RSIS S. RAJARATNAM SCHOOL OF INTERNATIONAL STUDIES
Nanyang Technological University, Singapore

RSIS COMMENTARY

www.rsis.edu.sg No. 062 – 9 June 2022

Growing Food Insecurity

Asia's Huge Appetite for Fish: Can It Be Met?

By Genevieve Donnellon-May and Paul Teng

SYNOPSIS

The global demand for fish continues to skyrocket, led by Asian consumers, notably in China. There is now a global crisis in fisheries caused by over-fishing and climate change. Aquaculture (fish farming) is expected to plug this gap and is projected to be the primary source by 2030.

Asia's huge appetite for fish is under threat of a supply crisis due to over-fishing and climate change. — image by Unsplash.

COMMENTARY

THE LATEST report by the Food and Agricultural Organisation (FAO) of the United Nations on world fisheries and aquaculture estimated that 156 million tonnes of fish were eaten as food in 2018. Of these, 82 million tonnes or 52% were produced from aquaculture.

Today, each person eats about twice as much fish as 50 years ago on average. Nevertheless, by 2030 fish consumption is expected to jump by another 30 million tonnes due to the expansion of the middle-class. Increasing the availability of fish by harvesting from the wild is no longer a viable option. Some of the world's richest fisheries have already fallen into a perilous state. By 2050, all fisheries are expected to have collapsed.

The Rise of Aquaculture: Can It Plug the Gap?

One approach to meeting Asia's enormous appetite for fish is through aquaculture. Aquaculture or 'fish farming' is considered a more sustainable alternative to commercial fishing, which has depleted fish stocks worldwide.

Various countries in Asia such as Singapore and China have implemented frameworks and policies to harness the benefits of aquaculture. Nonetheless, this approach is not without environmental concerns which must be addressed to ensure the sustainability of Asia's fish supplies.

Why is the demand for fish growing? The global demand for fish follows the unprecedented growth in demand for protein worldwide since the beginning of the 21st century.

In many countries, fish plays a key role in providing a nutritious diet and is rich in key nutrients such as long-chain omega-3 fats. As such, fish and related products are considered some of the healthiest foods available on the planet and promote food security and nutrition at varying scales (local, regional, national, and global).

Recent estimates from the FAO suggest that fish provides approximately 3.3 billion people, or nearly 43% of the world's total population, providing 20% of their average per capita animal protein intake. In per capita terms, food fish consumption increased from 9.0 kilograms (kg) (live weight equivalent) in 1961 to 20.3 kg in 2017.

Overfishing: Even Wild Fish Population in Crisis

Fish remains the only key protein source supplied from the wild. However, large, destructive industrial fishing fleets with sophisticated technologies, supplanting local fishermen and destroying habitats, and overfishing have caused a crisis.

Consequently, much of the world's fisheries are in perilous states. An estimated 70% of fish populations are overused or entirely used, while one-third of commercial fish stocks are being harvested at unsustainable levels. At the same time, climate change is causing warmer temperatures in the oceans, much to the detriment of many fish species.

Comprising either marine or inland (mainly freshwater) aquaculture, aquaculture has become the fastest-growing sector in agriculture in recent decades. Aquaculture has expanded fish availability to countries and regions which would otherwise have minimal to no access to fish, often cheaply, encouraging better nutrition and food security.

Globally, since 2016, aquaculture has become the leading source of fish available for human consumption and in 2018 accounted for 52% of all fish harvested. As the UN FAO noted, between 1990 to 2018, there was a 527% jump in global aquaculture production and a 122% increase in total food fish consumption.

Importance of Aquaculture to Asia

Global aquaculture production is dominated by Asia which accounted for 92% of all aquaculture production worldwide. It is the region's biggest source of fish for human consumption, accounting for 23% of animal protein in Asian diets, and will increase further in the future. Key producers include Bangladesh, China, India and Vietnam.

Aquaculture and related industries are also a major source of employment, with 20.5 million people working in aquaculture in 2018, of which Asia accounted for 85%.

In China — Asia's leading aquaculture producer — aquaculture is considered one of the country's four primary seafood sources, along with freshwater fishing, coastal fishing, and distant-water fishing.

The country's new 14th Five-Year Plan for Fisheries (2021-2025), targets the promotion of aquaculture to attain food security, by encouraging pond-based aquaculture and industrial recirculating aquaculture systems.

Negative Environmental Impact

There are growing concerns over aquacultural practices and their damage to the environment along with environmental standards, food safety standards and biosecurity. With more people interested in knowing where their food comes from and what is on their plate, there will likely be growing scrutiny over aquacultural practices.

Aquaculture has been linked to habitat destruction (e.g. mangrove destruction), environmental degradation, biodiversity loss, and ecosystem loss due to factors like the introduction of exotic species that can displace native fish species and the excess of nutrients such as nitrogen and phosphorous from non-consumed feed (mainly due to overfeeding) flowing into natural ecosystems.

As most aquaculture production currently comes from developing countries with limited ability to govern and implement regulations on aquaculture production, it may be challenging to enforce sound environmental management.

Sustaining Aquaculture as a Source of Fish t

An inter-linked approach can overcome the challenges posed by aquaculture. Firstly, countries could use different technologies and types of business to balance environmental conservation and growing fish demands.

In Norway, this approach saw a 60% increase in the productivity of the salmon industry through offshore marine aquaculture. Other countries like Singapore are supporting inland fish farming using "disruptive technologies" (e.g. artificial intelligence, Internet of Things and blockchain) to provide sustainable solutions and minimise environmental impact.

Secondly, the efficiency and sustainability of the aquaculture industry may be strengthened to meet the growing global appetite for fish and contribute to the attainment of the relevant United Nations Sustainable Development Goals (UN SDGs). This could include supportive regulatory frameworks, targeted investment, and capacity building.

Ultimately, fish, like rice and vegetables, are historically and culturally important components in the diets of many Asians. Thus, it is not of matter of "whether to" but rather a question of how aquaculture can be made sustainable to ensure a continued supply of fish.

Genevieve Donnellon-May is a master's student in Water Science, Policy and Management at the University of Oxford. Paul Teng is an Adjunct Senior Fellow at the Centre for Non-Traditional Security Studies (NTS Centre), S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University (NTU) Singapore. He was also a former Deputy Director General of the WorldFish Centre.

S. Rajaratnam School of International Studies, NTU Singapore
Block S4, Level B3, 50 Nanyang Avenue, Singapore 639798
T: +65 6790 6982 | E: rsispublications@ntu.edu.sg | W: www.rsis.edu.sg