A deep-dive into the

Aquaculture Industry

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Overview of the Industry

Aquaculture, also known as aquafarming, is one of the fastest growing food production sectors and it has grown exponentially over the last 50 years. Aquafarming is the farming of aquatic organisms (in both coastal and inland areas) including fish, molluscs, crustaceans and aquatic plants. Freshwater fishes (such as carps and barbels) is the unchallenged number one aquaculture group in terms of both quantity and value.

Global growth

At the global level, aquaculture has experienced a continuous growth and reached 80 million tonnes of farmed food fish in 2016. Production is expected to increase by a further 30 million tons by 2030. Although this industry no longer enjoys the annual growth rate of the 1980s, its share of total world fish production is increasing compared with capture fisheries (Figure 1.).

Aquaculture also employs, directly and indirectly, about 26.1 million full-time workers worldwide. Indirect employees mainly work in activities such as the building of infrastructure (ponds, cages, tanks etc.), manufacturing of fish processing equipment, packaging, marketing and distribution. Increased production and workforce are strongly connected with and determined by the demand for fish and fishery products by consumers.

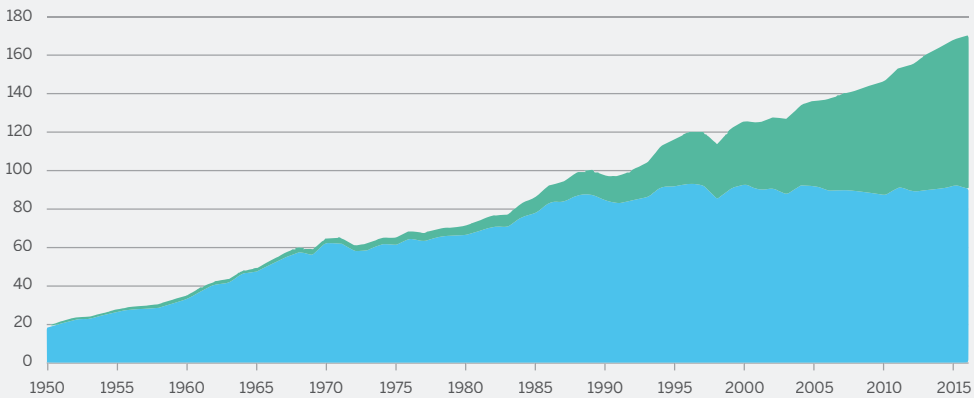
Demand and consumer preference

There are many reasons why aquaculture is important but the single reason why aquaculture is essential is **food security**. As the human population continues to increase, finding alternative means to feed the growing population is one of the most important challenges faced around the globe. Oceans are an important source of seafood, but they have a finite supply of fish.

Demand for seafood is on the rise, per capita consumption is now more than double what it was 50 years ago. In the 1960s, per capita consumption was 9.9kg and in 2016 it almost reached 21kg per capita (Figure 2). The rise in incomes, especially in developing countries, have contributed to this increase.

Fish production (million tonnes)

Figure 1

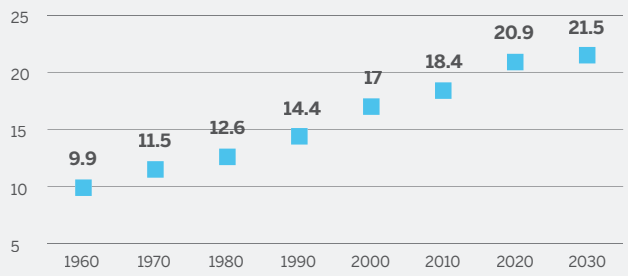


World capture fisheries and aquaculture production, 1950-2016 (FAO, 2016).

Note: Excludes aquatic mammals, crocodiles, alligators and caimans, seaweeds and other aquatic plants.

Figure 2

Per Capita Fish Consumption (Kg)



Annual per capita fish consumption from 1960 to 2020 and forecast for 2030.

Seafood is universally accepted as a high-protein food in comparison to other farmed protein. Apart from feeding the planet's growing population and preserving wild fish stocks, seafood can contribute to providing future generations with healthy and environmentally-friendly protein options. Consumers recognise the health benefits of seafood and increasingly include it in their diets.

Production processes in the aquaculture supply chain

Generally, there are three main stages of the production chain, starting in hatcheries and ending at the seafood counter of retail stores. These are:

- **Fish Hatchery**: The reproduction of aquatic animals, hatching of eggs and nurturing through the early life stages
- **Fish Farms**: The process of raising aquatic animals commercially in tanks or enclosures for human consumption. This is the lengthiest process in aquaculture supply chains
- **Processing and Export**: The manual or mechanised processing and then packaging for export and retail

Linked to the aquaculture supply chain is the manufacturing of fish feed. The manufacturing of fish feed is a business in itself, with its own supply chain. The fish feed supply chain typically consists of feed additives and ingredients, importers, local producers and suppliers to feed mills.

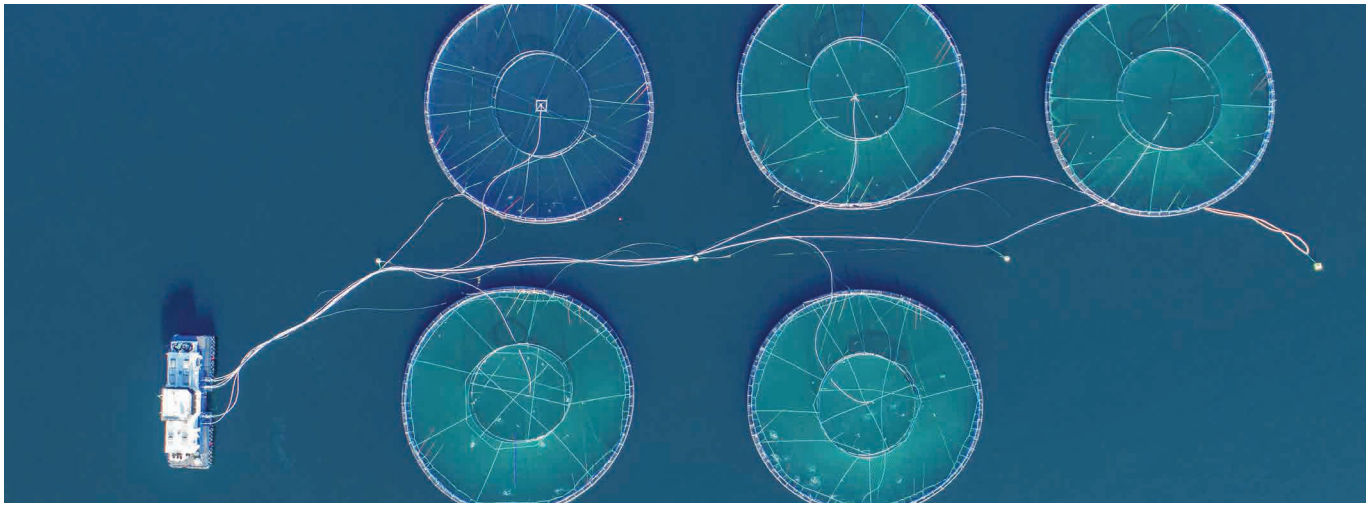
Supply Chain - The shorter the better

Aquaculture supply chains have a global reach. This is often the result of foreign direct investments and subcontracting. Typically, aquaculture supply chains connect independent businesses: each completing a production stage and supplying to the next. Technological advancement is, however, changing the industry model. The development of short aquaculture supply chains is now gaining momentum.

The structure of a supply chain can impact risk management strategies in terms of product quality but also those of human rights and the environment. In short, aquaculture supply chains can be:

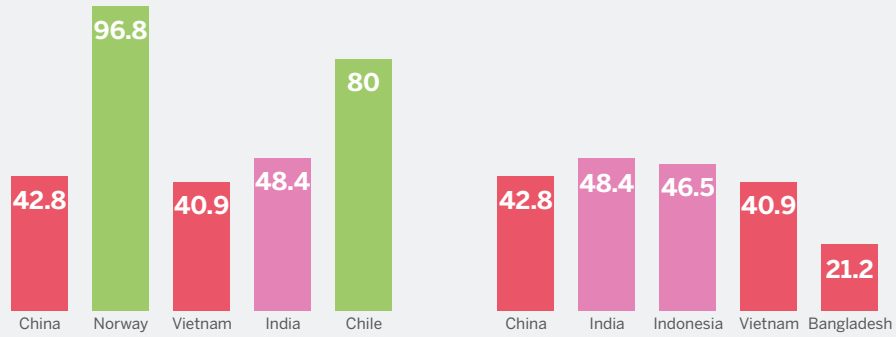
- **Fully fragmented**: every stage of production is owned by a different actor
- **Partially fragmented**: different farms supply a single player who owns the remaining stages of production
- **Integrated**: intermediaries between fish farms and consumers are removed, all production processes are vertically integrated

The shift from a fragmented to an integrated model is seen as an opportunity for risk and cost minimisation. In addition, it can impact risk management strategies in terms of human rights, environmental protection and quality of food products.



amfori's Countries Risk Classification Overall Risk

Figure 3



Overall score of the top five sourcing countries in the amfori Countries' Risk Classification tool.

Global aquaculture market at a glance

In many countries, aquaculture grew in economic importance during the second half of the twentieth century. This industry has experienced significant growth in the Asia Pacific region. Due to the fact that aquaculture is considered to promote economic growth, the region has invested substantial resources into this industry. Today, China is by far the largest producer of farmed food. It produces about two-thirds of the world's farmed fish. Besides China, the countries where aquaculture production has seen major growth are India, Indonesia, Vietnam and Bangladesh.

As well as being the number one aquaculture producer, China is also a top exporter, by a big margin. Top exporters, however, are not only concentrated in the Asia Pacific region of the globe. The **top five** exporters of fish and fish products worldwide are:

Top exporters of fish and fish products, in 2018

China	15.6%
Norway	7.28%
Vietnam	4.63%
India	4.22%
Chile	4.09%

The amfori Country Risk Classification tool, which uses the **World Bank Worldwide Governance Indicators** (WGI), is a tool that shows whether a country is considered as a High or a Low Risk country. The data gathered from this tool indicates that while three of the five largest aquaculture producers are considered Risk Countries, there is a score fluctuation among the top five exporters (Figure 3).

Opportunities and drivers for generating positive impact

Companies in the aquaculture sector are under increasing pressure to adopt sustainable business models that consider not only economic but also both environmental and social aspects. Increased demand for positive impact is mainly driven by consumers and regulatory and societal pressures. Companies that adopt sustainability practices can gain a competitive advantage by differentiating themselves from their competitors. amfori supports its members sourcing aquaculture products to:

- Assess risk
- Monitor their business partners
- Drive performance improvement and remedy severe violations.

amfori
Avenue de Cortenbergh 172
1000 Brussels - Belgium
Phone: +32 2 762 05 51
E-mail: info@amfori.org