Feasibility Study for a Survey of Fishers

Final Report – 14 June 2019

To

Defra

By

The Countryside and Community Research Institute

Project Title: Feasibility Study for a Survey of Fishers

Client Reference:

Start Date: 1 October 2018

Finish Date: 31 March 2019

Duration: 6 months

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Date of Report: 14 June 2019

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List of Acronyms

CFP	Common Fisheries Policy
DCF	Data Collection Framework
EU	European Union
FLAG	Fisheries Local Action Group
FQA	Fixed Quota Allocation
IFCA	Inshore Fisheries and Conservation Authorities
IFG	Inshore Fisheries Group
IMD	Index of Multiple Deprivation
ME	Margin of Error
MMO	Marine Management Organisation
MOU	Memorandum of Understanding
NGO	Non-Government Organisation
NESFO	North East of Scotland Fishermen's Organisation
NFFO	National Federation of Fishermen's Organisations
NIFPO	Northern Ireland Fish Producers Organisation
NUTFA	New Under Ten's Fishermen's Association
PO	Producer Organisation

Executive Summary

Background and aims

The promotion and development of a thriving fishing industry - that sustains livelihoods whilst sustainably exploiting marine resources - requires the development of social objectives in fisheries policy alongside environmental and economic objectives. In turn, these social objectives must be informed by a strong social science evidence base. Existing evidence is largely economic, with a focus on employment and a number of socio-demographic variables collected to comply with requirements under the EU Data Collection Framework (DCF). While this data has proved a useful starting point, there are significant gaps in understanding of the broader social issues affecting fishing communities. Data that includes socio-psychological measures of fishers, such as attitudes, knowledge, perceptions, values, and motivations driving behaviour, would be a valuable asset for both policy makers and industry stakeholders.

Through a combination of desk based reviews and stakeholder consultation via interviews and workshops, the project aimed to understand the extent to which a new social survey of fishers could add value to the existing evidence base and begin to identify areas of consensus on social data needs. Discussions, recognising that fishers are a hard to reach group, explored alternative approaches for implementing a survey, in terms of sampling and data collection strategies. As the project progressed, it became clear that any new social survey is likely to be more successful if designed and deployed collaboratively between government, researchers and fishing stakeholders. Indeed, stakeholders indicated that a survey that is jointly designed, funded and delivered, would achieve better response rates and support from fishers. The project team therefore sought to develop a framework for a co-produced survey that would actively involve a variety of stakeholders from policy makers through to fishers themselves.

Why a social survey of fishers?

A new social survey is needed to collect data to inform social sustainability and incorporate social objectives in fisheries policy, and importantly should not be conflated with economic objectives. The project findings suggested that, in addition to understanding better the socio-economic context in which fishers operate, a new social survey could be of benefit to **policy makers** by, (i) forging a better understanding of fishers' perceptions, attitudes and values underlying behaviour, which would allow them to help incentivise behaviours and practices that support stewardship and sustainability; (ii) enhancing understanding of fishers' awareness and perception of policy and management processes in order to improve communication strategies and partnership working with the sector; and (iii) provide mechanisms for assessment and monitoring of policy and management interventions over time through the subsequent development of social indicators.

In addition, **fishing stakeholders** could benefit through, (i) the provision of evidence demonstrating the economic, social and administrative needs of the sector, and its links to wider coastal communities; (ii) giving the fishing industry a stronger voice (and responsibility) in policy and management of the sector; and (iii) improving its relationships with administrators and other stakeholders.

A review of evidence from recent and **existing surveys** revealed social data is currently limited to a few socio-economic indicators, namely gender, nationality, highest job-related qualification, working patterns and remuneration. In addition, it highlighted a dearth of evidence around a number of important issues facing fishers, including inconsistencies in port infrastructure (e.g. ice equipment);

competition for space with leisure boats; difficulties in recruiting crew from local communities; low incomes and income uncertainty leading to problems with health, planning for difficult times and engaging crew; and significant levels of deprivation in terms of educational achievement in fishing communities. Further, social and economic challenges facing the under 10m sector were also highlighted in the review, including health and safety risks resulting from use of out-dated equipment.

Issues to be addressed by a new social survey

A new social survey would collect evidence on key social issues related to fishing but would also collect socio-psychological data (e.g. attitudes, values, behaviour) on wider issues and factors (e.g economic, environmental, science, governance and management). Research led to the identification of seven issue categories where current information levels are low and where a co-production process adopting social science approaches might be usefully employed:

- **employment structure and generational renewal**, including fisher attitudes, labour, succession and migrant crew;
- **socio-cultural impacts**, including the role of women, fishing's contribution to social fabric and issues around isolation and public perceptions;
- **health and wellbeing,** including health and safety, physical and mental health and crew welfare;
- **income and finance**, including financial support and income security;
- **impact of external drivers on businesses,** including port infrastructure, training, markets and technology;
- **participation in science and governance,** including fishers' willingness and opportunities to engage in science and governance;
- **fisheries management,** including issues such as empowerment and representation in post-Brexit fisheries policy, allocation of fishing opportunities and fishers' relationships with regulators.

The empirical research suggests that policymakers are particularly interested in fishers' perceptions, attitudes, values (i.e. psycho-sociological factors) as well as fishers' behaviours,, while stakeholders are more interested in practical considerations of the relationships between different parts of the industry and the health and wellbeing of fishers and other stakeholders. A central challenge for a co-produced survey is finding consensus between all parties on the focus and contents of the survey. The different interests and needs of policymakers and stakeholders will need to be duly explored and reconciled. Given the complex nature of the issues that need to be addressed, it is unlikely that a survey could address all of these, therefore other social science methods and datasets are likely to be required alongside the survey.

Methodological recommendations

Stakeholder discussions suggested that to maximise value, the survey would need to be regular and cumulative, rather than a one-off cross-sectional survey. This would allow development of a body of data about the sector, enabling monitoring of changes over time. The research identified that achieving a representative sample across the fishing sector is challenging, mainly due to the diversity within the sector, with some groups of fishers recognised as hard-to-reach. To address this a pragmatic sampling strategy is proposed, combining stratified random sampling with time-location sampling (a form of convenience sampling where surveys are conducted in the locations and at the times respondents are likely to gather) to boost under-surveyed quotas, to ensure that hard-to-reach groups are adequately sampled. Face-to-face data collection is likely to be the preferred data collection

approach, particularly by fishers. There is also potential for the use of digital technologies, such as mobile phone apps (building on existing app trials for collecting data from fishers). As the survey matures the options to innovate in data collection are likely to widen.

The proposed co-production framework

A co-production framework for a new social survey of fishers can be defined as **the set of relationships between providers, enablers, and users of information that permits timely identification of relevant issues, supports data collection and analysis, and underpins agreed forms of utilisation that result in recognised benefits to stakeholders.**

In terms of applying a co-production approach to the generation of social data - where both stakeholder and policy needs will significantly affect the development and utilisation of evidence – it will be necessary to create a resilient structure based on trust, transparency and accountability between the key players. The suggested approach conceptualises active involvement of three broad categories of fisheries sector stakeholder:

- *Providers:* those who experience the issue/problem; those who hold the information of interest; may be individuals or organisations; may include gatekeepers
- *Enablers:* those with special skills or knowledge who make it possible to access the relevant information of interest; may include analysts, scientists, data collectors, organisations that hold data; funding bodies; and, those that can transform data to make it useful
- *Users:* users of the information; may include government agencies/departments (or units within departments), providers of the information themselves; representative bodies, other stakeholder organisations

The **conceptual framework** for co-production of social fisheries data envisages four distinct stages, or 'levels' of activity, each one building on the previous. (i) Laying the foundation: establishing institutional structures, building trust and agreeing the scope and focus of the survey as well as agreements about the publication and use of the survey data; (ii) developing survey instruments, data collection and analysis; (iii) incorporating data into decision making, both by government bodies and other relevant organisations across the fisheries sector; (iv) evaluation of quality of evidence produced, effectiveness of the co-production processes that generated the data, and feedback to levels 1 to 3.

Next steps – towards implementation of a pilot

The report recommends that the above framework should first be piloted in one or more case study locations over the period of one year to test and refine the approach, including exploring how coordination might operate across various fisheries management bodies. This would require establishment of institutional arrangements that would enable co-production to take place, in particular development of the necessary relationships between organisations representing data providers, data users, and those enabling the process. The proposed approach would require Defra to take a leading role in the establishment of appropriate institutional arrangements, provide financial support to test the process, and evaluate the outcomes. In order to obtain sector engagement, however, the process would also require transparency, accountability, and a sharing of resource and responsibility in terms of survey design, data collection, analysis, and utilisation of the evidence base created.

1. Introduction

Our seas and oceans are integral to the history, economy and way of life of the UK, with commercial fishing important to many coastal communities (Defra, 2018b). Leaving the EU and the Common Fisheries Policy (CFP) presents the UK with an opportunity to develop a sustainable fisheries policy that balances environmental, economic and social objectives, ensuring our seascapes and fish stocks are sustainably managed now and for future generations (Defra, 2018a). Brexit offers the opportunity to devise new policies that further achieve good environmental status of our seas while allowing marine industries and communities to thrive.

Whilst the prospect of shaping a new UK fisheries policy is undoubtedly an exciting one, it is important to understand that the UK fishing industry, and the people and communities connected to this industry, is both complicated and highly diverse, with geographical heterogeneity across England, Wales, Scotland and Northern Ireland. Developing a robust understanding of the social dimensions of fishing – such as fishers' socio-demographic characteristics, their attitudes, knowledge and behaviours, the social context within which they operate and associated social practices, and the social impact of fishing - is required for shaping successful policy and fishing operations across the UK, and for incentivising behaviours and practices that support stewardship and sustainability.

While the CFP recognises the importance of social values, incorporation of social objectives in the CFP has been slow to emerge, with the focus largely around environmental sustainability and reducing the depletion of commercial fish stocks (Symes and Phillipson, 2009). Policy measures aimed at combatting overfishing, such as decommissioning, quota and effort (days at sea) restrictions and technical measures can come at a significant social cost with increasing numbers of fishers leaving the industry or struggling to make a living (Urquhart et al., 2011). Thus, the promotion and development of a thriving fishing industry, that sustains livelihoods whilst sustainably exploiting marine resources, requires the development of social objectives alongside environmental and economic objectives. In turn, these social objectives must be built on, and informed by, a strong social science evidence base. Existing evidence is largely economic, with a focus on profitability, employment and a number of socio-demographic variables collected to comply with requirements under the EU Data Collection Framework (DCF). This data has proved a useful starting point, but there are significant gaps in understanding broader social issues affecting fishing communities and driving behaviours, which needs to be addressed through the collection of data that includes socio-psychological measures, such as attitudes, knowledge, perceptions, values, behaviours and motivations, and an understanding of social practices.

Social science data can be collected in a number of ways and can be both qualitative and quantitative. Whilst both are valuable to policy and are complementary, there is currently a significant evidence gap in robust quantitative data at a national level, representative of the diversity of fishers across the UK. This project focused, therefore, on assessing the feasibility of conducting a new social survey of fishers. Within this, a key ambition was to explore whether a survey could not only have benefit for informing policy, but would also be of value and use to fishers and fishing stakeholders. This calls for an approach that extends participation in the design and development of a survey to a wider set of stakeholders (including individual fishers, fishers' associations, Producer Organisations, community representatives, fishing charities), and a framework that sets out the institutional and operational processes needed in order for policy makers, fishing stakeholders and researchers to effectively collaborate in the production of fisheries social science data.

This report sets out a platform from which processes, methods and pathways to achieving co-production of a new social survey of fishers can be built. A review of evidence and a scoping study provides an enhanced understanding of the priority social data needs identified by policy makers and fishing stakeholders across England, Wales, Scotland and Northern Ireland. A co-production framework then identifies the benefits and challenges of involving stakeholders in governance and science and establishes the processes needed to co-design and co-deliver a new social survey of fishers.

Aims and objectives

The overall aims of the project were to understand the extent to which a new social survey of fishers could add to the existing evidence base, identify and prioritise evidence gaps and determine the feasibility of conducting a (regular or not) survey that would be of value to both policy makers and fishing stakeholders. The project also sought to make recommendations for how a survey might be operationalised. These aims were achieved through the following objectives, by providing:

1. A review of existing surveys (in the UK and beyond) to identify how a new survey could complement existing surveys.
2. A review of surveys targeting hard-to-reach populations, recognising that fishers are a distinct hard-to-reach group.
3. Identification of key evidence gaps that could be filled by a new survey.
4. Should a survey be feasible, consideration and recommendations for a sampling approach including data collection and analysis methods.

As the project progressed, it became clear that any new social survey should be designed and deployed collaboratively between government, researchers and fishing stakeholders. Thus, a further objective was added following the first stage of the project:

5. Development of a conceptual and operational framework for a co-produced survey that would allow collection of social data that would be of use to both policy makers and fishing stakeholders.

2. Research approach

This section provides a brief overview of the research approach. Full details of the methods employed in this project can be found in Appendix 1. . The approach for this project proceeded in three stages as outlined in Figure 2.1. The first stage consisted of an **evidence review of existing surveys of fishers**, identifying survey scope, methodology, and barriers and solutions to surveying fishers. In addition, recognising that fishers can be hard to survey, the general literature on surveying hard-to-reach populations was reviewed to identify potential sampling and data collection approaches that may be appropriate for a new survey of fishers. Alongside the evidence review, key informant interviews were conducted to scope the potential for a new social survey of fishers. Stage 2 consisted of **two workshops with fishing stakeholders** to identify and prioritise social issues of interest, and to elicit stakeholder views on how a new social survey might be co-produced between fishing stakeholders, policy makers and researchers. The third stage involved, firstly, **two focus groups with Defra policy makers** to identify and prioritise social data needs for informing policy and management of fisheries; and secondly, drawing on the findings from previous stages of the project, the development of a **new conceptual framework for co-producing a social survey of fishers** (detailed in Chapter 6).
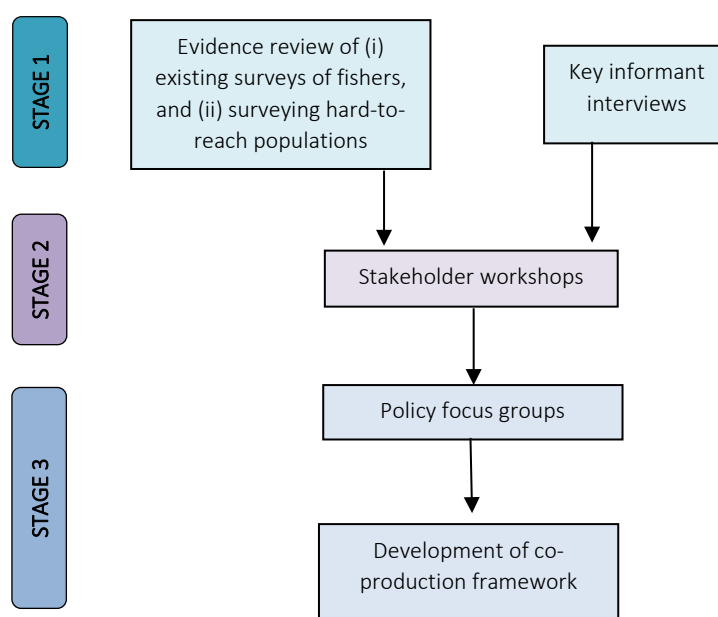

Figure 2.1 Methodological stages of report.

3. Why a social survey of fishers?

A new social survey would collect evidence on key social issues related to fishing but would also collect socio-psychological data (e.g. attitudes, values, behaviour) on wider issues and factors (e.g. economic, environmental, science, governance and management). Robust social evidence collected through a survey is potentially beneficial to both policy makers and fishing stakeholders. While each has particular data priorities, there are also significant areas of consensus (see chapter 4), which we suggest would form the core of a co-produced social survey.

Key areas where a new social survey could be of benefit to policy makers are:

- understanding fishers' perceptions, attitudes and values so that appropriate social issues are addressed in policy, allowing marine industries to thrive;
- understanding where industry support is for existing, and future, policies;
- understanding the causal mechanisms underlying behaviour and social practices can help incentivise behaviours and practices that support stewardship and sustainability;
- understanding fishers' awareness and perception of policy and management processes in order to improve communication strategies and partnership working with the sector;
- assessing the context within which fishers operate (e.g. gendered roles, networks of influence, opportunities to enter fishing, issues relating to migrant crew);
- providing mechanisms for assessment and monitoring of policy and management interventions over time through the development of social indicators.

Key areas where a new social survey could benefit fishing stakeholders are:

- evidencing links to wider coastal communities in terms of economy, society and culture;
- providing evidence to demonstrate the economic, social and administrative needs of the sector, providing a tool to negotiate;
- giving the fishing industry a stronger voice (and responsibility) in policy and management of the sector;
- improving relationships with administrators and other stakeholders.

In order to be of value, data would need to be at appropriate scales. Whereas national level data is important for guiding national policymaking, regional and local level data is important to identify specific regional or local circumstances that can be utilized by fishing stakeholders and that can inform local administration (e.g. IFCAs, local MMO). We would suggest survey data collected at national level, but that can be disaggregated to the regional or local scale.

Existing social data available through surveys

Currently, the UK has a requirement to collect data under the Data Collection Framework (DCF) Regulation (EU) 2017/1004. The DCF collects, manages and uses data on the fisheries sector to provide information to scientists and those responsible for decision-making and the management of fisheries. A key remit of the DCF is to provide scientific data that are needed to inform the annual assessments of fish stocks. Under the DCF regulations, member states are required to collect biological and economic data including:

- biological data on stocks caught by Union commercial fisheries and by recreational fisheries
- data to assess the impact of Union fisheries on the marine ecosystem

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- detailed data on the capacity and activity of Union fishing
- **social and economic data on fisheries**
- social, economic and environmental data on aquaculture

The requirements for collecting 'social and economic data on fisheries' include data on the following:

i. Fleet structure
ii. Fishing activity and output
iii. Employment and average salaries
iv. Economic performance
v. Resource productivity and efficiency
vi. Key socio-economic indicators – age, gender, nationality, education level, work pattern, remuneration

The collection of data required under (i) to (v) is collated from various sources including the fleet register, logbooks, sales notes, the Fixed Quota Allocation (FQA) Register, as well as an annual face-to-face survey with UK vessel owners, administered by Seafish (UK government, 2016). Alongside the survey, vessel owners are asked to provide their accounts for the previous financial year. Analyses of the economic performance and structure of the UK fishing fleet from the survey data are published annually in the 'Economics of the UK Fishing Fleet' reports (Lawrence et al., 2018).

For data under (vi), Seafish carried out a Pilot Survey of Employment in the UK Fishing Fleet in 2017 (Motova et al., 2017). From 2018 employment data are collected as part of the annual economic survey, and includes data on gender, age, professional qualifications, nationality, work patterns and remuneration of workings in the UK catching sector (Motova and Quintana, 2019).

The 2018 Seafish fleet survey collected economic and employment data on 291 UK fishing vessels and 730 jobs, accounting for approximately 7% of active vessels (Motova and Quintana, 2019). The sampling frame for the survey is the UK fishing fleet register (managed by the MMO) and includes all active vessels. The target is to cover 10% of the active fleet in the sample. By fleet segment, the highest coverage was for demersal trawlers over 18m (13.7%), whereas for the passive gear segment coverage was 6.5% and demersal trawlers under 18m was 7.7% (Motova and Quintana, 2019). The survey uses a convenience sampling approach, administering it face-to-face on the quayside so there is an element of self-selection resulting in a non-probability sample (Motova et al., 2017). Thus, some segments of the sector may be under or over represented, thus generalised findings are less reliable that if there were drawn upon a probability sample (UK government, 2016). Currently the economic survey is carried out annually, with the socio-economic indicator data collected every 2-3 years, as required for the EU DCF.

Prior to this, Seafish carried out 'The Scottish Sea Fisheries Employment Survey' (The Scottish Government, 2014, 2016) on behalf of the Scottish Government and the Marine Policy Unit to provide data required under the DCF. The survey covered the structure of employment, characteristics of crew (age, nationality, and skills), crew recruitment and retention, demographics, qualifications, mobility, crewing patterns and remuneration. The sample size was 254 vessels and 844 fishers in 2013, and 222 vessels and 753 fishers in 2015. As with the UK survey, the Scottish survey was administered face-to-face on the quayside. Before these national surveys, there were no existing records of education level and nationality of fishers in the UK.

Alongside data collected for the DCF, several other fisher surveys are of note. In Wales, the Welsh Government conducted a survey of under 10m commercial fishing vessels in 2016 (Welsh Government, 2016). The survey was deployed via fisheries officers in ports around the Welsh coast.

Officers administered the survey by hand to fishers in their ports, resulting in a response rate of 81%. The aim of the survey was to assess inshore fishers' membership of associations.

Seafarers UK commissioned a survey of fishers focusing on livelihoods, health, wellbeing and safety of fishers with a view to informing Seafarers' grant funding (Cornwall Rural Community Charity & Rose Regeneration, 2018). Data from 226 fishers in 41 ports and harbours were collected by a combination of an e-survey, face-to-face interviews on the quayside and interviews with intermediaries and those providing health services to fishers. The research involved two surveys, one that sought fishers' views regarding the key issues impacting their lives, and the other that surveyed health service providers in fishing communities. Where the survey provides valid information on fisher wellbeing and health and safety, a weakness is the lack of weighting of the results, so under 10m vessels are under-represented. Key issues affecting fishers' lives, identified through the Seafarers UK survey:

- inconsistences in port infrastructure (e.g. ice equipment)
- competition for space with leisure boats
- barriers to applying for funding include the level of paperwork involved
- uncertainties about regular work for under 10m vessels
- difficulties in recruiting crew from the local community
- lack of access, and uncertainty over, quota
- generally low incomes and income uncertainty makes planning (e.g. engaging crew) difficult and little provision for difficult times, such as ill health
- high levels of stress
- difficulty in accessing health care (GP, dentist) due to irregular working patterns, with evidence of poor health amongst fishers and the wider community, including poor lifestyle in terms of diet and substance misuse
- significant levels of deprivation in terms of educational achievement in fishing communities
- high incidences of under 10m fishers using old, and often worn, equipment, increasing safety risks

Box 1, overleaf, summarises the existing social data available through these surveys, which is limited to a few socio-economic indicators, namely gender, nationality, highest job-related qualification, work pattern, remuneration.

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1. GENDER

The majority of jobs in the catching sector in the Seafish sample were filled by men. Women were mostly employed in onshore jobs. Where women worked on vessels, this was usually on under 10m vessels using passive gears (Motova and Quintana, 2019).

2. DEPRIVATION

The Seafarers survey found that 61% of surveyed ports are deprived (using the relevant Index of Multiple Deprivation), with ports with a high ratio of larger boats more likely to be deprived than those with smaller boats. In contrast, 25% of the UK overall is deprived (Cornwall Rural Community Charity & Rose Regeneration, 2018).

3. REMUNERATION

The majority of vessels owners and on-board workers in the sample were paid a crew share of the vessel's earnings. The majority of onshore workers had a fixed wage (Motova and Quintana, 2019).

4. NATIONALITY

85% of jobs in the Seafish sample were filled by UK workers. 8% of jobs were filled by EU/EEA citizens and 7% by non-EEA citizens. Non-UK workers were mainly deckhands, engineers or had other on board roles (except for skipper). Most non-UK workers are from the Philippines, Latvia and Romania, and work on over 18m demersal trawlers and nephrops trawlers registered in Scotland and Northern Ireland (Motova and Quintana, 2019).

5. QUALIFICATIONS

Almost three quarters of skippers in the Seafish sample had a professional skipper qualification, while the highest professional qualification for deckhands and other on board workers was Basic Safety Training (Motova and Quintana, 2019).

6. ASSOCIATIONS

In Wales, 50% of under 10m fishers do not belong to any fishers' association, thus they may not have a representative who can voices their concerns (Welsh Government, 2016).

7. AGE

The average age of workers in the Seafish sample was 42 years. Younger workers (under 40) mainly held positions such as deckhand or other on board positions, while older workers were more likely to be skippers and vessel owners. Vessels registered in England and Wales had the highest proportion of 60+ workers, likely reflecting the higher number of smaller vessels in these countries, which have higher proportions of older workers than larger vessels (Motova and Quintana, 2019).

8. WORK PATTERNS

The most common work pattern for on-board workers in the Seafish sample was full-time, all year round (77% of vessel owners and 81% of employees), while onshore workers are mainly part-time, all year round (50% of owners and 44% of other onshore workers). Over 18m demersal trawlers (mainly registered in Scotland) have a significant number of shift workers and almost a quarter of onshore workers are seasonal (Motova and Quintana, 2019).

Box 3.1 What existing fisher surveys tell us.

In summary, while existing surveys (e.g. Seafish) collect some social data, it is limited to mainly demographic and employment data. To fully understand the social dimensions of the sector, a broader set of data needs to be collected that assesses the attitudes, motivations, values, behaviours and practices of individuals. A deeper understanding of how fishers think and act can enable policy makers to make more robust decisions. Much of the existing evidence that addresses the social (and cultural) dimensions of fishing (for example, Urquhart and Acott, 2013, Urquhart and Acott, 2014, Ross, 2013, Britton and Coulthard, 2013) consists of qualitative studies. These studies argue that while the social and cultural dimensions of fishing are vitally important to coastal communities, they are inadequately considered in policy, largely due to a lack of robust evidence to inform those policies (Symes and Phillipson, 2009).

While qualitative studies are important, and provide deep insights, these are largely case studies undertaken in specific geographical locations, and occur on an ad hoc basis. There is a need for regular data collected nationally that is representative of the different segments in the sector. This would most appropriately be achieved through a regular survey of fishers to provide a robust evidence base on which to design and monitor policy over time. Such a survey should remain distinct from the Seafish employment survey, as the objectives would be different. The Seafish employment survey focuses on economic data, and provides useful data to address *economic sustainability*. However, **a social survey is needed to collect data to inform *social sustainability* and incorporate social objectives in policy, and should not be conflated with economic objectives**.

4. What should a social survey cover?

It is important to note that 'social issues' are defined in various ways by different actors, ranging from quantitative assessments of economic activity through to qualitative perceptions about the social and cultural value of fishing to coastal communities. For any new social survey, it is important to first identify the purpose of the survey and the types of social issues that it seeks to address, with the understanding that these will evolve through discussion with stakeholders over time.

In this section, we set out the broad range of social issues identified through the stakeholder interviews and workshops, and the policy focus groups. The identified policy priorities are then cross-tabulated with fishing stakeholder priorities in order to determine a consensus priority list of social data needs that might be addressed through a new social survey.

Identification of social issues

Table 4.1 summarises the social issues identified through stakeholder interviews and workshops and Defra policy focus groups. These are organised around seven 'issue categories': employment structure and generational renewal; socio-cultural impact; health and wellbeing; income and finance; impact of external drivers on businesses; participation in science and governance; and fisheries management. Within each issue category, participating stakeholders and policy makers place a different emphasis on what is important. Policy makers have a greater focus on improving their understanding of fisher's perceptions in undertaking their activities, while fishing stakeholders are more interested in the practical considerations around relationships between different parts of the industry, and in the health and wellbeing of fishers and other stakeholders. It should be noted that the social issues presented here are based on relatively limited engagement with both stakeholders and policy and so Table 4.1 by no means presents a complete list of social issues. It is, however, a useful starting point for developing and prioritising a social survey of fishers.

Table 4.1 Issues identified by fishing stakeholders and policy makers.

Generalised Issue	Identified Issues	Fishing stakeholders	Policy makers
Employment structure and generational renewal	• Dependency on fishing • Fisher attitude towards fishing • Labour • Succession & new entrants • Migrant crew • Demographics	• Succession and new entrants (generational renewal) • Migrant crew – welfare, wages, displacing local crew • Degree to which fishers' occupational and geographical mobility (e.g. lack of qualifications, lack of alternative employment opportunities, lack of experience outside fishing sector) impact on fishing dependence • Reasons for being a fisher and levels of job satisfaction • Attitude of young people to fishing	• What do fishers want the future fishing fleet to look like? • What are the motivations for why a person wants to be a fisher? • Better understanding of fishers' careers in terms of what boats they have fished on/what they would like to fish on. • Better understanding of literacy levels and technological skills.
Socio-cultural impact	• Women's roles • Public perception of fishing • Fishing contribution to social fabric • Isolation from wider community	• Social fabric (health, community, wellbeing) • The contribution of fishing to cultural identity and sense of place in coastal communities • Women's roles/work (within business, family, community) – often invisible	• What is the importance of fishing for coastal communities, beyond providing jobs? • Are there social and cultural benefits that perhaps might also be of value to the community and local economy?
Health and wellbeing	• Health & safety • Physical & mental health • Crew welfare	• Health– access to health services • Welfare – mental health, work-life balance • Neglect and isolation from community • Health and safety (compliance) • The particular issues that fishing families face, often associated with fishers spending long periods away from home, and the high risks associated with the job • Fishers' perceptions of fishing (occupational, community identity)	• Are there trade-offs between economic values and wellbeing benefits? • Reasons for poor uptake of safety measures
Generalised Issue		Fishing stakeholders	Policy makers

Income & finance	• Admin support & info • Financial support • Income security	• Improving income security and equity across crew (e.g. pay systems between local and migrant workers) • Access to business advice and financial support • Access to help for applying for grants such as filling in forms. Willingness of fishers to accept such help • Heterogeneity across sector - gap between the highest and lowest earners	• What are the barriers to accessing and uptake of grants and wider finance options? What would enable fishers to better access grants? (i.e. views on application processes) • Fishers' perceptions and experience of access to finance (e.g. commercial loans).
Impact of external drivers on businesses	• Port infrastructure • Training / skills • Competition for space • Markets • Technology	• Changing market demands and impacts on fishing, e.g. who they sell to, what they fish, local economic linkages • Uncertainty of impact of Brexit on fishing rights (quota) and access to markets • Lack of training opportunities • Gentrification and other uses of harbours • Public perception of fishing: fishing as valued part of identity in coastal communities, or fishers as 'villains' in fisheries crisis • Lack of facilities in ports and harbours. Particularly for the inshore sector, much of the infrastructure is old • Use of technology (on board equipment, mobile phones)	• Is there an appetite for innovation amongst fishers? Is this more prevalent in certain demographics than others? • A better understanding of fishers' decision-making and behaviours: how fishers' make decisions about their business in terms of resilience and adaptability. • The rationale underlying decision making and business planning; why and when fishers decide to diversify between species etc. • What are fishers' future aspirations for their business? e.g. what would they do if they were given more fishing opportunities?
Participation in science & governance	• Fishers' participation in science • Fishers' role in management • Perceptions of sustainability & stewardship	• Willingness to engage in co-governance for sustainability • Participation in policy design and decision-making • The degree to which fishers engage with science and scientific surveys (and equity in opportunities to participate) • Perceptions of fishers' role as stewards of marine resources • The degree to which fishers feel well represented and that they have a voice	• What do fishers understand by the term 'sustainability'? • How do they view their role as stewards of the marine environment? • How can sustainable behaviour be incentivised? • Improved understanding of experiential knowledge held by fishers (e.g. in relation to fish stock and state of the marine environment). • How do fishers prefer to receive information?
Generalised Issue		Fishing stakeholders	Policy makers

Fisheries management	• Fairness in quota allocation • Sharing best practice • Fishers' relationship with regulators • Empowerment and representation • Visions of the future • Fisher decision-making	• Fishers' role in management • Perceptions regarding new post-Brexit fisheries policy	• To what extent do fishers understand the governance processes associated with fisheries and the broader system of marine management? • Fishers' perceptions of regulatory bodies (e.g. Defra, MMO, devolved administrations) and different perceptions of different bodies, particularly in terms of their engagement with the sector • What are their views about their relationships with enforcement bodies? • What are fishers' perceptions regarding equity and fairness in terms of access to fishing grounds and fishing opportunities? • How do fishers think the industry is changing - do they perceive a cultural shift? • A better understanding of the trade-offs that fishers are prepared to make, e.g. what measures would they be prepared to implement for more fishing opportunities?

Availability of data

For most of the issues identified (Table 4.1), both stakeholders and policy makers[1] agree that there is currently little or no robust evidence on which to base policy and management decisions (see Table 4.2). This suggests that a survey would be strategically beneficial to all parties, and is informed by an urgent need if social objectives for fisheries are to be defined and to be achieved.

Table 4.2 Comparison of perceptions of current data availability between stakeholders and policy makers, adopting a RAG coding: Red/R=low availability; Amber/A=medium availability; Green/G=high availability; blank=not mentioned.

	Stakeholder	Policy		Stakeholder	Policy
Employment structure & generational renewal			**Impact of external drivers on businesses**		
Fisher attitude towards fishing	R	R	Port infrastructure	A	
Labour	R	R	Training/skills	R	
Succession/new entrants	R	R	Competition for space	R	
Migrant crew	R	R	Markets	A	
Demographics	R		Technology		R
Socio-cultural impact			**Participation in science & governance**		
Women's role	R	R	Equity in participation in science & management		A
Public perception of fishing	R		Participation in science		A
Fishing contribution to social fabric	R	A	Fisher role in management	R	A
Isolation from wider community	R		Perceptions of sustainability	R	R
Health & well-being			**Fisheries management**		
Health & safety	R	A	Fairness in quota allocation		R
Physical & mental health	R	R	Sharing best practice	A	R
Crew welfare	G	R	Fishers' relations with regulators	A	R
Income & finance			Empowerment & representation	A	A
Admin support & info	G	R	Visions of the future	R	R
Financial support	R	R	Fisher decision-making		R
Income security	R				

Prioritisation of social data needs

A comparison of the social data needs expressed by stakeholders and policy makers reveals six areas of consensus, but that most issues are of more interest to either stakeholders or policy makers (see Table 4.3). This suggests a good opportunity for building dialogue and mutual investment in data and exchange of perspectives.

Table 4.3 Comparison of social data needs between stakeholders and policy makers, adopting a RAG coding: Red/R=high importance; Amber/A=medium importance; Green/G=low importance; blank=not mentioned.

	Stakeholders	Policy		Stakeholder	Policy
Employment structure & generational renewal			**Impact of external drivers on businesses**		
Fisher attitude towards fishing	R	A	Port infrastructure	R	
Labour	R	G	Training/skills	R	
Succession/new entrants	R	A	Competition for space	R	
Migrant crew	R	G	Markets	R	
Demographics	R		Technology		R
Socio-cultural impact			**Participation in science & governance**		
Women's role	R	G	Equity in participation in science & management		A
Public perception of fishing	G		Participation in science		A
Fishing contribution to social fabric	R	A	Fisher role in management	G	R
Isolation from wider community	R		Perceptions of sustainability	A	R
Health & well-being			**Fisheries management**		
Health & safety	R	R	Fairness in quota allocation		R
Physical & mental health	R	A	Sharing best practice	R	A
Crew welfare	R	G	Fishers' relations with regulators	A	A
Income & finance			Empowerment & representation	R	R
Admin support & info	R	R	Visions of the future	R	R
Financial support	R	R	Fisher decision-making		R
Income security	R				

It is evident from the research that the various groups with responsibility for, and within, the fishing sector have different priorities for new data, and needs for that data. A survey would offer a way of creating a dialogue over what data is needed, and why, as well as the opportunity to build greater consensus around data needs and awareness of the requirements of others. Survey data provides a

platform that is strategic but not directly instrumental (i.e. it is evidence, not policy), and as such has the potential to be less contentious than more direct policy negotiations.

In order to be of most value, the survey would need to be regular and cumulative, rather than a one-off cross-sectional survey. This would allow a body of data about the sector to be built, enabling change over time to be monitored, and providing a robust dataset that could be utilised by a range of actors. It would contain not only elements of 'raw' data open to those who wish to access it, but also tools to allow interpretation by those working or active within the sector who wish to follow up topics that are of interest to them.

The core survey would be an annual implementation of a structured sample of the commercial catching sector. In addition, there should be some flexibility to allow for specific topics that are beyond the scope of the 'core' survey. These could be included as 'bolt on' one-off pieces of research (either through a survey or more qualitative study) that address specific issues of interest. These bolt ons could be at national, regional or local scale as appropriate.

We suggest that a key outcome of a new social survey could be the development of a set of social indicators, which could be used to monitor the social performance of the sector and the wellbeing of fishing communities. Indicators are widely used to monitor ecosystems, but social indicators have the potential to provide a useful tool for incorporating assessments of the social dimensions of fishing, and monitoring change over time. This could be informed by existing work undertaken by the ICES Working Group on Social Indicators[2], as well as by general questions relating to social capital in the Census and the work currently being undertaken by Defra to establish social indicators in terrestrial farm businesses. As an example, such indicators could include:

> *% fishers with employment experience outside fishing* – to indicate the structure of the industry and employment patterns

> *% fishers expressing mental health issues*.

The following chapter sets out the methodological recommendations for deployment of the survey.

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[2] https://www.ices.dk/community/groups/Pages/WGSOCIAL.aspx

5. Methodological recommendations

A key challenge for surveying fishers is the diversity in the sector, in terms of its scale and organisation. Differentiation is often made between the over and under 10m vessels. Almost four fifths of the UK fleet comprises under 10m vessels, despite the fact that they account for only 9% of the fleet's capacity and 36% of the fleet's power (MMO, 2018). England and Wales have a higher proportion of under 10m vessels than Scotland and Northern Ireland. They operate largely in inshore waters (within 6nm), targeting species such as plaice and sole, as well as shellfish. Scotland and Northern Ireland have a higher proportion of larger vessels, and cover large areas of sea in the North Sea and West of Scotland waters, targeting mainly pelagic species such as herring and mackerel (MMO, 2018). Scotland's 356 over 15m vessels represent 6% of all UK vessels, but their capacity is equal to the rest of the UK fleet combined. Almost all pelagic and demersal fish is landed by vessels in a producer organisation (PO), whereas over half of shellfish are landed by vessels not in a PO (MMO, 2018).

Given the diversity of fleet structure and the value of landed fish geographically, there is likely to be variation in social and economic structures in the industry. This is evidenced by a small number of very wealthy large-scale fishers in large Scottish ports such as Fraserburgh, compared to many small-scale fishers in other parts of the UK who likely operating on a part-time, seasonal basis and need to supplement their household income by working outside the sector. In addition, some populations present particular challenges that make them harder to survey than the general population. Some groups may be difficult to survey because they are rare, others may be hidden, some may be difficult to find or contact, while others are unlikely to agree to take part in a survey (Tourangeau, 2014). Thus, Tourangeau (2014) distinguishes between "populations that are *hard to sample*, those whose members who are *hard to identify*, those that are *hard to find or contact*, those whose members who are *hard to persuade* to take part, and those whose members are willing to take part but nonetheless *hard to interview*" (p. 3). It is likely that all of these characteristics are relevant to UK sea fishing.

Methodological approaches in existing surveys

Analysis of existing national surveys, along with a wider evidence review of other surveys of fishers in the UK and in international contexts, highlights some of the challenges of surveying fishers and the limitations of existing survey mechanisms.

In our evidence review, descriptions of the sample population varied between studies, but were often licence holders/boat owners (10) and skippers (13). Only three studies specifically indicated that they surveyed crew. One study also surveyed government officials and NGO staff (Mexico), one surveyed a range of industry stakeholders (Norway), one surveyed members of inshore fisheries groups (Scotland), one surveyed fishing households (Northern Ireland) and two specifically focused on small-scale fishers.

An additional issue is that existing surveys often have relatively small sample sizes, with sample sizes varying from 37 cases to 2500 cases, with a median of 226 cases in the studies reviewed. This is particularly important when considering the diversity across fishing fleets; with some sectors recognised as likely to be grossly under-represented in survey data (such as small-scale fleets).

The most common data collection method for surveying fishers is face-to-face, usually on the quayside, with 15 of the reviewed studies adopting this method. A further seven surveys were self-administered by respondents, usually by post, three undertook telephone surveys and two used either

email or a mobile phone app to collect data. Three of the studies used a mixed methods approach. In the evidence review of hard-to-reach populations, the sampling approaches adopted include snowball sampling, time-space sampling, time-location sampling and respondent driven sampling (Marpsat and Razafindratsima, 2010). Most of the surveys were administered face-to-face (8), with two online surveys and one using Facebook. Six surveys used an incentive, involving either cash, travel costs or coupons.

Face-to-face is evidently the most successful data collection method, with better response rates, although existing surveys tend to be based on the availability of those present and willing to take part. It is possible that groups of fishers with other characteristics may be missed. Postal or self-completion surveys can lead to response bias in that those who are more interested in the topic are more likely to respond. Those with low literacy levels are also less likely to respond (Alexander et al., 2013).

There are also reliability issues when surveying, with recognised discrepancies between what fishers report they believe in or support, and the way they actually behave and act (Sønvisen, 2014), although this relates to all social surveys, not just those of fishers. Sønvisen (2014) describes this as fishers' attitudes and actions "not harmonising".

Response rates documented in the review also varied substantially, with generally higher response rates for face-to-face surveys (with response rates sometimes cited as between 80-95% (e.g. Pita et al., 2010a, Pita et al., 2010b, Booth and Nelson, 2014), although it is not always clear how this was calculated). Postal survey response rates varied between 22% and 62%. It was not possible to ascertain responses rates for the online surveys. Reasons for response rates may vary. For instance, a European Fisheries Fund survey on the health of fishers had a relatively low (28%) response rate, although this may relate to the deployment method (postal) and the length of the survey (over 17 pages, including 93 questions) (Østergaard et al., 2016).

Drawing on insights from the evidence review of surveys of a broad range of hard to reach groups, solutions to surveying the 'hard-to-reach' fisher groups may include:

- Access through their social networks and individuals or organisations who already have a relationship with the target respondents (e.g. gatekeeper). Employ social media as a snowball sampling approach to recruit participants or through channels such as the Fishing News.

- Time-location sampling (also known as time-space sampling and venue-based sampling): locations are selected at random from a sampling frame of expected locations, and respondents are enrolled by sampling at these locations.

- Respondent driven sampling: a form of chain-referral that combines snowball sampling with a mathematical model that weights the sample to compensate for the sample being collected in a non-random way.

- Data collection using peer researchers or through close interaction with established community groups.

The problems and solutions identified above can be usefully targeted via a co-production process. By bringing together the providers, enablers, and users of social survey data many of the problems of identifying and accessing fishers should be more easily resolved.

Recommendations for a sampling strategy for a new social survey of fishers

A sampling strategy is required that ensures good representativeness of the population and ensures hard-to-reach groups are adequately sampled. This can be achieved by a combined approach to sampling involving:

- A stratified random sample, and
- Sample boosts through time-space sampling

5.4.1 Randomised stratified sample

The sampling strategy is set out on the basis of surveying commercial fishers in the catching sector only, with a view to achieving a representative sample of the fisher population. In addition to this, specific 'bolt on' surveys or other research (outlined previously) may focus on other populations, such as fisher households, supply chain actors, representative bodies or community members. However, it would be difficult to obtain a representative sample across these groups, with data being indicative, rather than representative.

For the core fisher survey, the **sampling unit** is vessel owners and skippers.

The **target population** is defined at the national level and consists of all fishers.

The objective of developing a sampling strategy is to obtain a **sample** (i.e. the group of fishers that provide the data to be collected) of fishers in the UK, that is **representative** of the target population.

The representativeness of the sample will be ensured through two main parameters:

- Sample size; and

- Appropriate stratification of the sample

Obtaining a sample size

The size of the sample (i.e. the number of fishers included in the survey) depends on the size of the target population. In other words, the sample size depends on the number of fishers in, for instance, England.

The sample should contain a number of fishers sufficient to guarantee a **margin of error** lower than 10% for a significance level of 95%, which is the commonly accepted limit of error for socio-economic research.

The margin of error measures the reliability of the sample with respect to the population through a confidence interval. In other words, the margin of error measures how many percentage points the results of the survey differs from an equivalent value gathered from the real, or entire, population.

There are different ways for calculating the margin of error. For the purposes of this survey we suggest calculating the **margin of error for a proportion, with finite population correction**. This can be achieved through the following formula:

$$ME = z \frac{\sqrt{p * (1 - p)}}{\sqrt{\frac{(N - 1) * n}{(N - n)}}}$$

Where *z* is the *z*-score equal to 1.96 for 95% confidence; *p* is the proportion of the sample answering a question; *n* is sample dimension and *N* is the population size.

In order to illustrate how the margin of error (ME) can be used to inform the sample size, Table 5.1 provides three examples based on different sample sizes, using MMO data.

The total number of fishing vessels in England in 2017 was 4,716 (MMO, 2017). Suppose, for example, that we ask fishers the following question: "Do you make a profit out of fishing?" and 50% of the fishers answered "YES".

Based on this information we calculate the sample size allowing a ME<10% between case A and case B.

Table 5.1 Examples of ME calculation to inform decisions regarding the size of a representative sample.

Parameters	Sample size A	Sample size B	Sample size C
n	50	350	750
N	4,716	4,716	4,716
P (%)	50	50	50
ME (%)	± 13.8	± 5.0	± 3.3

The result means that:

A. When surveying 50 fishers, 25 answered that they do not make a profit, and we can conclude with 95% confidence that 50% of the fishers do not make a profit, give or take 13.8%

B. When surveying 350 fishers, 175 answered that they do not make a profit, and we can conclude with 95% confidence that 50% of the fishers do not make a profit, give or take 5.0%

C. When surveying 750 fishers, 375 answered that they do not make a profit, and we can conclude with 95% confidence that 50% of the fishers do not make a profit, give or take 3.3%

Clearly, the sample A is too small with ME>10%. Both samples B and C allows for acceptable ME (<10%), but sample C provides results which are more likely to be closer to the equivalent answers garnered from the real population.

Ideally, the lower ME should be adopted. However, the choice of the sample size can be driven by other constraining factors. Different methods of data collection (i.e. online, telephone, mail, face-to-face data collection) have different costs, human resources requirements, timings of execution and levels of efficiency. Therefore, the choice about the sample size is a balanced decision between acceptable ME, feasibility of the study and constraining factors. On balance, we would recommend a minimum sample size of 400 out of the 4,716 fishing vessels in England, which assuming a relatively

conservative 25% response rate would imply targeting 1,200 fishers, or around 800 if a 50% response rate is deemed achievable.

Ensuring representativeness through stratification

The **representativeness** of the sample depends on the sampling strategy and can be based on different characteristics of the target population. In order to ensure representativeness, it is recommended that a **multistage randomized sampling strategy** be employed.

The **first step** to design a representative sample is to obtain an (as much as possible) unbiased **sampling frame**, i.e. - the list of fishers that will be (randomly) contacted to be included in the survey. A sampling frame can be obtained through a variety of means, principally through the MMO Vessel Owner register, which contains details of all fishing vessels licensed across the UK. Subject to appropriate data protection arrangements, information about vessels and owners could be accessed via this route. However, it should be noted that not all vessel owners will also be fishers and contact information is mainly through postal addresses although phone numbers and email addresses are also provided in many cases. Sampling information could also be sourced via local authorities, fishers' organizations (e.g. associations, unions, cooperatives), and marketing companies, all of which have strengths and weaknesses.

The characteristics of the sampling frame can affect the possibility of undertaking certain stratifications. If the sampling frame does not provide information regarding, for example, a vessel's engine power, then stratifying for this parameter is not possible. Moreover, bias can occur when the sampling frame excludes major portions of the population. For example, a list of fishers obtained through a specific association is likely to exclude all the fishers that are not members of that particular association. In order to appropriately represent the target population, the sampling frame should reflect as closely as possible the population of interest. Thus, the analytical framework needs to be developed in advance, to ensure that the sample design provides the data required.

The **second step** is to stratify the sample according to relevant parameters. For the purposes of this survey, we recommend a stratification based on:

- Geographical distribution: representativeness of the number of fishers interviewed in each administrative port

- Vessel size: distinguishing between vessels below and above 10m reflects different types of fisheries, catches, market channels and economic conditions

Table 5.2 provides an example of stratification by administrative ports and vessel's size, based on a sample size of 350 fishers. Based on the total number of English vessels at the bottom of the second column, we calculate the proportion of vessels above and below 10m by administrative ports in columns 5 and 6 respectively. The same proportion is then used to calculate the number of fishers to be surveyed to achieve a final sample of 350 fishers. For example, in Newlyn 60 (=0.17*350) fishers with vessels <10m and 8 (=0.02*350) fishers with vessels >10m can be interviewed.

Table 5.2 Sample stratification by administrative ports and vessel size.

Administrative ports	N. of all vessels	N. of vessels <10m	N. of vessels >10m	Proportion of vessels <10m	Proportion of vessels >10m	Sample of vessels <10m	Sample of vessels >10m
Blackpool	85	74	11	0.02	0.00	8	1
Brixham	261	191	70	0.06	0.02	21	8
Grimsby	131	68	63	0.02	0.02	8	7
Hastings	367	343	24	0.11	0.01	39	3
Lowestoft	327	282	45	0.09	0.01	32	5
Newlyn	610	536	74	0.17	0.02	60	8
North Shields	358	268	90	0.09	0.03	30	10
Plymouth	342	255	87	0.08	0.03	29	10
Poole	476	436	40	0.14	0.01	49	4
Scarborough	156	109	47	0.04	0.02	12	5
England	**3,113**	**2,562**	**551**	**0.82**	**0.18**	**288**	**62**

Source: CCRI calculation on MMO 2012 data

The ideal approach would be a probability-based sample, as described above, but this is unlikely to be totally possible given the nature of the target population, the need for face-to-face engagement, incomplete data in the MMO Vessel Owner Register and the resource implications. Thus, we propose a two-stage approach. First, to achieve a **stratified sample with a random selection of the sample units**, the fishers to be surveyed should be randomly selected from the sample frame (e.g. MMO Vessel Owner Register). During the survey the representativeness of each stratum should be controlled, and potential biases reduced through a system of quotas. Where contact details are not available for sampled fishers, gatekeepers or other local contacts will be sought to enrol these individuals in the survey. Secondly, for underrepresented strata, a sample boost will be applied through a convenience sample in under-sampled geographical locations. Gatekeepers will also be consulted to identify potential participants that fit the criteria for under-represented strata. A future goal might be to work towards establishing a more complete register of vessels, including full contact details.

In addition to ensuring representativeness based on geographical distribution and vessels' size, for the purposes of this survey (i.e. studying the social condition of fishers and their household) it is also important to consider the different social and economic parameters. We propose to employ the UK index of multiple deprivation (IMD), which describes differences in economic, education and welfare opportunities among different areas, capturing a range of social conditions that may influence fishers' responses.

The IMD is calculated for England at ward level, while MMO data are at the level of main administrative ports. Therefore, it is unlikely that the IMD[3] can be used to directly stratify a sample of vessels. However, it can be used as a benchmark to survey fishers in the most and least deprived wards of the cities or districts where the administrative ports are located. This can be achieved by regularly monitoring the location of the surveyed fishers against the IMD, and eventually topping up the sample with fishers located in strongly underrepresented IMD areas.

5.4.2 Time-location sampling

Sampling will be a customised 'time-informed location approach' which relies on support from the management board (see chapter 6 for details of recommended institutional structure) and key stakeholders to access relevant local gatekeepers and individual fishers. The benefit of a co-production approach will be the ability to discuss directly with relevant stakeholders the best way to approach different providers.

Time-location sampling will also contribute to situations where sample quotas are under-represented in the sample, and sample boosts can be added in to the sample frame. This will involve face-to-face sampling in the locations, and at the particular times, that the under-represented sample groups are expected to congregate, e.g. particular ports or harbours. Local gatekeepers (such as harbour masters) can also be consulted to inform the most appropriate locations and time to facilitate this sampling approach.

5.4.3 Contacting fishers: some practical considerations

Depending on how fishers are identified will influence the approach to contacting and surveying them. For those identified via the MMO vessel data, it may be possible to contact them by telephone if contacts details are available. Otherwise, appropriate gatekeepers will be utilised, as outlined above, and fishers will either be approached on the quayside to undertake the survey there and then, or a date, time and location will be agreed with them that is mutually convenient. All appointments will be flexible to respect the nature of the job, and will be rearranged should a participant need to make a last minute decision to go fishing due to the weather etc.

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[3] A caveat being that in some cases the IMD may relate only to a fisher's place of residence, as opposed to both home port and residence.

6. A conceptual framework for the co-production of social data on fisheries

What is co-production?

Co-production in government is not new; it has been a key strategy within public services such as healthcare and social services since the mid-1990s (Brandsen et al., 2018, Realpe and Wallace, 2010, nef, 2008, Boyle and Harris, 2009) and is increasingly promoted in government strategy documents (Boyle and Harris, 2009). It involves service users being involved in different stages of a public service, such as planning, design, delivery and audit.

The term co-production originates from work in the 1970s by Elinor Ostrom and her colleagues in the context of the role of the public in successful policing in Chicago (Ostrom, 1996, Parks et al., 1981), defining co-production as the "process through which inputs used to produce a good or service are contributed by individuals who are not 'in' the same organisation" (Ostrom, 1996, p. 1073). Since then the concept has been implemented in a range of contexts and there are many definitions of co-production (for example, Bovaird, 2007, Voorberg et al., 2014, Horne and Shirley, 2009) mostly focused on notions of empowerment, partnership working and some form of sharing assets and expertise. Arnstein's 'Ladder of Participation' is often used to illustrate different levels of involvement of people and communities and more recently NEF (2014) have reflected on how co-production builds on the dynamics between service users and professionals moving from 'doing to' through to 'doing for' and ultimately 'doing with'. This shift in focus for public services from internal procedures to collaboration and co-design involves valuing people as assets, knowledge providers and legitimators, promoting reciprocity and building social networks based on trust (Horne and Shirley, 2009, Boyle and Harris, 2009, Bovaird and Loeffler, 2012).

Despite the popularity of co-production within public policy, participation of fishers in evidence gathering within fisheries remains under-developed and ad hoc. Where it has taken place, such as the Fisheries Science Partnership, established in 2003/4 by the NFFO, Defra and Cefas, and the Scallop Industry Consultation Group, fishers, policy makers and scientists have worked together to improve the knowledge around specific fisheries. The success of these partnerships depended on recognising the need for equality across the actors involved and enabling fisheries stakeholders to be part of the decision-making process. These collaborations, however, mostly relate to collecting evidence on fish stocks or other environmental attributes in order to inform natural science assessments (e.g. the North Sea Stock Survey). Collaborations between researchers, policy makers and fishers to collect **social** data is largely absent. Where this has taken place, the process of working together often improves collaboration between industry, academics and government and enhances understanding and appreciation of the needs of management, such as a recent project on the sustainability of Canada's fisheries (Stephenson et al., 2019). Likewise, Trimble and Lazaro (2014), drawing on their experiences of participatory research in Uruguay, note that building group cohesion, trust, respect, honesty and tolerance among stakeholders was a main strength of the co-production process, along with the importance of learning by listening to others who think differently. Existing relationships improved, and trust among participants increased over time, although those involved reported that it was challenging to get fishers to participate. There are also limitations to the approach if not applied in an open and transparent manner, resulting in loss of trust rather than improving relationships. Thus, in order for co-production to be successful, there needs to an iterative and negotiated process, requiring a commitment to shared responsibility and recognition of the importance of collaborative relationships (Needham and Carr, 2009).

The coastal governance literature more broadly offers some useful insights to designing co-production and proposes approaches for integrating diverse knowledge sources, including expert knowledge beyond those possessed by professional researchers (van der Molen et al., 2015). It often involves the creation of flexible institutions for adaptive management in which stakeholders can interact and evaluate the effects of management measures on an ongoing basis (Bremer and Glavovic, 2013, van der Molen et al., 2015). Organisations that mediate across scientific and governance spheres, *boundary organisations*[4] (Clarke et al., 2013), and across the fisher-scientist interface, '*boundary spanners*' (Johnson, 2008), play an important intermediary role for achieving cooperation around a particular objective. The inclusion of stakeholders is a key principle, along with interdependence and the distribution of responsibility and competences among the actors (Folke et al., 2005, Trimble and Berkes, 2013), although Trimble and Lazaro (2014) suggest that attempts at sharing control as part of a co-production process are often difficult to achieve.

To address some of these issues, Pieraccinia and Cardwell (2016), in their assessment of the inshore fisheries authorities in England and Scotland, note that deciding who should be involved in the co-management is crucial. Careful consideration needs to be given to who is co-producing and how many people are involved; the stage at which co-production will take place; the nature and degree of change that is being sought; and the type and extent of input from people and communities that is expected (Scottish Government, 2015). Mackinson and Middleton (2018) also offer some principles for designing co-production of fisheries evidence, drawing on the experience in New Zealand. These include (i) defined 'rules' of engagement, (ii) Memorandum of Understanding (MoU) to promote a shared vision and the planning to achieve it, (iii) an extended peer review process which might usefully include elements of Liboiron's (2018) Community Peer Review Approach and (iv) inclusion of research knowledge from industry and science-industry partnerships.

Conceptual framework for the co-production of a social survey of fishers

Drawing on the insights from the fisheries co-management literature outlined above and the empirical findings from this project, this section sets out a conceptual framework for the implementation of a new social survey of fishers in the UK based on a co-production approach. In developing this we have made an assumption that the survey will be regular, although the frequency of the survey would be established through the co-production process. We have also assumed that the survey would primarily be focused on **commercial fishers in the catching sector**, rather than others in the supply chain or fishing community. In this context, a co-production framework for the provision of social information in the fishing sector can be defined as:

> **the set of relationships between providers, enablers, and users of information that permits timely identification of relevant issues, supports data collection and analysis, and underpins agreed forms of utilisation that result in recognised benefits to stakeholders. In so doing it contributes to the creation of a more resilient and sustainable fishing industry**

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[4] Boundary organisation are a way of conceptualising governance and expertise at science-policy interfaces. It does not refer to a particular type of organisation nor refer to any specific way an organisation should operate. The term is useful in thinking about how an organisation might operate to facilitate interaction between groups that do not normally work together, and may view the world differently GUSTAFSSON, K. & LIDSKOG, R. 2018. Boundary organizations and environmental governance: Performance, institutional design, and conceptual development. *Climate Risk Management,* 19**,** 1-11.

An initial requirement is to determine who should be involved in a co-production process. The fishing industry incorporates a wide variety of organisations and individuals, from fishers themselves (and their families who are often involved in the business) to government policy makers, regulators, membership associations, producer groups and environmental NGOs. The sector also includes suppliers of materials (nets, boats, fuel, etc.), service providers (such as harbours, ice, safety, insurance) and the buyers, retailers and processors of the final product. The nature of the relationships between different organisations varies from cooperation to conflict, and fishers, retailers, and processors may be in competition with each other. Bringing relevant organisations into a co-production process will require appreciation of the potential benefits from improved social data; utilisation of collected data then becomes a key focus of the development process, along with understanding of who holds relevant data and how it can be accessed.

In terms of applying a co-production approach to the generation of social data, where both stakeholder and policy maker needs will significantly affect the utilisation of evidence, and hence the type of evidence desired, we need to be thinking of ways to create a resilient structure based on trust, transparency, and accountability between the key players. One approach is to conceptualise fisheries sector stakeholders as falling into three broad categories:

- *Providers:* those who experience the issue/problem; those who hold the information of interest; may be individuals or organisations; may include gatekeepers
- *Enablers:* those with special skills or knowledge who make it possible to access the relevant information of interest; may include analysts, scientists, data collectors, organisations that hold data; funding bodies; and, those that can transform data to make it useful
- *Users:* users of the information; may include government agencies/departments (or units within departments), providers of the information themselves; representative bodies, and other stakeholder organisations

A co-production framework will require involvement of organisations and individuals from each of the three categories. Table 6.1 summarises some basic roles and identifies institutional 'types' that might fall into each category. It is important to realise that some organisations might play multiple roles within a co-production framework since each one may not simply be a provider or a user of information, but also have capacity for 'enabling' some aspect of the data collection and analysis process, and/or have interests in using the evidence collected. Thus, a wide array of bodies may have an interest in deciding which data to collect and how it should be collected, how it should be analysed and interpreted, and how the evidence should be used. It is also important to recognise that organisations with a larger 'stake' in the activity (e.g. through provision of access or data) may want more input into how the data is to be used. Providers, or bodies representing providers, may thus also become enablers (perhaps funding some aspects of data provision) and potentially users of the information generated. The framework presented here is a simplification of what might happen in practice, a useful heuristic device for thinking about who needs to be involved and the nature of their involvement.

Table 6.1 Overview of activities

Role	Activity	Examples of likely stakeholders
Provider	Perception of an issue	Fishers; processors; representative bodies. Skippers, crew, spouses/partners.
	Provision of data on activities	Fishers; processors; representative bodies; other relevant individuals (e.g. harbourmasters), Skippers, crew, spouses/partners.
	Service provision	Purchasers, retailers, marketing organisations, suppliers, port management
	Access provision	Representative bodies; respected individuals within a sector; organisations holding data; boat skippers (access to crew); local community personnel (e.g. harbourmaster)
Enabler	Funding	Government bodies; NGOs that want access to information; representative bodies (e.g. POs, processors)
	Collecting/analysing and interpreting data	Universities, consultants, scientists, government agencies
	Validating findings	Respected stakeholders, scientists, relevant organisations with potential to be affected by utilisation of the data.
User	Regulating behaviour/activity	Government bodies; fishing representative bodies
	Communicating/raising awareness	Government bodies; fishing representative bodies, NGOs
	Changing approach/policy/strategy	Government bodies; fishing representative bodies; NGOs
	Increasing understanding	Government bodies; fishing representative bodies; NGOs

All three categories of provider, enabler, and user are essential to the operation of a resilient co-production framework. The nature of the linkages between individuals/organisations across the three categories is the key to operation of a co-production framework; linkages must be 'two-way' in order to both provide information and return benefits (i.e. there is a need to build trust, transparency, and accountability into the framework as all sides in any relationship must benefit).

Figure 6.1 suggests that the three co-producer categories can be conceptualised as existing on three separate planes of activity (as stated above, in reality it will be more complex, for example enablers may also be providers and users of the information). Each 'plane' of activity can be considered as an existing set of relationships between organisations embedded in a wider socio-cultural context. The mix of organisations on each plane (i.e. the provider plane, enabler plane, and user plane) will be different, although in some cases organisations will appear in more than one plane. Relationships within a 'plane' of activity (blue arrows) will vary in strength and character of the links (cooperative, competitive or conflicting in nature), and in some cases links will be absent.

The key to the creation of a co-production framework is the development of the relationships between the planes (orange arrows). A resilient co-production structure requires strong relationships between the planes of activity, it is these relationships that must be created, supported and maintained throughout the process. The structure of relationships between the three planes of activity will vary with the nature and scale of the information sought, and its intended utilisation. The structural integrity of a co-production process requires feedback from those collecting, analysing and using data, to those providing it. Some feedback links might be direct, i.e. from users to providers, while other links might be filtered in some way through enabling bodies. But overall, a clear set of objectives in terms of evidence needs and utilisation (i.e. a strong programme theory) is needed in order to ensure the relevant links are constructed.

Designing a structural framework will enable exploration of who needs to be involved in co-production and in what capacity, who might benefit from the information, how it might be utilised, and the nature of the linkages required between various individuals and organisations. It can, therefore, be seen as a basis for understanding how to manage the co-production process and a means of monitoring activity occurring within the (vertical) linkages.
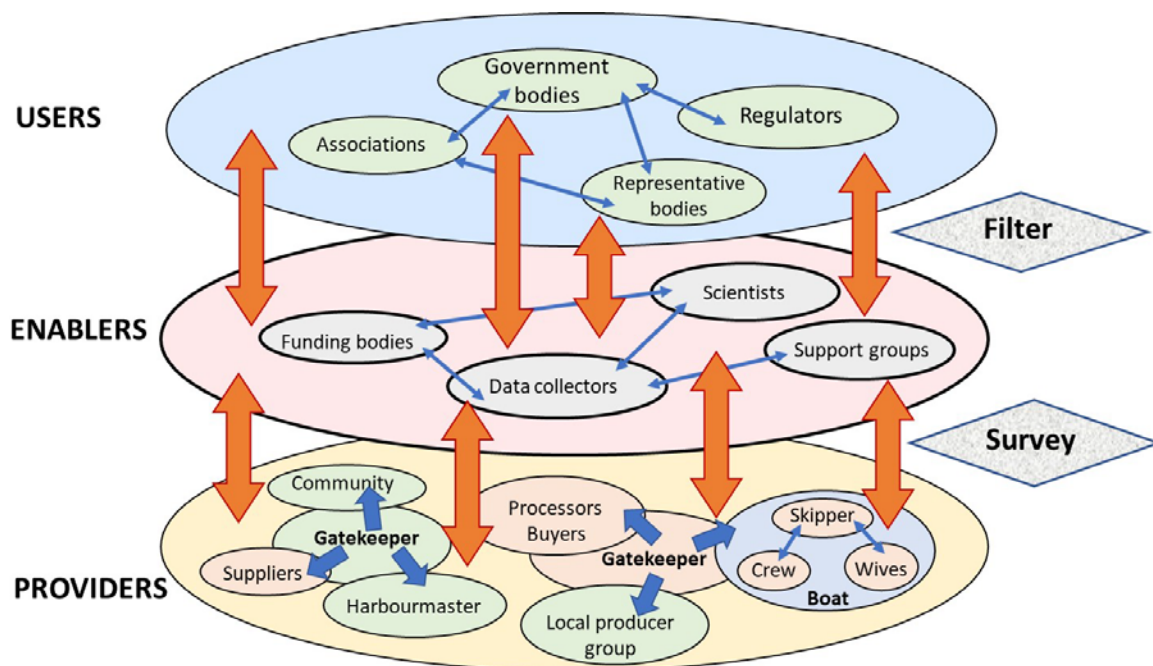
Figure 6.1 Conceptualisation of the users, enablers and providers who need to be involved in co-producing a social survey of fishers.

6.3.1 Stages of co-production activity

The conceptual framework for co-production of a social survey envisages four distinct stages, or 'levels' of activity, each one building on the previous (Figure 6.2 and 6.3). Level 1 is the most significant in terms of creating the conditions under which a resilient co-production system will develop and operate. Level 2 focuses on the development of survey instruments and techniques for collecting, analysing and presenting information. Level 3 is where evidence is incorporated into decision making,

both by government bodies and other relevant organisations across the fisheries sector. Demonstrating utilisation of the social data collected is an essential activity within the co-production system to encourage continuation of support. Level 4 evaluates quality of evidence produced, effectiveness of the co-production processes that generated the data, and provides feedback to Levels 1 to 3. Each of the four levels, or stages, is described in more detail below. We suggest that the framework could first be piloted in one or more case study locations over the period of one year, before scaling it up to the national level.
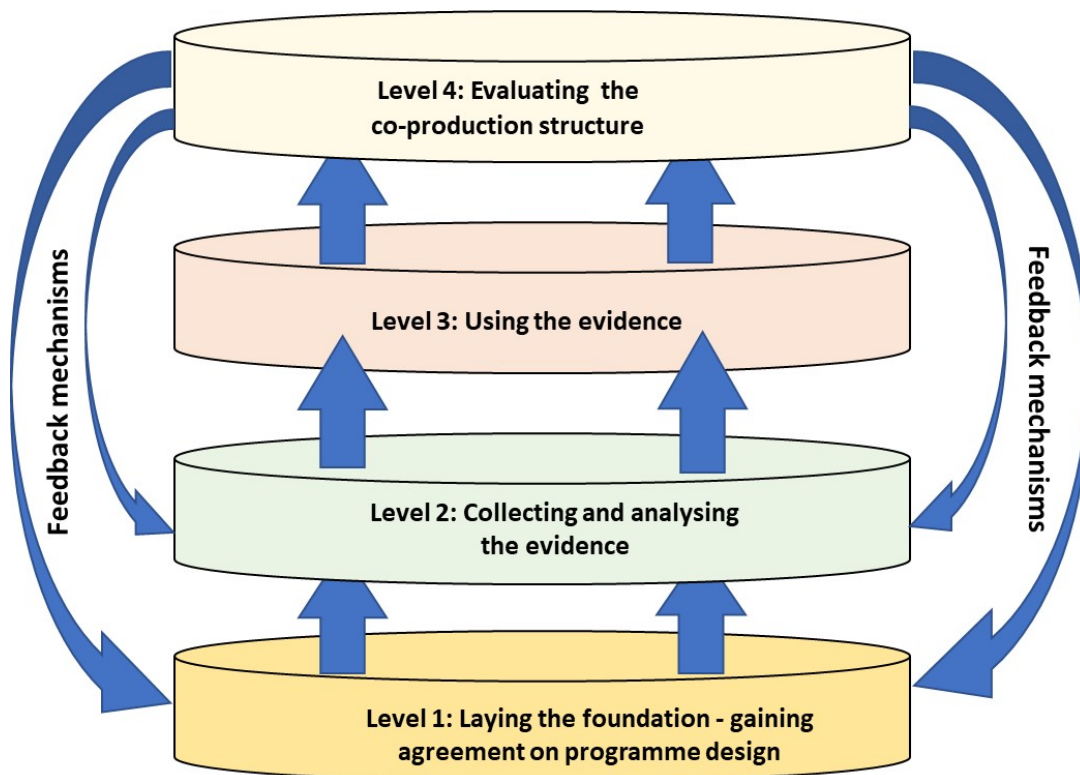
Figure 6.2 Stages in the development of a co-production framework.

5.3.2 Detailed description of tasks

This section, illustrated in Figure 6.3, describes the tasks to be carried out at each of the four levels of the co-production process. Co-production can be thought of as constructing a framework where significant effort has to be put in to ensure the foundations are solid and all the elements are carefully designed to fit together to enable efficient operation. Thus, a significant level of groundwork is required in order to create and operationalise the co-production framework.
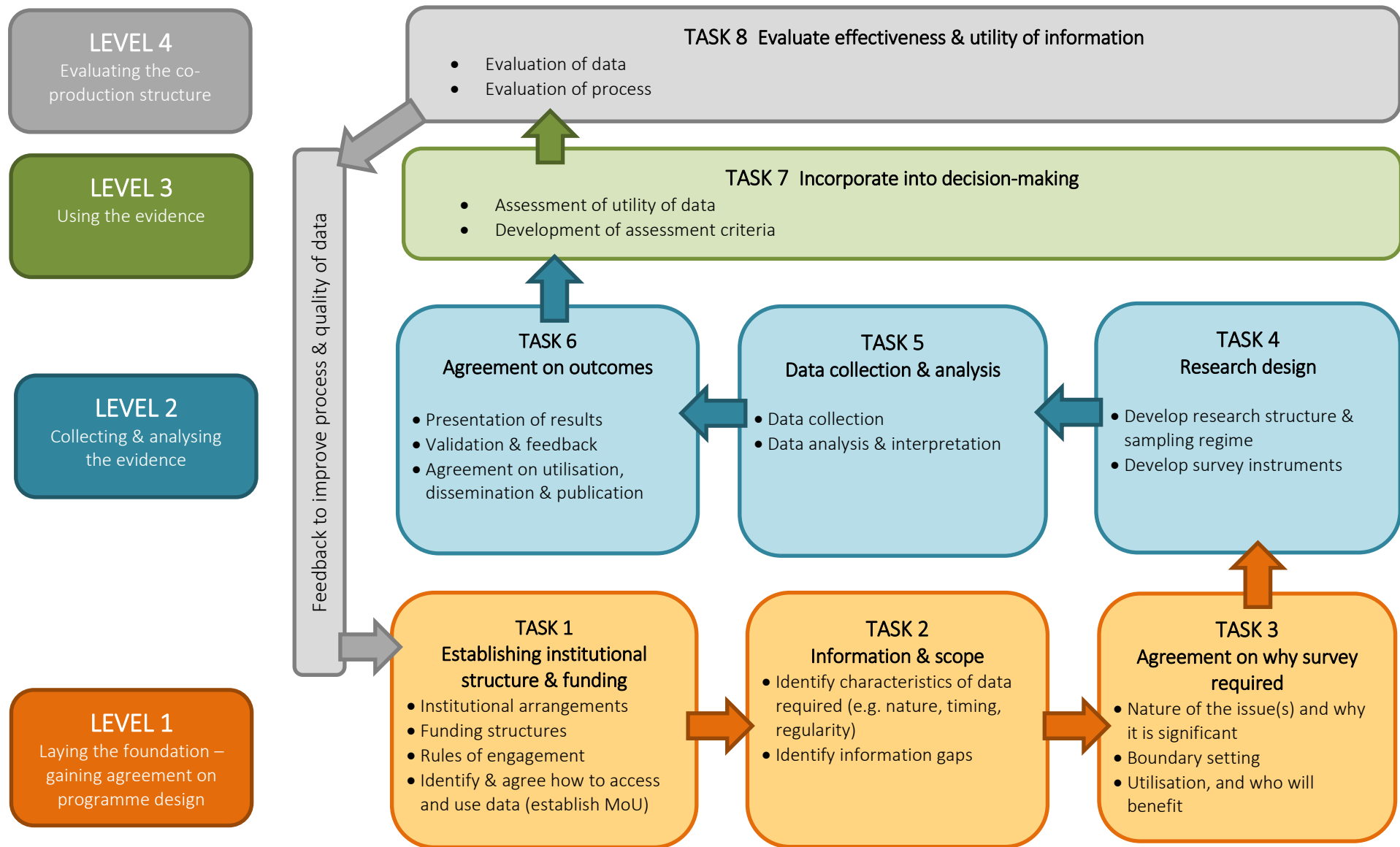
Figure 6.3 The co-production framework.

Level 1: Laying the foundation - gaining agreement on programme design

Level 1 requires development of new institutional arrangements within what Ostrom called, 'the action arena' (Ostrom, 1990) in order to resolve conflicts and power struggles in relation to provision and utilisation of specific forms of information. The key features of the action arena require engagement with organisations in competition or conflict with each other, where there is a lack of trust. Particular challenges for a social survey of fishers relate to the following:

- The nature and lack of resilience of links between organisations (often personal)
- Polarising impact of personalities (us and them attitude) and need to maintain organisational distinctiveness
- How to empower the 'providers' to complete the survey, i.e. what's in it for them?
- Policy makers fear 'capture' by one or other parts of the sector, loss of clarity
- Concerns over being 'an informant'; lack of trust; concerns over sharing information; funding can be viewed in a negative manner (i.e. being 'bought off')
- Isolated fishers and variability across fishing communities (also within same stretch of coast); limited membership of key fishing organisations (e.g. local cooperatives)
  (Alexander et al., 2015)
- Potential for 'knowledge battles' between scientists, fisheries managers, and fishers themselves (Holmes and Lock, 2010)

To address these challenges, Level 1 focuses on:

- Identifying areas of mutual benefit and improvement
- Development of formalised organisational/institutional links that clearly map out objectives
- Agreement on boundaries of activity, ways of working, and management of outcomes

A series of mechanisms (and perhaps transformational processes) will be required to build human and social capital within some new recognised network structure. Agreement and support are essential to co-produce evidence with greater validity and utilisation. These activities are described below as a set of inter-dependent tasks that form the buildings blocks of the co-production process and establish institutional arrangements.

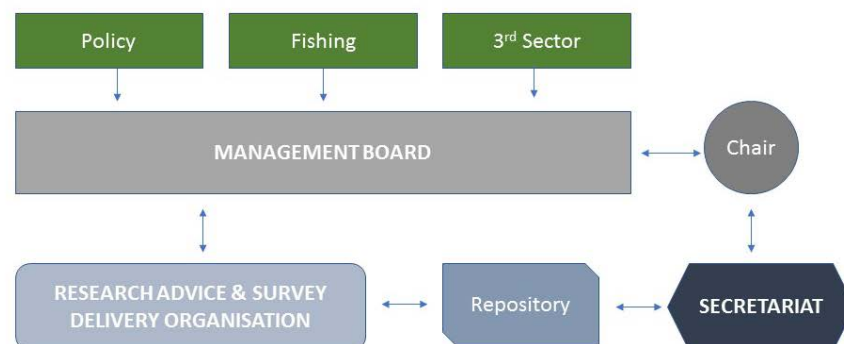*Task 1: Establishing the institutional structure and funding*

Figure 6.4 Organisational structure for survey co-production.

Co-production of a regular social survey of fishers requires a clear institutional and funding framework in order to operate. This task is the most significant as the nature and strength of relationships between those involved will ultimately determine the success of any co-production activity. The organisational structure proposed should be expected to evolve across the first iteration of generating co-produced evidence. It should be considered an embryonic institutional arrangement for testing and improvement. The proposed organisational structure is set out in Figure 6.4, comprising of three main bodies: (i) the management board, (ii) a secretariat and (iii) a research advice and survey delivery organisation.

The **management board** will provide strategic guidance and would comprise representation from three groups in the wider community:

- *Policy:* UK and devolved administrations as well as other statutory actors (such as IFCAs, MMO)
- *Fishing & Industry Representatives:* individuals and organisations (e.g. POs, fishermen's associations)
- *3rd Sector:* the charities and community organisations that work with and support fishers, their families and coastal communities, and environmental NGOs.

Each of these groups would be allocated a third share of the seats on the management board, which is divisible by three, such as 15. Although financial contributions will be sought from all members of the management board, representation will not be determined based on financial contribution financial contribution. The structure of the board will also need to reflect the key stakeholder types: providers, enablers, and users of the data, although these need not be balanced in terms of equal numbers. The management board will need a clear set of guidelines, and transparency regarding operational activity. It will also need to formalise links between organisations; and lines of communication, in order to both reduce reliance on personalities, and to increase a sense of trust across the industry. The structure also suggests an independent chair, ideally someone with considerable experience in convening groups broadly in public service but from a domain of activity that is distinct from fishing or marine management. The role of the chair would be to guide the board through the business of the survey as well as set out strategic goals and work with the board to ensure that the survey remained a viable project.

To support the work of the board a dedicated **secretariat** would be established to help convene the management board, liaise with the survey delivery organisation, manage contracts, public relations and communications for the survey, and perform maintenance of the data repository of the survey. The secretariat would likely sit within an administrative body, but would include individuals from academia and the fishing sector where appropriate. Members of the secretariat would not, however, sit on the management board itself.

The **research advice and survey delivery organisation** would be the social science research organisation contracted to undertake the survey. It is not suggested that the administration of the survey is done 'in-house', as in for example the Farm Business Survey, but that a specialist contractor is used to provide the service. There are arguments for the efficiency of such an approach, in that the survey would not have to bear the overheads or employ specialist staff. But it would also ensure that the operational aspects of the survey did not become the purpose of the project, allowing the board and secretariat to focus on the utilisation of the data and its wider purposes. It would also allow the project to change the survey delivery body, as appropriate or necessary, ensuring that it could remain a flexible organisation adjusting to changes in the sector's needs and the context in which it operates. However, it is recommended that the survey delivery organisation be contracted for a minimum of

five years in order to allow institutional knowledge and expertise to be established across several iterations of the survey. This would provide potential capacity to undertake 'sub-projects' relating to the survey (such as those undertaken by the FBS groups) and consistency in data storage and archiving.Researchers from the survey delivery organisation would also provide research advice and expertise to the management board. This would be in a purely advisory, rather than decision making capacity.

In terms of funding, informal enquiries suggested that a pooled model of funding would allow the survey to be supported at the necessary level. There is a clear opportunity for multiple routes of sponsorship including industry, government and the charitable sector, which supports community initiatives, as well as retailers. As part of community development, it may also be possible to raise some income through bolt on surveys or research. In order for it to be regular and to build the necessary confidence the survey will need to be move beyond the framework of being a short-term project and from the beginning will need to be seen as a sustained intervention. To that end it is proposed that the first term of operation set is 10 years, with a periodic review of activity at five years, following successful completion of a one-year pilot (including evaluation). This would involve a commitment of funding for this duration, delivering a one-year pilot to establish the survey, followed by evaluation and further development over the subsequent years. Co-production takes time to build trust, thus a sustained funding stream demonstrates commitment and longevity to the project. A key aspect of the funding model is that funding should be provided across the three organisational groups (policy, third sector and industry) from the outset, to ensure buy-in, responsibility-sharing and commitment from all parties.

Individuals and organisations involved will depend to a certain extent on the nature of the information desired and focus of utilisation, possibly starting with wide group of potential users/providers/enablers:

- Users: Defra, Marine Scotland, DAERA, Welsh Government, MMO, IFCAs, Seafish; fisheries scientists, retailers, environmental NGOs
- Enablers: Producer organisation(s); NFFO; NUTFA; Seafarers UK; Fishermen's Mission
- Providers: Representative of local fishing associations; industry representatives (e.g. processors)

Task 2: Information and scope

A central focus of Task 2 will be to elicit the nature and characteristics about the desired level and extent of social data which could be collected through a survey of commercial fishers. Discussion of issues and data needs can be a key aspect of building collaboration through raising awareness and recognition of similarities in requirements and utilisation. The management board should also check whether areas of interest are already being covered by existing surveys or could be added in (e.g. the Seafish survey). Detailed exploration of data characteristics will be required (e.g. nature, timing, regularity, volume). In addition, stakeholders will need to be clear about sources of information (i.e. who holds the relevant data) and challenges in accessing it.

Agreement on data utilisation (e.g. who owns/manages the survey and the data, who will utilise the data, how and when) will be essential before moving to Level 2. Ideally the data would be co-owned and open access. It will be important to think about this type of delivery model to gain trust and avoid appearing as a top-down survey. Transparency and accountability, along with re-assurance from parent organisations may be necessary in order to develop trust and cooperation. Thus, an initial task for the management board before moving to Level 2 is reaching agreement on (through the MoU):

support for access to data providers, organisational roles, sources of funding, and feedback of results for utilisation.

Activities would include:

- Circulation of mini-questionnaire/on-line survey to relevant target stakeholders – organisational representatives
- Scoping semi-structured interviews and/or focus groups with fishers to identify and/or test survey questions
- Exchange of information among the core group
- Rapid review of existing data and current activity
- Assessment of data quality

Part of Task 1 has in effect already been accomplished through the workshops, focus groups and stakeholder interviews in this project, which have identified key issues of interest where improvements in quality/quantity of data would be useful (see chapter 4). These provide a useful starting point for framing the discussions in Level 1.

Task 3: Agreement on why a survey is required

Task 3 will seek to reach agreement on why a survey is required, and to identify concerns, challenges, opportunities and benefits for the different stakeholders, in addition to securing agreement on the boundaries of action, data needs, ownership and utilisation. This task sets out the 'rules' of engagement for the co-production process - who should be involved, and in what way. Part of this process involves assessing the scale of polarising views, levels of trust, feelings of neglect, and recognising the strength of conflicts. The task involves identifying problems (in relation to social data needs) and then reaching agreement on what is important.

Level 2: Collecting and analysing the evidence

Level 2 is where specific research design takes place (based on identified issues and needs), followed by testing survey instruments, data collection and analysis.

Task 4: Research design

The task involves agreeing the research questions for a regular core survey. It requires decisions on which forms of evidence need to be collected at regular intervals (e.g. to enable time trends to be identified and analysed), and which data can be collected over longer time intervals, or when specific needs arise. The co-production process will enable stakeholders to discuss and agree on which information they would find most useful from a regular 'core' survey, and which data could be added as a one-off 'bolt-on' to the core survey. It also requires identification of the 'providers' (who holds the data required), development of a sampling framework, including how to sample from hard to reach groups (enabling access), and how the information will be utilised and by whom (users). Research design necessarily involves deciding on the most appropriate set of techniques for data collection within the respective time and resource constraints, engaging with stakeholders to determine how to access the information, and assessing the level of support needed by enablers (and local gatekeepers) to access those providing the data.

To build confidence it is suggested that each survey is 'proofed' by a panel of fishers and community members (up to 100) who will get the opportunity to review questions and comment on questionnaire

design. This is not a pilot community but rather, as used commonly now in publishing, a group who are asked to provide feedback on proposals. Such a consultative community would be recruited to reflect the overall profile of the sector, ensuring that, as well as the management board, a broader group have the opportunity to comment on proposals, as well as the survey tool in some detail. This process is not to contradict the role of the management board and secretariat, but rather to provide a forum in which ideas can be tested and to ensure that the wider community are not surprised by any surveys. Liboiron et al. (2018) found that such a process enabled their research to be much more relevant to local needs.

Task 5: Data collection & analysis

Task 5 includes a sampling protocol based on collecting a valid sample from the industry. Given the issues of interest (business decisions, quota issues, views on the industry, barriers and opportunities) the focus of the sample will be boat skippers. However, the actual sample frame will depend on the agreed focus of the questions and whether or not spouses/partners (involved in managing the business) and crew are felt to be important stakeholders. The sample will be stratified (see chapter 5) based on vessel size (<10m/>10m) and geographic location. Sample selection is not just a matter of deciding on margins of error. It also depends on the nature of the data to be collected, resources available (time, finance) and ease of access to providers holding the relevant data. The target population can be defined as hard to reach (i.e. difficult to contact, persuade to take part, and to interview). Sampling will therefore have to take into account availability and location of the target population (depending on species fished, tides, seasonality, and weather) which will vary across the sector (Tourangeau, 2014).

Given the need to establish trust and the difficulties of persuading fishers to engage, a face-to-face approach is likely to be required (although once the survey is established data collection via a smartphone app and/or telephone may be feasible). Support from local stakeholders for identifying and engaging respondents will be crucial. Further details on sampling and data collection are provided in the methodological recommendations in Chapter 5.

Task 6: Agreement

This task is a validation process involving feedback of findings to select audiences and verification of the analysis and interpretation (e.g. possibly through the survey panel outlined in Task 4). Agreement among the organisations playing a role in the co-production process is essential. Allowance should be made for possible additional data collection and/or analysis and interpretation at this stage.

Level 3: Using the evidence

Task 7: Incorporate into decision making

A key element of a co-production framework is the incorporation of evidence into decision making, by different stakeholders across the fishing sector, and demonstration of improvement in addressing issues. Robustness of the framework requires visible utilisation of the evidence provided, not only at policy level, but also utilisation by different stakeholder organisations. The focus of Task 7 is to allow the different organisations that expressed an interest in utilising the information time to assess the utility of the co-produced data and explore its potential for use within their operational activities.

Development of appropriate criteria will be required to enable different organisations to self-assess the utility of the evidence collected and analysed. Some consideration will be required early on in the process to think through how utilisation of the data can be communicated. Active engagement may be required to ensure that where the social data has been considered, and/or contributed in some way to enhanced understanding or improvements to policy, or other forms of activity, it is noted and reflected through some form of dissemination (e.g. an item in a newsletter, reference to value of the survey on a website of in a blog), and that the message gets out to those who have contributed. Most importantly, mechanisms to show that findings are being integrated into local management and are informing fisheries policy will need to be devised and demonstrated.

Level 4: Evaluating the co-production structure

Task 8: Monitor and evaluate effectiveness and utility

There are two elements to the task:

- Evaluate the quality and validity of social data, and its utilisation in government and across the wider fisheries sector.
- Evaluate the effectiveness and value of the co-production process

Evaluation criteria will need to be agreed at the start of the co-production process (Task 1) and if required modified at the start of Task 8. Evaluation will feed back down to Levels 1 and 2 to initiate improvements both to quality of the evidence provided on social issues, and the co-production processes themselves. For example, some organisations may only be partially involved in 'co-production' processes (e.g. perhaps only 'co-planning' what is needed without providing funding or access support), and it will be important to capture the effectiveness of data-based linkages and relationships. Evaluation will also enable identification of problems and issues arising across vertical relationships between providers, enablers and users, pointing out where further action may be required.

7. Conclusions

Through a review of existing evidence and consultation with fishing and policy stakeholders, this report concludes that the existing social evidence base for UK fisheries is limited, with data comprising only a small set of demographic variables. The findings from the policy and stakeholder engagement activities suggest both a need, and an appetite, for a new social survey that will provide evidence of value to both policy and industry stakeholders. However, it should also be noted that whilst we can see real value and support the case for a social survey it needs to be part of wider social research strategy in combination with other powerful social science methods.

Assessment of feasibility

This feasibility study has identified significant gaps in social data that could be usefully addressed through a new social survey of fishers. Through the project, both fishing stakeholders and policy makers recognised the considerable evidence gaps associated with the social issues facing the fishing sector today and highlighted the need for an improved evidence base to inform future policy. A survey offers the opportunity to collect data systematically across a broadly representative sample of the UK's fishing fleet, rather than a case study approach that is common with qualitative evidence. Further, the study suggested that there is interest and willingness from the fishing sector to develop a survey in collaboration with policy makers and researchers with the goal of providing data that could be of value to both policy makers and fishing stakeholders.

Despite the willingness to engage in this way, there are a number of challenges to surveying fishers that have been discussed in this report. The three main broad challenges that would need to be overcome in order to successfully enable a co-produced survey to be developed are: achieving representativeness of the data across the sector; building trust between actors engaged in the co-production process; and agreeing the nature and type of data to be collected. The first challenge will be achieving a dataset that cuts across the heterogeneity of the sector and overcomes the difficulties of accessing a hard-to-reach population. However, by co-producing the survey with fishing stakeholders it is anticipated that **this can be achieved** by those in the sector having a stake in the design and deployment of the survey and acting as gatekeepers across the different fleet segments. The second challenge is building trust between policy makers and fishing stakeholders; a process that takes time and commitment from all parties. Again, the co-production process is designed to facilitate this by ensuring sufficient engagement activities during the early stages and through the establishment of appropriate, equitable and transparent institutional structures. The third challenge is agreeing the nature and type of data to be collected via the survey. As the study has shown, policy makers and fishing stakeholders are likely to have different data needs, but through participation in co-design it is anticipated that consensus could be achieved for most issues in the core survey, supplemented by additional 'bolt on' questions to address topics of interest for particular groups.

Without a robust co-production framework for the design and management of a new social survey of fishers, the findings from this feasibility study suggest that achieving a dataset of social evidence that is representative of the fishing sector will be difficult, as many fleet segments are likely to be hard to reach. Despite the aforementioned challenges, achieving a broad understanding of fishers' perceptions, attitudes, values and behaviours across the diversity of the fleet **is crucial for the inclusion of appropriate and effective social issues in fisheries policy** that support the stewardship and sustainability of marine resources while allowing fishing industries to thrive. It is our recommendation that the most effective approach to achieving this is through Defra, and other

governmental bodies, working with fishing stakeholders to co-produce an appropriate social dataset collaboratively.

Next steps – towards a pilot

The next steps in realising a co-produced social survey of fishers would be a pilot of the co-production framework in one or more case study locations to test and refine the approach, along with securing short- and medium-term funding. For the pilot, it will be necessary for Defra to take a leading role in the establishment of appropriate institutional arrangements, providing financial support to test the process, and evaluating the outcomes. However, in order to obtain sector engagement the process would require transparency, accountability, and a sharing of responsibility in terms of survey design, data collection, analysis, and utilisation of the evidence base created. It would also be important to explore how coordination of a co-produced survey might work across different management bodies.

Figure 7.1 illustrates a proposed arrangement for a one-year pilot study, based on stakeholder representation in a 'social survey co-production forum', as a precursor to the more formal institutional arrangements proposed in the framework. As the key funding and administrative support body of the pilot study Defra could set the boundary rules (perhaps in conjunction with sector interests) enabling a greater degree of control over the objectives and delivery of the pilot study. The forum would include representatives from identified stakeholder interests and from the organisation assigned to design and carry out the survey.
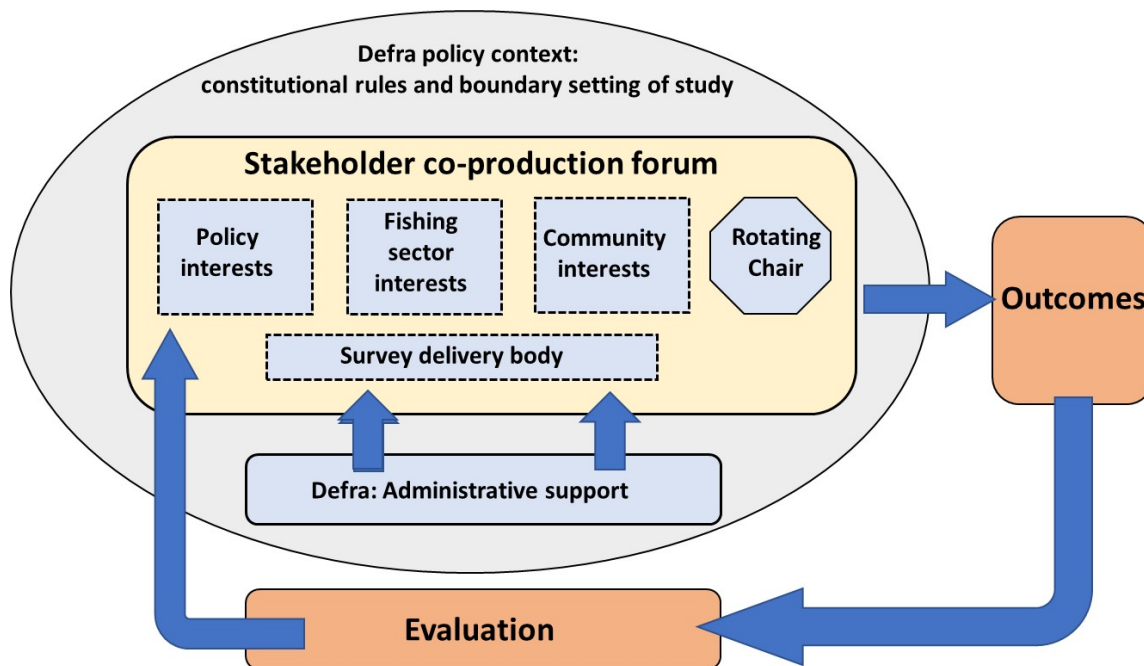
Figure 7.1 Potential institutional arrangements for a co-production pilot study.

One option to assist with stakeholder engagement and in building social capital in the pilot is to have a (3-monthly) rotating chair rather than having one organisation chair all the meetings (although the logistics of this will have to be carefully considered/managed given the time frame of the proposed

pilot). Evaluation of outcomes, in terms of both social data and the co-production process itself, would feed back into the forum, perhaps with added emphasis on institutional arrangements and processes through some form of continuous evaluation. Adequate time is required at the end of the pilot study to analyse outcomes and explore the challenges and opportunities emerging from co-production processes, as well as to consider issues pertaining to the survey content and structure.

Recommendations emerging from the pilot will be made in conjunction with stakeholders and will be used to refine the survey approach, the co-production process and the institutional structure going forward.

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Appendix 1: Methods

Evidence review

The aim of the evidence review was to (i) better understand the scope and purpose of existing surveys of fishers, including sampling and data collection methodologies; and (ii) assess the challenges of surveying hard to reach populations and identifying potential solutions to ensure improved representation across the diversity of the UK commercial fishing fleet. Thus, the focus for the search was two-fold: (i) grey literature and academic literature of **existing surveys of commercial fishers**; and (ii) **academic and grey literature relating to hard-to-reach or hidden populations** (e.g. migration studies, groups with literacy problems).

The criteria for the evidence review is outlined in Table A1. For identifying existing surveys of fishers, the review was undertaken using Elsevier Scopus, Google, AGRIS and the EU Data Collection Framework; for literature on surveying hard-to-reach groups, Elsevier Scopus and Google was used. Given the limited time period for conducting the search and analysis, the search was restricted to the period 2002-2018. While the focus was primarily on the UK, international evidence was also included. For evidence on surveying hard-to-reach populations, inclusion criteria included restricting the search to those studies where the hard-to-reach population had characteristics similar to fishers, such as geographically dispersed or remote communities, the socially isolated, those working at sea and those with low literacy levels.

Table A1 Search parameters for evidence review.

Criteria	Fisher Surveys	Hard to reach populations
Dates included	2002-2018 (i.e. 2002 Reform of CFP to present)	2002-2018
Search engines	EU Data Collection Framework; Elsevier Scopus; AGRIS; Google	Elsevier Scopus; Google
Search terms	"fisher" (or fishers, fishermen) AND "survey"	"surveying" (or researching, accessing, sampling) AND "hard to reach" (or hidden populations)
Geographical scope	UK + international	UK + international
Languages	English	English

Initially, 81 documents were identified, 43 relating to surveys of fishers, and 38 relating to hard-to-reach populations. Four members of the research team reviewed the abstracts or summaries of these documents to screen for relevance to the project's objectives. As a result, 17 documents were removed from the database, leaving 28 'fisher survey' documents, 4 other fisheries-related documents and 32 'hard to reach' documents. A summary of the evidence identification process is included in Figure A1.
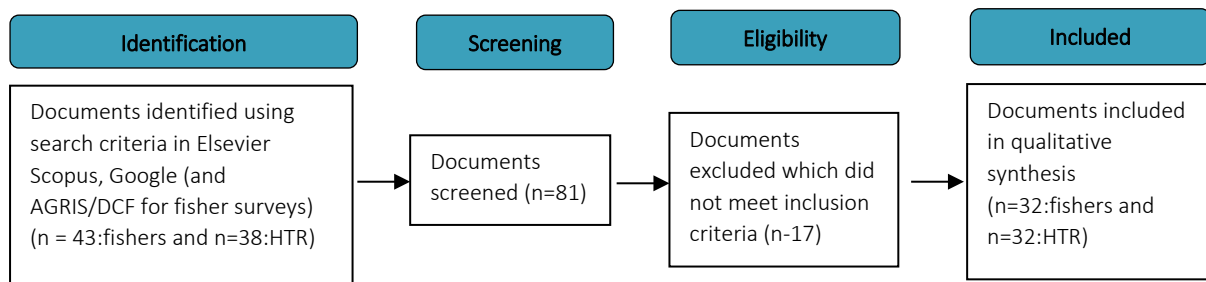
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Figure A1 Document identification process.

Each document was reviewed and summarised in an Excel spreadsheet to capture key data. A protocol was developed to ensure consistency in the analysis by three team members. Each paper was analysed according to the criteria outlined in Figure A2. For fisher surveys, criteria included the context for the survey in terms of geographical scope; who funded it; the purpose of the survey (to inform policy or basic research); the scope of the survey (i.e. what data was it collecting) and survey frequency; the sampling approach; methods; analysis and the outcomes of the survey. For surveys that targeted hard-to-reach groups, the literature criteria included the target population, methods used, and the challenges and solutions for surveying hard-to-reach groups. Our evidence search identified 32 documents that met the search criteria for hard-to-reach populations. Nineteen were from peer-reviewed academic journals, and the remaining were reports and online sources. Eight were from the USA, 3 from Australia, 3 from the UK, 2 from Canada and one each from Ethiopia, sub-Saharan Africa, Spain/Argentina, Czech Republic, Brazil, Europe, Mexico and Russia. The hard-to-reach groups surveyed in these studies included the homeless, sex workers, nomadic shepherds, conflict affected, immigrants, drug users, refugees and asylum seekers, gay men, middlemen in fish trading, sexual abuse victims, ex-army, migrant workers, socially-disadvantaged groups, older divorcees, gypsies, children in care, prisoners, BME groups and people with learning difficulties.

FISHER SURVEYS

Context of fisher surveys
- Geographical scope
- Funder
- Scope of survey (e.g. employment, attitudes, demographics etc.)
- Survey frequency
- Survey purpose (informing policy, basic research)

Sampling
- Sample size
- Source of sample
- Target population (e.g. skipper, crew, owner)
- Inclusion of rare groups

Methods
- Data collection approach (e.g. face-to-face, online)
- Use of incentive

Analysis method

Survey outcomes
- Benefits
- Limitations

HARD TO REACH GROUPS

Target HTR population
- Why is population HTR?

Challenges for surveying HTR groups

Solutions for surveying HTR groups

Methods
- Data collection approach (e.g. face-to-face, online)
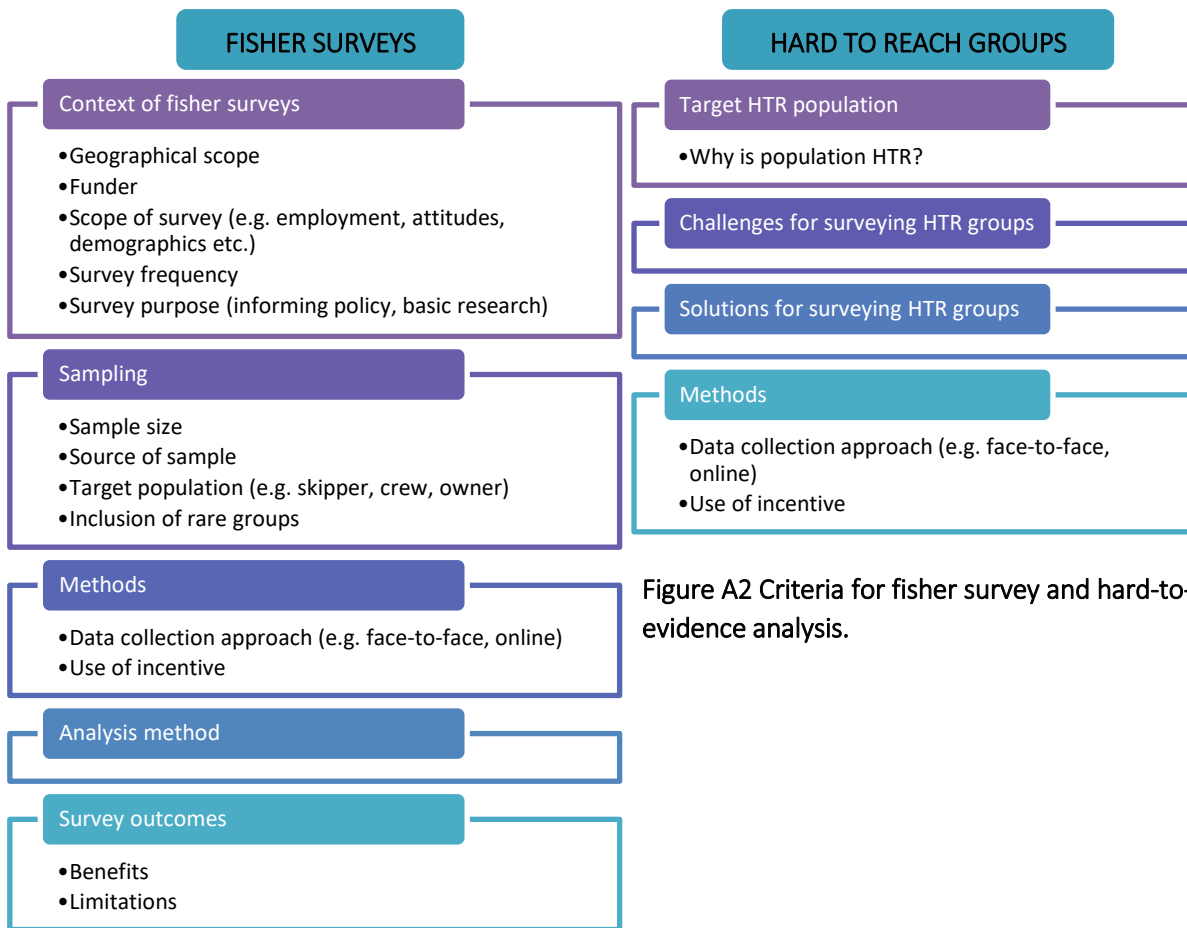- Use of incentive

Figure A2 Criteria for fisher survey and hard-to-reach evidence analysis.

Each document was read through and the relevant information for each criterion was recorded in the spreadsheet. A matrix was constructed to summarise the data from the spreadsheet and used to describe the findings according to the review criteria.

Description of evidence reviewed

In total, 32 papers and reports met the criteria and were reviewed according to the protocol for evidence on existing surveys of fishers. Of these, 20 were from peer-reviewed academic journals, and 12 were reports. The studies were from a wide range of countries (see Figure A3), with 18 from UK, 10 of which related specifically to Scotland, 2 to Wales, 2 to Northern Ireland and 4 to the UK more broadly. The majority of studies took a regional (12) or national (12) approach, 3 were international and 1 focused on Europe. Most of the evidence related to basic research, with only seven of the studies having a specific focus of informing policy.
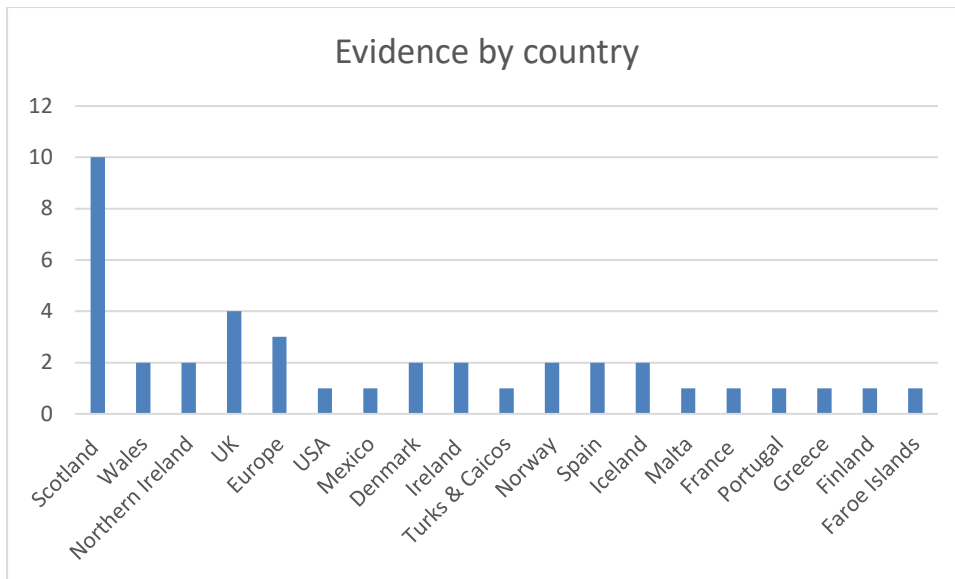
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Figure A3 Evidence by country.

Key informant interviews

Eleven interviews were conducted with key informants in November 2018. Eight of the interviewees were industry stakeholders representing fishers' associations and producer organisations in England, Wales and Northern Ireland. A further two interviews were conducted with those responsible for existing large-scale fisher surveys in the UK, Seafish and Seafarers UK. The final interview was with a representative of the Farm Business Survey. The objectives of the interviews were:

- to identify what social issues fishing stakeholders perceive as important
- to assess whether stakeholders feel existing evidence and policy addresses these issues
- to explore how a new social survey might be of value to the fishing sector
- to identify the barriers and solutions to surveying fishers
- to learn lessons from existing surveys (of fishers and the Farm Business Survey) that may be relevant in the design, sampling and data collection of a new survey

The interviews were conducted by telephone by four of the research team. Each interview was recorded and detailed summary notes were prepared by the interviewer.

The summary notes were analysed using the Qualitative Data Analysis (QDA) software NVivo version 11. Text fragments from each summary note were coded according to the content and context of the fragment, in a process of open coding. Relationships between the open codes were then identified and codes were grouped together into eight higher-level thematic codes and were used to aid interpretation of the data:

- Identification of social issues
- Existing evidence
- Social evidence needs
- Benefits of survey
- Challenges
- Potential for co-production
- Survey implementation
- Use of data

Stakeholder workshops

The aim of the workshops was to collect stakeholder input on the development of a methodology for designing and co-producing a new social survey of fishers. Two workshops were held, in Bristol on 25 January 2019 and in Edinburgh on 30 January 2019. Specific objectives were:

- To bring together fisheries representatives, researchers and government researchers to determine the potential for a co-produced social survey of fishers
- To identify key social issues in fisheries
- To identify what social data would be of value to the industry and policy makers
- To determine who should be involved in the design, delivery and analysis of a social survey, and how?
- To determine who should be surveyed and to identify the challenges of surveying fishers

Participants

Initially a long list of potential participants was assembled, including fishing stakeholders from across England, Wales, Scotland and Northern Ireland. These stakeholders largely consisted of representatives of local and regional fishers' organisations identified through the research team's contacts, as well as contacts of the project's steering group. In addition, fisheries social researchers, organisations who survey fishers, local fisheries management organisations (e.g. IFCAs, IFGs) and Fisheries Local Action Groups (FLAGs) were invited.

Invitations were sent out by email in mid-December. Twelve participants registered for the Bristol workshop and twenty-two registered for Edinburgh, although there were several last-minute cancellations, with a total of 10 attending Bristol and 14 attending Edinburgh. Table A2 outlines the background of the participants.

Table A2 Profile of workshop participants.

Workshop	No. participants	Organisation's represented
Bristol	Total: 10 England: 8 Wales: 1 N. Ireland: 1	• Northern Ireland Fish Producers Organisation Ltd (NIFPO) • Coastal Producer Organisation • National Federation of Fishermen's Organisations (NFFO) South West • North Devon Fishermen's Association • Hastings Fishermen's Protection Society • Welsh Fishermen's Association • Fishermen's Mission • Seafarers UK • Seafood Alliance • Shell fisherman
Edinburgh	Total: 14 Scotland: 11 England: 3	• Fishing company • Regional Inshore Fisheries Groups x 2 • Orkney Fisheries Association • Fisheries Local Action Groups x 4 • North East of Scotland's Fishermen's Organisation (NESFO) • Academics x 3 • Seafish • Marine Reserve manager

Workshop design

The workshops were designed around three main activities:

- Activity 1: Identifying and prioritising social issues
- Activity 2: The scope for co-production
- Activity 3: Working together in practice

Participants were divided into groups of 5 or 6 and a member of the research team facilitated each group.

Activity 1: Identifying social issues

In their small groups, participants were asked to identify and discuss the social issues faced by the fishing industry and fishing communities. A mapping exercise was used to facilitate the identification of issues, with participants asked to consider social issues broadly across the themes of 'relationships', 'attitudes/behaviours' and 'operational context', at a range of individual, community and national scales (see Figure A4). Issues were written on Post-It© notes and placed on the map.
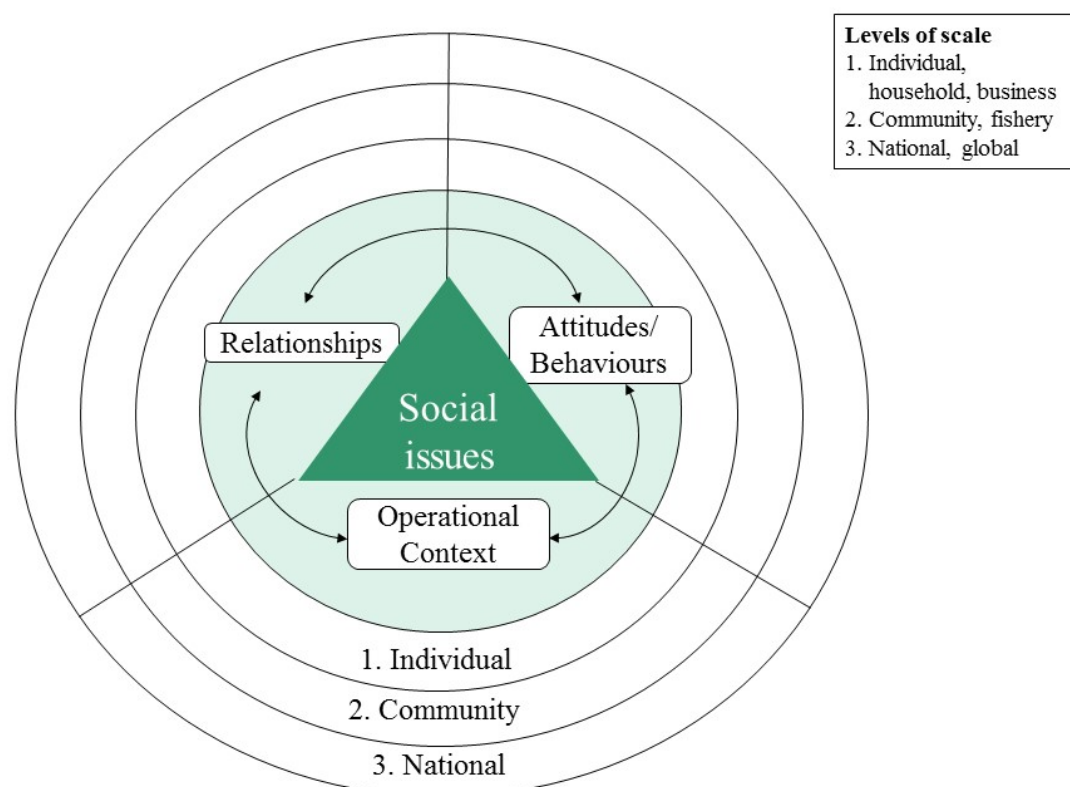

Figure A4 Mapping exercise for identifying social issues in fisheries.

The themes were not intended to constrain participants, but to act as a prompt to suggest the contexts within which social issues might be understood. For instance, the 'attitudes/behaviours' themes related to what fishers think (their attitudes, perceptions, values, etc.) and what they do. 'Operational context' reflected the physical environment (e.g. harbour infrastructure) and social/economic/institutional context in which they operate. 'Relationships' related to who they engage with through their social networks (e.g. co-governance, fishers' organisations, community). Social issues identified that did not fit into any of the themes were placed outside of the map.

Participants were asked to place the identified themes onto the map on a range of scales. The 'individual' level was issues that relate to individual fishers, their household or business; 'community' was issues relevant at the community scale; and the 'national' level referred to issues at a national, or even global, scale. The purpose of this was to encourage participants to think about issues at a range of scales, and not just their homeport.

The second part of the exercise involved prioritising the identified social issues in the context of social data needs. In their small groups, participants were asked to sort the identified social issues onto a matrix reflecting the degree to which they felt the issue was important and the degree to which they felt information was already available (see Figure A5).
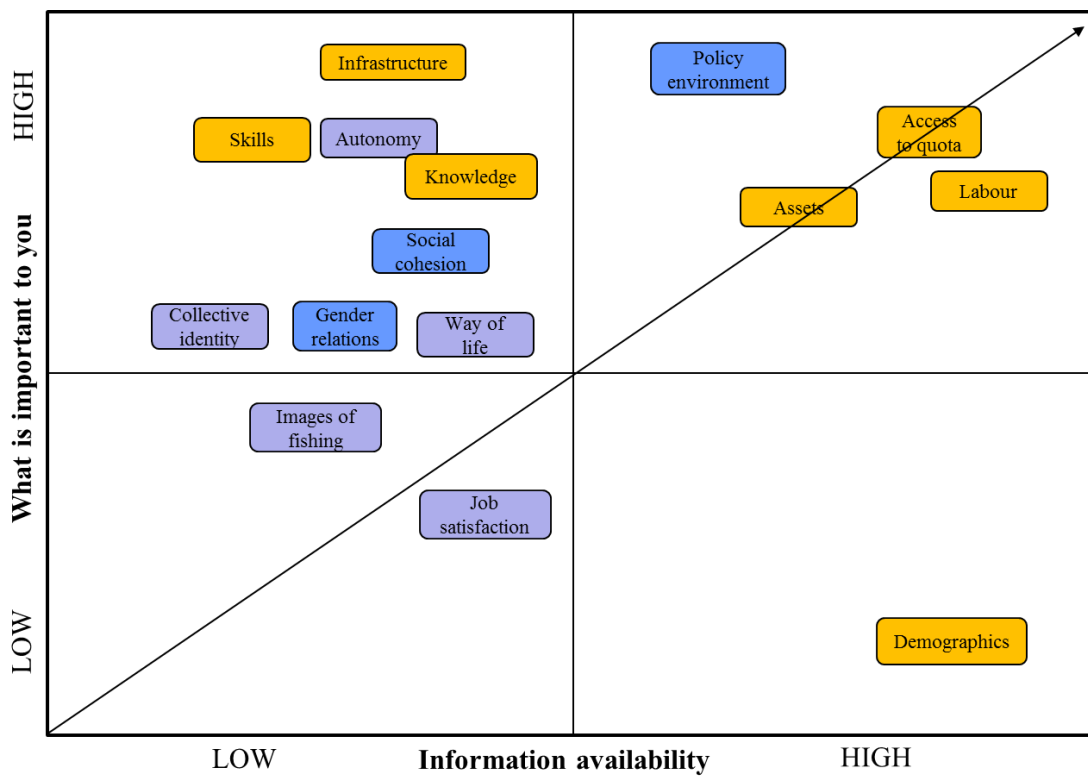
Figure A5 Example matrix for prioritising social data needs (social issues on matrix are for illustration purposes only).

The final part of the exercise was approached slightly differently in Bristol and Edinburgh. In Bristol, each group was asked to score the extent to which each of the social issues are important to fishing stakeholders and policy makers. Participants found this exercise challenging as they felt they could not answer what was important to policy makers. The exercise was adjusted for the Edinburgh

workshop, with groups simply asked to select the six most important social issues that they would expect a new social survey of fishers to include.

During the plenary session at the end of Activity 1, each group summarised their discussion and outlined their priority social data needs.

Activity 2: The scope for co-production

Activity 2 sought to determine the feasibility of undertaking a co-produced survey by exploring whether such a survey would be of interest to the sector, how it might be of use, what level of participation would be required by fishing stakeholders and how fishing stakeholders, policy makers and researchers might work together to co-design and deliver a social survey.

To set the context for the activity, co-production was defined as putting principles of empowerment into practice by working 'with' communities, offering communities greater control over the research process and providing opportunities to learn and reflect from their experience (Durose et al., 2011). Holmes (2017, p. 1) considers co-production as "collaboration between researchers and others with a stake in a project in its governance, priority-setting, conducting of research, and knowledge translation."

Drawing on 'Arnstein's Ladder of Citizen Participation' (Arnstein, 1969) which outlines participation from low (non-participation) to high (citizen control), the research team developed a simplified ladder of participation for the purposes of the workshop (Figure A6).

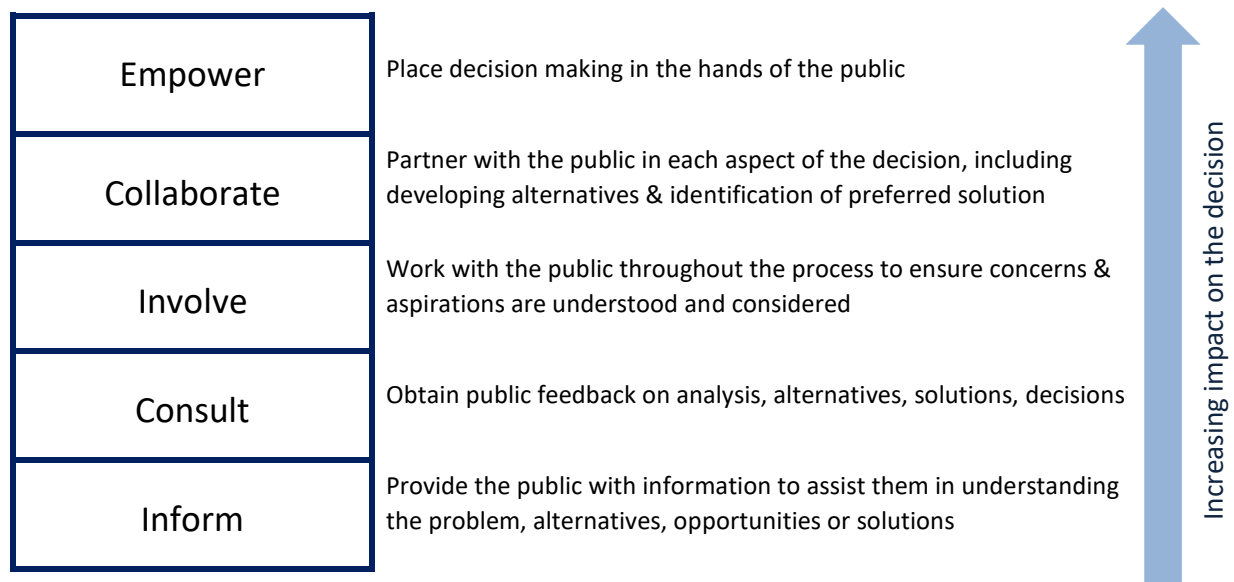|		
Empower	Place decision making in the hands of the public	
Collaborate	Partner with the public in each aspect of the decision, including developing alternatives & identification of preferred solution	Increasing impact on the decision
Involve	Work with the public throughout the process to ensure concerns & aspirations are understood and considered	
Consult	Obtain public feedback on analysis, alternatives, solutions, decisions	
Inform	Provide the public with information to assist them in understanding the problem, alternatives, opportunities or solutions	

Figure A6 Ladder of public participation and co-production (developed from Arnstein 1969).

Activity 2 consisted of three questions, discussed in small groups and then in plenary:

- **Why?** Would a 'co-produced' survey be of interest to the sector? If so, how might it be of use and to whom?

- **What?** Which level of the participation ladder do you think would be required in order to 'co-produce' a new social survey? What sort of resource input would this need from all involved?
- **How?** How might fishing stakeholders, policy makers and researchers work together to co-design and deliver a social survey? Which fishing stakeholders should be included in the design/delivery and how?

Activity 3: Working together in practice

The aim of this session was to explore how we might go about gathering data in practice. Each group was asked to focus on two of the social issues identified as priorities in Activity 1. The goal was to begin to address how data on social issues could be collected and from whom. For each issue addressed, the following questions were discussed:

- What information is needed?
- Who should we survey to get the information?
- How often do we need to access the information?
- Do we want to be able to see changes over time?
- Do we want to be able to compare different places and/or sectors of the industry?
- What is the easiest way of obtaining good quality information?
- How many people do we need to include?
- How do we ensure high response rates?
- Are there any groups within the sector that are likely to be hard to reach?
- How do we balance the costs of data collection against quality of data?

Policy focus groups

Two one-hour policy focus groups were held on 4 March with a total of twelve Defra/MMO policy or evidence staff (each participant joined in one focus group, with two attending both). The aim of the focus groups were to identify and prioritize the social data needs for policy making, and compare these to the social evidence priorities in the stakeholder workshops. The first part of the session was an open discussion about the social data needs that addressed the following questions:

- What do you need to understand about fishers and their communities?
- What information would be useful for you to have about fishers?
- At what scale do you need information? (e.g. individual, community, national/global)
- How would you use this data?
- What form of evidence do you need (e.g. quantitative and/or qualitative) and how might you use it?

The second part of the session asked participants to rank the issues they had identified onto a matrix (Figure A7) according to the extent to which they felt data was already available and the utility of data for informing policy change.

Figure A7 Matrix for prioritising social evidence in policy focus groups.

Analysis

The data from the stakeholder workshops and policy focus groups was analysed by collating both sets of data into matrices (see Figure A7) to describe respondents' perceptions of the utility of data on social issues compared to the availability of existing useable data. A 'Red Amber Green' system was then applied on both variables (utility of data and availability of data) to determine key priorities that might be explored through a new social survey.

Appendix 2: Literature reviewed

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A collaboration between