



Submission by the Food and Agriculture Organization of the United Nations (FAO)

To the United Nations Framework Convention on Climate Change (UNFCCC)

In relation to the Dialogue on the ocean and climate change to consider how to strengthen mitigation and adaptation action in this context (Decision 1/CP.25)

Purpose: This submission highlights **adaptation and mitigation options in fisheries and aquaculture, as part of a portfolio of nature-based solutions**, focussing on how ecosystem-based management approaches for marine resource management provide multiple benefits: fostering participatory approaches and including dependent communities in adaptation planning and decision-making; restoring and/or preserving ecosystems that sustain aquatic food production; ensuring food security, poverty alleviation and employment and therefore resilience of dependent communities; and developing consumer-led solutions that promote underutilized resources and reduce food loss and waste; as well as promoting low-carbon solutions.

This submission proposes a **dialogue on climate-resilient fisheries and aquaculture as nature-based solutions to foster adaptation and mitigation**. The expected outcomes of the dialogue include an increased understanding of the role of the fisheries and aquaculture sector in climate action, improved awareness on the importance of including the sector in Nationally Determined Contributions (NDCs), and a global roadmap to scale-up existing initiatives to build on positive examples and existing tools and guidance on adaptation planning and decision-making.

Background

There is a strong focus on nature for climate advocating for ecosystem restoration and protection to foster adaptation and mitigation. Aquatic and coastal ecosystems form an integrated and essential component of the Earth's ecosystem, and their conservation and restoration are considered to be an essential piece of the nature-based solutions to global climate change, owing to their roles in carbon sequestration and sustaining key ecosystem services such as coastal protection, nursery grounds for aquatic species, or food provision. Promoting sustainable fisheries and aquaculture practices entails a due consideration for adequate conservation and sustainable use of aquatic and coastal ecosystems and their resources. Therefore, adaptation and mitigation options for the fisheries and aquaculture sector are of relevance within a portfolio of nature-based solutions to climate change.

Fisheries and aquaculture make a crucial and growing contribution to food, nutrition and livelihood security. Global production of fish and other aquatic animals continued to grow and reached about 179 million tonnes in 2018, the bulk of which was used for direct human consumption. Fish accounts for about 17 percent of the world population's intake of animal proteins, but this share can be 50 percent or higher in some developing countries. Fish and fish products are important sources of nutrients and micronutrients such as vitamins, minerals (zinc, iron, iodine and selenium) and omega-3 fatty acids. In 2017, about 60 million people were engaged in the primary sector of capture fisheries and aquaculture, and the total engagement of women across both fisheries and aquaculture was over 50 percent when including the secondary sector. Implementing sustainable fisheries and aquaculture is thus central to achieving many of the SDGs, especially SDG 1 (No poverty), SDG 2 (Zero hunger) and SDG 14 (Life below water).

In order to be able to respond to the complex and rapidly changing challenges facing society especially those in relation to climate change and its impacts, it is essential that adaptation and mitigation strategies contribute to building the sustainability of the fisheries and aquaculture sector. This is one of the key messages that were highlighted by the [FAO International Symposium on Fisheries Sustainability](#) (18-21 November 2019, Rome, Italy).

Aquatic food production and climate change

In order for fisheries and aquaculture to continue to play an important role in food, nutrition and livelihood security, increasing inclusion of aquatic food production in climate dialogue and action should become a priority. In addition to marine capture fisheries, inland capture fisheries and aquaculture combined provide a significant portion (53%)¹ of global fish production and thus require climate-related strategies and processes to give specific focus to their concerns.

Half of the fish caught worldwide are from stocks that are scientifically monitored and, on average, are increasing in abundance. Effective management is the main reason why these stocks are now at sustainable levels or successfully rebuilding. It is thus crucial to recognize the importance of effective fisheries management in addressing the current level of overexploitation as well as the anticipated impacts of climate change on fish species productivity. Effective management is also at the heart of sustainable aquaculture development. It is not only a necessary condition for aquaculture to fully realize its potential for growth but also a basic foundation for resilience of the production system or dependent communities to absorb changes due to global warming or recover from more abrupt changes such as extreme events or disasters. In this sense, climate change provides an opportunity to improve fisheries and aquaculture management, and thus sustainability of the sector globally.

Moreover, healthy coastal and aquatic ecosystems are more than ever important to cope with climate change implications and effective management is the most adequate tool to conserve or restore them. However, climate-related solutions should go beyond the conservation and restoration of these ecosystems and give due consideration to people and communities who rely on them for food and livelihoods security, especially in developing countries where this reliance is high. In this sense, nature-based solutions can play an essential role in preserving vulnerable ecosystems and enhancing conservation for resilience to climate change impacts while promoting sustainable aquatic food production.

Efforts to adapt to and mitigate climate change impacts must be human-centred. It should be recognized that the fisheries and aquaculture sector is often viewed as a food and income-generating social safety net of last resort when other food and livelihood security avenues are closed. Millions of people in the sector are already struggling to maintain reasonable livelihoods. These are the people who are most vulnerable to the impacts of climate change, which adds to the many threats and obstacles that already confront them in their day-to-day lives. While effective adaptation and mitigation will be required across all scales and sectors of fisheries and aquaculture, particular attention needs to be given to the most vulnerable if the sector is to continue to contribute to meeting global goals of poverty reduction and food security.

The formulation and implementation of climate-related strategies that recognize, integrate and address concerns specific to the fisheries and aquaculture sector will lead to greater resilience of the sector and of the communities that it supports in the face of climate and other environmental threats. The mainstreaming of fisheries and aquaculture issues in national adaptation processes is improving but often remains incomplete and superficial. As of 1 August 2019, out of the 157 NDCs and 10 Intended NDCs (INDCs) submitted by countries as part of their commitment to the Paris Agreement, 89 (53%) included fisheries and aquaculture as a climate change adaptation and mitigation priority.

FAO offers extensive guidance and experience based on positive examples of work on the ground for inclusion of fisheries and aquaculture in climate dialogue and action. FAO supports countries to both adapt to and mitigate the impacts of climate change for fisheries and aquaculture, as an integral part of the 2030 agenda and the Sustainable Development Goals (SDGs), through a series of initiatives and action concerning: provision and compilation of knowledge on impacts of climate change and guidance on adaptation and mitigation strategies at global and regional levels; support to governments and institutions to revise their management structures and procedures; support to communities to diversify their targets, livelihoods, and social support systems; and development of good

¹ Statistics for the year 2018 from FAO FishStatJ - Software for Fishery and Aquaculture Statistical Time Series (published in March 2020; also available at <http://www.fao.org/fishery/statistics/software/fishstati/en>)

practices that can be replicated and scaled up in different contexts to inform policies and implement programmes and projects effectively.

Increasing global momentum on fisheries and aquaculture

The [2019 Special Report on the Ocean and Cryosphere \(SROCC\)](#) of the Intergovernmental Panel on Climate Change (IPCC) singles out the fisheries and aquaculture sector as one of the human activities exposed and vulnerable to climate drivers and impacts (e.g., fluctuations in population abundance linked to climate-induced impacts on reproductive success) and analyses relevant responses, echoing the most relevant messages of the 2018 [FAO Technical Paper 627](#) *Impacts of climate change on fisheries and aquaculture. Synthesis of current knowledge, adaptation and mitigation options*.

In addition, robust and resilient agri-food production systems - undoubtedly including aquatic food production - are huge economic, social and environmental drivers of transformational change and can be accelerators of progress on the SDGs including combatting and building resilience to climate change. Transforming the agri-food systems as a priority climate solution was highlighted by over 100 participants at the Marrakech Partnership Global Climate Action (MPGCA) Agri-food Chains Roundtable during UNFCCC COP25 (5 December 2019, Madrid, Spain).

With the increased momentum on oceans within UNFCCC, UNFCCC established in 2019 a working group on adaptation in coastal areas with the aim of designing a focal point forum and co-designing actions regarding adaptation beyond the forum. This working group provided inputs to a [scoping paper](#) on *Adaptation of the Ocean, Coastal Areas and Ecosystems*, which recognizes the critical relevance of climate resilient fisheries and agriculture in addressing food security concerns and climate change impacts, through both adaptation action and mitigation that can provide co-benefits for adaptation efforts.

The Ocean Dialogue could build on these milestones to make progress on the inclusion of fisheries and aquaculture sector in the global climate agenda with the expectation that this will eventually translate into enhanced action on the ground with direct benefits for countries and ultimately the communities that depend on the sector for their livelihoods, food security and employment.

Existing guidance and experience

To highlight adaptation and mitigation options in the fisheries and aquaculture sector as part of a portfolio of nature-based solution, the Ocean Dialogue could draw on FAO's existing guidance and experience based on positive examples of work on the ground. FAO divides its recommendations on resilience building for the sector into three thematic areas.

Adaptation: The [FAO Technical Paper 627](#) provides a toolbox consisting of adaptation tools and measures existing and recommended for fisheries and aquaculture. The **adaptation toolbox** comprises: institutional adaptation (e.g., spatial planning, cross-sectoral planning, ecosystem approach to fisheries/aquaculture (EAF/EAA), adaptive fisheries management, and conflict-solving mechanisms); measures addressing livelihoods (e.g., diversification of markets/fish products/livelihoods); and measures intended for reduction and management of risk and thereby strengthening resilience (e.g., monitoring, safety at sea, rehabilitate ecosystems, reinforced barriers, social protection, stronger farming structures, addressing underlying poverty problems).

In particular, **adaptive fisheries management** can play a crucial role in addressing the anticipated impacts of climate change on aquatic systems and their dependent communities and livelihoods. Built on the analysis of selected case studies with practical experiences on the ground of successful adaptation, FAO is working to identify examples of good practices to increase fisheries resilience.

Based on the adaptation toolbox, the [FAO Technical Paper 650](#) has further developed a range of **different approaches and methods to assess the costs and benefits of adaptation options** in the sector, with the overall aim to help adaptation planners and practitioners identify the most appropriate interventions.

For national adaptation plans (NAPs) or adaptation projects, priorities should be placed on **early adaptation** that focuses on adaptation undertaken in the next 5-10 years. This is because early adaptation measures are likely to have good returns on investment, and some fish populations and ecosystems are expected to be more at risk from

early climate change impacts. Early adaptation measures mainly include no- and low-regret options, early adaptation in decisions with long lifetimes, and early adaptive management activities.

Mitigation: Although being a relatively small global contributor, opportunities exist for mitigating emissions of greenhouse gases (GHGs) in capture fisheries and aquaculture. In the case of capture fisheries, a reduction of vessel emissions by 10 to 30 percent is achievable with efficient engines and larger propellers, better vessel shape and hull modifications, and speed reductions. For aquaculture, a reduction of 21 percent in CO₂ emission per tonne of fish produced can be expected through improving technological efficiency, reducing reliance on fossil fuel, replacing fish-based feed ingredients, and improving feed conversion rates.

Action addressing both adaptation and mitigation: Adoption and use of **digital innovations and technologies** can transform food production and improve climate change adaptation and mitigation practices. This has been implemented in FAO field projects that harnesses the power of digital technologies such as WhatsApp and gadgets (in Malawi), drones and GIS Mapping (in Myanmar), very-high-frequency (VHF) radios and dual repeater systems (in the Eastern Caribbean) to pilot, accelerate and scale innovative ideas with high potential for addressing climate change impacts.

Overall, there is a comprehensive set of measures to support adaptation and mitigation that can lay the ground for an increased inclusion of fisheries and aquaculture in NDCs. FAO has been working with partners to mobilize resources to support member countries to mainstream fisheries and aquaculture in formulating and implementing their climate change related commitments, with priorities on countries most dependent on the sector and with high exposure to climate change impacts.

Focus of the proposed dialogue

This submission proposes a dialogue to highlight adaptation and mitigation options in fisheries and aquaculture as part of a portfolio of nature-based solutions. The proposed dialogue, regardless of the format that will be ultimately agreed upon, should give specific focus to the following items:

1. Continue building knowledge of impacts at a variety of geographic and management scales.
2. Develop understanding of available technical solutions to manage resources subject to significant climate change uncertainty.
3. Share best, scalable and transportable solutions.
4. Ensure inclusion of the sector in NDCs to foster access to climate finance.
5. Raise awareness on the link between sectoral adaptation and resource sustainability, including the importance of a sustainable sector for achieving the SDGs.
6. Build on experience on the ground and interact with governments and national institutions to close the gap between national policies and needs at the local/community level.
7. Continue providing support to countries to ensure aquatic food production is adequately represented in climate dialogue and action.

Format and expected outcomes of the proposed dialogue

The dialogue could be carried out through a **dedicated subgroup on fisheries and aquaculture** with the following expected/desired outcomes:

1. Develop and articulate a new vision for climate resilient fisheries and aquaculture as part of a portfolio of nature-based solutions.
2. Raise awareness on the agri-food systems as a priority climate solution.
3. Promote strategies for synergistic actions and supportive policies, at all levels, to promote sustainable aquatic food production while meeting climate change related commitments.
4. Increased assistance to countries to mainstream fisheries and aquaculture in NDCs.

5. Promote scientific monitoring and effective management of fish stocks as a priority solution not only to address the current level of overexploitation but also to address the anticipated impacts of climate change on fish species productivity.
6. Provide inputs on fisheries and aquaculture adaptation and mitigation strategies to the planning processes of the UN Decade of Action and Delivery for Sustainable Development, the Decade on Ecosystems Restoration, and the Decade of Ocean Science for Sustainable Development.

Useful references

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