



# COMMITTEE ON FISHERIES

## Thirty-sixth Session

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### THE ROLE OF FISHERIES AND AQUACULTURE IN FOOD SECURITY AND NUTRITION

#### Executive Summary

This document reviews the role of aquatic foods<sup>1</sup> in healthy diets, nutrition, and food security. Aquatic animals are recognized as an excellent source of protein but also play a particular role in providing essential fatty acids and micronutrients, which are lacking in many diets. Other aquatic foods such as seaweed are also recognized for their micronutrient content. The recent FAO/WHO expert consultation on the risks and benefits of fish consumption (2023) highlighted strong evidence of the benefits of fish consumption during all life stages, including during pregnancy, childhood, and adulthood. There are many opportunities to better integrate nutritious, affordable, and appetizing aquatic foods into health and nutrition policies and programs to ensure these foods continue to play a role in healthy diets.

#### Suggested action by the Committee

The Committee is invited to:

- provide guidance on improving FAO's assistance to Members on the role of aquatic foods in healthy diets and improving nutrition and food security through integrating aquatic foods in nutrition programming and policy making;
- recommend measures on extending the work on risk-benefit analysis by improving the collection and use of data on the chemical composition of important aquatic food resources at regional, national, and sub-national levels;

<sup>1</sup> Food for human consumption grown in or harvested from water. Note: Includes all types of fish, crustaceans, mollusks, other aquatic animals and algae (e.g. seaweed) (FAO, 2022)

- provide recommendations on improving the collection, analysis, and use of data on the consumption and nutrient composition of aquatic foods to understand their contribution to healthy diets better; and
- recommend FAO to further study the impact that sustainable fisheries, aquaculture, and reduced food loss and waste could have in improving the yield of aquatic foods for human consumption and reducing post-harvest losses.

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## I. INTRODUCTION

1. Food, land, and water systems are facing unprecedented change. Nourishing 9.7 billion people with healthy diets from sustainable agrifood systems by 2050 is recognized as one of the biggest challenges facing humanity. Strategies that included aquatic foods offer significant potential in the transformation to sustainable agrifood systems for healthy diets, while also sustaining livelihoods and generating income for women and youth, and ensuring accessibility to healthy diets by vulnerable populations, even in the face of shocks and disruptions that affect food and water systems.
2. Aquatic foods contain a variety of nutrients and bioactive compounds that can make an important contribution to healthy diets. In addition, aquatic food production has a lower carbon footprint than terrestrial animal-source foods ([Gephart et al., 2021](#)) and there is growing potential of sustainable aquaculture to contribute to sustainable agrifood systems as well as improved nutrition and health.
3. The global sustainable development community is off track for meeting most of the SDGs targets for hunger and malnutrition. Aquatic foods and food security and nutrition have traditionally been disconnected concepts, and as a result aquatic food systems fall short of their full potential to enhance food security and nutrition for those most in need.
4. Fisheries and aquaculture policies tend to focus primarily on production, economic efficiency, resource management, and environmental sustainability. They often pay less attention to value chains and the contribution of aquatic foods to healthy diets. Recent studies have shown the huge potential contributions that aquatic foods could make in reducing micronutrient deficiencies ([Hicks et al., 2019](#)). However, a recent policy review highlighted that only 68 out of 165 public health nutrition policies identify fish and shellfish consumption as key objectives, and 77 of 158 national fisheries policies identified nutrition as a key objective in the sector ([Koehn et al., 2022](#)).
5. Recognizing and working to enhance the role of aquatic foods in alleviating hunger and malnutrition can provide an additional long-term development incentive, beyond revenue generation and biodiversity conservation, for governments, international development organizations, and society more broadly to invest in the sustainability of capture fisheries and aquaculture. Modelling analysis has indicated that boosting global production of aquatic animal-source foods by 2030 could potentially drive down prices, increase consumption and would have potential to reduce micronutrient deficiencies ([Golden et al., 2021](#)).

## II. THE IMPORTANCE OF AQUATIC FOODS FOR NUTRITION

6. Globally, aquatic animals provide about 15 percent of the overall global supply of animal protein, reaching over 40 percent in several countries in Asia and Africa.<sup>2</sup>
7. As other animals, aquatic animals provide protein containing all essential amino acids. Aquatic foods are also a source of long-chain poly-unsaturated omega-3 fatty acids (PUFAs), particularly Eicosapentaenoic acid (EPA) and Docosahexaenoic acid (DHA). Aquatic animals may also provide other nutrients including calcium, iron, zinc, iodine, selenium, vitamins A, B12, and D. The nutrients and their content vary according to the species, the parts consumed and preparation methods, among other factors.
8. It has been recognized that small fish consumed whole are particularly rich in micronutrients (which are highly concentrated in eyes, viscera, bones, etc.), and some studies have demonstrated the potential use of micronutrient-rich parts of larger fish (bones, eyes, etc.) for consumption ([Abbey et al., 2016](#)).

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<sup>2</sup> It should be noted that this is based on supply data, not consumption data.

9. Additionally, there is evidence of an enhancing factor on the absorption of micronutrients (primarily iron and zinc) from plant-source foods when they are consumed in conjunction with as little as 40 grams of fish ([Consalez et al., 2022](#)).

10. Current guidelines recommend adults consume 1-2 servings of fish (finfish or shellfish) per week ([FAO/WHO, 2011](#) and [EFSA, 2014](#)). The recent FAO/WHO expert consultation on the risks and benefits of fish consumption ([FAO/WHO, 2023](#)) highlighted strong evidence of the benefits of fish consumption during all life stages, including pregnancy, childhood, and adulthood. For example, associations are found for maternal consumption during pregnancy with improved birth outcomes and for adult consumption with reduced risks for cardiovascular and neurological diseases ([FAO/WHO, 2023](#)). In addition, studies have shown that infants and young children consuming aquatic foods (from 6 months of age) and / or breastmilk from their mother who consumes aquatic foods have improved cognitive development and reduced stunting and severe acute malnutrition. Adolescent consumption of aquatic foods has been linked to improved cognitive development, higher IQ, improved school performance and improved behavioral and mental health outcomes ([UN Nutrition 2021](#)).

11. Benefits of consumption vary depending on the overall diet, food safety conditions and practices and characteristics of consumers (e.g. omega-3 PUFA fatty acid status) and fish consumed (e.g. fish species and food preparation methods) ([FAO/WHO, 2023](#)). Risk-benefit assessments at regional, national, or subnational levels are needed to refine fish consumption recommendations considering local consumption habits, nutrient composition of the fish, nutritional status of the population of interest, cultural habits, and demographics ([FAO/WHO, 2023](#)). However, few risk-benefit analyses of aquatic food consumption exist due to a lack of high-quality data on food consumption patterns and nutrient and contaminant content of aquatic foods.

### III. CONTRIBUTIONS OF SMALL-SCALE FISHERIES TO FOOD SECURITY AND NUTRITION

12. Small-scale fisheries account for at least 40 percent of the global catch from capture fisheries and almost 500 million people depend at least partially on the sub-sector for their livelihoods, including nearly 53 million engaged in subsistence activities ([FAO, 2023](#)). Hence, for millions globally, including vulnerable people and those beyond the reach of formal markets, aquatic foods from small-scale fisheries represent a crucial and sometimes irreplaceable source of micronutrients and fatty acids important for growth and good health. Ensuring the realization of the right to adequate food and enhancing the contribution of small-scale fisheries to food security and nutrition are therefore explicit objectives of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines).

13. The benefits from small-scale fisheries accrue directly and indirectly through consumption or economic pathways, such as income generated by fish and aquatic food processing and sales to purchase food. A better understanding of these pathways is central to developing policy actions and capacities that secure small-scale fisheries and the nutrition function they support. The FAO Technical Paper ‘Small fish for food security and nutrition’ ([FAO, 2023](#)) for example, finds that the combination of governing actors in food systems and supply chains of small fish can be successful in providing rural and urban consumers in low-income developing countries with fish to supplement their diets. It also cautions that certain types of upgrading of small fish supply chains can put them out of reach of low-income populations: “affordable fish” then risk becoming “too expensive fish” ([Banvick et al., 2023](#)). In some regions, e.g. West Africa, there is also apparent localized competition between small pelagic fish for direct human consumption and their reduction into fishmeal and fish oil for use in animal feed products used in aquaculture and livestock production. This calls for a better understanding of the contribution of small pelagic fish and of the trade-offs between direct and indirect human use of such fish on livelihoods as well as on nutrition and food security ([Thiao and Bunting, 2022](#)). Understanding the small pelagic fish contribution to diets is important because small species, often consumed whole, provide significant nutrition benefit.

14. An analysis of World Bank Living Standards Measurement Surveys found that for the African Great Lakes region households living close to small-scale fisheries, and engaging in these fisheries,

were less likely to be income-poor (by 9–15 percent), had increased fish consumption (between 2-3 times as often per week), and had higher rates of household food security (by 12.6 percent) ([Simmance et al., 2022](#)).

15. It is imperative to further leverage the benefits of small-scale fisheries across supply chains for better nutrition. The FAO project ‘Implementing the Small-Scale Fisheries Guidelines for gender-equitable and climate-resilient food systems and livelihoods’ ([www.fao.org/voluntary-guidelines-small-scale-fisheries/en](http://www.fao.org/voluntary-guidelines-small-scale-fisheries/en)) aims to contribute to this by supporting women’s and small-scale fisheries organizations capacities in relation to improved post-harvest practices and engagement in decision-making processes in five African countries, providing entry points for upscaling.

#### IV. CONTRIBUTIONS OF AQUACULTURE TO FOOD SECURITY AND NUTRITION

16. Aquaculture contributes to global food security and nutrition by bridging the growing demand gap for aquatic foods, especially important in developing nations where aquatic foods are often a dietary staple and primary source of animal protein. FAO’s Blue Transformation recognizes the significant contribution of aquaculture to sustainable food production and in achieving the Sustainable Development Goals, and the importance of aquaculture was highlighted by the Twelfth Session of the Sub-committee on Aquaculture for its role in food security and nutrition. As reported in ([SOFIA 2024](#)), in 2021 aquaculture accounted for 56 percent of aquatic animal food production available for human consumption.

17. The Guidelines for Sustainable Aquaculture ([GSA](#)) envision an aquaculture sector that contributes significantly to a world free from hunger. It fulfils its potential to meet the increasing demand for safe, healthy, accessible, and affordable aquatic food and aquatic products with reduced environmental impacts, and it contributes to sustainable development through the eradication of poverty, malnutrition and hunger.

18. Within the GSA, countries are recommended to recognize aquaculture within action plans to address national food security and nutrition, and to promote safe and nutritious aquatic foods in food-based dietary guidelines, school feeding programmes and other food and nutrition strategies. The GSA recommends for countries to support innovation and investment in aquaculture value chains that increase consumer value, safety, and nutritional benefits of aquaculture products. For example, the nutritional content of aquatic foods produced from aquaculture depends on species, feed, and farming methods as well as post-harvest processing techniques ([Mohanty et al., 2019](#)).

19. Aquaculture systems with high aquatic biodiversity, such as integrated agriculture-aquaculture, rice fish systems or polyculture, increase the efficient use of resources and can enhance dietary diversity and availability of affordable aquatic foods. The introduction of integrated systems can be catalytic for poor communities to address wider challenges of improving food security and nutrition, and examples exist from Bangladesh, Lao PDR, Zambia, and others ([Dubois et al., 2021](#)).

#### V. AQUATIC FOOD COMPOSITION AND CONSUMPTION DATA

20. Unfortunately, appropriate data on the consumption and composition of aquatic foods is lacking. When available, consumption data is often combined with other animal-source foods or lacks important details on which parts of the fish were consumed, impacting nutrient content and nutrient intake estimations. To help address these gaps, FAO is leading three important initiatives.

21. FAO and partners conducted a review of food composition databases that include data on aquatic foods to understand the strengths and synergies amongst existing databases ([Cohen et al., 2022](#)). To increase the availability of food composition data, FAO is updating the FAO/INFOODS global food composition database for fish and shellfish (uFiSh), published in 2016. The update, due to be published in 2025, aims to expand the coverage of species, including small fish consumed whole and seaweed species.

22. FAO gathers and publishes data from individual-level dietary intake surveys in the FAO/WHO Global Individual Food Consumption Data Tool ([FAO/WHO GIFT](#)). FAO/WHO GIFT currently

includes 54 datasets from 33 countries, providing detailed information on food consumption including aquatic foods. These data provide information of interest on fresh and dried categories for freshwater, diadromous and marine fish, offal, shellfish, and fish and seafood dishes ([FAO, 2022](#)).

23. In 2024, FAO launched the Food and Diet domain on FAOSTAT ([FAO, 2024](#)), the first centralized location for sharing of statistics on different types of dietary data. This work involved preparing a global nutrient conversion table for application to the FAO Supply Utilization Accounts (SUA) ([Grande et al., 2024](#)). Until 2024, SUA statistics included only energy, protein and fat but based on the new food composition data, information is now also available for ten vitamins and minerals and, additionally, two minerals, two vitamins and fatty acids for aquatic items. An analysis of global nutrient supply including these new components is presented in SOFIA 2024.

## VI. AQUATIC FOODS IN INSTITUTIONAL MEALS

24. Cost, acceptability and food safety risks are some of the main challenges that governments encounter when introducing aquatic foods in school meal programmes and other institutional public procurement schemes. There has been an increasing demand for assistance from FAO on integrating aquatic food products in school food and nutrition programmes ([FAO, 2020](#)). Technical and policy support has been provided particularly to mitigate such challenges and to strengthen capacities for adequate implementation.

25. Key strategies to manage the cost of introducing aquatic foods into food and nutrition programmes include preference of sustainable small and indigenous fish species which are consumed whole and underutilized species that can easily be adapted.

26. Another strategy is the increased focus on food loss and waste reduction and prevention and improving the utilization of all parts of the fish, such as by-products generated during processing. In many cases, this would require developing new products based on raw materials that are traditionally not used for consumption, and the final products meeting local preferences.

27. Lack of familiarity and perceived lack of acceptability are other barriers to the introduction of aquatic foods in school food and nutrition programmes. Linking food in schools to school-based food and nutrition education, consulting and co-creating menus with students, focusing on taste, sustainability, and the food culture, and working with families and the whole school community can improve children's familiarity and acceptability of nutritious foods, including aquatic foods ([FAO, 2020](#)).

28. Foods are in many cases highly perishable, and therefore, securing food safety is an absolute requirement and good hygiene practices at all stages of the value chain must be implemented. Low-cost solutions to preserve the products are needed to ensure foods from the aquatic environment can be stored, transported and used without compromising food safety requirements.

29. FAO has recently developed a toolkit ([FAO, 2024](#)), which focuses on the challenges to help countries include aquatic foods in school food and nutrition programmes. Introducing aquatic foods in school food and nutrition programmes should always follow context-specific nutrition guidelines and standards ([FAO, 2019](#)). Such standards should be aligned with national food-based dietary guidelines and international normative rights-based instruments and the possibilities of the school food system in terms of supply, infrastructure, systemic capacities and procurement modalities should be considered.

30. The right to adequate food is intrinsic to school food and nutrition programs and essential for children's rights, including to health and education. This year (2024) marks the 20th anniversary of the adoption by FAO Council of "The Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security," a milestone that underscores the need for their continued implementation to ensure that everyone everywhere has access to sufficient, safe, and nutritious food at all times. This year also marks ten years since the endorsement of The Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication.

## VII. CONCLUSIONS / NEXT STEPS

31. Promoting the consumption of sustainably produced and safe aquatic foods, in alignment with national food-based dietary guidelines as part of healthy diets, can improve diet quality and contribute to addressing malnutrition in vulnerable populations, including through school food and nutrition programs and other institutional procurement schemes.

32. In addition to promoting consumption of aquatic foods as part of a healthy diet, it is necessary to ensure supply of these foods, through sustainable production and post-harvest practices. The role of small-scale fisheries in providing aquatic foods, particularly to nutritionally vulnerable populations, as well as the role of reducing loss and waste and utilizing fish by-products in aquatic food value chains, has been highlighted here.

33. Data on the production and consumption of aquatic foods and their nutritional value, are limited, especially in developing countries. To fully understand the role aquatic foods can play in the diet, there is a need to generate more country-specific knowledge on the nutritional value and consumption of species to understand better nutrient intake and the role these foods have in a healthy diet.