Food and Agriculture Organization of the United Nations

Duke University

WorldFish

Small-scale fisheries and sustainable development

Key findings from the Illuminating Hidden Harvests report

This brief presents the main results from the Illuminating Hidden Harvests (IHH) report, providing new, clearer insights to support the implementation of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines) and progress toward the Sustainable Development Goals (SDGs).

- Small-scale fisheries account for at least **40 percent of global fisheries catch**.
- **90 percent of the people employed** along capture fisheries value chains operate in small-scale fisheries.
- **45 million women** participate in small-scale fisheries, including for subsistence.
- **492 million people** depend at least partially on small-scale fisheries for their livelihoods.
- **Small fish and midwater fish are especially nutritious** and found abundantly in small-scale fisheries landings.
- **Co-management** is likely implemented for about **20 percent of the catch** from small-scale fisheries.

Illuminating Hidden Harvests (IHH) is a global research report produced by the Food and Agriculture Organization of the United Nations (FAO), Duke University and WorldFish. The report provides new evidence on the benefits, interactions and impacts of small-scale fisheries to inform policy and practice.

The IHH team developed a rigorous methodology, based on a multidisciplinary approach, to collect and synthesize the information currently available on small-scale fisheries (Figure 1). More than 800 experts contributed to 58 country and territory case studies – covering 68 percent of global marine catch and 62 percent of global inland catch – and a series of thematic studies to address key topics (Figure 2).

The full research findings, due out in 2022, the International Year of Artisanal Fisheries and Aquaculture, look holistically at small-scale fisheries by examining their environmental, economic, nutrition and governance dimensions while using gender as a cross-cutting theme.

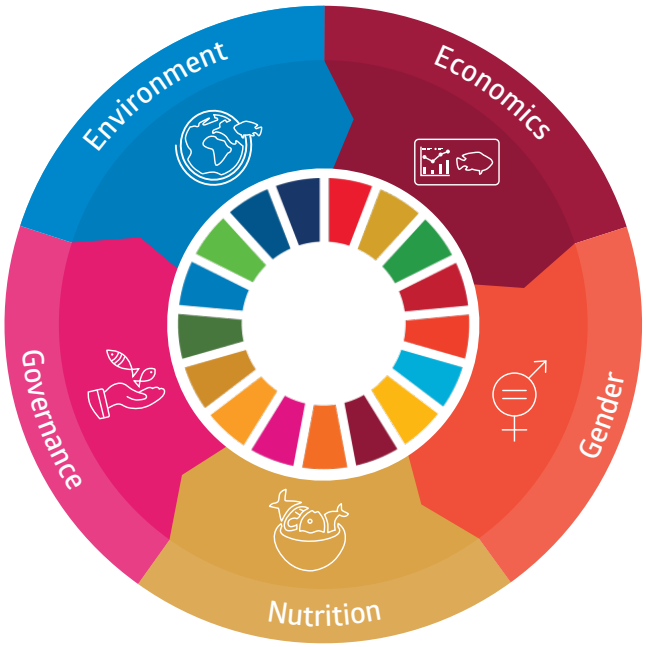

Figure 1. The multidisciplinary approach of the IHH report

Figure 2. Tapestry of approaches used in the IHH report

Environmental dimensions of small-scale fisheries

A substantial portion of current and future production from capture fisheries comes from small-scale fisheries, underscoring the importance of identifying the scope and composition of their contributions to the fisheries sector. Global catch from marine and inland capture fisheries is estimated to be 92 million tonnes.[1] Of this, small-scale fisheries account for 37 million tonnes (40 percent) and large-scale fisheries account for 55 million tonnes (60 percent) (Figure 3).

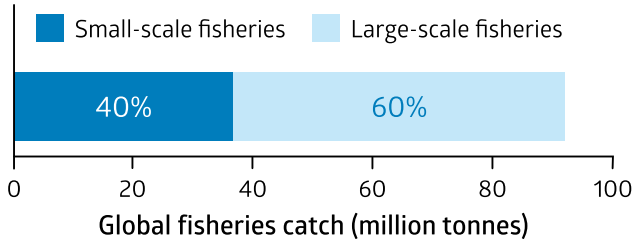

Figure 3. Contributions of small- and large-scale fisheries to global catch

The share of small-scale fisheries catch varies greatly across regions (Figure 4). The regions with the highest share are Africa and Asia, at 66 percent and 47 percent, respectively. The region with the lowest share is Europe, with only 5 percent of total fisheries catch from small-scale fisheries.

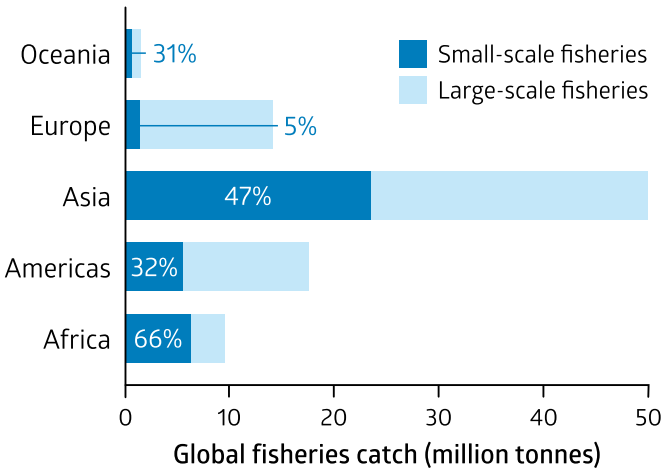

Figure 4. Contributions of small- and large-scale fisheries to global catch, by region

[1] Average in 2013-2017 extrapolated from 58 IHH country and territory case studies.

Globally, 68 percent of fisheries catch comes from marine small-scale fisheries, and 32 percent comes from inland small-scale fisheries. Looking at regional patterns (Figure 5), almost half of the catch in Africa comes from the inland subsector, highlighting the absolute importance of these fisheries for the region. For the Americas and (unsurprisingly) Oceania, the importance of the inland fisheries subsector in terms of catch volume is low, with marine small-scale fisheries accounting for 90 and 95 percent, respectively.

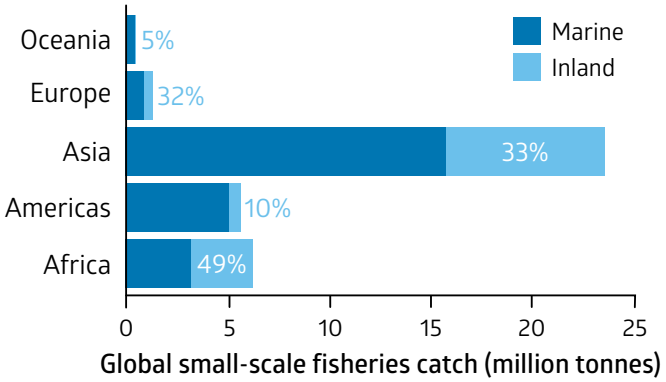

Figure 5. Marine and inland small-scale fisheries catch, by region

In the IHH report, 63 percent and 40 percent of marine and inland small-scale fisheries catch, respectively, were identified at the species family level. The most prevalent functional groups of species in the inland catch were carps, tilapias and small pelagics. For the marine counterpart, the most prevalent functional groups included small pelagics (such as sardines, herrings and anchovies) and other pelagic fish (such as mackerels, scads and tunas), adding up to almost 50 percent of the total marine small-scale fisheries catch. Clearly, better species disaggregation of small-scale fisheries catches will yield an even greater understanding of these fisheries and their nutritional and economic contributions, as well as provide critical information needed for evidence-based management.

Economic contributions of small-scale fisheries

Globally, in 2016, over 60 million people were employed part or full time along the small-scale fisheries value chain.[2] This represents 90 percent of all of those employed along capture fisheries value chains. An additional 53 million people were engaged in subsistence fishing and processing at least once during the year,[3] adding up to a total of 113 million people either employed in small-scale fisheries or engaged in subsistence activities. In addition, these 113 million people have an estimated 379 million household members, adding up to 492 million people who can be considered at least partially dependent on small-scale fisheries (Figure 6) – almost 7 percent of the world population in 2016. When considering the 45 least developed countries globally, in the same year over 13 percent of their population were at least partially dependent on small-scale fisheries.

The average annual total revenues from the first sale of small-scale fisheries catch in 2013–2017 are estimated to be USD 77 billion (Figure 7). Of these, USD 58 billion were from marine small-scale fisheries and USD 19 billion were from inland small-scale fisheries. The economic value of small-scale fisheries production is significant: for the 58 country and territory case studies, small-scale fisheries generated 44 percent of the average annual total revenues from the first sale of all fish catch.

Figure 6. Composition of people dependent on small-scale fisheries

= 10 million people

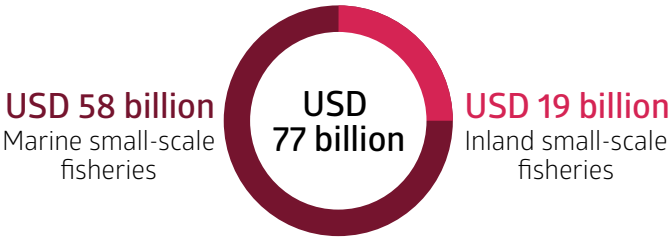

Figure 7. Average annual total revenues from the first sale of small-scale fisheries catch in USD (2013-2017)

The estimated total revenue from the marine harvesting segment of small-scale fisheries places it among the largest industries in the ocean economy – bigger than cruise tourism, port activities, and offshore wind (Figure 8).[4]

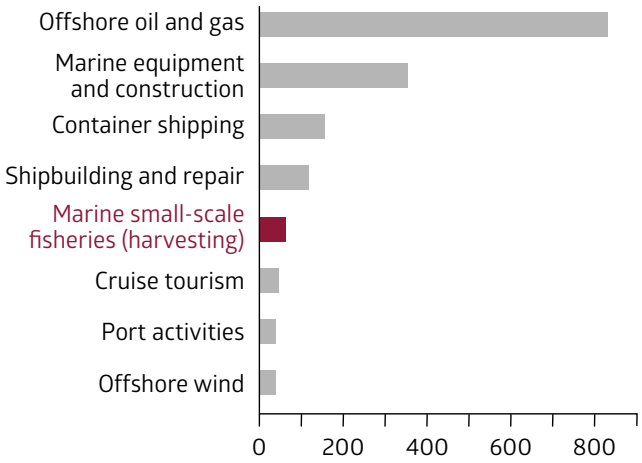

Figure 8. Total ocean economy revenues in 2018 (USD million)

[2] Extrapolation from 78 national household-based surveys for 2016, including full- and part-time employment along the value chain (numbers rounded).

[3] For this analysis, subsistence workers in small-scale fisheries were defined as people who were engaged in the subsector, primarily for their own consumption, at least once during the year. Given that subsistence production activities represent an important basis for workers' livelihoods in many low-income and lower-middle-income countries, participation in subsistence fishing constitutes an important safety net.

[4] Based on estimated total industry revenues in 2018 (USD million). See Virdin, J., Vegh, T., Jouffray, J., Blasiak, R., Mason, S., Österblom, H., Vermeer, D., Wachtmeister, H. & Werner, N. 2021. The Ocean 100: transnational corporations in the ocean economy. *Science Advances*, 7(3).

Gender and small-scale fisheries

The sustainable development of small-scale fisheries cannot be understood, or equitably enacted, without considering gender. Gender-disaggregated data from the IHH report indicate that at least 45 million women participate in small-scale fisheries value chains and subsistence activities worldwide, representing 40 percent of all of those estimated to engage in small-scale fisheries (Figure 9).

4 out of 10 people engaged in small-scale fisheries are **women**

Figure 9. Women's participation in small-scale fisheries

Along the small-scale fisheries value chain, women account for:

15 percent of pre-harvest labour (e.g. gear fabrication and repair, bait and ice provisioning, boat-building)

19 percent of commercial harvest labour (including vessel and non-vessel-based activities)

50 percent of post-harvest labour (e.g. processing, transporting, trading, selling).

In addition, women account for:

45 percent of those engaging in small-scale-fisheries for **subsistence**.

The IHH gender analysis of the contributions to and benefits from small-scale fisheries highlights several patterns. First, women are overrepresented in informal and unpaid activities – including subsistence fishing activities such as gleaning, and informal activities that support fishing businesses and operations – which are rarely accounted for in official fisheries statistics. Second, while women participate in small-scale fisheries in substantial numbers, they are under-represented in governance arenas and face significant barriers to meaningful participation in management and decision-making. Finally, in many contexts, women – especially marginalised groups of women – have less access to small-scale fisheries but stand to disproportionately benefit from them, especially their income and nutrition-related benefits.

> "In Nigeria, net-making is considered an extension of women's reproductive or household activities and is therefore not included in censuses of fisheries employment."
>
> - K. Fakoya, IHH gender advisor, 2020

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Nutrition contributions of small-scale fisheries

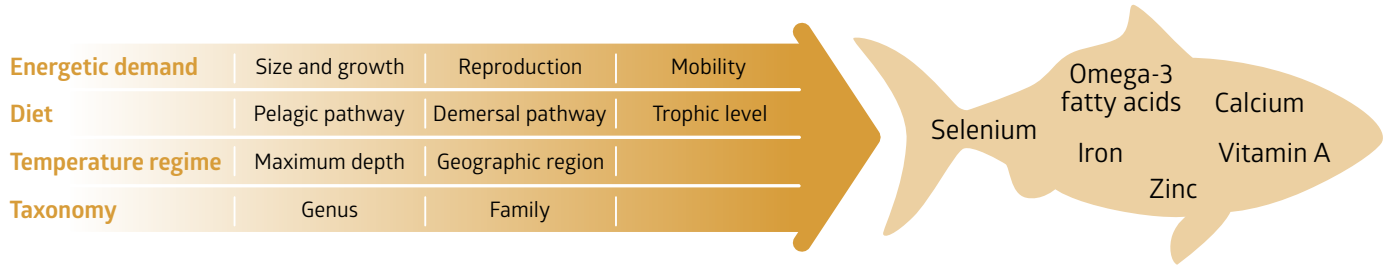

Figure 10. Predicting the nutrient value of fish species

Small-scale fisheries can play an important role in addressing known nutrition deficiencies, even at the scale of national populations, thus contributing to the objectives of the SSF Guidelines. For instance, omega-3 fatty acids are important for brain development and growth in infants, and to protect against heart disease in adults, yet are only available from a very limited number of foods. The omega-3 fatty acids in small-scale fisheries landings could provide 50 percent of the recommended nutrient intake (RNI) for 150 million women in Africa and 773 million women in Asia.[5] Similarly, the total nutrient yield from small-scale fisheries landings could provide more than 20 percent of RNI for the three most abundant micronutrients – calcium, selenium and zinc – to 137 million women in Africa and 271 million women in Asia.[5]

The IHH team conducted predictive modelling of the nutrient composition of fish,[6] which involved using the known nutrient composition of the relatively small number of species for which nutrient analysis had been undertaken, to predict nutrient values for any species globally (Figure 10).

The modelling showed that while all fish provide diverse macro- and micronutrients, concentrations are much higher in some species than in others (Figure 11). Small fish and pelagic species were frequently the most nutritious. These species – including sardines, anchovies and inland cyprinids – are the fish most often available for rural populations, and also the most affordable.

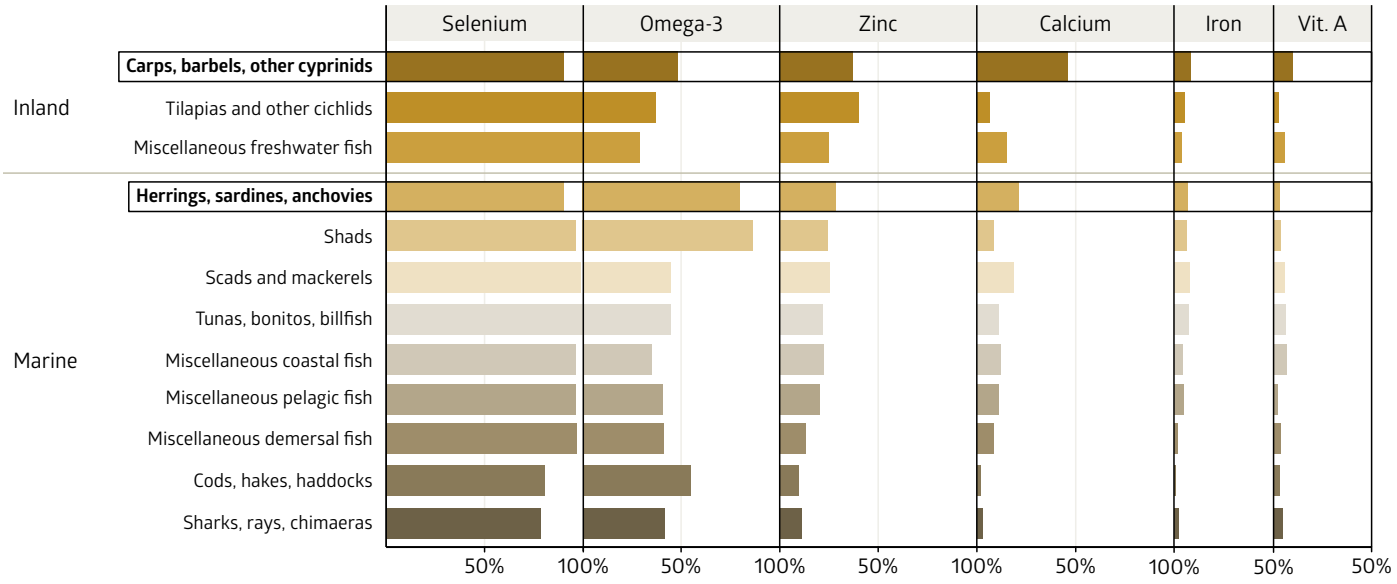

Figure 11. Percentage of recommended nutrient intake provided by a 100 g portion of various fish species

[5] Based on the application of predicted nutrient values to the IHH regional extrapolations for small-scale fisheries catches from Africa and Asia.

[6] This modelling was conducted in partnership with Lancaster University, based on development of models first published in Hicks, C.C., Cohen, P.J., Graham, N.A.J., Nash, K.L., Allison, E.H., D'Lima, C., Mills, D.J. et al. 2019. *Nature*, 574(7776): 95–98.

Governance of small-scale fisheries

Results from the IHH global survey of small-scale fisheries producer organizations show that 99 percent of organizations have goals related to harvesting and sustainable fisheries management, while 60 percent of organizations have goals related to human well-being, including labour rights, food security, or human and environmental health.[7] This demonstrates that: (a) there is strong alignment between the goals of fisheries organizations and the SSF Guidelines; (b) fishers and fishworkers see high compatibility between sustainable fisheries management and human well-being; and (c) fishers and fishworkers see themselves as active contributors to the implementation of the SSF Guidelines and not passive recipients of state action.

To better understand the extent to which co-management has been implemented globally, IHH researchers analysed fisheries policies and the amount of catch governed by co-management policies.[8] At the national level, according to country and territory case study authors, for every 10 tonnes of small-scale fisheries catch there are formal co-management provisions for 4 tonnes, of which 2 tonnes are co-managed with a high level of engagement from fishers. These results are mirrored at the subnational level, but the proportion of co-managed catch increases significantly at the local level – where 9 out of 10 tonnes have formal co-management provisions and, of these, 4 tonnes have a high level of engagement from fishers. Regionally, analysis shows co-management is implemented the most (i.e. having higher levels of engagement) in the Americas, Europe and Oceania, and implemented the least in Africa and Asia (Figure 12).

These results emphasize that better alignment is needed between formally established co-management and implementation. This is important because facilitating the participation of fishers in decision-making processes at local and national levels is key to strengthening the implementation of the SSF Guidelines and, subsequently, the many contributions that small-scale fisheries make to sustainable development. Understanding the characteristics and scope of governance in small-scale fisheries is an important next step to ensure the voices of fishers and fishworkers are heard at a policy level.

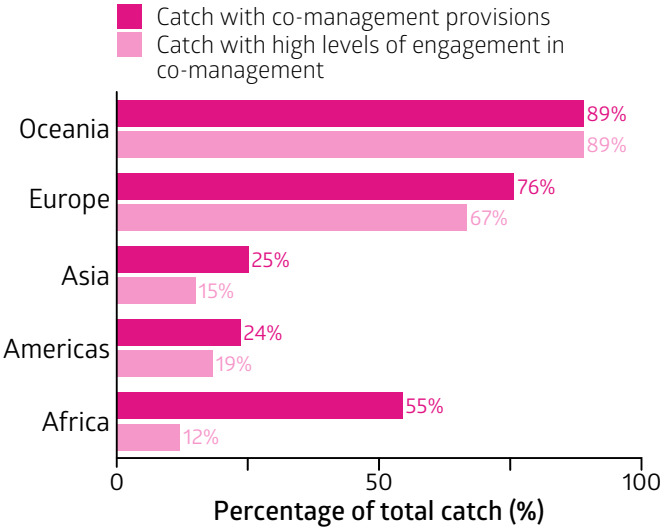

Figure 12. Co-management provisions and implementation, by region

> It is true that fishers have rights to resource management through legal co-management provisions. However, fisher management rights are [often] not implemented largely due to lack of capacity by fishers to build up a social management structure.
>
> - Christopher Aura Mulanda, Kenya Marine and Fisheries Research Institute, 2020

[7] Based on an IHH global survey of 424 small-scale fisheries producer organizations, as part of a broader survey of 717 fisheries organizations.

[8] Based on governance data on marine and inland catch from 58 countries and territories, representing about 55 percent of the global catch.


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Looking ahead

The IHH findings help quantify the essential contribution of small-scale fisheries to sustainable development in relation to livelihoods, food security and nutrition, and resource sustainability. Equally, the findings reinforce the need to adopt a research and monitoring approach that transcends individual disciplines to integrate different policy domains and sources of information. For instance, looking beyond the usual social, environmental and economic contributions to incorporate gender, nutrition and governance has helped to reveal new insights on the importance of small-scale fisheries, and the opportunities and challenges they face.

Results from the IHH research are consistent with the official data currently available. Yet, despite the depth of study achieved through the country and territory case studies, it has become clear that some data were not available, or not entirely – for instance, on inland fisheries or on foot fishers in remote areas – and hence a lot still remains unknown. The IHH research is an important step, but further efforts are needed to improve methods and capacities to collect, analyse and utilise data and information on small-scale fisheries and aquaculture. This is needed as a basis for sound and inclusive policymaking and resource governance, as well as a source of evidence on the importance of small-scale fisheries in food and livelihood security dialogues.

Illuminating Hidden Harvests is a global initiative of FAO, Duke University and WorldFish to generate and disseminate new evidence about the benefits, interactions and impacts of small-scale fisheries. The initiative helps to inform all levels of policymaking processes and contributes to empowering fishing communities, their organizations, and advocates to make a strong case for productive, sustainable and equitable small-scale fisheries.

https://www.fao.org/voluntary-guidelines-small-scale-fisheries/ihh/en/
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