SEAWISE POLICY BRIEF ON

SOCIAL AND ECONOMIC EFFECTS OF FISHERIES

PURPOSE OF THIS BRIEF

For effective implementation of Ecosystem Based Fisheries Management (EBFM), an understanding of the human dimensions of fisheries, encompassing social, cultural, and economic aspects, is key. This brief summarises SEAwise's research exploring the diverse social and economic effects of fisheries.

Through a combination of modelling with in-depth qualitative methods, our work contributes knowledge on how fisheries affect society, culture, and economics and vice versa across Europe. Offering insights on how future regulatory and environmental change may shape the socio-economic benefits derived from fisheries, our findings highlight key areas for improvement across EU fisheries management – essential to ensure that implementation of EBFM is not only ecological successful but also socially just.

KEY POINTS

- SEAwise has identified the factors that are most significant in informing fisher's behaviour and developed sub-models to better predict how fishers may respond to management change.
- Through socio-economic modelling, also accounting for the carbon footprint of fleets and market dynamics, we have developed more realistic projections of how fisheries might respond to change.
- By developing community profiles and outlining social vulnerability indices, SEAwise has provided rich data and knowledge to support policymakers in navigating trade-offs and understanding the impact of management change on communities.
- Our work on the health benefits of different fish species provides regionally-tailored guidance on seafood consumption, including which fish to eat and how often.

KEY RECOMMENDATIONS

- **Policymakers must consider the full complexity of fisheries as 'social-ecological' systems.** SEAwise research highlights that balancing ecological goals with the needs of fishers, communities, and consumers is central to ensuring that implementation of EBFM is effective.
- **Integrating social and economic dimensions into the design and implementation of EBFM is of the utmost importance**, with this essential to ensure the vital resilience of fisheries social-ecological systems and to ensure that outcomes are both ecologically sustainable and socially fair.
- **EBFM should be implemented in an adaptive and contextually-sensitive manner**, tailored to account for regional (and sub-regional) variation in ecological conditions, fleet structures, and socio-economic realities. Our research emphasises that this is core to ensuring that management effectively addresses specific challenges at appropriate scales, grounding policy in local contexts.
- **Targeted investment, action, and economic support will be needed** to ensure fleets have the capacity to meet EU decarbonisation goals and weather shocks resulting from regulatory and climate-related change.
- **Improved coverage and integration of social data is essential.** Our work highlights that utilising this data is vital for both anticipating and mitigating any unintended socio-economic consequences that could result from management change.
- Our work on the health benefits of different fish species provides **regionally-tailored guidance that is directly applicable to consumers and suitable for inclusion within EU and Member State dietary guidelines.**

BACKGROUND

SEAwise's work is underpinned by an understanding of fisheries as complex 'social-ecological' systems, within which people and nature are deeply interconnected and interdependent. Resultantly, **our work addresses fisheries not just as ecological systems but also vital social and economic ones** – recognising the essential role of EU fisheries in supporting jobs, food security, and the social fabric of coastal communities across Europe.

The impact of regulatory and environmental change (i.e. climate change) is not only felt by marine ecosystems, it also extends to the fishers and coastal communities that depend on them. Integrating knowledge on social and economic dimensions into the design and implementation of Ecosystem Based Fisheries Management (EBFM) is, therefore, essential to ensure sustainable and equitable outcomes.

Our research has mapped and assessed social-ecological dimensions (such as fisher behaviour and coastal community vulnerability) across European fisheries, exploring how societal, cultural, and economic factors influence fisheries activity, and vice-versa. By developing improved models and providing knowledge on social indicators, **SEAwise has projected how environmental and management changes may affect both marine ecosystems and fishing communities.**

This brief synthesises this work, providing key recommendations to strengthen the integration of socio-economic considerations into EU fisheries policy and management.

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SEAWISE AT A GLANCE

Involving 24 universities and research organisations from across Europe funded under Horizon2020, the **SEAwise project has worked to deliver the knowledge needed to support fishers, managers, and policy makers in the practical implementation of Ecosystem Based Fisheries Management (EBFM)** across European waters.

Building on the recognition that societal and ecological objectives are interdependent under EBFM, SEAwise has assembled a new knowledge base that captures the social, economic and ecological complexity of European fisheries. Drawing on this to develop predictive models, tools, and ready-for-uptake advice, SEAwise's work enables stakeholders to evaluate the potential trade-offs of management decisions and forecast their long-term impacts.

Through this, SEAwise has laid the foundation for a whole-ecosystem approach to management in Europe – one that would equip both fisheries and management with the resilience needed to successfully navigate future challenges and change.

EXPLORING FISHER BEHAVIOUR

EBFM aims to take into account all factors that affect the sustainable management of fish stocks – including the behaviour of the people fishing them, and how they may react to changes in management or profit and market dynamics. However, understanding fisher behaviour remains one of the key uncertainties within fisheries science and management.

SEAwise addressed this through examining how fishers respond to environmental, regulatory and economic change (1) – drawing on interviews with fishers and examining existing data and literature to understand the variables influencing fisher behaviour. Across the Baltic Sea, Mediterranean,

Western Waters, and North Sea, we identified **the factors that are most significant in informing decisions made by fishers across social, economic and ecological variables** (see below).

While this work highlighted commonalities across regions, we found that the factors which dictate whether fishers choose to go to sea are highly context-dependent (1). With, for example, differences in business structure (i.e. family ownership), cultural norms, and vessel size dictating how fishers may respond to the same external pressures (1). As this variability means these behavioural insights cannot be applied uniformly across the EU fisheries, **our findings reinforce the need for tailored, contextually-sensitive management approaches** (1).

Utilising these insights, SEAwise developed behavioural sub-models based on the most frequent driving factors (such as fuel consumption and profit) of fisher behaviour. These sub-models capture specifically the behavioural dynamics of fishers which, as components that were integrated within our broader modelling work, allow us to better capture how fishers respond to

Figure 1. Factors informing fisher decision-making

Photo credit: Benedict Wilson, Mindfully Wired

management measures (2). **Recognising that these measures affect European fleets and communities differently, these behavioural sub-models improve our ability to anticipate and mitigate the unintended consequences that might result from the implementation of EBFM.**

MODELLING SOCIO-ECONOMIC IMPACTS & CO2 EMISSIONS

SEAwise has developed and iteratively enhanced several models to assess how different management measures, climatic conditions, and macro-level socio-economic scenarios together impact the profitability and carbon footprint of European fisheries (2, 3, 4). Through this and continual refinement of sub-models (on aspects such as fuel cost, fish pricing, and fisher behaviour), **SEAwise has produced more realistic projections of how fisheries might respond to change** – tailored across SEAwise's case study regions of the Baltic Sea, North Sea, Western Waters, and the Mediterranean.

Across our case studies, findings show that targeted fisheries management measures – including gear modifications, spatial closures, fishing effort reallocation, and catch limits – can enhance socio-economic performance (4). This is true even with the FMSY-based management objectives currently in force across regions (Landing Obligation in the north Atlantic and effort-based quota allocation in the Mediterranean) (4).

Additionally, whilst these management measures produce trade-offs (such as initial losses in economic performance due to spatial closures or sharp decreases in fishing opportunities due to reduction of effort-based quotas), we found these are often offset over time by higher first sale prices, lowered costs, and improved stock management (4). **These trade-offs, however, highlight the need for temporary fleet- and region-specific economic packages to ensure that affected fleets have the capacity to weather the time-limited shocks that may result from management change.**

Overall, across our case study regions, we found the impact of climate change to be variable. In fact, in many cases, our projections showed that climate is likely to have a more minimal impact on economic performance than changes to management or the broader socio-economic context (2, 4). In the North Sea, for example, fuel and fish price developments together with climate change affected the economic performance of the demersal mixed-fishery fleet, but this effect was less than that of the management scenarios explored (2). We also found climate to often have an exacerbating effect – for example, in the Bay of Biscay subregion (Western Waters), the small-scale fleet was found to be particularly vulnerable to changes in fish and fuel price, with climate change amplifying the effect of these scenarios (2).

On carbon footprints, our findings highlight CO2 emissions vary by region, fleet type, and management scenario. In some areas, we found that gear modifications and adjustments in effort can support both stock recovery and reduce emissions (4). For example, in the Mediterranean Sea – where the small-scale fleet is importantly represented in certain sub-regions – our findings underscore the significant role of small-scale fisheries in decarbonisation efforts, with small-scale fleets often producing less CO2 per kg of fish landed (4). Nonetheless, the cumulative impact of small-scale fleets, involving a large number of vessels operating across extensive coastal areas, should not be overlooked. Across fleets and regions, **our modelling explored several options to reduce carbon emissions, such as gear modifications and different effort allocation among métier, providing information on where investment and action may be needed to support fleet decarbonisation so as to deliver on the EU's energy efficiency goals.**

Given the impacts of climate and management change vary by region, gear type, and target species, **our findings emphasise the need for an adaptive, regionally-tailored approach in the EU fisheries management** – more accurately reflecting the varied local ecological conditions, fleet structures, and socio-economic realities within each region.

Photo credit: Tomas Griger

MAPPING FISHING COMMUNITIES

Fishing communities are critical to the fabric of cultural, social, and economic life in coastal areas. They provide more than just economic benefits; they are vessels of tradition, culture, and social bonds (5). When management measures impact fisheries, they also impact coastal communities – both directly and indirectly. Understanding and incorporating data on the social impacts of fisheries policies, on land as well as at sea, is therefore critical to the success of EBFM – to ensure that policies support not just the sustainability of fish stocks but also the communities that depend on them (5).

Across the Mediterranean, North Sea, and Western Waters regions, SEAwise identified and mapped fishing communities, linking them to specific fleets, ports, and regional industries and activities (i.e. fish auctions and processing) (5). Building on this mapping to develop community profiles, we have outlined across several sub-regions the cultural, organisational and historical characteristics that surround fishing activities (5). Through detailing the socio-economic and cultural contexts that shape fishing communities and value chains, **these community profiles provide rich data for use within Social Impact Assessments – through this providing policymakers with a more detailed picture of how communities might be impacted by fisheries policy change** (5).

Along the UK coast of the North and Celtic Seas, SEAwise outlined social vulnerability indices – encompassing employment, education, income, and other factors – to identify communities that are highly dependent on fishing and most exposed to the impacts of environmental, regulatory, and market change (5). Complementing SEAwise's community profiling, these approaches **provide both quantitative and qualitative data to help policymakers anticipate and mitigate the potential unintended consequences of future management changes.** In doing so, **supporting more just management decision-making which addresses specific challenges at appropriate scales by grounding policy in respective place-based realities.**

Photo credit: Benedict Wilson, Mindfully Wired

Our work here demonstrates **how diverse social data can be effectively gathered and integrated to ensure that changes to fisheries management not only enhance ecological sustainability but also support the resilience of coastal communities**. Without such data, there remains the risk that social impacts may be overlooked, in turn undermining the ability of the Common Fisheries Policy to reach its outlined objectives.

HEALTH BENEFITS OF DIFFERENT FISH SPECIES

Fish landed into European ports contributes to public health and food security across the EU and beyond. Alongside other socio-economic benefits of fisheries, EBFM recognises the important contribution of fish as a vital source of high-quality nutrition. Whilst the nutritional benefits of seafood are well established, consumers often remain uncertain about which species to eat and how often.

Responding to this, SEAwise developed regionally-tailored seafood consumption guidelines (6, 7). These guidelines assess locally available species based on key nutrients (in particular those not easily found in other foods, such as omega-3) and the health risk they pose on account of contaminants. To ensure our recommendations were accessible to consumers, species were ranked as either "good for you", "very good for you", or "best for you". Guidance was offered by region across the Baltic Sea, Western Waters, North Sea, and Mediterranean, and according to individual dietary needs across different population groups (6). Beyond their direct utility for consumers, **SEAwise's guidelines offer recommendations that can be integrated within EU and Member State dietary guidance, to support healthier, more sustainable seafood consumption.**

Across regions, small pelagic species such as herring, mackerel and sardine, and shellfish such as lobster or crab were ranked the highest – as either "best for you" or "very good for you" (6). Some species – such as Baltic herring and salmon – were

recommended with consumption limits due to contaminants (6). As an illustrative example, in the Western Waters region, the "best for you" group included sardines, mackerel, and lobster, while "very good for you" species included bluefin tuna, crab, and prawns. In the "good for you" group were species like scallop and monkfish (6).

Beyond considering species landed into regional ports, SEAwise also assessed commonly consumed fish across Europe, ensuring that our guidelines are relevant EU-wide – including for inland populations reliant on imported seafood (6).

CONCLUSIONS

SEAwise's research highlights that **for the implementation of EBFM to be effective, policymakers must consider the full complexity of fisheries as 'social-ecological' systems** – making sure to balance ecological goals with the needs of fishers, communities, and consumers.

Our work provides a stronger foundation for more adaptive and inclusive policy making by advancing knowledge on the behavioural, economic, social, and nutritional dimensions of European fisheries. Nonetheless, **social and economic data needs to be further integrated within policy and management decision-making**. This is vital so as to mitigate the potential unintended consequences resulting from regulatory change, and to ensure that transitions towards more sustainable fisheries management are just.

Building on this knowledge, **tailored approaches to fisheries management in Europe are needed**, spanning regional, national, and local levels, to more effectively mirror the complexity of the social-ecological systems they manage. **Integrating these insights into EU fisheries policy will be key to delivering on the CFP's objectives and, beyond this, fully and effectively implementing EBFM.**

Photo credit: Benedict Wilson, Mindfully Wired

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This policy brief has been produced as part of **SEAwise's work theme on 'Social and Economic Effects'.** For further information on this work and to dive into our findings in-depth visit: https://tinyurl.com/SEAwiseSocialEcon.

This work theme was led by Isabella Bitetto, COISPA Foundation, Italy, as part of the broader SEAwise project coordinated by Prof. Anna Rindorf, Technical University of Denmark (DTU).

This brief sits as part of a broader series of six policy briefs offering an overview of SEAwise's research, coinciding with the culmination of the project in September 2025. These briefs can be found here: https://tinyurl.com/SEAwisePolicyBriefs.

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