



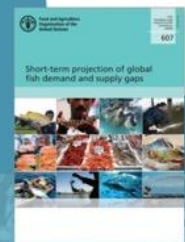
Food and Agriculture Organization
of the United Nations

Aquaculture growth potential in the Republic of Korea

WAPI factsheet to facilitate evidence-based
policy-making and sector management in
aquaculture

March 2023

World Aquaculture Performance Indicators (WAPI)



WAPI is an FAO initiative to develop user-friendly tools for compiling, generating and providing easy access to quantitative information on aquaculture sector performance at the national, regional and global levels. WAPI information and knowledge products include data analysis tools, technical papers and policy briefs.

Data analysis tools

- **WAPI Aquaculture Production Module (WAPI-AQPRN)** analyses the status and trends of aquaculture production (quantity and value) of over 650 species items in nearly 250 countries and areas under different farming environments (inland waters, marine areas and all areas) for seven decades, from the 1950s to the 2010s.
- **WAPI Fish Consumption Module (WAPIFISHCSP)** includes 10 indicators – three nutrition indicators and seven food indicators – to examine food supply and utilization patterns (with a focus on the contribution of fish to food and nutrition) in 270 countries and areas for six decades, from the 1960s to the 2010s. The module focuses on 14 fish/seafood items, but also includes 26 nonfish/seafood items.

Download WAPI tools and other products at:
www.fao.org/fishery/statistics/software/wapi/en
Contact us: WAPI@fao.org



Preparation of this factsheet

- This factsheet provides data and information to facilitate the assessment of aquaculture growth potential in the Republic of Korea (ROK). It relies on official data and statistics readily available to the public. The factsheet is not a comprehensive, tailor-made sector assessment report. Some important dimensions, such as aquaculture's contribution to GDP and employment, are not evaluated due to the lack of global data. While most analyses in the factsheet are straightforward, there are some advanced analyses (e.g. [aquaculture growth potential from demand-side perspective](#)) based on certain (sometimes simplified) assumptions, which provide useful indications but do not cover all relevant aspects.
- Analyses in the factsheet are based on official data and statistics published by FAO and other international or national organizations. The data and statistics may differ from data and statistics used in other WAPI factsheets because of different data sources or different versions of the same datasets. They may not be consistent with data and statistics from other sources (e.g. national statistics).
- The term “country” used in this factsheet includes non-sovereign territory. The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.
- Unless noted otherwise, country grouping in this factsheet follows the United Nations [M49 standard](#); under which the Republic of Korea is listed in [Asia](#) and Eastern Asia.
- The preparation of the factsheet has benefited from tables and charts generated by various World Aquaculture Performance Indicator (WAPI) modules. Most of these data analysis tools are for FAO internal use, yet some of them are available for test use. See [slide 77](#) or visit the [WAPI webpage](#) for more information about WAPI information and knowledge products.
- The factsheet was prepared by Junning Cai (FAO-NFI), Giulia Galli (FAO-NFI) and Xiaowei Zhou (FAO-NFI). Technical and other assistance provided by Junghoon Jee (FAO-NFI), Yujie Ma (FAOKR), and Dimitar Taskov (FAO-NFI) as well as three government institutes in the ROK (the Ministry of Oceans and Fisheries [MOF], the National Institute of Fisheries Science [NIFS], and the Korea Maritime Institute [KMI]) is acknowledged.
- The validity and relevance of the results depends on the quality (in terms of timeliness and accuracy) of the underlying data and statistics used in the analyses – see some remarks on data and statistics in [Slide 3](#). Errors could also occur in the analyses despite our efforts to minimize them. Please let us know if you have any concern.
- Contact: Junning Cai (FAO Aquaculture Officer); junning.cai@fao.org; wapi@fao.org.

Remarks on FAO aquaculture statistical data – the Republic of Korea (ROK)

- FAO aquaculture statistics are based on data submitted by member countries. When there is a lack of data formally reported by a country, FAO usually estimates the country's aquaculture production based on data and information from alternative sources or relies on relatively conservative estimation methods when alternative data sources are not readily available.
- While many countries lack a national statistics system for collection of aquaculture production data on a regular basis for dissemination and for reporting to FAO, the ROK is among the 25 countries or territories in [Asia](#) that reported aquaculture production data to FAO in all the five years during 2013–2017.
- A robust national system of aquaculture data collection is first and foremost for the countries' own benefit. Generally speaking from a global perspective, there is an urgent need for national capacity development in aquaculture statistics system at several levels, including (i) the legal status, institutionalization and resource allocation; (ii) development of national statistical standards in line with international standards; (iii) adequate and stable staffing plus an effective mechanism for data collection, compilation, storage, dissemination and reporting.
- For further information about FAO statistics on aquaculture production, contact: Xiaowei Zhou (FAO Aquaculture Officer (Statistics); Xiaowei.Zhou@fao.org).

Species grouping

In this factsheet, “fish” or “seafood” may be used interchangeably as a general term for narrative convenience. When it is necessary to define the scope of a species group for a specific quantitative measure, the following definitions are used.

- Aquatic organisms; aquatic species; aquatic foods; aquatic products; or aquatic commodities = fish & seafood + miscellaneous aquatic animal products + aquatic plants (or algae)*
- Fish & seafood = finfish + shellfish + miscellaneous aquatic animals
- Finfish = marine fishes + diadromous fishes + freshwater fishes
- Shellfish = crustaceans + molluscs
- Molluscs = shell molluscs (i.e. molluscs excluding cephalopods) + cephalopods

*Aquatic plants is one of the ISSCAAP Divisions; [ISSCAAP](#) = International Standard Statistical Classification of Aquatic Animals and Plants. In FAO global fisheries and aquaculture production statistics, aquatic plants are virtually equal to algae, with only a few sporadic historical data (before the early 2010s) on the harvest of wild seagrass.

Contents

Introduction

Preparation of this factsheet.....2

Remarks on aquaculture statistics.....3

Species grouping.....4

Highlights.....6

Resources.....8

Food security, nutrition and health.....13

Contribution to food and nutrition.....18

Domestic market (consumption).....24

International trade.....30

Export.....34

Import.....41

Total fisheries production.....48

Capture fisheries production.....52

Aquaculture production.....60

Outlook.....71

Further Reading.....76

Highlights (I)

Status and trends

- Aquaculture production in the Republic of Korea (ROK) increased from ~0.7 million tonnes in 2000 to 2.3 million tonnes in 2020. The 6.4 percent of annual growth was higher than sub-regional, regional and world averages. In 2020, the country was the 6th largest aquaculture country in Asia ([slide 61](#)).
- Brown seaweeds (51.73 percent) and red seaweeds (23.19 percent) accounted for three fourths of the country's 2.3 million tonnes of aquaculture production in 2020, and oysters contributed 12.89 percent. The 2.3 million tonnes of production was contributed by 58 ASFIS species items; the effective number of species (ENS, a measure of species diversity) was 7. The country contributed over one fourth of (world aquaculture of) flatfishes, nearly three fourths of green seaweeds, nearly 80 percent of sea squirts, and 100 percent of scorpionfishes and flatheads ([slides 67-70](#)).

Supply-side perspective

- The ROK's share in world aquaculture production tonnage (1.9 percent) was higher than its share in world land area (0.07 percent) and its share in world population (0.66 percent). The country's share in world inland aquaculture production (0.04 percent) was smaller than its share in world surface area of inland waterbodies (0.07 percent) and also smaller than its 0.13 percent share in world renewable water resources. Its share in world marine aquaculture production (3.39 percent) was greater than its share in world coastline length (0.3 percent) ([slides 9-10](#); [slide 75](#)).
- The Republic of Korea's total fisheries production increased from ~200 000 tonnes in 1950 to 2.4 million tonnes in 1976 thanks mostly to the expansion of capture fisheries. The production further increased to 3.7 million tonnes in 1986, reflecting increases in both capture and culture production. The production declined to 2.5 million tonnes in 2000, reflecting mostly a decline in capture production, and then increased to 3.7 million tonnes in 2020, reflecting the expansion of aquaculture ([slide 49](#)).
- The Republic of Korea was one of the 11 countries in Asia with over 1 million tonnes of capture fisheries production in 2020. Its capture fisheries production declined from 1.84 million tonnes in 2000 to 1.38 million tonnes in 2020; the 1.44 percent annual decline represented a lower growth than sub-regional, regional and world averages ([slide 53](#)).
- Aquaculture production in the ROK increased from ~0.7 million tonnes in 2000 to 2.3 million tonnes in 2020. The 6.4 percent of annual growth was higher than sub-regional, regional and world averages. In 2020, the country was the 6th largest aquaculture country in Asia ([slide 61](#)). The country's 0.57 million tonnes of aquaculture production of aquatic animals (i.e. including all species but algae) was ranked the 15th, and its 0.11 million tonnes of finfish aquaculture production ranked the 29th. Yet its ~87 000 tonnes of marine fish aquaculture production ranked within the top 10 (i.e. the 8th place).
- In 2017, 2 922 514 tonnes total fish consumption in the ROK came from 1 648 091 tonnes food fish supply from domestic sources (56 percent) and 1 274 423 tonnes net food fish import (44 percent) ([slides 22-23](#)). The ROK's import of aquatic products increased from USD 1.41 billion in 2000 to USD 5.43 billion in 2020; the 7 percent annual growth rate was higher than sub-regional, regional and world averages, and the country was the third largest fish importing country in Asia. The country's import of aquatic products (1.5 million tonnes; USD 5.43 billion) was spread across various species groups, with the largest group, i.e. marine fishes not identified (in terms of volume) or squids/cuttlefishes/octopuses (in terms of value), accounting for less than one fifth of the total amount ([slides 42-47](#)).

Highlights (II)

Demand-side perspective

- The Republic of Korea (ROK) is a high-income country with growing per capita GDP that is expected to stay well above regional and world averages ([slides 9 and 73](#)). The country's 51.27 million population in 2020 is expected to decline slightly to 51.15 million in 2030, and it is the only top 10 national aquaculture in Asia with an expected decline in population ([slides 11, 12 and 72](#)). The country's food security and nutrition status was better than sub-regional, regional and world averages, except for its higher percentage of overweight children ([slide 14](#)). Its 83.2 years of life expectancy in 2019 was higher than sub-regional, regional and world averages ([slide 17](#)).
- The ROK's per capita protein intake was higher than regional and world averages ([slide 16](#)); so was its per capita animal protein intake ([slide 20](#)). Fish & seafood contributed 30.2 percent of the country's animal protein intake in 2019; the share was higher than both regional and world averages ([slides 20 and 21](#)).
- Between 1997 and 2017, ROK's per capita consumption of fish & seafood (excluding algae) increased from 50.3 kg to 57.2 kg. The 0.6 percent annual growth was lower than sub-regional, regional and world averages, and the per capita consumption has reached a plateau since the mid-2000s. The country's 57.2 kg per capita fish & seafood consumption in 2017 was the highest among the top 10 countries with the highest aquaculture production, yet the consumption was ranked the 4th among the top 10 Asian economies with the highest per capita GDP ([slides 25–28](#)).
- In 2020, the ROK was the seventh largest fish exporting country in Asia. The country's export of aquatic products increased from USD 1.49 billion in 2000 to USD 1.85 billion in 2020, the 1.1 percent annual growth rate was lower than sub-regional, regional and world averages. Tunas/bonitos/billfishes contributed 40 percent of the volume of the country's export of aquatic products (30 percent of the export value). The country accounted for nearly 90 percent of world export of cold-water red seaweeds and over 70 percent of brown seaweeds export value (or 61 percent of export volume) ([slides 35-40](#)).
- While fish & seafood demand driven by population and income growth represents a large potential for aquaculture growth in many countries, such demand-side potential tends to be limited for the Republic of Korea whose per capita fish & seafood consumption is already very high (over 50 kg) and whose population is expected to decline. However, the country could further develop its aquaculture sector through import substitution as well as expansion of its export markets ([slide 74](#)).

Resources

Republic of Korea (2020): 1.9 percent of world aquaculture production; 0.66 percent of world population; a high-income country (~300 percent of world average GDP per capita).

Status of aquaculture production, population and GDP, 2020

Country/area	Aquaculture production (2020) ¹		Population (2020) ²		GDP per capita (2020) ³	
	Tonnes	Share of world total (%)	Million	Share of world total (%)	Current USD	Ratio to world average (%)
World	122 580 187	100.00	7 795	100.00	10 989	100.00
Asia	112 301 149	91.61	4 641	59.54	7 203	65.54
Eastern Asia	74 770 377	61.00	1 678	21.53	13 679	124.48
Top 10 largest aquaculture countries in 2020						
1. China	70 483 538	57.50	1 439	18.47	10 329	93.99
2. Indonesia	14 845 014	12.11	274	3.51	3 874	35.25
3. India	8 641 286	7.05	1 380	17.70	1 928	17.54
4. Viet Nam	4 614 692	3.76	97	1.25	3 525	32.08
5. Bangladesh	2 583 866	2.11	165	2.11	1 962	17.85
6. Republic of Korea	2 327 903	1.90	51	0.66	31 954	290.77
7. Philippines	2 322 831	1.89	110	1.41	3 299	30.02
8. Egypt	1 591 896	1.30	102	1.31	3 550	32.30
9. Chile	1 505 486	1.23	19	0.25	13 225	120.35
10. Norway	1 490 412	1.22	5	0.07	66 870	608.50

Data sources: 1. FAO Fishery and Aquaculture Statistics. Global aquaculture production 1950-2020 (FishStatJ). 2. UN World Population Prospects (2019 Revision). 3. Total GDP from IMF World Economic Outlook Database (April 2021) divided by population from UN World Population Prospects (2019 Revision).

Notes: Country grouping based on UN-OHRLS and UN M49 standard. The top 10 national aquaculture listed in descending order per their production in 2020.

Natural resources of the Republic of Korea: 0.07 percent of world land area (including inland water surface area); 0.07 percent of world inland water surface area; 0.3 percent of world coastline length; 0.13 percent of world total renewable water resources.

Land and water resources

Country/area	Total country area (excluding coastal waters; 2013-17) ¹		Surface area of inland waterbodies (2018) ²		Coastline length (2019) ³		Total renewable water resources (2013-17) ¹	
	km ²	Share of world total (%)	km ²	Share of world total (%)	km ²	Share of world total (%)	Billion m ³ /year	Share of world total (%)
World	134 108 230	100.00	3 485 962	100.00	805 942	100.00	54 737	100.00
Asia	31 978 947	23.85	768 998	22.06			14 442	26.38
Eastern Asia	11 762 980	8.77	155 627	4.46			3 452	6.31
Top 10 largest aquaculture countries in 2020								
1. China	9 600 010	7.16	125 985	3.61	14 500	1.80	2 840	5.19
2. Indonesia	1 913 580	1.43	39 227	1.13	54 716	6.79	2 019	3.69
3. India	3 287 260	2.45	50 935	1.46	7 000	0.87	1 911	3.49
4. Viet Nam	331 230	0.25	7 640	0.22	3 444	0.43	884	1.62
5. Bangladesh	147 630	0.11	11 629	0.33	580	0.07	1 227	2.24
6. Republic of Korea	100 340	0.07	2 530	0.07	2 413	0.30	70	0.13
7. Philippines	300 000	0.22	8 513	0.24	36 289	4.50	479	0.88
8. Egypt	1 001 450	0.75	8 096	0.23	2 450	0.30	58	0.11
9. Chile	756 700	0.56	27 555	0.79	6 435	0.80	923	1.69
10. Norway	625 220	0.47	22 666	0.65	25 148	3.12	393	0.72

Data sources: 1. FAO. 2016. AQUASTAT Main Database – Food and Agriculture Organization of the United Nations (FAO). Website accessed on 16 May 2019. 2. FAOSTAT Land Cover database (updated September 2020; CCI_LC). 3. The World Factbook, Central Intelligence Agency (CIA), United States of America. Web accessed on 20 May 2019. Coastline length of world equal to the sum of coastline length of 265 countries and territories listed in the data source.

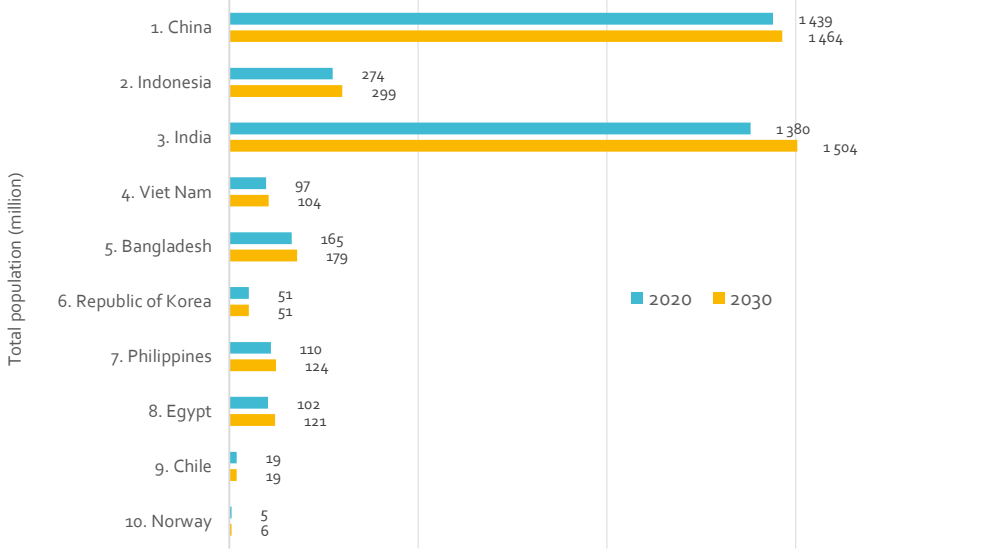
Notes: Country grouping based on UN-OHRLS and UN M49 standard. The top 10 national aquaculture listed in descending order per their production in 2020.

Population prospects in the Republic of Korea (2020 versus 2030):

The Republic of Korea's population is expected to decline slightly from 51.27 million in 2020 to 51.15 million in 2030.

Among the top 10 countries with the largest aquaculture production in 2020, the country is the only one with an expected declined population during the period.

Population prospects in the top 10 largest aquaculture countries: 2020 versus 2030



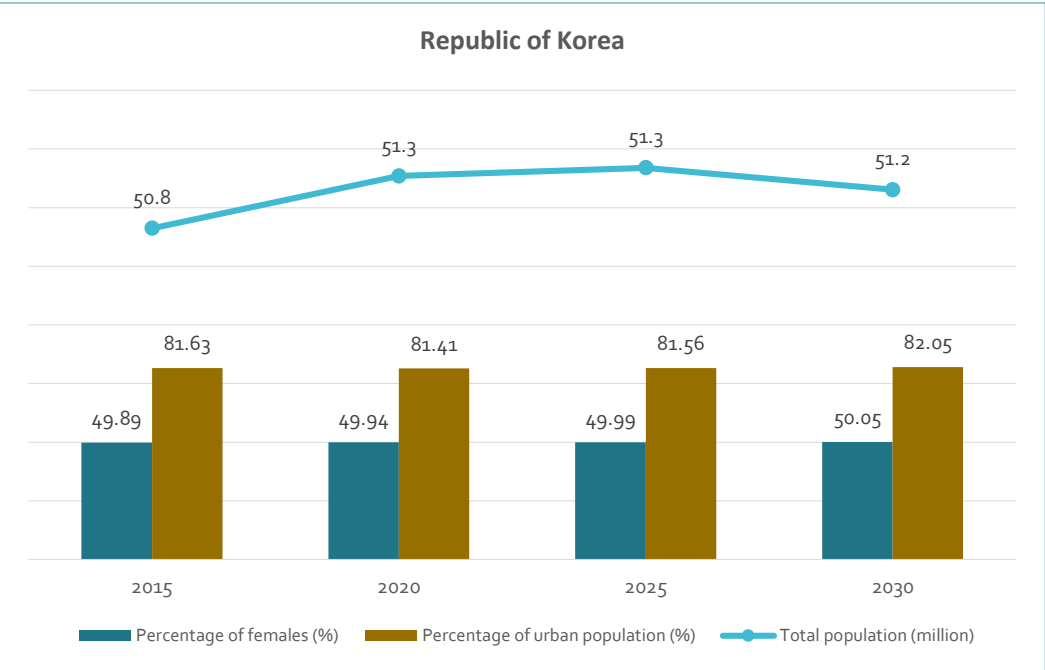
Data source: United Nations World Population Prospects (2019 revision) <https://esa.un.org/unpd/wpp/Download/Standard/Population> .

Demographic features in the Republic of Korea (2015–2030):

Population expected to increase between 2015 and 2025, then decline slightly between 2025 and 2030.

Urban ratio of total population expected to increase slightly between 2015 and 2030.

Female ratio in total population expected to increase beyond the 50-percent mark in 2030.



Data source: United Nations World Population Prospects (2019 revision) <https://esa.un.org/unpd/wpp/Download/Standard/Population>; United Nations World Urbanization Prospects (2018 revision) <https://population.un.org/wup>.

Food security, nutrition and health

Food security and nutrition status in the Republic of Korea

Prevalence of undernourishment

< 2.5 percent of prevalence of undernourishment, which was lower than regional (Asia) and world averages.

Prevalence of severe food insecurity

0.6 percent of prevalence of severe food insecurity, which was lower than sub-regional, regional and world averages.

Stunted children

2.2 percent of children under 5 years of age were stunted, which was lower than sub-regional, regional and world averages.

Overweight children

8.8 percent of children under 5 years of age were overweight, which was higher than sub-regional, regional and world averages.

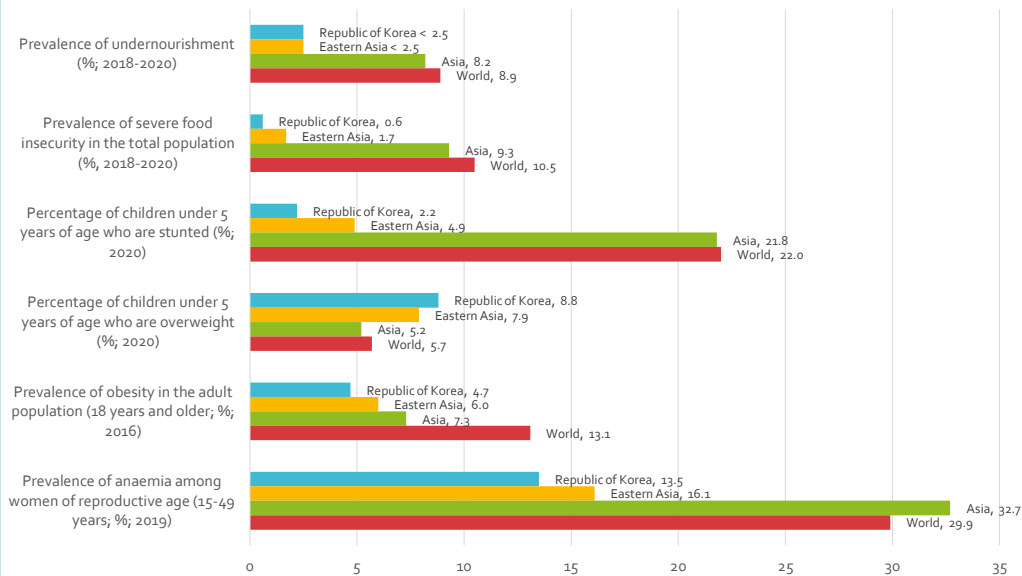
Adult obesity

4.7 percent of adult population were obese, which was lower than sub-regional, regional and world averages.

Women anaemia

13.5 percent of reproductive-age women were anaemic, which was lower than sub-regional, regional and world averages.

Food security and nutrition status in the Republic of Korea



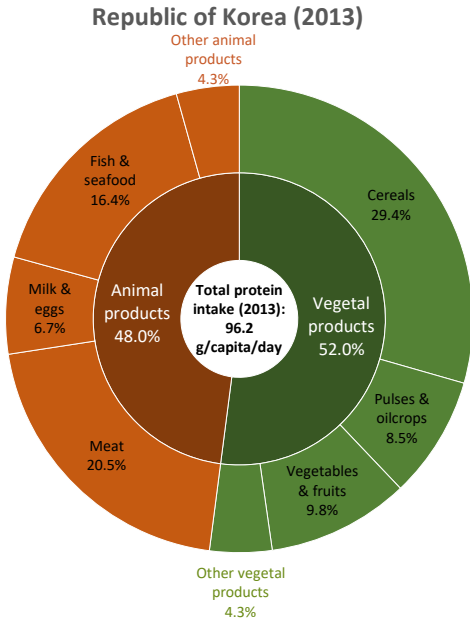
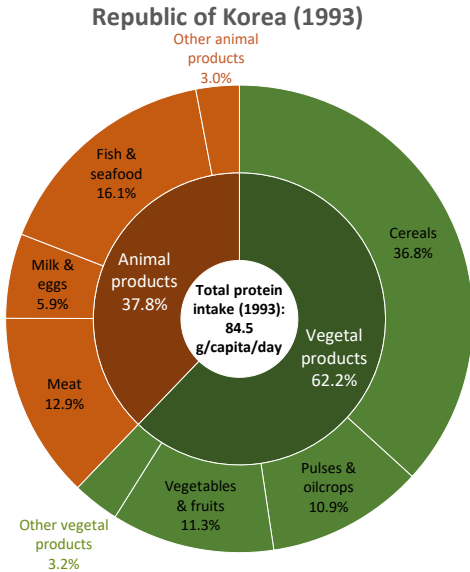
Data source: The chart uses the latest available data in the FAOSTAT – Suite of Food Security Indicators (updated on 20 August 2021)
www.fao.org/faostat/en/#data/FS

Per capita protein intake in the Republic of Korea (1993 versus 2013):

Per capita total protein intake increased from 84.5 g/day to 96.2 g/day between 1993 and 2013.

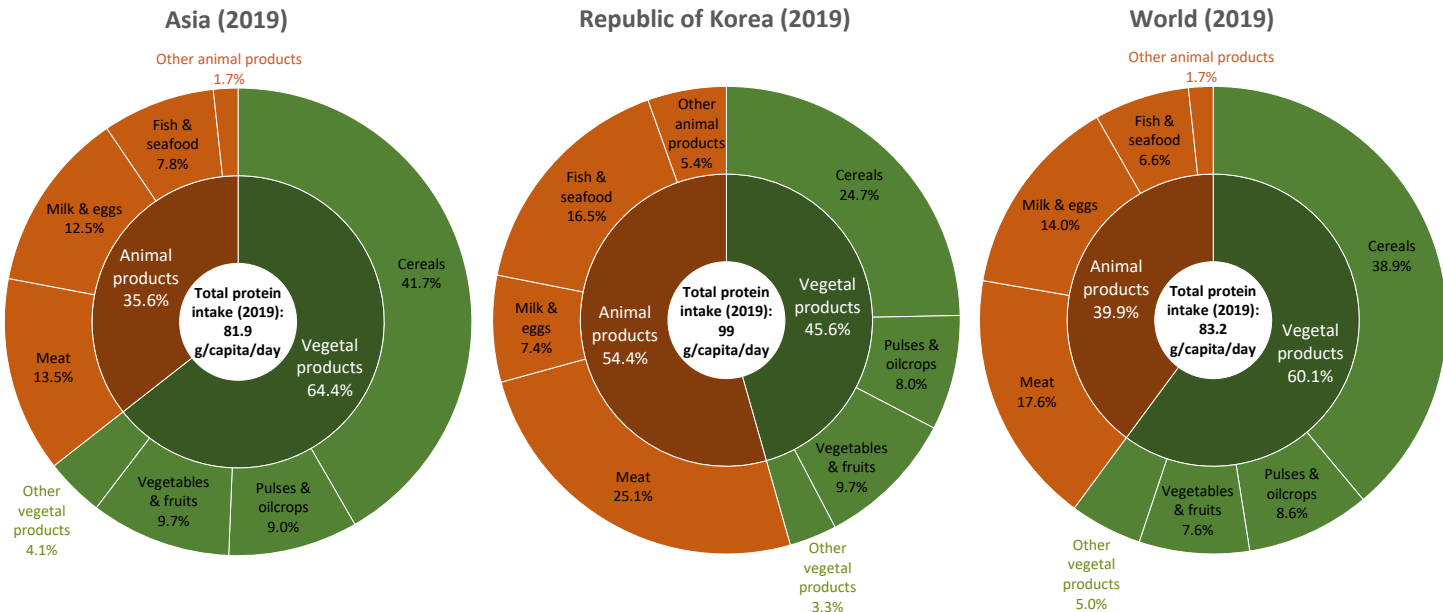
The share of animal protein in total protein intake increased from 37.8 percent to 48 percent.

The share of fish & seafood slightly increased from 16.1 percent to 16.4 percent.



Data source: FAOSTAT Food Balances 1961-2013 (accessed in January 2018; www.fao.org/faostat/en/#data/FBSH). The data here are not comparable to the data from FAOSTAT New Balance Sheet presented in slide 16.
 Notes: See [slide #4](#) for the scope of fish & seafood. Food items with a small contribution to total protein intake may not be labelled.

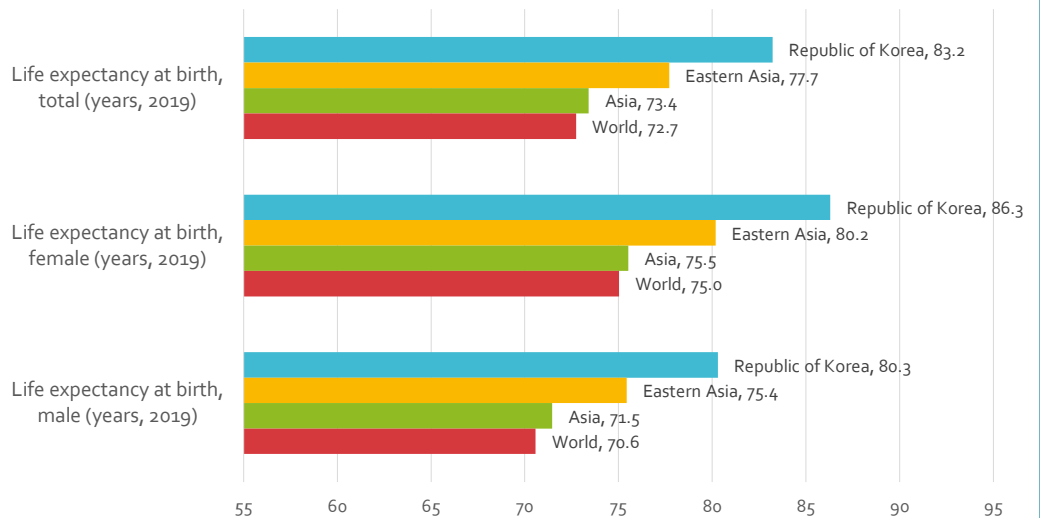
Per capita protein intake in the Republic of Korea (2019): The 99 g/day of per capita protein intake was higher than world average (83.2 g/day) and Asia average (81.9 g/day). The share of animal proteins in the country's total protein intake was higher than both world and regional averages.



Data source: FAOSTAT New Food Balances (updated on 14 February, 2022; <http://www.fao.org/faostat/en/#data/FBS>).

Notes: See [slide #4](#) for the scope of fish & seafood. Food items with a small contribution to total protein intake may not be labelled.

Life expectancy in the Republic of Korea



Life expectancy in the Republic of Korea (2019):

Life expectancy at birth for the total population was 83.2 years, which was higher than sub-regional, regional and world averages.

Life expectancy for female population (86.3 years) was higher than male population (80.3 years) – a general pattern applying to most countries and areas.

Data source: World Bank World Development Indicators (WDI), downloaded on 3 October, 2021 (<http://datatopics.worldbank.org/world-development-indicators/#archives>); United Nations World Population Prospects (2019 revision; <https://esa.un.org/unpd/wpp/Download/Standard/Population>) used to calculate life expectancy at the regional level.

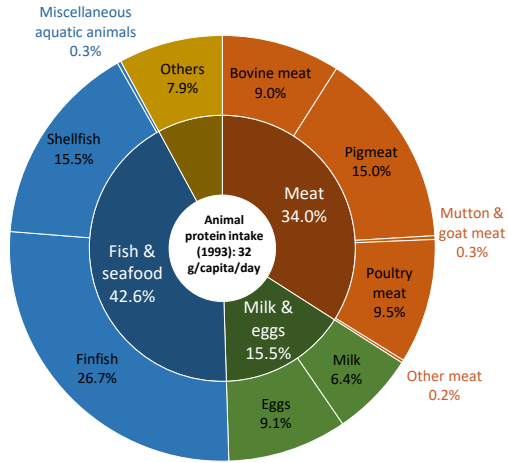
Contribution to food and nutrition

Animal protein intake in the Republic of Korea (1993 versus 2013):

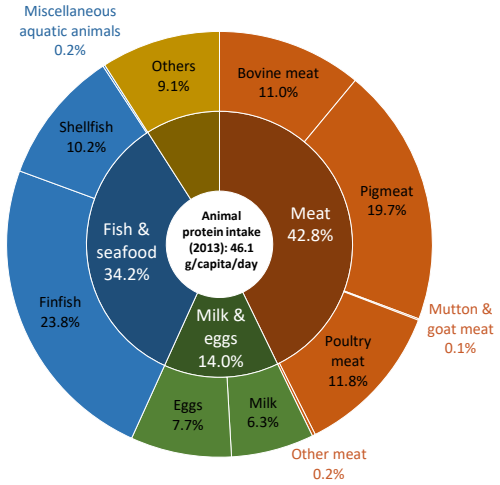
Per capita animal protein intake increased from 32 g/day in 1993 to 46.1 g/day in 2013.

The share of fish & seafood in animal protein intake declined from 42.6 percent to 34.2 percent.

Republic of Korea (1993)



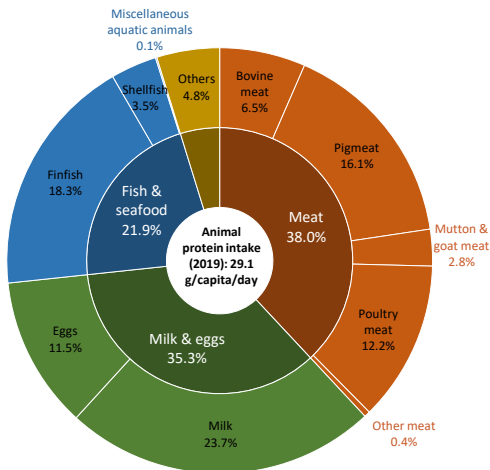
Republic of Korea (2013)



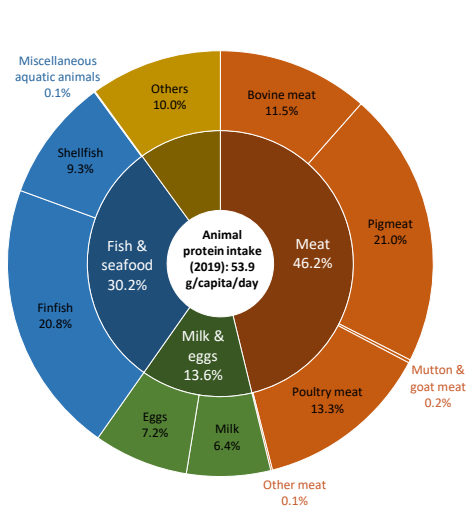
Data source: FAOSTAT Food Balances 1961-2013 (accessed in January 2018; www.fao.org/faostat/en/#data/FBSH). The data here are not comparable to the data from FAOSTAT New Balance Sheet presented in slide 20.
 Note: See slide #4 for the scope of fish & seafood. Food items with a small contribution to animal protein may not be labelled.

Animal protein intake in the Republic of Korea (2019): The 53.9 g/day of per capita animal protein intake was higher than regional and world averages. So was the fish share in animal protein intake.

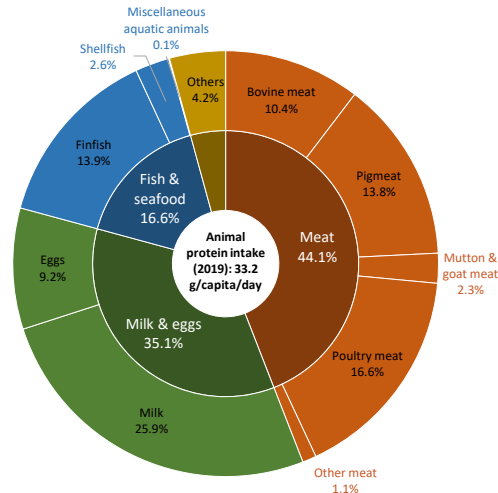
Asia (2019)



Republic of Korea (2019)



World (2019)



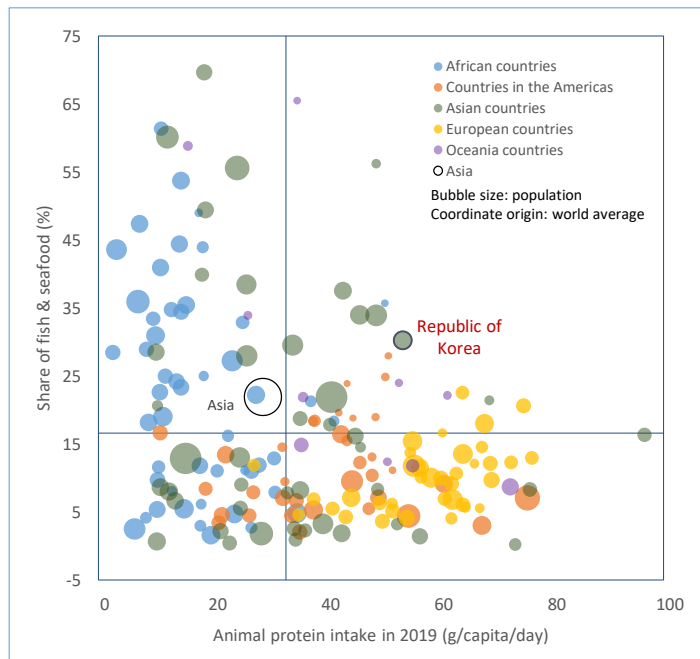
Data source: FAOSTAT New Food Balances (updated on 14 February, 2022; <http://www.fao.org/faostat/en/#data/FBS>).

Note: See [slide #4](#) for the scope of fish & seafood.

Republic of Korea (2019): Locating in the first quadrant in the bubble chart, indicating that animal protein intake was higher than the world average; so was the share of fish & seafood.

Contribution of fish & seafood to animal protein, 2019

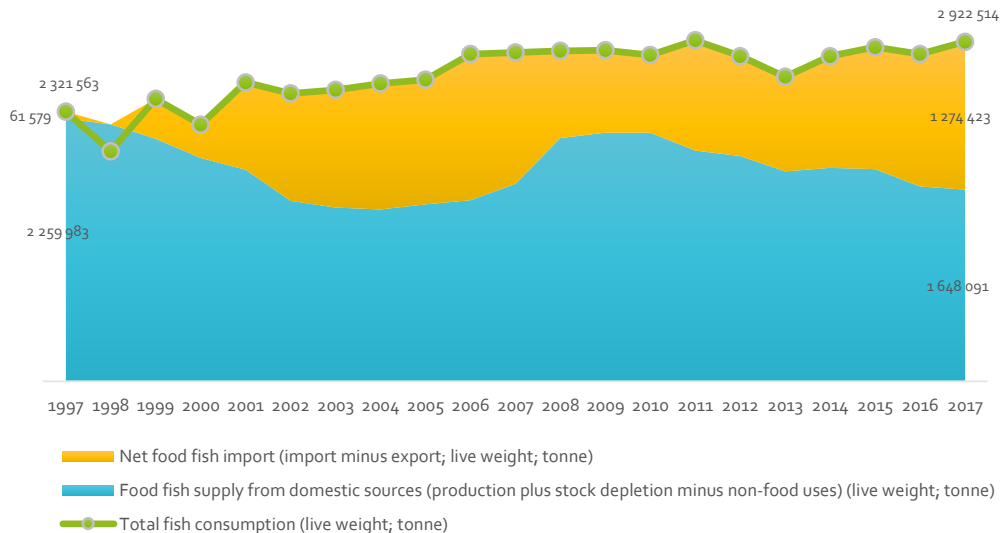
Country/area	Per capita protein intake in 2019 (g/capita/day)		Fish & seafood share (%)
	Fish & seafood	Animal products	
World	5.5	33.2	16.6
Asia	6.4	29.1	21.9
Eastern Asia	9.7	42.1	23.1
Top 10 largest aquaculture countries in 2020			
1. China	9.0	41.3	21.9
2. Indonesia	13.6	24.5	55.6
3. India	2.0	15.4	12.9
4. Viet Nam	10.2	34.4	29.5
5. Bangladesh	7.4	12.2	60.1
6. Republic of Korea	16.3	53.9	30.2
7. Philippines	7.3	26.3	28.0
8. Egypt	6.5	23.7	27.2
9. Chile	3.5	49.6	7.1
10. Norway	14.5	64.4	22.6



Data source: FAOSTAT New Food Balances (updated on 14 February, 2022; <http://www.fao.org/faostat/en/#data/FBS>).

Notes: Country grouping based on UN-OHRLS and UN M49 standard. Sub-Saharan Africa includes Sudan. The top 10 aquaculture countries listed in descending order per their aquaculture production in 2020.

Fish & seafood supply and utilization in the Republic of Korea (1997–2017)



Status and trend of fish & seafood supply and utilization in the Republic of Korea (1997–2017):

Food fish & seafood supply from domestic sources declined from 2 259 983 tonnes in 1997 to 1 648 091 tonnes in 2017.

Total fish & seafood consumption increased from 2 321 563 tonnes in 1997 to 2 922 514 tonnes in 2017.

Net import increased from 61 579 tonnes to 1 274 423 tonnes.

In 2017, 2 922 514 tonnes total fish & seafood consumption = 1 648 091 tonnes food fish & seafood supply from domestic sources (56 percent) + 1 274 423 tonnes net import of food fish & seafood (44 percent).

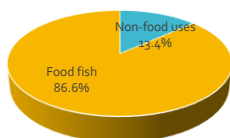
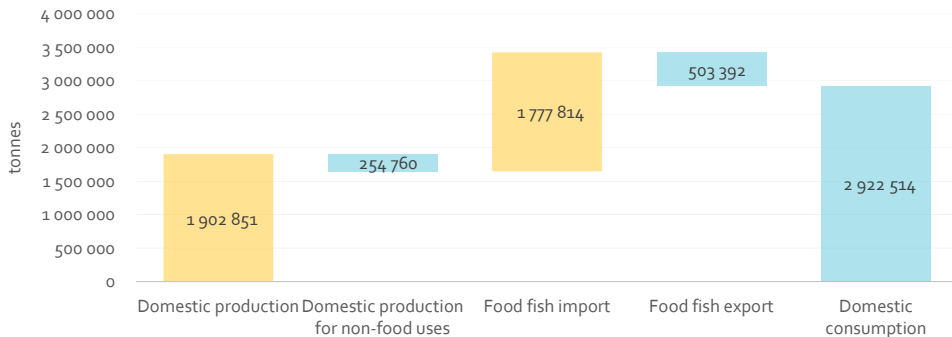
Republic of Korea's food balance sheet for fish & seafood, 2017

1 902 851 tonnes domestic fish & seafood production – 254 760 tonnes for non-food use (13.4 percent of total food and non-food production) = 1 648 091 tonnes domestic food fish & seafood production (86.6 percent).

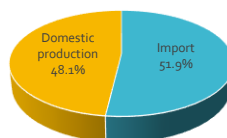
1 648 091 tonnes domestic food fish & seafood production (48.1 percent of food fish supply) + 1 777 814 tonnes import of food fish & seafood (51.9 percent) = 3 425 905 tonnes food fish & seafood supply available for utilization.

3 425 905 tonnes utilization of food fish & seafood = 503 392 tonnes export of food fish & seafood (14.7 percent of food fish & seafood utilization) + 2 922 514 tonnes domestic (food) fish & seafood consumption (85.3 percent).

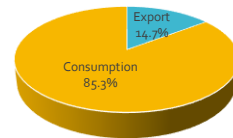
Fish & seafood supply and utilization in the Republic of Korea (2017)



Domestic production (2017):
1 902 851 tonnes



Food fish supply (2017):
3 425 905 tonnes



Food fish utilization (2017):
3 425 905 tonnes

Data source: FAO. 2020. Fishery and Aquaculture Statistics. Food balance sheets of fish and fishery products 1961-2017 (FishStat); www.fao.org/fishery/statistics/software/FishStatJ/en.

Note: See [slide #4](#) for the scope of fish & seafood. Numbers may not add up exactly due to rounding.

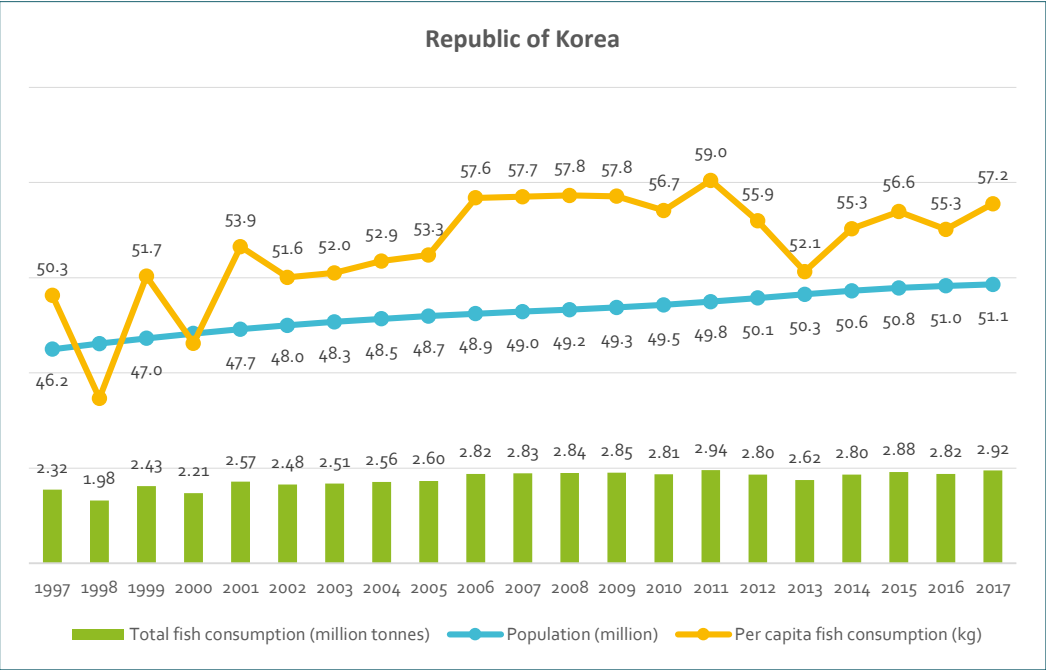
Domestic market (consumption)

Status and trend of fish & seafood consumption in the Republic of Korea (1997–2017):

Between 1997 and 2017, the Republic of Korea’s total fish & seafood consumption increased from 2.3 million tonnes to 2.9 million tonnes.

This reflected increases in its total population (from 46.2 million to 51.1 million) as well as per capita fish & seafood consumption (from 50.3 kg to 57.2 kg).

However, the per capita consumption has reached a plateau since the mid-2000s.



Data source: FAO. 2020. Fishery and Aquaculture Statistics. Food balance sheets of fish and fishery products 1961-2017 (FishStat); www.fao.org/fishery/statistics/software/FishStat/en.

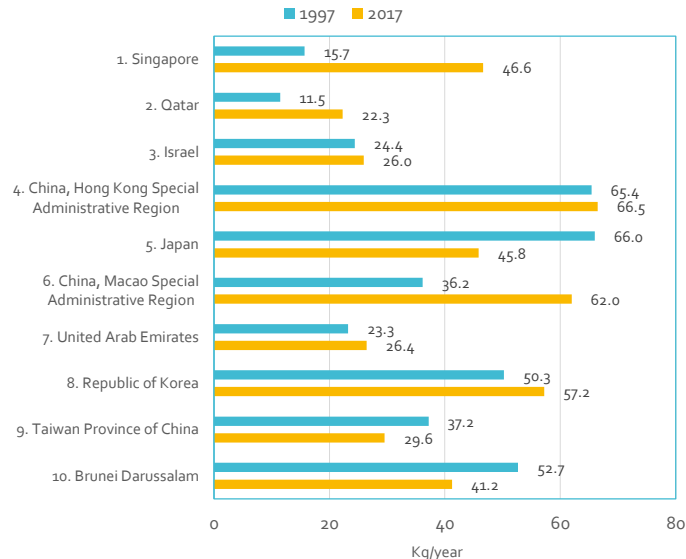
Note: See slide #4 for the scope of fish & seafood.

Between 1997 and 2017, per capita fish & seafood consumption in the Republic of Korea increased from 50.3 kg to 57.2 kg, yet the 0.6 percent annual growth was lower than regional and world averages. The country's 57.2 kg per capita consumption in 2017 was the highest among the top 10 countries with the largest aquaculture production, yet the consumption was ranked the 4th among the top 10 Asian economies with the highest per capita GDP.

Status and trend of per capita fish & seafood consumption

Country/area	Per capita fish & seafood consumption (kg/year)		Annual growth (%)
	1997	2017	
World	15.5	20.3	1.4
Asia	16.6	24.1	1.9
Eastern Asia	27.1	39.4	1.9
Top 10 largest aquaculture countries in 2020			
1. China	22.3	38.8	2.8
2. Indonesia	18.9	44.7	4.4
3. India	4.5	6.9	2.1
4. Viet Nam	15.7	37.7	4.5
5. Bangladesh	10.5	26.0	4.6
6. Republic of Korea	50.3	57.2	0.6
7. Philippines	29.6	26.2	-0.6
8. Egypt	9.9	23.7	4.5
9. Chile	15.1	12.0	-1.1
10. Norway	52.2	51.4	-0.1

Per capita fish & seafood consumption in top 10 Asian economies with highest per capita GDP (kg/year)



Data source: FAO. 2020. Fishery and Aquaculture Statistics. Food balance sheets of fish and fishery products 1961-2017 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en).

Notes: See slide #4 for the scope of fish & seafood. The top 10 countries with largest national aquaculture listed in descending order per their aquaculture production in 2020; the top 10 countries in Asia with the highest per capita GDP listed in descending order per their per capita GDP in 2020.

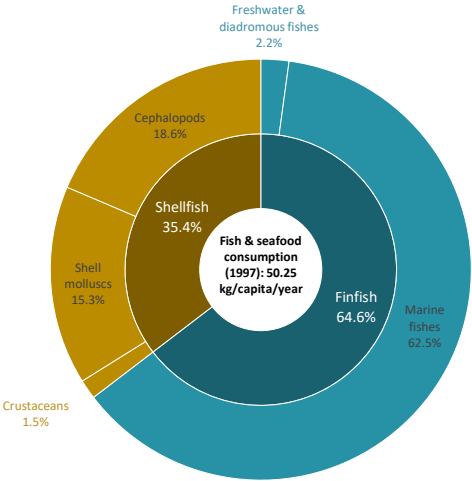
Per capita fish & seafood consumption in the Republic of Korea (1997 versus 2017):

Per capita fish & seafood consumption increased from 50.25 kg in 1997 to 57.2 kg in 2017.

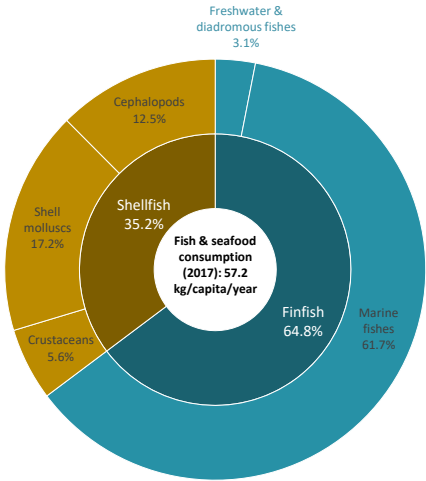
Finfish and shellfish accounted for around two thirds and one third of the consumption, respectively.

The share of shell molluscs increased from 15.3 percent to 17.2 percent; that of crustaceans from 1.5 percent to 5.6 percent; and that of freshwater & diadromous fishes from 2.2 percent to 3.1 percent.

Republic of Korea (1997)



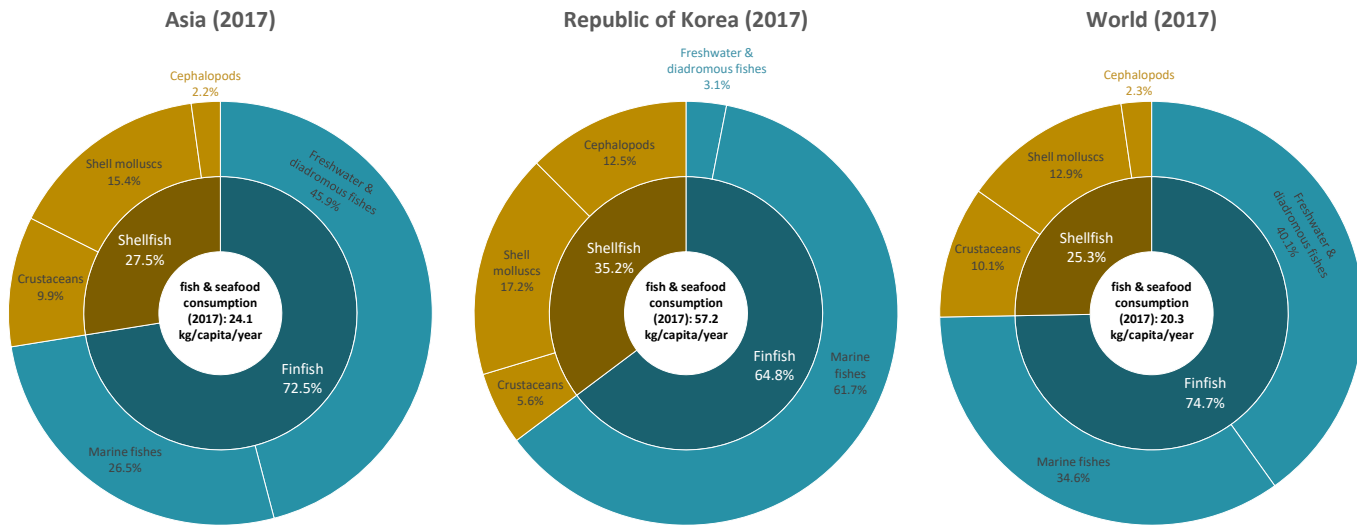
Republic of Korea (2017)



Data source: FAO. 2020. Fishery and Aquaculture Statistics. Food balance sheets of fish and fishery products 1961-2017 (FishStat); www.fao.org/fishery/statistics/software/FishStatJ/en.

Note: See slide #4 for the scope of fish & seafood.

Republic of Korea (2017): The share of marine fishes (61.7 percent) was higher than regional and world averages. So were its shares of shellfish (35 percent), shell molluscs (17.2 percent) and cephalopods (12.5 percent).



Data source: FAO. 2020. Fishery and Aquaculture Statistics. Food balance sheets of fish and fishery products 1961-2017 (FishStat); www.fao.org/fishery/statistics/software/FishStat/en.

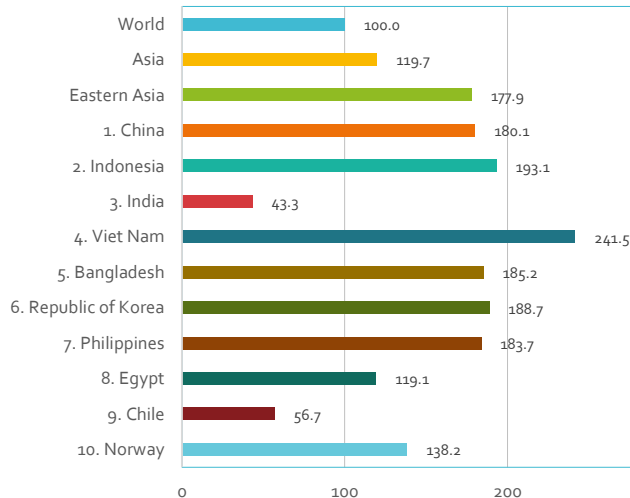
Note: See [slide #4](#) for the scope of fish & seafood.

The Republic of Korea's 188.7 seafood liking index (SLI) in the 2010s indicates that its preference for fish & seafood was nearly twice of world average. The SLI was also above the Asian average (119.7). The country's SLIs for different aquatic foods vary from 9 for freshwater & diadromous fishes to 329.3 for marine fishes and 402.6 for cephalopods. The country's 188.7 SLI_{seafood} was ranked the third among the top 10 largest aquaculture countries.

Republic of Korea's preferences for aquatic foods

Aquatic foods	Seafood liking index (SLI, 2010-17 average)	Per capita consumption, 2010-17 average	
		kg/year	Ratio to world average (%)
Fish & seafood	188.7	55.99	309.2
Finfish & shellfish	186.8	54.98	306.4
Finfish	157.3	35.05	260.4
Freshwater & diadromous fishes	9.0	1.45	22.8
Marine fishes	329.3	33.60	523.7
Shellfish	185.7	19.93	462.1
Crustaceans	63.8	3.03	188.8
Molluscs	256.3	16.91	645.6
Shell molluscs	180.4	10.28	498.7
Cephalopods	402.6	6.62	1,677.0
Miscellaneous aquatic animals	206.9	1.01	751.1

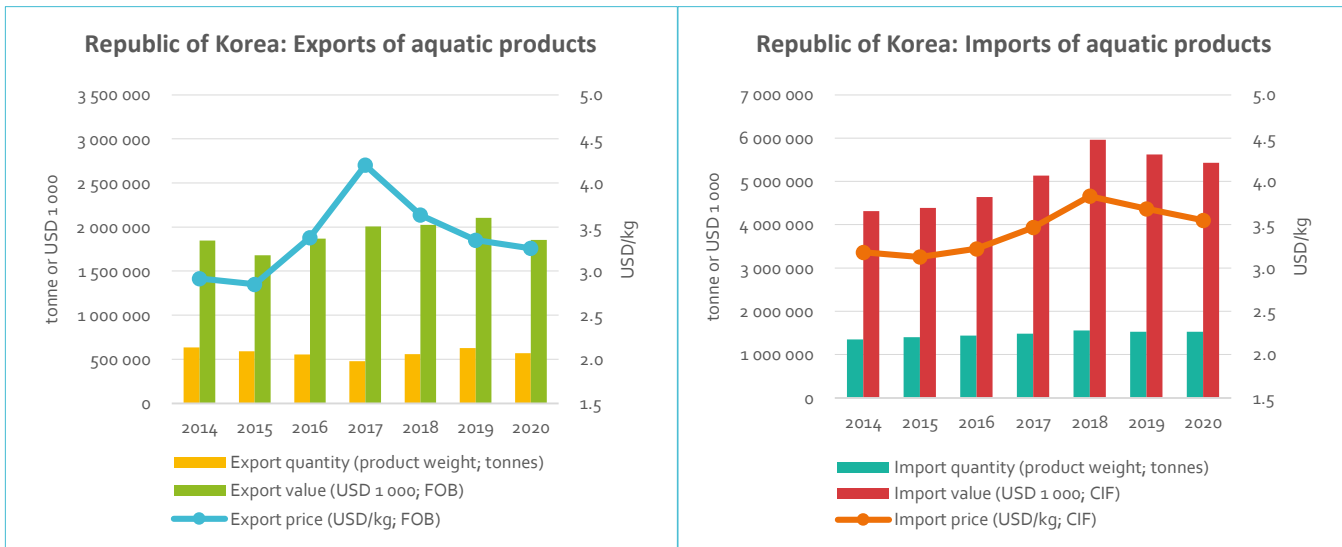
Seafood liking index (SLI; 2010–2017 average) for the top 10 largest aquaculture countries in 2020



Data source: Cai, J. & Leung, P.S. 2022. Unlocking the potential of aquatic foods in global food security and nutrition: A missing piece under the lens of seafood liking index. *Global food security*, 33, 100641. doi.org/10.1016/j.gfs.2022.100641
 Note: SLI = Seafood Liking Index.

International trade

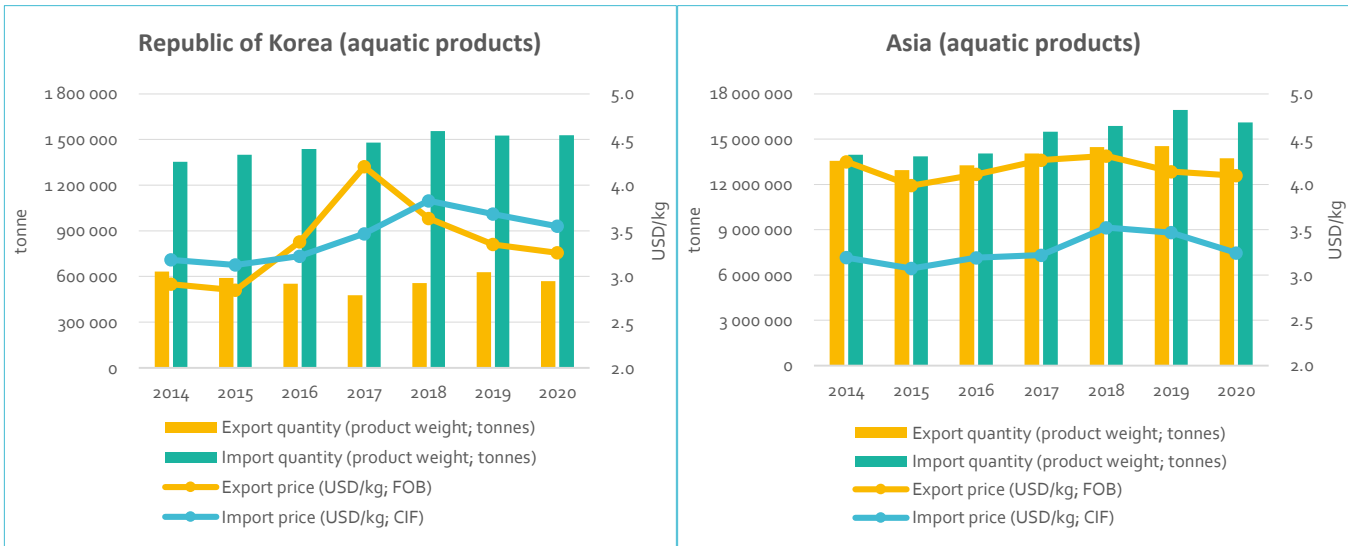
Status and trend of the international trade of aquatic products in the Republic of Korea, 2014–2020



Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global Fisheries commodities production and trade 1976-2020 (FishStat); www.fao.org/fishery/statistics/software/FishStat/en.

Notes: Includes all aquatic commodities recorded in the data source; see [slide #4](#) for the scope of aquatic products. CIF = Cost, insurance and freight; FOB = Free on board.

Republic of Korea (2014–2020): Aquatic products export quantity was much smaller than aquatic products import quantity. Similar imbalance also occurred in Asia, with a smaller gap. Aquatic products export price was higher than import price in Asia, whereas the two prices were nearly the same in the Republic of Korea.

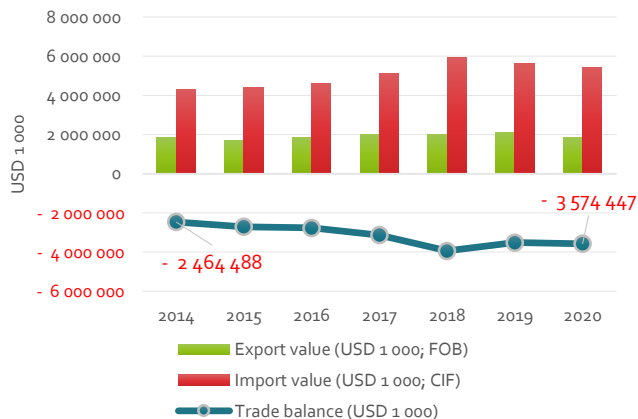


Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global Fisheries commodities production and trade 1976-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en).

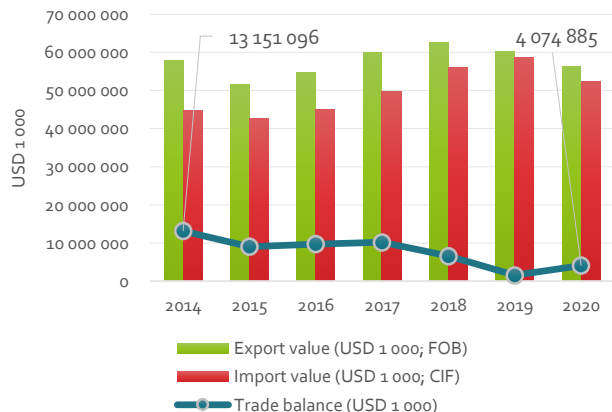
Notes: Includes all aquatic commodities recorded in the data source; see [slide #4](#) for the scope of aquatic products. CIF = Cost, insurance and freight; FOB = Free on board.

Aquatic products trade deficit in the Republic of Korea increased from USD 2.46 billion in 2014 to USD 3.57 billion in 2020, while the trade surplus in Asia declined from USD 13.15 billion to USD 4.07 billion.

Republic of Korea (aquatic products trade balance)



Asia (aquatic products trade balance)



Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global Fisheries commodities production and trade 1976-2020 (FishStat); www.fao.org/fishery/statistics/software/FishStatJ/en.

Notes: Includes all aquatic commodities recorded in the data source; see [slide #4](#) for the scope of aquatic products. CIF = Cost, insurance and freight; FOB = Free on board.

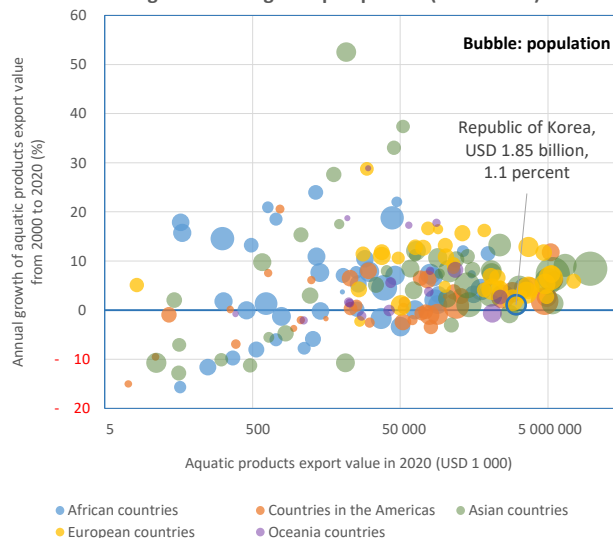
Export

In 2020, the Republic of Korea was the seventh largest fish exporting country in Asia. The country's export of aquatic products increased from USD 1.49 billion in 2000 to USD 1.85 billion in 2020, the 1.1 percent annual growth rate was lower than sub-regional, regional and world averages.

Status and trend of aquatic products export (2000–2020)

Country/area	Aquatic products export value (USD 1 000)		Annual growth (%)
	2000	2020	
World	55 833 945	152 032 046	5.1
Asia	19 193 820	56 338 256	5.5
Eastern Asia	7 980 791	24 534 890	5.8
Top 10 exporters of aquatic products in Asia, 2020			
1. China	3 706 339	18 651 325	8.4
2. Viet Nam	1 484 316	8 514 592	9.1
3. India	1 417 853	5 810 122	7.3
4. Thailand	4 384 437	5 739 224	1.4
5. Indonesia	1 608 609	5 043 546	5.9
6. Japan	832 088	2 041 127	4.6
7. Republic of Korea	1 491 441	1 852 932	1.1
8. Taiwan Province of China	1 762 576	1 503 234	-0.8
9. Turkey	92 363	1 108 381	13.2
10. Malaysia	200 469	863 746	7.6

Republic of Korea's aquatic products export growth from a global and regional perspective (2000–2020)



Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global Fisheries commodities production and trade 1976-2020 (FishStat); www.fao.org/fishery/statistics/software/FishStat/en.

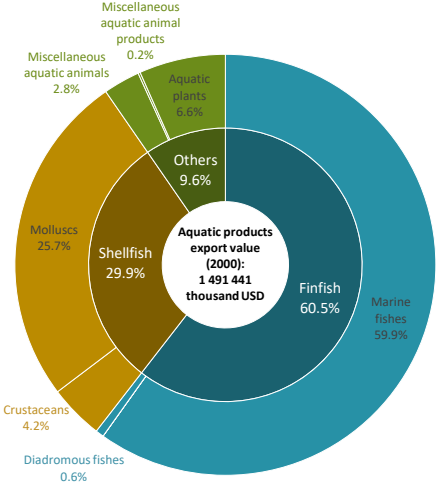
Notes: Includes all aquatic commodities recorded in the data source; see [slide #4](#) for the scope of aquatic products. The top 10 exporters of aquatic products in Asia listed in descending order per their aquatic products exports in 2020.

Republic of Korea's export of aquatic products (2000 versus 2020):

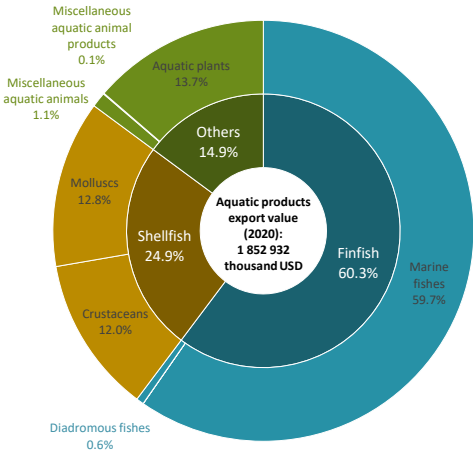
Aquatic commodities export increased from USD 1.49 billion in 2000 to USD 1.89 billion in 2020, with relatively stable finfish and shellfish shares.

The share of molluscs declined from 25.7 percent to 12.8 percent, whereas that of crustaceans increased from 4.2 percent to 12 percent.

Republic of Korea (2000)

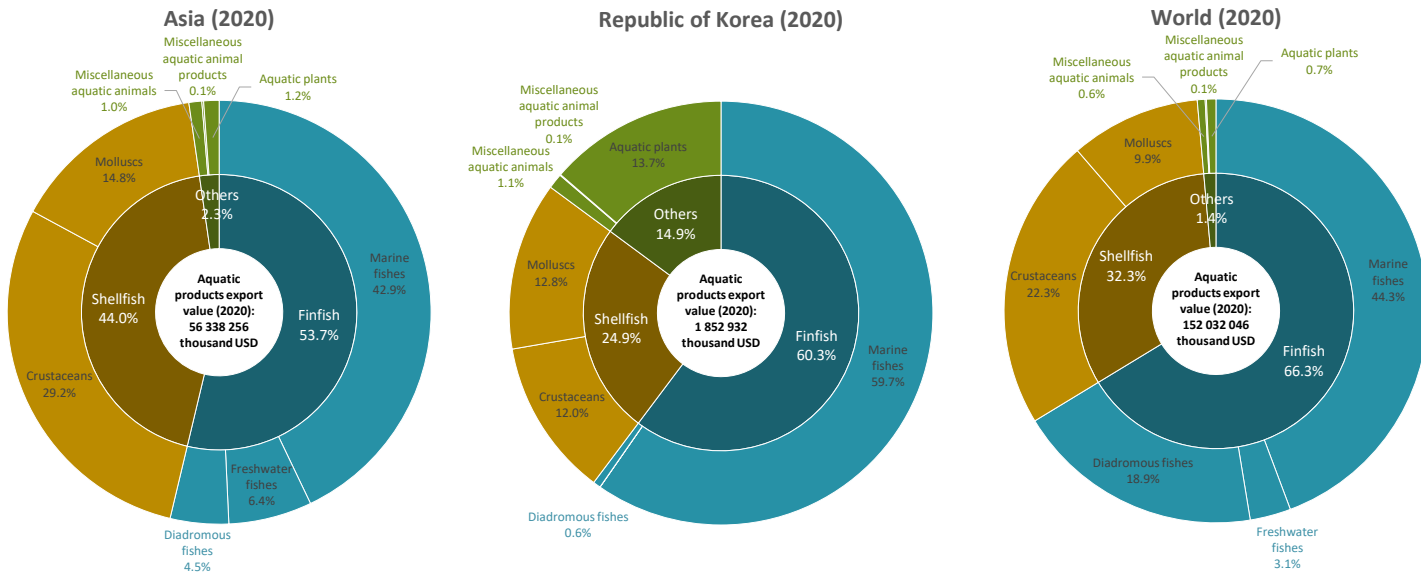


Republic of Korea (2020)



Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global Fisheries commodities production and trade 1976-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en). Notes: Includes all aquatic commodities recorded in the data source; see slide #4 for the scope of aquatic products. Species groups less than 0.1 percent of the total value not labelled in the charts.

The Republic of Korea's export of aquatic products in 2020 comprised 60.3 percent finfish, higher than the regional average yet lower than world average. The shellfish share (24.9 percent) was lower than regional and world averages. The share of aquatic plants (14.9 percent) was much higher than regional and world averages.



Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global Fisheries commodities production and trade 1976-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en).

Notes: Includes all aquatic commodities recorded in the data source; see [slide #4](#) for the scope of aquatic products. Species groups less than 0.1 percent of the total value not labelled in the charts.

Republic of Korea (2020): Tunas/bonitos/billfishes contributed 40 percent of the volume of the country's export of aquatic products (30 percent of the export value). The country accounted for nearly 90 percent of world export of cold-water red seaweeds and over 70 percent of brown seaweed export value (61 percent of export volume).

Republic of Korea's export of aquatic products, 2020

Top 10 export species groups in terms of quantity			
ISSCAAP groups	Product weight (tonnes)	Share of the country's total export of all aquatic commodities (%)	Share of world export of the same species group (%)
1. Tunas, bonitos, billfishes	227 407	40.00	5.56
2. Marine fishes not identified	60 149	10.58	0.64
3. Miscellaneous marine crustaceans	55 883	9.83	32.02
4. Miscellaneous pelagic fishes	55 673	9.79	1.63
5. Cods, hakes, haddocks	40 715	7.16	0.86
6. Herrings, sardines, anchovies	28 138	4.95	0.83
7. Brown seaweeds	18 649	3.28	61.13
8. Clams, cockles, arkshells	11 917	2.10	4.74
9. Red seaweeds (cold-water)	10 126	1.78	87.11
10. Oysters	9 457	1.66	8.10
Others	50 376	8.86	
Aquatic products	568 490	100.00	1.42

Top 10 export species groups in terms of value			
ISSCAAP groups	FOB value (USD 1 000)	Share of the country's total export of all aquatic commodities (%)	Share of world export of the same species group (%)
1. Tunas, bonitos, billfishes	561 302	30.29	3.91
2. Marine fishes not identified	225 729	12.18	1.08
3. Red seaweeds (cold-water)	177 309	9.57	88.14
4. Crabs, sea-spiders	163 132	8.80	3.82
5. Cods, hakes, haddocks	135 843	7.33	0.92
6. Oysters	71 484	3.86	13.66
7. Miscellaneous pelagic fishes	68 147	3.68	1.19
8. Miscellaneous demersal fishes	61 356	3.31	4.27
9. Brown seaweeds	60 563	3.27	71.53
10. Abalones, winkles, conchs	56 299	3.04	8.36
Others	271 769	14.67	
Aquatic products	1 852 932	100.00	1.22

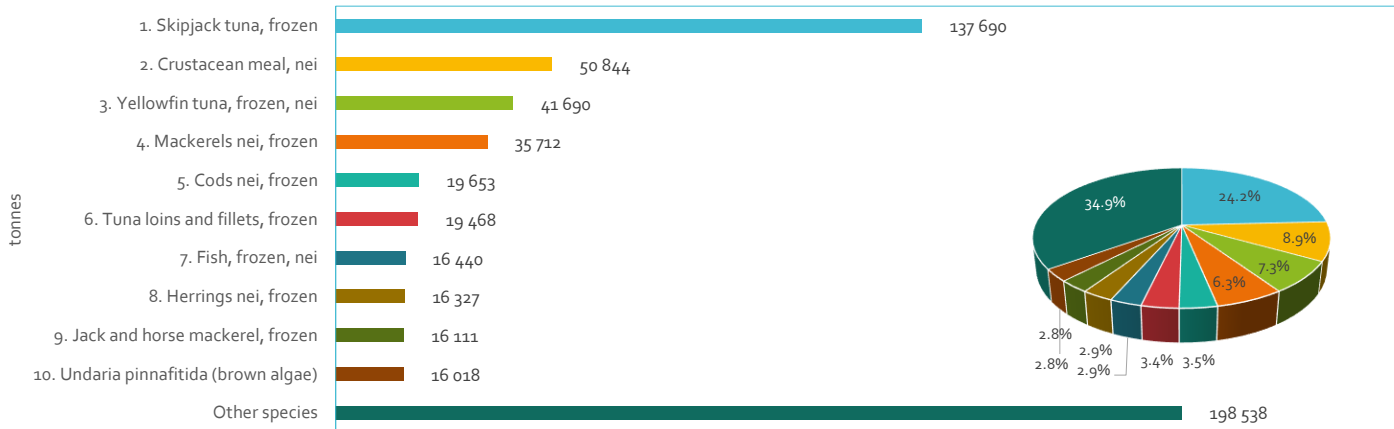
Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global Fisheries commodities production and trade 1976-2020 (FishStatJ)

www.fao.org/fishery/statistics/software/FishStatJ/en

Notes: Includes all aquatic commodities recorded in the data source; see [slide #4](#) for the scope of aquatic products. FOB = Free on board; ISSCAAP = International Standard Statistical Classification of Aquatic Animals and Plants.

Republic of Korea's export of aquatic products (quantity; 2020)

Republic of Korea's top-10 export aquatic products (2020; in terms of quantity)

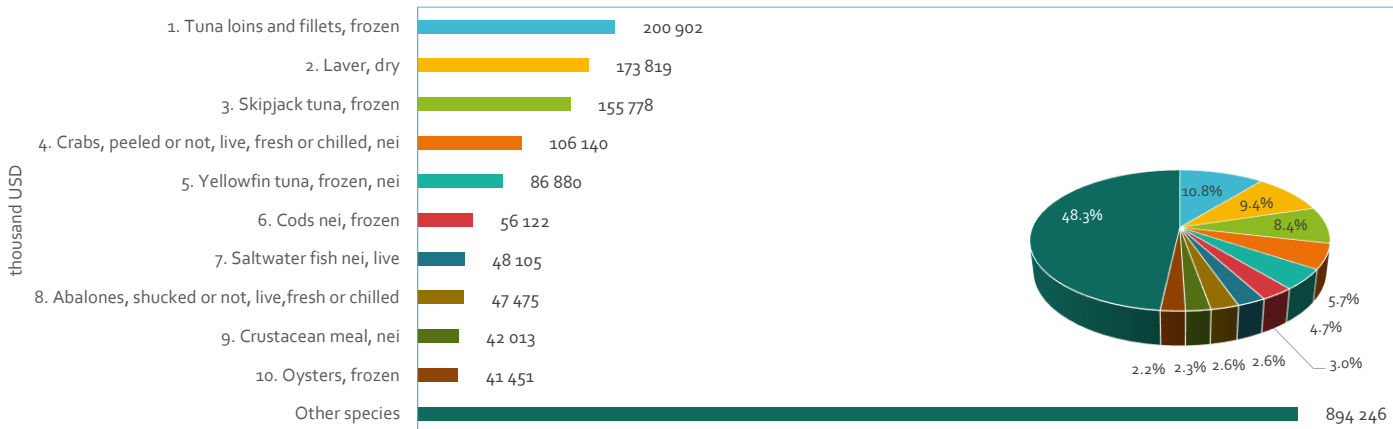


Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global Fisheries commodities production and trade 1976-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en).

Notes: Includes all aquatic commodities recorded in the data source. Nei = not elsewhere included.

Republic of Korea's export of aquatic products (value; 2020)

Republic of Korea's top-10 export aquatic products (2020; in terms of value)



Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global Fisheries commodities production and trade 1976-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en).

Notes: Includes all aquatic commodities recorded in the data source. Nei = not elsewhere included.

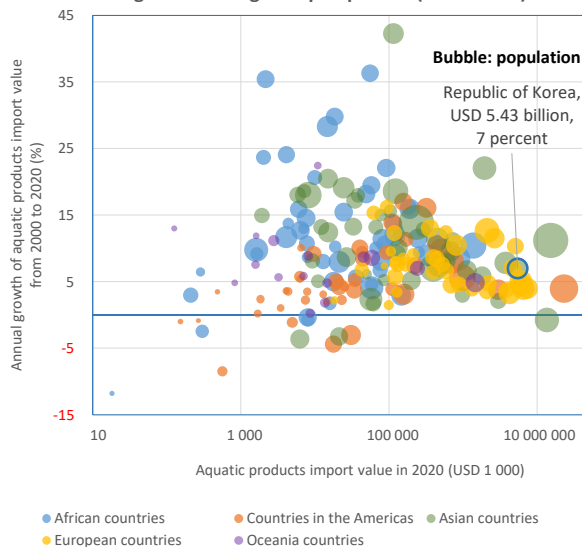
Import

The Republic of Korea's import of aquatic products increased from USD 1.41 billion in 2000 to USD 5.43 billion in 2020; the 7 percent annual growth rate was higher than sub-regional, regional and world averages, and the country was the third largest importers of aquatic products in Asia.

Status and trend of aquatic products imports (2000–2020)

Country/area	Aquatic products import value (USD 1 000)		Annual growth (%)
	2000	2020	
World	61 029 946	151 617 079	4.7
Asia	24 224 979	52 263 371	3.9
Eastern Asia	21 553 335	39 067 567	3.0
Top 10 importers of aquatic products in Asia, 2020			
1. China	1 820 699	15 219 789	11.2
2. Japan	15 742 561	13 479 930	-0.8
3. Republic of Korea	1 411 994	5 427 379	7.0
4. Thailand	826 699	3 743 441	7.8
5. China, Hong Kong Special Administrative Region	1 972 035	2 994 366	2.1
6. Viet Nam	36 242	1 947 428	22.0
7. Taiwan Province of China	578 933	1 801 049	5.8
8. Malaysia	307 340	1 122 053	6.7
9. Singapore	544 165	980 277	3.0
10. United Arab Emirates	86 919	723 563	11.2

Republic of Korea's aquatic products import growth from a global and regional perspective (2000–2020)



Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global Fisheries commodities production and trade 1976-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en).

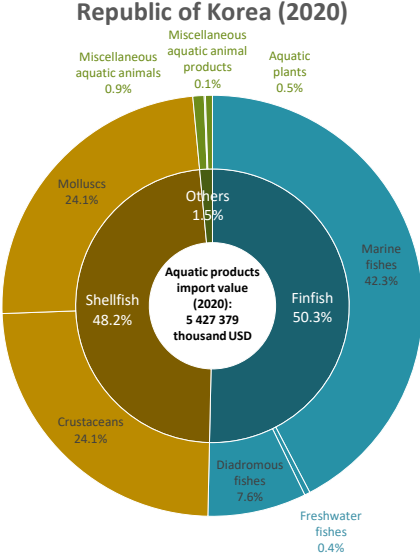
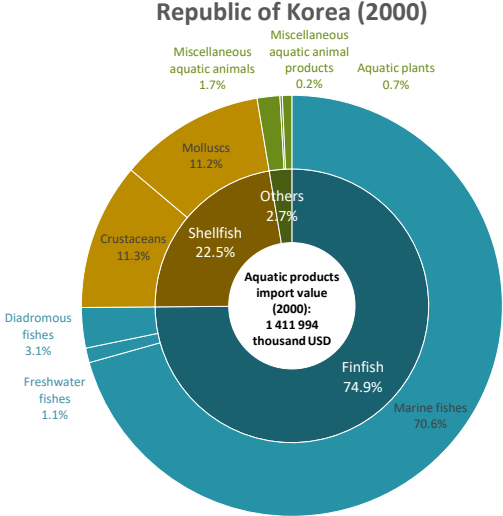
Notes: Includes all aquatic commodities recorded in the data source; see [slide #4](#) for the scope of aquatic products. The top 10 importers of aquatic products in Asia listed in descending order per their aquatic products imports in 2020.

Republic of Korea's import of aquatic products (2000 versus 2020):

Aquatic commodities import increased from USD 1.41 billion in 2000 to USD 5.43 billion in 2020.

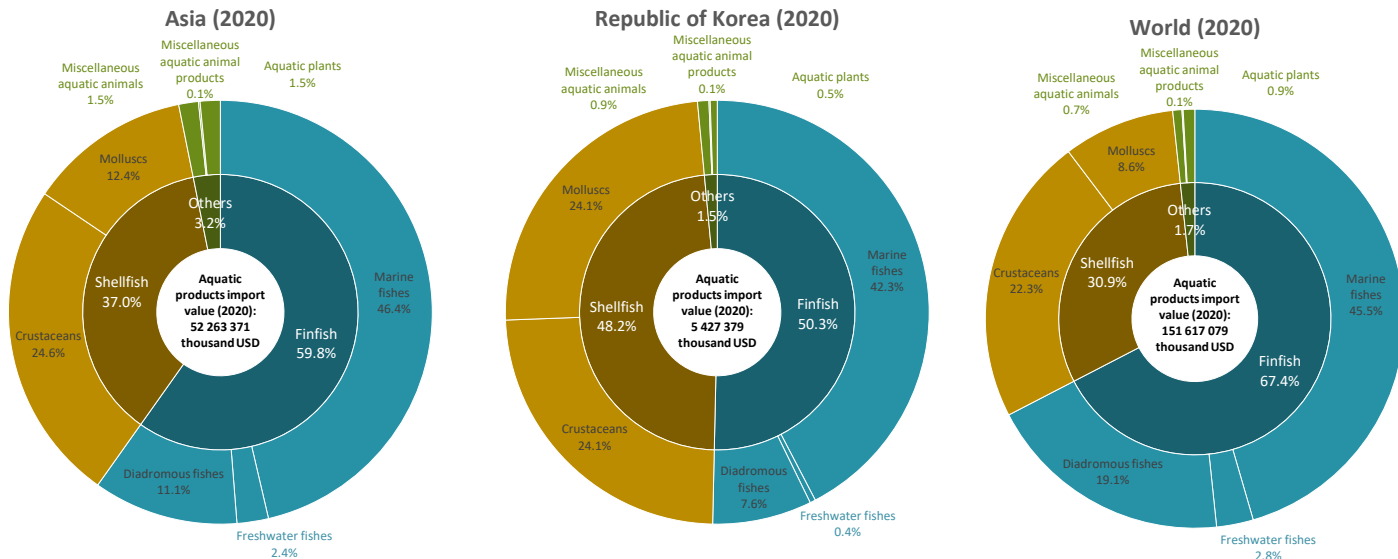
The share of finfish declined from 74.9 percent to 50.3 percent, which primarily reflected the decline in marine fishes from 70.6 percent to 42.3 percent, whereas the share of diadromous fishes increased from 3.1 percent to 7.6 percent.

The share of shellfish increased from 22.5 percent to 48.2 percent, reflecting increases in both crustaceans and molluscs shares.



Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global Fisheries commodities production and trade 1976-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en). Notes: Includes all aquatic commodities recorded in the data source; see slide #4 for the scope of aquatic products. Species groups less than 0.1 percent of the total value not labelled in the charts.

Republic of Korea's import of aquatic products (2020): The USD 5.43 billion of aquatic products import in 2020 was nearly split between finfish (50.3 percent) and shellfish (48.2 percent). The share of marine fishes (42.3 percent) was similar to regional and world averages, whereas that of diadromous fishes or freshwater fishes was smaller. The share of crustaceans (24.1 percent) was similar to regional and world averages, whereas the molluscs share (24.1 percent) was greater.



Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global Fisheries commodities production and trade 1976-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en).

Notes: Includes all aquatic commodities recorded in the data source; see [slide #4](#) for the scope of aquatic products. Species groups less than 0.1 percent of the total value not labelled in the charts.

Republic of Korea (2020): The country's import of aquatic products (1.5 million tonnes; USD 5.43 billion) spread across various species groups, with the largest group, i.e. marine fishes not identified (in terms of volume) or squids/cuttlefishes/octopuses (in terms of value), accounting for less than one fifth of the total amount.

Republic of Korea's import of aquatic products in 2019

Top 10 import species groups in terms of quantity			
ISSCAAP groups	Product weight (tonnes)	Share of the country's total import of all aquatic commodities (%)	Share of world import of the same species group (%)
1. Marine fishes not identified	285 373	18.67	3.05
2. Squids, cuttlefishes, octopuses	234 507	15.34	10.84
3. Cods, hakes, haddocks	233 472	15.28	4.94
4. Miscellaneous coastal fishes	142 359	9.32	28.17
5. Shrimps, prawns	98 093	6.42	2.93
6. Miscellaneous pelagic fishes	86 462	5.66	2.53
7. Herrings, sardines, anchovies	84 829	5.55	2.50
8. Miscellaneous demersal fishes	61 227	4.01	14.03
9. Crabs, sea-spiders	53 296	3.49	15.69
10. Clams, cockles, arkshells	51 784	3.39	20.61
Others	196 851	12.88	
Aquatic products	1 528 254	100.00	3.81

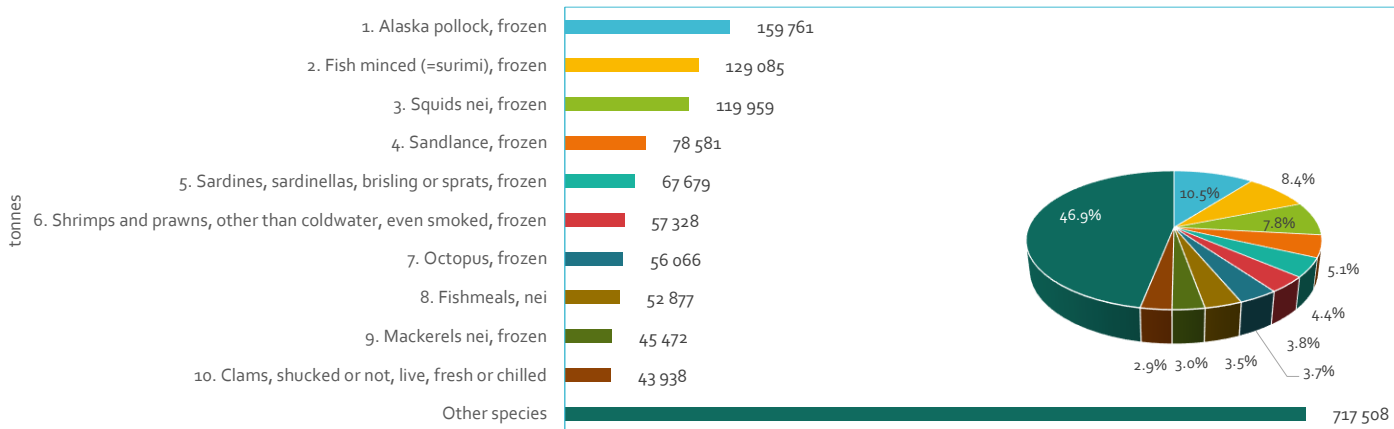
Top 10 import species groups in terms of value			
ISSCAAP groups	CIF value (USD 1 000)	Share of the country's total import of all aquatic commodities (%)	Share of world import of the same species group (%)
1. Squids, cuttlefishes, octopuses	1 040 779	19.18	10.18
2. Marine fishes not identified	862 912	15.90	4.12
3. Shrimps, prawns	644 047	11.87	2.64
4. Crabs, sea-spiders	559 629	10.31	13.10
5. Cods, hakes, haddocks	477 153	8.79	3.23
6. Salmons, trouts, smelts	358 322	6.60	1.31
7. Miscellaneous coastal fishes	298 888	5.51	13.02
8. Tunas, bonitos, billfishes	213 425	3.93	1.49
9. Miscellaneous demersal fishes	151 438	2.79	10.54
10. Miscellaneous pelagic fishes	139 072	2.56	2.43
Others	681 716	12.56	
Aquatic products	5 427 379	100.00	3.57

Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global Fisheries commodities production and trade 1976-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en).

Notes: Includes all aquatic commodities recorded in the data source; see [slide #4](#) for the scope of aquatic products. CIF = Cost, insurance and freight; ISSCAAP = International Standard Statistical Classification of Aquatic Animals and Plants.

Composition of the Republic of Korea's import of aquatic products (2020; in terms of quantity)

Republic of Korea's top-10 fish imports products (2020; in terms of quantity)

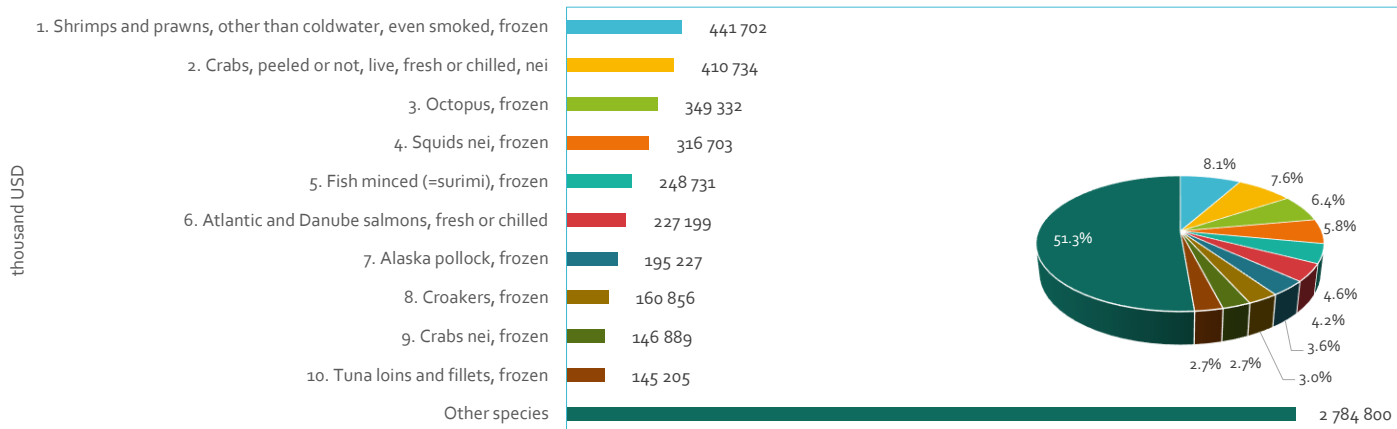


Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global Fisheries commodities production and trade 1976-2020 (FishStatJ); www.fao.org/fishery/statistics/software/FishStatJ/en.

Notes: Includes all aquatic commodities recorded in the data source. Nei = not elsewhere included.

Composition of the Republic of Korea's import of aquatic products (2020; in terms of value)

Republic of Korea's top-10 fish imports products (2020; in terms of value)

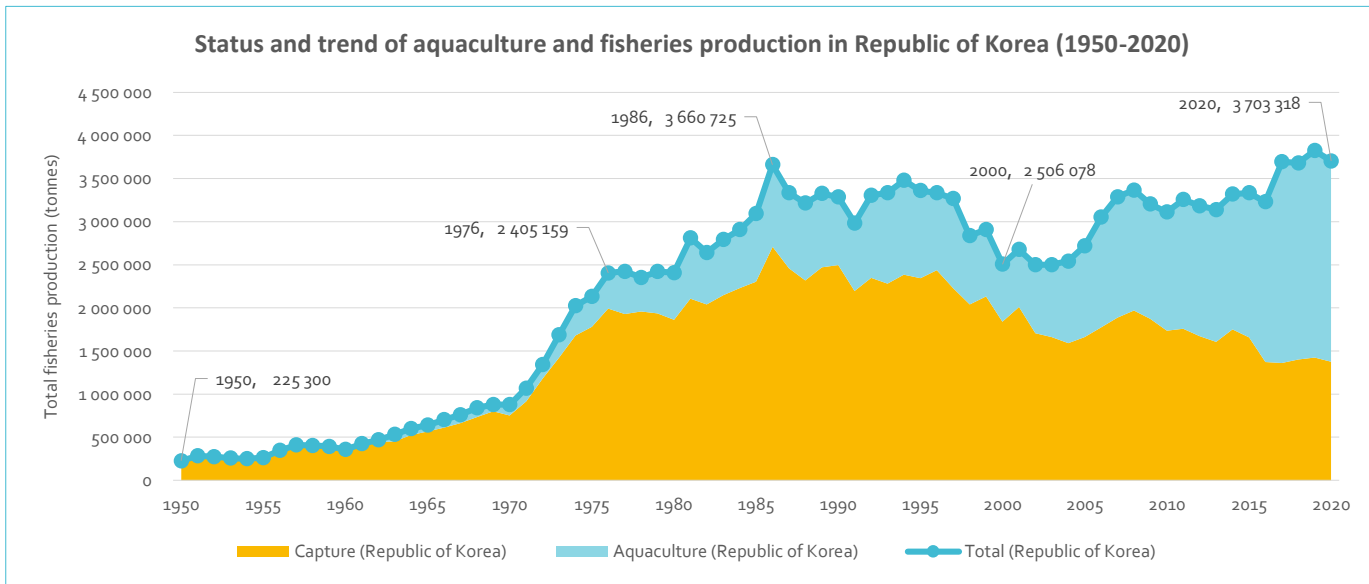


Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global Fisheries commodities production and trade 1976-2020 (FishStatJ); www.fao.org/fishery/statistics/software/FishStatJ/en.

Notes: Includes all aquatic commodities recorded in the data source. Nei = not elsewhere included.

Total fisheries production

Republic of Korea (1950–2020): Total fisheries production increased from ~200 000 tonnes in 1950 to 2.4 million tonnes in 1976 thanks mostly to the expansion of capture fisheries. The production further increased to 3.7 million tonnes in 1986, reflecting increases in both capture and culture production. The production declined to 2.5 million tonnes in 2000, reflecting mostly a decline in capture production, and then increased to 3.7 million tonnes in 2020, reflecting the expansion of aquaculture.



Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global production by production source 1950-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en).

Notes: Production covers all aquatic species measured in tonnage; see [slide #4](#) for the scope of aquatic species.

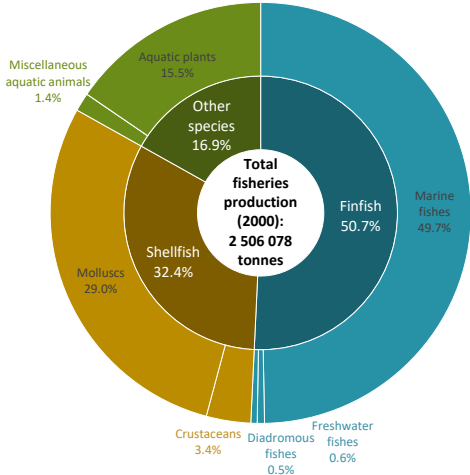
Total fisheries production in the Republic of Korea (2000 versus 2020):

Total fisheries production increased from 2.5 million tonnes in 2000 to 3.7 million tonnes in 2020.

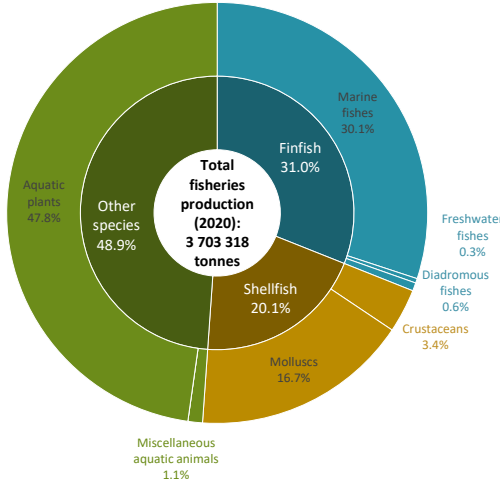
The share of marine fishes declined from 49.7 percent to 30.1 percent, and that of molluscs from 29 percent to 16.7 percent, whereas the share of aquatic plants (algae) increased from 15.5 percent to 47.8 percent.

These composition changes were primarily due to the decline in capture fisheries production (which comprised mostly finfish and molluscs) with the increase in aquaculture production (which was dominated by seaweed cultivation).

Republic of Korea (2000)



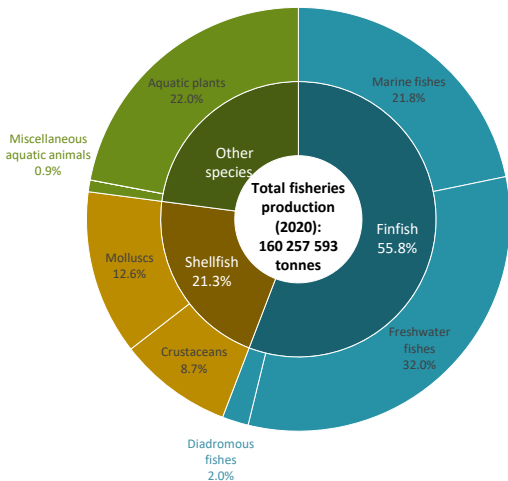
Republic of Korea (2020)



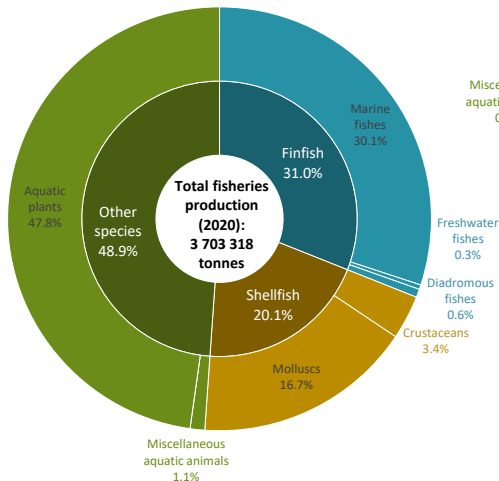
Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global production by production source 1950-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en).
 Notes: Production covers all aquatic species measured in tonnage; see slide #4 for the scope of aquatic species. Species accounting for less than 0.1 percent of total production not labelled in the charts.

Nearly half of total fisheries production in the Republic of Korea (2020) came from aquatic plants (algae). The share of marine fishes (30.1 percent) was slightly lower than world average yet higher than the regional average, whereas the share of molluscs (16.7 percent) was higher than regional and world averages.

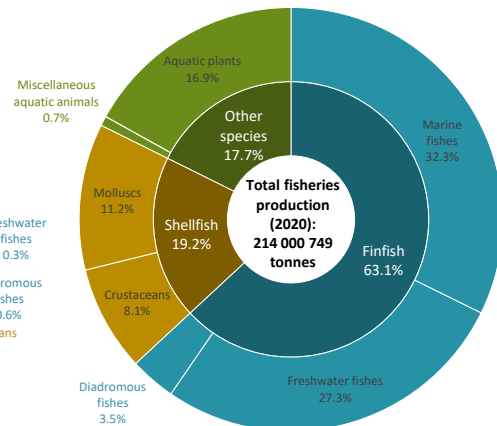
Asia (2020)



Republic of Korea (2020)



World (2020)



Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global production by production source 1950-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en).

Notes: Production covers all aquatic species measured in tonnage; see [slide #4](#) for the scope of aquatic species. Species accounting for less than 0.1 percent of total production not labelled in the charts.

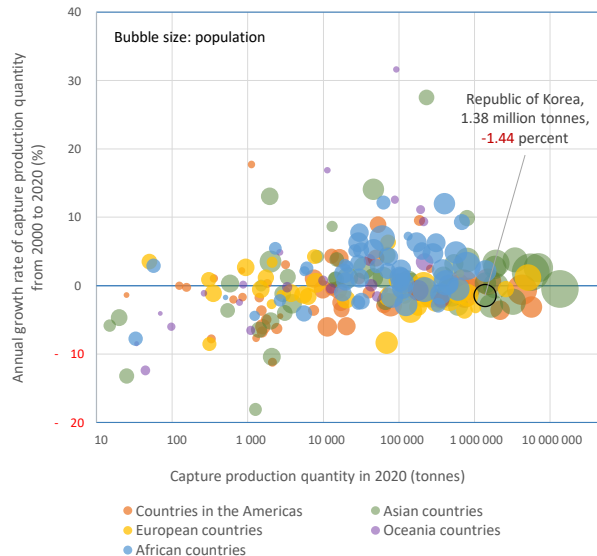
Capture fisheries production

The Republic of Korea was one of 11 countries in Asia with over 1 million tonnes of capture fisheries production in 2020. Its capture fisheries production declined from 1.84 million tonnes in 2000 to 1.38 million tonnes in 2020; the 1.44 percent annual decline represented a lower growth than sub-regional, regional and world averages.

Status and trend of capture fisheries production

Country/area	Capture fisheries production (tonnes)		Annual growth (%)
	2000	2020	
World	94 780 558	91 420 562	-0.18
Eastern Asia	23 319 442	18 966 007	-1.03
Asia	43 985 051	47 956 444	0.43
Top 10 largest capture fisheries countries in Asia, 2020			
1. China	14 823 866	13 445 983	-0.49
2. Indonesia	4 158 535	6 989 382	2.63
3. India	3 726 427	5 522 714	1.99
4. Viet Nam	1 629 612	3 421 880	3.78
5. Japan	5 191 575	3 215 130	-2.37
6. Bangladesh	1 004 264	1 919 505	3.29
7. Philippines	1 920 017	1 914 854	-0.01
8. Myanmar	1 093 200	1 853 564	2.68
9. Thailand	2 997 124	1 655 380	-2.92
10. Malaysia	1 293 397	1 393 004	0.37
11. Republic of Korea	1 838 195	1 375 415	-1.44

Growth of capture fisheries in the Republic of Korea from a global and regional perspective (2000-2020)



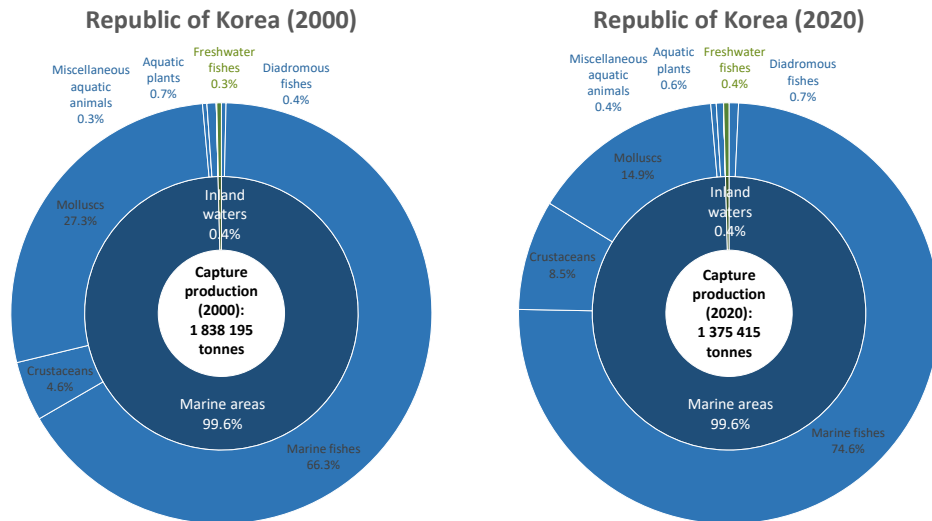
Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global capture production 1950-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en).

Notes: N.a. = not available. Country grouping based on UN-OHRLS and UN M49 standard. Production covers all aquatic species measured in tonnage; see [slide #4](#) for the scope of aquatic species. The top 10 largest capture fisheries countries listed in descending order per their capture production in 2020.

Capture fisheries in the Republic of Korea (2000 versus 2020):

Capture fisheries production declined from 1.84 million tonnes in 2000 to 1.38 million tonnes in 2020.

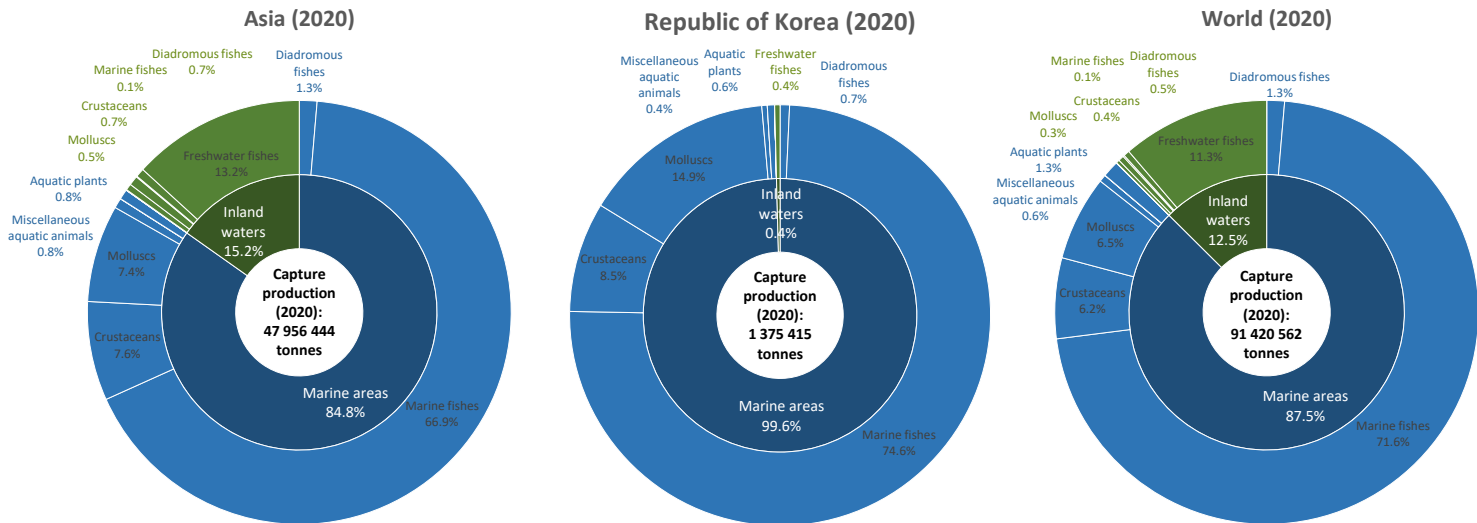
99.6 percent of the production came from marine fisheries.



Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global capture production 1950-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en).

Notes: Production covers all species measured in tonnage; see [slide #4](#) for the scope of aquatic species. Marine areas including coastal areas. Species accounting for less than 0.1 percent of total production not labelled in the charts.

Capture fisheries in the Republic of Korea (2020): Inland fisheries contributed less than half a percent of the country's capture fisheries production in 2020, as opposed to 15.2 percent in Asia and 12.5 percent in the world.



Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global capture production 1950-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en).

Notes: Production covers all species measured in tonnage; see [slide #4](#) for the scope of aquatic species. Marine areas including coastal areas. Species accounting for less than 0.1 percent of total production not labelled in the charts.

Taxonomic composition of capture fisheries production in the Republic of Korea (2000 versus 2020):

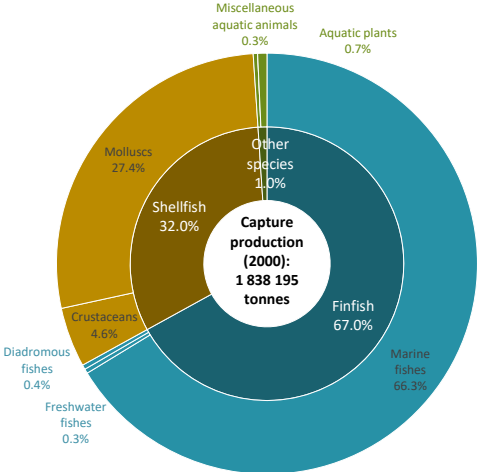
Capture fisheries production declined from 1.84 million tonnes in 2000 to 1.38 million tonnes in 2020.

The share of marine fishes increased from 66.3 percent to 74.6 percent.

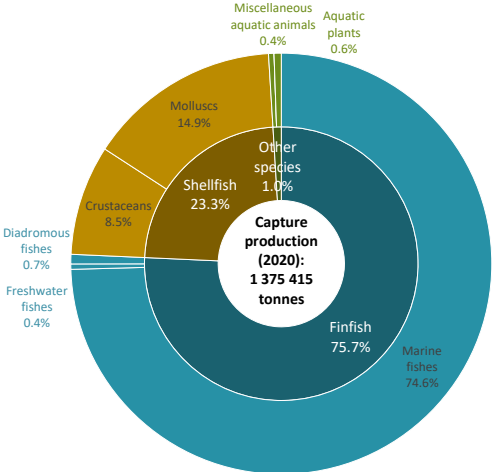
The share of crustaceans increased from 4.6 percent to 8.5 percent.

The share of molluscs declined from 27.4 percent to 14.9 percent.

Republic of Korea (2000)



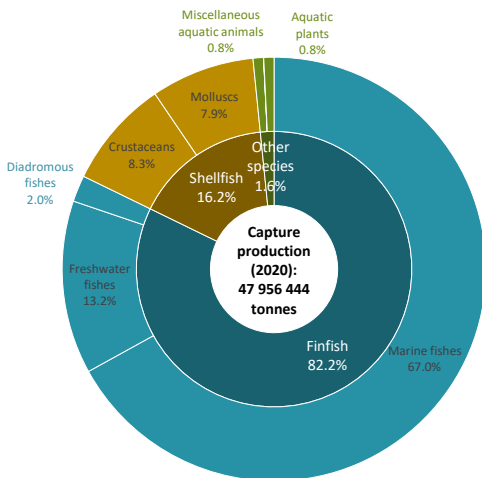
Republic of Korea (2020)



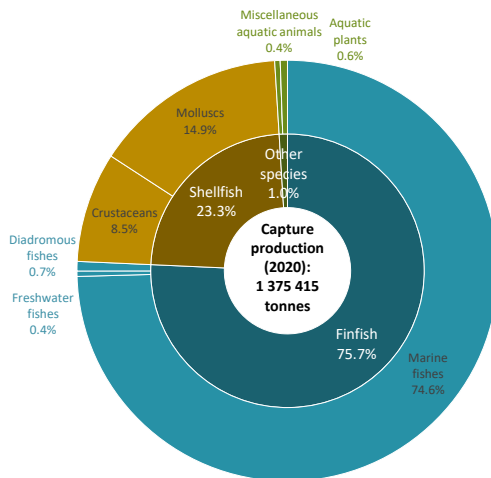
Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global capture production 1950-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en).
 Notes: Production covers all species measured in tonnage; see [slide #4](#) for the scope of aquatic species. Species accounting for less than 0.1 percent of total production not labelled in the charts.

Marine fishes accounted for three fourths of the Republic of Korea's capture fisheries production in 2020. The share was higher than world and regional averages; so was the share of molluscs. The share of freshwater fishes (less than half a percent) was much lower than regional and world averages.

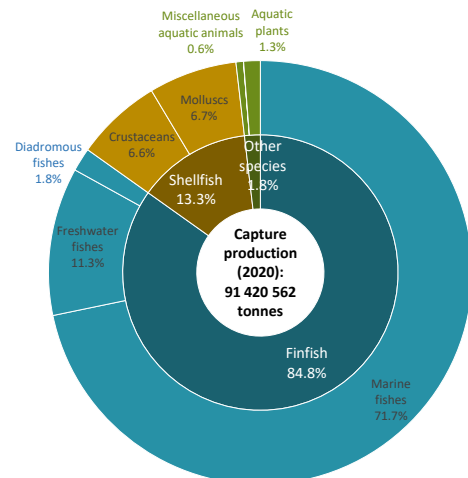
Asia (2020)



Republic of Korea (2020)



World (2020)

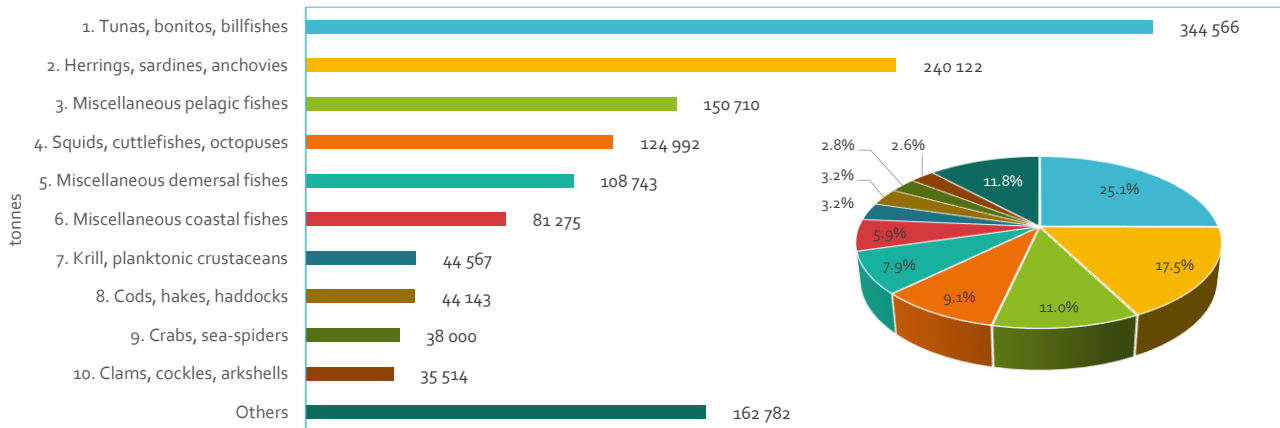


Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global production by production source 1950-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en).

Notes: Production covers all species measured in tonnage; see [slide #4](#) for the scope of aquatic species. Species accounting for less than 0.1 percent of total production not labelled in the charts.

Taxonomic composition of ROK's capture fisheries production: tunas/bonitos/billfishes, herrings/sardines/anchovies, and miscellaneous pelagic fishes accounted for over half of the country's capture fisheries production in 2020.

Top-10 ISSCAAP groups in the Republic of Korea's capture production quantity (2020)

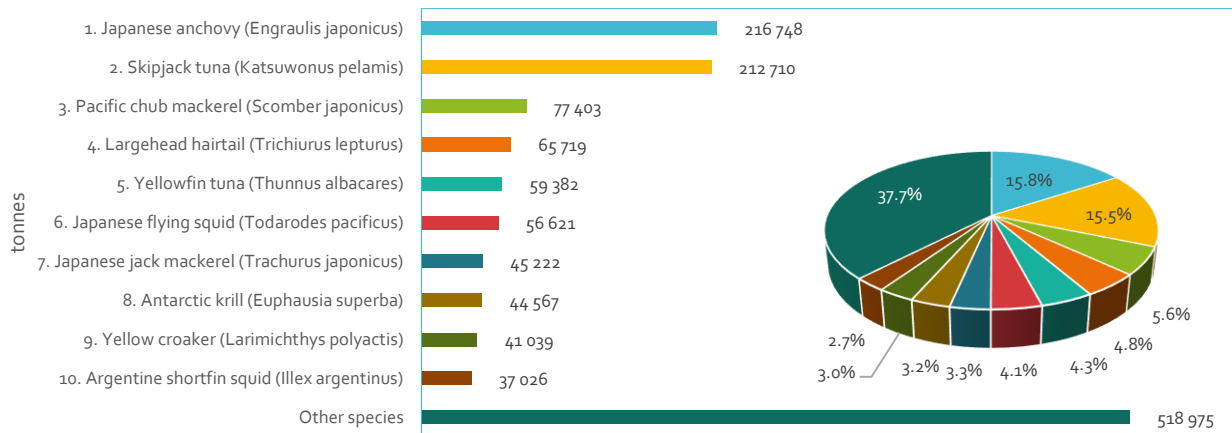


Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global capture production 1950-2020 (FishStatJ). www.fao.org/fishery/statistics/software/FishStatJ/en

Note: **ISSCAAP** = International Standard Statistical Classification of Aquatic Animals and Plants.

Species composition of ROK's capture fisheries production: Japanese anchovy (*Engraulis japonicus*) and skipjack tuna (*Katsuwonus pelamis*) accounted for around one third of the country's capture fisheries production in 2020; the rest spread across a variety of species.

Top-10 ASFIS species items in Republic of Korea's capture production quantity (2020)



Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global capture production 1950-2020 (FishStatJ). www.fao.org/fishery/statistics/software/FishStatJ/en

Notes: The common and scientific names of a species follow the names adopted in the database. Nei = not elsewhere included. ASFIS = Aquatic Sciences and Fisheries Information System. www.fao.org/fishery/collection/asfis/en

Aquaculture production

Aquaculture production in the Republic of Korea increased from ~0.7 million tonnes in 2000 to 2.3 million tonnes in 2020. The 6.4 percent of annual growth was higher than sub-regional, regional and world averages. In 2020, the country was the 6th largest aquaculture country in Asia (also the 6th largest in the world).

Status and trends of aquaculture production

Country/area	Aquaculture production of all species (tonnes)		Annual growth (%)
	2000	2020	
World	43 016 624	122 580 187	5.38
Eastern Asia	32 438 399	74 770 377	4.26
Asia	38 910 396	112 301 149	5.44
Top 10 largest aquaculture countries in Asia, 2020			
1. China	29 749 708	70 483 538	4.41
2. Indonesia	993 727	14 845 014	14.48
3. India	1 942 531	8 641 286	7.75
4. Viet Nam	513 517	4 614 692	11.60
5. Bangladesh	657 120	2 583 866	7.09
6. Republic of Korea	667 883	2 327 903	6.44
7. Philippines	1 100 902	2 322 831	3.80
8. Myanmar	98 912	1 145 018	13.03
9. Japan	1 291 735	996 297	-1.29
10. Thailand	738 155	962 467	1.34

Aquaculture growth in Republic of Korea from a global and regional perspective (2000-2020)

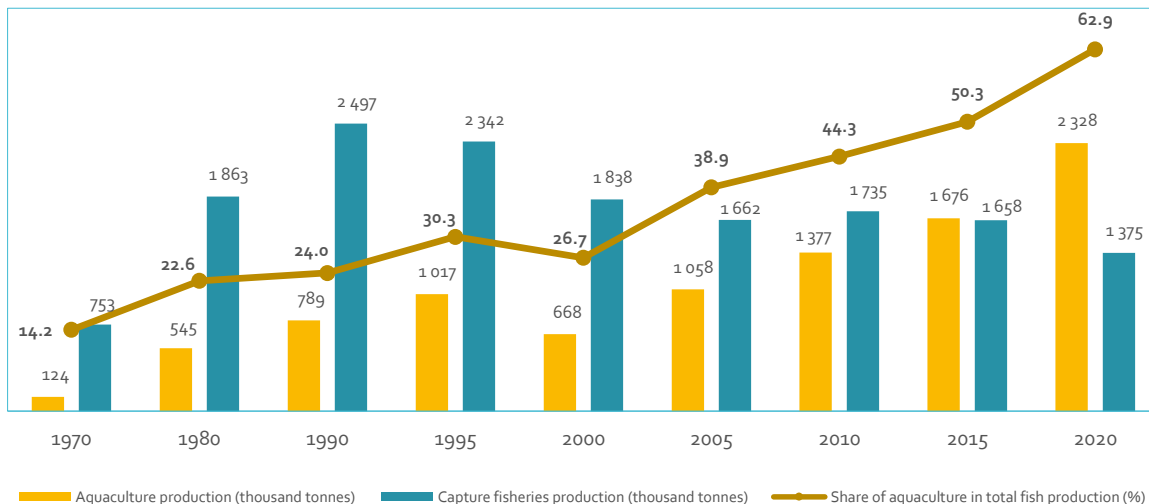


Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global aquaculture production 1950-2020 (FishStat); www.fao.org/fishery/statistics/software/FishStatU/en.

Notes: Production covers all aquatic species measured in tonnage; see [slide #4](#) for the scope of aquatic species. The top 10 largest aquaculture countries in Asia listed in descending order per their aquaculture production in 2020.

Aquaculture production in the Republic of Korea increased from 124 000 tonnes in 1970 to 2.3 million tonnes in 2020; the share of aquaculture in Total fisheries production increased from 14.2 percent to 62.9 percent.

Republic of Korea: aquaculture's share in total fishery production

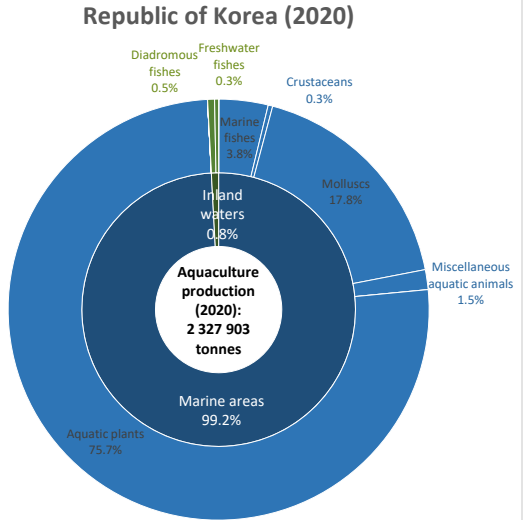
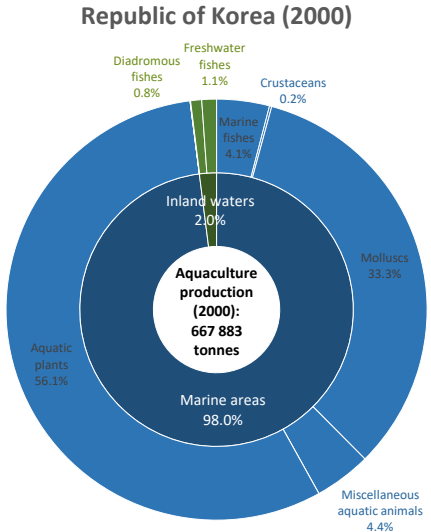


Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global aquaculture production 1950-2020 (FishStat); www.fao.org/fishery/statistics/software/FishStat/en.
 Notes: Production covers all aquatic species measured in tonnage; see [slide #4](#) for the scope of aquatic species.

Aquaculture production in the Republic of Korea by farming area (2000 versus 2020):

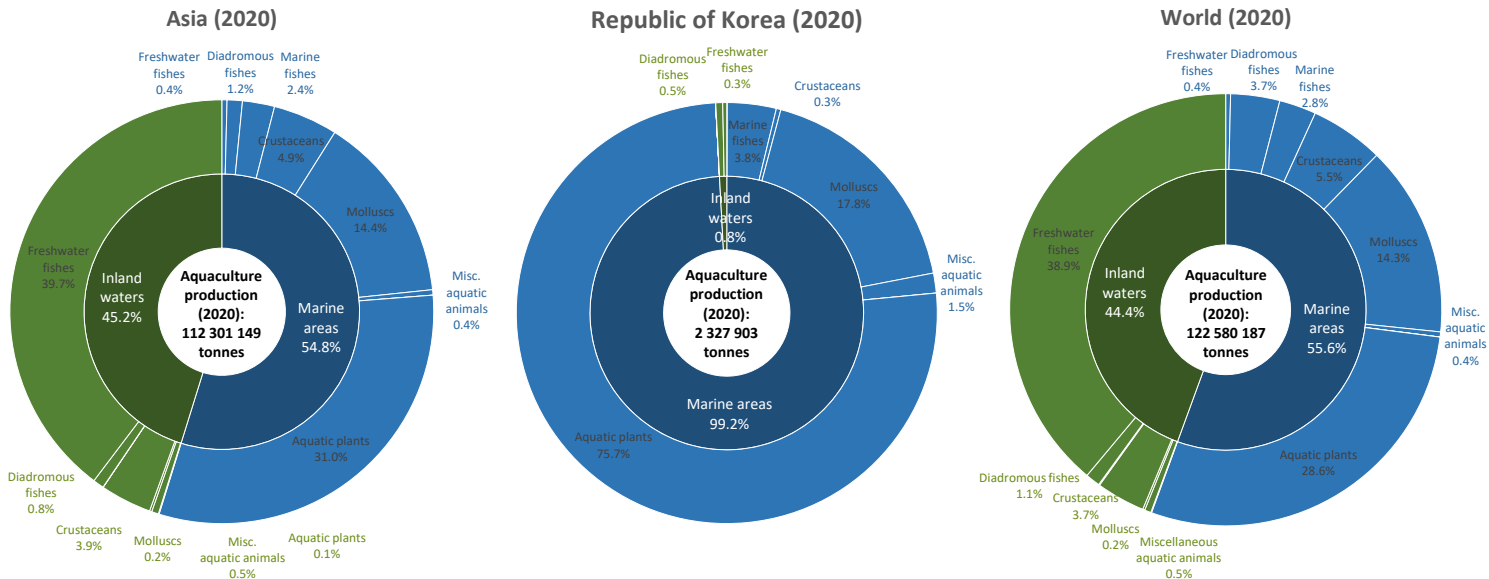
Aquaculture production increased from 0.7 million tonnes in 2000 to 2.3 million tonnes in 2020.

The share of inland aquaculture declined from 2 percent to 0.8 percent.



Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global aquaculture production 1950-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en).
 Notes: Production covers all species measured in tonnage; see slide #4 for the scope of aquatic species. Species group less than 0.1 percent of total production may not be labelled.

Aquaculture production in the Republic of Korea by farming area (2020): Inland aquaculture accounted for 0.8 percent of the country's aquaculture production in 2020, as opposed to 45.2 percent in Asia and 44.4 percent in world aquaculture.



Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global aquaculture production 1950-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en).

Notes: Constructed by the FAO WAPI Aquaculture Production Module (WAPI-AQPRN); see Figure 1.5 in WAPI-AQPRN v.2018.1 for a similar example (www.fao.org/fishery/statistics/software/wapi/en).

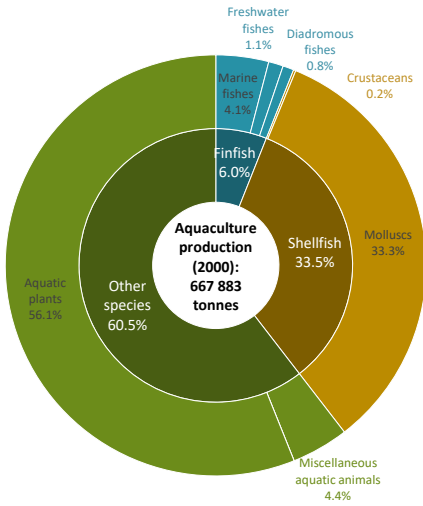
Production covers all aquatic species measured in tonnage; see [slide #4](#) for the scope of aquatic species. Species group less than 0.1 percent of total production may not be labelled.

Taxonomic composition in the Republic of Korea's aquaculture production (2000 versus 2020):

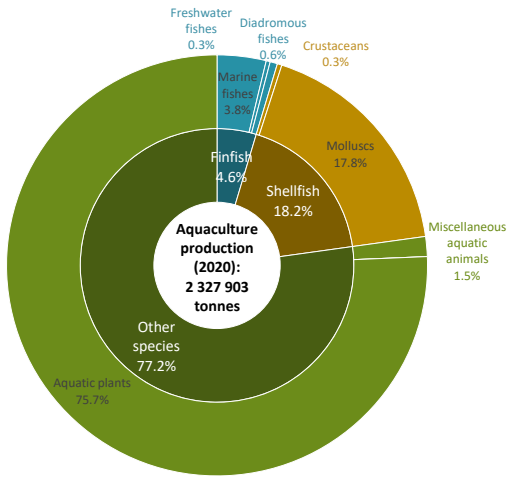
Aquaculture production increased from 0.7 million tonnes in 2000 to 2.3 million tonnes in 2020.

The share of aquatic plants (algae) increased from 56.1 percent to 75.7 percent, whereas the share of shellfish (mostly molluscs) declined from 33.5 percent to 18.2 percent and the finfish (mostly marine fishes) share from 6 percent to 4.6 percent.

Republic of Korea (2000)



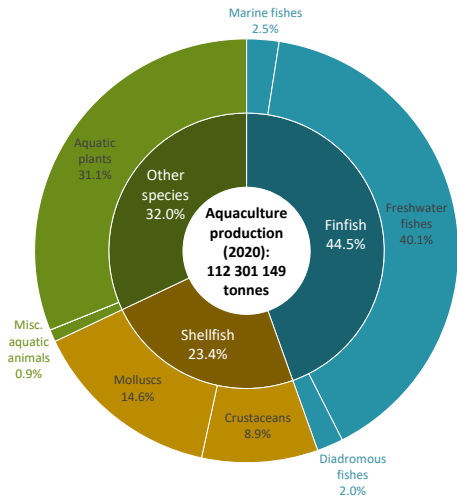
Republic of Korea (2020)



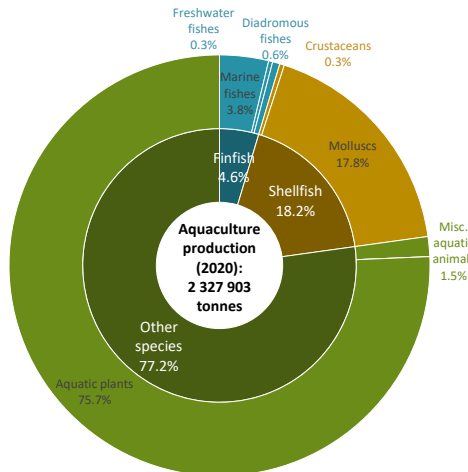
Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global capture production 1950-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatJ/en).
 Notes: Production covers all species measured in tonnage; see [slide #4](#) for the scope of aquatic species. Species accounting for less than 0.1 percent of total production not labelled in the charts.

The Republic of Korea's 2.3 million tonnes of aquaculture production in 2020 was concentrated on aquatic plants (algae; 75.7 percent) and molluscs (17.8 percent). The 4.6 percent finfish share was much lower than Asia (44.5 percent) and world aquaculture (46.9 percent).

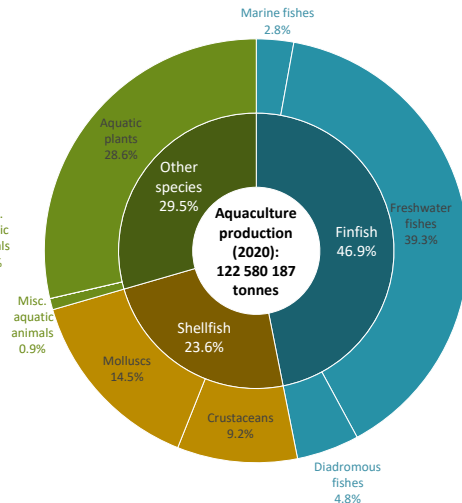
Asia (2020)



Republic of Korea (2020)



World (2020)



Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global aquaculture production 1950-2020 (FishStatJ; www.fao.org/fishery/statistics/software/FishStatU/en).

Notes: Production covers all aquatic species measured in tonnage; see [slide #4](#) for the scope of aquatic species. Species group less than 0.1 percent of total production may not be labelled.

The ROK's 2.3 million tonnes of aquaculture production in 2020 was contributed by 58 ASFIS species items, yet the effective number of species (ENS; a measure of species diversity) was only 7. Brown seaweeds (51.73 percent) and red seaweeds (23.19 percent) accounted for three fourths of the country's 2.3 million tonnes of aquaculture production in 2020, and oysters contributed 12.89 percent. The 2.3 million tonnes of production was contributed by 58 ASFIS species items; the effective number of species (ENS, a measure of species diversity) was 7. The country contributed over one fourth of (world aquaculture of) flatfishes, nearly three fourths of green seaweeds, nearly 80 percent of sea squirts and 100 percent of scorpionfishes and flatheads.

Top 10 aquaculture species groups by production quantity		Republic of Korea (all areas; quantity; 2020)				
WAPI species group	ISSCAAP division	Number of ASFIS species items in the group farmed by the country		The country's aquaculture production quantity of each species group (live weight; tonnes)	Share of the country's aquaculture production quantity of all species (%)	Share of world aquaculture production quantity of the same species group (%)
		Total	Effective			
1. Brown seaweeds (ISSCAAP group)	Aquatic plants	4	2.2	1 204 218	51.73	7.15
2. Red seaweeds (ISSCAAP group)	Aquatic plants	2	1.0	539 799	23.19	2.98
3. Oysters (ISSCAAP group)	Molluscs	1	1.0	300 084	12.89	4.79
4. Mussels (ISSCAAP group)	Molluscs	1	1.0	61 968	2.66	3.03
5. Flounders, halibuts, soles (ISSCAAP group)	Marine fishes	2	1.3	47 149	2.03	26.46
6. Sea-squirts and other tunicates (ISSCAAP group)	Miscellaneous aquatic animals	2	1.5	35 539	1.53	79.08
7. Clams, cockles, arkshells (ISSCAAP group)	Molluscs	4	2.3	27 067	1.163	0.47
8. Scorpionfishes and flatheads (Scorpaeniformes)	Marine fishes	2	1.1	21 818	0.94	100.00
9. Abalones, winkles, conchs (ISSCAAP group)	Molluscs	1	1.0	20 059	0.86	4.10
10. Green seaweeds (excluding microalgae)	n.a.	3	2.6	17 456	0.75	74.78
Other species		36	n.a.	52 746	2.27	n.a.
Aquatic products		58	7.0	2 327 903	100.00	1.90

Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global aquaculture production 1950-2020 (Fishstat); www.fao.org/fishery/statistics/software/fishstatj/en

Notes: ASFIS = Aquatic Sciences and Fisheries Information System. www.fao.org/fishery/collection/asfis/en. ISSCAAP (International Standard Statistical Classification of Aquatic Animals and Plants) grouping can be found at www.fao.org/tempref/FI/DOCUMENT/cwp/handbook/annex/AnnexS2listISSCAAP2000.pdf. The taxonomic scope of WAPI species groups indicated in bracket. More information about the WAPI species grouping can be found at www.fao.org/3/cb5012en/cb5012en.pdf. "Effective Number of Species" as a diversity measure is discussed in FAO Fisheries and Technical Paper 605 - Benchmarking Species Diversification in Global Aquaculture. www.fao.org/3/cb8335en/cb8335en.pdf.

Species diversity in ROK's USD 2.76 billion of aquaculture production (13.5 ENS) was higher than that in terms of volume (7 ENS; see the previous page). Abalones/winkles/conchs was the largest species group in terms of value, contributing 18.72 percent of total production value (USD 2.76 billion). In contrast, brown seaweeds contributed 51.73 percent of production volume and 7.13 percent of value, whereas red seaweeds contributed 23.19 percent of volume and 15.62 percent of value.

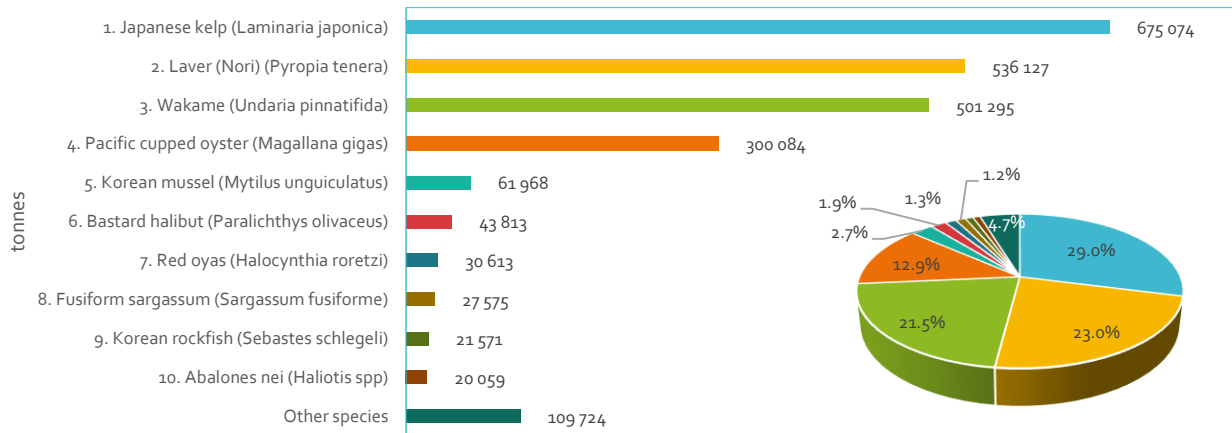
Top 10 aquaculture species groups by production value		Republic of Korea (all areas; value; 2020)				
WAPI species group	ISSCAAP division	Number of ASFIS species items in the group farmed by the country		The country's aquaculture production value of each species group (farmgate value; USD 1 000)	Share of the country's aquaculture production value of all species (%)	Share of world aquaculture production value of the same species group (%)
		Total	Effective			
1. Abalones, winkles, conchs (ISSCAAP group)	Molluscs	1	1.0	517 121	18.72	19.62
2. Flounders, halibuts, soles (ISSCAAP group)	Marine fishes	2	1.3	487 895	17.66	35.91
3. Red seaweeds (ISSCAAP group)	Aquatic plants	2	1.0	431 387	15.62	5.09
4. River eels (ISSCAAP group)	Diadromous fishes	1	1.0	260 147	9.42	12.19
5. Oysters (ISSCAAP group)	Molluscs	1	1.0	223 244	8.08	3.04
6. Brown seaweeds (ISSCAAP group)	Aquatic plants	4	2.4	196 928	7.13	2.49
7. Scorpionfishes and flatheads (Scorpaeniformes)	Marine fishes	2	1.1	147 840	5.35	100.00
8. Marine shrimps and prawns (ISSCAAP group)	Crustaceans	2	1.0	118 004	4.27	0.28
9. Marine perch-like fishes (Percoidea, marine)	Marine fishes	7	3.6	72 882	2.64	1.21
10. Clams, cockles, arkshells (ISSCAAP group)	Molluscs	4	2.3	63 302	2.29	0.64
Other species		n.a.	n.a.	243 747	8.82	n.a.
Aquatic products		58	13.5	2 762 497	100.00	0.98

Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global aquaculture production 1950-2020 (FishstatJ); www.fao.org/fishery/statistics/software/fishstatj/en

Notes: ASFIS = Aquatic Sciences and Fisheries Information System. www.fao.org/fishery/collection/asfis/en. ISSCAAP (International Standard Statistical Classification of Aquatic Animals and Plants) grouping can be found at www.fao.org/tempref/FI/DOCUMENT/cwp/handbook/annex/AnnexS2listISSCAAP2000.pdf. The taxonomic scope of WAPI species groups indicated in bracket. More information about the WAPI species grouping can be found at www.fao.org/3/cb5012en/cb5012en.pdf. "Effective Number of Species" as a diversity measure is discussed in FAO Fisheries and Technical Paper 605 - Benchmarking Species Diversification in Global Aquaculture. www.fao.org/3/cb8335en/cb8335en.pdf.

Republic of Korea (2020): Farmed ASFIS species items ranked by quantity

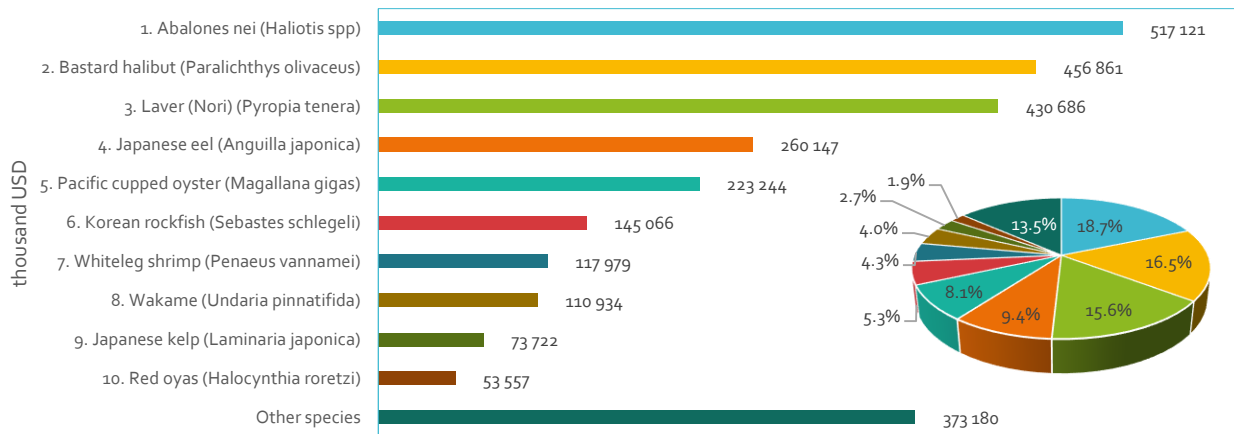
Top-10 ASFIS species items in Republic of Korea's aquaculture production quantity (2020)



Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global aquaculture production 1950-2020 (FishStatJ). www.fao.org/fishery/statistics/software/FishStatJ/en
Notes: The common and scientific names of a species follow the names adopted in the database. Nei = not elsewhere included. Species item less than 1 percent of total production may not be labelled in the pie chart. ASFIS = Aquatic Sciences and Fisheries Information System. www.fao.org/fishery/collection/asfis/en

Republic of Korea (2020): Farmed ASFIS species items ranked by value

Top-10 ASFIS species items in Republic of Korea's aquaculture production value (2020)



Data source: FAO. 2022. Fishery and Aquaculture Statistics. Global aquaculture production 1950-2020 (FishStatJ). www.fao.org/fishery/statistics/software/FishStatJ/en
Notes: The common and scientific names of a species follow the names adopted in the database. Nei = not elsewhere included. Species item less than 1 percent of total production may not be labelled in the pie chart. ASFIS = Aquatic Sciences and Fisheries Information System. www.fao.org/fishery/collection/asfis/en

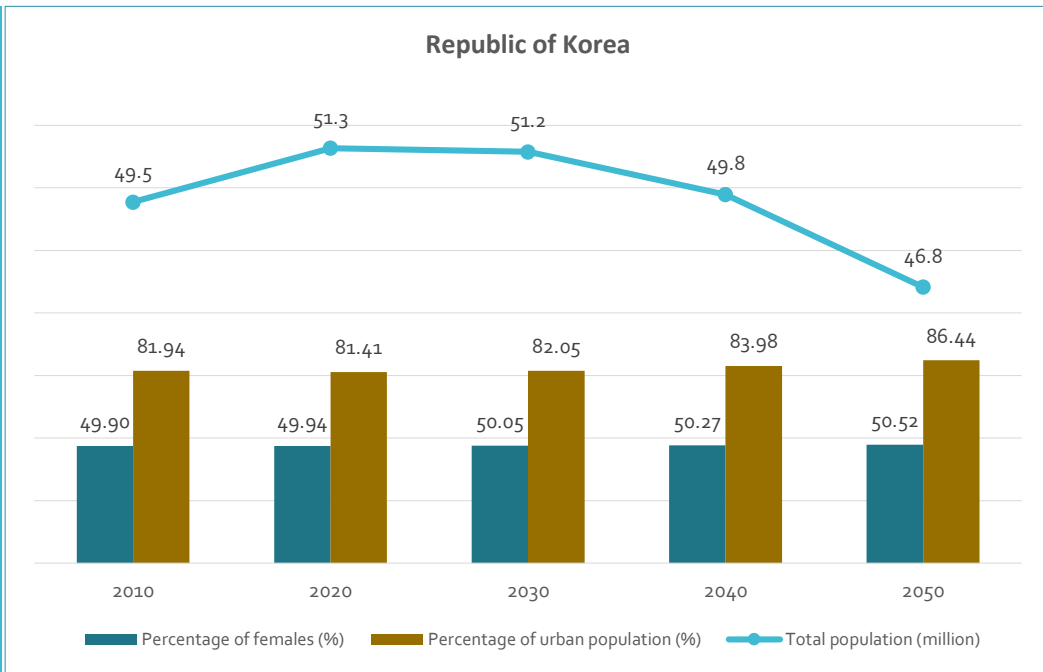
Outlook

Population prospects in the Republic of Korea (2010–2050):

Total population is expected to decline from 51.3 million in 2020 to 46.8 million in 2050.

The ratio of urban population is expected to increase beyond 85 percent in 2050.

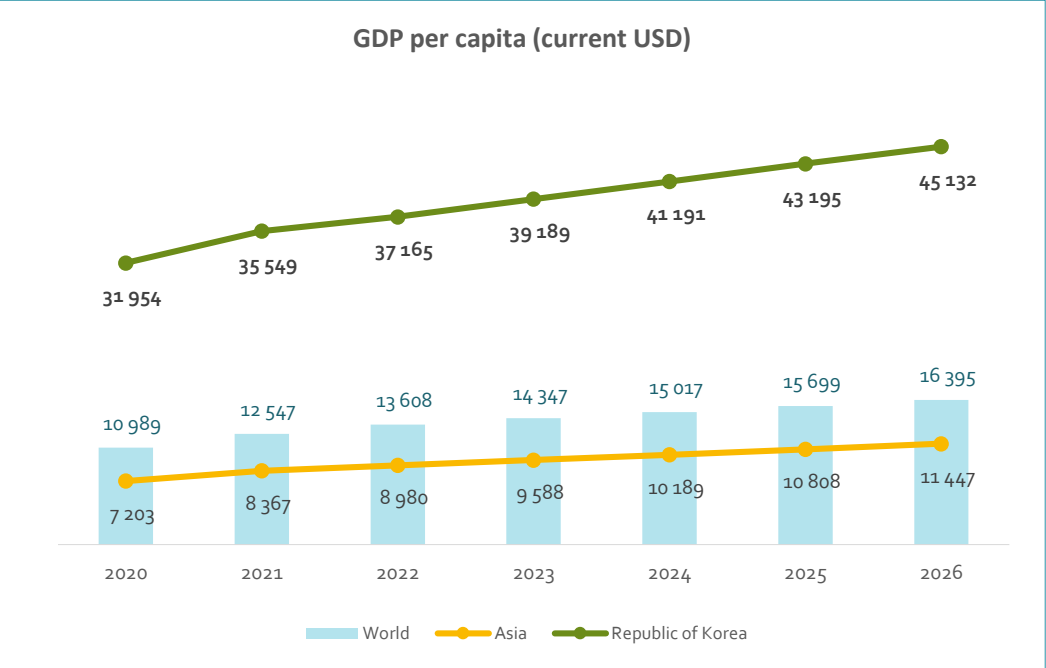
The female ratio is expected to increase beyond 50 percent in 2030 and reach 50.52 percent in 2050.



Data sources: United Nations World Population Prospects (2019 revision; <https://esa.un.org/unpd/wpp/Download/Standard/Population>). United Nations World Urbanization Prospects (2018 revision; <https://population.un.org/wup>).

Republic of Korea's GDP prospects (2020-2026):

According to IMF's projection, the Republic of Korea's GDP per capita is expected to increase from USD 31 954 to USD 45 132 between 2020 and 2026, staying well above Asia and world averages.



Data sources: Per capita GDP equal to total GDP from IMF World Economic Outlook Database (October 2021; <https://www.imf.org/external/pubs/ft/weo/2019/01/weodata/download.aspx>) divided by population from UN World Population Prospects (2019 Revision). United Nations World Population Prospects (2019 revision; <https://esa.un.org/unpd/wpp/Download/Standard/Population/>).

Republic of Korea (2020–2030): Aquaculture growth potential from the demand-side perspective

- The ROK has a relatively high preference for fish & seafood ([slide 29](#)), with per capita consumption reaching a plateau since the mid-2000s ([slide 25](#)). There may not be much room for the per capita demand to grow, yet changes in demand composition may occur with socioeconomic development, such as economic growth.
- Population growth is also unlikely to be a major driving force of fish & seafood demand in the ROK due to the expected decline in its total population between 2020 and 2030 ([slide 72](#)).
- However, as indicated by the following evidence, there is potential for expanding ROK's aquaculture through import substitution.
 - In 2017, the ROK imported 1.8 million live weight tonnes (LWTs) of fish & seafood (excluding algae), which nearly matched its 1.9 million LWTs of domestic production of fish & seafood ([slide 23](#)).
 - In 2020, the country imported 1.5 million product weight tonnes (PWTs) of aquatic products ([slide 45](#)), and it was the third largest importer of aquatic products in Asia ([slide 42](#)).
 - Even not considering that a PWT is equivalent to more than one LWT, the country's of ~140 000 PWTs of import of miscellaneous coastal fishes ([slide 45](#)) was nearly ten times of its ~17 000 LWTs of aquaculture production of this diverse species group (including mullets, seabream, seabass, grouper, etc.), which was not large enough to appear in the country's top-10 farmed specie groups ([slide 67](#)) or its top-10 farmed species items ([slide 69](#)).
 - Similarly, the country's ~60 000 PWTs import of miscellaneous demersal fishes ([slide 45](#)) was also much greater than its ~22 000 LWTs of aquaculture production of the species group (including solely the "scorpionfishes and flatheads" on [slide 67](#)), which primarily comprised Korean rockfish ([slide 69](#)).
 - In 2020, the ROK produced ~27 000 LWTs of wild flounders and ~47 000 LWTs of farmed flounders ([slide 67](#)), while it also consumed ~29 000 PWTs of imported flounders.
- Aquaculture growth in the ROK could also be driven by export markets. In 2020, the country accounted for nearly 90 percent of world export of cold-water red seaweeds (primarily nori) and over 60 percent of world export of brown seaweeds (primarily kelp and wakame), and it also had a substantial export of bivalve molluscs, such as clams and oysters ([slide 38](#)). Increasing global attention and support to the development of such non-fed, eco-friendly species, which account for a large proportion of the country's aquaculture production ([slides 67–70](#)), could present a great stimulus to its aquaculture development.
- Capture fisheries production in the ROK declined from 2.7 million tonnes in 1986 to 1.4 million tonnes in 2020, yet the downward trend appears to be levelling off in the second half of the 2010s ([slide 49](#)). A further decline in the capture production will generate opportunities for aquaculture expansion, while a recovery (e.g., thanks to better fisheries management) could pose competition to the aquaculture sector.

Republic of Korea: Aquaculture growth potential from a supply-side perspective

- The Republic of Korea's share in world aquaculture production tonnage (1.8991 percent):
 - **Higher than** its share in world land area (0.07 percent).
 - **Higher than** its share in world population (0.66 percent).
- The Republic of Korea's share in world inland aquaculture production (0.0363 percent):
 - **Smaller than** its share in world surface area of inland waterbodies (0.07 percent).
 - **Smaller than** its share in world renewable water resources (0.13 percent).
- The Republic of Korea's share in world marine aquaculture production (3.3878 percent):
 - **Higher than** its share in world coastline length (0.3 percent).
- While the comparisons provide a general idea of the aquaculture growth potential based on the country's natural resource endowments, they only offer a rough indication. More comprehensive assessments are necessary to determine the suitability and availability of these resources for aquaculture development.

Republic of Korea	Share of world total (%)
Total country area (excluding coastal waters, 2013-2017) ¹	0.07
Surface area of inland waterbodies (2018) ²	0.07
Coastline length (2019) ³	0.3
Total renewable water resources (2013-2017) ¹	0.13
Population (2020) ⁴	0.66
Aquaculture production (all areas, 2020)⁵	1.8991
Aquaculture production (inland waters, 2020)⁵	0.0363
Aquaculture production (marine areas, 2020)⁵	3.3878

Data sources: 1. FAO. 2016. AQUASTAT Main Database – Food and Agriculture Organization of the United Nations (FAO). Website accessed on 16 May 2019. 2. FAOSTAT Land Cover database (updated September 2020; CCI_LC). 3. The World Factbook, Central Intelligence Agency (CIA), United States of America. Website accessed on 20 May 2019; coastline length of world equal to the sum of coastline length of 265 countries and territories listed in the data source. 4. United Nations World Population Prospects (2019 revision). 5. FAO. 2022. FAO Fishery and Aquaculture Statistics. Global aquaculture production 1950-2020 (FishStatJ).

Further reading

FAO FISHERIES DIVISION NASO/ NALO FACTSHEETS:

- The National Aquaculture Sector Overview (NASO) collection provides a general overview of the aquaculture sector at national level in a concise and comprehensive product. The NASOs contain detailed information on the history of aquaculture; its human resources and farming systems; and development trends and issues, among others. More than 100 NASO factsheets are available in five languages at: <http://www.fao.org/fishery/naso/search/en>
- The National Aquaculture Legislation Overview (NALO) consist of a series of comparative national overviews of aquaculture laws and regulations from the top 40 aquaculture producing countries. NALO factsheets have been prepared in collaboration with the FAO Development Law Service and are updated on a regular basis. The NALO collection is available in several languages at: <http://www.fao.org/fishery/nalo/search/en>

MORE INFORMATION ON WAPI:

- World Aquaculture Performance Indicators (WAPI) is a process to generate information and knowledge products for evidence-based policymaking and sector management. Key WAPI information/ knowledge products include data analysis tools, technical papers and policy briefs. For more details, visit our webpage at: <http://www.fao.org/fishery/statistics/software/wapi/en>
- World Aquaculture Performance Indicators (WAPI) banner: <http://www.fao.org/3/CA0198EN/ca0198en.pdf>
- *World Aquaculture Performance Indicators (WAPI) – Information, Knowledge and Capacity for Blue Growth* (brochure): <http://www.fao.org/3/I9622EN/i9622en.pdf>
- *The Potential of World Aquaculture Performance Indicators as a Research and Educational Tool* (FAN article, April 2017): <http://www.fao.org/3/a-i7171e.pdf>
- *Report of FAO Expert Workshop on Assessment and Monitoring of Aquaculture Sector Performance, Gaeta. Italy, 5–7 November 2012* (FAO Fisheries and Aquaculture Report 1063): <http://www.fao.org/3/a-i3539e.pdf>