

# The impact of climate change on global food security—a fisheries perspective

March 11 2016, by Jessica Spijkers

---

*Jessica Spijkers is a PhD student at the Stockholm Resilience Center and at James Cook University. After having studied a Master's in European Studies (Catholic University of Leuven) and a Master's in Social-Ecological Resilience for Sustainable Development (Stockholm Resilience Center), she now conducts research on the effects of climate-change induced distribution changes to internationally shared fish stocks on governance arrangements. She shares her thoughts on the impacts of climate change on global food security, shifting the focus to marine resources. Views are her own.*

That the oceans and consequently the marine organisms they contain are under great stress is no longer novel information. The impacts of [climate change](#) on the physical and chemical properties of the oceans are well-recorded: rising sea water temperatures, ocean acidification and [sea level rise](#) due to excess heat and [CO2 are a concerning reality](#). Add the usual suspects of human mismanagement into the mix (overfishing, illegal fishing, pollution and habitat destruction) and we can start to fathom how different our future oceans might look if we do not limit [greenhouse gas emissions](#) and overthrow unsustainable ocean management.

## **Fisheries: vital component of global animal protein supply**

Saving the future of our oceans is of vital importance not only because

the vast blue moderates the effects of greenhouse gas emissions on the climate, or because it houses tremendous diversity of organisms.

Marine ecosystems also provide essential social and economic services that are expected to feel the hit of climate change hardest. For one, [between 11-12 percent of the world's population depend on fisheries and aquaculture for their livelihoods.](#)

Perhaps more importantly (and often overlooked) is the significant contribution capture fisheries and aquaculture sectors make to global nutritional security by providing the world with an average of [16.7 percent of animal protein intake.](#)

In certain low income food deficit countries fish contributes on average 25 percent to animal protein intake, and more than 50 percent in some small island developing states such as Bangladesh or Cambodia.

Despite the large contribution of fisheries to global animal protein supply, [the conversation oftentimes features only the climactic impacts on production from terrestrial biomes.](#)

A recent example is an [article featured in the Guardian discussing how climate change affects land-based agriculture](#) (e.g. by cutting available fruit and vegetables by 4%), and the impacts of those changes on diets available to people. The grim conclusion resulting from the study was that "severe climate change would cause changes in food availability, leading to 529,000 more people dying in 2050 than would have without warming". Opening up this conversation to include capture fisheries and the aquaculture sector is imperative to ensure comprehensive assessments of climate change impacts on global food security.

## **Effects of climate change on fisheries**

Large-scale changes are anticipated in the capture fisheries sector as climate change alters the distribution of fish and total fish catch. Certain [fish species are undergoing a shift in distribution as a consequence of ocean warming](#), including commercially important fish species.

Cheung et al. (2010) reported that regions in the northern hemisphere could largely gain in catch potential, while many tropical and subtropical regions may lose. Changes in distribution are expected to affect especially tropical and polar fish, where the Pacific could face a decrease by up to 42% from the 2005 level in catch potential.

The warming of northern waters, on the other hand, could result in an increase of the abundance of species into new territories such as the North Atlantic (Rose 2005). Besides capture fisheries, climate change will also impact aquaculture (varying by location, species, and aquaculture method) due to possible higher mortality rates and lower productivity.

## **Future for food security**

The projected changes in species distribution and decrease in total catch are expected to have important implications for global food security. Many tropical communities that are strongly dependent on fisheries resources for both protein intake and revenues, such as Indonesia, could experience a disastrous reduction in fish supply.

Lam et al. (2012) put their focus on West-Africa and have reported on a [potential loss of 7.6% in protein for Sierra Leone due to climate change](#) (with respect to what they consumed in the 2000s), and 7.0% for Ghana, both countries being highly dependent on fish protein relative to other proteins.

Further taking into consideration that most fish stocks are fully

exploited, over-exploited or collapsed and that the global marine catch has reached or even exceeded its biological limits, [it is hard to imagine how we can either prevent fish-dependent communities from experiencing a grave decline in the nutritional quality of their diets](#), or how we can provide a rapidly growing population with ample fish protein.

Many turn to aquaculture as a savior because the sector has expanded around 8.3 percent per year, making it the fastest growing food production system. However, aquaculture has its own set of issues to deal with as its growth has relied heavily on the availability of fishmeal and fish oil from wild catches while the efficient use and sharing of those products represents a major hurdle for the sector.

Of course, the drivers and interactions that ultimately determine food supply and consumption are complex. Consequently, so will be the solutions geared towards food security.

However, it is important to make a holistic assessment of all food sectors and their projected productivity under climate change to understand how we can ensure global food security with a world population headed to 9.3 billion in 2050. This holistic approach is essential to achieve the sustainable development outcomes in a post-Paris agenda architecture.

*This story is republished courtesy of PLOS Blogs: [blogs.plos.org](https://blogs.plos.org).*

Provided by Public Library of Science

Citation: The impact of climate change on global food security—a fisheries perspective (2016, March 11) retrieved 23 April 2024 from <https://phys.org/news/2016-03-impact-climate-global-food-security.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.