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Why the World Is Severely Underestimating Just How Much Fish it Catches

Catches by local, non-commercial fishers are often ignored or under-reported by governments globally. But Dirk Zeller, a professor at the University of Western Australia, reckons their size may well rival that of industrial fleets.

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A local fisher holds up one of his morning catches on the seafloor at Bolinao, a five-hour drive north from the Philippines capital of Manila. Ben Davies/LightRocket via Getty Images

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ESTIMATING FISH CATCHES MAY SEEM SIMPLE — a country monitors how many fish its ships land by weight and records a number. In fact, the process is much more tricky, leading to a severe under-reporting of the annual global fish catch.

Dirk Zeller, a professor of marine conservation at the University of Western Australia, says the issue is most pronounced within small operations, where individual fishers catch food to feed their families or sell locally. Several governments do not even include many of these catches in the figures they submit to the United Nations' Food and Agriculture Organization (FAO).

However, these catches all add up. Aggregates of small-scale fisheries now rival industrial fleets in catch tonnage, Zeller says, meaning that government and international researchers who estimate and manage fish populations have been working with incomplete or incorrect data.

To help set the record straight, Zeller has co-edited a book, the "Global Atlas of Marine Fisheries," using statistics based on human population data to reconstruct and improve small-scale fishery estimates around the world. One of his recent papers estimated that the catch by small fisheries from the South Pacific island of Vanuatu had been under-reported by 200 percent between 1950 and 2014.

Zeller says his reconstruction method has already been adopted by some countries, but it is likely to be a long time before it is widely used. Oceans Deeply spoke with him about what he learned from Vanuatu and why it is important to calculate catch sizes more accurately.

Oceans Deeply: Can you summarize what you found on Vanuatu?

Dirk Zeller: Vanuatu is actually typical of most Pacific island countries or entities. The country's government focuses far more on the [monetary] returns from the industrial tuna fisheries, which are mainly or almost exclusively conducted by foreign fleets. However, small-scale fisheries are actually what feed the people, and most of these fisheries are coastal.



So here you have a situation where a country knows and claims that small-scale fisheries are absolutely crucial for domestic food security and livelihoods, yet they monitor them very little. They have limited resources to monitor everything. They focus on [what] brings in the cash.

The main reason why small-scale catches are so under-reported, not just in Vanuatu but throughout the world, is that they're very difficult to monitor. They consist of a very large number of fishers who use a large number of boats (or fish from shore), and they land their catch not in centralized commercial ports, but on every single beach on every island throughout the country. That makes it almost impossible to monitor all of it.

You would need a lot of staff, and that, of course, is a financial challenge that most developing countries can't handle. Instead, what they do is they often monitor a small number of small-scale fisheries or a few landing sites, and that's all the data they report, which means it's a substantial underestimate.

Oceans Deeply: Were you surprised by the discrepancy on Vanuatu?

Zeller: No, not really. In terms of small-scale fisheries, we often find a 50 [to] 400 percent difference.

Oceans Deeply: What do these underestimates mean for the marine ecosystem around Vanuatu?

Zeller: The fact that a lot more fish are caught than the country reports may not necessarily have any repercussions for the marine ecosystem. However, what it means is that whoever may look at small-scale fisheries or do policy development or management, they do that in the absence of reliable data, which makes it very difficult.

By and large, most small-scale fisheries are actually for local or domestic consumption, so they reflect the population trend. They also reflect the income levels, because if a country develops a larger cash economy, there is more cash available for people to go and buy the fish on the local market, instead of spending time going out and fishing themselves. But none of this can be properly managed if a country doesn't have appropriate data.

Oceans Deeply: Why is the FAO not using your reconstruction process?

Zeller: Because we are not a government; we are academic scientists. The only people that are allowed to tell the FAO about data are countries. The only way our estimates can ever get into the FAO is if a country says: "OK, those guys ... did a good job. We kind of believe that."

It's happening right as we speak in the Bahamas.

The number one economic driver in the Bahamas is tourism, which includes recreational fishing. The Bahamian government has known for many years that [it] is a very important issue, but until now it had no serious numbers. Together with a colleague from the Bahamas, we did a catch reconstruction, and it showed that the recreational catch is as large as or even larger than the commercial catch each year.

The Bahamian government was shocked by the magnitude of it. Overnight, their catches over the last 60-plus years doubled.

Oceans Deeply: In the paper, you mention that the FAO says that for decades global fish catches have basically been stable, but you argue they've been declining. What do you mean?

Zeller: Global catch peaked in the mid-1990s. We argue that it's been declining fairly strongly since, whereas the FAO argues that catches have been fairly stable. So, the question arises, why the discrepancy over the last couple of decades?

Countries try, over time, to improve their statistical system. By doing that, they have an impact on the global catch trend. In areas and in countries with good statistics, let's say Europe and North America, we've seen a strongly declining trend for quite a few decades; however, this is overwritten in the FAO data [by] countries that do not have reliable statistics. Countries improve their statistical system over time. But because they don't do the retroactive adjustment, it all of a sudden looks like the catch has gone up, when as a matter of fact it might have gone down.

The prime example of this is Mozambique. One of the poorest countries in the world, in the early 2000s it made a fundamental effort to try to improve the monitoring of its small-scale fisheries. Suddenly you had an almost tripling overnight of the reported catch by Mozambique, because again they didn't do retroactive adjustment. If, like us and some other experts, you know about this change in reporting, you can understand it. But it gives the wrong impression. Now we imagine that pattern replicated all over the world in every country that tries to do a better and better job each year. That's why the FAO data gets a different pattern.\

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