Submission by the Food and Agriculture Organization of the United Nations (FAO) to the 25th meeting of the Open-ended Informal Consultative Process on Oceans and the Law of the Sea, on the theme "Capacity building and the transfer of marine technology: New developments, approaches and challenges"

As a United Nations specialized agency leading international efforts to defeat hunger including through the sustainable production of food from the ocean, rivers and lakes, FAO is pleased to submit this written statement to the 25th Meeting of the Open-ended Informal Consultative Process on Oceans and the Law of the Sea, on the topic of **"Capacity building and the transfer of marine technology: New developments, approaches and challenges"**.

FAO works with Members and partners to transform aquatic systems and promote the responsible and sustainable management of aquatic food systems. In doing this, FAO undertakes a number of activities related to capacity building and transfer of marine technology. The submission is structured around the following sub-headings: 1) Safety at sea, 2) Marine plastic pollution, 3) New developments in fishing technology, 4) Small scale fisheries, 5) Aquaculture, and 6) Capacity building and innovation through partnerships.

Safety at sea

1. FAO supports the implementation of safety at sea capacity-building and awareness raising activities through Train-the-trainer workshops and the development of safety guidelines, and safety codes. FAO collaborated with the Bay of Bengal Programme Intergovernmental Organization (BOBP-IGO) and the Western Central Atlantic Fishery Commission (WECAFC), to develop regional plans of action for enhanced safety, decent work and social protection in the fisheries sector.[1] Training of Trainers on safety at sea for small-scale fishers in marine and inland waters have been conducted in the Caribbean, Latin America, South Asia, Latin America and Africa.
2. Furthermore, FAO continues to develop safety materials for educational and training purposes. In partnership with the Shanghai Ocean University, FAO published a training guide on the rules of the road at sea for small-scale fisheries, available in Chinese.[2] The latter builds on and

[1] FAO. 2024. Action Plan for Safety, Social Protection and Decent Work in Fisheries and Aquaculture in the Western Central Atlantic Fishery Commission (WECAFC) Region. Rome.
https://doi.org/10.4060/cd3641en
FAO. 2023. *Plan of action for enhanced safety, decent work and social protection in the fisheries sector of the Bay of Bengal Programme region (BOBSAFE)*. Rome.
https://doi.org/10.4060/cc8204en
[2] https://doi.org/10.4060/cc8214zh.

complements the online "Rules of the road at sea for small-scale fishers" course.[3] FAO published a sea safety guide for small-scale fishers in the Pacific,[4] and prepared safety posters to raise awareness on safe fishing practices in small-scale fisheries.[5]

3. FAO co-organized the sixth edition of the International Fishing Industry Safety and Health Conference (IFISH 6)[6] at FAO headquarters, held in, Rome, from 8 to12 January 2024. In an effort to increase knowledge exchange in between conferences attendees discussed an initiative entitled "International IFISH Innovation Exchanges" to encourage knowledge exchange, transdisciplinary problem-solving, data publication, skills development and the dissemination of evidence-based health and safety solutions to international worker populations in various geographic locations.

Marine plastic pollution

4. As part of the IMO OceanLitter program, FAO works closely with IMO in supporting developing countries to prevent and reduce plastic pollution from the shipping and fisheries sector. The projects that are part of this program include: GloLitter Partnerships,[7] RegLitter[8] and Plastic Reduction in the Oceans: Sustaining and Enhancing Actions on Sea-based Sources (PRO-SEAS).[9]Through these projects, the two UN agencies are developing capacity building material (knowledge products, training materials and e-learning courses) and fostering regional cooperation to address sea-based sources of marine plastic pollution based on the implementation of the MARPOL Annex V, the London Convention and its Protocol and the FAO Voluntary Guidelines on the Marking of Fishing Gear.
5. FAO regularly informs the International Maritime Organization (IMO) members and raise awareness on activities and ongoing initiatives in the fisheries sector, as for example the work conducted within Regional Fisheries Management Organization addressing marine plastic litter, including abandoned, lost, or otherwise discarded fishing gear (ALDFG). These contributions inform the ongoing development processes under IMO for the further development of reporting of lost fishing gear requirements, and development of fishing gear marking under MARPOL Annex V.
6. Coordination at national and regional level within the relevant authorities dealing with sea-based sources on marine pollution (environment, maritime, ports, fisheries and aquaculture, etc.) is still a challenge that hampers existing efforts to address this transboundary and multidisciplinary issue.

New developments in fishing technology

7. FAO has been providing fisheries expertise to the Joint Group of Experts on the Scientific Aspects of marine Environmental Protection (GESAMP), a group of independent scientific experts that provides advice to the UN member countries on scientific aspects of marine environmental protection. Adopting a cross-sectoral and interdisciplinary approach, GESAMP produces

[3] The online course on the Rules of the road at sea for small scale fishers was released in 2021 and is available in Chinese, English, French and Spanish at the following link: https://elearning.fao.org/course/view.php?id=704
[4] FAO. 2023. *Sea safety guide – A guide for small-scale fishers*. Apia. https://doi.org/10.4060/cc6257en.
[5] https://www.fao.org/fishing-safety/news-events/news/detail/en/c/1628567/.
[6] https://ifishconference.ca/
[7] GloLitter Partnerships Project | Preventing and reducing marine plastic litter from sea-based sources
[8] RegLitter: Agreement signed with the Republic of Korea | GloLitter Partnerships Project
[9] Projects | GEF

publications sharing information, knowledge and research results, as well as providing recommendations to guide decision-making processes. These are publicly disseminated through the GESAMP website[10].

8. FAO supports the work of the ICES/FAO Working Group on Fishing Technology and Fish Behaviour (WGFTFB) which collates, discusses and shares information on global research activities related to development of selective and environmentally friendly fishing gears for the reduction of bycatch, discards and impacts on habitat. Knowledge is shared via annual meeting reports and publicly disseminated on ICES FAO dedicated website[11].
9. Through implementation of the project "Strategies, technologies and social solutions to manage bycatch in tropical Large Marine Ecosystem Fisheries (REBYC-III CLME+)", FAO delivers capacity building workshops to developing country fishers, and production of relevant fishing gear technology knowledge products. These activities contribute to improving fishing practices to manage bycatch and reduce discards and the negative impacts of fishing gears in Caribbean and North Brazil Shelf Large Marine Ecosystem fisheries.
10. Fishing vessels technological developments are often driven by economic incentives, which commonly lead to larger vessels with higher fishing capacity in terms of tonnage, length and engine power. FAO updated recently its overview of industrial fishing vessels by type[12], documenting the trends in fishing vessels design and supporting better statistical data collection on fishing vessels. FAO is supporting its Members with the transition of their small-scale fishing fleets towards using more sustainable, safe and fuel-efficient vessels. This work includes the design of better and safer vessels, make these designs available onlineat the FAO's Fishing Vessel Design Database (FVDD)[13], development of training materials for vessel building and repair, and capacity building of boat builders in better construction techniques for construction of fiberglass reinforced plastic (FRP) and high density polyethylene (HDPE) hulled small fishing vessels.
11. The project GloLitter Partnerships implemented by IMO in collaboration with FAO has a dedicated component on fishing gear modification to reduce impacts of abandoned, lost and otherwise discarded fishing gear (ALDFG) which is one form of plastic pollution coming from fishing activities. Fishing gear modifications have been developed and trailed in three small scale fisheries in GloLitter countries. The results will be published in the project website in early 2025.

Small scale fisheries

12. Small-scale fisheries (SSF) account for at least 40% of the global capture fisheries production, whereby two-thirds are from marine capture fisheries[14]. Women play a significant role in the post-harvest sector, though they are often marginalized and face challenges with high fish loss and waste. Capacity development of local SSF organizations and local fishing communities, targeting women, has been prioritized and enabled through trainings and provision of post-

[10] http://www.gesamp.org/publications
[11] https://wgftfb.org/
[12] Thermes, S., Van Anrooy, R., Gudmundsson, A. & Davy, D. 2023. Classification and definition of fishing vessel types. Second edition. FAO Fisheries and Aquaculture Technical Paper, No. 267. Rome, FAO. https://doi.org/10.4060/cc7468en
[13] https://www.fao.org/fishery/en/collection/vesseldesign
[14] FAO, Duke University & WorldFish. *2023. Illuminating Hidden Harvests – The contributions of small-scale fisheries to sustainable development.* Rome. https://doi.org/10.4060/cc4576en

harvest technology (small infrastructure). For example, in Madagascar[15], women associations were supported to help improve their livelihood activities in preserving, handling, processing and selling fish products. These capacity development activities also align to the implementation of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines)[16] and SDG 14.b[17].

Aquaculture

13. Aquaculture can meet the rising global demand for aquatic foods. Target policies, technology transfer, capacity building and responsible investment are crucial to boost sustainable aquaculture where it is most needed, particularly in Africa.
14. Innovative in aquaculture systems is essential for an intensification or expansion of sustainable and resilient aquaculture. Innovation has already boosted aquaculture's growth in recent decades, contributing to global food security and socioeconomic development. In recent decades, technological improvements in aquaculture systems, such as raceways and integrated food production, have resulted in increased efficiency and adoption of best practices. Integrated food production systems such as aquaculture–agriculture and integrated multitrophic aquaculture are experiencing a renewal because of their ability to optimize resource uses, improve income and contribute to food security[18].
15. By supporting the transfer and adoption of innovative systems and technologies, FAO provides solutions to introduce aquaculture in regions where it did not exist before. For instance, producers are adopting innovative aquaculture systems in arid or desert ecosystems to overcome water scarcity, such as recirculating aquaculture systems and biofloc technology to improve water efficiency and biosecurity[19].
16. Digitalization of aquaculture is a transformative process based on the use of digital technologies along the production cycle to improve operations and create value. Aquaculture digitalization increases the amount and quality of data collected; furthermore, the systematic availability of data throughout the cycle facilitates analysis to inform management and control decision-making. Digitalization links farmers, input suppliers, service providers and traders, strengthening and accelerating the connections across value chains and lessening many of the challenges faced in the sector. FAO is paving the way for the digital transformation of aquaculture through a wide range of initiatives. These include the global Smart Aquaculture Biosecurity project, which aims to assist countries to effectively implement biosecurity governance and best practices through

[15] https://www.fao.org/voluntary-guidelines-small-scale-fisheries/news/news-detail/fao--in-collaboration-with-the-ministry-of-fishing-and-the-blue-economy-and-the-national-network-of-women-in-fisheries--distribute-post-harvest-materials-and-equipment-and-provide-training-to-women-s-associations-in-madagascar/en
[16] https://www.fao.org/voluntary-guidelines-small-scale-fisheries/en
[17] https://www.fao.org/sustainable-development-goals-data-portal/data/indicators/14b1-access-rights-for-small-scale-fisheries/en
[18] FAO. 2024. *The State of World Fisheries and Aquaculture 2024 – Blue Transformation in action*. Rome. https://doi.org/10.4060/cd0683en
[19] FAO. 2024. *The State of World Fisheries and Aquaculture 2024 – Blue Transformation in action*. Rome. https://doi.org/10.4060/cd0683en

smart and digital tools, and the global information system on aquatic genetic resources (AquaGRIS[20]), which collects, validates, monitors and reports below the species level.

Capacity building and innovation through partnerships

17. The Common Oceans Program (2022–2027)[21] is a Global Environment Facility-funded partnership of regional fisheries management organizations (RFMOs), intergovernmental organizations, civil society and the private sector that aims to bolster the sustainable use of marine resources and biodiversity conservation in areas beyond national jurisdiction (ABNJ). It is implemented jointly by FAO, the United Nations Environment Programme and the United Nations Development Programme and aims to bring about transformational changes by making use of the best scientific knowledge and expertise of over 65 partners, and to encourage coordinated global action, innovation and improved performance in the ABNJ. There are a number of activities under this project, including the Common Oceans Tuna project, where partners (including RFMOs) work on strengthening monitoring, control and surveillance, and compliance through capacity building, training courses and compliance support missions. For example, the project is supporting the Pacific Islands Forum Fisheries Agency to develop an Advanced Diploma in Fisheries Management qualification program aimed at building the capacity of fisheries officers and staff from other related government agencies. Another activity under the Common Oceans Project is the Deep-sea fisheries (DSF) project, which applies participatory approaches to tackle technical, scientific and procedural challenges in the management of resources in ABNJ. The project aims to strengthen the management of DSF through training and capacity building on, for example, stock assessment, developing tools, guidelines and frameworks for the implementation of the EAF in eight RFMOs, and fostering dialogue between different sectors.

[20] https://www.fao.org/aquatic-genetic-resources/activities/aquagris/en/
[21] https://www.fao.org/in-action/commonoceans/en/