

Experts discuss food security from oceans

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Stanford scientists say food from the oceans should play an important role in feeding a growing global human population, along with much more protein from plants. Credit: Pexels.com

The world will have an additional 2 billion people to feed over the next 30 years—and doing that without decimating the planet's resources will require exploring as many options as possible. Yet, a significant option—seafood—is often overlooked in global food security planning and discussions about future diets.

Stanford Report spoke with Jim Leape, co-director of the Stanford Center for Ocean Solutions, and Rosamond Naylor, the William Wrigley Professor in Earth System Science, about integrating oceans into a sustainable and equitable food future. Leape is an expert in seafood sustainability issues, with over three decades of experience in conservation; he serves on the board of the Marine Stewardship Council and on the Global Future Council for the Environment of the World Economic Forum. Naylor's research focuses on economic and biophysical dimensions of food security and environmental impacts of food production.

Why focus on oceans as a solution to global food security?

Leape: Food production takes up around 40 percent of the planet's land surface, and livestock represents almost 80 percent of that agricultural land—livestock is the world's largest user of natural resources. Thinking about it another way, of all the mammals on Earth, 96 percent are livestock and humans—only 4 percent are wild. As the global population grows from 7 to 10 billion people, and growing prosperity increases appetites for protein, it will be vitally important that we become less reliant on cattle, pigs, sheep and chickens to produce the protein we consume. Food from the oceans, along with much more protein from plants, will be a key part of the solution.

Naylor: Oceans provide an alternative source of protein to beef or chicken, and can create more resilience in the overall food system by meeting global food demands and averting price shocks in a single sector. The broader the portfolio for food production, the more resilient the system to shocks, including climate shocks. Aquaculture, or aquafarming, is actually the fastest growing segment of the world food economy. It offers promise of meeting food demands, but also carries the risk of ecological damage to marine ecosystems if not managed in an environmentally sound way. Oceans also provide important input for animal feeds. In these ways, the oceans play a major, yet not widely recognized, role in the global food system.

What are some examples of win-win opportunities in terms of protecting oceans/seafood?

Naylor: When [fish](#) is farmed in a sustainable way—not feeding aquafarms with wild-caught fish—it can reduce pressure on wild fisheries while also adding to fish supplies. Sustainable aquaculture practices can also prevent diseases and parasites that might spread to wild fish populations and can harm local habitats if fish are treated with medicines or pesticides. Sustainable fisheries management by small-scale fishing communities also provides a win-win outcome by raising

incomes over the long run and protecting fish populations from over-fishing.

Leape: Harvest of wild fish rose sharply in the last several decades, driving many fisheries into decline and even collapse. We've since learned that if we exclude some areas for fishing—creating parks, or marine protected areas—we can restore the health of reefs, seagrass beds and other vital marine ecosystems and at the same time restore the productivity of fish stocks. Protected reserves allow fish to grow big and to produce many more offspring, and thus offer an actual win-win for the ocean and for fishers.

What are some surprising ways the oceans can help mitigate food insecurity?

Naylor: Most people focus on the role of fish in meeting protein requirements for a growing [global population](#) in the future. But many types of fish also contribute significantly to micronutrient demands. The most important problem related to [food](#) insecurity today is nutrition insecurity. Most of the world's population—with the exception of communities in protracted conflict—has access to adequate calories. Yet 2 to 3 billion people around the world suffer from micronutrient deficiencies that compromise physical and cognitive development. The kinds of fish that are typically used in animal feeds, like anchovies and sardines, also provide omega-3 fatty acids and essential vitamins (D, A and B) and minerals (calcium, iodine, zinc, iron and selenium) to consumers.

What is an example of an exciting/promising development in the seafood sector?

Naylor: Aquaculture, when practiced sustainably, is the most important development in the seafood sector, and now contributes over half the fish consumed directly by humans. Within the aquaculture sector, innovations in fish feed technologies are key to reducing the dependence on wild fish and adding to global net fish supplies. Feed innovations include, for example, the development of algal-based and insect feeds, genetic engineering to promote long-chain omega-3 fatty acids in plant-based feeds, and the production of high-quality fish proteins from methane capture

in wastewater and natural gas processing. The opportunities in feed innovation are massive.

Leape: Over the last couple of decades we have also seen the rise of the sustainable seafood movement—scores of consumers, fishers, processors, retailers and chefs who have committed to producing and selling seafood from well-managed fisheries. Large companies like Walmart and McDonald's have helped take this movement mainstream. Today, in some of the world's most important seafood sectors, such as whitefish and wild salmon, most fisheries are now certified as sustainable. As new technological capabilities come online, it will increasingly be possible to trace each fish back to the boat that caught it, and the day it was caught.

What can individual people do to improve ocean health?

Leape: One of the most important things you can do every day is be careful about the seafood you buy. Look for seafood that carries the blue logo of the Marine Stewardship Council or that is rated highly by Seafood Watch or another guide. If [seafood](#) isn't labeled, ask the waiter or the clerk at the fish counter where it came from. You'll be able to make better choices, and you'll be sending a strong signal to the restaurant or the store that they should pay attention too.

What are the major obstacles to and opportunities for improving ocean health and expanding the role of seafood in food security?

Leape: For millennia, our ability to protect the health of the oceans has been hampered by the fact that it has been impossible to know very much about what is happening in the water or even on the surface. That is now rapidly changing, as new sensors in the water, on satellites, on boats and even on fishing nets provide a new era of transparency in the use of [ocean](#) resources. This allows us to manage those resources much more successfully and to create real accountability for those who abuse them.

Provided by Stanford University

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