All on the table: Researchers call for a more comprehensive assessment of the global food system

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While we are increasingly aware of the environmental costs and impacts of raising a handful of widely eaten, large-scale production foods such as

cows and pigs, we have glaring blind spots when it comes to such effects of many other foods that are a major part of the global diet. A more complete understanding of the impacts of these "underassessed" foods would go a long way toward creating a clearer picture of what sustainable consumption looks like. And that, in turn, would help people, companies and politicians make smarter decisions about how to feed ourselves without overwhelming the planet.

So say researchers from the National Center for Ecological Analysis and Synthesis (NCEAS) at UC Santa Barbara and their colleagues, in a letter that appears in the *Proceedings of the National Academy of the Sciences*.

"You can't manage what you don't measure; at least you can't manage it well," said Ben Halpern, NCEAS director, professor in the Bren School of Environmental Science & Management, and lead author of the paper. "If we don't know what is happening with underassessed foods, we can't make smart decisions about food policy that pursues the most sustainable options."

"Underassessed foods" are those "hidden from standard statistics" or left out of most scientific assessments, including food grown in backyards and community gardens, small-scale fisheries and aquaculture, and bushmeat and other wild-harvested foods. And indeed, in a synthesis of data from open-access and published literature, the researchers found that "underassessed foods represent more than half of animal production in 76 countries and more that 25% of total food in 40 countries." Translation: there are significant gaps in our knowledge of what it would truly take to feed the world and maintain a healthy environment.

"We all need to eat, and presumably we all want to do this in a way that doesn't destroy our planet," said Halpern, a marine biologist and ecologist specializing in fisheries and aquaculture. He first noticed this assessment gap when he realized that nearly all food studies left marine

food off the table—a blind spot, he said, "that has led to food science and food policy that overlooks 70% of the planet that is the ocean."

According to the researchers, the environmental impacts of underassessed foods are likely more diverse and variable than those of crops and livestock farmed commercially; thus the tradeoffs vary. For instance, marine fisheries generally emit less carbon than does land-based livestock raising, but that value could vary depending on factors such as location and motorization. In another example, bushmeat hunting and wild harvesting may decrease biodiversity in certain locations, but they also provide low-cost nutrition to marginalized communities and have low impacts on water pollution and greenhouse gas emissions.

The researchers also pointed out that there are myriad interdependencies between land and marine foods that need to be addressed. This includes the 27% of wild-caught fish that is used to feed farm-raised fish and livestock, and the terrestrial pollution that runs into the ocean, affecting marine aquaculture. Another example: the finding that feeding seaweed to cows dramatically reduces methane emissions while potentially decreasing the need to convert new land for feed crop cultivation.

To ensure food security while maintaining sustainability and biodiversity, policy needs to reflect the nuances and complexities of the global food system, the researchers said. To do this, they argue, more priority needs to be placed on data collection, linkages within the food system need to be better defined, and dialogue and data-sharing between people and departments responsible for different aspects of the food system must be increased. A more complete global food assessment, the team posits, would lead to more sensitive and versatile local and regional solutions to environmental and food security issues while minimizing large-scale food waste and unnecessary emissions.

"We can't know how to do this if we don't have comprehensive

assessments," Halpern said.

More information: Benjamin S. Halpern et al, Opinion: Putting all foods on the same table: Achieving sustainable food systems requires full accounting, *Proceedings of the National Academy of Sciences* (2019). DOI: 10.1073/pnas.1913308116