski, S. D. The Delphi method as a research tool: an example, design considerations and applications. *Inf. Manage.* **42,** 15–29 (2004).

76. De Loe, R. C. Exploring complex policy questions using the policy Delphi: A multi-round, interactive survey method. *Appl. Geogr.* **15,** 53–68 (1995).

77. Likert, R. A technique for the measurement of attitudes. *Arch. Psychol.* (1932).

78. Charles, A. T. Living with uncertainty in fisheries: analytical methods, management priorities and the Canadian groundfishery experience. *Fish. Res.* **37,** 37–50 (1998).

Fisheries Innovation Scotland

Scottish Charity Number SC045119

Company Number SC477579

FIS MEMBER ORGANISATIONS

marinescotland

The Scottish Government

SFF SERVICES LIMITED

SWFPA The Scottish White Fish Producers Association Ltd

Scottish Natural Heritage
Dualchas Nàdair na h-Alba
All of nature for all of Scotland
Nàdar air fad airson Alba air fad

SEAFISH the authority on seafood

Young's SEAFOOD LIMITED

Sainsbury's