

# Fish biodiversity found to benefit nutrition, particularly for lower income people

July 18 2024, by Krishna Ramanujan

---



A community fish refuge within the rice field fisheries of Cambodia. Credit: Kathryn Fiorella

Households caught and consumed a far more diverse array of fish than they sold at market, which has important implications for how loss of biodiversity might affect people's nutrition, especially for those with lower incomes. A Cornell study is one of the first to examine the relationship between diet and biodiversity in a wild food system.

"Commercially Traded Fish Portfolios Mask Household Utilization of Biodiversity in Wild Food Systems," [published](#) July 17 in the *Proceedings of the National Academy of Sciences*, examined how households make use of biodiversity of wild [fish](#) in the freshwater Tonlé Sap lake system in Cambodia.

"People naturally want to sell the most profitable fish, and around the world those tend to be larger body fish," said Kathryn Fiorella, associate professor in the Department of Public and Ecosystem Health in the College of Veterinary Medicine and corresponding author of the study. Sebastian Heilpern, a postdoctoral researcher in Fiorella's lab, is the paper's final author.

Global biodiversity has been rapidly declining due to development, agriculture, [habitat loss](#), pollution and [climate change](#), with [freshwater ecosystems](#) experiencing the highest rate of decline.

In the study, the variety of fish available in the ecosystem was compared to the varieties households reported they consumed. Consumed species represented 43% of species present in the ecosystem, but they sold only 9% of species. People tended to sell larger, less nutritious and more common species, and yet ate a range of species themselves that mirrored the diversity of the fish they caught.

Culinary habits are part of the reason why larger fish are more often sold, Fiorella said. "We tend to eat them as filets, which tend to have a slightly lower nutrient content than some of the small fish where people are eating the head and the bones," she said. In this way, while likely trying to maximize income, people sell the less nutritious fish and consume the more nutritious ones at home.

Household fishing effort, demographics and distance to the nearest market did not affect these dynamics, though the study did find that

poorer households consumed a wider variety of species. "It suggests that these ecosystems may be even more of a safety net for poor [households](#), that they may get greater benefits from biodiversity than their wealthier neighbors," Fiorella said.

In the study, the researchers analyzed data collected over three years by WorldFish, an international research organization. These included ecological and biodiversity data from 40 protected sites, recorded every three months, and household surveys, conducted every two months, at 414 homes in the Tonlé Sap lake area.

The Tonlé Sap lake is partly fed by the Mekong River, which floods every year during the rainy season. The floods greatly expand the lake's area to many times its size and allow fish to migrate and inhabit rice paddies where they are commonly caught.

Biodiversity accounting often only tracks commercial [species](#), which may be underestimating the true biodiversity present in wild food systems and the consequences of biodiversity loss for people who most rely on fisheries as a source of nutrition, according to the paper.

By not fully accounting for how people use biodiversity, scientists and planners may be misestimating the consequences of actions that impact ecosystems, such as building dams, which is especially relevant in the Mekong River region, Fiorella said.

Co-authors include Elizabeth Bageant '10, M.S. '14, a former member of Fiorella's lab, and Shakuntala Thilsted, global lead for nutrition and [public health](#) at IFPRI (International Food Policy Research Institute) and 2021 World Food Prize laureate.

**More information:** Kathryn J. Fiorella et al, Commercially traded fish portfolios mask household utilization of biodiversity in wild food

systems, *Proceedings of the National Academy of Sciences* (2024). DOI: [10.1073/pnas.2403691121](https://doi.org/10.1073/pnas.2403691121)

Provided by Cornell University

Citation: Fish biodiversity found to benefit nutrition, particularly for lower income people (2024, July 18) retrieved 18 July 2024 from <https://phys.org/news/2024-07-fish-biodiversity-benefit-nutrition-income.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.