



Food and Agriculture
Organization of the
United Nations

2018

IN BRIEF

THE STATE OF
**WORLD FISHERIES
AND AQUACULTURE**

**MEETING THE SUSTAINABLE
DEVELOPMENT GOALS**

CONTENTS

This booklet contains the main points of the publication *The State of World Fisheries and Aquaculture 2018*. The numbering of the tables and figures corresponds to this publication.

FOREWORD

PART 1 WORLD REVIEW

- ▶ Figure 1
- 1. Capture fisheries production
 - ▶ Table 1
- 2. Aquaculture production
 - ▶ Figure 5
- 3. Fishers and fish farmers
 - ▶ Table 11
- 4. The fishing fleet
- 5. The status of fishery resources
 - ▶ Figure 14
- 6. Fish utilization and processing
- 7. Fish trade and commodities
 - ▶ Figure 21
- 8. Fish consumption
 - ▶ Figure 29
 - ▶ Figure 2
- 9. Governance and policy
 - ▶ Figure 32


4	PART 2 FAO FISHERIES AND AQUACULTURE IN ACTION	19
7	Combatting illegal, unreported	
7	and unregulated fishing: global developments	19
8	Implementation of the Port State Measures Agreement	20
8	Global Record of Fishing Vessels, Refrigerated Transport Vessels	20
9	Catch documentation schemes	20
9		
10	PART 3 HIGHLIGHTS OF ONGOING STUDIES	21
11	Climate change impacts and responses	21
11	Assessing climate change impacts for fisheries and aquaculture	21
12	▶ Figure 39	22
12	Adaptation concepts and tools	23
13	Guiding countries on the integration of fisheries and aquaculture in National Adaptation Plans	23
13		
14		
15	PART 4 OUTLOOK AND EMERGING ISSUES	24
16	Projections of fisheries, aquaculture and markets	24
17	Baseline projections	24
17	▶ Figure 50	25
18	Summary of main outcomes from the projections	26

FOREWORD

Human societies face the enormous challenge of having to provide food and livelihoods to a population well in excess of 9 billion people by the middle of the twenty-first century, while addressing the disproportionate impacts of climate change and environmental degradation on the resource base. The United Nations' 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs) offer a unique, transformative and integrative approach to shift the world on to a sustainable and resilient path that leaves no one behind.

Food and agriculture are key to achieving the entire set of SDGs, and many SDGs are directly relevant to fisheries and aquaculture, in particular SDG 14 (Conserve and sustainably use the oceans, seas and marine resources for sustainable development). Galvanized by public and political attention, in June 2017 the United Nations convened a high-level Ocean Conference in New York to support the implementation of SDG 14. This event was shortly followed by the appointment of Peter Thomson of Fiji as the UN Secretary-General's Special Envoy for the Ocean and the launch of the Communities of Ocean Action, an initiative to track and build on the over 1 400 voluntary commitments registered and announced at the Ocean Conference.

The global momentum on SDG implementation has framed much of the international discourse since the publication of the 2016 edition of *The State of World Fisheries and Aquaculture*. I would particularly highlight the specific SDG 14 target of ending illegal, unreported and unregulated (IUU) fishing by 2020. On 5 June 2016, the Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (PSMA) entered into force. The first operational version of the Global Record of Fishing Vessels, Refrigerated Transport Vessels and Supply Vessels (Global Record), a phased and collaborative global initiative to make available certified vessel data from State authorities, was launched in 2017. The FAO Voluntary Guidelines on Catch Documentation Schemes for wild-captured fish caught for commercial purposes was



approved in July 2017, while the FAO Guidelines for the Marking of Fishing Gear to assist in the prevention of abandoned, lost or otherwise discarded fishing gear and its harmful impacts will be tabled for approval at the 2018 session of the FAO Committee on Fisheries. The successful implementation of PSMA, the Global Record and these voluntary guidelines will mark a turning point in the fight against IUU fishing and in favour of the long-term conservation and sustainable use of living marine resources.

The Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC), which came into force on 4 November 2016, has also become omnipresent in the international discourse on oceans. The agreement, which aims at keeping the global temperature rise this century well below 2 °C above pre-industrial levels, recognizes the fundamental priority of safeguarding food security and ending hunger. As co-leader of the UNFCCC Oceans Action Agenda, and in support of the Koronivia Joint Work on Agriculture launched at the twenty-third Conference of the Parties to UNFCCC (COP 23), FAO has elevated recognition of the essential role of fisheries and aquaculture for food security and nutrition in the context of climate change, especially in the developing world.

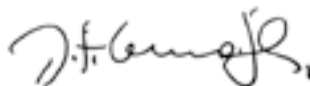
The State of World Fisheries and Aquaculture 2018 highlights the critical importance of fisheries and aquaculture for the food, nutrition and employment of millions of people, many of whom struggle to maintain reasonable livelihoods. Total fish production in 2016 reached an all-time high of 171 million tonnes, of which 88 percent was utilized for direct human consumption, thanks to relatively stable capture fisheries production, reduced wastage and continued aquaculture growth. This production resulted in a record-high per capita consumption of 20.3 kg in 2016. Since 1961 the annual global growth in fish consumption has been twice as high as population growth, demonstrating that the fisheries sector is crucial in meeting FAO's goal of a world without hunger and malnutrition. While annual growth of aquaculture has declined in recent years, significant double-digit growth is still recorded in some countries, particularly in Africa and Asia. The sector's contribution to economic growth and the fight against poverty is

growing. Strengthened demand and higher prices increased the value of global fish exports in 2017 to USD 152 billion, 54 percent originating from developing countries.

The fisheries and aquaculture sector is not without challenges, however, including the need to reduce the percentage of fish stocks fished beyond biological sustainability, currently 33.1 percent; to ensure that biosecurity and animal disease challenges are tackled successfully; and to maintain complete and accurate national statistics in support of policy development and implementation. These and other challenges engendered FAO's Blue Growth Initiative, an innovative, integrated and multisectoral approach to the management of aquatic resources aimed at maximizing the ecosystem goods and services obtained from the use of oceans, inland waters and wetlands, while also providing social and economic benefits.

The State of World Fisheries and Aquaculture is the only publication of its kind, providing technical insight and factual information on a sector increasingly recognized as crucial for societal success. In addition to reporting major trends and patterns observed in global fisheries and aquaculture, this edition scans the horizon for new and upcoming areas that need to be considered if we are to manage aquatic resources sustainably into the future, including cooperation through regional fisheries bodies and advances such as blockchain technology, to ensure that in delivering the SDGs we tackle the root causes of poverty and hunger while building a fairer society that leaves no one behind.

Previous editions have been accessed on the Internet well over 1 500 times a day. I hope this edition will have the same quantitative and qualitative impact, making a valuable contribution to help meet the challenges of the twenty-first century.



José Graziano da Silva
FAO Director-General

PART 1 WORLD REVIEW

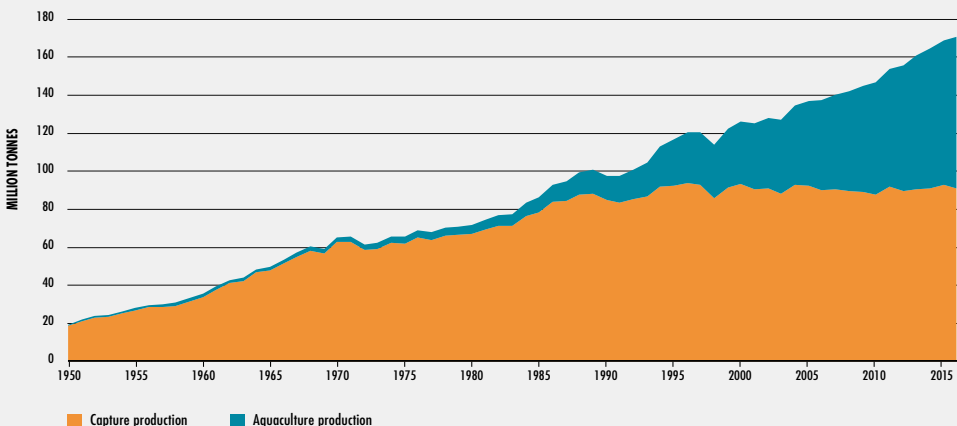
The world review in Part 1 of *The State of World Fisheries and Aquaculture 2018* presents FAO's official world fishery and aquaculture statistics.

Global fish production¹ peaked at about 171 million tonnes in 2016, with

aquaculture representing 47 percent of the total and 53 percent if non-food uses (including reduction to fishmeal and fish oil) are excluded. With capture fishery production relatively static since the late 1980s, aquaculture has been responsible for the continuing impressive growth in the supply of fish for human consumption.

¹ Unless otherwise specified, throughout this publication, the term "fish" indicates fish, crustaceans, molluscs and other aquatic animals, but excludes aquatic mammals, crocodiles, caimans, seaweeds and other aquatic plants.

FIGURE 1
WORLD CAPTURE FISHERIES AND AQUACULTURE PRODUCTION



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

1. CAPTURE FISHERIES PRODUCTION

Global total capture fisheries production, as derived from the FAO capture database, was 90.9 million tonnes in 2016, a small decrease in comparison to the two previous years. World total marine catch was 81.2 million tonnes in 2015 and 79.3 million tonnes in 2016. Catches of anchoveta (*Engraulis ringens*) by Peru and Chile, which are often substantial yet highly variable because of the influence of El Niño, accounted for 1.1 million tonnes of this decrease (Tables 2 and 3). Decreasing catches affected 64 percent of the 25 top producer countries, but only 37 percent of the remaining 170 countries

Total marine catches by China, by far the world's top producer, were stable in 2016, but the inclusion of a progressive catch reduction policy in the national Thirteenth Five-Year Plan for 2016–2020 is expected to result in significant decreases in coming years, with a predicted reduction of more than 5 million tonnes by 2020.

As in 2014, Alaska pollock (*Theragra chalcogramma*) again surpassed anchoveta as the top species in 2016, with the highest catches since 1998. However, preliminary data for 2017 showed a significant recovery of anchoveta catches. Skipjack tuna (*Katsuwonus pelamis*) ranked third for the seventh consecutive year. All the most valuable species groups with significant production – lobsters, gastropods, crabs and shrimps, with an estimated average

TABLE 1
WORLD FISHERIES AND AQUACULTURE PRODUCTION AND UTILIZATION (MILLION TONNES)^a

Category	2011	2012	2013	2014	2015	2016
Production						
Capture						
Inland	10.7	11.2	11.2	11.3	11.4	11.6
Marine	81.5	78.4	79.4	79.9	81.2	79.3
Total capture	92.2	89.5	90.6	91.2	92.7	90.9
Aquaculture						
Inland	38.6	42.0	44.8	46.9	48.6	51.4
Marine	23.2	24.4	25.4	26.8	27.5	28.7
Total aquaculture	61.8	66.4	70.2	73.7	76.1	80.0
Total world fisheries and aquaculture	154.0	156.0	160.7	164.9	168.7	170.9
Utilization^b						
Human consumption	130.0	136.4	140.1	144.8	148.4	151.2
Non-food uses	24.0	19.6	20.6	20.0	20.3	19.7
Population (billions) ^c	7.0	7.1	7.2	7.3	7.3	7.4
Per capita apparent consumption (kg)	18.5	19.2	19.5	19.9	20.2	20.3

^a Excludes aquatic mammals, crocodiles, alligators and caimans, seaweeds and other aquatic plants.

^b Utilization data for 2014–2016 are provisional estimates.

^c Source of population figures: UN, 2015e.

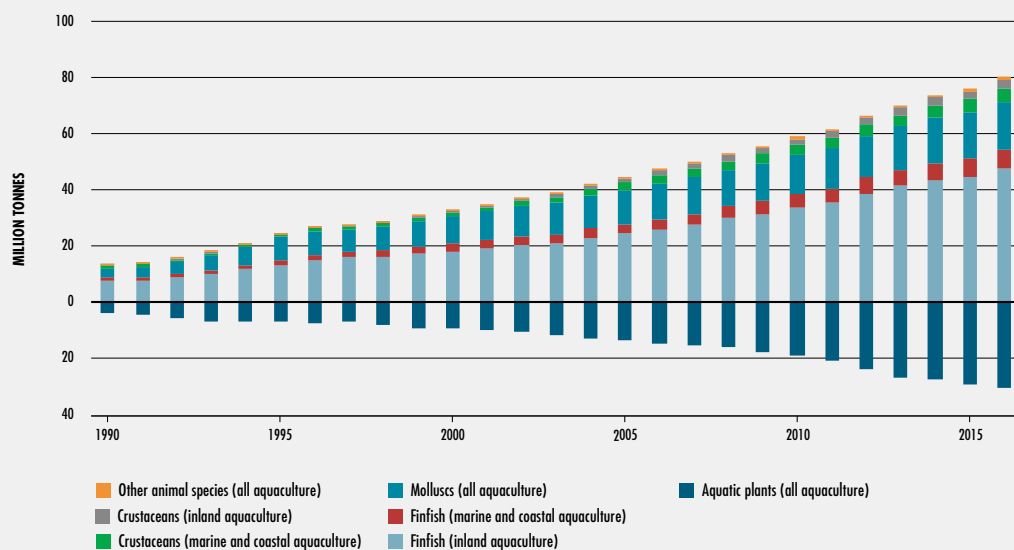
value by group of USD 8 800 to USD 3 800 per tonne – marked a new catch record in 2016.

Total global catch in inland waters was 11.6 million tonnes in 2016, an increase of 2.0 percent over the previous year and of 10.5 percent in comparison to the 2005–2014 average. In 2016, 16 countries, mostly in Asia, produced almost 80 percent of these catches. The continuously increasing trend of inland fisheries production may be misleading, however, as some of the increase can be attributed to improved reporting and assessment at the country level and may not be entirely due to increased production.

2. AQUACULTURE PRODUCTION

Global aquaculture production (including aquatic plants) in 2016 was 110.2 million tonnes, with the first-sale value estimated at USD 243.5 billion. The first-sale value, re-estimated with newly available information for some major producing countries, is considerably higher than previous estimates. The total production included 80.0 million tonnes of food fish (USD 231.6 billion) and 30.1 million tonnes of aquatic plants (USD 11.7 billion) as well as 37 900 tonnes of non-food products (USD 214.6 million).

FIGURE 5
WORLD AQUACULTURE PRODUCTION OF FOOD FISH AND AQUATIC PLANTS,
1990–2016



The contribution of aquaculture to the global production of capture fisheries and aquaculture combined has risen continuously, reaching 46.8 percent in 2016, up from 25.7 percent in 2000. With 5.8 percent annual growth rate during the period 2001–2016, aquaculture continues to grow faster than other major food production sectors, but it no longer enjoys the high annual growth rates experienced in the 1980s and 1990s. Also, the disparity in the level of sectoral development and uneven production distribution remain great among the countries within the regions and across the world.

The growth of farming of fed aquatic animal species has outpaced the farming of unfed species in world aquaculture. The share of unfed species in total aquatic animal production decreased gradually from 2000 to 2016, shrinking by 10 percentage points to 30.5 percent.

In 2016, aquaculture was the source of 96.5 percent by volume of the total 31.2 million tonnes of wild-collected and cultivated aquatic plants combined. Global production of farmed aquatic plants, overwhelmingly dominated by seaweeds, grew in output volume from 13.5 million tonnes in 1995 to just over 30 million tonnes in 2016.

3. FISHERS AND FISH FARMERS

The most recent official statistics indicate that 59.6 million people were engaged in the primary sector of capture fisheries and aquaculture in 2016, with 19.3 million

people engaged in aquaculture and 40.3 million people engaged in fisheries. The proportion of those employed in capture fisheries decreased from 83 percent in 1990 to 68 percent in 2016, while the proportion of those employed in aquaculture correspondingly increased from 17 to 32 percent.

In 2016, 85 percent of the global population engaged in the fisheries and aquaculture sectors was in Asia, followed by Africa (10 percent) and Latin America and the Caribbean (4 percent). The trends in the number of people engaged in the fisheries and aquaculture primary sectors vary by region. Europe and North America have experienced the largest proportional decreases in the number of people engaged in both sectors, with particular decreases in capture fishing. In contrast, Africa and Asia, with higher population growth and increasing economically active populations in the agriculture sector, have shown a generally positive trend for the number of people engaged in capture fishing and even higher rates of increase in those engaged in aquaculture.

It is estimated that in 2016, overall, women accounted for nearly 14 percent of all people directly engaged in the fisheries and aquaculture primary sector, as compared with an average of 15.2 percent across the reporting period 2009–2016. The decrease could be partially ascribed to decreased sex-disaggregated reporting.

TABLE 11
WORLD EMPLOYMENT FOR FISHERS AND FISH FARMERS BY REGION (thousands)

Region	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
Fisheries and aquaculture										
Africa	2 392	4 175	4 430	5 027	5 250	5 885	6 009	5 674	5 992	5 671
Asia	31 296	39 646	43 926	49 345	48 926	49 040	47 662	47 730	50 606	50 468
Europe	530	779	705	662	656	647	240	394	455	445
Latin America and the Caribbean	1 503	1 774	1 907	2 185	2 231	2 251	2 433	2 444	2 482	2 466
North America	382	346	329	324	324	323	325	325	220	218
Oceania	121	126	122	124	128	127	47	46	343	342
Total	36 223	46 845	51 418	57 667	57 514	58 272	56 716	56 612	60 098	59 609
Fisheries										
Africa	2 327	4 084	4 290	4 796	4 993	5 587	5 742	5 413	5 687	5 367
Asia	23 534	27 435	29 296	31 430	29 923	30 865	29 574	30 190	32 078	31 990
Europe	474	676	614	560	553	544	163	328	367	354
Latin America and the Caribbean	1 348	1 560	1 668	1 937	1 966	1 982	2 085	2 092	2 104	2 085
North America	376	340	319	315	315	314	316	316	211	209
Oceania	117	121	117	119	122	121	42	40	334	334
Total fishers	28 176	34 216	36 304	39 157	37 872	39 411	37 922	38 379	40 781	40 339
Aquaculture										
Africa	65	91	140	231	257	298	267	261	305	304
Asia	7 762	12 211	14 630	17 915	18 373	18 175	18 088	17 540	18 528	18 478
Europe	56	103	91	102	103	103	77	66	88	91
Latin America and the Caribbean	155	214	239	248	265	269	348	352	378	381
North America	6	6	10	9	9	9	9	9	9	9
Oceania	4	5	5	5	6	6	5	6	9	8
Total fish farmers	8 049	12 632	15 115	18 512	19 015	18 861	18 794	18 235	19 316	19 271

4. THE FISHING FLEET

The total number of fishing vessels in the world in 2016 was estimated to be about 4.6 million, unchanged from 2014. The fleet in Asia was the largest, consisting of 3.5 million vessels, accounting for 75 percent of the global fleet. In Africa and North

America the estimated number of vessels declined from 2014 by just over 30 000 and by nearly 5 000, respectively. For Asia, Latin America and the Caribbean and Oceania the numbers all increased, largely as a result of improvements in estimation procedures.

Globally, the number of engine-powered vessels was estimated to be 2.8 million in 2016, remaining steady from 2014. Motorized vessels represented 61 percent of all fishing vessels in 2016, down from 64 percent in 2014, as the number of non-motorized vessels increased, probably because of improved estimations.

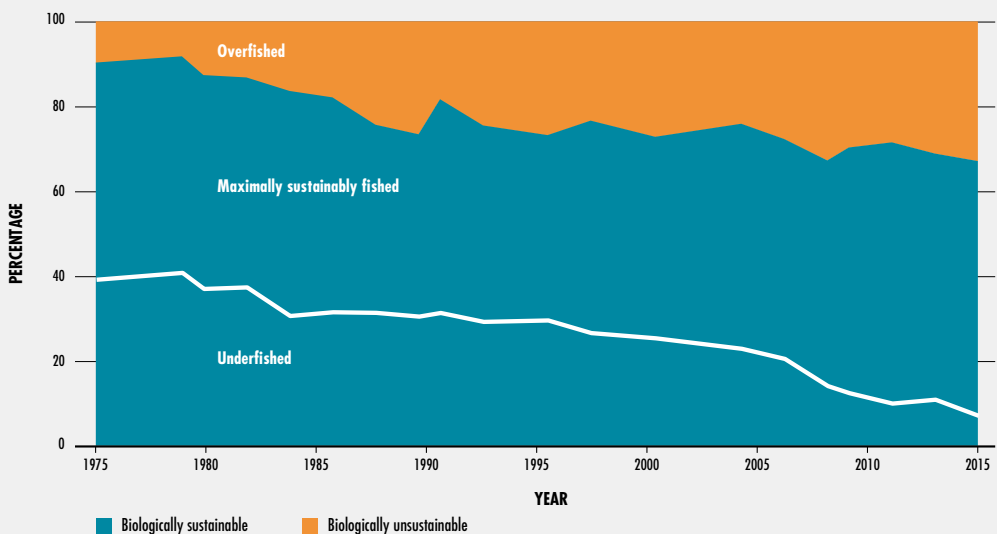
In 2016, about 86 percent of the motorized fishing vessels in the world were in the length overall (LOA) class of less than 12 m, the vast majority of which were undecked, and those small vessels dominated in all regions. Conversely, the largest vessels, classified as those with LOA greater than 24 m made up about 2 percent of the total fleet.

5. THE STATUS OF FISHERY RESOURCES

The fraction of fish stocks that are within biologically sustainable levels has exhibited a decreasing trend, from 90.0 percent in 1974 to 66.9 percent in 2015. In contrast, the percentage of stocks fished at biologically unsustainable levels increased from 10 percent in 1974 to 33.1 percent in 2015, with the largest increases in the late 1970s and 1980s.

In 2015, maximally sustainably fished stocks (formerly termed fully fished stocks) accounted for 59.9 percent and underfished stocks for 7.0 percent of the total assessed stocks. While the proportion of underfished stocks decreased

FIGURE 14
GLOBAL TRENDS IN THE STATE OF THE WORLD'S MARINE FISH STOCKS, 1974–2015



continuously from 1974 to 2015, the maximally sustainably fished stocks decreased from 1974 to 1989, and then increased to 59.9 percent in 2015.

In 2015, among the 16 major statistical areas, the Mediterranean and Black Sea (Area 37) had the highest percentage (62.2 percent) of unsustainable stocks, closely followed by the Southeast Pacific 61.5 percent (Area 87) and Southwest Atlantic 58.8 percent (Area 41). In contrast, the Eastern Central Pacific (Area 77), Northeast Pacific (Area 67), Northwest Pacific (Area 61), Western Central Pacific (Area 71) and Southwest Pacific (Area 81) had the lowest proportion (13 to 17 percent) of fish stocks at biologically unsustainable levels.

6. FISH UTILIZATION AND PROCESSING

In 2016, of the 171 million tonnes of total fish production, about 88 percent or over 151 million tonnes were utilized for direct human consumption. This share has increased significantly in recent decades, as it was 67 percent in the 1960s.

In 2016, the greatest part of the 12 percent used for non-food purposes (about 20 million tonnes) was reduced to fishmeal and fish oil (74 percent or 15 million tonnes), while the rest (5 million tonnes) was largely utilized as material for direct feeding in aquaculture and raising of livestock and fur animals, in culture (e.g. fry, fingerlings or small adults for ongrowing), as bait, in pharmaceutical uses and for ornamental purposes.

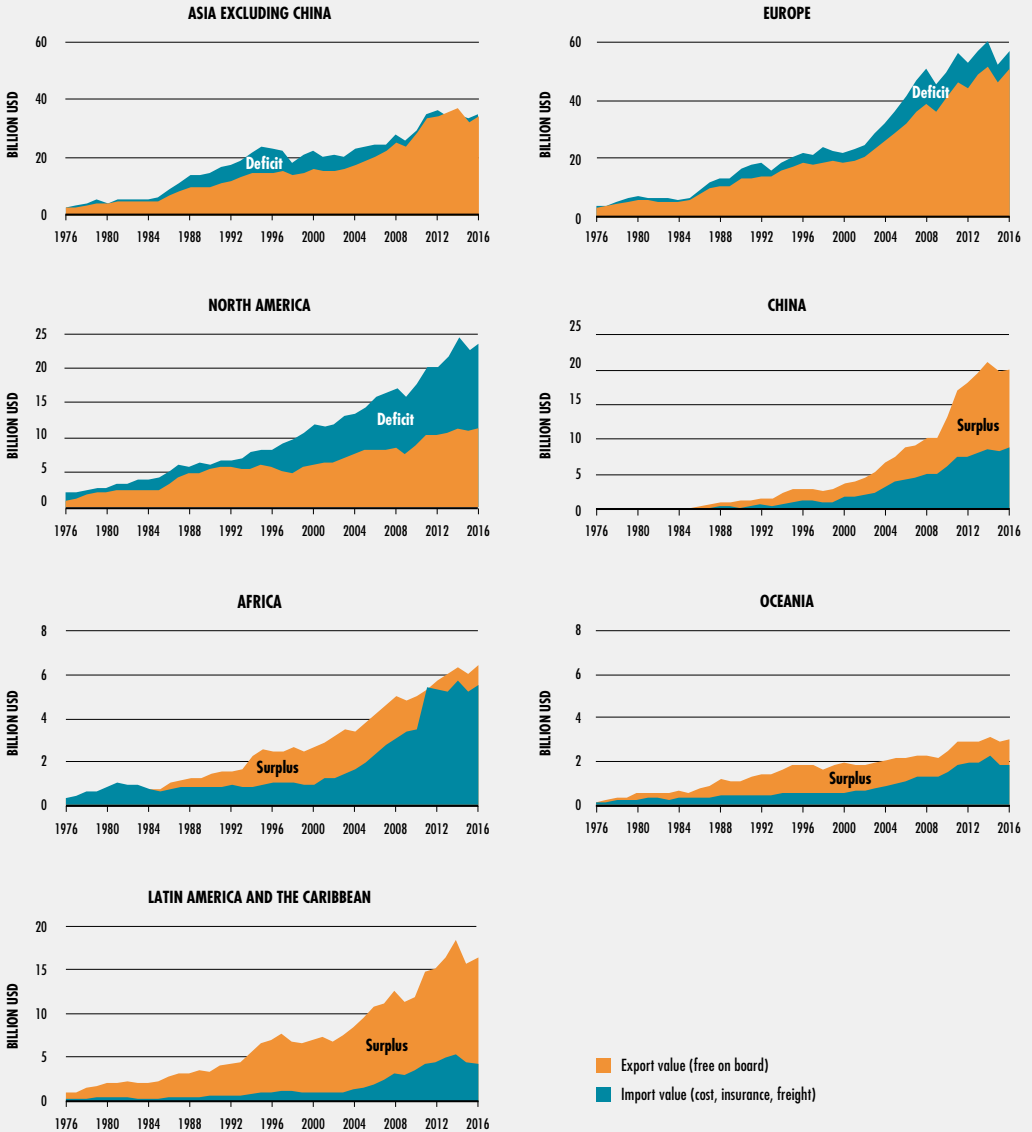
Live, fresh or chilled is often the most preferred and highly priced form of fish and represents the largest share of fish for direct human consumption, 45 percent in 2016, followed by frozen (31 percent), prepared and preserved (12 percent) and cured (dried, salted, in brine, fermented smoked) (12 percent). Freezing represents the main method of processing fish for human consumption; it accounted for 56 percent of total processed fish for human consumption and 27 percent of total fish production in 2016.

Major improvements in processing as well as in refrigeration, ice-making and transportation have allowed increasing commercialization and distribution of fish in a greater variety of product forms in the past few decades. However, developing countries still mainly use fish in live or fresh form (53 percent of the fish destined for human consumption in 2016), soon after landing or harvesting from aquaculture. Loss or wastage between landing and consumption decreased, but still accounts for an estimated 27 percent of landed fish.

7. FISH TRADE AND COMMODITIES

Fish and fish products are some of the most traded food items in the world today, and most of the world's countries report some fish trade. **In 2016, about 35 percent of global fish production entered international trade** in various forms for human consumption or non-edible purposes.

FIGURE 21
IMPORT AND EXPORT VALUES OF FISH PRODUCTS FOR DIFFERENT REGIONS, INDICATING NET DEFICIT OR SURPLUS



The share of global fish production being exported as fish and fish products for human consumption has shown an upward trend, from 11 percent in 1976 to 27 percent in 2016. The 60 million tonnes (live weight equivalent) of total fish and fish products exported in 2016 represent a 245 percent increase over 1976, and the increase is more than 510 percent if only trade in fish for human consumption is considered.

During the same period, world trade in fish and fish products also grew significantly in value terms, with exports rising from USD 8 billion in 1976 to USD 143 billion in 2016, at an annual growth rate of 8 percent in nominal terms and 4 percent in real terms.

The rapid rate of expansion of international trade in fish and fish products over recent decades has taken place in the context of a broader process of globalization, a large-scale transformation of the world economy driven by trade liberalization and technological advancements. Developing countries play a key role in this trade and during the past 40 years, the growth rate of exports from developing countries has increased faster than from developed ones. In 2016 and, according to preliminary figures, also in 2017, developing country exports made up approximately 54 percent of the total value and about 59 percent of the total quantity (in live weight equivalent) of exports of fish and fish products.

China is the main fish producer and since 2002 has also been the largest exporter of fish and fish products, although they represent

only 1 percent of its total merchandise trade. Behind China, Norway is the next largest exporter of fish and fish products, followed by Vietnam. The European Union followed by the United States and Japan are the major importers of fish and fish products. Overall developed countries accounted for about 71 percent of global import value in 2016 and, according to preliminary figures, also in 2017.

8. FISH CONSUMPTION

Since 1961, the average annual increase in global apparent food fish consumption (3.2 percent) has outpaced population growth (1.6 percent) and exceeded consumption of meat from all terrestrial animals, combined (2.8 percent) and individually (bovine, ovine, pig, other), except poultry (4.9 percent). **In per capita terms, food fish consumption has grown from 9.0 kg in 1961 to 20.2 kg in 2015, at an average rate of about 1.5 percent per year.**

Preliminary estimates for 2016 and 2017 point to further growth to about 20.3 and 20.5 kg, respectively.

The expansion in consumption has been driven not only by increased production, but also by a combination of many other factors, including reduced wastage, better utilization, improved distribution channels and growing demand, linked with population growth, rising incomes and urbanization.

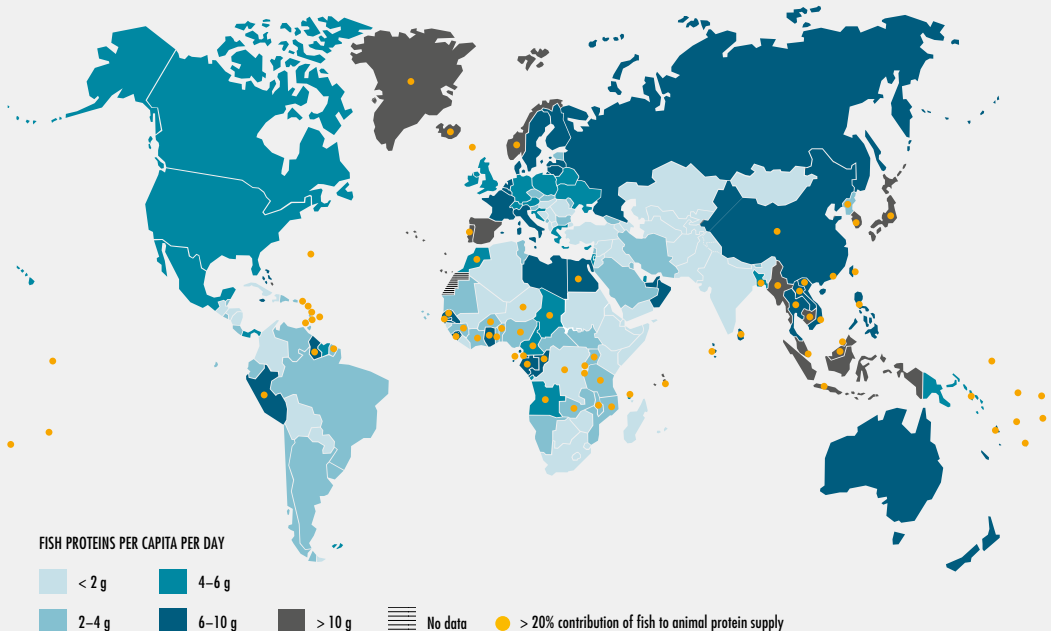
Globally, fish and fish products provide an average of only about 34 calories per capita per day. However **more than as an**

energy source, the dietary contribution of fish is significant in terms of high-quality, easily digested animal proteins and especially in fighting micronutrient deficiencies. A portion of 150 g of fish provides about 50 to 60 percent of an adult's daily protein requirement. Fish proteins are essential in the diet of some densely populated countries where the total protein intake is low, and are particularly important in diets in small island developing States (SIDS).

Europe, Japan and the United States of America together accounted for 47 percent of the world's total food fish

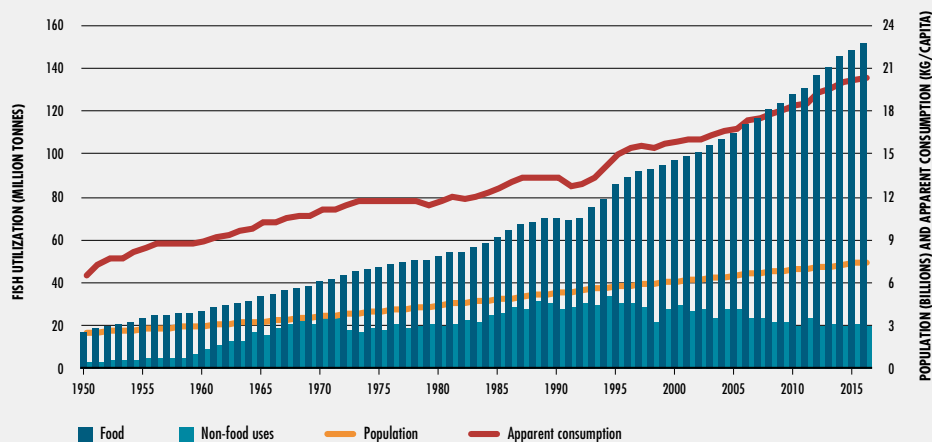
consumption in 1961 but only about 20 percent in 2015. Of the global total of 149 million tonnes in 2015, Asia consumed more than two-thirds (106 million tonnes at 24.0 kg per capita). Oceania and Africa consumed the lowest share. The shift is the result of structural changes in the sector and in particular the growing role of Asian countries in fish production, as well as a significant gap between the economic growth rates of the world's more mature fish markets and those of many increasingly important emerging markets around the world, particularly in Asia.

FIGURE 29
CONTRIBUTION OF FISH TO ANIMAL PROTEIN SUPPLY, AVERAGE 2013–2015



NOTE: Final boundary between the Sudan and South Sudan has not yet been determined.

FIGURE 2
WORLD FISH UTILIZATION AND APPARENT CONSUMPTION



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

9. GOVERNANCE AND POLICY

In fisheries and aquaculture, the commitment to leave no one behind is a call to focus action and cooperation on achieving the core ambitions of the 2030 Agenda for the benefit of all fish workers, their families and their communities.

Sustainable Development Goal 14 (SDG 14), Life below water, has clear connections to the fisheries and aquaculture sectors. Fisheries are an integral part of healthy ecosystems, and the ecosystem approach to fisheries (EAF) and the ecosystem approach to aquaculture (EAA) are being mainstreamed in management of capture fisheries and aquaculture. However, the sector is also highly relevant to nine other

SDGs. Thus, **the focus of fisheries governance and development has broadened** to include not only conservation of resources, biodiversity and the environment, but also recognition of the social agency, well-being and livelihoods of people working in the sector and the contributions of fisheries **to include a multiplicity of interconnected global agendas, such as for food security, nutrition and trade.**

Through a series of conferences, events, and other platforms, the international community is seeking to ensure the involvement of stakeholders from the fisheries and aquaculture sector in the SDG discussions and is raising awareness to promote policies and practices that will ensure the sector's contributions towards meeting all ten relevant SDGs.

The biennial meetings of the **FAO Committee on Fisheries (COFI)** – which serves as the only global intergovernmental forum examining major international fisheries and aquaculture issues – **support the 2030 Agenda** through recommendations and guidance addressed to governments, regional fishery bodies, non-governmental organizations (NGOs), fish workers, FAO and the international community.

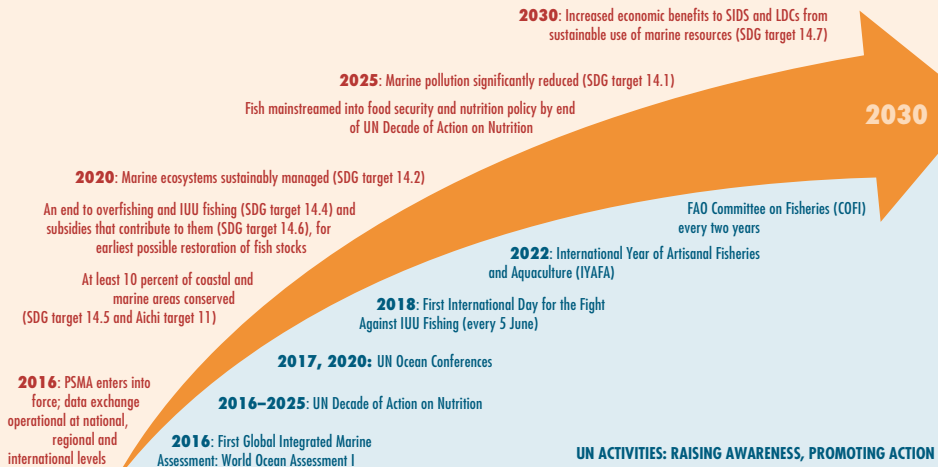
The **United Nations Ocean Conference in 2017** (formally, the high-level United Nations Conference to Support the Implementation of SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development) **was the first UN global event**

dedicated to oceans. The outcomes included adoption of a Call for Action which focuses on concrete and action-oriented recommendations and more than 1 300 voluntary commitments for future work related to the implementation of SDG 14.

With people consuming more fish than ever, **the Code of Conduct for Responsible Fisheries (CCRF) is increasingly relevant as the guiding framework for implementing the principles of sustainable development in fisheries and aquaculture.** New initiatives being taken to advance the implementation of CCRF include efforts to move towards SDG-compliant investments, integrated networks for reducing IUU fishing and management of the risks of food production from aquaculture. ■

FIGURE 32
KEEPING MOMENTUM TO ACHIEVE THE 2030 AGENDA

DELIVERABLES



PART 2

FAO FISHERIES AND AQUACULTURE IN ACTION

Part 2, “FAO Fisheries and Aquaculture in action”, presents FAO’s position on key work areas for which FAO strategies are established, including: FAO fisheries and sustainable development goals; FAO’s approach to data collation, curation, management and dissemination; **combatting IUU fishing**; mainstreaming biodiversity in fisheries and aquaculture; inland fisheries contribution to achievement of the SDGs; fish, nutrition and health; and recent successes in implementing the ecosystem approach to fisheries and to aquaculture.

COMBATTING ILLEGAL, UNREPORTED AND UNREGULATED FISHING: GLOBAL DEVELOPMENTS

The promotion, regulation and monitoring of responsible fishing practices, through robust fisheries management and governance frameworks, are essential for the sustainability of fisheries resources in both coastal areas and high seas.

The principles of responsible fisheries management have been prescribed in a number of international ocean and fisheries instruments. However, States do not always satisfactorily fulfil their duties in line with such instruments and IUU fishing often occurs, undermining national, regional and global efforts to manage fisheries sustainably. It is not enough for States to detect IUU fishing; they must strengthen fisheries laws and regulations and be able to take effective action against perpetrators to deter non-compliance.

Although States need to improve performance and implement port State measures, there have been important achievements in the fight against IUU fishing. These include the development and adoption of international guidelines to promote the use of catch documentation schemes (CDSs) for better traceability of fish and fish products in the value chain; the global and regional development of fishing vessel records; and the adoption of the FAO Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and

Unregulated Fishing (PSMA). The PSMA, the CDS Guidelines and the Global Record represent a synergistic framework for combating IUU fishing.

Implementation of the Port State Measures Agreement

The PSMA entered into force in June 2016 with 30 Parties, including the European Union as one Party. As of 5 April 2018, the agreement had 54 Parties and numerous other States had initiated steps to take part, ensuring that the number of ports for use by IUU fishing vessels will continue to decrease. The PSMA sets conditions for the entry and use of ports by foreign fishing vessels and defines minimum international standards to be applied by port States in reviewing information prior to the vessels' entry into port; conducting inspections in their designated ports; taking measures against vessels found to have engaged in IUU fishing; and exchanging information with concerned States.

Global Record of Fishing Vessels, Refrigerated Transport Vessels

The Global Record of Fishing Vessels, Refrigerated Transport Vessels and

Supply Vessels (Global Record) was launched in April 2017, less than a year after the entry into force of the PSMA. This information system, which has been widely supported by FAO Members and Observers, is expected to close the information gap on vessels carrying out fishing and fishing-related activities. In addition to recording identification information such as registration, vessel characteristics and ownership, it also includes information relevant to the fight against IUU fishing such as previous vessel names, owners and operators as well as authorizations to fish, transship or supply and history of compliance.

Catch documentation schemes

Voluntary Guidelines on Catch Documentation Schemes were officially approved by the Conference of FAO in July 2017, following a lengthy development process. The guidelines are designed to provide assistance to States, RFMOs (Regional Fishery Management Organizations), regional economic integration organizations and other intergovernmental organizations in developing and implementing new Catch Documentation Schemes or harmonizing or reviewing existing ones. ■

PART 3

HIGHLIGHTS OF ONGOING STUDIES

Part 3, “Highlights of ongoing studies”, discusses global issues and reviews possible solutions and strategies with specific attention to cross-cutting and cross-sectoral aspects. Topics include State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (PSMA); **climate change impacts and responses**; small-scale fisheries and aquaculture; realizing aquaculture’s potential; market developments; sustainable value chains and consumer protection; ocean pollution; and social issues in fisheries and aquaculture.

CLIMATE CHANGE IMPACTS AND RESPONSES

The Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC), which came into force on 5 October 2016, strengthens the global response to climate change and is an integral part of the 2030 Agenda, wherein SDG 13 calls for urgent actions to combat climate change and its impact. Implementation of the Paris

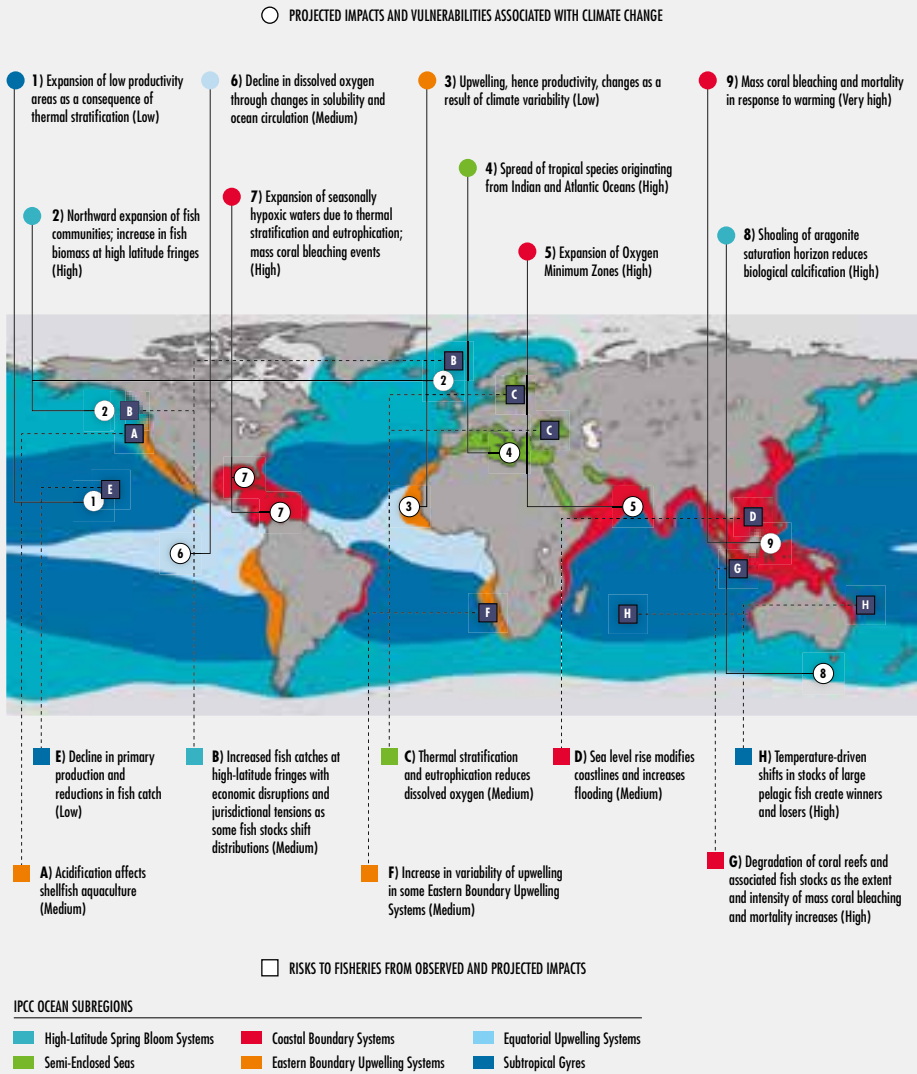
Agreement is based on Nationally Determined Contributions (NDCs).

Over 80 countries have so far included fisheries and/or aquaculture in their priority adaptation areas and actions, but these priority areas have limited specificity and ambition, mainly because of limited understanding of the impacts of climate change, insufficient guidance on adaptation tools, and insufficient technical capacity to integrate fisheries and aquaculture in nationally determined contributions (NDCs). Addressing these elements would ensure that effective measures are taken to minimize the negative impacts of climate change.

Assessing climate change impacts for fisheries and aquaculture

Primary production of the **global ocean is expected to decline by 6 percent by 2100 and by 11 percent in tropical zones**. Diverse models predict that by 2050, the total global fish catch potential may vary by less than 10 percent depending on the trajectory of greenhouse gas emissions, but with very significant geographical variability.

FIGURE 39
EXAMPLES OF PROJECTED IMPACTS AND VULNERABILITIES ASSOCIATED WITH CLIMATE CHANGE IN OCEAN SUBREGIONS (TOP), WITH EXAMPLES OF RISKS TO FISHERIES FROM OBSERVED AND PROJECTED IMPACTS (BOTTOM)



NOTE: Level of confidence is indicated in brackets
 SOURCE: Modified from Figure 30-12 in Hoegh-Guldberg *et al.*, 2014

While impacts will be predominately negative in many fisheries-dependent tropical regions, opportunities will also arise in temperate regions.

Recent projections also reveal decreases in both marine and terrestrial production in almost **85 percent of coastal countries analysed**, varying widely in their national capacity to adapt (Blanchard *et al.*, 2017). These findings underline the importance of responding to climate change in a coordinated manner across all food systems, to ensure opportunities are maximized and negative impacts reduced, and to secure food and livelihood provision.

Adaptation concepts and tools

IPCC (2014) defines adaptation as “the process of adjustment to actual or expected climate and its effects”. Low-income countries and population groups, in particular, often lack the institutional, financial and technological capacity to adapt effectively. The Paris Agreement thus urges a significant increase in financial assistance for adaptation in developing countries. Adaptation interventions may be designed to target three areas or a

combination of these: Institutions and management; Livelihood adaptation; Resilience and risk reduction.

Guiding countries on the integration of fisheries and aquaculture in National Adaptation Plans

National Adaptation Plans (NAPs) are mechanisms to enhance medium- to long-term climate change adaptation planning formally established at the sixteenth Conference of the Parties to UNFCCC (COP 16) in 2010. In support of the NAP process, FAO has developed a set of guidelines (in addition to the ones issued by the UNFCCC) for all agricultural sectors as well as specific guidelines for fisheries and aquaculture.

The guidance for fisheries and aquaculture builds on the principles of EAF/EAA, proposing clear steps to ensure that the specificities of the sector are reflected in the NAP process and support adaptation planning within the sector. The guidance addresses the following four elements: Institutional stocktaking and assessment; Technical assessment; Planning integration; and Implementation. ■

PART 4

OUTLOOK AND EMERGING ISSUES

Part 4, “Outlook and emerging issues”, is firmly geared on sectoral perspectives through modelled projections and a prospective review of our changing environment. It addresses emerging topics such as blue growth (an innovative, integrated and multisectoral approach to the management of aquatic resources aimed at maximizing the ecosystem goods and services obtained from the use of oceans, inland waters and wetlands, while also providing social and economic benefits); regional cooperation for sustainable development; the role of regional fishery bodies in aquaculture development; and disruptive technologies (new technologies that are not yet refined but have the potential to change fishing activity, to make it safer, more precise, more predictable and more sustainable).

PROJECTIONS OF FISHERIES, AQUACULTURE AND MARKETS

This section presents short-term fish demand and supply projections and medium-term projections obtained using

the FAO fish model, a dynamic policy-specific partial equilibrium model developed in 2010 to gain insight on the potential path of development of the fisheries and aquaculture sector.

Baseline projections

Production: Based on the assumption of higher demand and technological improvements, total world fish production (capture plus aquaculture, excluding aquatic plants) is expected to continue to expand over the course of the projection period to reach 201 million tonnes in 2030. This represents a growth of 18 percent over 2016, or 30 million tonnes at a lower annual growth rate (1.0 percent) than observed in the period 2003–2016 (2.3 percent). The major growth in production is expected to originate from aquaculture, which is projected to reach 109 million tonnes in 2030, with growth of 37 percent over 2016.

Prices: The sector is expected to enter a decade of higher prices in nominal terms. Factors driving this tendency include

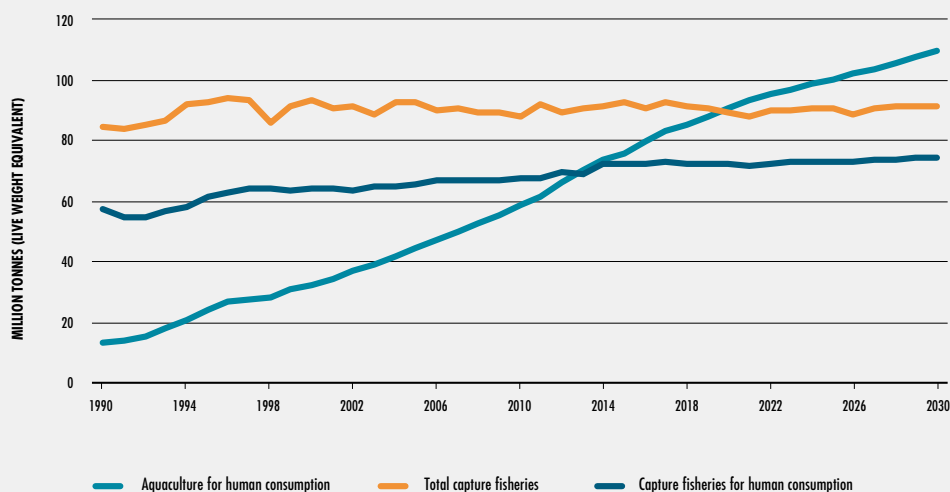
income, population growth and meat prices on the demand side; and the potential slight decline in capture fisheries production as a result of policy measures in China, the slowdown in growth of aquaculture production and cost pressure from some crucial inputs (e.g. feed, energy and crude oil) on the supply side. In real terms, adjusted for inflation, it is assumed that all prices will decline slightly over the projection period but will remain high. As aquaculture is expected to represent a higher share of world fish supply, aquaculture could have a stronger impact on price formation in the sector overall (both production and trade).

Consumption: A growing share of fish production is expected to be destined for

human consumption (around 90 percent). The driving force behind this increase will be a combination of rising incomes and urbanization, linked with the expansion of fish production and improved distribution channels. World food fish consumption in 2030 is projected to be 20 percent (or 30 million tonnes live weight equivalent) higher than in 2016. However, it is predicted that average annual growth rate will be slower in the projection period (+1.2 percent) than in the 2003–2016 period (+3.0 percent), mainly because of reduced production growth, higher fish prices and a deceleration in population expansion.

In per capita terms, world fish consumption is projected to reach 21.5 kg in 2030, up from 20.3 kg in 2016.

FIGURE 50
GLOBAL CAPTURE FISHERIES AND AQUACULTURE PRODUCTION, 1990–2030



The highest growth rates are projected for Latin America (+18 percent) and for Asia and Oceania (+8 percent each). In Africa, per capita fish consumption is expected to decrease by 0.2 percent per year up to 2030, declining from 9.8 kg in 2016 to 9.6 kg in 2030, as a result of population growth outpacing supply.

Trade: Fish and fish products will continue to be highly traded. It is projected that about 31 percent of total fishery production will be exported in 2030 (38 percent if trade within the European Union is included), in the form of different products for human consumption or non-edible purposes, traded at various stages of processing. In quantity terms, world trade of fish for human consumption is expected to grow by 24 percent in the projection period and to reach more than 48million tonnes in live weight equivalent in 2030 (60.6 million tonnes if trade within the European Union is included). China will continue to be the major exporter of fish for human consumption (followed by Viet Nam and Norway), with its share in total fish exports for human consumption remaining at 20 percent.

Summary of main outcomes from the projections

The following major trends for the period up to 2030 emerge from the analyses:

- ▶ World fish production, consumption and trade are expected to increase, but with a growth rate that will slow over time.
- ▶ Despite reduced capture fisheries production in China, world capture fisheries production is projected to increase slightly through increased production in other areas if resources are properly managed.
- ▶ Expanding world aquaculture production, although growing more slowly than in the past, is anticipated to fill the supply–demand gap.
- ▶ Prices will all increase in nominal terms while declining in real terms, although remaining high.
- ▶ Food fish supply will increase in all regions, while per capita fish consumption is expected to decline in Africa, which raises concerns in terms of food security.
- ▶ Trade in fish and fish products is expected to increase more slowly than in the past decade, but the share of fish production that is exported is projected to remain stable. ■

2018

THE STATE OF WORLD FISHERIES AND AQUACULTURE

MEETING THE SUSTAINABLE DEVELOPMENT GOALS

The 2018 edition of *The State of World Fisheries and Aquaculture* emphasizes the sector's role in achieving the 2030 Agenda for Sustainable Development and the Sustainable Development Goals, and measurement of progress towards these goals. It notes the particular contributions of inland and small-scale fisheries, and highlights the importance of rights-based governance for equitable and inclusive development.

As in past editions, the publication begins with a global analysis of trends in fisheries and aquaculture production, stocks, processing and use, trade and consumption, based on the latest official statistics, along with a review of the status of the world's fishing fleets and human engagement and governance in the sector. Topics explored in Parts 2 to 4 include aquatic biodiversity; the ecosystem approach to fisheries and to aquaculture; climate change impacts and responses; the sector's contribution to food security and human nutrition; and issues related to international trade, consumer protection and sustainable value chains. Global developments in combating illegal, unreported and unregulated fishing, selected ocean pollution concerns and FAO's efforts to improve capture fishery data are also discussed. The issue concludes with the outlook for the sector, including projections to 2030.

As always, *The State of World Fisheries and Aquaculture* aims to provide objective, reliable and up-to-date information to a wide audience, including policy-makers, managers, scientists, stakeholders and indeed all those interested in the fisheries and aquaculture sector.



2018 *The State of World Fisheries and Aquaculture*
(full text)



Some rights reserved. This work is available under a CC BY-NC-SA 3.0 IGO licence