



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.

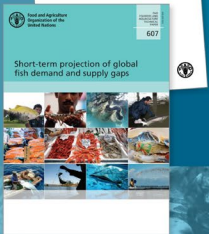
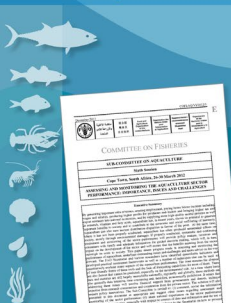
– **WAPI Fish Consumption Module (WAPIFISHCSP)** includes 10 indicators – three nutrition indicators and seven food indicators – to examine food supply and utilization patterns (with a focus on the contribution of fish to food and nutrition) in 270 countries and areas for six decades, from the 1960s to the 2010s. The module focuses on 14 fish/seafood items, but also includes 26 nonfish/seafood items.

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Assessment of international markets of tilapia products for measuring export potential of tilapia aquaculture in Pakistan

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

January 2020



Preparation of this factsheet

- This factsheet summarizes the results of an international market assessment of tilapia products conducted to support the FAO Mission on “Assessment of market opportunities for an expanded Pakistani aquaculture” (August/September, 2019; FAO/World Bank Cooperative Programme).
- The assessment was based on data and statistics from the [UN Comtrade Database](#) (accessed on 30 July, 2019). Data reported by exporters or importers were used to measure the tilapia trade between them – see [Slide 6](#) for details about the data processing methodology, which is similar to the one used by Junning Cai, Xiao Liang, Weiwei Wang and Nianjun Shen in a [previous assessment of global tilapia markets](#) conducted in 2017.
- 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](#).
- The preparation of the factsheet has benefited from tables and charts generated by the World Aquaculture Performance Indicator (WAPI) Module on Fish Trade. The trade module is currently for FAO internal use, yet another two WAPI modules (one on aquaculture production and the other on fish consumption) are available for test use. Visit the [WAPI webpage](#) for more information about WAPI information and knowledge products.
- The factsheet was prepared by Junning Cai and Giulia Galli. The validity and relevance of the results depend on the quality (in terms of timeliness and accuracy) of the underlying data and statistics used in the analyses. 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.

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Data and methodology

Market indicators

- **Market size** is measured by two indicators: (i) trade volume and (ii) trade value
- **Market price** is measured by trade value divided by trade volume. It should be noted that at an aggregate level, directly using trade value divided by trade volume may result in an inaccurate measure of trade price because some Comtrade data points report only trade value but not trade volume. While such data points are included in the calculation of trade volume or trade value, they have been excluded from the calculation of trade prices at the aggregate level.
- **Number of suppliers** in a market has two measures. One is the **actual number of suppliers** that measures how many countries or territories export to the market. The other is the **effective number of suppliers** that measures the diversity of suppliers (i.e. the evenness of the market share distribution among suppliers). The effective number of suppliers in a market is calculated by $\exp(-\sum s_i \ln s_i)$, where s_i denotes supplier i 's share in the market (equal to its export to the market divided by the total export of all suppliers to the market). For example, while 11 countries/territories exported tilapia products to Mexico in 2017 ([Slide 18](#)) – i.e. the actual number of suppliers being 11 – the effective number of suppliers is only 1.1 ([Slide 16](#)), reflecting the situation that Mexico's tilapia import market in 2017 was dominated by one supplier, China (98 percent market share) – see [Slide 18](#).
- **Per capita import** is calculated by dividing a country's import of a commodity by its total population – the population data are from the United Nations World Population Prospects 2019. This indicator could give some indication of market potential, i.e., a country that has a relatively small per capita import of a commodity may have a relatively large potential in importing the commodity.

Data and methodology

The international market assessment used annual data from the [UN Comtrade Database](#), accessed on 30 July, 2019.

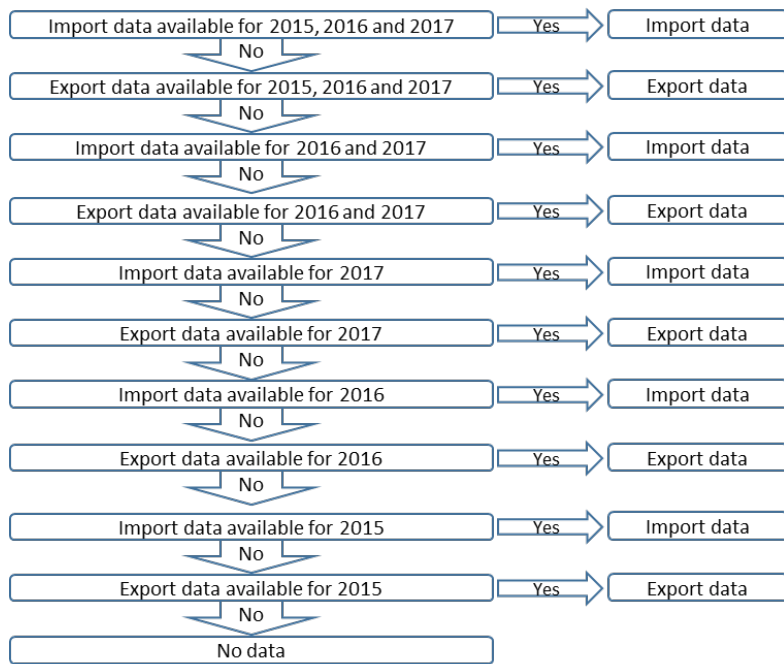
Trade patterns for recent three years (2015–2017) were examined, with year 2017 being the focus. While the data for 2018 were available for many countries, they were not used because the data for China (a major supplier of tilapia commodities) were only updated to 2017 at the time of this analysis.

International trade between two countries can be measured by trade volume or value reported by the importer (i.e. import data) or that reported by the exporter (i.e. export data).

In this exercise, import data are used as the primary data, whereas export data are used as supplementary data when the import data are not available or less complete – the procedure of determining whether to use import or export data is illustrated by the flow chart on the right.

The Comtrade data on export (or import) include re-exports (or re-imports). In order to assess international trade patterns more accurately, re-exports (or re-imports) have been removed from the export (or import) data used in this exercise.

Procedure of determining whether to use import or export data



Tilapia commodities: The trade volume or value of 6-digit HS (Harmonious System) code commodities at the country level are directly obtained from the Comtrade database. These basic data are aggregated into high-level commodity groups.

Tilapia commodities	Composition
All tilapias products	HS030271 + HS030323 + HS030431 + HS030461
Tilapias, whole	HS030271 + HS030323
Tilapias, fresh whole	HS030271
Tilapias, frozen whole	HS030323
Tilapias, fillet	HS030431 + HS030461
Tilapias, fresh fillet	HS030431
Tilapias, frozen fillet	HS030461
Tilapias, fresh	HS030271 + HS030431
Tilapias, fresh whole	HS030271
Tilapias, fresh fillet	HS030431
Tilapias, frozen	HS030323 + HS030461
Tilapias, frozen whole	HS030323
Tilapias, frozen fillet	HS030461

World tilapia market

World import of tilapia products, 2015–2017

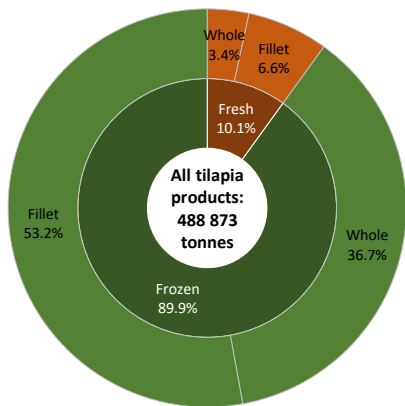
The world market of tilapias declined (in terms of both quantity and value) during 2015–2017 with a relatively stable product composition. The market size was nearly 0.489 million tonnes (USD 1.424 billion) in 2017, including 53.22 percent (in terms of quantity) of frozen tilapia fillet, 36.73 percent of frozen whole tilapia, 6.65 percent of fresh tilapia fillet and 3.4 percent of fresh whole tilapia.

Quantity	2015		2016		2017	
	Tonnes	Share (%)	Tonnes	Share (%)	Tonnes	Share (%)
All tilapias products	504 020	100.00	475 732	100.00	488 873	100.00
Tilapias, fresh whole	27 748	5.51	11 075	2.33	16 642	3.40
Tilapias, frozen whole	174 225	34.57	165 953	34.88	179 555	36.73
Tilapias, fresh fillet	32 832	6.51	30 969	6.51	32 503	6.65
Tilapias, frozen fillet	269 214	53.41	267 736	56.28	260 173	53.22
Value	2015		2016		2017	
	USD 1 000	Share (%)	USD 1 000	Share (%)	USD 1 000	Share (%)
All tilapias products	1 746 587	100.00	1 518 355	100.00	1 424 603	100.00
Tilapias, fresh whole	67 389	3.86	52 537	3.46	47 463	3.33
Tilapias, frozen whole	305 435	17.49	281 781	18.56	274 556	19.27
Tilapias, fresh fillet	255 031	14.60	223 675	14.73	226 224	15.88
Tilapias, frozen fillet	1 118 733	64.05	960 361	63.25	876 361	61.52

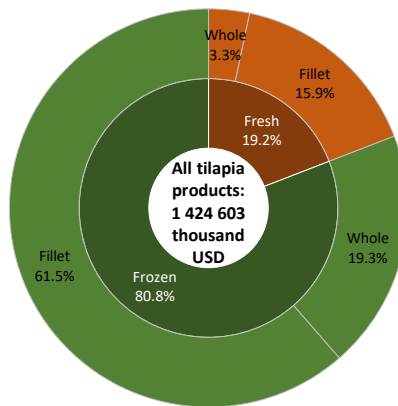
Note: See [Slide 7](#) for a detailed list of tilapia commodities.

Product composition of world tilapia international market, 2017

World tilapia international market
(quantity, 2017)



World tilapia international market
(value, 2017)



Notes: products less than 0.5 percent of the total may not be labelled in the charts. See [Slide 7](#) for a detailed list of tilapia commodities.

Top 10 tilapia exporters (by value) to the world market, 2017

Top 10 suppliers by value	Export of tilapia products to the world market			
	Value (USD 1 000)	Market share (%)	Volume (tonnes)	Price (USD/kg)
China	945 553	66.37	371 797	2.52
Indonesia	69 353	4.87	10 918	6.34
Colombia	61 230	4.30	6 991	8.76
Honduras	59 189	4.15	9 131	6.48
Taiwan Province of China	44 249	3.11	17 486	2.53
Costa Rica	41 938	2.94	5 625	7.46
Viet Nam	24 800	1.74	11 374	2.18
Netherlands	21 689	1.52	3 976	5.45
Mexico	21 646	1.52	3 036	7.13
Egypt	12 689	0.89	8 843	1.39
<i>Rest of the world</i>	<i>122 267</i>	<i>8.58</i>	<i>39 698</i>	<i>3.08</i>
World	1 424 603	100.00	488 873	2.89
<i>Southern Asia</i>	<i>5 733</i>	<i>0.40</i>	<i>3 443</i>	<i>1.66</i>
<i>Pakistan</i>	<i>478</i>	<i>0.03</i>	<i>190</i>	<i>2.51</i>

Regional tilapia markets

Regional tilapia markets

Ranked by market value

- Northern America (52.74 percent of the world market value).
- Latin America and the Caribbean (LAC; 14.85 percent of the world market).
- Asia (11.5 percent)
- Europe (10.44 percent)
- Africa (10.14 percent)
- Oceania (0.23 percent)

Ranked by market price

- Northern America (USD 4.11/kg)
- Europe (USD 2.95/kg)
- LAC (USD 2.47/kg)
- Asia (USD 2.37/kg)
- Oceania (USD 2.25/kg)
- Africa (USD 1.42/kg)

Ranked by per capita import (kg/person)

- Northern America (0.5 kg; USD 2.08)
- LAC (0.13 kg; USD 0.33)
- Africa (0.08 kg; USD 0.12)
- Europe (0.07 kg; USD 0.2)
- Oceania (0.04 kg; USD 0.08)
- Asia (0.02 kg; USD 0.04)

Regional markets of tilapia export, 2017

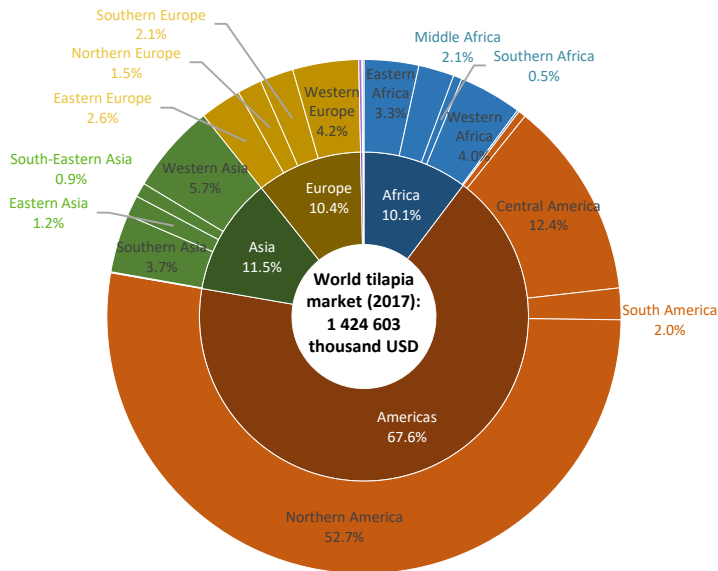
Regional markets	Tilapias import of each region				Per capita import	
	Value (USD 1 000)	Share of total world import (%)	Volume (tonnes)	Price (USD/kg)	USD/person	kg/person
Africa	144 388	10.14	101 605	1.42	0.12	0.08
Americas	962 990	67.60	266 489	3.58	0.96	0.27
LAC	211 598	14.85	85 550	2.47	0.33	0.13
N. America	751 393	52.74	180 940	4.11	2.08	0.50
Asia	163 802	11.50	68 448	2.37	0.04	0.02
Europe	148 724	10.44	50 472	2.95	0.20	0.07
Oceania	3 295	0.23	1 462	2.25	0.08	0.04
World	1 424 603	100.00	488 873	2.89	0.19	0.06

Notes: World market value or volume includes that of unspecified areas. Numbers may not add up due to rounding. LAC = Latin America and the Caribbean. N. America = Northern America.

Sub-regional tilapia markets (share of the world market value)

- Northern America (52.74 percent)
- Central America (12.44 percent)
- Western Asia (5.65 percent)
- Western Europe (4.16 percent)
- Western Africa (3.98 percent)
- Southern Asia (3.68 percent)
- Eastern Africa (3.35 percent)
- Eastern Europe (2.61 percent)
- Middle Africa (2.14 percent)
- Southern Europe (2.12 percent)
- South America (1.99 percent)
- Northern Europe (1.54 percent)
- Eastern Asia (1.23 percent)
- South-Eastern Asia (0.88 percent)
- Southern Africa (0.55 percent)
- Caribbean (0.42 percent)
- Australia and New Zealand (0.21 percent)
- Northern Africa (0.12 percent)
- Central Asia (0.06 percent)
- Pacific islands (0.03 percent)

Regional/sub-regional markets of tilapia export, 2017



Notes: regions or sub-regions with a less than 0.5 percent share of the world market may not be labelled in the chart.

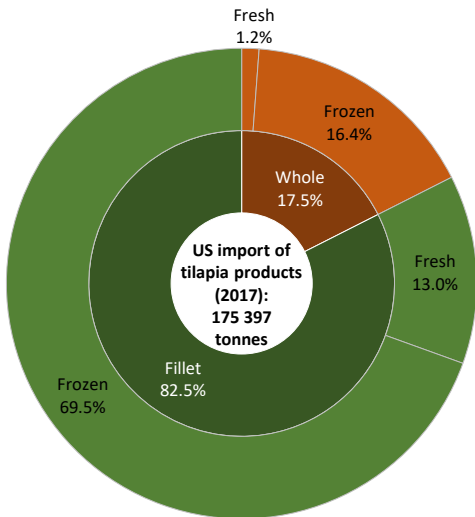
Countries and trade unions

Major country or trade union markets of tilapia export, 2017: United States of America, Mexico and EU are the largest international tilapia markets. Relatively large tilapia markets in Pakistan's neighbouring countries or regions include Iran (Islamic Republic of), GCC (primarily Saudi Arabia), AFTZ and EAEC/EurAsEC. SAARC (where Pakistan belongs) accounted only 0.03 percent of the world market value; the share of Pakistan was only 0.001 percent.

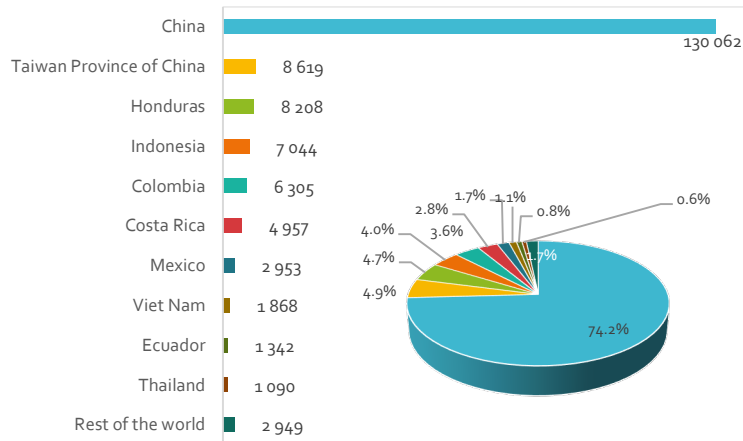
Top 10 tilapia markets	World tilapias export to each market				Number of suppliers		Per capita import	
	Value (USD 1 000)	Share of world market value (%)	Volume (tonnes)	Price (USD/kg)	Actual	Effective	USD/person	kg/person
United States of America	715 634	50.23	175 397	4.08	31	4.38	2.20	0.54
Mexico	148 042	10.39	64 833	2.28	11	1.10	1.19	0.52
EU28	124 018	8.71	39 153	3.17	101	7.91	0.24	0.08
Iran (Islamic Republic of)	52 022	3.65	15 200	3.42	2	1.40	0.64	0.19
Israel	43 114	3.03	16 429	2.62	5	1.19	5.23	1.99
Côte d'Ivoire	38 191	2.68	35 485	1.08	7	1.09	1.56	1.45
Canada	35 572	2.50	5 509	4.93	26	7.17	0.97	0.15
Saudi Arabia	22 527	1.58	14 588	1.54	16	6.32	0.68	0.44
Costa Rica	21 376	1.50	7 351	2.91	5	1.90	4.32	1.49
Russian Federation	19 942	1.40	9 964	2.00	3	1.01	0.14	0.07
Rest of the world	204 166	14.33	104 964	1.95				
World	1 424 603	100.00	488 873	2.89	122	5.13	0.19	0.06
Gulf Cooperation Council (GCC)	35 079	2.46	25 760	1.36	33	7.80	0.63	0.46
African Free Trade Zone (AFTZ)	65 664	4.61	39 291	1.67	26	2.50	0.10	0.06
Eurasian Economic Community (EAEC/EurAsEC)	20 893	1.47	10 229	2.04	5	1.12	0.11	0.05
South Asian Association for Regional Cooperation (SAARC)	402	0.03	119	3.39	14	3.24	0.0002	0.0001
Pakistan	15	0.001	11	1.40	1	1.00	0.0001	0.0001

Notes: The members of GCC include Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates. The members of AFTZ include 26 countries in Northern, Eastern and Southern Africa (Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Seychelles, United Republic of Tanzania, Uganda, Zambia, Zimbabwe, Angola, Democratic Republic of the Congo, Egypt, Libya, Sudan, Botswana, Lesotho, Namibia, South Africa and Swaziland). The members of EAEC/EurAsEC include Belarus, Kazakhstan, Kyrgyzstan, Russian Federation and Tajikistan. The members of SAARC include Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka.

United States of America: Import of tilapias, 2017

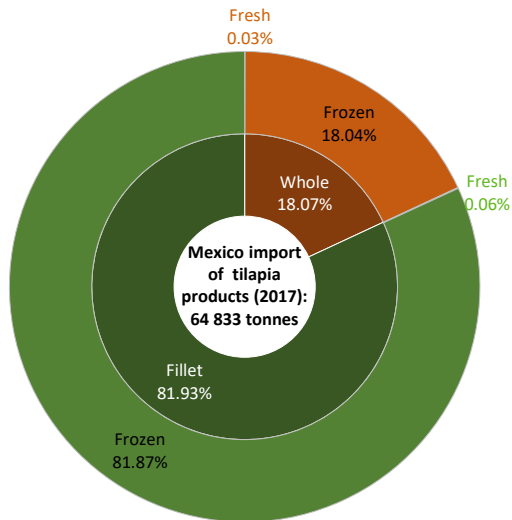


Top 10 tilapia exporters to United States of America (2017, tonnes)

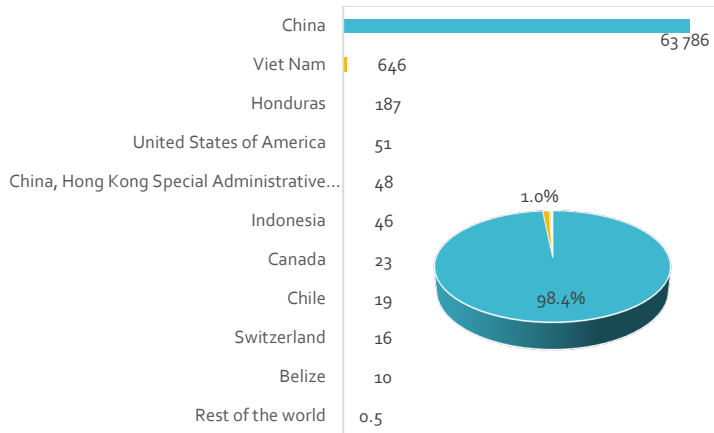


Notes: US = United States of America. See [Slide 7](#) for a detailed list of tilapia commodities.

Mexico: Import of tilapias, 2017

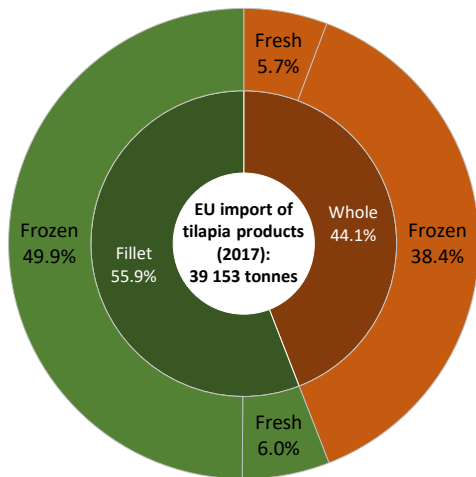


Top 10 tilapia exporters to Mexico (2017, tonnes)

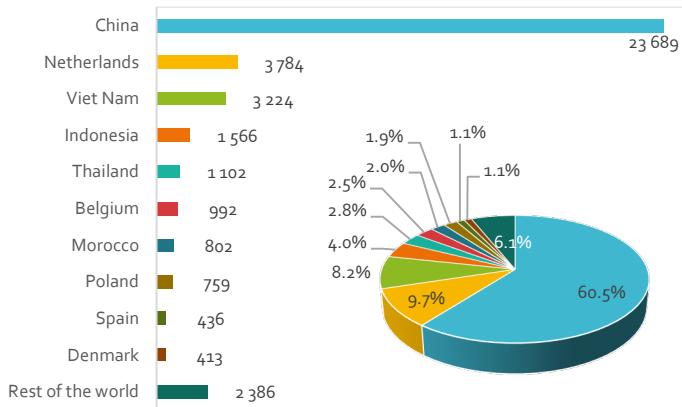


Note: See [Slide 7](#) for a detailed list of tilapia commodities.

EU: Import of tilapia, 2017

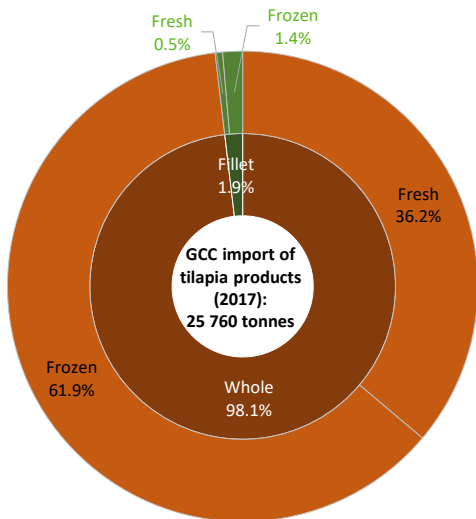


Top 10 tilapia exporters to EU (2017, tonnes)

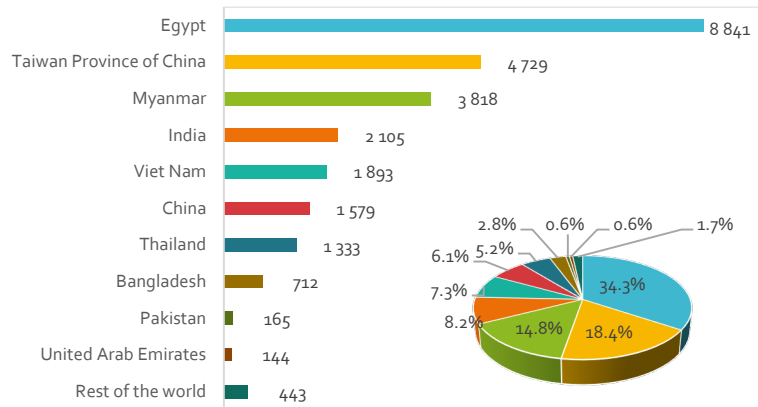


Note: See [Slide 7](#) for a detailed list of tilapia commodities.

Gulf Cooperation Council (GCC): Import of tilapias, 2017

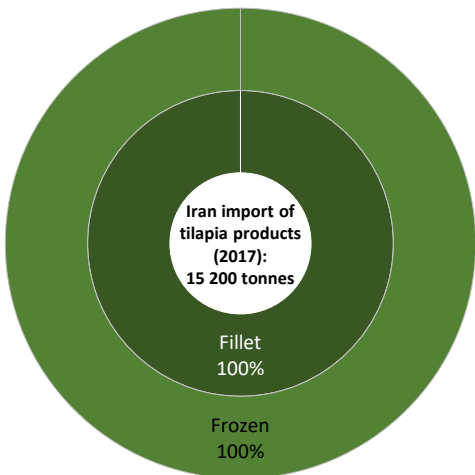


Top 10 tilapia exporters to GCC (2017, tonnes)

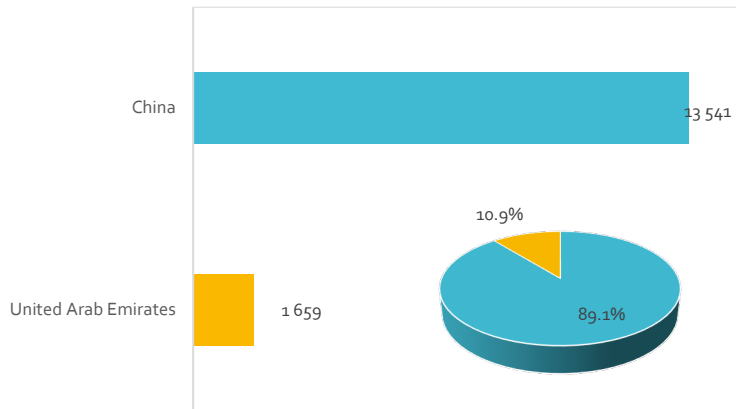


Notes: The members of GCC include Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates. See [Slide 7](#) for a detailed list of tilapia commodities.

Iran (Islamic Republic of): Import of tilapias, 2017

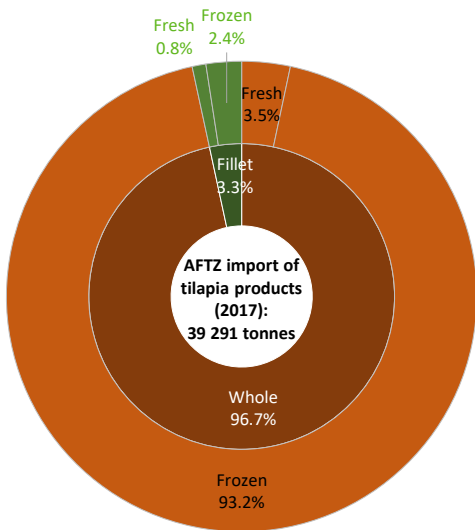


Tilapia exporters to Iran (2017, tonnes)

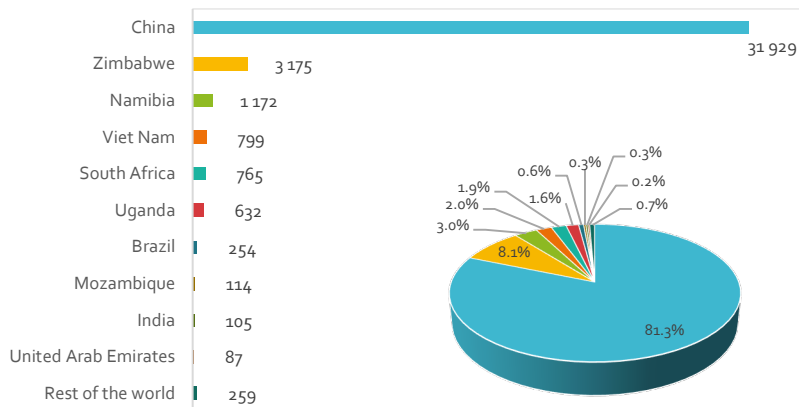


Note: See [Slide 7](#) for a detailed list of tilapia commodities.

African Free Trade Zone (AFTZ): Import of tilapias, 2017

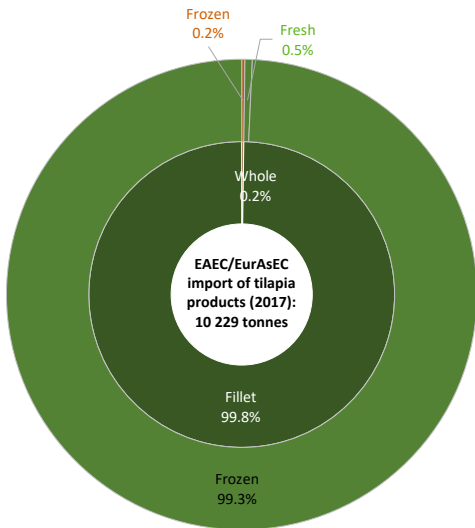


Top 10 exporters to AFTZ (2017, tonnes)

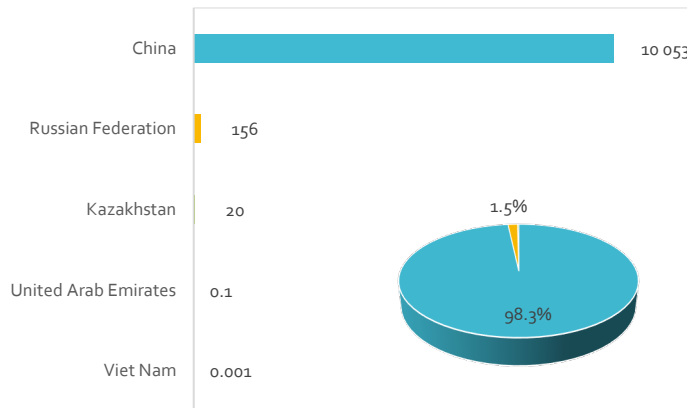


Note: The members of AFTZ include 26 countries in Eastern Africa (Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Seychelles, United Republic of Tanzania, Uganda, Zambia and Zimbabwe), Middle Africa (Angola and Democratic Republic of the Congo), Northern Africa (Egypt, Libya and Sudan), and Southern Africa (Botswana, Eswatini, Lesotho, Namibia and South Africa). See [Slide 7](#) for a detailed list of tilapia commodities.

Eurasian Economic Community (EAEC/EurAsEC): Import of tilapias, 2017

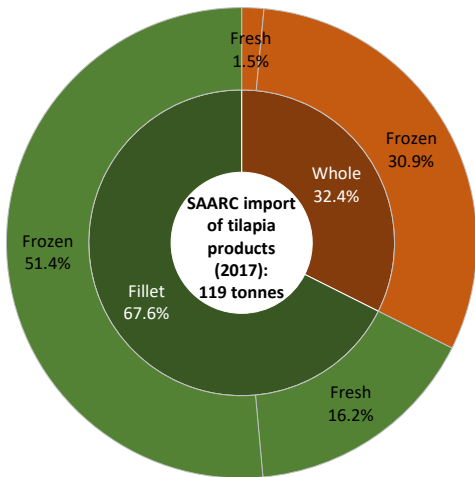


Top 10 exporters to EAEC/EurAsEC (2017, tonnes)

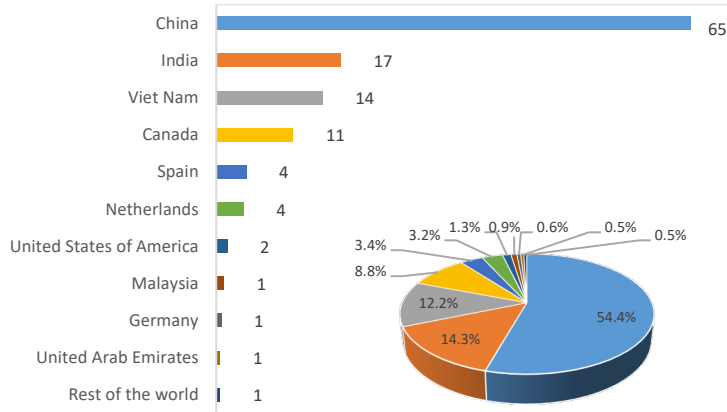


Note: The members of EAEC/EurAsEC include Belarus, Kazakhstan, Kyrgyzstan, Russian Federation and Tajikistan. See [Slide 7](#) for a detailed list of tilapia commodities.

South Asian Association for Regional Cooperation (SAARC): Import of tilapias, 2017



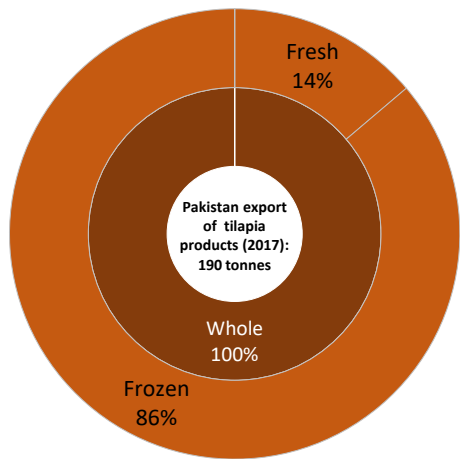
Top 10 tilapia exporters to SAARC (2017, tonnes)



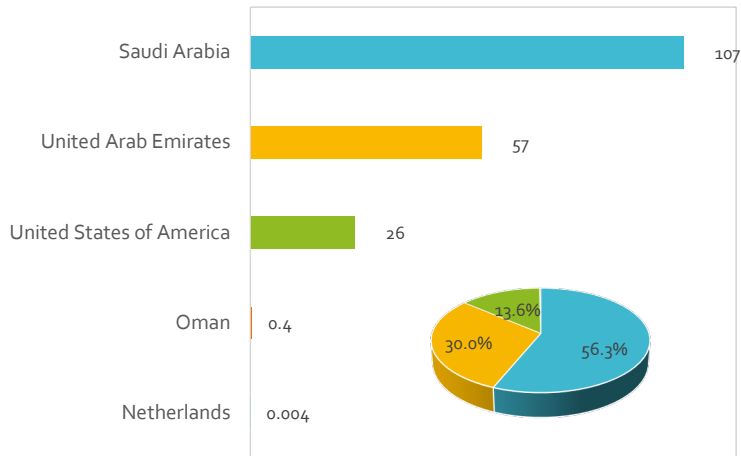
Note: The members of SAARC include Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. See [Slide 7](#) for a detailed list of tilapia commodities.

Pakistan's tilapia exports

Pakistan's tilapia exports (2017): The Comtrade statistics indicate that Pakistan exported 190 tonnes of tilapia products in 2017; 86 percent of which were frozen whole tilapia (including primarily 107 tonnes exported to Saudi Arabia and 57 tonnes to UAE) and 14 percent were 26 tonnes of fresh whole tilapia exported to the United States of America.



Countries importing tilapias from Pakistan (2017, tonnes)



Note: See [Slide 7](#) for a detailed list of tilapia commodities.

International market potential and export marketing strategy for tilapia aquaculture in Pakistan

International market potential and export marketing strategy for tilapia aquaculture in Pakistan

- Tilapias are new farming species in Pakistan with increasing popularity yet no established export markets. In the short run, Pakistan could target the neighbouring GCC market which primarily imports fresh or frozen whole tilapia. The market has a diverse group of suppliers and is yet to be dominated by the largest tilapia exporters (e.g. China) (Slide 20). The geographic proximity and cultural connections could give Pakistan a comparative advantage in the GCC market.
- Africa, particularly AFTZ, is another potential export market for tilapias from Pakistan. The AFTZ market primarily imports frozen whole tilapia with China being the dominant supplier (Slide 22). Even though tilapia farming is taking off in the continent, Africa tends to remain a major market for frozen whole tilapia export because of its consumers' favourable preference over fish in general and tilapia in particular, its fast population growth, and its income and urban expansion. However, the perception of cheap yet low quality tilapia imports flushing in to destroy the local tilapia industry has become increasingly popular across the African continent and pressured governments to impose restrictions over tilapia imports. Thus, even with its geographic proximity to the market, Pakistan would need a proper marketing strategy in order to tap into the market.
- In the long run, frozen tilapia fillet could be a suitable product type for tilapia export from Pakistan because: (i) frozen fillet is the main tilapia commodity accounting for more than half of world tilapia export (Slide 9); (ii) without a traditional dietary preference over whole fish, Pakistan's domestic market would tend to favour tilapia fillet over whole tilapia; and (iii) Pakistan's large labor force gives it a comparative advantage in fillet processing.
- However, international frozen tilapia fillet markets tend to be highly competitive. For example, despite being the largest tilapia producer in the Americas and geographically close to the largest international frozen tilapia fillet market (i.e. the United States of America), Brazil has little export of frozen tilapia fillet.
- As a neighboring country of Pakistan with substantial import of frozen tilapia fillet supplied by only two exporters (Slide 21), Iran could become a major market for tilapia export from Pakistan in the long run. Geographic proximity and a large labor force (good for fish processing) could give Pakistan a competitive advantage in Iran's tilapia market.