



# Counting the fish eaten rather than the fish caught

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Counting fish underwater is more difficult than counting sheep on a pasture but is needed to support fishery management and to enumerate the contribution fish catches currently make to human society in the form of food, income, and revenue. Inland fisheries are particularly challenging to monitor and assess. They take place in variable and structurally complex environments, such as river floodplains and swamps, and are mainly found in resource-poor countries of the global South, and the larger ones (e.g., the Amazon, the Mekong, and the African Great Lakes) straddle national boundaries, requiring interstate collaboration for their governance. Moreover, the fish caught from the myriad smaller lakes, reservoirs, floodplain forests, and river tributaries escape being recorded because they are consumed directly by those who catch them or sold in informal markets in remote areas, far from the gaze of any reporting or management authority. In response to these challenges, Fluet-Chouinard et al. recently reported on a study that assesses fish catches by counting how many fish are eaten (1). Rather than trying to improve how we count fish through ecological surveys or to correct for the weaknesses in catch statistics, as others have previously done (2, 3), they have back-calculated national and global inland fishery harvests using estimates of consumption of freshwater fish from household consumption and expenditure surveys administered to 548,000 households across 42 countries.

The consensus among fisheries scientists working on freshwater fisheries is that difficulties in assessing freshwater fish catches result in them being underreported and consequently undervalued (4). Fluet-Chouinard et al.'s (1) studies reveal that freshwater catches are, on average, likely to be ~65% higher than those officially reported by national governments to the United Nations (UN) Food and Agriculture Organization (FAO). The FAO is charged with compiling and disseminating fishery statistics. Global summaries are published every 2 y in the influential *State of World Fisheries and*

*Aquaculture* reports (5). These statistics are then used by FAO, working with its 192 member countries, to craft appropriate management and policy measures to ensure that fisheries contribute sustainably and equitably to poverty reduction and human nutrition. The “hidden harvests” reported above are concentrated in low-income countries where they represent the equivalent of the total annual animal protein consumption of 36.9 million people (1). This is a significant finding because long-term underreporting of inland fisheries has masked their critical role in feeding the world's poor and has confounded efforts to use catch statistics, with other biological information, to evaluate the impact of overharvest and ecosystem degradation.

In using a household food consumption survey methodology, the study contributes to a rapidly growing policy discussion about the role of fish in nutrition and food security, a discussion which is emphasizing the important contribution that fish—wild, marine, freshwater, and farmed—make to micronutrients such as vitamins A and B12, zinc, and iron (e.g., 6–8). By showing that the world's under-pressure surface freshwaters (9) contain more fish and are more important for nutrition than we previously thought, the authors remind water resource managers and national policy makers and decision makers to add fish to their plans to use water for crops, people, hydropower, and the dilution of pollutants. How water is managed is key to maintaining fish habitat and supporting an important food source. Fish also act as a “bank in the water” (10) for rural households to draw from to meet short-term expenditure needs or to trade for other forms of capital.

The new study comes with numerous caveats, which the authors are conscientious in documenting. Cross-checks with other studies and alternative methodologies—notably from the World Bank, FAO, and WorldFish (11) Big Numbers or Hidden Harvests projects—provide valuable insights here. Fluet-Chouinard et al. (1) highlight the remarkable convergence between their 65% estimate for global underreporting and the

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flippantly, study of biblical texts on fishing reveal that, in much of the world, the societal role of inland fisheries remains substantially unchanged two millennia later: In the Sea of Galilee (Lake Kinneret) fisheries were socially embedded activities and fish were a valued food, but fisherfolk were reported as poor and marginalized (26). If

bringing the “hidden harvests” of inland fisheries to the surface helps to create a more supportive policy environment for the livelihoods, aspirations, and food systems of the world’s riparian people, and the continued resilience of freshwater ecosystems, then their paper will have contributed to a small miracle.

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