Chapter 1
Trends in fish production, employment and exports

Global production and employment: Summary[2]

In 2014, the total world production of fish was 167 million tons. The global supply of fishery products has steadily grown at an average annual rate of 3.2 per cent in the last five decades, but capture production has reached a plateau since the mid-1990s, at around 90 million tons. The growth in fish production has been sustained by the rapid expansion of aquaculture; over the last three decades, global aquaculture production has tripled, growing at an average annual rate of 8.3 per cent. In 2014, aquaculture constituted 44 per cent of world fish production, compared with 26 per cent in 1994.

The growing importance of aquaculture is also reflected in employment trends. In 2008–2012, employment in fish farming increased by 5.5 per cent annually, in contrast to the 0.8 per cent recorded for both marine and inland capture fisheries. However, in 2012, aquaculture only accounted for about 32 per cent of total fishing employment. Capture fisheries are on average more labour-intensive than aquaculture, mainly due to the predominance of low-productivity small-scale or artisanal fisheries.

Fish production supports employment across a variety of sectors. Harvesting, processing, packaging and distribution activities constitute the supply chain for delivery of the commodity. The production of equipment and technology for vessels, handling, processing and shipping constitute support services. The primary sector alone generated employment for 56.6 million people in 2014; nearly 36 per cent of the total employment generated in the fishery sector is full time and 23 per cent is part time. If all related services and dependents of the employed are taken into account, fisheries support the livelihoods of about 10–12 per cent of the world's population.

Large-scale industrial fishing and small-scale artisanal fishing both contribute to GDP, but in different ways. The latter are more labour intensive and employ the vast majority of people engaged in fishing-related activities in developing countries. The World Bank et al. (2010) estimated that in the mid-2000s, in developing countries, small-scale fisheries employed about 79 million people, of whom 23 million were engaged in fishing and 56 million in post-harvest employment, while large-scale fishing employed a total of only approximately 5 million, of which 1.5 million were fishers and 3.5 million were engaged in post-harvest activities. FAO estimates that, in 2014, nearly 57 million people were engaged in the primary sector; 90 per cent, or 52 million, were small-scale fishers. There is significant variation in fishery sector employment data, particularly between national and international sources.

Exports: Focus on developing countries

Fish is one of the highest value commodities in world trade and accounts for approximately 10 per cent of total world agricultural exports. Global trends in fish trade are shown in tables 1–9. Exports of fish as a proportion of total fishery production rose from 25 per cent in 1976 to 37 per cent in 2012.

The evolution of world fishery export volume and average annual growth rate in 1981–2013 is shown in table 1; the 36.4 million tons exported in 2013 were more than triple the volume in 1981. The increase in trade in seafood reflects several factors, including increased consumption demand, especially in developed countries; depletion of stocks in developed country fishing waters; and technical advances in preservation, processing and transport.

Table 1. World fishery export volume and average annual growth, 1981–2013

	1981	1991	2001	2011	2013	Average annual growth rate, 1981–2011
	(Millions of tons)					*(Percentage)*
Total	10.5	17.3	27.5	35.4	36.4	3.90
From all developed countries	6.7	9.5	13.8	16.0	16.8	2.73
From all developing countries	3.8	7.8	13.8	19.4	19.6	5.30
From the least developed countries	0.2	3.6	0.7	1.2	1.3	6.89

Source: FAO, 2017a.

The diffusion of storage and packaging technology and improved processing methods have been crucial drivers of the globalization of fish distribution. Processed fish make up to 90 per cent of total world fish trade due to the highly perishable nature of fish commodities. Frozen fish accounted for 46 per cent of exports in 2012, compared with 25 per cent in 1980,

2 Unless otherwise stated, all data in this chapter are from FAO, 2012a; FAO, 2012b; FAO, 2016; and FAO, 2017a.

and the proportion of prepared and preserved fish as a share of total fish trade expanded from 9 to 17 per cent in the same period (FAO, 2014).

In addition to large stocks of fish, developing country comparative advantages derive from the high labour intensity of fishing and fish processing. Advances in transport and storage technology also enable global fragmentation of the fishing value chain, as in manufacturing (Golub et al., 2007); fish may thus be caught, produced, processed and ultimately consumed in different countries. In the last three decades, exports from developing countries have increased more rapidly than exports from developed countries, and LDC exports have grown even faster, although from a lower base (see table 1). The shares of these groups of countries in world fishery exports by volume and value in 1981–2013 are shown in tables 2 and 3.

Table 2. Share of fishery export volume in world total by income group, 1981–2013

(Percentage)

	1981	1991	2001	2011	2013
Developed countries	63.8	54.7	50.0	45.1	46.3
Developing countries					
Least developed countries	1.6	2.1	2.4	3.5	3.5
Other	34.6	43.2	47.6	51.3	50.2
Total	100.0	100.0	100.0	100.0	100.0

Source: FAO, 2017a.

Table 3. Share of fishery export value in world total by income group, 1983–2013

(Percentage)

	1983	1993	2003	2013
Developed countries	62.7	55.2	52.6	46.0
Developing countries				
Least developed countries	1.1	1.0	2.6	2.0
Other	36.3	43.8	44.9	52.0
Total	100	100	100	100

Source: United Nations International Trade Statistics Database (COMTRADE), 2017.

As shown in table 2, the share of fishery exports from non-LDC developing countries rose from 34.6 per cent in 1981 to 50.2 per cent in 2013. While the share of fishery exports from LDCs rose from 1.6 per cent in 1981 to 3.5 per cent in 2013, it totals only 1.3 million tons, equivalent to 34.2 per cent of the quantity exported by non-LDC developing countries in 1981. Several LDCs are among the leading global inland water and marine fish producing countries, yet their share in global fishery exports is marginal. With the exception of, for example, aquaculture-grown shrimp, catfish and canned tuna, consumers in the United States of America and the European Union tend to prefer North Atlantic and North Pacific species found closer to home (FAO, 2011). These species are caught by domestic fishers and often exported to processing hubs such as China, then re-exported back to retailers. In addition, much of LDC fishery exports take the form of unrecorded cross-border trade with neighbours, particularly in Africa, for example around Lake Victoria. The share of LDCs in global exports may thus be higher than as shown in tables 1–3.

The leading exporting and importing countries by value are shown in tables 4 and 5. Fishery exports are increasingly concentrated in a few relatively labour-abundant developing economies that supply the developed world.

Table 4. Top 10 fishery exporters, 2003 and 2013

	2003 (Millions of dollars)	2013 (Millions of dollars)	Average annual growth rate, 1983–2013 (Percentage)
China	3 335	12 526	13.69
Norway	3 386	10 125	8.80
United States	2 927	5 128	5.91
Viet Nam	2 074	5 062	17.04
India	1 276	5 033	9.32
Chile	1 574	4 111	13.09
Canada	2 886	3 864	3.78
Sweden	599	3 405	13.37
Spain	1 810	2 885	8.05
Indonesia	1 437	2 856	8.70

Sources: COMTRADE, 2017; FAO, 2017a.

Table 5. Top 10 fishery importers, 2003 and 2013

	2003 (Millions of dollars)	2013 (Millions of dollars)	Average annual growth rate, 1983–2013 (Percentage)
United States	9 227	14 714	4.65
Japan	10 583	11 782	3.90
China	1 864	5 993	19.24
Spain	4 611	5 336	9.10
France	2 901	4 992	5.35
Germany	1 844	4 317	6.64
Italy	2 819	4 300	6.25
Sweden	833	4 097	10.55
Hong Kong (China)	1 564	3 237	6.97
Republic of Korea	1 737	3 136	14.78

Source: COMTRADE, 2017.

Note: Average annual growth rate for China calculated from 1984 to 2013 as data unavailable for 1983.

China contributed about 12.5 per cent of total fishery exports in 2013 (COMTRADE, 2017). Increasing volumes of fresh or minimally processed catches are imported into China and subsequently reprocessed and exported to major consumer markets. Such reprocessing has driven the recent emergence of China as the leading fish-exporting nation. Viet Nam and Thailand – the fourth and fourteenth largest exporters by value, respectively – have also established major fish processing industries that have fuelled their contribution to trade. The formation of major reprocessing centres in these countries has meant that re-exports of fish have been a major driver of the trade in fishery products.

The evolution of the volume of world imports and average annual growth rate in 1981–2013 is shown in table 6, and the shares of groups of countries in world fishery imports by volume and value in 1981–2013 are shown in tables 7 and 8. Developing country imports have grown rapidly. For example, the share of fish imports of non-LDC developing countries increased from 25.3 per cent in 1981 to 42.0 per cent in 2013. However, developed countries still account for the majority of fish imports – around 72.6 per cent of imports by value in 2013.

Table 6. World fishery import volume and average annual growth, 1981–2013

	1981	1991	2001	2011	2013	Average annual growth rate, 1981–2011
	(Millions of tons)					(Percentage)
Total	10.1	17.8	27.9	35.9	35.2	4.08
To all developed countries	7.4	12.4	18.7	19.7	19.7	3.09
To all developing countries	2.7	5.4	9.2	16.2	15.5	6.05
To the least developed countries	0.2	0.2	0.2	0.6	0.7	1.83

Source: FAO, 2017a.

Table 7. Share of fishery import volume in world total by income group, 1981–2013

(Percentage)

	1981	1991	2001	2011	2013
Developed countries	72.9	69.8	66.9	54.8	56.0
Developing countries:					
Least developed countries	1.8	1.2	0.7	1.7	2.0
Other	25.3	29.0	32.4	43.5	42.0
Total	100	100	100	100	100

Source: FAO, 2017a.

Table 8. Share of fishery import value in world total by income group, 1983–2013

(Percentage)

	1983	1993	2003	2013
Developed countries	87.3	86.4	81.2	72.6
Developing countries				
Least developed countries	0.1	0.03	0.2	0.8
Other	12.6	13.6	18.6	26.7
Total	100.0	100.0	100.0	100.0

Source: COMTRADE, 2017.

The European Union, the United States and Japan are the three largest import markets for fish, and their dependence on developing country imports is expected to increase in future. They are highly reliant on external suppliers, with imports accounting for approximately 64, 60 and 54 per cent, respectively, of domestic fish consumption (European Fish Processors Association and European Federation of National Organizations of Importers and Exporters of Fish, 2013). The European Union – the largest market for imported fish products – currently accounts for slightly more than one quarter of world imports, and has a common regulatory system for such products in the 28 member nations. Excluding intraregional trade, the European Union accounted for 37.8 per cent of total world fishery imports in 2013. In addition, it is a particularly important market for sub-Saharan Africa – with 34 of the 48 LDCs – due to both proximity and historical connections. The volume of fish exported from sub-Saharan Africa is relatively limited, yet 70 per cent of these exports are destined to the European Union (Josupeit, 2011). The European Union has the most stringent quality and sanitary regime (see chapter 2), which many small-scale producers and processors cannot satisfy, although there is potential for increasing exports of fishery products, since European Union import demand is projected to rise as local supply is reduced by the need to rebuild depleted fish stocks.

There is also substantial regional fisheries trade between LDCs. However, statistics can be unreliable due to the fact that such trade takes place in black or grey markets. In Africa, particularly in the Great Lakes region, a large amount of regional cross-border fish trade is unrecorded.

Bilateral trade between non-LDC developing countries and developed countries, and between non-LDC developing countries and LDCs, have grown more rapidly compared with that between LDCs and developed countries, as shown in table 9.

Table 9. Bilateral trade by income group, 1993–2013

(Millions of dollars)

	1993	1998	2003	2008	2013
Least developed countries to other developing countries	38.3	71.02	201.01	454.1	590.0
Least developed countries to developed countries	221.5	375.1	973.3	1 281.4	726.1
Developed countries to least developed countries	24.0	65.3	58.8	127.9	253.0
Developed countries to other developing countries	1 436.2	2 279.4	3 695.3	6 360.7	11 667.0
Other developing countries to least developed countries	8.1	18.7	33.5	115.8	502.2
Other developing countries to developed countries	8 929.7	12 502.8	16 055.2	22 407.2	28 427.6

Source: COMTRADE, 2017.

Major traded commodities

Higher priced fish products such as shrimp, prawns, salmon and tuna are the most frequently traded products by value, and exports of these species are mostly directed towards markets in developed countries. Aquaculture has facilitated the production and trade of these high-value species, allowing producers to diversify product ranges and sell in developed markets. Species such as shrimp, prawns, salmon, tilapia and catfish – among the most farmed fish products – are those that have demonstrated the highest export growth rates in the last decade. LDCs have generally not been able to participate in the trade of high-value species; one reason is their proportion of world aquaculture production – in 2013, their share was only 4.2 per cent by quantity and 5.6 per cent by value. Low-value species such as anchovies are exported in large quantities, yet the value of trade in anchovies and other pelagic species is less than the value of trade in high-value species.

LDCs tend to supply unprocessed or minimally processed fish. Southern European countries buy mostly whole fish, while northern European consumers, particularly in Germany and the United Kingdom of Great Britain and Northern Ireland, buy more processed fish products such as frozen or breaded fillets. Consequently, most LDC exports are to southern Europe.

The most important fishing product from sub-Saharan Africa is canned tuna. African countries are exempt from the 24 per cent tariff on imported tuna, providing a significant competitive advantage over non-LDC exporters. Tuna fishing and canning has shifted from East to West Africa; the largest African exporter was Senegal and is currently Mauritius. Frozen

fish fillets, mainly of hake from Namibia and South Africa but also including Nile perch from lakes in Kenya, Uganda and the United Republic of Tanzania, are the second most important fish product from Africa (Josupeit, 2011).

Importance of fishing to gross domestic product, employment and poverty reduction

Fishing plays a crucial role in a number of LDC and non-LDC developing countries, including those emphasized in the present study. The World Bank et al. (2010) noted that the share of capture fishing (gross value of fishery output) as a percentage of GDP was 4 per cent in Bangladesh, 10 per cent in Cambodia, 15 per cent in the Comoros, 4 per cent in Mozambique and 3 per cent in Uganda. Including post-harvest activities raised the share to 16 per cent in Cambodia and 12 per cent in Uganda (data unavailable for the other countries).

In addition to job creation, agriculture and fishing contribute to food security, both directly and indirectly. In many LDCs, such as Bangladesh, Cambodia, the Gambia, Guinea, Sierra Leone and Togo, fish provide more than half of the animal protein consumed (Béné, 2006). Incomes earned from selling fish are also important. People engaged in artisanal fishing and fish processing tend to have low incomes (Béné 2006; Béné et al., 2010). Nevertheless, fishing can contribute to poverty alleviation through several mechanisms. Artisanal fishing, as does the informal economy more generally, provides employment of last resort. The common resources aspect and low capital intensity of fishing enable easy entry by low-skilled people with few other options. Béné et al. (2010) distinguished a labour-buffer effect of absorbing chronic surplus labour and a safety-net effect during short-term shocks. However, artisanal fishers are vulnerable due to high exposure to risks, high sensitivity to risks and low capacity to adapt to risks, including physical risks, such as drowning and accidents; weather-related risks, such as tropical storms, tsunamis and floods, possibly exacerbated by climate change; and resource-related risks, such as migration of fish stocks or subjection of fish stocks to overfishing or disease. Béné et al. (2010) contrasted wealth-based and welfare models of poverty alleviation for fisheries – the former focuses on increased investment, value added and exports, and the latter on safety-net and labour-buffer effects in sustaining the incomes of the poor – and stated that the former focused overly on resource conservation and income growth at the expense of employment.

Limiting the overexploitation of resources is essential to maintaining fishing as an income-generating activity. Modernizing fishing and fish processing does not necessarily imply a decline in demand for labour, as both are likely to remain labour intensive. Moreover, the scale effect of expanded fishing activities on employment could dominate the reduced labour intensity following from increased production. There is no evidence that creating processing factories, for example, reduces the employment of artisanal fishers. On the contrary, local processing can increase demand for fish (see chapter 9). To the extent that fish exports contribute to higher earnings, they lower poverty; there may not necessarily be a contradiction between improving productivity and maintaining employment.

Role of women

Fishing may often be considered a profession dominated by men yet this usually refers only to the capture of fish. With regard to freshwater fishing, for example, women may own boats, as for example in Benin and Cambodia. In Bangladesh, fishing was traditionally reserved for low-caste Hindu men, yet this is gradually changing; the World Bank et al. (2010) found that women of different religions and castes engage in shrimp fishing in coastal areas. In addition, the majority of jobs in fisheries are in post-harvest distribution and processing, and women tend to dominate in these activities, particularly when they are artisanal. The World Bank et al. (2010) estimated that 47 per cent of those involved in fisheries worldwide are women, with wide variations across countries, for example 73 per cent in Nigeria, 72 per cent in India, 57 per cent in Cambodia, 32 per cent in Senegal, 19 per cent in China and 5 per cent in Bangladesh. In 2014, 19 per cent of women were directly engaged in the fishery primary sector. Women also frequently provide funds to invest in family fishery businesses. Yet despite women's substantial and increasing involvement in fisheries in some countries, a lack of gender equality arises from traditional beliefs and customs and existing legal and regulatory barriers.