

## FISH

### Market situation

The market prospects for fish continue to be positive. The year 2014 was characterised by historical peaks in production, trade and consumption, only slightly affected by events such as the Russian Federation's import ban and reduced catches in South America.

Apparent per capita fish consumption is estimated to have reached about 20 kg in 2014, with aquaculture overtaking capture fisheries as the main source of fish for human consumption for the first time.

Developing countries, in particular in Asia, will continue to drive major changes and expansion in global fishery production, trade and consumption, being the main producers, exporters and growing consumers. However, in 2014, trade increased faster in developed countries than in developing countries. This is counter to the long-term trend, which has seen developing countries, particularly in South America and South and East Asia, steadily increase their proportion of world trade in fishery products. The major factors behind this reversal were booming growth in the United States market and a record-breaking year for key producer and exporter Norway.

Fish prices grew sharply during the first part of 2014 and weakened during the rest of the year due to softening consumer demand in many European markets and Japan, and improving supply situation of certain fishery species. However, fish prices remained above 2013 levels for most species and products, in particular for farmed species. The FAO Fish Price Index (base 2002-04 = 100) indicates that prices are at record heights reaching a peak in March 2014 (at 164, with aquaculture species at 168).

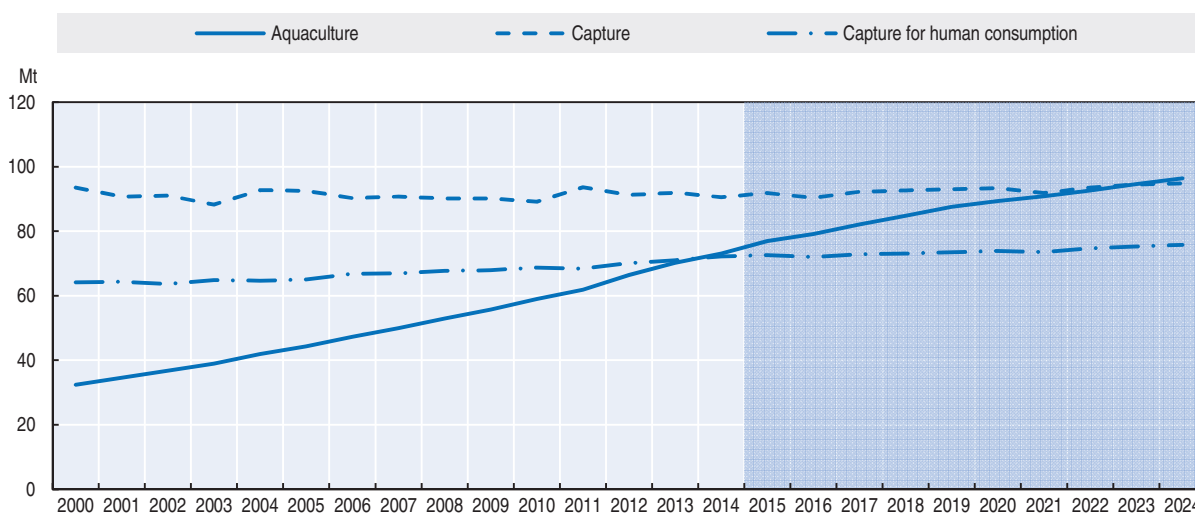
### Projection highlights

The main drivers affecting world fish prices for capture, aquaculture and traded products will be income and population growth, limited increase in capture fisheries production, high meat prices in the short term, and feed prices. All these factors will contribute to high fish prices in the near future followed by a decline in the remaining years of this decade and an increase in the 2020s. In real terms, prices are expected to decline from the record high of 2014. The aquaculture to coarse grains price ratio is expected to be cyclical over 2015-24 and to eventually stabilise slightly lower than the historical average (1990-2014). The price ratio between aquaculture and fishmeal will remain relatively stable. Since the feed demand for fishmeal from aquaculture and livestock sectors is growing faster than supply, an increase in the fishmeal to oilseed meal price ratio is expected. The popularity of the Omega-3 fatty acids in human diets and the growth in aquaculture production have both contributed to a rise in the fish oil to oilseed price ratio since 2012, which is expected to be maintained over the medium term. However, since fish oil and oilseed oil prices are starting from very high levels, a decline is expected in nominal terms for the rest of this decade.


Fisheries production worldwide is projected to expand by 19% between the 2012-14 base period and 2024, to reach 191 Mt. The main driver of this increase will be aquaculture, which is expected to reach 96 Mt by 2024, 38% higher than the base period (average 2012-14) level. Aquaculture will remain one of the fastest growing food sectors, notwithstanding a

slowdown of its average annual growth rate going from 5.6% in the previous decade to 2.5% in the projection period. In 2023, aquaculture will surpass total capture fisheries (Figure 3.6). This development heralds a new era, indicating that aquaculture will increasingly be the main driver of changes in the fisheries and aquaculture sector. Nonetheless, the capture sector will remain dominant for a number of species and vital for domestic and international food security. World production of fishmeal is expected to eventually return to the 5 Mt level by the end of the outlook period and world fish oil production should hover around 1 Mt. In both cases, the share of production of fishmeal and fish oil obtained from whole fish is expected to fall compared to the previous decade.

Figure 3.6. **Aquaculture and capture fisheries**



Note: "Capture for human consumption refers" to the Capture production excluding ornamental fish, fish destined to the production of fishmeal, fish oil and other non-food uses. All aquaculture production is assumed to be destined to human consumption.

Source: OECD/FAO (2015), "OECD-FAO Agricultural Outlook", OECD Agriculture Statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.  
StatLink  <http://dx.doi.org/10.1787/888933229221>

World per capita apparent fish food consumption is projected to reach 21.5 kg in live weight (lw) equivalent in 2024, up from 19.7 kg in the base period. The average annual growth rate will be lower in the second half of the outlook period, due to more competitive meat prices. Per capita fish consumption is expected to increase in all continents, with Asia showing the fastest growth. In contrast with previous *Outlook Reports*, for the first time, a slight increase is projected for Africa. Lower feed and crude oil prices reduced production and transportation costs enhancing African aquaculture production and imports. Per capita fish consumption will remain higher in more developed economies, even if it is expected to grow more rapidly in developing countries.

Fuelled by sustained demand, innovations and improvements in processing, preservation, packaging, transport and logistics, total fish, and fishery products (fish for human consumption, fishmeal on a lw basis) will continue to be highly traded, representing about 31% of production (36% including intra-EU trade) in 2024. However, global fish trade for human food is projected to grow slower than in the past decade due to increasing domestic consumption by main producers. Developing countries are expected to account for 64% of global fish exports for human consumption by 2024, down from 66% in the base period. Developed regions will continue to remain the main importers.

The key uncertainty for the fish projections remains the productivity gains in aquaculture, which might be affected by several factors, including availability and accessibility to land, water, financial resources, improvement in technology, feeds, etc. In addition, animal disease outbreaks have shown to the potential to affect aquaculture production and subsequently domestic and international markets depending on the size and the species involved. Natural productivity of fish stocks and ecosystem and the occurrence of El Niño are the key uncertainties impacting capture fisheries and also the fishmeal and fish oil outlook. Trade policies, and in particular bilateral trade agreements, remain an important factor influencing the dynamics of the world fish markets.

**The expanded fish chapter is available at**  
[http://dx.doi.org/10.1787/agr\\_outlook-2015-12-en](http://dx.doi.org/10.1787/agr_outlook-2015-12-en)

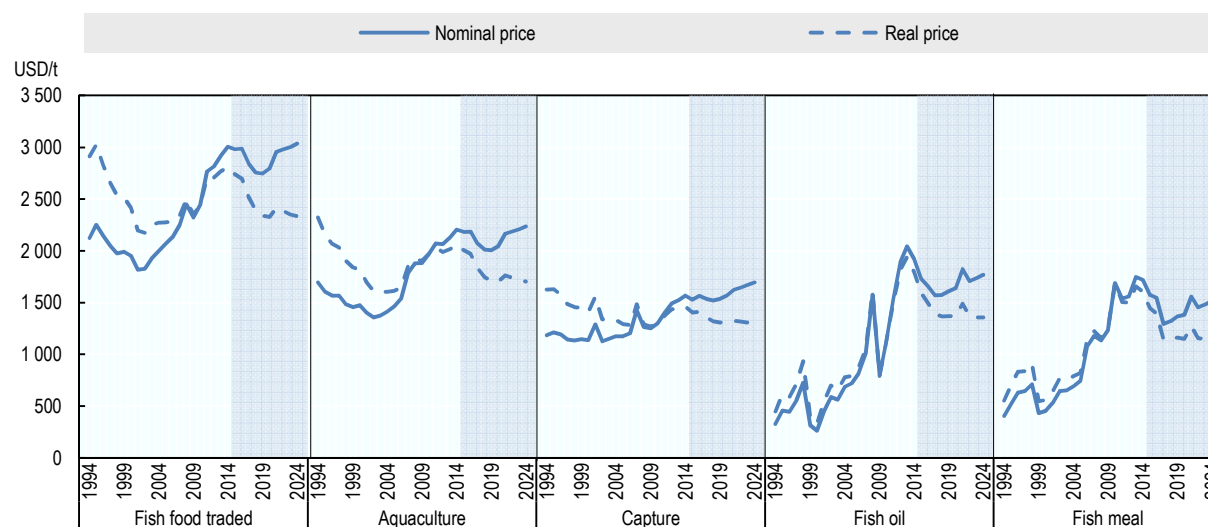
## Prices

Fishery<sup>1</sup> prices are currently at very high levels, and little moderation is foreseen in the coming ten years as long as production costs remain high. The average price of fish caught in the wild (excluding fish for reduction) in nominal terms is expected to increase more than farmed fish (11% compared to 5%) between the 2012-14 base period and 2024 (Figure 3.6.2). This is mainly due to the fact that capture fisheries are expected to remain under severe production quotas, with demand for certain species continuing to be sustained. However, the price of capture fisheries will remain lower than that of aquaculture. One of the main reasons is the large share of lower value fish in overall catches.

In real terms (Figure 3.6.2), however, capture and aquaculture prices are expected to decline, by 10% and 16% respectively during the outlook period. The stronger decline in the aquaculture price is caused by continued productivity gains (even though at a slower pace than previous decades) and by a decline of feed prices, its main input.

Starting from a high plateau, the average fishmeal price is projected to decline during the projection period. By 2024, the price will be 9% less in nominal terms and 27% in real terms as compared to the 2012-14 base period. The only exceptions will be in the years of the *El Niño* phenomenon<sup>2</sup>, affecting catches in South America, in particular anchoveta species in Peru and Chile, which are mainly used for reduction into fishmeal and fish oil. The price ratio between fishmeal and oilseed meal is expected to increase due to the strong preference for fishmeal in certain stages of animal rearing (e.g. in the weaning stage for pigs and initial stages for salmon rearing) and because oilseed meal price is projected to decrease more than the fishmeal price. This will be even more evident in years of the *El Niño*, as fishmeal supply will be more limited than demand.

**Figure 3.6.2. World fish prices**



Note: Fish food traded: world unit value of trade (sum of exports and imports). Aquaculture: FAO world unit value of aquaculture fisheries production (live weight basis). Capture: FAO estimated value of world ex-vessel value of capture fisheries production excluding for reduction. Fishmeal: 64-65% protein, Hamburg, Germany. Fish oil: any origin, N.W. Europe.

Source: OECD/FAO (2015), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

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Starting from very high levels, fish oil prices are expected to decline during 2015-24, but still remaining higher than fishmeal prices. In nominal terms, the average fish oil price is projected to decline at the same rate as fishmeal (by 9% and in real terms by 27%) between the 2012-14 base period and 2024.

In nominal terms, the price of traded fish products will remain rather stable, with a slight (4%) increase over the outlook period. In real terms it will decline by about 16% from the base period. As no major increases are expected to the already low or minimal import tariffs in the main importing developed countries, international fish trade is expected to remain relatively liberal and global price changes should continue to be readily transmitted from one market to another. In many developing countries, however, import tariffs and licenses can continue to play a significant role. Price changes in international markets will have spillover effects on non-traded species as well. For individual fishery commodities, price volatility could be more pronounced due to supply swings caused by drastic changes in catch quotas and disease outbreaks in the aquaculture sector.

## Production

The growth of fishery production will be stimulated by higher demand for fish and technological improvements. World fish production is projected to increase by 1.4% p.a., lower than the 2.2% p.a. of last decade. The absolute growth will be more than 30 Mt in 2024 compared to the average 2012-14 level. Almost all of the increase in production is expected to originate from developing countries, which will account for about 96% of the additional output. Their share in total production will increase from 82% in the base period to 85% in 2024. A marked expansion is expected in Asia, with its share in total production increasing from 70% to 72%. Of the additional 30 Mt output by 2024, 25 Mt will be produced in Asia, 2 Mt in Africa, 1.6 Mt in Latin America and the Caribbean, 1 Mt in Europe, and the rest in Oceania and North America. About 90% (172 Mt) of total fishery production (191 Mt), is estimated to be destined for direct human consumption.

Capture fishery production is projected to increase by 4% reaching about 95 Mt in 2024. This improvement is due to a combination of factors, including the recovery of certain species from progress in rebuilding fishery stocks and establishing robust management regimes by some countries; some growth of harvest in those few countries not subject to strict production quotas; declining oil prices and enhanced utilisation of fishery production through reduced discards, waste and losses as required by changes in legislation or stimulated by high fishery prices (including for fishmeal and fish oil). Capture production is not expected to increase very much at the beginning of the outlook period due the *El Niño* effect on South American captures set in the model in 2016 and also in 2021. In those two years, *El Niño* is expected to cause a 2% decline in world capture fisheries, with stronger effects on catches of anchoveta harvested by Peru and Chile.

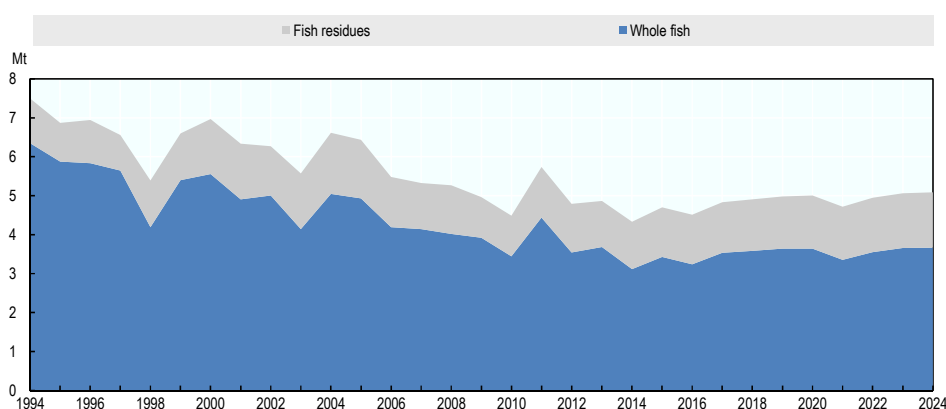
With the supply of wild-caught fish rather stable, future increase in world fish supply will be heavily dependent on aquaculture. Its total growth is estimated to be 26.4 Mtmore than the average 2012-14 level, reaching 96.4 Mt in 2024. Developing countries will continue to dominate aquaculture production, capturing about 95% of its additional output in the projection period. However, aquaculture production should continue to expand on all continents, with variations across countries and regions in the product range of species and products. Asian countries will remain the main producers, with a share of 89% of total production in 2024, with the People's Republic of China (hereafter "China") alone representing 62% of world output. Other major increases are expected in Latin America, in particular in Brazil (52% higher) due to significant investments in the sector. African production will also expand over the projected period by 36% (reaching 2.2 Mt) due partly to the additional capacity put in place in the last 14 years, but also in response to rising local demand from higher economic growth, and local policies promoting aquaculture.

The slowdown of the average annual growth rate of aquaculture production (from 5.6% p.a. in the last decade to 2.5% p.a. in the next one) will be mainly caused by constraints on natural resources, including availability and quality of water, competition

for optimal production locations from alternative uses, insufficient investments on infrastructure in regions endowed with natural resources for aquaculture production and, even if slightly declining, the still high costs of fishmeal, fish oil and other feeds. Aquaculture will have an increasing share of global fishery production, growing from 43.4% on average in 2012-14 to 50.4% in 2024.

The portion of capture fisheries used to produce fishmeal will be about 16% by 2024,<sup>3</sup> about 2% below the base period due to the growing demand for fish for human consumption. By 2024, the estimated fishmeal and fish oil production, in product weight, should reach 5.1 Mt and 1.1 Mt, respectively. In that year, fishmeal production (Figure 3.6.3) will be 9% higher compared to the 2012-14 average, but about 48% of the increase will be derived from improved use of fish waste, cuttings and trimmings. As more fish is consumed as fillets or in other prepared and preserved forms, a growing share of its residual production is expected to be reduced into fishmeal and fish oil. Fishmeal produced from fish waste will represent 28% of world fishmeal production in 2024, compared to 26% of the 2012-14 average level.

**Figure 3.6.3. Shares of fishmeal obtained from fish residues and from whole fish**



Source: OECD/FAO (2015), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

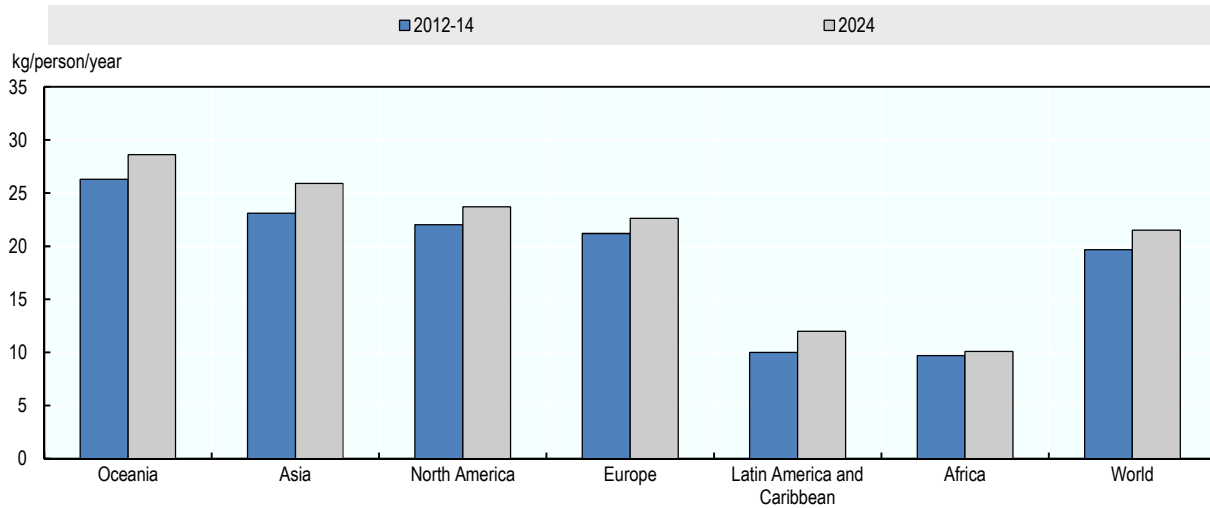
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## Consumption

World apparent<sup>4</sup> fish consumption is projected to increase by 31 Mt during next decade to reach 172 Mt in 2024. On a per capita basis, apparent fish consumption will be 21.5 kg live weight equivalent (lw), in 2024, 9% above the base period level. However, this represents a lower increase than in previous decades. The annual growth rate of the per capita apparent fish consumption is expected to decline from 1.7% p.a. in the last decade to 0.6% p.a. over the next ten years. Fish consumption will expand in all continents (Figure 3.6.4), with higher increases expected in Asia and Oceania. Growth in demand will stem mostly from consumers in developing countries, who are projected to eat 94% of the additional fish available for human consumption during the projected period. Their apparent per capita fish consumption will grow by 11% in 2024 relative to the base period. This outcome will be due to the combination of several factors affecting the intake of animal proteins at expense of other food, including rising living standards, population growth, rapid urbanisation, a growing recognition of fish as healthy and nutritious food, and technological development in food, processing, packaging and distribution. The ongoing improvements in preservation and storage will continue to be particularly important as, being highly perishable; fish need specific handling and preservation techniques. In spite of this additional growth, annual per capita apparent fish consumption in developing countries will remain lower than that of more developed

regions (21.1 kg lw compared with 23.2 kg lw in 2024), even though this gap will narrow over the next decade (it was 18.9 kg lw against 22.7 kg lw in the base period).

**Figure 3.6.4. Apparent per capita fish consumption by continent**



Source: OECD/FAO (2015), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

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Consumers in developed countries, with ageing populations and already high rates of per capita consumption, are projected to only slightly increase their per capita fish intake (2% higher in 2024 with respect to 2012-14 average). This limited expansion reflects, among other things, slowing population growth and dietary shifts that are already underway. Furthermore, consumers, in particular those in more developed economies are increasingly concerned by sustainability issues, animal welfare and food safety, which may also impact their consumption patterns, including for fishery products.

Notwithstanding the increased availability of fish to most consumers, the rise in fish consumption will not be homogenous among countries and within countries in terms of quantity and variety consumed. This heterogeneity reflects the different levels of availability of fish and other foods in different regions, including the accessibility of fishery resources in adjacent waters as well as the interaction of several socio-economic and cultural factors affecting demand, including food traditions, tastes, income levels, seasonality, prices, infrastructure and marketing. As the fisheries sector will remain one of the most globalised of all food sectors, consumers will also be exposed to and subject to the impacts of global trends as supply chains get longer, and growing urbanisation and improved distribution increase the range of products available.

Consumption of fishmeal and fish oil is characterised by the traditional competition between aquaculture and livestock for fishmeal, and between aquaculture and dietary supplements for direct human consumption for fish oil, but will be constrained by the rather stable production.

## Trade

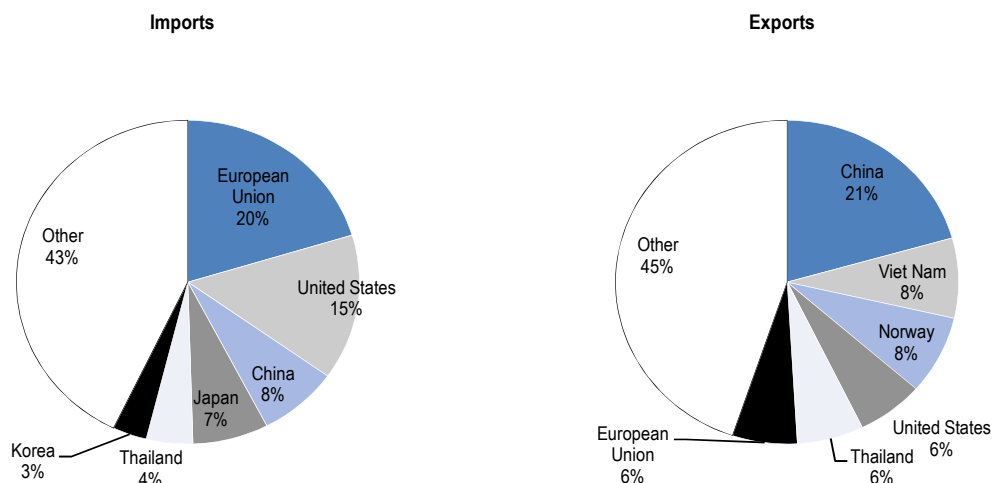
Fish and fishery products are and will continue to be among the most traded food commodities with about one third of production exported in 2024. Sustained demand, trade liberalisation policies, globalisation of food systems, improved logistics and technological innovations will further expand international fish trade, even if at a slower rate than in the previous decade. World exports of fish for human consumption are



projected to reach more than 45 Mt lw, representing an increase of 19% by 2024, which corresponds to more than 7 Mt. However, the annual growth rate of exports is expected to decline from 2.3% for the last decade to 1.7% over the next ten years. This is partly due to increasing prices, which will reduce consumption growth, high transportation costs and slower expansion of aquaculture production.

The fishery supply chain is complex as fish products often cross national boundaries several times before final consumption due to the increasing outsourcing of processing. Trade in fish and fishery products is characterised by a wide range of product types and participants. The role of fishery trade varies among countries and is important for many economies, in particular for developing nations, which are expected to remain the key suppliers to world markets, notwithstanding a slight decline of their share in total trade of fish for human consumption (from 66% in the base period to 65% in 2024). The bulk of the growth in fish exports is projected to originate largely from Asian countries, which will account for about 57% of the additional exports by 2024. In the same year, Asian countries are expected to slightly increase their share in world exports for human consumption from 50% to 51% as a result of further expansion of their aquaculture production. China, Viet Nam and Norway will be the world's largest fish exporters (Figure 3.6.5), growing, respectively, at 2.5% p.a, 3.5 p.a. and 2.2% p.a. over the outlook period. China will account for over 21% of world exports, and Viet Nam and Norway for 8% each.

**Figure 3.6.5. Trade of fish for human consumption in 2024**



Source: OECD/FAO (2015), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), <http://dx.doi.org/10.1787/agr-outl-data-en>.

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Developed countries will continue to be dependent on imports to satisfy their demand of fish and fishery products, due to their rather stable fishery production. However, their share in total imports of fish for human consumption is expected to slightly decline from 55% of the average 2012-14 level to 53% in 2024. The European Union, the United States and Japan will remain the leading importers. Developing countries will increase their imports of fish for human consumption. These will consist of supplies of raw material, which are then processed and subsequently re-exported and, growingly, of products destined to meet surging domestic consumption, in particular for species not produced locally.

Trade of fishmeal is projected to increase only slightly during the next decade, with an overall 4% growth by 2024, due to stagnating production. Peru and Chile are estimated



to remain the leading exporters of fishmeal, even if their combined share in total exports will decline from 47% to 41% over the outlook period. Asian countries, and in particular China, are projected to remain the main importers of fishmeal due to their sizeable aquaculture production. Fish oil exports will slightly decrease (-3%) by 2024. European countries will continue to be the main importers of fish oil (mainly for salmon production, but also for pharmaceutical purposes) with a share of 49% of world imports of fish oil.

### Issues and uncertainties

The fish projections reported in this chapter are based on specific assumptions regarding the future macroeconomic environment, international trade rules and tariffs, frequency and effects of *El Niño* phenomenon, absence of abnormal fish related disease outbreaks, fishery quotas, longer term productivity trends and the absence of market shocks. Should one of these assumptions change, the resulting fish projections would be affected.

Overall capture fisheries production is projected to remain rather stable. The effective prospects of capture fisheries are rather difficult to determine, because they depend on the natural productivity of fish stocks and ecosystems, and are subject to many variables and uncertainties, including effects of climate change, pollution, and ocean acidification that can create damage to habitats, ecological functions and biodiversity. According to the latest FAO estimates<sup>5</sup>, the percentage of stock groups monitored by FAO which are under fished is diminishing, reaching about 10%, while about 30% of the assessed stocks are estimated to be fished at a biologically unsustainable level. During the last few years, overall capture production has been rather stable, with exceptions in the years of the *El Niño*, with declining catches. Yet, a share of current harvest has also been obtained by fleets moving their operations from depleted areas to new areas, a practice which can cause a long term decline in global catches as overexploitation spreads. Furthermore, the overcapacity of fishing fleets globally and Illegal Unreported and unregulated (IUU) fishing are other important threats affecting the sustainability of fisheries resources. These situations are also linked with, and exacerbated by, the poor governance characterising several fisheries activities. At the same time, owing to better resource management practices, some fisheries and stocks are showing signs of recovery, which could help to maintain and stabilise overall capture fishery production through compensation between increases of catches in some fisheries and areas, and decreases in others. However, in order to obtain these results, effective fisheries management policies that maintain stocks and productivity from fisheries should be implemented.

In this respect, it is important to remember the role of the FAO Code of Conduct for Responsible Fisheries, which celebrates its 20<sup>th</sup> anniversary in 2015. In a non-mandatory manner, it establishes principles and standards applicable to the conservation, management and development of all fisheries. The Code, which was unanimously adopted on 31 October 1995 by the FAO Conference, provides a necessary framework for national and international efforts to ensure sustainable exploitation of aquatic living resources in harmony with the environment. Grounded on the principles of the Code and its associated guidelines, FAO has recently developed the “Blue Growth” initiative as a coherent approach for the sustainable, integrated and socio-economically sensitive management of oceans and wetlands focusing on four components: capture fisheries, aquaculture, ecosystem services, and livelihoods and food systems. To achieve its integrated approach to Blue Growth, FAO is collaborating with a wide array of other UN agencies, intergovernmental organisations and other initiatives or processes where synergies exist with the work of FAO.

The majority of future fish consumption is expected to be heavily dependent on aquaculture. However, the prospects of this sector depend on numerous interlinked factors, including access and availability to areas and water; availability, sustainability and cost of fishmeal and fish oil and of other alternative sources of feeding; availability of technology and finance; inadequate biosecurity measures and disease outbreaks; effects on biodiversity; environmental externalities including climate change, pollution and

problems that can originate from not guided, and monitored aquaculture practices; governance; food safety and traceability issues as well as concerns over the environmental, spatial or legal impacts. Future growth of aquaculture will also depend on how the sector will invest to enhance productivity in a sustainable manner through technological development and better management practices. Improvements in genetics, breeding and nutrition are particularly important as well as progress in developing substitutes for fishmeal and fish oil in feeds used to farm aquaculture species. In order to sustainably increase aquaculture production and value, aquaculture should improve its productivity and environmental performance, and address any social issues raised. Policies and instruments are required along three main axes to foster this growth: environmental sustainability, economic performance and distribution of benefits

Over the next decade, with aquaculture becoming a much larger share of total fish supply, the cyclical nature of certain aquaculture production and disease outbreaks could have a significant impact on price formation in the sector overall. This could lead to more volatility in the future. Furthermore, high feed prices could have an impact on the species composition of aquaculture output, towards those requiring less expensive feed or no purchased feed for their production.

The bulk of aquaculture production is concentrated in developing countries, in particular in Asia, while aquaculture production in some OECD members is relatively stagnant. This is partly due to a range of governance challenges, regulatory framework and the scarcity of suitable locations. Work is in progress to overcome some of these limitations through specific policies, such as the new Common Fisheries Policy (CFP) in the European Union. Fishery projections presented in this *Outlook for the European Union* do not take into consideration the effects that can be generated by the effective implementation of the new CFP, which could increase EU capture fisheries and aquaculture production during the next decade, as they are still difficult to be predicted. The CFP was first introduced in the 1970s and has gone through successive updates, the most recent of which took effect on 1 January 2014. It covers different aspects of the fisheries and aquaculture sector. For aquaculture, the European Commission intends to boost aquaculture through the CFP. The common priorities and general objectives are reported in the Strategic Guidelines published in 2013 which present common priorities and general objectives at European Union level. Four priority areas have been identified in consultation with all relevant stakeholders: reducing administrative burdens; improving access to space and water; increasing competitiveness; and, exploiting competitive advantages due to high quality, health and environmental standards. On the basis of the guidelines, the Commission and European Union countries will collaborate to help increasing the sector's production and competitiveness. European Union countries are asked to set up multiannual plans to promote aquaculture. The Commission will help with the coordination and exchange of best practices. In respect to capture fisheries, the CFP is a set of rules for managing European fishing fleets and for conserving fish stocks. This to ensure the European fishing industry is sustainable and does not threaten the fish population size and productivity over the long term. The current policy stipulates that between 2015 and 2020 catch limits should be set to be sustainable and maintain fish stocks in the long term.

The projections reported in the chapter are considered to be the baseline that prevails through to 2024, with aquaculture representing the main source of additional supply. However, as projections portray an important slowdown of the growth in aquaculture production in the next decade (at 2.5% p.a. from 5.6% p.a. for the previous one), an additional scenario was developed. This scenario focuses on more sustained increase of aquaculture relative to the baseline, but still below the previous decade. This different level of growth takes into account assumed technological improvements, expansion of cultivated area and intensification (in yield per unit of area or volume). However, achieving such production increases could be constrained by tighter regulations, scarcer and more stressed land and water resources, and feed supply problems. In this scenario, capture fisheries are expected to maintain the same growth pattern as in the baseline. The increase in aquaculture production is assumed to be homogeneously distributed among countries.

With this alternative scenario, total fish production is estimated to reach 204 Mt in 2024, with an overall growth of 27% relative to 2012-14. In the same period, aquaculture production will increase by 40 Mt (or 57%), reaching 110 Mt, with a growth of 3.9% per year. In 2024, 54% of fish produced will originate from aquaculture. The increase in production will affect prices. In contrast with the baseline results, the average prices of capture and aquaculture and traded products are projected to decline by, respectively, 4%, 29% and 28%, in nominal terms, during the outlook period. With more sustained aquaculture expansion, more pressure is expected on fishmeal and particularly on fish oil. The average fishmeal price will be higher compared to the baseline and declining by only 2% during the outlook period respect to the 9% decline in the baseline. In contrast with the baseline, the average price for fish oil will increase by 13%, due to demand higher than supply. Further growth in production will foster consumption of fish and fishery products of an extra 3.4 kg per capita relative to the base period, to reach 23.0 kg. Developing countries will capture 93% of this additional global consumption over the projection period. In 2024, farmed fish products will represent 59% of the fish consumed.

### Notes

1. The terms “fish and seafood” or simply “fish” indicate fish, crustaceans, molluscs and other aquatic invertebrates but excludes aquatic mammals and aquatic plants.
2. Set in the model in 2016 and 2021.
3. That share will be lower in years of *El Niño* (set in 2016 and 2021) due to reduced catches of anchoveta.
4. The term “apparent” refers to the average food available for consumption, which, for a number of reasons (for example, waste at the household level), is not equal to average food intake or average food consumption.
5. FAO (2014), *The State of World Fisheries and Aquaculture 2014*, FAO Publications, Rome.

Table 3.A1.7. World fish and seafood projections

Calendar year

		Average 2012-14est	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
<b>FISH</b>												
<b>World</b>												
Production	kt	161 180	168 792	169 486	174 471	177 582	180 775	182 833	182 831	186 256	189 130	191 348
of which aquaculture	kt	69 942	76 945	79 113	82 124	84 843	87 544	89 352	90 869	92 648	94 618	96 395
Consumption	kt	160 982	168 779	169 473	174 458	177 569	180 762	182 820	182 818	186 243	189 117	191 335
of which for food	kt	140 807	149 520	151 142	155 028	158 031	161 124	163 298	164 577	167 327	169 905	172 199
of which for reduction	kt	14 998	14 774	13 911	15 075	15 248	15 413	15 362	14 147	14 886	15 247	15 236
Price												
Aquaculture <sup>1</sup>	USD/t	2 132.1	2 183.9	2 187.2	2 075.6	2 015.4	2 007.4	2 041.0	2 158.4	2 174.5	2 188.3	2 215.3
Capture <sup>2</sup>	USD/t	1 525.2	1 528.7	1 564.4	1 535.5	1 521.2	1 537.2	1 566.2	1 621.5	1 644.4	1 666.9	1 693.5
Product traded <sup>3</sup>	USD/t	2 913.9	2 983.5	2 992.1	2 843.3	2 760.9	2 749.9	2 795.9	2 956.7	2 978.7	2 997.6	3 034.6
<b>Developed countries</b>												
Production	kt	28 472	28 780	28 884	29 095	29 202	29 367	29 492	29 552	29 641	29 729	29 821
of which aquaculture	kt	4 310	4 439	4 574	4 762	4 968	5 175	5 333	5 440	5 560	5 659	5 762
Consumption	kt	36 665	36 921	36 372	36 770	36 855	37 010	37 093	37 073	37 247	37 519	37 696
of which for food	kt	31 634	32 231	31 692	32 140	32 276	32 494	32 636	32 635	32 894	33 203	33 417
of which for reduction	kt	4 221	4 073	4 062	4 013	3 960	3 898	3 839	3 820	3 735	3 698	3 660
<b>Developing countries</b>												
Production	kt	132 707	140 012	140 601	145 376	148 380	151 408	153 341	153 279	156 615	159 401	161 527
of which aquaculture	kt	65 632	72 505	74 540	77 362	79 875	82 369	84 019	85 429	87 088	88 958	90 632
Consumption	kt	124 317	131 858	133 101	137 688	140 715	143 753	145 728	145 745	148 996	151 599	153 639
of which for food	kt	109 173	117 290	119 450	122 888	125 755	128 630	130 662	131 942	134 433	136 702	138 782
of which for reduction	kt	10 777	10 701	9 849	11 062	11 288	11 515	11 524	10 326	11 151	11 550	11 576
<b>OECD</b>												
Production	kt	30 829	31 302	31 144	31 571	31 771	32 061	32 277	32 183	32 526	32 642	32 766
of which aquaculture	kt	5 962	6 184	6 385	6 644	6 906	7 196	7 434	7 615	7 766	7 918	8 061
Consumption	kt	38 509	39 057	38 492	38 993	39 167	39 432	39 613	39 571	39 950	40 321	40 596
of which for food	kt	31 656	32 568	32 185	32 702	32 909	33 210	33 446	33 529	33 905	34 329	34 655
of which for reduction	kt	6 097	5 961	5 779	5 763	5 729	5 695	5 639	5 514	5 516	5 464	5 413
<b>FISHMEAL</b>												
<b>World</b>												
Production	kt	4 666.3	4 701.3	4 518.7	4 840.2	4 913.2	4 986.3	5 009.3	4 728.6	4 950.5	5 072.2	5 100.4
from whole fish	kt	3 446.2	3 433.0	3 239.1	3 535.8	3 592.0	3 646.3	3 647.7	3 359.1	3 556.9	3 661.9	3 673.0
Consumption	kt	4 872.8	4 782.4	4 573.8	4 600.9	4 863.0	4 936.0	5 067.8	4 971.4	4 693.7	5 045.9	5 074.1
Variation in stocks	kt	-206.5	-81.1	-55.1	239.3	50.2	50.3	-58.6	-242.8	256.8	26.4	26.3
Price <sup>4</sup>	USD/t	1 674.3	1 574.5	1 547.9	1 296.7	1 323.1	1 370.7	1 387.1	1 565.4	1 459.2	1 487.5	1 520.3
<b>Developed countries</b>												
Production	kt	1 316.5	1 377.3	1 394.5	1 397.0	1 395.9	1 398.2	1 398.7	1 405.2	1 399.0	1 402.7	1 406.5
from whole fish	kt	977.3	978.0	979.3	971.5	962.5	951.0	940.1	939.3	921.9	916.2	910.3
Consumption	kt	1 689.2	1 502.1	1 411.8	1 422.3	1 474.6	1 453.7	1 457.7	1 385.6	1 288.0	1 377.8	1 381.1
Variation in stocks	kt	11.7	-42.4	-6.1	24.3	0.2	0.3	-28.6	19.2	14.8	1.4	1.3
<b>Developing countries</b>												
Production	kt	3 349.8	3 324.0	3 124.2	3 443.2	3 517.3	3 588.1	3 610.6	3 323.5	3 551.5	3 669.5	3 693.9
from whole fish	kt	2 469.0	2 455.0	2 259.9	2 564.3	2 629.4	2 695.3	2 707.5	2 419.8	2 635.1	2 745.7	2 762.7
Consumption	kt	3 183.6	3 280.3	3 162.0	3 178.6	3 388.5	3 482.3	3 610.1	3 585.8	3 405.7	3 668.0	3 693.0
Variation in stocks	kt	-218.2	-38.7	-49.0	215.0	50.0	50.0	-30.0	-262.0	242.0	25.0	25.0
<b>OECD</b>												
Production	kt	1 684.8	1 760.4	1 737.0	1 745.8	1 748.7	1 757.2	1 758.0	1 739.8	1 754.0	1 754.4	1 755.1
from whole fish	kt	1 327.1	1 351.9	1 312.6	1 311.0	1 306.1	1 300.8	1 290.2	1 264.7	1 267.7	1 258.6	1 249.8
Consumption	kt	1 913.6	1 735.2	1 628.8	1 662.7	1 728.8	1 720.4	1 736.7	1 650.6	1 542.2	1 660.9	1 672.6
Variation in stocks	kt	-30.1	-53.1	-18.1	34.3	0.2	0.3	-28.6	8.2	25.8	1.4	1.3


StatLink  <http://dx.doi.org/10.1787/888933229811>

Table 3.A1.7. **World fish and seafood projections (cont)**

Calendar year


		Average 2012-14est	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
<b>FISH OIL</b>												
<b>World</b>												
Production	kt	951.7	1 021.3	974.2	1 036.3	1 048.3	1 063.2	1 065.3	1 006.7	1 049.0	1 071.1	1 074.3
from whole fish	kt	575.3	600.4	552.3	610.5	618.4	625.9	622.5	559.7	597.2	614.4	612.7
Consumption	kt	996.3	1 039.9	1 029.9	942.0	1 049.2	1 064.0	1 066.0	1 102.5	954.2	1 071.6	1 074.8
Variation in stocks	kt	-44.6	-18.7	-55.6	94.3	-0.9	-0.8	-0.7	-95.8	94.8	-0.5	-0.5
Price <sup>5</sup>	USD/t	1 951.3	1 731.1	1 661.1	1 571.5	1 575.9	1 608.8	1 639.0	1 823.1	1 700.1	1 727.0	1 754.5
<b>Developed countries</b>												
Production	kt	418.7	460.0	459.0	458.9	461.0	465.8	468.4	471.6	472.1	474.9	477.8
from whole fish	kt	173.8	181.1	179.3	175.6	173.7	171.4	168.8	168.1	164.1	162.3	160.5
Consumption	kt	596.4	661.9	654.5	565.6	630.6	631.1	624.6	660.2	535.1	604.5	599.5
Variation in stocks	kt	11.1	-9.7	-23.6	22.3	-0.9	-0.8	-0.7	-23.8	22.8	-0.5	-0.5
<b>Developing countries</b>												
Production	kt	533.0	561.3	515.3	577.4	587.4	597.5	596.9	535.1	576.9	596.1	596.5
from whole fish	kt	401.5	419.3	373.0	434.9	444.7	454.5	453.6	391.6	433.2	452.1	452.2
Consumption	kt	399.9	378.0	375.3	376.4	418.6	432.9	441.3	442.4	419.1	467.1	475.2
Variation in stocks	kt	-55.7	-9.0	-32.0	72.0	0.0	0.0	0.0	-72.0	72.0	0.0	0.0
<b>OECD</b>												
Production	kt	554.7	614.9	606.1	608.6	610.4	615.3	617.4	614.9	619.5	621.4	623.4
from whole fish	kt	268.7	286.4	276.5	275.3	273.0	270.6	267.2	260.5	260.4	257.5	254.7
Consumption	kt	747.4	806.1	792.4	702.0	783.4	786.6	781.0	810.3	674.8	760.1	753.8
Variation in stocks	kt	10.7	-23.5	-30.6	29.3	-0.9	-0.8	-0.7	-30.8	29.8	-0.5	-0.5

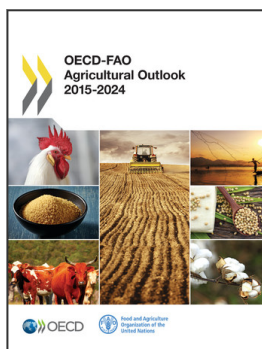
Note: The term "fish" indicates fish, crustaceans, molluscs and other aquatic animals, but excludes aquatic mammals, crocodiles, caimans, alligators and aquatic plants.

Average 2012-14est: Data for 2014 are estimated.

1. World unit value of aquaculture fisheries production (live weight basis).
2. FAO estimated value of world ex vessel value of capture fisheries production excluding for reduction.
3. World unit value of trade (sum of exports and imports).
4. Fishmeal, 64-65% protein, Hamburg, Germany.
5. Fish oil, any origin, N.W. Europe.

Source: OECD/FAO (2015), "OECD-FAO Agricultural Outlook", OECD Agriculture Statistics (database). doi: <http://dx.doi.org/10.1787/agr-outl-data-en>

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