FOOD FORWARD NDCs

Implementing sustainable fisheries management

Overview

Globally, oceans have absorbed more than 93% of heat and over 26% of carbon dioxide emissions emitted by humans. This has altered ocean ecosystems, contributed to rising sea levels, led to more frequent disease outbreaks, acidified sea water, increased mortality and decreased productivity of key species, and changed the geographic distribution of many important fish stocks. These changes affect the lives of 500 million people in small-scale, non-commercial fisheries whose health, well-being, and livelihoods depend on fishing.

At the same time, unsustainable fishing contributes to climate change, including by degrading marine ecosystems and through emissions from fishing fleets. In 2020, for example, the world's fishing fleets were responsible for roughly 1.2% of total global fuel consumption. Unsustainable fishing undermines the resilience of coastal and marine ecosystems and the multiple benefits and mitigation and adaptation potential they offer.

As defined by WWF, a "fishery is sustainable where the ecological basis of the fishery is being maintained and restored, thereby ensuring future generations are not disadvantaged; so that the benefits of the fishing activity strengthen community/societal resilience and where the management and governance actions reflect the precautionary approach, facilitating necessary adjustments in the catch, effort and gear with transparency and public reporting." Poor fisheries management and global inequities in access, combined with impacts of climate change, pollution, and ecosystem degradation, has placed marine ecosystems, fish stocks, and livelihoods at risk.

A shift to sustainable, ecosystem-based fisheries management includes a transition to renewable sources of energy and low carbon practices. It is essential to increase the resilience of coastal and marine ecosystems to environmental change, reduce the industry's climate and other environmental impacts, and better allow the sector to adapt to these changes. Importantly, increasing fish biomass through sustainable management can significantly **contribute to blue carbon sequestration** and help mitigate climate change.

Concrete measures to implement

There are several tried and tested practices that can improve the sustainability of fishery management. These include actions that:

- Tackle overfishing and restore stocks:
    - Implement science-based harvest strategies and rebuilding plans at the provincial, national and regional level.
    - Eliminate Illegal, Unreported and Unregulated (IUU) fishing including through the **Agreement on Port State Measures**, which aims to prevent vessels engaged in IUU fishing from using ports and landing their catches. The FAO's **checklists and technical guidelines** can also be used to combat IUU fishing. Another tool is Catch Document Schemes, which national competent authorities can use to validate documents and verify that products have been legally sourced. These accompany the harvested aquatic animals from fishing grounds to markets, allowing the catch to be fully traceable and verifiably compliant with all applicable requirements.
    - Regulate fishing equipment to ensure that it has minimal impact on natural habitats, biodiversity, the seabed or surrounding waters.
    - Establish and increase reserves and replenishment zones to provide fish with safe areas for growth and reproduction.
    - Introduce open-and-closed seasons where fishers can catch specific fish species, and mandate fishery closure periods to allow time for stock recovery.
- Reduce and eliminate bycatch:

- Bycatch is one of the greatest threats to the marine environment, causing dramatic declines in populations of many marine species. Reducing bycatch can be achieved through both policy and technical measures, such as the introduction of innovative fishing equipment that reduces bycatch and negative habitat impacts. More detailed actions to reduce bycatch are outlined in the FAO's International **Guidelines on Bycatch Management and Reduction of Discards.**

- **Promote adoption** of responsible and sustainable fishing guidelines:

  - Encourage adoption of the FAO's **Code of Conduct for Responsible Fishing.**
  - Promote responsibly caught seafood, such as that certified as sustainable by **ISEAL**– and **GSSI**-approved third-party certification schemes, e.g. the **Marine Stewardship Council** (MSC), and/or 'green' rated according to WWF's **seafood guides**.
  - Promote the adoption of relevant international instruments by states (e.g., United Nations Convention on the Law of the Sea (UNCLOS), United Nations Fish Stocks Agreement (UNFSA), Agreement on Port State Measures (PSMA), WTO Fisheries Subsidies Agreement, UNCLOS Agreement on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ Agreement), etc.) WTO **agreed to prohibit certain harmful fisheries subsidies in 2022**, urging members to continually work towards a global fisheries framework emphasizing equity, sustainable development and resilience-building for both people and nature.

- Promote sustainable, ecosystem-based small-scale fishing and strengthen its role in environmental stewardship:

  - Improve registration and information reporting by fishers, in particular small-scale fishers and fisheries workers. This can ensure inclusion of the fisheries sector in the design of social protection schemes as well as improve fisher access to these programmes.
  - Support effective, equitable, and inclusive community-based fisheries management and support small-scale fisheries actors by implementing the FAO's Voluntary **Guidelines** for Securing Small Scale Fisheries. Also increase financial support in the context of the blue economy and ocean management.

    - Utilise the Fisheries Management Assessment Tool (FISHMAT) which provides a platform to assess small-scale fisheries, visualize data and use adaptive management to achieve fishery goals.
    - Secure tenure rights against competition from more powerful blue economy actors (e.g., oil/gas, maritime transport, tourism) who often negatively impact marine ecosystems and coastal communities.
    - Enable more equal access to fisheries, while developing labor protection policies, strategies, and programmes for fishery workers.
    - Increase financial support in the context of the blue economy and ocean management.
- Reduce fossil fuel use and promote renewable energy in fishing, with the restriction that vessel modernization not lead to increased fleet capacity:
    - Adopt and promote low-impact, fuel-efficient (LIFE) practices and gears that improve the efficiency of fishing techniques.
    - Promote efficient propulsion and onboard energy generation by reducing cruising speed, using hybrid propulsion systems (electric + diesel) and biofuels, and optimizing hull and propeller design. These have shown to generate fuel reduction and cost savings.
    - Promote use of solar PV systems to charge motors of small fishing boats.
- Prevent plastic waste from fishing:
    - Minimize at-sea fishing gear losses to avoid "ghost fishing". This can include engaging in the Global Ghost Gear Initiative.
    - Specific actions can include:
        - Control measures for eliminating and reducing the production, use and trade of avoidable and high-risk plastic fishing gear.
        - Control measures on the safe circulation and environmentally sound management of fishing gear.
        - Environmentally sound waste management of fishing gear.

A reed fishing basket filled with freshly caught fish. Mafia Island, Tanzania.

Enabling governance measures

In addition to those already outlined, to further ensure that management and governance arrangements provide for the sustainability of the fishery, including best science-based harvest control rules, facilitation of adequate reporting, monitoring and surveillance / compliance, high levels of transparency and regular assessment and adjustment, the following steps can be taken:

- Ensure the application of a precautionary approach regarding ecological, social, and economic impacts of the fishery, including climate change impacts.
- Through national and international resource management strategies:
    - Integrate fisheries into broader planning and governance frameworks.
    - Work with Member States of Regional Fisheries Management Organisations to implement more equitable and sustainable resource harvest strategies in the High Seas – areas beyond national jurisdictions.

    - Establish large scale marine protected areas through the **Biodiversity Beyond National Jurisdiction treaty**, agreed within the **Kunming Montreal Global Biodiversity Framework**.
    - Include management measures to protect and conserve blue carbon ecosystems and the conservation and restoration of coastal and marine ecosystems, including coral reefs, mangroves, tidal marshes and seagrass beds, to strengthen adaptation and resilience.
- Enhance fisheries management capacity:
    - Increase transparency in the sector under such mechanisms as the **Fisheries Transparency Initiative (FiTI)**.
    - Improve the quality of fisheries data. This is key to implementing sustainable fishery practices, as an absence of robust data collection programmes limits opportunities for responsive action.
    - Develop tools and train staff in data management, exploration and curation (i.e. quality control) and in the use of suitable assessment approaches (e.g. data-limited, simple indicator-based methods).
    - Promote and support the collaboration with fishing communities in data gathering and interpretation, and facilitate the use of technology and knowledge transfer in the collection of data and information.
- Strengthen enforcement capacities:
    - Assess and strengthen technical capacities for compliance and enforcement.
    - Develop and implement monitoring processes to understand the social and economic implications of management actions.
    - Develop safety-at-sea measures suited to a changing climate and shifting fish availability.
- Ensure inclusive fisheries policies:
    - Ensure fisheries policy and management decisions are inclusive and enable equal access (i.e., impacted populations, including small-scale fishers, Indigenous Peoples, women, local communities, and other marginalised groups who need a voice and seat at the table) while promoting respectful recognition of both scientific evidence and local and traditional knowledge.

- Publish all available information in local languages as a basis for greater knowledge access, education and participation of fishery stakeholders.
- Explicitly consider gender differences in terms of vulnerability and build on the specific skills and the positive role women and youth can play.
- Strengthen the tenure and rights of access to fisheries and fishery-related resources by fishing communities.
- Promote the reduction of socioeconomic inequalities and implement measures to reduce poverty and increase food security, as these measures can **increase resilience and sustainability** in fishery resources use.

- Build partnerships:
  - Build partnerships with the fishing industry and work to influence seafood markets and supply chains, including the development of fishery improvement partnerships, certification and business coalitions.
  - Build management partnerships with stakeholders through collaborative mechanisms for decision-making, with clear rules and processes for efficient management of fisheries which consider the interests of all stakeholders including small-scale fishing communities.
  - Establishing inclusive and sustainable seafood producer organisations.

- Reduce harmful subsidies and encourage investment in sustainable practices:
  - Invest in and innovate around fishing and fish farming practices, modern insurance alternatives, early warning systems, communication and the use of industry real-time data.
  - Prohibit harmful fishery subsidies, which are a key factor in the widespread depletion of the world's fish stocks, through effective implementation of the **WTO Agreement on Fisheries Subsidies** and through supporting the conclusion of an extended WTO Agreement on Fisheries Subsidies.

- Improve finance for sustainable small-scale fisheries, with possible measures including risk insurance, microcredit, cooperative building, and increased coherence in trade and development aid.

Tools for implementation and monitoring

In addition to the tools already outlined in the preceding sections, another useful resource is:

WWF's Oceans Futures initiative

Forecasts how fish populations may shift as a result of climate change and can thus facilitate collaborative conservation actions to prevent future conflicts.

Link: https://www.oceansfutures.org/about

FAO Blue Ports Initiative (BPI)

An open-source platform by FAO that supports fishing ports to promote environmental, social, and economic sustainability across port operations and management. It currently includes a network of 26 countries in Asia, Africa and Latin America.

Link: https://www.fao.org/in-action/blue-ports-initiative/en

FAO Climate-Smart Fisheries and Aquaculture

E-learning Course to support climate-smart agriculture (CSA) approach inclusion into the fisheries and aquaculture sector. It offers technical knowledge on CSA principles and implementation guidance.

Link: https://elearning.fao.org/course/view.php?id=579

Climate change mitigation benefits

- Sustainable, ecosystem-based fisheries management can significantly contribute to blue carbon sequestration.
- Restoration of coastal ecosystems, especially mangroves, provides substantial climate mitigation.
- Sustainable, ecosystem-based fisheries with healthy fish stocks mean a **reduction in fossil fuel use** as boats must spend less time at sea (effort) for the same amount of catch.
- Switching to low-fuel gears and hybrid and renewable energy sources reduces fishing emissions. Prioritization of low-fuel gears within each fishery alone could reduce greenhouse gas emissions by **4 -61 %**, depending on the species being fished.

Adaptation benefits

Implementation of measures to reduce the environmental and climate impacts associated with fisheries, through more sustainable practices, will **increase the resilience of fish stocks to the negative impacts of climate change**.

Other sustainable development benefits

Aside from contributing to SDG 14: Life Below Water, the wider benefits of sustainable, ecosystem-based fisheries contribute to the following SDGs:

- SDG 1 (No poverty) & SDG 2 (Zero hunger): improving food security and livelihood of local coastal communities.
- SDG 3 (Good health and well-being): helping to secure access to aquatic nutrition and improving food security.
- SDG 5 (Gender equality), SDG 8 (Decent work and economic growth), & SDG 10 (Reduced inequalities): securing employment opportunities in coastal communities and improving the long-term profitability and stability of the industry.
- SDG 12 (Responsible consumption and production): embedding the principles of sustainable management in the provision of aquatic food.

- SDG 13 (Climate action): increasing the resilience of fisheries and of coastal and marine ecosystems to environmental change; reducing the sector's impact on climate and marine ecosystems; and increasing blue carbon sequestration.

Potential challenges, externalities, and trade-offs

- Potential barriers: A lack of political will and commitment; geopolitical dynamics and conflicts that impede regional fisheries management; lack of finance for management structures; and global inequalities in the fisheries trade system.
- Measures to reduce overfishing may require the development of alternative livelihoods among some fishers and related businesses.
- Mechanisms are needed to avoid the potential negative rebound effects (e.g., increased fishing pressure on wild fish stocks) from more efficient fisheries technologies.

Measures to address potential challenges, externalities, and trade-offs

- Measures to address potential barriers: Foster international collaboration; Address poverty, food insecurity, and nutritional insecurity; improve financing mechanisms for small-scale fishery actors; reduce inequalities in global fisheries value chains.
- Investments in inclusive community-based alternative livelihood initiatives.
- Implementing co-management plans for marine governance and exploring **other effective area-based conservation measures (OECMs)** to support sustainable livelihoods.
- Research and technology development and investments into different food production systems and related land/water-use efficiencies.

Interventions in practice

A lot can be achieved by working collaboratively, with a few specific examples of successful sustainable fishery interventions highlighted below. A full outline of what can be achieved can be seen in WWF's **Oceans Impact** Report.

- Since 2015, the Global Environment Facility (GEF) and FAO have been implementing the Project on the Sustainable Management of Bycatch in Latin America and Caribbean Trawl Fisheries. In countries across the region, including Brazil, Costa Rica, Colombia, Mexico, Suriname and Trinidad and Tobago, the project joins with local partners in testing, adapting, supporting and disseminating techologies, best practices, and socioeconomic policies to reduce bycatch in bottom trawling fisheries. Project countries support the measures by establishing institutional structures for participatory management, engaging the fishing sector and increasing trust between governments and fishery actors. Several simple technological changes in gear (e.g., changing the net mesh size) have been widely accepted and reduced bycatch in industrial and semi-industrial fleets by 25 to 50 percent. Meanwhile, the project has assisted local communities and vulnerable women's groups to participate in decision making processes for fisheries.
- In the Philippines, the national and local governments partnered with USAID to launch the five-year **Ecosystems Improved for Sustainable**

Fisheries (ECOFISH) Project in 2012. Building upon previous national, USAID, and local initiatives in the country, the project aimed to conserve marine biodiversity and improve coastal and marine resource management in the local economies of eight Marine Key Biodiversity Areas. Based upon a participatory, decentralized, and multisectoral approach, ECOFISH promoted the Ecosystem Approach to Fisheries Management (EAFM) and expanded its adoption among communities, while ensuring that fishery benefits would be shared by local resource users. The project resulted in a 24 percent increase of fishery biomass and 12 percent increases or improvement in employment, improving management for more than 1.8 million hectares of municipal marine waters.

- WWF and partners' long-term investment to help secure the landmark and binding World Trade Organisation **Fisheries Subsidies Agreement** will fundamentally ensure that government financial interventions do not harm the sustainability of marine resources. This will include curtailing, for example, fuel subsidies, resulting in lower GHG emissions produced by the global fishing industry.
- **In Indonesia**, residents of the fishing village of Menarbu decided to implement '*Sasi*', a local tradition to close the sea for an agreed period – similar to a periodic no-take zone. As Menarbu is located within the Teluk Cenderawasih National Park, WWF-Indonesia initially planned to collaborate with rangers to help manage these marine areas. But further consultations with local leaders showed that *Sasi* would not only be efficient, but also an inclusive, equitable and sustainable approach for marine and coastal resource management.
- The marine reserve Hermandad, established in 2022, expanded the protected waters of the Galápagos in Ecuador by 6 million hectares. Located at the confluence of three ocean currents, the Galápagos archipelago is one of the richest marine ecosystems in the world. Hermandad builds on the existing marine reserve, which protects about 13.3 million hectares from extractive activities. WWF Ecuador supported the establishment of the Hermandad Marine Reserve and development of its management plan – the result of three years of intense negotiation between the fishing sector and conservation organizations. Elsewhere in Latin America, WWF helped secure new marine protected areas (MPAs) in Argentina (11 million hectares), Brazil (92 million hectares), Colombia (17 million hectares) and Mexico (14 million hectares), protecting a diverse array of coastal and oceanic ecosystems.

References

1. Bastardie, F., Hornborg, S., Ziegler, F., Gislason, H., & Eigaard, O. R. (2022). Reducing the Fuel Use Intensity of Fisheries: Through Efficient Fishing Techniques and Recovered Fish Stocks. *Frontiers in Marine Science*, *9*, 817335
2. BSI. (2011). *PAS 2050:2011 – Specification for the assessment of the life cycle greenhouse gas emissions of goods and services*. Retrieved from https://biolatina.com/wp-content/uploads/2018/08/PAS2050.pdf
3. Cordano, J., & O'Dea, N. (2023). *Informal summary report of the ocean and climate change dialogue 2023*. Retrieved from https://unfccc.int/documents/631689#:~:text=UNFCCC%20Nav&text=The%20
4. FAO. (2009). *Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing*. Retrieved from https://www.wto.org/english/tratop_e/rulesneg_e/fish_e/2009_psma.pdf
5. FAO. (2020). *The State of World Fisheries and Aquaculture 2020: Sustainability in action*. Retrieved February 12, 2024, from https://www.fao.org/3/ca9229en/ca9229en.pdf
6. FAO. (2022). *The State of World Fisheries and Aquaculture 2022: Towards Blue Transformation*. Retrieved February 12, 2024, from https://www.fao.org/documents/card/en?details=cc0461en
7. FAO. (n.d.). Management Measures and Approaches. Retrieved February 12, 2024, from https://www.fao.org/3/W4230E/w4230e07.htm
8. FAO (2020). Addressing fisheries and aquaculture in National Adaptation Plans. Retrieved June 25, 2024, from https://openknowledge.fao.org/items/384f23a5-57db-4e70-8c75-6156c523d904
9. FAO (2020). Climate-smart fisheries and aquaculture. Retrieved at https://elearning.fao.org/course/view.php?id=579
10. FAO. (2015). *Fuel and Energy Use in the Fisheries Sector*. Retrieved from https://www.fao.org/documents/card/en?details=89457227-b55f-4ac6-95ad-cccd53a3dcb0/
11. Ferrer, E. M., Giron-Nava, A., & Aburto-Oropeza, O. (2022). Overfishing Increases the Carbon Footprint of Seafood Production from Small-Scale Fisheries. *Frontiers in Marine Science*, *9*, 768784
12. Global trends in carbon dioxide (CO2) emissions from fuel combustion in marine fisheries from 1950 to 2016. (2019). *Marine Policy*, *107*, 103382
13. HLPE (2023). *Reducing inequalities for food security and nutrition*. Rome, CFS HLPE-FSN. Available from https://www.fao.org/cfs/cfs-hlpe/insights/news-insights/news-detail/reducing-inequalities-for-food-security-and-nutrition/en

14. Lam, V. W. Y., Allison, E. H., Bell, J. D., Blythe, J., Cheung, W. W. L., Frölicher, T. L., et al. (2020). Climate change, tropical fisheries, and prospects for sustainable development. *Nature Reviews Earth & Environment*, *1*(9), 440–454

15. Macusi, E. D., Camaso, K. L., Barboza, A., & Macusi, E. S. (2021). Perceived Vulnerability and Climate Change Impacts on Small-Scale Fisheries in Davao Gulf, Philippines. *Frontiers in Marine Science*, *8*, 597385

16. Mariani, G., Cheung, W. W. L., Lyet, A., Sala, E., Mayorga, J., Velez, L., et al. (2020). Let more big fish sink: Fisheries prevent blue carbon sequestration—half in unprofitable areas. *Science Advances*. Retrieved February 12, 2024, from https://www.science.org/doi/10.1126/sciadv.abb4848

17. Parker, R. W. R., Blanchard, J. L., Gardner, C., Green, B. S., Hartmann, K., Tyedmers, P. H., et al. (2018). Fuel use and greenhouse gas emissions of world fisheries. *Nature Climate Change*, *8*(4), 333–337

18. Rare. (n.d.). Restoring, protecting, and managing our coastal seas. *Fish Forever*. Retrieved February 12, 2024, from https://rare.org/program/fish-forever/

19. Scotti, M., Opitz, S., MacNeil, L., Kreutle, A., Pusch, C., & Froese, R. (2022). Ecosystem-based fisheries management increases catch and carbon sequestration through recovery of exploited stocks: The western Baltic Sea case study. *Frontiers in Marine Science*, *9*, 879998

20. Sumaila, U. R., & Tai, T. C. (2020). End Overfishing and Increase the Resilience of the Ocean to Climate Change. *Frontiers in Marine Science*, *7*, 541070

21. Sumaila, U. R., de Fontaubert, C., & Palomares, M. L. D. (2023). How overfishing handicaps resilience of marine resources under climate change. *Frontiers in Marine Science*, *10*, 1250449

22. Sumaila, U. R., Ebrahim, N., Schuhbauer, A., Skerritt, D., Li, Y., Kim, H. S., et al. (2019). Updated estimates and analysis of global fisheries subsidies. *Marine Policy*, *109*, 103695.

23. Sustainable Fisheries. (n.d.-a). *WWF Baltic*. Retrieved February 12, 2024, from https://www.wwfbaltic.org/our-work/marine/sustainable-fisheries/

24. Sustainable Fisheries. (n.d.-b). *WWF*. Retrieved February 12, 2024, from https://www.wwf.eu/what_we_do/oceans/sustainable_fisheries/

25. Suuronen, P., Chopin, F., Glass, C., Løkkeborg, S., Matsushita, Y., Queirolo, D., et al. (2012). Low impact and fuel-efficient fishing—Looking beyond the horizon. *Fisheries Research*, *119–120*, 135–146

26. United Nations General Asssembly. (2023). *Draft agreement under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction*. Retrieved from https://www.un.org/bbnj/sites/www.un.org.bbnj/files/draft_agreement_advance

27. World Trade Organization. (2022). *Agreement on Fisheries Subsidies*. Retrieved from https://www.wto.org/english/tratop_e/rulesneg_e/fish_e/fish_factsheet_e.pdf

28. WWF. (2022). *Setting Science-Based Targets in the Seafood Sector: Best Practices to Date*. Retrieved from https://files.worldwildlife.org/wwfcmsprod/files/Publication/file/8cn3jb0kvv_Se

29. WWF. (2023). *WWF COP28 Ocean-Climate Expectations*. Retrieved from https://wwfint.awsassets.panda.org/downloads/wwf-cop28-ocean-climate-expectations-paper-nov-2023.pdf

30. WWF (2022). *WWF welcomes long-awaited WTO agreement to curb harmful fisheries subsidies* Retrieved from https://wwf.panda.org/wwf_news/?5852941/WWF-welcomes-long-awaited-WTO-agreement-to-curb-harmful-fisheries-subsidies