

Policy brief

Inland capture fisheries in a development context

More research and capacity building is urgently needed on inland capture fisheries in low-income countries. This policy brief addresses reflections and recommendations for further measures.

Global catches and associated benefits

Ninety-five per cent of the world's inland fisheries catch originates from developing countries and 43 per cent comes from LIFDCs (1). Catches are concentrated in the tropical and subtropical latitudes of the world (Figure 1) from freshwater and brackish environments. These inland fisheries deliver quality nutrition to some of the world's most vulnerable populations (2) in a manner that is both accessible and affordable and these nutritional and food security benefits are an integral part of the agricultural landscape of these countries (3).

KEY MESSAGES

- Inland capture fisheries is crucial to food security and micronutrient needs of human populations in many low income countries.
- Small-scaler fisheries, including artisanal and subsistence fishers, is the major group utilizing inland waters in low income countries.
- Major effects on the resource include environmental changes, degradation and loss of freshwater ecosystems.
- Overall, there is a lack of reliable data on inland fish stocks and fisheries and more research and capacity building is urgently needed.



Inland fisheries invisible

In contrast to marine fish stocks and fisheries, there is no specific Sustainable Development Goal, SDG (4), that monitors inland fish stocks and fisheries (5). There are however clear links to SDG 2, 6 and 15 and the Aichi Target 6 that underscores that all fish stocks should be managed and harvested sustainably, legally and applying ecosystem based approaches (6). The omission of inland fisheries from the SDGs illustrates how their value has yet to be recognized and underlines the need to raise their importance in policy discussions and decisions (5).

Threats to inland fish biodiversity and habitats

The 20,235 inland fish species (7), fifty-five percent of all fish species, rely on freshwater habitats for their survival but almost one-third of freshwater biodiversity face extinction. The major external threats to inland fisheries are environmental changes and degradation and loss of freshwater ecosystems (8) as well as loss of access to them. Destructive and unsustainable fishing practices further threaten inland fisheries (9) and in many cases are individual species overexploited. Climate change will further intensify these effects in inland waters through increased water temperatures, decreased dissolved oxygen levels, and the increased toxicity of pollutants (10). These changes could affect the quality of fish habitat, lead to exacerbated or offset eutrophication, more pronounced and stronger stratification resulting in altered food webs and habitat availability and quality. There are hence clear conflicts and synergies between

the different SDGs that links to inland fisheries (e.g. 6, and 15). However, more data and research is needed to understand the full effect on inland fish and fisheries (11).

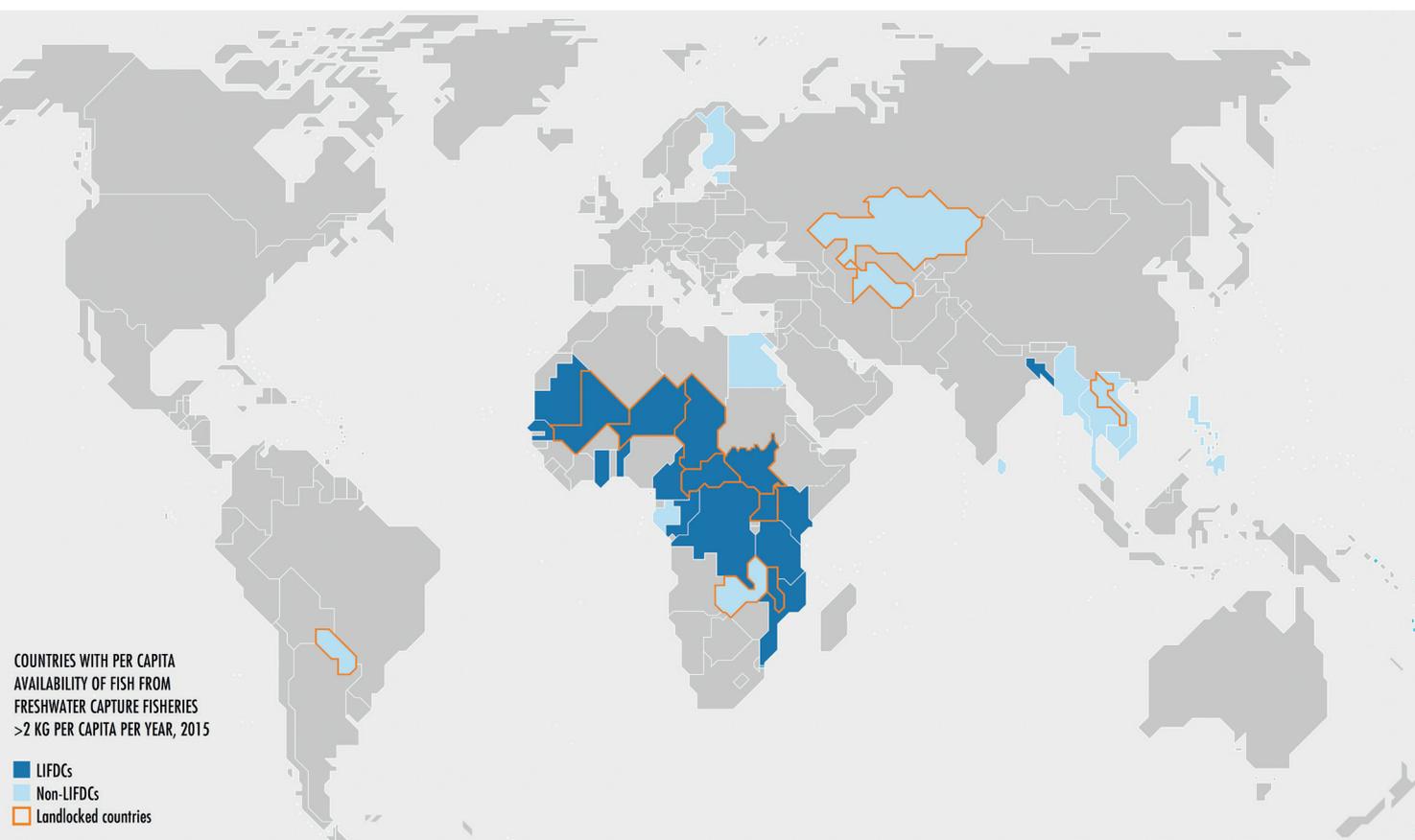
Availability of data

The available body of scientific data and information on inland fish stocks and fisheries in developing countries are low (12), hence hindering the implementation of an ecosystem approach to fisheries (13). Similarly scientific data on the economic value from the variety of fisheries that make up the sector are missing (14). There are several studies that highlight that reported catches in these countries is an underestimate; e.g. through estimation of theoretical yields (15), correlation with water productivity (16), food consumption studies (17) or through the contribution from a certain sector, small scale-fisheries (18). There is still a need for more biological assessments and correctly value inland fisheries (19).

Inland fisheries and livelihoods

Inland capture fisheries provide food for nearly a billion people, are important in the livelihoods of millions of households worldwide, and provide income and employment to over 60 million people worldwide, many amongst the poorest and most vulnerable rural populations (3), including artisanal and household fishers.

Figure 1, below. Countries with high per capita availability of fish from freshwater capture fisheries, highlighting low-income food deficit countries and landlocked countries. (FAO 2018)



NOTE: Final boundary between the Sudan and South Sudan has not yet been determined.

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In general, the contribution of women to fisheries is overlooked and although starting to be realized (e.g. women's contribution to fisheries value chain and fish marketing), the role of women as fishers has yet to be recognized and accepted (20). In inland fisheries women could be the main utilizers of certain wetlands types (floodplains, ponds, swamps and nearshore fisheries in lakes and dams).

Conclusion

In conclusion, there is a need for more research on fish stocks and fisheries in inland waters especially in countries where the sector is a major contributor to food security and nutritional needs of the population. Capacity building efforts on environmental monitoring and assessment of inland fish stocks and fisheries in developing countries is crucial to minimize conflicts and maximize synergies between SDGs, and hence successfully deliver on Agenda 2030.

Road side fish market in Zambia's Zambezi River Valley.



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Small-scale fisheries, including artisanal and subsistence fishers, is the major group utilizing inland waters in low income countries and main contributors to local fisheries value chains.



Fisherman on Lake Inle, Myanmar, Burma.

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References

1. Funge-Smith, S. and A. Bennett (2019). "A fresh look at inland fisheries and their role in food security and livelihoods." *Fish and Fisheries* 20(6): 1176-1195.
2. Belton, B. and S. H. Thilsted (2014). "Fisheries in transition: Food and nutrition security implications for the global South." *Global Food Security - Agriculture Policy Economics and Environment* 3(1): 59-66.
Lymer, D., et al. (2016). *Freshwater Fisheries Harvest Replacement Estimates (Land and Water) for Protein and the Micronutrients Contribution in the Lower Mekong River Basin and Related Countries*.
3. Funge-Smith, S. J. (2018). *Review of the state of the world fishery resources: Inland fisheries* FAO Fisheries and Aquaculture Circular Rome, Italy, Food and Agriculture Organization of the United Nations. C942 Revision 3.
4. United Nations (2015). "Transforming Our World: The 2030 Agenda For Sustainable Development."
5. Lynch, A. J., et al. (2017). "Inland fisheries - Invisible but integral to the UN Sustainable Development Agenda for ending poverty by 2030." *Global Environmental Change-Human and Policy Dimensions* 47: 167-173.
6. CBD (2010). *Decision X/2. The Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets TENTH MEETING*. Nagoya, Japan, Convention on biological diversity.
7. Balian, E. V., et al. (2008). "The Freshwater Animal Diversity Assessment: an overview of the results." *Hydrobiologia* 595(1): 627-637.
8. FAO (2011). *Review of the State of the World Fishery Resources: Inland Fisheries*. FAO Fisheries and Aquaculture Circular No. 942, Rev. 2. Rome, Italy, Food and Agriculture Organization of the United Nations (FAO): 97 pp.
9. Allen, J. D., et al. (2005). "Overfishing of inland waters." *BioScience* 55(12): 1041-1051.
10. Ashley, D., et al. (2007). "Potential impacts of global climate change on freshwater fisheries." *Rev Fish Biol Fisheries* 17: 581-613.
11. Paukert, C. P., et al. (2017). "Designing a global assessment of climate change on inland fishes and fisheries: knowns and needs." *Reviews in Fish Biology and Fisheries* 27(2): 393-409.
12. Bartley, D. M., et al. (2015). "Inland capture fisheries: status and data issues." *Fisheries Management and Ecology* 22(1): 71-77.
13. Beard, T. D., et al. (2011). "Ecosystem approach to inland fisheries: research needs and implementation strategies." *Biology Letters* 7(4): 481-483.
14. Grantham, R. W. and M. A. Rudd (2015). "Current status and future needs of economics research of inland fisheries." *Fisheries Management and Ecology* 22(6): 458-471.
15. Lymer, D. Martin, F. Marmulla, G. and D. M. Bartley. (2016). *A Global Estimate of Theoretical Potential Annual Inland Capture Fisheries Harvest*. *Freshwater, Fish, and the Future: A cross-sectoral conference to sustain livelihoods, food security, and aquatic ecosystems*. American Fisheries Society.
16. Deines, A. M., et al. (2015). "A review of the global relationship among freshwater fish, autotrophic activity, and regional climate." *Reviews in Fish Biology and Fisheries* 25(2): 323-336.
17. Fluet-Chouinard, E., et al. (2018). "Global hidden harvest of freshwater fish revealed by household surveys." *Proceedings of the National Academy of Sciences of the United States of America* 115(29): 7623-7628.
18. Mills, D. J., et al. (2011). *Under-reported and Undervalued: Small-scale Fisheries in the Developing World*.
19. Lynch, A. J., et al. (Early Access: OCT 2019). "Examining progress towards achieving the Ten Steps of the Rome Declaration on Responsible Inland Fisheries." *Fish and Fisheries*.
20. Frangoudes et al. (2019). "Situated transformations of women and gender relations in small-scale fisheries and communities in a globalized world". *Maritime Studies*.

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