CLIMATE RESILIENCE: LESSONS FROM ABROAD

POLICY BRIEF NO. 12 - AUGUST 2021

OVERVIEW

- There is a need for fisheries, and the communities they support, to be able to respond effectively to increasingly changing conditions.
- Building this resilience will rely upon flexible and adaptive management, robust datasets and projections for the future, and close cooperation both between sectors and between nations.
- A number of regions across the world are working on building resilience into their fisheries management strategies. They provide useful insights for the rest of the world, including the UK.

BACKGROUND

Climate change is already affecting fisheries in a number of ways and its effects are expected to intensify into the future (1). Changes to the marine environment, such as warming waters and ocean acidification, lead to changes in the abundance and distribution of key species, which are often challenging to predict. Additionally, storms become stronger and more prevalent, leading to more dangerous conditions at sea. Extreme weather events and sea level rise also threaten many fishing communities.

With these existing and future changes in mind, it is crucial that the fisheries sector, worldwide, carefully considers how to anticipate these changes and respond accordingly. This is essential for building climate resilience: the ability to 'bounce back' from challenges brought about by the effects of climate change.

This briefing summarises the outputs from the APPG on Fisheries open Parliamentary webinar, 12 July 2021. This meeting heard from speakers from around the world who have made pioneering efforts to build climate resilience into fisheries and coastal communities. This document is a synthesis of the discussions that took place both at the event and online (via #FishingClimateResilience).

GLOBAL LESSONS

Environmental Defense Fund (EDF) recommends taking an ecosystem approach to fisheries management to effectively incorporate climate change considerations into decision making. This approach involves taking into account all ecological factors that affect fisheries, including climate change, leading to a more holistic method of management. EDF has outlined five guiding principles for climate resilience (2).

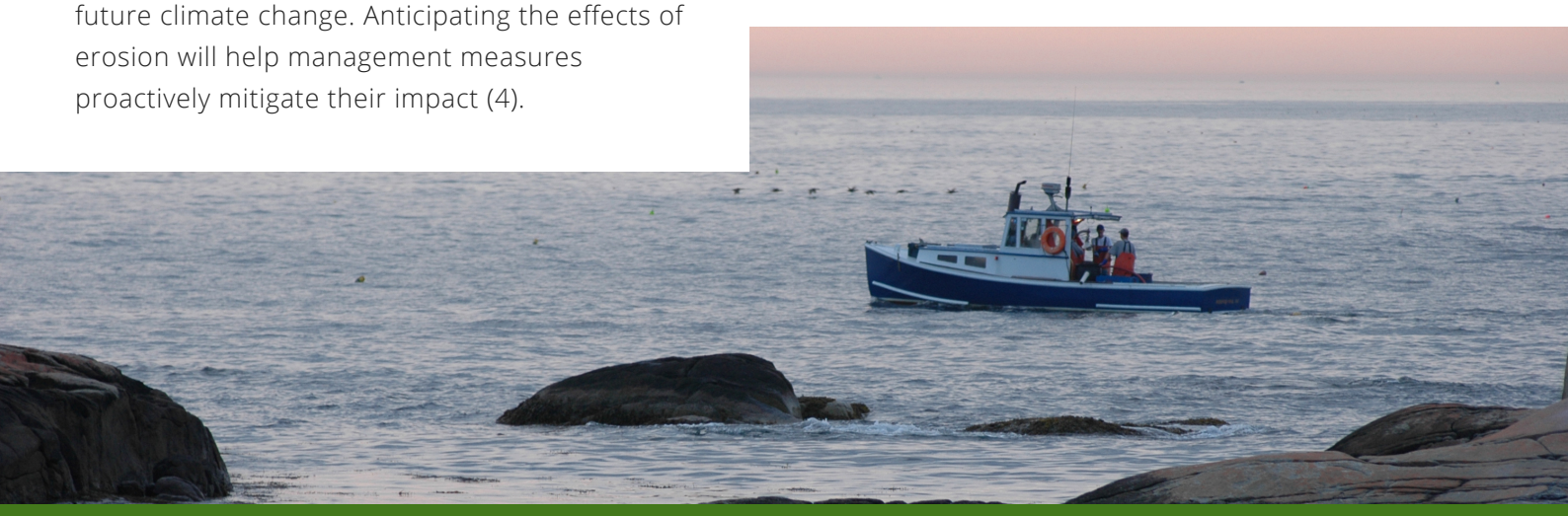
Robust fisheries governance and management is essential for any sustainable and responsible exploitation of fisheries stocks. Improvements in this respect have been pursued for several decades across the world, and some significant progress has already been made. Whilst sustainability metrics will continue to be essential, management measures will need to acknowledge inevitable changes to what a 'healthy' fishery for any particular area looks like under new environmental conditions (3). Management needs to have the capacity to be adaptive and systematically incorporate the latest data.

Management needs to anticipate changes to stocks, and identify the nature of risks and uncertainties so they can be mitigated. Proactive management is more effective than reactive management. For instance, modelling of Myanmar's fisheries found that whilst poorly regulated legal fishing represents the current principal threat to stocks, the effects of erosion are projected to become a greater threat under future climate change. Anticipating the effects of erosion will help management measures proactively mitigate their impact (4).

Transnational cooperation needs to be enhanced. Climate change will increasingly lead to stocks shifting across political boundaries, which introduces the possibility of conflicts concerning stock management as the ranges of commercial species change. Through anticipating these shifts and negotiating equitable outcomes, fair and sustainable harvesting remains possible. The SAPO project (see first case study) provides an example of this.

Improvements to ecosystem health lead to better resilience, because diverse ecosystems are better able to absorb environmental changes. For instance, Cuba is focusing on the protection of 'ecological engineers' - species that have a significant positive impact on ecosystem health - as an effective way of ensuring that the ecosystem maintains a high capacity for resilience (5).

The principles of fairness and equity must be upheld, if compliance and cooperation are to be expected between policymakers, fisheries managers, and the wider industry. This will involve participatory processes that prioritise equitable outcomes. For instance, the range of black sea bass along the US East Coast is shifting northwards, leading to greater fishing opportunities for fishermen in the north, rather than those fishermen further south who have historically invested more in sea bass conservation. Changing quota allocations to account for this could reduce fishing costs and increase fairness (6).



CASE STUDY:
Chile, Peru, and Ecuador

The Humboldt Current Large Marine Ecosystem, which stretches along South America's Pacific coast, represents a major productive area of the ocean, and supports 370,000 direct and indirect jobs (4). For the Humboldt Current, climate change is resulting in enhanced environmental variability, changes in stock productivity and distribution, and greater uncertainty regarding stock dynamics (7).

Chile, Peru, and Ecuador have formed a tri-national partnership to create a roadmap towards an ecosystem approach to fisheries management, which will incorporate climate resilience (8). The roadmap will involve the co-design of the Observation, Prediction and Early Warning System (SAPO) tool, which will inform adaptive management and help facilitate international agreements on transboundary stocks (9).

SAPO will involve scientific institutions from the three countries working in partnership with the fishing industry to collect data on the ocean, such as through sensors on fishing boats, which will feed into ecosystem-level prediction models. Accessible real-time data visualisation will provide a tool for use by fisheries authorities to make informed management decisions concerning the impacts of climate change.

The holistic quality of an integrated transnational system such as SAPO ultimately leads to more accurate predictions about the future and allows more timely adaptive management. Through involvement of fishing communities in data collection and decision making, these management measures can be inclusive and equitable.

CASE STUDY:
Australia

Australia's oceans are warming faster than the global average (10), and fisheries are already seeing profound changes, with knock-on effects for markets and communities. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) is helping the Australian government take steps to build resilience into the fisheries sector.

Fisheries vulnerability analyses have identified those species most vulnerable, according to projected changes in abundance, distribution, and behaviour (11). Species-environment models indicate that populations of most species are projected to decline by 2050, with most species declining by less than 20% but some declining by 60% or more (12).

Recommended next steps include the creation of practical fisheries forecasts that anticipate changes both in the short and long term (13). New management tools, such as flexible regulations and non-static assessments, will help protect both stocks and the communities that depend on them. Cross-jurisdictional coordination will ensure that movements of stocks across political boundaries are accounted for.

The Australian Fisheries Management Authority (AFMA) is creating a fisheries adaptation handbook to clarify the changes needed (4). This includes suggestions for changes that AFMA can make to its regulatory system to deliver on management objectives, and the potential consequences of these changes for industry and stakeholders.

CASE STUDY:

Canada's Pacific Coast

The waters off Canada's west coast (NE Pacific Ocean) have already seen significant changes to the marine environment (14). Recent assessments of the Federal government's ability to respond and adapt to climate change impacts on fisheries, highlight Institutional barriers such as limited capacity and communication and lack of strategic focus on climate change and fisheries (15, 16).

To address these challenges, there are calls for the development of national and regional action plans and strategies to address climate change impacts on fisheries. Work is underway to support the creation of these tools, such as a synthesis report, currently under development, that summarises the state of knowledge on climate change and fisheries in Canada's Pacific Region, highlighting examples from other jurisdictions who are advancing the responsiveness of fisheries management to a changing climate (17). A key finding of this report is that while the projected impacts of climate change on individual fish stocks are increasingly being documented, there is far less knowledge about the social and economic impacts on the fisheries sector and fishing communities. A recent survey led by Nature United on fishermen's perceptions of climate change found that harvester adaptive capacity is hindered by inflexible regulations, and an inability to move into new fisheries or find alternative work (4). Better communication, representation, and transparency were suggested by fishers as management measures that could enable greater flexibility and nimbleness.

Meanwhile, Nature United is also advancing efforts to develop a fisheries adaptation evaluation status tool, involving a collaboration between Fisheries Oceans Canada (DFO) and a number of academic institutions (4). The tool, while still in development, takes a score-based approach to assess institutional uncertainty and management flexibility on a fishery by fishery basis. This tool has the potential to identify those fisheries most in need of attention and funding to improve their capacity to be responsive and adaptive.

So far, these efforts by Nature United have uncovered some key insights. Firstly, there is a need to be strategic, purposeful, and targeted when building climate resilience in fisheries. It is important to remember that fishing communities face many competing challenges as well as climate change, that may operate on very different scales and involve different groups and institutions. Secondly, it is important to find effective entry points in the science-policy pipeline where changes can be made and the right audiences targeted. Lastly, collaborations and partnerships are essential for building capacity and bringing a diversity of ideas and perspectives into the development of potential solutions (18).

CASE STUDY:

Maine's lobster fishery

The American lobster fishery has been the US's most valuable fishery since 2014 (19), and represents 80% of landed value of all marine fisheries for the state of Maine (20). It therefore has a high economic and cultural value for many Maine communities, but this also means that the Maine fisheries sector is highly dependent upon lobster stocks.

Maine's lobster fisheries have already been affected by climate change, although so far the shifts to lobsters' annual cycles as a result of marine heatwaves have led to increased catches. In 2012, the increased landings observed as a result of a marine heatwave led to a backlog in the supply chain and subsequent price collapse (21).

The industry learnt from this, both by preparing to expand capacity and introducing new market initiatives to increase uptake from consumers, should another heatwave occur. When a similar event struck in 2016, their efforts paid off and prices held (22). This indicates that anticipation of future disruptions can help build resilience.

There is no guarantee that climate-induced changes to the marine environment will continue to benefit lobster populations. Further south along New England's coast, lobster stocks are declining, likely due to water temperatures exceeding a 'threshold' optimum for growth (19). When sea temperatures reach this threshold in Maine, a similar effect is predicted, though differences in management (such as the protection of large females in Maine) may lend the stock extra resilience.

There are a number of steps that can be taken to ensure that lobster fisheries are resilient to environmental changes. Protection measures that help the stock remain healthy and viable are paramount. A co-management approach to fisheries management, with a participatory governance structure, can ensure that decisions are made equitably and in everyone's best interest.

There is a need to cultivate a 'resilience mindset' that looks to the long term, to ensure these management decisions can take place. Conservation commitments will continue to act as an effective buffer, and can take place alongside a flexible and adaptive approach to management of the entire supply chain. To build resilience of the fleet, there also needs to be flexibility to pursue other species if lobster populations become less viable.

CONCLUSIONS

As climate change progresses and intensifies, the need to build resilience into fisheries around the world becomes more pressing. As well as facing direct effects such as rising sea levels and more intense storms, coastal communities also face indirect threats from changes to the fish stocks on which many rely. The case studies above give an indication of the progress made in different regions, highlighting both successes and obstacles, and provide useful lessons for the UK's own approach to fisheries management and support for coastal communities. They give an indication of the importance of proactive planning, robust science, and cross-border and cross-sector cooperation in ensuring that fisheries and coastal communities are as effectively prepared for the future as possible.

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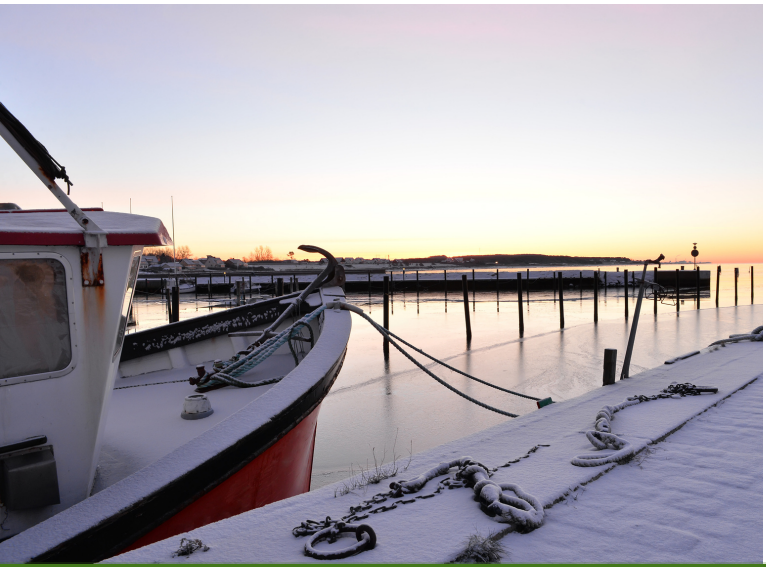

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