



A comparative analysis on expansion of Pakistan fisheries trade: World & China

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China Pakistan Economic Corridor (CPEC) is a major pillar of Belt and Road initiative project of Chinese Government. China has investing billions of US\$ in Pakistan to forestall the major energy crises, bilateral trade and mutual development. This research article describes the comparative analysis of fisheries products exported from Pakistan to china and rest of the world. An in-depth analysis is done on cooperation position and coming possibilities in export by fisheries product between Pak-China. On this basis, we will explore into how the “Belt and Road Initiative” will promote further expansion of China-Pakistan Economic Trade Cooperation and propose specific measures for China-Pakistan to expand economic and trade cooperation. China is the one of the biggest export markets of fisheries products from Pakistan. China has imported and exported 39599 thousand tons of fisheries products and this figure is expected increase in future. The annual growth in value from 2014 to 2018 exports of fish & fishery products from Pakistan to the China registered high growth in fresh or chilled (0302) fish products which increased by 20 %, 18 % growth is observed in dried or salted (0305), 17 % growth in live fish (0301) and 13 % in frozen fish (0303) products. While, the annual growth in export value from 2014 to 2018 to the World have registered an increase at 14 % in fish fleets (0304), 12 % in Molluscs (0307), 11 % in frozen fish (0303) and 10 % in dried or salted (0305) fish products.

[Keywords: China, Comparative analysis, CPEC, Fishery Trade, World]

Introduction

Pakistan has established a long-term and stable relationship with China. The relationship between two countries is mutually beneficial¹. Sino Pakistan bilateral relationships is instigated during 1950, and Pakistan was among the foremost countries to recognize the empowerment and established the official diplomatic relations with People's Republic of China (PRC). Both countries regularly exchanged high-level visits and reached various agreements. China provides economic, military and technical assistance to Pakistan^{2,3}. The Chinese leadership recognizes Pakistan's firm support on key issues. Pakistan also helped China re-establishing formal relations with the West, where they helped Nixon visit China in 1972^(ref. 4). China has also consistently supported Pakistan's record on regional issues. China's cooperation with Pakistan has reached a high point in economics. China has invested heavily in infrastructure expansion in Pakistan, including the deep-water port of Gwadar, Pakistan⁵. Both countries have signed free trade agreements⁶. In Pakistan, the main source of employment for people, residing along the coastal belt, is the fisheries sector. Fisheries and

aquaculture sector has prime importance in Pakistan for food security, nutrition balance, and employment. In 2014, marine coastal fishing employed over 194420 people⁷. The sector consists of fishermen community and other related businesses such as boat building and net manufacturing and fisheries processing plants and laborers. Aside this, the sector also creates other jobs for the fisheries community, which includes fish hawkers, vendors, storekeepers, tourist guides, drivers, etc. Opportunities after CPEC: In Pakistan, the export of fisheries products currently stands at approximately 0.25 of total exports in the world. Aside from a huge domestic market, Pakistan's fish and its fisheries products have a huge export market across the world. The country is exporting 30 % of the total fish catch to 30 different countries in the world. The total export potential stands at US\$1.0 billion which is a rough estimate based on maximum sustainable yield figures, existing value addition and foreign benchmarks. The fisheries export potential can rise if modern CPEC infrastructure is in place and if the high potential area of aquaculture is exploited⁸. Pakistan fish exports form an important item in the basket of Pakistan. The slow progress in marine

production and rising demand for seafood products resulted in the increasing importance of aquaculture.

Globally the fisheries have contributed 170.9 million metric tons (MT) of food in 2016, about 90.9 MT by fish catch (87 % from marine and 13 % from inland waters) and rest 80.1 MT from the aquaculture sector (64 % from Inland and 36 % marine respectively)⁹. Pakistan is containing enormous fisheries resources; having a 1050 km long coastline spread into two provinces; Sindh (250 km) and Baluchistan (800 km), respectively. Besides the coastline, country holds 8.56 million hectares (Mh) of inland resources. While, the Exclusive Economic Zone (EEZ) boundary is extended from 200 to 350 nm with the total area of 2,900,00 km² approved by UNCLS in 2015. To process and handling of the fish, the government has established four landing jetties¹⁰. Pakistani waters are rich in variety of fish fauna such as demersal, shrimp, crabs, small prawns, medium and large pelagic, squids (octopus/cuttlefish), and lobsters at coastal, marine and inland waters¹¹. Pakistan's fisheries sector plays a substantial role to contribute towards food security, livelihood, and poverty alleviation among the coastal and inland areas. In addition, the fisheries sector produces 0.658 MT of fisheries products including 77 % (0.503 MT) by capture and 23 % (0.154 MT) by aquaculture sector. The contribution of fisheries sector to the national Gross Domestic Product (GDP) has increased by 5.3 % in the fiscal year (2016-17)^{12,13}. In 2017, share of the agriculture sector was about 19.53 % in GDP, including its important subsectors i.e. crop production, livestock farming, inland fisheries, and range forests. Whereas, fisheries sector subsidize in agriculture about 2.12 % and in GDP was 0.41 %, respectively¹⁴. Fisheries sector in Pakistan (Marine and Inland) provide 0.4 million (m) directly and 0.6 m indirect employment opportunity, which accounts 1 % of national labor force¹⁵⁻¹⁸. Figure 1 presents the total fisheries products exported from Pakistan to different regions of the world.

According to the authority, the fisheries exports in country have showed a decline of 7.35 percent to USD (11.837 million) during July 2018 and from USD 12.776 m in the same month of 2019. Similarly, the fisheries exports' quantity has also witnessed a decline of 2.87 % i.e. from 5,713 to 5,452 tons in the same period under review¹⁹. Pakistan import heavy machinery, electronics and electrical equipment, steel, iron, agrochemicals, and synthetic fibers, from China, while exports to China include fisheries products and seafood, cotton, metallic ores and rice²⁰. Karachi is

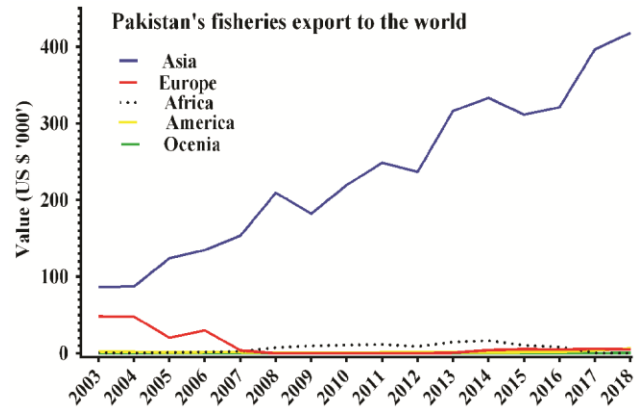


Fig. 1 — Pakistan's fisheries export to word by regions

the main hub of Fisheries industry. Baluchistan also has a rich coastal line, having a potential to grow seafood industry²¹. The main objective of this study is comparative analysis on the expansion of Pakistan fishery products trade between Pakistan and China. In addition to export of fisheries products exports the study also examined export growth and value potential in terms of value and quantity to China compared to the World. The secondary objective of the study is to examine growth in fisheries products export after bilateral trade, Free Trade Agreement (FTA) between Pakistan and China.

The study is based on the assessment of exports of different types of fisheries products and their value and quantity, from the period of 2003 to 2018 to account for the problem of wide fluctuations in exports. Pakistan export seafood products in different forms and their description codes (HS) are identified as Indian Trade Clarification (ITC) and are based on Harmonized System (HS) of Coding²². HS Codes are Code 0301: living fish, Code 0302: fresh salted fish, Code 0303: Frozen chilled fish, Code 0304: ready to cook Fish fillets and other fish meat, whether or not minced, Code 0305: ready to eat Fish, Code 0306 Crustaceans, HS Code 0307: Mollusks, Code 0308: other aquatic invertebrates.

This study aims to compare export figures for different products of fisheries to the world and China from 2003 to 2018. Besides, this study assesses an upward and downward trend in exports to the world and China and its causes.

Material and Methods

Data sources

The Fisheries export data was collected from the International Trade Centre (ITC) - statistical database

from the period 2003 to 2018^(ref. 23). All values of export and import have been referred to in US\$ (Million dollars) and Quantity in million tons. The different fisheries products, exported to World and China, is presented in Table 1. The compound growth rate technique was used to compare the growth in exports to World and China.

Data preparation and retrenchment

The five-year compound growth rate was calculated to find out the growth in exports of fisheries products from Pakistan to World and China and similar method of estimating growth was used by Prajneshu & Chandran²⁴.

If Y_t is the study variable at time period t , then the mathematical expression employed for calculation of compound growth rate (CGR) r is conventionally given by:

$$Y_t = y_0(1+r)^t$$

In general, after a multiplicative error ϵ is assumed in the above equation, logarithmic transformation is

done throughout to make it a linear statistical model. That is,

$$\log y_t = \log y_0 + t \log(1+r) + \text{Log } \epsilon$$

The above model can be rewritten as:

$$\log y_t = A + Bt + \epsilon'$$

Where: $A = \log y_0$; $B = \log(1+r)$; and $\epsilon' = \text{Log } \epsilon$.

Unknown parameters A and B have been estimated by method of Ordinary Least Square. Thus once B is estimated the CGR estimate \hat{r} is given by:

$$r = \exp(\hat{\beta}) - 1$$

Results

The data was divided into three periods of five-year i.e 2003-2007, 2008-2012 and 2013-2017; each to estimate compound growth rate (CGR). While, the CGR for fisheries products export (quantity and value) to World revealed a maximum growth during the last period of the study i.e. during 2008-2017.

Table 1 — CGR Export of Fisheries products from Pakistan

Period Years	Product Codes	World		China	
		Growth rate (value)	Growth rate (Quantity)	Growth rate (Value)	Growth rate (Quantity)
2003-2007	(0301)	-0.003 %	-0.004 %	-0.001 %	-0.0004 %
2008-2012		0.028 %	0.016 %	0.007 %	0.004 %
2013-2017		-0.033 %	-0.012 %	0.017 %	0.006 %
2003-2007	(0302)	-0.011 %	0.029 %	0.013 %	0.859 %
2008-2012		-0.188 %	-0.110 %	-0.044 %	-0.929 %
2013-2017		-0.380 %	-0.180 %	-0.044 %	-0.862 %
2003-2007	(0303)	0.75 %	0.16 %	-0.02 %	-0.17 %
2008-2012		1.56 %	0.19 %	0.82 %	-0.18 %
2013-2017		5.25 %	0.74 %	1.11 %	0.03 %
2003-2007	(0304)	0.162 %	0.109 %	0.023 %	0.029 %
2008-2012		0.266 %	0.120 %	0.004 %	-0.002 %
2013-2017		0.215 %	0.057 %	0.008 %	0.003 %
2003-2007	(0305)	0.129 %	0.004 %	0.134 %	0.193 %
2008-2012		-0.076 %	-0.134 %	-0.021 %	0.039 %
2013-2017		0.254 %	0.254 %	0.113 %	0.0013 %
2003-2007	(0306)	-0.095 %	0.028 %	0.081 %	0.052 %
2008-2012		0.319 %	0.091 %	0.211 %	0.089 %
2013-2017		0.352 %	-0.046 %	0.288 %	0.037 %
2003-2007	(0307)	0.047 %	1.038 %	0.022 %	0.025 %
2008-2012		0.083 %	0.355 %	-0.011 %	-0.007 %
2013-2017		-0.007 %	0.014 %	-0.024 %	-0.022 %
2003-2007	(0308)				
2008-2012					
2013-2017		-0.009 %	-0.009 %	-0.00003 %	0.0001 %
2003-2007	(Total)	1.149 %	0.412 %	0.276 %	0.104 %
2008-2012		2.578 %	-0.196 %	-0.070 %	-0.165 %
2013-2017		2.609 %	0.716 %	0.513 %	0.169 %

CGR of Live Fish (0301) export

Table 1, illustrates that the CGR for exports of Live Fish (0301) to World has revealed a negative growth by -0.0023 % in value and -0.0038 % in quantity during first 5-year period. Similarly, the CGR for exports to China has shown a negative growth by -0.0005 % in value and -0.0004 % in quantity, respectively. On the contrary, the CGR for exports to World has increased by 0.028 % in value and 0.016 % in quantity, respectively during the second 5-year period (2008-2012). Similarly, in the same period the CGR for exports to China has also demonstrated the positive growth by 0.0067 % in value and 0.0037 % in quantity, respectively. From 2013 to 2017, the CGR for exports to World has illustrated a negative growth by -0.034 % in value and -0.0118 % in quantity, respectively. On the contrary, the CGR for exports to China has shown a positive growth by 0.01743 % in value and 0.0058 % in quantity (Fig. 2).

CGR of Fish Fresh or Chilled (0302) export

Table 1 illustrates that the CGR for exports of 0302 Product Code to world has revealed a negative growth in value by -0.0094 % but a positive growth in quantity i.e. by 0.029 % during period 2003-2007. While the CGR for exports to China have shown positive growth in both value and quantity by 0.013 % and 0.86 %, respectively during the same period (Fig. 3). During the period 2008-2012, the CGR for exports to world has registered a decline in both value and quantity by -0.19 % and -0.111 %, respectively. While, in the same period the CGR for exports to China has illustrated a negative growth by -0.044 % in value and -0.93 % in quantity, respectively. From 2012 to 2017, the CGR for exports to World has demonstrated a negative growth by -0.38 % in value

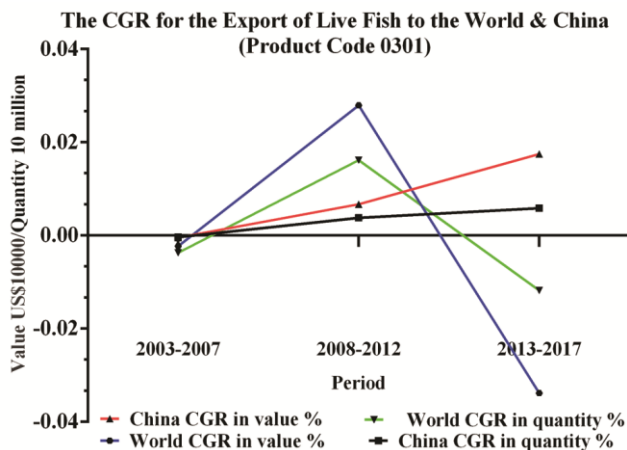


Fig. 2 — CGR export of Live Fish (0301)

and -0.181 % in quantity, respectively. In the same way, the CGR for exports to China has shown a decline of -0.043 % and -0.86 % in value and quantity, respectively during the same period.

CGR of Frozen Fish (0303) export

Table 1 shows that during the five-year (2003-2017) period, CGR for the exports of Frozen fish (0303) in both value and quantity to world from Pakistan has shown a positive growth (Fig. 4). While, the exports of the same products (in value and quantity) to China was recorded negative growth in first five-year tenure but in third period, the CGR for export to China has shown positive growth. The CGR for export in second period (2008-2012) to China has shown positive growth in value but negative growth in quantity. During first five-year (2003-2007) tenure, the export of this product to world has revealed an increase in CGR by 0.75 % in value and 0.16 % in quantity, respectively. On the contrary, its exports to China have shown a decrease in CGR by -0.015 % in value and -0.17 % in quantity, respectively. During second five-year period (2008-2012), the CGR for

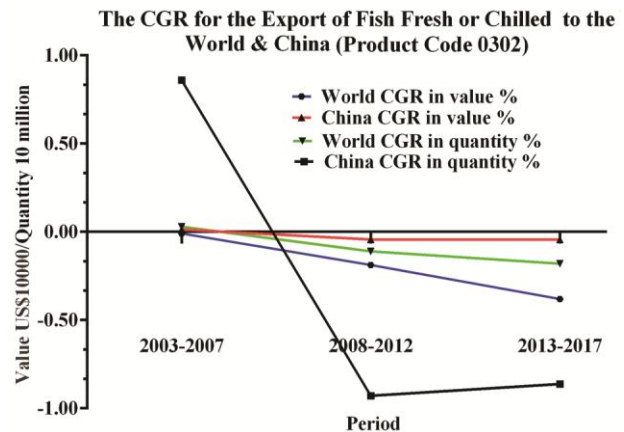


Fig. 3 — CGR export of Fish Fresh or Chilled (0302)

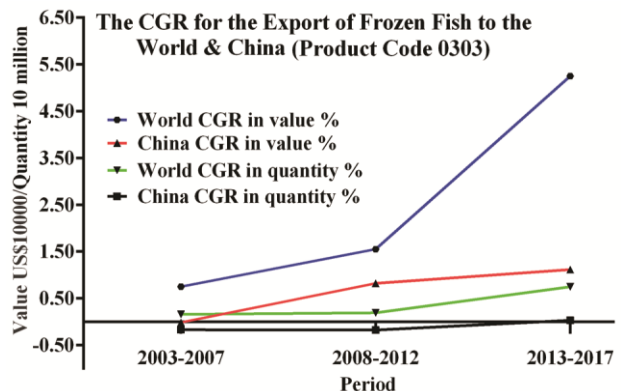


Fig. 4 — CGR export of Frozen Fish (0303)

export to World has shown rise in the growth by 1.55 % in value and 0.189 % in quantity, respectively, whereas its CGR for export to China in value and quantity has surged by 0.83 % and -0.18 %, respectively. During third period of 2013-2017, the CGR for exports value to World and China has revealed a growth by 5.25 % and 1.11 %, respectively. In the same period, the CGR for exports quantity to World and China has shown a growth by 0.75 % and 0.029 %, respectively.

CGR of Fish Fillets (0304) export

Table 1 indicates that CGR for the exports of Fish Fillets (0304) to World from Pakistan has shown growth by 0.16 % in value and by 0.109 % in quantity, respectively during first 5-year period. During the period under review, the CGR for export value and quantity to China has also registered an increase by 0.023 % and 0.029 %, respectively. In the same way, during the second period of 2008-2012 the CGR for exports to World has revealed the growth by 0.266 % in value and 0.12 % in quantity, respectively. While, the CGR for exports to China has shown the positive growth in value by 0.00397 % but negative growth in quantity by -0.0024 % during same period under review. Similarly, the CGR for exports to World for the period of 2013-2017 has also registered a rise of 0.215 % in value and 0.052 % in quantity, respectively. During the same period, the CGR for exports value and quantity to China has increased by 0.0078 % and 0.0031 %, respectively (Fig. 5).

CGR of Fish Dried (0305) export

Table 1 shows that, in the first 5-year period, the CGR for exports of Fish Dried (0305) to world has registered a rise in growth by 0.129 % in value and

0.0036 % in quantity, respectively. Whereas, the CGR for exports to China in both value and quantity has revealed a growth by 0.13 % and 0.19 %, respectively. Unlike, CGR for exports to World has shown a negative growth by -0.077 % in value and -0.13 % in quantity, respectively during second period of 5-year. While, CGR for exports to China has decreased by -0.0218 % in value but increased by 0.039 % in quantity during same period under review (Fig. 6). During third period (2013-2017), the CGR for exports to World has revealed the growth in both value and quantity by 0.26 % and 0.26 %, respectively. The CGR for exports to China has shown a positive growth of 0.112 % in value and 0.0014 % quantity, respectively during 2013-2017.

CGR of Crustaceans (0306) export

Table 1 shows that in the first period of five-years (2003-2017), CGR for the exports of Crustaceans (0306) to world from Pakistan has shown a negative growth in value but positive growth in quantity (Fig. 7). In second period of 5-year tenure, the CGR for exports to world has registered a rise in both quantity and value. On the contrary, the CGR for exports to world has shown positive growth in value but negative growth in quantity. In contrast, the CGR for exports of same product (in value and quantity) to China has revealed a positive growth during the period under review. During the first 5-year period (2003-2007), CGR for exports to World has decreased by -0.095 % in value but increased by 0.029 % in quantity. While, CGR for exports to China in both value and quantity has shown the growth by 0.079 % and 0.052 %, respectively. The CGR for exports (value and quantity) to world has revealed the growth by 0.319 % and 0.09 % during second 5-year period.

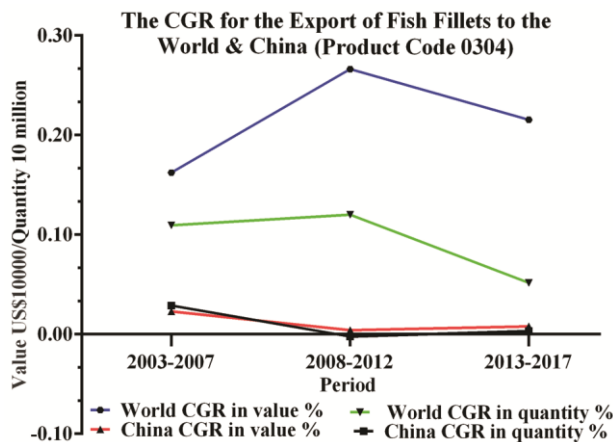


Fig. 5 — CGR export of Fish Fillets (0304)

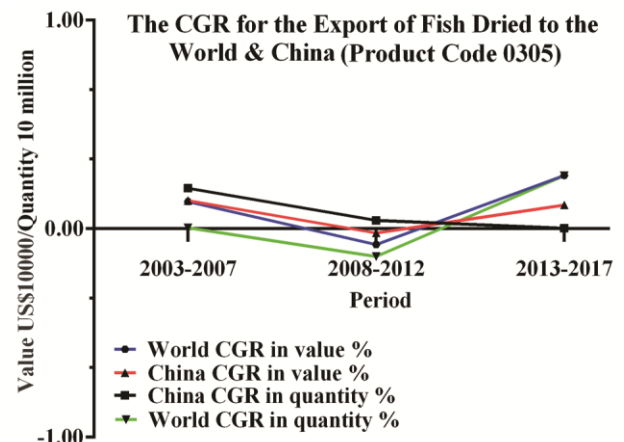


Fig. 6 — CGR export of Fish Dried (0305)

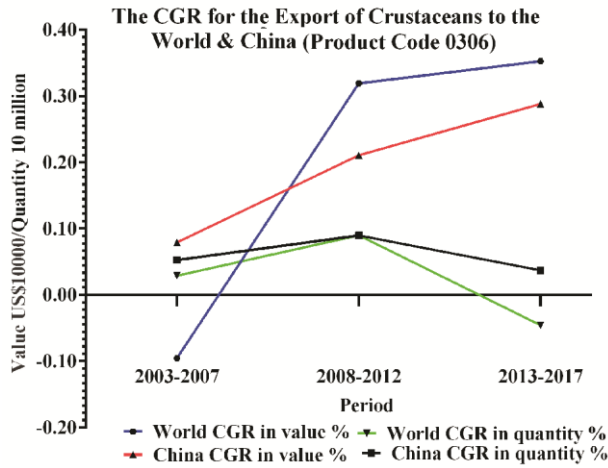


Fig. 7 — CGR export Crustaceans (0306)

Whereas, CGR for exports to China in both value and quantity has registered a rise by 0.211 % and 0.09 %, respectively during the period under review. During third period of 5-year (2013-2017), the CGR for exports to world has shown an increase by 0.35 % in value but a decline by -0.044 % in quantity. On the contrary, the CGR for exports to China in whole study period was recorded a positive growth by 0.29 % in value and 0.037 % in quantity, respectively.

CGR of Molluscs (0307) export

Table 1 display that the CGR for exports of Molluscs (0307) to world from Pakistan has revealed the growth in the value by 0.047 % and in quantity by 1.038 %, respectively during first 5-year (2003-2007) period. In the second 5-year period (2008-2012), it has shown a positive growth by 0.083 % and by 0.36 % in value and quantity, respectively. On the contrary, the CGR for exports to World in third 5-year period (2013-2017) has registered a decline in growth by -0.0067 % in value, but positive growth in quantity by 0.0144 %. Similarly, the CGR for exports value and quantity to China has shown a positive growth by 0.0218 % and by 0.025 % during 2003-2007. During the second period (2008-2012) of study, the CGR for exports value and quantity to China has registered a decline by -0.0119 % and -0.0074 %. Similarly, the CGR for exports to China for third 5-year period of study has shown negative growth in value by -0.024 % and quantity by -0.0223 % (Fig. 8).

Discussion

The CGR for exports of different fisheries products was estimated by using CGR technique. According to data analysis, the CGR for exports of frozen fish to world and China has shown maximum growth, while

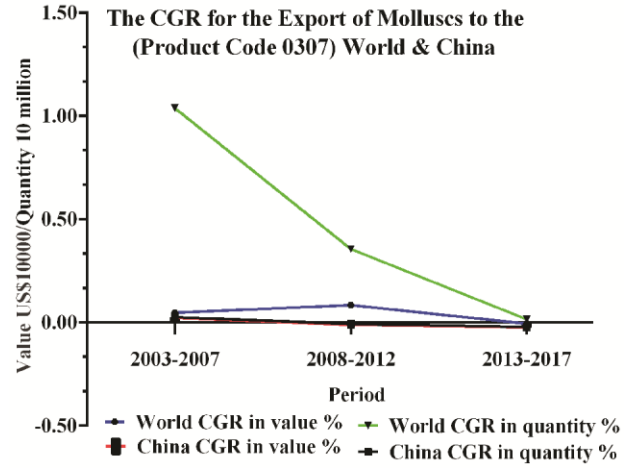


Fig. 8 — CGR export of Molluscs (0307)

CGR for exports of fresh fish to world and China has shown minimum growth during the same period. The CGR for exports of frozen fish (0303) to world has shown positive growth in value from 0.75 % to 5.25 % during the period of 15 years. Similarly, the CGR for exports of frozen fish to world has demonstrated a positive growth in quantity from 0.16 % to 0.75 % during period under review. Likewise, the CGR for exports of frozen fish products to China has illustrated the positive growth in value from -0.015 % to 1.1133 % during 15 years period. Same way, the CGR for exports of Fresh Fish fresh or chilled fish to China has shown positive growth in quantity from -0.17 % to 0.029 % during the same period. In contrast, the CGR for exports of Fresh Fish (0302) to World has demonstrated the negative growth in value from -0.0094 % to -0.38 % during the period 2003-2017. Similarly, the CGR for exports of fresh fish to world has also demonstrated a negative growth in quantity from 0.029 % to -0.18 %. In the same way, the CGR for exports of fresh fish to China has revealed the negative growth in value from 0.013 % to -0.044 % during the period under review. Whereas, the CGR for exports of fresh fish to China has illustrated a negative growth in quantity i.e. from 0.86 % to -0.86 % during the same period.

The CGR for exports of Crustaceans to world and China has shown growth in values, while it demonstrated a decline in export of quantities. The CGR for export of Fish dried to world and China has revealed different patterns during three periods from 2003-2017. In first period (2003-2007), the CGR for exports to world and China has registered a decline in both value and quantity, while CGR for exports has started again to emerge from a decline during second

period (2008-2012). In third period, CGR for exports has shown a rise in growth in quantity and value. The CGR for exports of Molluscs to world and China has shown slight decline from 2003 to 2017, while CGR for exports to world has revealed the highest decline in quantity. The CGR for exports of Fish Fillets to world in quantity has shown a rise in the growth from first period (2003-2007) to till second period (2008-2012) and later started to decline from second period to third period (2013-2017). Whereas, the CGR for exports to world in quantity has revealed a downward trend from first to third period. However, the CGR for exports of all seafood to China in both quantity and value has shown downward trends from first period, but it showed a slight surge in third period. The CGR for export of Live Fish to world in quantity and value has revealed the positive growth from first period till second period, later in third period it started to decline and showing the highest decline in third period. On the contrary, the CGR for exports of Live Fish (0301) to China in both value and quantity has demonstrated the upward trends commenced from first period to third period. The CGR for export of Fish Fresh or Chilled to world has shown a decline in growth in quantity, while it revealed the highest decrease in value. However, the CGR for exports of Fish Fresh or Chilled (0302) to China in value and quantity demonstrated the downward trends from first period to third period.

Challenges and issues

Of all, CGR for exports of frozen product has shown a surge both to world and China when compared to other products' growth. This increase is attributed to the adoption of export facilities by Pakistan since 2006. Besides, the adoption of new technology like boat modification by government authorities also supported a positive growth in exports of frozen fisheries products to world as well as to China. Furthermore, training of human resources and technology enhancement also boosted the export of frozen products. Besides, information technology also helped the business community to improve the communication with importers and re-exporters in global markets. However, the CGR for exports of fisheries products including frozen products is not satisfactory when compared to the production of fisheries products in the country. Of total production, the country is exporting less than 30 percent catch. Alike rise in production in the country, the demand for fisheries products is growing due to cooperative

initiatives with China. Because of non-compliance with hygienic and phytosanitary standards on fisheries and seafood products and other agriculture products, Pakistani exporters have faced restrictions by developed countries. Therefore, the exports registered a decline in said products. Aside from this, other factors also affected exports from Pakistan to world and China, including high cost of business, poor market access, poor trade facilitation, law and order, war on terror and political instability, low level of technological advancement and research and development and less education and low skills labor quantifiable factors.

Conclusion

The results of the present study show that there is a gap between exports of fisheries products and its production in Pakistan. Of the total, the country is exporting less than 30 percent. The country can enhance its export share by 50 percent. But it needs more effort from the government. Based on the analysis and conclusions, some recommendations included that the government authorities should adopt strategies to encourage exports of high-value fisheries products. Besides, the government should also enhance access of Pakistani exporters to global markets. The government should re-negotiate already discussed free trade agreements (FTAs) as Pakistan can decrease the trade deficit with partner countries. The government should promote coherence between investment, industrial, and trade policies, as Pakistan has a potential to increase its fishery exports.

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Conflict of Interest

The authors hereby declare that they don't have any competing or conflicts of interest to influence the research work reported in this paper.

Author Contributions

AM and MY: Conceptualization, Formal analysis, Funding acquisition, Investigation, Resources, Software,

data collection and Supervise the manuscript SBH, OS, data Analysis, Roles/Writing the original draft; MTK, MAK and GML: modification, review, further editing and Suggestions.

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