

Fishermen, communities need more than healthy fish stocks

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A typical day at the fish market in Dakar, Senegal. Credit: U of Washington

The Alaska salmon fishery is touted as one of the best in the world. When measured with an ecological yardstick, it is - fish stocks are healthy and the fishery is certified by the Marine Stewardship Council as consistently meeting rigorous biological standards. Fish are individually counted as they swim upstream to ensure there are enough to breed.

But Alaska salmon falls short and lags behind some of the world's [fisheries](#) in how it benefits local fishermen, processing workers and nearby rural communities, according to a new assessment that ranks the vitality of a fishery by looking at its economic and community benefits as well as its ecological health.

The Fishery Performance Indicators are the most comprehensive, global tool that considers social factors in addition to the usual biological measures when gauging a fishery's health, said Chris Anderson, a University of Washington associate professor of aquatic and fishery sciences and a lead author of a paper published May 6 in the journal *PLOS ONE* describing the new methodology.

"This tool is designed to help us evaluate a fishery system's performance toward achieving economic, community and ecological sustainability - the 'triple bottom line,'" said co-author James Anderson, director of the Institute for Sustainable Food Systems at the University of Florida.

The authors found that globally, less healthy fish stocks usually lead to worse economic and community outcomes. However, they identified several cases where weaker stocks contribute importantly to the livelihoods of harvesters and their communities, and healthy [fish stocks](#) generated meager economic or community benefits.

"It is often assumed that economic and social benefits always follow healthy stocks, but this is rarely tested due to the lack of social data," Chris Anderson said. "Our strategy was to develop a rapid assessment instrument that would organize the knowledge of local fishery experts to help us understand how harvesters and processors are performing economically and how the fishery is supporting its community. Economically effective management, access to high-value markets and having other income opportunities often play a larger role in human outcomes than stock health, especially in communities where fishing is a

large share of the economy."

Anderson and 26 co-authors at the World Bank and other universities and organizations around the world chose 61 fisheries as initial case studies to build the assessment tool.



Fishermen in Sri Lanka returning from a three-week trip pull yellowfin tuna and swordfish from their icy holds to sell to middlemen. Credit: U of Washington

Since 2010, they have visited and studied fisheries ranging from Alaska halibut and Oregon Dungeness crab to Norway cod, Louisiana shrimp,

Nile perch in Uganda and blue swimming crabs in Indonesia to gather information and refine the tool.

Here's how it works: The authors created dozens of measurable statements that capture the range of three performance indicators - ecology, economics and community. Example statements relate to the degree of overfishing, price trends, the capacity of processors to export to the U.S. and E.U., health care access for processing workers, captains' earnings relative to other jobs in the region and the social standing of the crew.

Then, to characterize a fishery, the authors drew on the knowledge of local experts who work with fishermen, processors and community leaders, scoring each statement from one to five, with five being the best, based on carefully defined categories of performance. The responses in each category were then averaged.

The results are sometimes surprising. Alaska salmon ranks 4.88 (almost a perfect five) in its ecological performance, but it was a mere 2.86 in economics and 3.40 in community performance. Alternatively, Colombian artisanal shrimp only hit 2.25 for ecological performance but reached 4.20 for its community impact. (See the paper for a full list.)

In the case of Alaska salmon, nearly all of the money businesses make selling the fish is spent catching it. The fishery operates as a derby, deploying several times the boats needed to catch the fish, and it's expensive and financially risky to operate seasonal processors in rural Alaska.

Alternatively, in many developing countries a fishery whose stock is at a low level might still provide a key source of income within a community where resources are few.

"This highlights the importance of selecting development and management strategies that not only sustain stocks but also sustain industries and communities," Chris Anderson said.

The co-authors used several international workshops and pilot cases with different users to refine their final set of statements to make the instrument robust across many different fisheries. They plan to add data from more fisheries and associate differences in performance with fishery management and governance factors.

"An overarching purpose is to be able to compare fisheries systems across species, management approaches and nations. With our new metric, I would argue you can now compare fisheries systems in Ghana to those in Iceland," James Anderson said.

As former lead of the World Bank's global program for fisheries and aquaculture, he said these indicators could be very useful for institutions like the World Bank, the U.S. Agency for International Development, and nongovernmental organizations that fund projects on fisheries reform in developing countries to monitor and evaluate progress.

"Researchers will be able to make meaningful comparisons between large-scale and small-scale fisheries, nearshore and offshore fisheries, operations in industrialized countries compared to ones in developing countries, seafood aimed at export markets versus seafood primarily consumed locally, and a host of other possibilities," said co-author Martin Smith, a professor of environmental economics at Duke University.

Provided by University of Washington

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