

# WORKING GROUP ON SOCIAL INDICATORS (WGSOCIAL; outputs from 2023 meeting)

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## WORKING GROUP ON SOCIAL INDICATORS (WGSOCIAL)

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## i Executive summary

The Working Group on Social Indicators seeks to improve the integration of social sciences in ICES Ecosystem Overviews and Integrated Ecosystem Assessments through the development of culturally relevant social indicators.

To advance progress on this, WGSOCIAL has broadly discussed the context of the social dimension of fishing. This has led to coordination with other working groups within ICES and outside ICES with the Scientific, Technical and Economic Committee for Fisheries Expert Working Group Social and with the Regional Coordination Group on Economics Issues. WGSOCIAL develops methods for qualitative and quantitative approaches. It has also continued providing input to the updating of ecosystem overviews finalising those of the Celtic Seas and North Sea. WGSOCIAL has advanced work on the definition and context of trade-offs and trade-off analysis in the social context of fisheries.

To assess social and cultural significance of commercial fishing, WGSOCIAL members have advanced case studies in a number of ICES member countries: two regions in Spain, Portugal, the Netherlands, Sweden and Norway. Each case study tackles a different approach with a different context. In addition, WGSOCIAL has advanced work on the topic of what a fishing community is and how the definition can change in different contexts. Lastly, WGSOCIAL has developed a database of social and economic indicators for evaluating fisheries management and identified a comprehensive list of categories and sub-categories of social and economic indicators that could be used to structure the selection of social indicators that inform fisheries managers. As a next step, WGSOCIAL will identify key social indicators and data gaps for selected ICES member countries with recommendations for approaches to close the gaps.

To support integrated socio-ecological evaluations in ecosystem-based management, WGSOCIAL has contributed to the development of work on the impacts of wind farms on commercial fishing activities. This work will continue in collaboration with WGECON, with whom several parallel terms of reference (ToRs) are shared. WGSOCIAL decided to transfer to the new ICES Human Dimension Steering Group.

## ii Expert group information

<b>Expert group name</b>	Working Group on Social Indicators (WGSOCIAL)
<b>Expert group cycle</b>	Multi-annual fixed term
<b>Year cycle started</b>	2021
<b>Reporting year in cycle</b>	3/3
<b>Chair(s)</b>	Amber Himes-Cornell, Italy
	Marloes Kraan, the Netherlands
<b>Meeting venue(s) and dates</b>	10-11, 15, 17-18 June 2021, online meeting (37 participants)
	9-10 and 16-19 May 2022, online meeting (36 participants)
	28 August – 1 September 2023, Copenhagen, Denmark (33 participants)

# 1 Progress of work per ToR

## 1.1 ToR a - Identify current social science work and future needs while making connections to relevant international social science organizations

ToR a is ongoing, as the WG will continuously reflect on what social science work might be relevant in ICES context, as well as make and maintain contact with relevant international social science organizations.

WGSOCIAL is an interdisciplinary community of practice within ICES that works on both a general and a place/space specific understanding of the social aspects, concerns and knowledge of marine resource use and governance. WGSOCIAL aims to help integrate social science knowledge in the current management and advice system by contributing to and improving the ongoing processes (understanding, approaches and methods) at ICES (i.e., the IEAs and ecosystem and fisheries overviews). WGSOCIAL shares knowledge, methods, indicators, concepts, provides support, and links with other expert groups within ICES (see ToR e) and outside ICES (ToR a). Contact with these organizations is maintained mainly via WG members' connections to and participation in each working group organization.

The European Union (EU) Commission's Directorate-General for Maritime Affairs and Fisheries (DG MARE) has shown continued interest in the work of WGSOCIAL in this time period. The development of social indicators is of particular relevance for the European countries and the European Commission. First, Raymond Maes, later Antonios Stamoulis and since 2023 also Joan Roussouliere-Azzam (DG MARE) have been present as observers to the WGSOCIAL meetings to help WGSOCIAL be as relevant for policymakers as possible. They have given yearly updates on developments on the social dimension in the Common Fisheries Policy (CFP) context.

DG MARE has been pursuing work with the Scientific, Technical and Economic Committee for Fisheries (STECF) on the development of social indicators to be used in the analysis of socio-economic reports (specifically on methodology and validation framework), as well as the development of National Fisheries Profiles (NFPs) and analysis of national methods of allocation of fishing opportunities (including the potential use of social criteria for this allocation). An EU-wide foresight project is also being launched in the fall of 2023 to forecast the crucial role of fishers in society and identify trends, opportunities and threats that determine the attractiveness of the fishing sector. The latest STECF report (22-14) puts particular emphasis on the need to coordinate work across all bodies (STECF, RCGECON and the WGSOCIAL), specifically relating to the development of social indicators.

The findings and contributions from WGSOCIAL played a pivotal role in informing discussions and shaping recommendations of the STECF-Expert Working Group on Social Data meeting in 2022 (see ToR b for details). Likewise, recommendations included in the STECF report were aligned with future WGSOCIAL developments (e.g. regarding fishing communities, to include information on ports national databases in the national profiles) and foster collaborative endeavours (e.g. the establishment of coordination between the ICES Data call proposed by WGSOCIAL and the EU Multi Annual Programme (EU MAP) data calls). To further this, WGSOCIAL also liaised with the RCGECON by participating in the meeting in 2023.

In 2021, ICES launched a process to formalise how stakeholders are engaged within the organisation, acknowledging their central role in contributing to the scientific basis and societal context of advice. The Workshop on Stakeholder Engagement Strategy (WKSHOES) in 2021 set the basis

for the Stakeholder Engagement Strategy (ICES 2023c), followed by the Workshop on Implementation of Stakeholder Engagement Strategy (WKSTIMP) in 2023 which identified the practical actions necessary to achieve the strategy's vision and goals. WGSOCIAL has contributed through the process, supporting the debate and delivering presentations for reflective thinking in defining actions and designing monitoring and evaluation tools. In addition, WGSOCIAL supported the IEA groups in exploring how best to engage with stakeholders within the development of the EOs (2023).

In its second term, WGSOCIAL maintained connections with a number of relevant entities outside ICES, including:

- The Centre for Maritime Research (MARE) is an interdisciplinary social science organization interested in the use and management of marine resources. [www.marecentre.nl](http://www.marecentre.nl)
- The Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES) is an independent intergovernmental body which was established to provide policymakers with scientific information about the current state of global biodiversity, ecosystem services, and how they benefit people. <https://ipbes.net/>
- The Society for Applied Anthropology (SfAA) is a professional organization that promotes the integration of social and behavioral sciences for better understanding human behavior and current social issues. <https://www.appliedanthro.org/>
- The North Pacific Marine Science Organization (PICES) is an intergovernmental scientific organization that helps to promote and coordinate marine research in the northern North Pacific Ocean and adjacent maritime areas. <https://meetings.pices.int/about>
- #marsocsci is a social media outlet for those interested in marine social science to share information, stories and events with a broad community. The Marine Social Sciences Network is an interdisciplinary and international network working to bring together a growing community and facilitate knowledge exchange between diverse stakeholders from across the marine and coastal sector. [www.marsocsci.net](http://www.marsocsci.net)
- Scientific, Technical and Economic Committee for Fisheries (STECF) was established by the European Parliament to give advice to the EC with regards to implementation of the CFP. Two working groups have been held to develop social indicators. [https://ec.europa.eu/fisheries/partners/stecf\\_en](https://ec.europa.eu/fisheries/partners/stecf_en)
- Organisation for Economic Co-operation and Development (OECD) – Every two years the OECD publishes statistics related to economic and social indicators of the fisheries sector across 37 member countries and other key partners. <https://www.oecd.org/>
- Coast action: The Action, Oceans Past Platform (OPP), aims to measure and understand the significance and value to European societies of living marine resource extraction and production to help shape the future of coasts and oceans. <https://www.tcd.ie/history/opp/>
- COST action: Rethinking the Blue Economy - Socio-ecological impacts and opportunities aims to assess the impact of the blue economy on coastal societies as well as to explore opportunities deriving from innovations and potential synergies between established and emergent marine activities. <https://www.cost.eu/actions/CA22122>
- Integrated Marine Biosphere Research (IMBER) - Best practices in integrating natural and social science data in marine research. The aim is to develop a new database with case studies showcasing good practices in integrating natural and social sciences.



## **1.2 ToR b - Identify culturally relevant social indicators, data gaps, data collection needs and research including institutional needs and training**

### **1.2.1 Social Indicators in fisheries management**

A subgroup of WGSOCIAL members are undertaking a systematic literature review of the use of social and economic indicators in fisheries management and decision making. The aim of the review is to identify literature that documents the use of social and economic indicators in specific case studies so that we can ultimately create a database of what indicators have been used, how they have been used and in what context. This database will then be used to identify a common set of core social indicators that could be used in fisheries management, including in the ICES EOs and Fisheries Overviews. A total of 358 publications have been identified as likely fit for purpose. A subset of WGSOCIAL members have done a full review of these publications to systematically capture the same information from each of them, including the geographical region where the indicators are used, what types of indicators are used and the methods to generate them, the management objectives, data being used, and whether trade-off analysis has been conducted. A publication is expected to be published in 2024 and will be followed by a peer-review publication focused on the use of social indicators to evaluate fisheries management in ICES member countries, including a gap analysis to identify social concepts that are not regularly assessed and to propose potential indicators that could be considered.

### **1.2.2 Integrating social science into the ICES Ecosystem Overviews**

A key element of ToR b is to identify culturally relevant social indicators for use in ICES EOs, which provide a description of a defined ecosystem (e.g., the Celtic Seas Ecoregion), including its ecosystem components and relevant major ecological events, trends and pressures, with fishing identified as a pressure. The EOs were identified by the Strategic Initiative on the Human Dimension (SIHD) as one of the avenues through which social science information can be incorporated into the ICES advice process.

In the first 3-year term of WGSOCIAL, the ICES Workshop on the Design and Scope of the 3rd Generation of ICES Ecosystem Overviews (WKEO3) requested input from WGSOCIAL on what social indicators could be included in future EOs. WGSOCIAL proposed to move towards a social-ecological system framework. While many ICES documents already include such language, it was not yet reflected in the current EOs. New language could explain how human activity contributes to society as well as how human activity can be a pressure on the environment.

Work toward ToR b also included a first step in identifying and mapping the geospatial importance of fisheries to coastal communities and presenting them in the EOs. This provides baseline information, and a starting point for further indicator development and analysis. WGSOCIAL collaborated with the Working Group on Ecosystem Assessment of Western European Shelf Seas (WGEAWESS) and WGECON to develop a proof of concept using the Celtic Seas EO as a pilot study.

WGSOCIAL continued working in collaboration with ICES Integrated Ecosystem Assessments Steering Group chair Debbi Pedreschi, and in particular with WGEAWESS and Working Group on Integrated Assessments of the North Sea (WGINOSE). As a result of this collaboration two EO were updated incorporating Socio-economic analysis of commercial fisheries that are mainly focused on:

- mapping main ports of landings for commercial fleets (above 10m length vessels) operating within the ecosystem region;
- analysis of countries involved in utilising fisheries resourced and their main economic performance indicators, such as value of landings, gross value added and net profits generated as well as employment in terms of full time equivalent jobs; and,
- a short overview of recent external factors impacting the industry in the regions (such as Covid and Brexit).

Two main data sources were used to contribute to the EOs:

- ICES Regional DataBase (RDB);
- STECF Annual economic report data set<sup>1</sup>

More detailed analysis of the methods and data limitations is available in WGECON 2021-23 report. Both EOs are now published on the [ICES ecosystem overviews](#) web page.

### 1.2.3 Role of WGSOCIAL work in STECF

The work of WGSOCIAL has been instrumental for the STECF advances in the operationalization of the social dimension of the CFP:

1. Providing evidence at levels other than national (EU MAP data only available at national level).
2. Showcasing the implications of core definitions (e.g., fishing communities) and pointing the data needs to apply them.
3. Supporting the development of social indicators based on WGSOCIAL systematic literature review, debates on core concepts and running of case studies.

The roadmap for developing social indicators recommended by the Expert Working Group (EWG) on Social Data (STECF-22-14) builds on those findings and proposes four consecutive stages: a scoping exercise with policy-makers and advisory bodies (including Advisory Committees); the development of a conceptual framework; the conceptual methodological and data considerations; and the selection of indicators grounded in the WGSOCIAL systematic review.

WGSOCIAL outputs also informed the identification of critical variables to measure the fisheries' social dimension. Those variables balance relevance with the "reality check" (how feasibility is to use them in the short-term) and should enable temporal and spatial comparison, being applicable at multiple scales. Variables on the domain of working conditions, participation and fisheries behaviour were considered.

Following the request from previous STECF-EWGs (EWG 18-15, 19-03, 20-14), the EWG 22-14 explored how to operationalize indicators for dependence (reliance) and resilience, benefiting from WGSOCIAL outputs for designing the development of indexes.

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<sup>1</sup> Data available through [Economic and Social Analyses - European Commission \(europa.eu\)](#)

### 1.2.4 Social indicator development in the United Kingdom

Colleagues from Defra and Scottish Government are managing the development of the UK Commercial Fishing Social Survey (UK-CFSS), which is an initiative to develop baseline social indicators for the United Kingdom (UK) commercial fishing sector. Progress toward the delivery of the UK-CFSS was presented at the WGSOCIAL 2023 annual meeting. The survey has been co-designed with fishers, policy makers, and members of the third sector from across the UK and a regional trial of the survey is set to run in late 2023. The full delivery of wave-1 of the survey is anticipated in mid to late 2024. WGSOCIAL discussions on social indicators have informed design of the UK-CFSS. A copy of the survey is to be provided to all members of WGSOCIAL when it is finalised later in the year.

Related, the UK's Centre for Environment, Fisheries and Aquaculture Science (Cefas) is conducting work to assess the social vulnerability and fisheries resilience of coastal communities in England with the purpose of providing evidence on the potential social impacts of introducing Highly Protected Marine Areas to coastal communities. The study adopts an indicator approach, based on the method developed and applied by Colburn and Jepson (2012), to assess social vulnerability. The work is on-going (anticipated delivery mid 2024), WGSOCIAL discussions on social indicators will be used to inform the development of the study and indicators used.

### 1.2.5 Training provided by WGSOCIAL

#### ICES training course 'social science methods for natural scientists'

The ICES training course 'social science methods for natural scientists' was developed in 2016 by Maiken Bjorkan and Marloes Kraan, based on its initial creation in the GAP2 project with Marc Dubois. It was first held in 2016 and planned to held in 2020 but due to Covid this was delayed. It has now been planned to be held in January 2024 by Marloes Kraan and Nathalie Steins, who have previously given this course in an adapted way in the Netherlands at Wageningen Marine Research. The course is designed to facilitate "learning by doing." The facilitators provide guidance on the basics of the methods (i.e., interviewing) while participants develop their confidence in using them. Background information (such as the epistemology and ontology of the social sciences) and the underpinning social science theory is also discussed for participants to learn more. Through gaining new skills, participants will be better at working effectively with stakeholders in (cooperative) research projects, as well as having a better appreciation of the strengths of social sciences in fisheries research.

#### DG MARE training

Both in 2022 (21-23 November) and in 2023 (10-12 May 2023), ICES held a course called: Ecosystem Based Management in Practice to DG MARE. In 2023, the training was also open to members of the Advisory Committees. Marloes Kraan and Marta Ballesteros were two of the instructors and gave lectures on the social and governance dimension of ecosystem-based management (EBM).

## Stakeholder engagement in IEA

The IEASG conveyed the need for support in engaging stakeholders through the IEA processes. In April 2023, Debbi Peddreschi, Marloes Kraan and Marta Ballesteros organised an online meeting with eleven members of the ICES Working groups on Integrated Ecosystem Assessment (WGIEA) to: i) gain a better understanding of the IEASG needs; ii) share experiences, knowledge and know-how; iii) raise awareness of the ICES Stakeholder Engagement Strategy (ICES 2023c) and gather insights for its implementation; iv) explore next steps. The output shows a broad spectrum of needs, experience and capabilities across the groups. WGSOCIAL provided some initial toolkits and recommendations. The findings from this IEASG-WGSOCIAL interaction were used to propose pilot actions for the IEASG in the implementation of the stakeholder strategy (WKSTIMP; action 7 WGIEA with the ICES Working Group on the Integrated Assessments of the Norwegian Sea (WGINOR)).

### **1.3 ToR c - Information needed for trade-off analysis of the impacts of alternative management measures on communities and stakeholder groups**

Under ToR c, WGSOCIAL focused on investigating the approaches, methods, tools and information flow needed to provide trade-off analysis of the impacts of alternative management measures on communities and stakeholder groups.

In its second term, WGSOCIAL focused on how to incorporate social aspects into trade-offs analysis to aid decision-making in fisheries management. To do so, in addition to discussions during the annual meetings, a workshop of two half days has been organised in January 2022 to shape a manuscript on this subject. The goal of this work is to provide guidance in advising fishery managers confronted with multiple objectives at different scales (including ecological, social/cultural, economic and institutional). More specifically, this preliminary work aims at providing advice on how trade-off analysis in a social context can contribute to ICES' advice to its member countries. To note that the work has been presented at the ICES ASC 2022 conference.

The workshop's entry point was to help scientists answer the question: "How can social aspects be integrated into trade-off analyses?" The workshop aimed thus to address and provide some answers to this question, by discussing and defining the framework of a manuscript addressing this issue, to serve as a guide for those who want to incorporate social aspects into trade-off analyses in a fisheries decision-making context.

First, WGSOCIAL pointed out why the integration of social and governance aspects in trade-off analysis is important. Then, WGSOCIAL started the discussion around four main types of trade-offs that should be considered : i) trade-offs between objectives (e.g., ecological, biological, economic, social, institutional; for example, what are the consequences of a decision in a fishery with respect to economic objectives of efficiency versus social objectives related to distribution of benefits?); ii) trade-offs between human activities (including recreational, artisanal, industrial fisheries, different fishing segments, etc.; for example, the consequences of devoting a certain area to wind farms or MPAs versus maintaining the area's yield in fisheries; the consequences of a management measure for different fleet segments); iii) trade-offs along a spatial scale (e.g., geographical distribution of impacts of management policies; e.g. distribution of impacts between various countries, fishing communities, fishing segments, MPAs etc.); and iv) trade-offs over time scale (e. g., short versus long-term effects). Note that this list is non-exhaustive, as other types of trade-off exist, such as trade-offs between risk and performance; trade-offs in terms of reversibility (some impacts may be irreversible, hence the importance of studying threshold

effects); trade-offs between governance approaches (e.g. participatory, top-down, input vs output, etc.). It is important to look at who is involved in the trade-offs and where the trade-offs lie in the fishery management process.

With this in mind, WGSOCIAL looked at how social aspects could be incorporated in trade-off analyses across diverse contexts toward sustainable fishery management. More specifically, WGSOCIAL investigated potential social considerations in trade-off analyses for decision-making in five different contexts: a) a fishery is conflicting with an endangered/ protected species, with interventions impacting some fleets more than others; b) a proposed spatial marine activity (e.g., marine windfarms, petroleum developments, marine protected areas) conflicts with fishing activities; c) commercial species distributions change as an ecological response to climate change, and vessels are trying to adapt; d) the total allowable catch for a specific fish stock is allocated between various fishery participants; and e) managing fisheries via quotas or controlling effort.

During the various discussions, it has been pointed out that it is important to look specifically at the 'values' (i.e., what people care about), the distribution of benefits and costs, and what are the social indicators that can be used. This last point is in link with the work carried out by WGSOCIAL in ToR b where WGSOCIAL has conducted a systematic literature review of case studies using socio-economic indicators in fisheries management that will be used to support this trade-off analysis work and other work being conducted by the working group.

In addition, WGSOCIAL has worked with WGECON on discussions around methods and tools for trade-off analysis.

## Trade off analysis work in the United Kingdom

Defra, through supporting UK research council funding and research programmes, is part of the steering group for the research project, 'Resilience of Coastal Communities' (ROCC). An output of the ROCC project is the Marine Planning Trade-off Analysis (MaPTA) tool which is being trialled in fisheries and non-fisheries to identify and appraise trade offs in resilience, well-being and ocean sustainability practices. The MaPTA tool is free to use and can be accessed at the following link [<https://www.smmr.org.uk/funded-projects/resilience-of-coastal-communities/outputs/mapta-demo-video/>]

### **1.4 ToR d - Social and cultural significance of commercial fishing for select regions**

#### Defining fishing communities

Based on the multidimensional concept of fishing community (see ICES, 2021a for the conceptual framework), the development of a methodology to put fishing communities on the map (now used in ICES for the EOs) and the ongoing discussion of case studies (see below), a subgroup of WGSOCIAL will develop a manuscript on fishing communities. During the annual meeting in 2023 an outline was developed. It was decided to explain the process that was taken in the last six years in WGSOCIAL to develop this work: first to define fishing communities as a concept, then to think of a useful application of this in ICES' work, develop that – which was the idea to map communities by making use of landing ports as a proxy, and implement it in EOs. The manuscript will describe what it has delivered and why this is important and end with a discussion including on the limitations and for the discussion, will make use of the case studies.

Tor d is related to Tor b, as some of the social indicators developed in Tor b can be linked to fishing communities and used to measure certain aspects of importance (i.e., the level of well-being, their dependency on fishing). This can be done to describe a certain state, on a regular basis to monitor trends, or used to perform an impact assessment of certain causes of change such as climate or policy. Mapping fishing communities and linking social indicators to them, are important inputs for community profiling, a task that is planned to commence in STECF. The case study of the United States where extensive indices have been developed for coastal communities (see ICES 2021) serves as a source of inspiration.

Next to these applications of a *place based definition* of fishing community, the other uses of the concept (a historical perspective or the community of practice approach) continue to be explored. This is done throughout the three years of this reporting period by discussing different cases.

The work done in WGSOCIAL has been used again elsewhere, for instance in the Netherlands the three perspectives of fishing community were used in a SIA performed in 2022-2023 (see case below) and in the SEAWISE project ([www.seawiseproject.org](http://www.seawiseproject.org)) the method to identify communities based on landing ports will also be used.

The next sections describe the case work that members of WGSOCIAL have worked on and reported on in meetings. These cases can be linked to place based approaches, have a historical perspective or be linked to community of practice approaches, or combine the three elements of the concept for a holistic approach. The evolving case studies enhance understanding of how to create social indicators that are contextually relevant across many countries. Each of the following case studies illustrate different, but related, approaches to recognizing the social and cultural importance of fishing to a social dimension, such as communities, national or regional heritage.

## **1.4.1 Case studies**

### **1.4.1.1 Spain - Galicia**

WGSOCIAL followed the methodology developed by the United States National Oceanic and Atmospheric Association (NOAA) to analyse how fishing engagement relates to social well-being in Europe, starting with the case of Galicia, Spain (see e.g., Colburn et al. 2017). The goal of WGSOCIAL is to develop a standard set of indicators for all ICES member areas, based in the experience of the Galician case using regional fisheries and socio-economic data.

As the primary fishing region of Spain and one of the EU's most fishing-dependent regions, Galicia was chosen as the study's first case (Villasante et al. 2016). Galicia's gross domestic product is significantly influenced by fishing, which is also a significant industry within the EU. About 40% of Spain's fleet, 60% of all jobs in the country related to fishing, and 50% of the catches reported by Spanish vessels fishing in EU waters come from Galicia (STECF, 2020; [www.pescadegalicia.com](http://www.pescadegalicia.com), 2020).

In Galicia, the small-scale fishing industry (vessels under 12 metres) employs over 35,000 indirect workers in addition to nearly 13,000 fishers. More than 80 towns and villages are home to the small-scale fishing fleet, which employs more than 60% of all people working in the fishing industry. In coastal waters, there are about 4,000 small-scale fishing boats in operation (Xunta de Galicia, 2020). This fleet uses a wide range of gear, such as nets, hooks and lines, and traps, to take advantage of a variety of species, the majority of which are not under TACs (Villasante et al. 2016).

Additionally, there is a large-scale fishing fleet that operates in the waters of the European Union, Africa, and South America, harvesting highly valued species like cephalopods, hake, mackerels, and megrim. Historically, the ports of A Coruña, Burela, Celeiro, and Vigo have been home to



ships operating in EU waters; in contrast, Marín, Ribeira, and Vigo have been home to the fleet operating in Africa and South America.

The Galician government's official platform ([www.pescadegalicia.gal](http://www.pescadegalicia.gal)) provided the data on fisheries from 1997 to 2019. Data included the number of fishing vessels (length, tonnage, and fishing power) by port as well as reported landings (volume, value, and average prices) by auction markets (also known as "Lonjas") for about 290 commercial species (fishes, crustaceans, and mollusks). The team also gathered social data for the years 1995–2018 from 123 indicators on the Galician government's ([www.ige.eu](http://www.ige.eu)), at the municipal level. The primary variables needed to analyse the social vulnerability of the coastal communities in Galicia over time were found using these indicators.

To illustrate the significance of fishing activities to a particular community in comparison to other coastal communities in the region, a Fishing Engagement Index (FEI) was computed. Based on the variations between small and large fishing vessels operating out of Galician ports, this index was estimated over space and time.

Based on the fisheries data gathered, the degree of participation of the coastal communities of Galicia in fishing activities and the migration patterns of the fishing community (especially pertinent in Galicia, following a vigorous emigration process in the 20<sup>th</sup> Century) were determined. The results show that coastal communities of A Coruña, Celeiro, Marín, Ribeira, Vigo, and Viveiro showed the highest level of engagement.

The great significance of fishing activities developed outside Galician waters (namely European, African, and South American fishing grounds) unites all these active fishing communities (Villasante et al. 2014). Moreover, coastal municipalities such as Illa de Arousa, Cambados, Cangas, Noia, and Rianxo showed the highest FEI scores, indicating that small-scale fishing is a highly relevant socioeconomic activity in these areas. Women play a crucial role in carrying out shell-fishing operations in the coastal municipalities of Cambados and Noia (Macho et al. 2013). In addition to providing the local population with jobs and economic benefits, small-scale and shell-fishing activities also strengthen community bonds (Pita et al. 2019).

Ultimately, it was discovered that there has been a general decline in the Galician population due to an increasing trend of more deaths than births. Over time, it appears that both kinds of communities—those primarily involved in small- and large-scale fishing—are going through this similar pattern. Nonetheless, we found that FEI scores were typically lower in communities that had steadily declining vegetative growth over time.

The research team has summarised the findings of this study in a manuscript, which is presently undergoing revisions in preparation for submission to a scientific journal soon.

#### **1.4.1.2 Spain - Cadiz**

Ecosystem-based fishery management (EBFM) may prove ineffective in complex socio-ecosystems grappling with the pressures of multi-sectoral activities. In such cases, a more comprehensive approach, such as ecosystem-based management (EBM), becomes imperative. Progressing towards EBM necessitates a blend of ecological and social data, yet numerous European coastal areas are deficient in them.

In Southern Europe (Spain-Cadiz), the SNAPQUIVIR project, titled "Science for nature and people to achieve EBM in the Guadalquivir estuary and the Gulf of Cádiz (Ge-GoC)," is currently in motion. The Guadalquivir estuary plays a pivotal role as a nursery for numerous commercially species, such as sardines and anchovies, which are integral to the region's economy and culture. The abundance of commercial species in the Gulf of Cádiz hinges heavily upon the environmental status of this nursery (Llope et al., 2017; Carvalho-Souza et al., 2019). Nevertheless, the estuary

and its nursery are beset by a multitude of pressures emanating from activities such as fishing, agriculture, aquaculture, mining, and shipping activities. The social system around the estuary is very complex, with diverse stakeholders and sectors vying for access to natural resources.

Despite the availability of extensive ecological data for the Ge-GoC, there have been no studies in the social context. SNAPQUIVIR has stepped in to fill this void by conducting the first social network analysis. This analysis involved personal interviews with 55 stakeholders representing 11 sectors. The analysis has proven invaluable for pinpointing pivotal actors and sectors, unravelling density and homophily trends, decoding power dynamics, understanding alignment relationships, and identifying primary management objectives.

Armed with this newfound knowledge, SNAPQUIVIR is actively facilitating the establishment of a participatory process with stakeholders—an acknowledged and powerful instrument for advancing toward EBM. More specifically, SNAPQUIVIR is collaborating with stakeholders to co-create conceptual models about particular issues. This collaborative effort is instrumental in identifying the trade-offs within the socio-system. In the subsequent phases of the project, there are plans to collectively develop an overarching model encompassing the entire socio-ecosystem. Additionally, this will involve an exploration of potential future scenarios, including the impacts of climate change and participatory management. Ultimately, these conceptual models will be formalized through the application of bayesian belief networks, and the insights gained will be channelled towards informing policymakers about management options.

#### **1.4.1.3 Portugal**

A third key case study for WGSOCIAL is the tradition of fishing and current importance of fishing to livelihoods and well-being in Portugal. It is an integral part of Portuguese culture and society and has long been an economically important activity for many coastal communities (Pita et al. 2015, Pita and Gaspar 2020). The Portuguese fishing sector accounts for 10% of the EU fleet in number and 12% in employment (European Commission, 2020). The fishing sector contributes directly and indirectly to employment and income for many rural coastal communities where there are restricted employment opportunities (Pita et al. 2010).

The small-scale fishing sector is a major component of Portuguese fisheries, due to its extensive national coverage, diversity of gears used, species captured, high number of fishers and other people indirectly involved in the sector, as well as its high social and cultural importance at local, regional and national levels (Gaspar et al. 2014, Pita et al. 2015, Pita and Gaspar 2020). Portuguese fisheries (in the mainland, Azores and Madeira archipelagos) have traditionally been characterized as being artisanal, small-scale, labor intensive, multi-gear and multispecies fisheries. They tend to catch species with a high commercial value and supply fresh fish to the local and national markets (Pita and Gaspar 2020).

Fish is an important component of the traditional diet. Despite the Portuguese fishing sector landing a small proportion of the of the total EU-28 landings (4% in quantity), the Portuguese are the biggest consumers per capita of fishery products in the EU (56.8 kg/person/year), consuming more than double the EU average consumption per capita (24.9 kg/person/year) and the country spends almost six times the value of fish landings importing fish food products (fish, crustaceans and molluscs) (EC 2020, INE 2020).

WGSOCIAL's intent is to create community level indices of fishing participation in Portugal, following the work done in the U.S. and Galicia. As a first step, WGSOCIAL members gathered a time series of fisheries data (1993-2018) for 46 fishing ports, including:

- landings data (volume, value and average prices) by fishing port for all the species (fishes, crustaceans, molluscs),



- number of fishing vessels (length, tonnage, fishing power, age of vessel, etc) by fishing port and by segment of the fleet,
- number of fishers

The next step will be to collect a time series of official social data from 51 municipalities along the Portuguese coast (depending on available resources). Based on the differences between the different segments of the fleet (local and coastal multi-gear, local and coastal purse-seiners, and coastal trawlers) operating from Portuguese ports, WGSOCIAL aims to estimate the FEI which demonstrates the importance of fishing activities to a given community relative to other coastal communities in a region (Colburn et al. 2017).

#### **1.4.1.4 The Netherlands (Social impact assessment)**

The Dutch government commissioned Wageningen University in the Netherlands to describe the socio-cultural value of (marine) fishing in the country and the consequences of recent and foreseen policy changes on Dutch fishing community(s) (i.e., the offshore wind parks, Brexit, the ban of pulse fishing, N2000 areas etc.) (Kraan et al 2023). This study involved three members of WGSOCIAL. Also, the conceptual framework developed in WGSOCIAL to define a fishing community was used. The Dutch study used the approach suggested by WGSOCIAL to first identify fishing communities by using a place-based approach. Once communities are identified, the social and cultural value of fishing can be studied. However, instead of using landing ports as was done for the ICES EOs, ports of registration were used to map fishing communities. Using landing ports as a proxy for the Netherlands would result in for instance the fishing community of Urk to not be identified. Urk has become an inland fishing community due to the damming off of the Zuiderzee (in 1932), turning the sea in a fresh water basin (called lake IJsselmeer). Yet, Urk is a well-known and historical fishing community in the Netherlands, with a large part of the Dutch fleet being from Urk. They study found that ports of registration would work very well in the Netherlands as proxy for fishing communities (unlike for instance in Ireland). Therefore, following the logic of taking the most appropriate proxy to identify communities based on the social and cultural context, port of registration were used in the Dutch study.

The Dutch study revealed that, spread across the six fishing regions identified in this study, there are 44 fishing communities in 34 municipalities (Figure 1.1). By looking at historical data from 1906, it became clear that in the past there were almost three times as many fishing communities, namely 128. Besides this geographical and cultural-historical view of fishing community(s), this study has shown that understanding the concept 'fishing community' as a community of practice is also useful. As part of the study a survey was developed which yielded responses of 241 fishers (both owner operators and crew) and fisher spouses. They can be seen as a community of practice as they have shared experiences and practices linked to fishing. Many fishers in the Netherlands have inherited family businesses and fishing as a practice since childhood.

They share the experience of how tough and dangerous fishing is, everyone knows someone who has not returned from sea. In addition, they share the experience of the influence of 'outsiders' who 'interfere with their work'. They share the pride for the profession as well as the obviousness of it and they sympathise with fishers and their families who have to stop fishing. This was particularly present during this study as the Dutch government opened a decommissioning scheme for which more than 70 vessels had registered. The similarities between survey respondents' answers were often greater than the differences (for instance between men and women or between fishing regions). The survey, next to interviews and regional meetings gave insight into the perceptions of the fishing community in the Netherlands about the impact of all the policy changes on the fleet and fishing community(ies). Thus, this study has shown that all three

dimensions of fishing community (geographical, cultural historical and practice-related) are important (Kraan et al., 2023).

The study also described the social and cultural importance of fisheries in the Netherlands. Besides fishing being an economic activity resulting in trade, and providing employment, income and food - it also contributes to the social well-being of fishermen. Fishing is a way of life and is important for the identity of fishermen and their families. Fishing is an historical activity in the Netherlands and has taken place from a number of fishing communities.

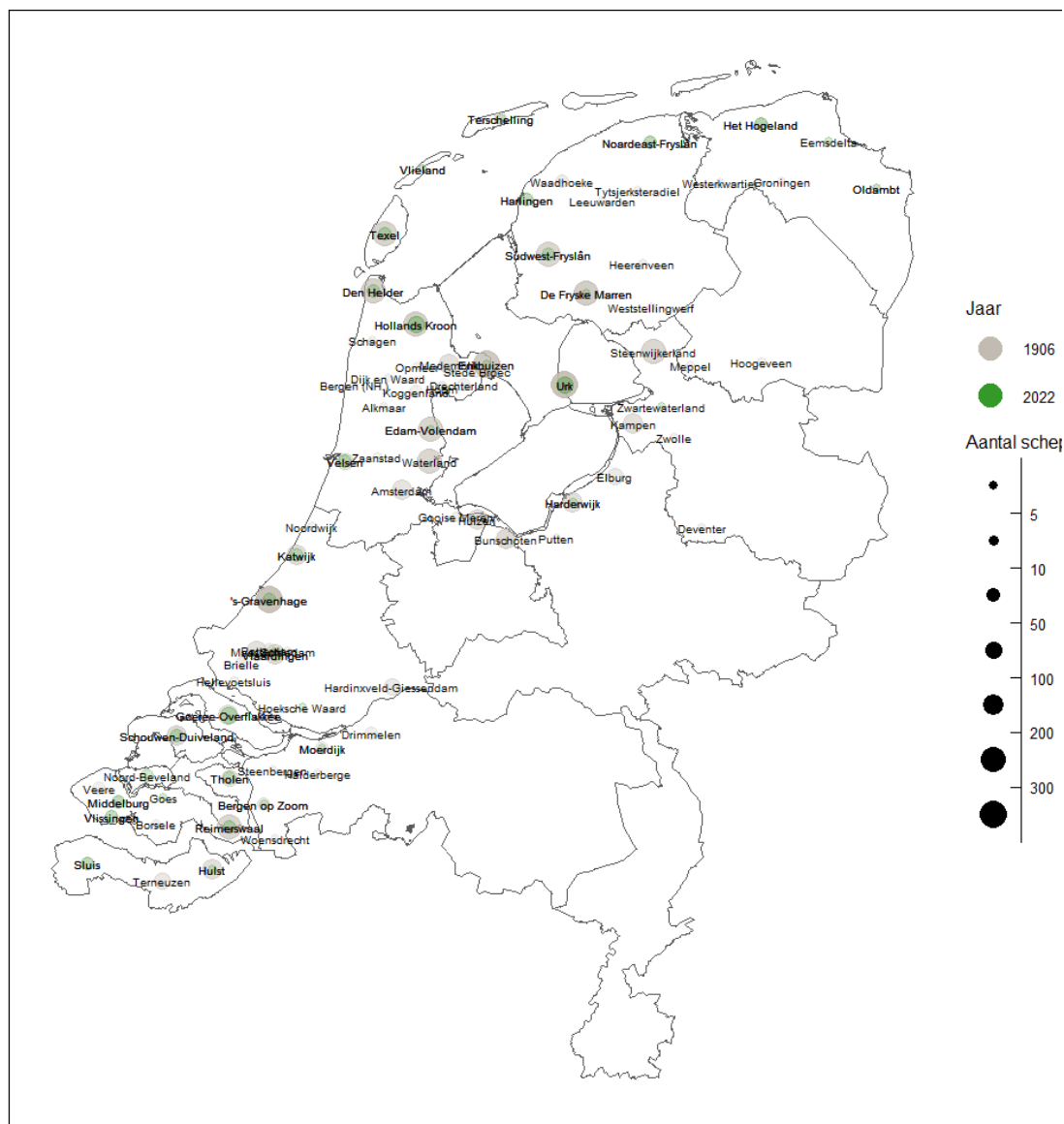


Figure 1.1. Map of the Netherlands, showing the fishing communities from 1906 (grey) and 2022 (green). The size of the dots indicates the number of vessels. Source: Kraan et al 2023.

It is largely carried out by family businesses and is thus a source of (cultural) historical, ecological and artisanal knowledge. It thereby contributes to social cohesion in those communities and has left its mark in diverse (im)material cultural heritage throughout the Netherlands. Fishing not

only contributes to the identity of fishers but is also part of Dutch identity through the role fishing played in history (such as the herring fleet). Fishing is part of two aspects embedded in Dutch identity: living with water and maritime history (Kraan et al., 2023).

#### 1.4.1.5 Sweden

The Baltic Sea fisheries case study in Sweden stresses crucial improvements in the integration of social sustainability concerns and indicators in current fisheries management. Those social concerns embrace both, institutional changes to prevent the overexploitation of fish stocks and the need to assess and value non-material, non-market contributions of fisheries and in particular coastal fisheries.

Over the last decades, Swedish fisheries relied heavily on cod, herring and salmon landings from the Baltic Sea. At present (2023), zero catch advice has been set by ICES for the Baltic cod and the western Baltic herring for the next years and only minimal bycatch quotas are allowed. Those bans for fishing cod and herring are a response of the reduced biomass sizes of these fish stocks. At the same time, ICES catch advice in 2022 for the herring in the Gulf of Riga was pushed above the scientific advice. As for the central Baltic herring; the stock has been severely depleted over the last 10 years, probably due to scientific miscalculations of the spawning stock biomass. Swedish coastal fishermen have been raising concerns about a shortage of large herring in coastal waters and the Swedish government has started a study to explore the possibility to move the trawling limit for herring further from coastal zones. This decision was put in place in parallel to a sound campaign on Swedish media about the loss of herring due to trawling in the central Baltic Sea. Regarding salmon, all catches in the open sea in the southern Baltic Sea (south of Stockholm) have been also prohibited. In the Gulf of Finland (shared with Swedish fishers), only a catch of 9,204 individual salmon was allowed in 2022. Despite fisheries management, it is evident that the Baltic Sea fishing stocks have been heavily overexploited and its fishery is unsustainable. The socio-economic contributions of fisheries in the Baltic Sea are impacting Swedish coastal areas.

In 2021, 457 Swedish vessels reported catches from the Baltic Sea compared to 348 in 2022, a decrease of more than 100 vessels in just one year. Over 100 of those who stopped reporting catches are coastal fishers with vessels under 12 metres. The overexploitation of fish stocks in the Baltic Sea has exacerbated the reduction in the number of coastal fishers impacting their contribution to Swedish food provision, employment and socio-cultural values. The latter – as opposed to landings and employment which can be measured when placed into markets – can be only estimated as non-market values for fisheries management and trade-offs calculations. Examples of these values are (adapted from Waldo and Lovén 2019):

- Coastal fisheries connect people to their traditional culture and allow people to express their links to their past through cultural heritage;
- Coastal fisheries enhance tourism and recreation;
- Coastal fisheries defines place identity, social trust and order, ways of live, wellbeing for vulnerable social groups, employment for women and fisheries-related economic activities (what is known as coastal fisheries providing the “glue” for coastal communities);
- Coastal fisheries have the potential to attract people to live and work in rural areas;
- Coastal fisheries deliver certain security though a sense that local food will be available in case of food shortages or crisis; and,
- Coastal fisheries are a repository of unique local knowledge and enables a regular and systematic observation and monitoring of the marine environment.

Swedish (and EU) fisheries management is not integrating these socio-cultural contributions of fisheries to ecosystem-based management, marine spatial planning or quota allocation systems.

Fishers in Sweden are aware of their socio-cultural contribution and are dissatisfied with the current fisheries management that do not value it and does not react against the disappearance of the coastal fishery sector. This situation has negative impacts in the level of job satisfaction and well-being of coastal fishers who in their majority are considering quitting the fishing profession in a near future (Arias Schreiber and Gillette 2021). Despite the vulnerability of the coastal fishing sector, Sweden does not include coastal fisheries in the late Swedish Strategy for Fisheries and Aquaculture for the period 2021-2026. The strategy was developed by the Swedish Agency for Marine and Water Management and the Swedish Board of Agriculture. In this document, rather than coastal fisheries, it is recreational fisheries and coastal tourism that contribute to healthy coastal communities; and it is aquaculture that fosters national food security.

#### 1.4.1.6 Norway

The fisheries sector represents one of Norway's most profitable sectors, as Norway is one of the largest exporters of wild-caught and farmed fish in the world. Norway applies an ecosystem approach to fisheries management, embedding management within broader ecosystem, conservation, and stakeholder concerns. Norway has productive waters, both offshore – the North Sea, the Barents Sea, and the Norwegian Sea – and coastal that have supported major fish resources for centuries. In 2022, Norwegian wild-caught fish exports were valued at Norwegian kroner (NOK) 40.1 billion (a 14% increase from 2021) and comprised approximately 1.6 million tonnes, including: pelagic fish, cod and cod-like fish, flatfish, deep-water fish, shellfish, molluscs, echinoderms, and cartilaginous fish (sharks, skates, and rays). Also in 2022, Norway exported 1.3 million tonnes of farmed seafood, valued at NOK 111.3 billion (a 30% increase from 2021), NOK 100 billion of this attributable to farmed salmon alone. Thus, the Norwegian seafood export value in 2022 totalled NOK 151.4 billion (USD 13.7 billion).

Traditionally, fishing in Norway has been open and freely accessible to all, and foundational to coastal communities. Over recent decades, fisheries management in Norway, as in other industrialized nations, has evolved into a complex, multifaceted system that employs a variety of input and output controls, including access limitations and annual total allowable catch quotas. The specific management approach can vary significantly by fisheries, depending, for example, on the species and vessel type, and ranging from regulated systems of open access to individual vessel quotas that cannot be transferred.

The Norwegian fishing fleet can be categorized into three main segments: purse seiners; trawlers; and the coastal fleet. The coastal fleet is highly diverse, ranging from small, open boats operating in sheltered fjord regions to smaller seiners and larger conventional vessels exceeding 28 meters in length (Årland and Bjørndal, 2002)<sup>2</sup>. In recent years, approximately 9,500 individuals consider fishing their primary occupation, and the number of vessels has generally remained stable at around 6,000, although it decreased to 5,600 in 2021. About 80% of vessels belong to the coastal fishing category, measuring less than 11 meters in length, with approximately 60% of employment associated with this fleet (Iversen *et al.* 2022).

The most important fisheries in Norway are cod and herring. These key species are abundant during spawning seasons and available to the small-scale fleet temporarily when close to the coast, before they move offshore or to other countries' waters. Ninety percent of caught fish is exported. Thus, Norwegian fisheries support various nodes in their value chains: fishing, processing, transport, and export. To protect the interests of small-scale fishers and to maintain the economic and social structure of the fisheries, three laws are instrumental: 1) the Marine Resources Act: what, how and where to fish; 2) the Participation Act: who can fish and under what

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<sup>2</sup> Note that the trawler fleet is primarily composed of cod and shrimp trawlers, along with industrial trawlers.

terms; and 3) the Fish Sales Act: regulates the turnover. Their objectives must be balanced also with the social, economic, and environmental pillars of sustainability.

The traditional rule has been that only active fishers could own vessels for professional fishing. The ideal for the fishing population was a fleet of small- and medium-sized coastal vessels owned by fishers. Trawling was intended to be a supplementary means of ensuring a supply of cod raw material during specific periods when coastal fishers could not provide enough fish for fillet production.

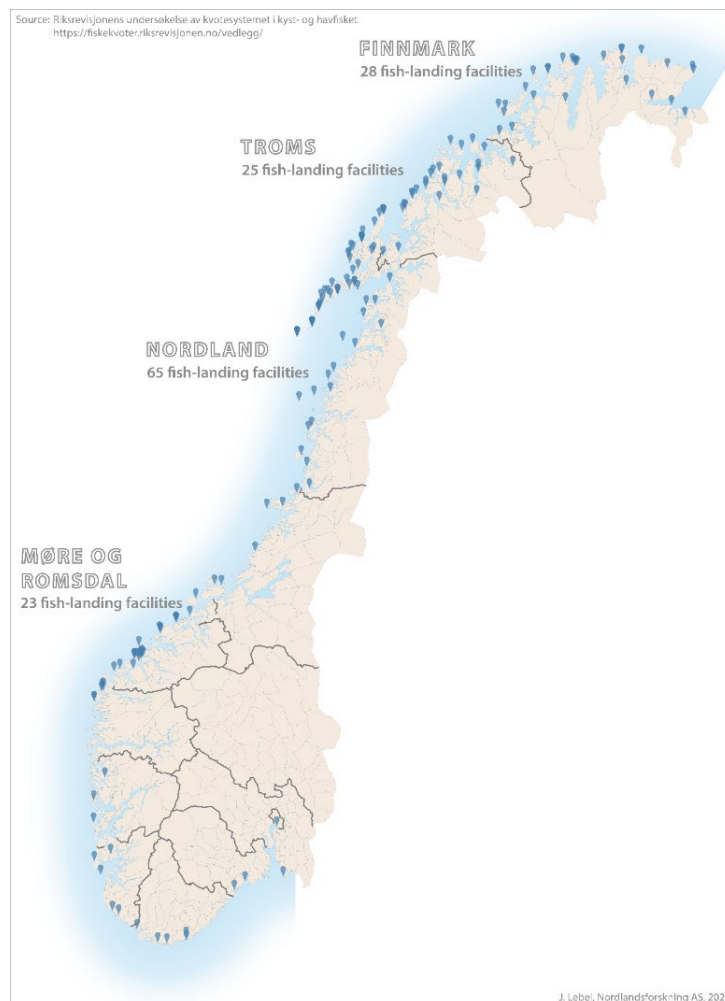
In the 1970s, 1980s and 1990s, Norwegian governments introduced novel measures to manage fishery resources, including area-based trawling bans, licensing systems, and fishing quotas. Complete access regulation was established for the offshore fishing fleet (vessels over 90 feet or 28 meters in length) in 1986, with exceptions for the fleet of larger vessels using longlines and gillnets (the autoline fleet). Small-scale fisheries became regulated in the 1990s<sup>3</sup>, ending the tradition where coastal inhabitants had free access to fishing as a means of livelihood (without apparent negative effects on stocks and ecosystems). Vessel quotas were introduced for the coastal fleet during this period, causing many smaller actors to exit the industry. The "trawl ladder" also was introduced, a sharing mechanism between the trawler and coastal fleets, where the coastal fleet's percentage share of the total quota increases as the total quota decreases. For example, when the cod quota is high, as it has been in recent years, the coastal fleet is allocated 67% of the annual cod quotas and the trawler fleet, only 33%. This mechanism aims to strike a balance between the interests of the trawler fleet and the coastal fleet, while taking into account the available resources and the sustainable management of fish stocks.

While fisheries management in Norway is complex, the core policy objective remains unchanged: the well-being and differentiation of the small-scale fisheries sector, with a geographically dispersed fleet of small vessels (Participation Act 1999, Ocean Resources Act 2008). Currently, the sector is anticipating a new structural policy for Norwegian Fisheries Management.

The Norwegian coastline is extensive and stretches for over 100,000 km, with 80% of the population living within 10 km of the coast. Historically, coastal communities in Norway have relied on a mix of fisheries and farming, illustrated by the term "Norwegian fisher-peasant." The fisheries sector has been and continues to be a significant contributor to employment and income in coastal communities across Norway. Coastal fisheries "are strongly rooted in the place where fishers live and deliver their catch" (Hovelsrud *et al.* 2015). However, many of the fisheries are seasonal and often geographically concentrated, so there is not necessarily a strong connection between where the fleet is based and where the fish is landed (see Figure 1.2 for an overview of landing sites in Norway).

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<sup>3</sup>A more detailed history of when the different coastal fisheries were closed is found here, page 18: <https://www.regjeringen.no/contentassets/3716cc15332f4cf683f01a50159d712a/no/pdfs/nou201620160026000dddpdfs.pdf>



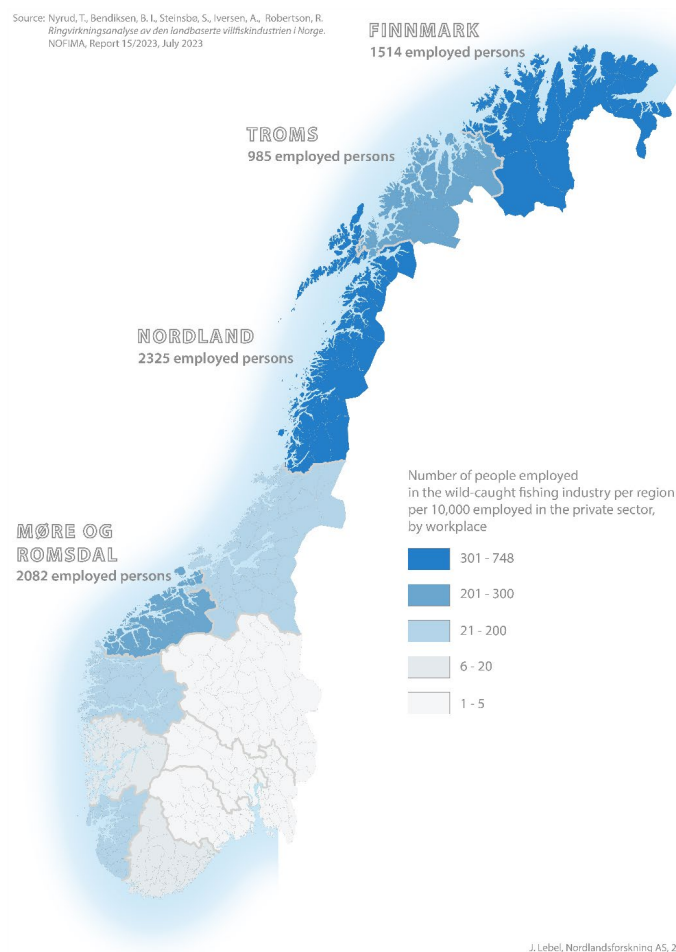
**Figure 1.2. Map of fish landing facilities along the coast of Norway, demarcated by regional municipality (county).**

Coastal community life is diversifying to include aquaculture and tourism. However, fishing is still important for settlement and economic development in many municipalities (Figure 1.2). Direct value creation is distributed among approximately 250 municipalities, with around 360 municipalities benefitting from the fishing fleet's ripple effects (Iversen *et al.* 2022). In 2021, approximately 18,800 individuals were employed in fishing, with 10,700 working directly in fisheries and 8,100 in supplier companies, constituting about 16,600 full-time equivalent positions. Fishing companies are largely concentrated in Northern Norway and on the West Coast, notably the three counties of Nordland, Møre and Romsdal, and Finnmark, making these regions the most affected by the fishing industry's overall ripple effects (Figure 1.3). The number of men whose primary occupation is fishing has declined since 1995, but has stabilized since 2015, while the number of women in the fishing register has been increasing (Iversen *et al.* 2022).

Coastal communities are influenced directly by the development of the fishing fleet, and indirectly by its impact on the onshore industry. Where the fishing fleet lands its catch is significant for the development of the onshore industry, which in turn has implications for the development

of coastal communities, both in terms of employment and settlement<sup>4</sup>. In 2021, the Norwegian fishing fleet landed 2.59 million tons of fish and shellfish, a slight decrease in catch volume from 2.62 million tons in the previous year, whereas the total first-hand value increased by NOK 1.1 billion to NOK 23.9 billion.

Fleet restructuring is leading to the same amount of fish being landed by increasingly fewer vessels, which leads to greater competition for fish and requires the industry to invest in increased capacity to handle larger catches. This, in turn, has reduced the companies in the industry and the places with fishing industry (Iversen *et al.* 2018a). This concentration is reflected in the geographical distribution of the fishing activity and its ripple effects.



**Figure 1.3.** Map showing the number of employed people in the wild-caught fishing industry in Norway

Norway has not published a study on what might comprise a social indicator for Norwegian fisheries, nor has it included the term in any existing fisheries legislation. The Norwegian Fisheries Directorate and the National Bureau of Statistics report on some “social adjacent” data, such as the number of registered vessels by county and by size, and the number of fishers classified

<sup>4</sup><https://www.riksrevisjonen.no/undersokelse-av-kvotesystemet-i-kyst--og-havfisket/rapport/sysselsetting-og-bosetting-i-kyst-samfunnene/>

by fishing as a primary or secondary occupation. As the fishing sector is such an integral part of Norwegian society, its management does not (yet) differentiate a fishing community from the rest of society. However, some informal or autonomous self-groupings have emerged, such as via Facebook. Interestingly, a large collaborative project involving the Norwegian Institute for Marine Research, WorldFish, Food and Agriculture Organization of the United Nations (FAO), and Duke University reported on Norwegian small-scale fisheries<sup>5</sup>, but did not mention social or socioeconomic indicators or any data in Norway.

## 1.5 ToR e - Integrate culturally relevant social indicators and analysis with economic and ecological information

In order to make sure that the work of WGSOCIAL is taken up within the wider ICES community, it is important to collaborate with other WGs (i.e., WGECON) and to participate in interdisciplinary meetings (i.e., ICES Workshop on Challenges, Opportunities, Needs and Successes for including human dimensions in IEAs (WKCONSERVE)). WGSOCIAL also has a relationship with other ICES WGs via its members (see Table 1.1 below) and other WGs who request support from WGSOCIAL.

**Table 1.1. ICES working groups and initiatives that include WGSOCIAL members**

ICES WG / Strategic Initiative Name	WGSOCIAL members also part of this group	Useful thematic / methodological linkage
SIHD - Strategic Initiative on the Human Dimension	Marloes Kraan, Lisa Colburn, Amber Himes-Cornell, David Goldsborough, Fanny Barz, Sebastian Linke, Ana Rita Fraga, Arina Motova, Cristina Pita, Gesche Krause, Mimi Elizabeth Lam, Paulina Ramirez-Monsalve, Sebastian Villasante, Tony Charles	WGSOCIAL has been erected as part of the SIHD. ToR A is a direct link to why this is important.
WGECON - Working Group on Economic Indicators	Arina Motova, Sophie Gourguet, Claire Delpeuch, Leyre Goti, David Goldsborough, Sebastian Villasante	<i>See below</i>
WGBESEO - Working Group on Balancing Economic, Social and Ecological Objectives	David Goldsborough, Paulina, Leyre Gohti, Ana Rita Fraga, Claire Delpeuch, Debbi Pedreschi, Mimi Elizabeth Lam, Robert L. Stephenson, Sónia Seixas, Marta Ballesteros	<i>See below</i>
WGEAWESS - Working Group on Ecosystem Assessment of Western European Shelf Seas	Debbi Pedreschi, Arina Motova, David Goldsborough, Marloes Kraan, Paulina Ramirez-Monsalve, Sónia Seixas, Alfredo García de Vinuesa	In the Celtic Seas CS close collaboration is set up with WGEAWESS. WGEAWESS has a key responsibility in reviewing and updating ICES Ecosystem Overviews for the Bay of Biscay and Iberian Coast, and the Celtic Seas ecoregions. Connecting with this group will help to identify needs of the groups, and routes to include social science and indicators into the Ecosystem Overviews, key to this ToR (A).

<sup>5</sup> <https://www.hi.no/en/hi/nettrapporter/rapport-fra-havforskningen-en-2022-18>



WGMARS - Working Group on Maritime Systems	Marloes Kraan, Amber Himes-Cornell, Debbi Pedreschi, Leyre Gohti, Sebastian Linke, Ana Rita Fraga, Jessica Fuller, Marc Larose, Mimi Elizabeth Lam, Tony Charles, David Goldsborough, Robert L. Stephenson, Nathalie Steins	The WGMARS 2020-2022 ToRs focus on several key areas of interest to WGSOCIAL, including Integrated Ecosystem Assessments (IEA), social network analysis (SNA), and behavioural economics (BE), as well as a focus on interacting with variety of types of stakeholders.
WGCOMEDA - Working Group on Comparative Ecosystem-based Analyses of Atlantic and Mediterranean marine systems	M. Cristina Mangano	WGCOMEDA aims to investigate and improve the Ecosystem-based Approaches to Fisheries (EAF) across European Seas. ToR d explores socio-ecological systems to support integrated fisheries advice and marine management.
WGRMES - Working Group on Resilience and Marine Ecosystem Services	Sebastián Villasante, Pablo Pita, Amber Himes-Cornell, Milena Arias Schreiber, Cristina Pita, Elene Ojea, Maraja Riechers	WGRMES explores a variety of aspects of human-environment interactions, including monetary and non-monetary assessment of marine ecosystem services.
WGRFS - Working Group on Recreational Fisheries Surveys	Pablo Pita	WGRFS deals with recreational fishing surveys, including socioeconomic data, fishers' profiles, communication gaps, etc.
WGSEDA - Working Group on Social and Economic Dimensions of Aquaculture	Gesche Krause, Sebastian Villasante, Amber Himes-Cornell	WGSEDA develops and tests methods on how to capture social/socio-economic indicators that can be used to capture aquaculture production effects in an operational manner.
WKSHOES - Workshop on Stakeholder Engagement Strategy	Marta Ballesteros	WKSHOES examines stakeholder interactions across ICES expert groups, assesses needs and opportunities, and develops elements for a strategy to formalise stakeholder involvement in ICES groups.
WKSTIMP - Workshop on Implementation of Stakeholder Engagement Strategy	Marta Ballesteros, Sónia Seixas, Marloes Kraan	Focuses on the operationalization of ICES Stakeholder Engagement Strategy, identifying the practical actions necessary to achieve the strategy's vision, and goals.
WKENSURE - Workshop on developing guidance for ensuring the integrity of scientific information submitted to ICES by data providers	Nathalie Steins	Tasked with developing guidance for identifying, assessing and managing potential conflict of interest in data and information provision that may affect the integrity of ICES science and advice.
WKSEIOWFC - Workshop on the Socio-Economic Implications of Offshore Wind on Fishing Communities	Marloes Kraan, Angela Silva	Examined the impact from offshore wind development for fishing behaviour, fishing communities and coastal economies. The aim was to improve the understanding of socio-economic effects of offshore wind projects on fisheries; these activities are considered to have a very high priority given

		the rapid expansion of the wind energy sector.
WKAFFA - Accounting for fishers and other stakeholders' perceptions of the dynamics of fish stocks in ICES advice	Nathalie Steins	Identify where the knowledge of perceptions of fish stock dynamics could usefully be applied in ICES assessment and advisory process.
WKINOSE - Working Group on Integrated Assessments of the North Sea	Arina Motova-Surmava	WGINOSE analyses how the natural ecosystem and human activities in the North Sea have changed over time and are expected to change in the future. WGSOCIAL collaborated with this WG when developing socio-economic analysis for the Greater North Sea EO.

### WGECON

Since the start of the working groups, WGECON and WGSOCIAL the groups have collaborated. They share many similarities in the ToRs and both groups have been created to support socio-economic data input and understanding for a more transdisciplinary approach in ICES. The chairs either have intersessional joint groups related to specific topics (i.e., of wind energy) or share sections of the annual meetings. Collaboration continued on updating EOs with fishing communities and related social and economic data, on trade off analysis and on wind parks and its impact on fisheries.

### WGBESEO

The Working Group on Balancing Economic, Social and Ecological Objectives (WGBESEO)'s goal is to develop a generic methodology for identifying, characterizing, and classifying social, economic, and ecological objectives - enabling the awareness of such objectives in ICES advisory process. Synergies between WGBESEO and WGSOCIAL are in relation to three points:

- Social indicators

WGSOCIAL's ToR b aims to report on culturally relevant social indicators. WGBESEO's ToR d aims to define a methodology that will allow social, as well as ecological and economic objectives (and indicators where applicable), to be extracted from policy documents. The information is intended to be of use for Integrated Ecosystem Assessment groups.

- Trade-off analysis

WGSOCIAL's ToRc aims to collect information that can help do trade-off analysis specifically related to impacts on fishing-dependent/coastal communities. WGBESEO's ToRb aims to identify the most common discussions on trade-offs that tend to occur between ecological, social, and economic objectives, and provide an indication of the type of indicators that could be used for understanding the potential implications. The information is intended to support potential future advice requests.

- Contribute to the development of a framework for collective reporting of social, economic and ecological data

WGSOCIAL's ToR e aims to coordinate provision of social indicators with economic and ecological information. WGBESEO's ToR d aims to define a methodology that will allow social, as well as ecological and economic objectives (and indicators where applicable) to be extracted from policy documents.

These synergies are on the basis upon which WGSOCIAL aims to concentrate on culturally relevant social indicators and trade-offs for fishing-dependent /coastal communities. WGBESEO's methodology is for identification of a broader set of all social (economic and ecological) objectives, required for trade-off discussions between these objectives for ecosystem-based management.

### 1.5.1 Interdisciplinary ICES meetings

#### WKSHOES

The Workshop on Stakeholder Engagement Strategy (WKSHOES) met to address ICES need to formalise its stakeholder engagement activities. As stakeholder interactions have become more a part of the ICES system, there are a number of processes that have evolved to support and monitor the involvement of stakeholders, with special attention given to the role of observers in the advisory process.

Acknowledging the pivotal role of stakeholder engagement in tackling environmental challenges, understanding human impacts and values, the group discussed the valid concern that if stakeholder engagement is done incorrectly, it could compromise the perceived objectivity of ICES science and its independence. Workshop participants challenged the idea of objective or "pure" science, but also recognized the practical need to have ICES advice be transparent and science-based. Participants also understand that when providing advice, trade-offs have to be made that are informed by the different weights that stakeholders place on various management objectives.

WKSHOES proposed goals, principles, roles and definitions that informed the drafting of the ICES Stakeholder Engagement Strategy, released in 2023 (ICES 2023c).

#### WKSTIMP

WKSTIMP supported the ICES Stakeholder Engagement Strategy, through drafting elements for the Implementation Plan. The participants represented a plurality of profiles and backgrounds including natural and social scientists, representatives from the fisheries sector, NGOs, Advisory Councils, ICES Head of the ICES Science Committee (SCICOM) and the ICES Advisory Committee (ACOM) and ICES staff.

The analysis and reflective thinking on the Strategy set the basis for exploring actions within the ICES system (Expert Groups, Advice Drafting Groups) and across topics (research ethics, data protection, informed consent, conflicts of interest, transparency). The discussion in WKSTIMP highlighted the centrality of stakeholders as data, information and knowledge providers, and highlighted how two complementary ICES initiatives reinforce the Strategy: firstly, the development of guidelines for ensuring the integrity of scientific information submitted to ICES by data providers (e.g., WKENSURE); and secondly, the accountability for fishers and other stakeholders' perceptions (forthcoming Workshop on perceptions on the dynamics of fish stocks in ICES advice, WKAFPA). Furthermore, participants discussed risks associated with opportunistic

behaviour in the engagement processes (creative and created blindness and advice shopping), tailoring specific actions to cope with them.

WKSTIMP proposed 35 time-based priority actions, urges the implementation plan's timely approval, and suggests strengthening ICES capability by creating an expert group on engagement.

## WKING2

In 2020, ICES advised the European Commission on innovative fishing gear. The advice headline included the following: "ICES advises that technical innovations are always sociotechnical. The level of uptake and sociotechnical aspects associated with the innovation should therefore be part of the development of a more comprehensive state-of-the-art review" (ICES, 2020).

In 2023, ICES received a special request from EU DG MARE request to advice on the progress and impact that has been made in innovative gear use within EU waters. It specifically asked to include an assessment of drivers that affect uptake of gear innovation. WGSOCIAL (and WGECON) were involved in the Workshop 2 on innovative fishing gear (WKING2) that was tasked to produce the report for this special request, and specifically in addressing ToR C "For those innovations not implemented, discuss the main drivers that prevented their use if known. Where possible, include analysis of the socio-economic trade-offs and propose ways to facilitate their implementation" (ICES 2023b.). As part of addressing this ToR, we developed an initial tool to aid a structured assessment of external factors influencing gear uptake. The WKING2 report provides further detail (ibid). It is important to note that the first WKING report recommends that there is a need for regular and systematic data collection regarding the development and uptake of innovative gears, including the factors that affect uptake. The report explicitly mentions that this should be done in collaboration between gear technologists from Joint ICES/FAO Working Group on Fishing Technology and Fish Behaviour (WGFTFB) and social scientists from WGECON and WGSOCIAL and that new ToRs should be developed to enable this (ibid).

### 1.5.2 WGSOCIAL Contributions to ICES advice

#### Ecosystem Overviews

WGSOCIAL will be working on creating, updating and expanding the fishing communities section in future revisions of the ICES Ecosystem Overviews. 2024 Revision: Bay of Biscay and Iberian coast (see ToR b).

#### Innovative gears

Following Article 31 of the EU regulation 2019/1241, ICES has in the past advised the EU Commission on innovative gears for potential use in EU waters and their impacts ([advice 2021](#)). The 2021 advice defined innovation and catalogued 33 gears. ICES was requested to provide a new round of advice aiming at: making the catalogue more complete; assessing the level of uptake of innovative gears by the EU industry; identifying the main drivers that prevented the innovative gear use, including the analysis of behavioural drivers and social and trade-offs and propose ways to facilitate their implementation. Experts from WGSOCIAL worked together with gear technologists inter-sessionally and during a workshop to create the report ([ICES 2023b](#)) and draft advice manuscript. Additionally, WGSOCIAL experts participated in the advice drafting group

producing the final advice that was accepted by the ICES advisory committee and published in October 2023 ([ICES 2023d](#)). In this advice ICES used and developed the strategic PESTEL framework containing political, economic, social, technological, environmental, and legal factors for the evaluation of the barriers and opportunities for innovative fishing gears to be systematically applied. This work was especially important as it is one of the first requests to ICES from the EU commission with direct inclusion of social and economic analysis and assessment, and it will be the basis for the future iterations assessing the behavioural drivers and social trade-offs around innovative fishing gears.

## TRADE-OFFs

The EU Commission has requested ICES to update its previous trade-off advice between the impact of fisheries on seafloor habitats and their landings and economic performance (2021, [eu.2021.08](#)). This work includes assessing and further developing the 2021 the trade-off analysis. The new advice will be published in March 2024 and WGSOCIAL has been asked to participate in this request looking into how to better incorporate social factors associated with fisheries, given the different management scenarios (e.g., redistribution effects on fishing harbour communities).

## ICES Offshore Wind Roadmap for science and advice

In March 2023, ICES held the Workshop on a Research Roadmap for Offshore and Marine Renewable Energy (WKOMRE) examining ICES' role in providing science, data, and advice in the context of offshore and marine renewable energy development. A draft roadmap of strategic action was developed, with the vision to provide state-of-the-art science, data and advice on the interactions between offshore and marine renewable energy activities and marine ecosystems. These efforts aim at advancing ICES scientific capacity to support advice regarding the interactions among offshore and marine renewable energy development and marine socio-ecological systems. WGSOCIAL members gave their input to the development of the roadmap during a meeting at the ASC 2023. The roadmap will be published in autumn 2023 and will build on the ongoing WGSOCIAL work focused on developing in trade-offs and offshore wind.

## 2 Looking forward

### 2.1 Additional work on social issues

Through the WGSOCIAL work, we have identified the following additional topics that should be addressed:

- Integration of fishers' knowledge contributions;
- Fisher behavior;
- Working conditions (including slavery) and drug trafficking.

These will be described below with a discussion on the scope of WGSOCIAL work in relation to other ICES groups under the different steering groups. This will also be linked to the positioning of WGSOCIAL in the new Human Dimension Steering Group.

### 2.2 Integration of fishers' knowledge contributions in ICES science

WGSOCIAL members from the UK Centre for Environment, Fisheries and Aquaculture Science (Cefas) and Department for Environment Food and Rural Affairs (Defra) have been building on the "GAP1/ GAP2" projects (Mackinson et al, 2015) which sought to demonstrate the role and value of participatory science within the context of fisheries' governance. WGSOCIAL members have carried out various activities within the ICES community around this topic.

First, an interactive panel session on "Identifying best practices to integrate fishers' experiential knowledge (FEXK) into marine science and management" was organised at the ICES Annual Science 2022. The session focussed on five topics: (1) Wealth and depth of knowledge of FEXK; (2) Experiences with integrating FEXK; (3) Organising fishers' involvement; (4) Methodologies for FEXK and (5) Lessons learnt (ICES, 2022). Further analysis of the discussion post-conference, resulted in the identification of best practices for FEXK integration and are included in a manuscript that has been accepted for publication in the ICES Journal of Marine Science (Calderwood et al., 2023).

Second, a WGSOCIAL member co-chaired the WKENSURE, tasked with developing guidance for addressing potential conflict of interest in data and information provision that may affect the integrity of ICES science and advice. ICES receives an increasing number of data and information contributions by third parties, such as the fishing industry and environmental organisations, often in response to existing knowledge gaps. Such additional data contributions may result in perceived or real conflicts of interests by data providers. ICES guidance on managing potential conflict of interests will contribute to protecting the legitimacy of ICES advice when data-providers with potential conflict of interests are involved (ICES, 2023a).

Third, a case study was conducted, within Cefas, to identify and describe the institutional capacity and problems faced when integrating fishers' knowledge in scientific communities to support a more systematic use of participatory science. The study identified several drivers and barriers to integrating fishers' knowledge to achieve participatory science and subsequently inform fisheries management. The findings of the case study will likely be applicable to other ICES member states. A report will be published later this year and presented at the ICES ASC 2023 conference.

Finally, WGSOCIAL members were invited to present and contribute to the ICES WKAFPA which took place in October 2023, with a specific request to focus on how to embed experiential knowledge from fishers.

## 2.3 Fisher behaviour

In view of major marine spatial use and management changes in many of the ICES ecoregions (e.g., offshore energy, mariculture and establishment of Marine Protected Areas), it is vital to increase our interdisciplinary understanding of fisher behaviour in relation to for instance displacement and the consequences for modelling fisher behaviour and fleet and ecosystem impacts (Schadeberg et al 2021). Similarly, this applies to understanding fisher behaviour in relation to engagement in fishing gear innovations and uptake, which is related to both ability and willingness (Steins et al., 2022). Understanding the factors that contribute to ability and willingness (or lack thereof) to adopt more sustainable gears and other more sustainable fishing practices is key to many areas of ICES science and advice. WGSOCIAL has assisted work in relation to gear innovation (ICES 2023b) but work on this should be continued in the next year in order to be prepared for the next advice request on this topic which is expected in 2026.

## 2.4 Working conditions (including slavery) and drug trafficking

Working conditions is a topic that cannot be missed, when assessing the social cultural value of fishing. There are a number of angles to this. First, although we know that fishing often is carried out by people whom have become a fisher as part of their family history and for whom it is part of their identity, there are also fishers whom carry out the profession under less favourable circumstances. Second, fishing is one of the most dangerous professions globally, therefore, safety issues are a continuous concern, for all fishers, but even more so for some, for instance, when they do not speak the dominant language on board. Furthermore, employment conditions (including insurance, income) differ amongst fishers, and although fishing is highly regulated in the EU, conditions under which fishers work can vary a lot. Not all fishers have the same level of agency. Some foreign workers in EU countries for instance need to remain on board of the vessel as their work permit does not allow them to disembark. Keeping an eye on these aspects is important, and the question is which social indicators and what qualitative research is needed to have these topics in sight. With fisheries under pressure in a number of member states due to rising fuel costs, less space for fishing at sea and sometimes other policy measures or ecological changes impacting their fishing opportunities, the risk that working conditions (including safety and hours working and income) deteriorate is present. Outside of the EU there are accounts of slavery conditions on board of fishing vessels (i.e. in New Zealand waters and on Chinese vessels). Related to this, fisheries in the EU are under pressure – resulting in new practices of employment (see above). In some EU member states (i.e. the Netherlands and Spain), there is concern of fishers being approach by organised crime to play a role in drugs trafficking. Therefore, monitoring this, is an important topic.

## 2.5 Scope of WGSOCIAL

The aforementioned new topics that have passed into WGSOCIAL activities or have been identified as topics that require interest, brings about questions about the scope of WGSOCIAL. The presence of the working group has obviously attracted interest from other groups in the ICES network where a human dimension is involved, in addition to joint activities already taking place around offshore wind energy reported elsewhere in this report. Furthermore, ICES clients are

increasingly requesting to include social impact analysis in special request for advice (e.g., special request on innovative gear addressed by WKING2; e.g., trade-off advice between the impact of fisheries on seafloor habitats received in August 2023). Whilst these are positive developments and testament to the progress the group has been made, WGSOCIAL is not able to work on everything.

To deal with the growing number of topics where WGSOCIAL could play a role, it was suggested that other working groups could be created that are focussed on different social topics, for example one expert group that works on social indicators and communities, one group on trade-offs (which would also concern WGECON), and groups on other issues. An example is the offshore wind work, where there seem to be multiple groups working on offshore wind issues including socioeconomic work; it is not desirable to do the same work in different places, instead different groups should join forces, support each other and create synergies. Becoming part of the new Steering Group on the Human Dimension (HUDISG) (see below) will give a clearer 'home' for the social science group(s) and at the same time will make this differentiation and collaboration easier. The chair of the new HUDISG should work closely with the other Steering Groups that include offshore wind to coordinate and achieve synergies. It was decided to engage with the new HUDISG chair and the secretariat on how to best move forward with the scoping of the social work in one or multiple groups.

## **2.6 Steering Group**

WGSOCIAL was developed as a WG under the SIHD. WGSOCIAL became part of the IEASG. ICES decided to develop the HUDISG as a follow up from the SIHD which brought the opportunity for WGSOCIAL to become a working group in this new SG. After discussing this at the WGSOCIAL 2023 annual meeting and consulting the wider membership of WGSOCIAL via email, it was decided that WGSOCIAL will move from IEASG to HUDISG.

## **2.7 New chairs**

After 6 years of acting as chairs, Amber Himes-Cornell and Marloes Kraan will step down, following the earlier stepping down of Lisa Colburn. The WG elected two new chairs: Cristina Pita and Edd Hind.



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## Annex 1: List of participants

Table represents joint participant list from meetings taking place in 2021-2023.

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## Annex 2: Resolutions

**2020/FT/IEASG02** The **Working Group on SOCIAL indicators** (WGSOCIAL), chaired by, Amber Himes-Cornell, FAO, and Marloes Kraan, Netherlands, and will work on ToRs and generate deliverables as listed in the Table below.

	MEETING DATES	VENUE	REPORTING DETAILS	COMMENTS (CHANGE IN CHAIR, ETC.)
	30 March	Online meeting		
<b>Year 2021</b>	17 May	Online meeting	E-evaluation	Lisa L. Colburn will step down by end-2021
	10,11,15,17,18 June	Online meeting		
<b>Year 2022</b>	9-10 May	Online meeting	E-evaluation	
	16-19 May	Online meeting		
<b>Year 2023</b>	13 February	Online meeting	Final year E-eval due 15 September 2023	
	28 August–1 September	ICES Secretariat	Final ICES Scientific report by 13 October 2023	

### ToR descriptors 2021 – 2023

ToR	DESCRIPTION	BACKGROUND	<a href="#">SCI-ENCE PLAN CODES</a>	DURATION	EXPECTED DELIVERABLES
a	To continue building capacity for social science in ICES, giving consideration to research and institutional needs in all ICES member countries, as well as useful connections to international marine/ fisheries social science organizations, such as the Society for Applied Anthropology and the Centre for Maritime Research (MARE).	This builds on the initial scoping exercise within ICES to expand social science capacity building efforts, but also ensures coordination of activities with other international bodies and links to the wider scoping work in the Strategic Initiative for the Human Dimension (SIHD).	5.4, 6.6	Years 1–3	Annual reporting
b	To identify and report on culturally relevant social indicators and community data gaps that point to priorities for data collection, research, institutional needs, and training in all ICES member countries; and where possible propose systems to collect missing data.	To aid prioritization of data collection, management and analysis to enable qualitative and quantitative analyses of social issues for Ecosystem Overviews, Integrated Ecosystem Assessments and future advice requests. The ToR also links to ICES Data Centre.	4.2, 5.4, 6.6, 7.1, 7.2, 7.7	Years 1–3	Annual reporting, potentially also scientific manuscript

c	To investigate the approaches, methods, tools and information flow needed to provide trade-off analysis of the impacts of alternative management measures on communities and stakeholder groups	To develop a system to support potential future advice requests and development of Ecosystem Overviews and Integrated Ecosystem Assessments.	5.4, 5.8, 6.5, 7.3, 7.5, 7.6	Years 1–3	Annual reporting
d	To assess and report on the social and cultural significance of commercial fishing and its management for selected coastal regions in the ICES area	To support future potential advice requests and development of Ecosystem Overviews and Integrated Ecosystem Assessments.	2.7, 5.8, 6.6, 7.1, 7.2, 7.7	Years 1–3	Annual reporting, potentially also scientific manuscript(s)
e	To coordinate the provision of culturally relevant social indicators and analysis as part of integrated socio-ecological evaluations in support of Ecosystem-Based Management.	To contribute to the development of a framework for integrated assessment of alternative scenarios for marine fisheries, as part of broader Ecosystem-Based Management approaches.	2.7, 4.3, 6.5, 6.6,, 7.1, 7.2, 7.7	Years 1–3	Annual reporting

### Summary of the Work Plan

<b>Year 1</b>	Continue the current work and identification of ongoing needs for social science in ICES (ToR a). Continue defining culturally relevant social indicators and identifying data gaps for specific contexts and applications (ToR b). Link with the work on social indicators of STECF. Start work on defining the information flow needed to provide trade-off analysis (ToR c). Develop and maintain connections with other relevant groups within and outside ICES (ToRs a and e) Collaborate with WGECON on shared case studies (ToR e). Produce Interim Report.
<b>Year 2</b>	Work toward completion of case studies with WGECON (ToRs b, c and d) and assessing the social and cultural significance of commercial fishing (ToR d). Work with other relevant groups within and outside ICES (ToR e). Produce Interim Report.
<b>Year 3</b>	Aim to complete ToR c, d, and e, including the planned manuscripts. Discuss and plan strategies and concrete steps for future work. Produce Final Report.

### Supporting information

Priority	<p>Nations are concerned about the sustainability of fish stocks and marine ecosystems, not least because they can contribute to human well-being and food security; therefore, these natural resources have a societal value. The social dimension is increasingly an integral part of marine science and scientific advice regarding the use and conservation of marine resources.</p> <p>In 2017, ICES realised that the demand for science and advice to address social and societal considerations was increasing, and the <a href="#">Strategic Initiative on the Human Dimension</a> (SIHD) has served to raise the profile of social science in ICES in the last few years. With WGSOCIAL, ICES has an EG that addresses social issues and focuses primarily on the development of social metrics and core social analyses that are demanded in parts of the ICES network (e.g., further development of ecosystem overviews).</p> <p>The benefits of expanding the engagement of ICES in social science were highlighted in the MSEAS meeting 2016, resulting in a second MSEAS meeting, planned for 2021. The recent ICES webinar on COVID-19 also demonstrated the value of social science for marine science and ICES commitment to it. Although there has been no official request of social indicators as of 2020, it is clear that interest is growing for interdisciplinary approaches. DGMARE is also exploring what the social dimension of the</p>
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	Common Fisheries Policy is and can be. Within ICES there is recognition that it is desirable to add social metrics to ICES <a href="#">ecosystem overviews</a> and thus to recognize people and their livelihoods as part of the ecosystem.
Resource requirements	The group will rely on ongoing international and national research projects to support involvement of WGSOCIAL members. WGSOCIAL will work with the ICES Data Centre to obtain port data in order to develop a socio-economic product for the ecosystem overviews.
Participants	41 participants, from 15 countries
Secretariat facilities	None.
Financial	No financial implications.
Linkages to ACOM and groups under ACOM	In the longer term the EG will be ready to support ACOM in addressing advisory requests from ICES clients if these are forthcoming.
Linkages to other committees or groups	<p>The subject area of this EG has close linkage with the following ICES groups: WGEAWESS, WGBESEO, WKCONSERVE, WGMARS, WGCOMEDA, WGIMM, WGBIE, WGIAB, WGSEDA, WGECON, WGIMM, WGRMES, WGNARS, WGHIST and the Strategic Initiative SIHD.</p> <p>Frequent interaction with WGECON and SIHD is especially important to ensure the smooth and efficient introduction of further social and economic science into the ICES network.</p>
Linkages to other organizations	Society of Applied Anthropologists (SfAA), NOAA Fisheries Human Dimensions and IEA Program, the Centre for Maritime Research (MARE), the Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES), Organisation for Economic Cooperation and Development (OECD), Scientific, Technical and Economic Committee for Fisheries (STECF EWG 20-14), Coast Action, PICES, IMBER Human Dimension group, Future Coasts



## Annex 3: List of abbreviations and acronyms

ACOM	ICES Advisory Committee
ASC	Annual Science Conference
Cefas	Centre for Environment, Fisheries and Aquaculture Science
CFP	Common Fisheries Policy
Defra	Department for Environment Food and Rural Affairs
DG MARE	Directorate-General for Maritime Affairs and Fisheries
EBFM	Ecosystem-based fishery management
EBM	Ecosystem-based management
EO	Ecosystem Overviews
EU	European Union
EU MAP	EU Multi Annual Programme
EWG	Expert Working Group
FAO	Food and Agriculture Organization of the United Nations
FEI	Fishing Engagement Index
FEXK	Fishers' experiential knowledge
Ge-GoC	Guadalquivir estuary and the Gulf of Cádiz
ICES	International Council for the Exploration of the Sea
IEA	Integrated Ecosystem Assessment
IEASG	Integrated Ecosystem Assessment Steering Group
IMBER	Integrated Marine Biosphere Research
IPBES Ecosystem Services	Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services
MaPTA	Marine Planning Trade-off Analysis
MARE	Centre for Maritime Research
MENSA	Managing Ethical Norwegian Seascape Activities
MSEAS	Marine Social-Ecological Systems Symposium
NGO	Non-governmental organisation
NOAA	National Oceanic and Atmospheric Association
NOK	Norwegian kroner
NFPs	National Fisheries Profiles
OECD	Organisation for Economic Co-operation and Development
OPP	Oceans Past Platform
PICES	North Pacific Marine Science Organization

RDB	Regional DataBase
RCGECON	Regional Coordination Group on Economics Issues
ROCC	Resilience of Coastal Communities
SCICOM	ICES Science Committee
SfAA	Society for Applied Anthropology
SIHD	Strategic Initiative for the Human Dimension
SNAPQUIVIR	Science for nature and people to achieve Ecosystem-Based Management in the Guadalquivir estuary and the Gulf of Cádiz
STECF	Scientific, Technical and Economic Committee for Fisheries
ToR	Term of Reference
UK	United Kingdom
UK-CFSS	UK Commercial Fishing Social Survey
WG	Working group
WGIEA	Working groups on Integrated Ecosystem Assessment
WGBESEO objectives	Working Group on Balancing Economic, Social and Ecological Objectives
WGCOMEDA	Working Group on Comparative Ecosystem-based Analyses of Atlantic and Mediterranean marine systems
WGEAWESS Shelf Seas	Working Group on Ecosystem Assessment of Western European Shelf Seas
WGECON	Working Group on Economic Indicators
WGINOR Sea	Working Group on the Integrated Assessments of the Norwegian Sea
WGINOSE	Working Group on Integrated Assessments of the North Sea
WGMARS	Working Group on Maritime Systems
WGRFS	Working Group on Recreational Fisheries Surveys
WGRMES	Working Group on Resilience and Marine Ecosystem Services
WGSEDA ture	Working Group on Social and Economic Dimensions of Aquaculture
WGSOCIAL	Working Group on Social Indicators
WKAFPA	Workshop on accounting for fishers and other stakeholders' perceptions of the dynamics of fish stocks in ICES advice
WKCONSERVE	Workshop on Challenges, Opportunities, Needs and Successes for including human dimensions in IEAs
WKENSURE	Workshop on developing guidance for ensuring the integrity of scientific information submitted to ICES by data providers
WKEO3	3rd Generation of ICES Ecosystem Overviews
WKOMRE	Workshop on a Research Roadmap for Offshore and Marine Renewable Energy

WKSEIOWFC on Fishing Communities	Workshop on the Socio-Economic Implications of Offshore Wind
WKSHOES	Workshop on Stakeholder Engagement Strategy
WKSTIMP egy	Workshop on Implementation the Stakeholder Engagement Strat-
WGFTFB	Working Group on Fishing Technology and Fish Behaviour
WKING2	Workshop 2 on innovative fishing gear