



Identifying the Factors of Export Competitiveness for Agricultural Products

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Recently, agriculture exports have been receiving a lot of attention from academicians, researchers, governments, and policymakers. However, India's agri-products competitiveness is generally low, and the economic significance of agriculture has been declining over the years. This compels undertaking studies on the export competitiveness of agri-products. The purpose of this study is to explore the critical factors of India's agri-product export competitiveness. The competitiveness research has put less than adequate attention on the agriculture sector as compared to other constituents of the economy, such as industries and services. Overall, the present study has successfully identified the key factors that affect India's agri-products export competitiveness in the global market. Indian agriculture has a huge export potential in the world market, and this can be fully exploited if competitiveness issues are addressed properly. Therefore, by identifying the abovementioned influencing factors, this study may offer very useful insight to

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farmers, exporters, and the government on how to strengthen India's agricultural exports in the global market. Further, the framework of the study also lays the foundation for undertaking econometric-aided empirical research on export competitiveness of selected agri-products or the entire agriculture sector.

Keywords: Agri-products; determinants; export competitiveness; international trade; India.

1. INTRODUCTION

Agriculture is a vital sector for the sustained growth of the Indian economy. In India, a large number of areas are tropical which has provided ample opportunity to grow different types of agri-products. An increase in agriculture earnings directly contributes to rural income and welfare [1]. The agriculture sector plays a crucial role in poverty reduction by employing 56 percent of the Indian workforce and ensuring food security for the majority of the Indian population [2]. Recently, the Economic Survey [3] pointed out that approximately 47 percent of India's population relies on the agricultural sector as their primary source of income. Therefore, agriculture sector provides income for both food and non-food expenditures [4]. Additionally, this sector holds significant importance, despite its relatively low share in India's GDP. In the fiscal year 2020-21, the share of gross value added (GVA) of agriculture and allied sectors in the Indian economy stood at 19 percent. This sector contributes 16 percent to India's gross domestic product (GDP) and 10 percent of the total country's exports [5]. India's agriculture has also significantly contributed to national merchandise exports. In 2021-22, agricultural exports accounted for 11.90 percent of India's total merchandise exports. Indian agriculture has undergone significant transformation over the last few decades and during this period the sector has emerged as a force to reckon with in the global economy, particularly in exports. Overall, the Indian agricultural exports have played a significant role in shaping the country's economic development.

India is one of those developing countries that has been trying eagerly to increase agricultural export in the world market. Currently, India is a net exporter of agricultural trade [4,3]. In 2021-22, Bangladesh, United States of America, China, Vietnam, United Arab Emirates, Indonesia, Saudi Arabia, Malaysia, Nepal, Egypt, Sri Lanka, Netherlands, Iran, Iraq, United Kingdom, Japan and Thailand were the major export destinations for India's agricultural and allied commodities [6]. Hence, there is a strong demand for Indian agricultural products in the

international market. The agricultural products from Southeast Asian, Middle Eastern, Central and Eastern European countries have significant trade potential and are very complementary to India's imports. Cheong et al. [4] argued that India is a net exporter in the south Asia and has great trade potential. According to World Trade Statistical Review [5], India ranks amongst the top 10 exporters of agricultural products in the world. In 2021-22, India has reached US\$ 50.2 billion in agricultural exports [3,7,8].

Agriculture export is considered as one of the key drivers for achieving robust and sustained economic growth and it helps raising the incomes of farmers and other stakeholders in developing countries. Amiti and Freund [9] advocated that export growth can be mainly accounted for by high export growth of existing products (the intensive margin) rather than in new varieties (the extensive margin). It is an essential tool for achieving India's objective of agriculture exports becoming US\$ 100 billion in the next few years and US\$ 5 trillion economy by 2024-25 [10,11]. According to Keynesian argument, export growth enhances income growth via foreign exchange multiplier. It helps reaping benefits of economies of scale through larger production volume and encourages technological innovation. Therefore, similar to overall exports, agricultural exports can play a significant influence on economic development [12], as agricultural trade is a subset of the aggregate merchandise trade.

However, India's share in world's agri-product exports has remained stagnant at around 2.5% only [13]. In 2020, India's agricultural export share was 2.5% in the total world agriculture exports, which has declined marginally to 2.4% in 2021 [13,8]. The corresponding figures for smaller nations like Netherlands, Germany, France, Spain, Italy, and Belgium are 6.3%, 5.2%, 4.3%, 3.7%, 3.3% and 2.8%, respectively. In this context, Patil et al. [14] mentioned that India's agri-export share is comparatively low in global export which may be due to less farmers' involvement in export chain. It was merely 1.1% of country's Agri and allied export in 2000 that has been increased to 2.5 percentage in 2020 with a value of about 42.07 billion US dollar.

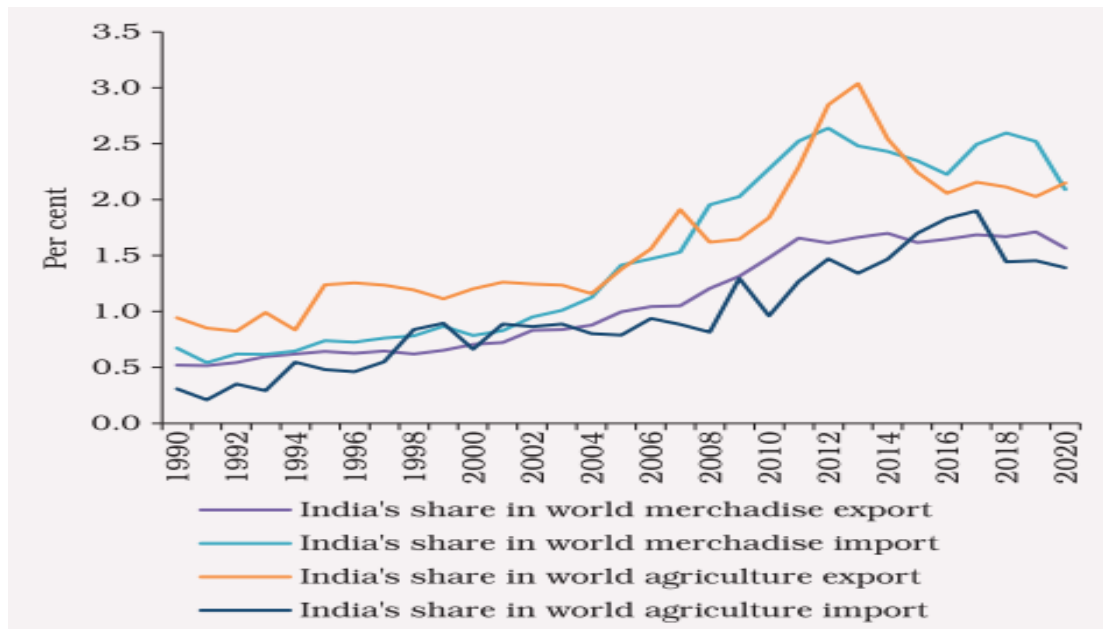


Fig. 1. India's % share in world agriculture and merchandise trade

Source: FAOSTAT, MoA&FW, RBI

Fig. 1 depicts that India's agriculture exports have gained low importance in the international trade basket. However, the country's agriculture export share increased steadily; from 1990 to 2020 where it was highest in 2013 to 2014. World Trade Organization asserted that major agro-products such as cereals, meat, dairy, sugar, and a range of fruits and vegetables faced trade barriers on a scale hidden compared to other merchandise trade [13]. Overall, India isn't competitive enough (or export-oriented enough) to boost its exports [15]. Similarly, India's export ranking is not commensurate with the production advantages due to high domestic consumption, less value addition, lack of cost competitiveness, and compliance-related issues, amongst others.

Despite all these facts, the agricultural sector has not been able to exploit the full potentials in the export front. One of the reasons behind this also is the lack of understanding on what factors influence/contribute to India's agri-product exports. Though several studies like Adhikari et al. [16], Bojnec and Fertő [17], Bhattacharya [18], Geetha and Srivastava [19], Navghan et al. [20], Narayan and Bhattacharya [21], and Reddy and Patel [22] have tried to examine this, still enough scope lies in exploring the issue further. This is also inadequate information about India's agri-product competitiveness. It is, therefore, pertinent to identify the determining factors that

influence the export performance of agri-products and ascertain whether these factors emerge from internal sources e.g., supply-side issues, or act externally through factors like market size, export prices, and openness of the economy etc. This paper is a humble attempt in that direction. The outcome may help the stakeholders of agri-products, including the farmers, exporters and policymakers.

2. INDIA'S AGRICULTURE TRADE

India has been both an exporter and importer of agriculture products for a long time. In agri-products trade, export is one of the most profitable business activities for any developing country. It is a crucial source of the foreign exchange earnings which will be beneficial for the favourable balance of trade. Hence, the export of agricultural products has an important role in securing the surplus in the external trade balance. Table 1 presents India's agricultural trade balance scenario for the period 2010-11 to 2020-21. It shows that India's agricultural trade balance was at its peak in 2013-14 with INR 177051.24 crores.

Similarly, a recent study by Suganthi [7] also mentioned that India's agricultural trade balance reached to its highest level in 2013-14. However, the country's agri-trade balance remained volatile during the period 2010-11 to 2020-21.

Table 1. India's agricultural balance of trade

(Values in INR crore)

Year	Agriculture Export	Agriculture Import	Trade Balance
2010-11	113046.58	51073.97	61972.61
2011-12	182801.00	70164.51	112636.49
2012-13	227192.61	95718.89	131473.72
2013-14	262778.54	85727.30	177051.24
2014-15	239681.04	121319.02	118362.02
2015-16	215395.68	140289.22	75106.46
2016-17	226651.91	164726.83	61925.08
2017-18	251563.94	152095.20	99468.74
2018-19	274571.28	137019.46	137551.82
2019-20	252976.06	147445.81	105530.25
2020-21	308830.00	154510.72	154319.28

Source: Agricultural Statistics at a Glance 2022, Government of India

Agri-products are increasingly traded regionally and globally, and the volume and direction of exports is changing depending on how the products could be exported competitively, both in the short and long term. A recent report by the United Nations [23] emphasized that global agricultural trade tripled in terms of both imports and exports between 1996 and 2019. In 1950-51 the value of India's agriculture export was only INR 149 crores which has been significantly increased to the level of INR 3.1 lakh crores in 2020-21. Even during the hardship moments during the COVID-19 global pandemic, India maintained its agri-exports and supply chain in the world market.

Generally, agricultural exports are affected by production, consumption and governmental

policy. As mentioned in Table 2 India has emerged as a significant exporter of agri-products after globalization, the highest export achieved was Rs. 3,08,830.00 Crores in 2020-21. In addition, the percentage share of agricultural export to total national export has increased from 9.94 percentage in 2010-11 to 14.30 percentage in 2020-21. According to Table 2, this share reached its peak (14.30 percentage) in the recent year 2020-21. India's agricultural exports and their proportion of total exports have steadily increased over the years. According to the data above, Table 2 shows the increasing trend in India's agriculture exports during the period 2010-11 to 2020-21. This suggests that India has a high potential to increase its share in the global market for agricultural products.

Table 2. India's agricultural exports and their share in total exports

(Values in INR crore)

Year	Agriculture Exports	India's Total Exports	% Share of Agricultural Export to total national Exports
2010-11	113046.58	1136964.22	9.94
2011-12	182801.00	1465959.31	12.47
2012-13	227192.61	1634318.29	13.90
2013-14	262778.54	1905011.08	13.79
2014-15	239681.04	1896445.47	12.64
2015-16	215395.68	1716378.05	12.55
2016-17	226651.91	1849433.55	12.26
2017-18	251563.94	1956514.52	12.86
2018-19	274571.28	2307726.19	11.90
2019-20	252976.06	2219854.17	11.40
2020-21	308830.00	2159043.00	14.30

Source: Agricultural Statistics at a Glance 2022, Government of India

2.1 Exports of Agri-Products from India - A Snapshot

India is the second highest producer of agricultural products in the world with gross agriculture production of US\$ 539 billion (in 2018) and has the largest arable land of 156 million hectares. India leads production worldwide in several commodities, including shrimps, spices, fruits etc. India is the world's largest producer of milk, pulses, and jute, and ranks as the second largest producer of rice, wheat, sugarcane, groundnut, vegetables, fruits, and cotton. It is also one of the leading producers of spices, fish, poultry, livestock, and plantation crops, such as mango, papaya, banana. India has the largest population of buffaloes. Over the last decade, India has emerged as a major exporter of rice, cotton, and buffalo meat [23]. Hence, India has emerged as a key player in global exports of major agri-commodities [7].

The export composition of agriculture commodities at the HS four-digit are reported in Table 3. Further, Table 3 exhibits India's top ten agri-export commodities scenario for the period 2015-16 to 2019-20. Based on the Table 3, rice is a highly exported commodity from India. Here, some agri-products have shown satisfactory export performance during the period. However, the export shares of these commodities have seen fluctuations during the time period due to global demand and various other factors. This fluctuation attains the researcher's interest to identifying the key determinants that determine agri-export competitiveness.

2.2 Major Challenges in India's Agri-Export Front

Though there has been an increasing trend in India's agricultural exports, but the country has established its export competitiveness only in limited agro-products such as rice, tea, milk, guar gum, and castor. Lots of agriculture products have lower comparative advantage or disadvantage in the world agriculture trade. Here a few main issues and challenges have been identified in India's agriculture trade and competitiveness front:

1. Quantitative restriction or export quotas, export duties and import duties have imposed on several agro-products. For instance, export restrictions or export bans were applied to wheat, non-basmati rice, chickpeas, sugar and milk during 2000 to 2016 which have adversely affected India's

agricultural trade. According to the Organization for Economic Co-operation and Development (OECD) [24] the farmers in India have been affected by a combination of complex domestic market regulations and by import and export trade restrictions.

2. Market access, domestic support, and export subsidies [25] are among the major challenges for Indian agriculture exports. Because a better market access may positively and significantly impact agri-products export competitiveness. Hence, market access is a major issue in agri-products' export competitiveness.
3. World Trade Organization's (WTO) issue on the Sanitary and Phytosanitary (SPS) agreement promoted member countries to recognize each other's conformity assessment systems based on international standards so that products certified in one country are accepted without the need for further inspection/testing by other countries. India is facing this challenge from major agriculture export destination such as EU, US, Australia and Japan. Indeed, SPS has major barriers on agriculture trade [26-30].
4. Yield risk [5] and price risk have also other challenges in the Indian agriculture sector that become crop insurance and minimum support price (MSP) policy failure in domestic agro-farming. Anderson et al. [31] find out that there has been negative relationship between agricultural subsidies and comparative advantage in the long run.
5. In case of exchange rate, Mousavi and Leelavathi [32] have suggested that there is no significant relationship between quantity of India's agricultural export and real exchange rate in the long run. Further, they argued that exchange rate is not a good indicator for predicting future quantity of agricultural exports.
6. The Indian agriculture products need to be actively promoted with unique value proposition. Branding and Market Development are among the key differentiators when it comes to influencing product buying decisions. There are examples of countries that have created brands and have successfully built export competitiveness leveraging the country-of-origin image e.g. California Almond, New Zealand Kiwi, Peru Quinoa etc. Ecuador has built a strong brand for its shrimp

industry anchored on sustainable farming and has built a strong presence in China's growing market segment for sustainable shrimp [6]. Therefore, export promotion and branding are another major challenge for Indian agri-export in the international markets.

These challenges address quantitative (quotas and duties) and qualitative (SPS) barriers, infrastructure deficiencies, productivity and domestic policy concerns, regulatory and policy matters, market access and promotion issues. These challenges require a collaborative effort among the government, corporate sector, and agricultural stakeholders. Furthermore, infrastructural improvements, regulatory changes, technical advancements, and better market access tactics will help India's agricultural exports become more competitive. After discussing the aforementioned issues, the following reviews have shown various influencing factors of agri-products and overall agriculture export competitiveness.

3. LITERATURE REVIEW

A country's agriculture export is determined by various factors. Reliable assessments of the

factors of export are necessary for formulating suitable policy [16]. Hence, this study identifies the determinants and influencing factors of agriculture export competitiveness. The following Table 4 exhibits the list of factors that affect agri-product export competitiveness across regions and in different time periods.

These studies collectively provide a comprehensive understanding of the multifaceted determinants of agricultural exports, highlighting the importance of major drivers, like production, export price, exchange rate, market size, trade openness, and policy advancements in driving export growth. The literature review unequivocally demonstrates that agriculture exports are impacted by a multitude of factors. The review is aimed at addressing the main issue of what are the key factors that influence agri-product export competitiveness. Based on the extant literature review, we found that market size, yield, production cost, trade openness and export price are major determinants of India's agri-products export competitiveness. Indeed, these sources provide comprehensive insights into the factors determining agricultural exports and suggest key measures to enhance export competitiveness.

Table 3. India's top 10 agri-products at HS four-digit level

(Values in INR crore)

Sr. No.	H.S. Code	Product's Name	2015-16 (% share)	2016-17 (% share)	2017-18 (% share)	2018-19 (% share)	2019-20 (% share)
1	1006	Rice	38201.99 (17.74%)	38442.79 (16.96%)	50307.90 (20.00%)	53975.47 (19.66%)	45426.66 (17.96%)
2	5201	Cotton	12515.54 (5.81%)	10340.60 (4.56%)	11336.54 (4.51%)	13920.61 (5.07%)	7141.47 (2.82%)
3	0902	Tea	4466.96 (2.07%)	4602.77 (2.03%)	5059.22 (2.01%)	5452.73 (1.99%)	5446.05 (2.15%)
4	0801	Coconut	5461.07 (2.54%)	5928.81 (2.62%)	6494.14 (2.58%)	5049.46 (1.84%)	4381.69 (1.73%)
5	2401	Unmanufactured Tobacco	4373.45 (2.03%)	4249.85 (1.88%)	3828.13 (1.52%)	3984.53 (1.45%)	3761.37 (1.49%)
6	0901	Coffee	3450.18 (1.60%)	3736.57 (1.65%)	4184.38 (1.66%)	3671.78 (1.34%)	3290.06 (1.30%)
7	0703	Onions	3311.71 (1.54%)	3349.86 (1.48%)	3493.95 (1.39%)	3560.19 (1.30%)	2388.59 (0.94%)
8	1202	Ground-Nuts	4075.63 (1.89%)	5444.33 (2.40%)	3386.30 (1.35%)	3297.32 (1.20%)	5096.39 (2.01%)
9	0806	Grapes	1576.69 (0.73%)	2065.29 (0.91%)	2205.56 (0.88%)	2602.76 (0.95%)	2460.95 (0.97%)
10	1005	Maize (Corn)	1162.01 (0.54%)	1030.13 (0.45%)	1230.59 (0.49%)	1872.01 (0.68%)	1024.49 (0.40%)

Source: DGCI&S, Ministry of commerce, Government of India. Note: Figures in brackets indicate an agri-product's share in the total agriculture exports from India

Table 4. Summary of the key literature review on the factors affecting agricultural products' export competitiveness

Sr. No.	Author(s)	Year	Country	Identified Factors	Products
1	Dawson [12]	2005	62 LDCs Countries	GDP growth, Investment (Capital, Labor), Agricultural and non-agricultural exports	Agro-Products
2	Boughanmi et al. [33]	2007	Oman	Firm size, Management characteristics, Marketing strategy, Investment, Market diversification, Exchange rate and Financial schemes	Fish
3	Kumar et al. [34]	2008	India	World market size, Exchange rate, and Export price.	Cucumber and Gherkin
4	Abolagba et al. [35]	2010	Nigeria	Production, Consumption, Producer price, Exchange rate, Interest rate and Rainfall	Cocoa and Rubber
5	Lv et al. [36]	2010	China	Agricultural market size, Agricultural import, Agricultural export and Agricultural fiscal expenditure.	Agro-Processed and Beverage Products, Tobacco, Textile, Garments and Fiber, Timber, Furniture, Papermaking, Printing and Rubber
6	Jesse [37]	2011	USA	Border measures, Federal and state marketing orders, Government purchase, and Income support	Milk, Butter, Cheese and Non-fat dry milk.
7	Mousavi and Leelavathi [32]	2013	India	Quantity of agricultural export and real exchange rate	Agriculture products
8	Boansi et al. [38]	2014	Mali	Export volume, Export value, Production, Terms of trade index, Comparative export performance index, World export volume	Cotton
9	Adhikari et al. [16]	2016	India	Export volume, Export price, Exchange rate, International price, Domestic consumption, and Lagged production.	Rice
10	Suresh and Mathur [39]	2016	India	Production, Total factor productivity and Market diversification	Meat and offal's, Fish and marine products, Vegetables and tubers, Fruits and nuts, Coffee, Tea, Cereals, Spices, Oilseeds, Guar gum and other resins, Rice, Rubber, Sugar, Cotton
11	Braha et al. [40]	2017	Albania	GDP, Population, Domestic Demand, Transportation Cost, Sharing common border, Exchange rate, FTA and Quality of institutions	Agricultural Commodities

Sr. No.	Author(s)	Year	Country	Identified Factors	Products
12	Geetha and Srivastava [19]	2018	India	Domestic consumption, Exports volume, Export price, Exchange rate, International price and Production.	Maize
13	Bhattacharya [18]	2019	India	Domestic price, Investment, Per capita GDP, REER, Storage facilities.	Fresh Fruits
14	Shahriar et al. [41]	2019	China	GDP, Exchange rate, Common language, Country land area, Belt road initiative and Common borders.	Meat

Source: Author's own compilation

4. IDENTIFYING THE FACTORS OF EXPORT COMPETITIVENESS

The notion of competitiveness lies at the heart of the economic debate. Today, competitiveness has become one of the most important economic issues worldwide. Countries from both developed and developing world are trying to garner the largest share of world market by increasing their economic competitiveness in a highly competitive global market. Though competitiveness is discussed widely, at the level of nations, firms, industries, or products, the concept has still remained debatable, particularly on issues such as how to define or measure it. Therefore, Liu and Jiang [42] stated that competitiveness is a complex concept. In case of agricultural products trade, Zhou and Tong [43] stated that the competitiveness refers to the ability of the country's agricultural products to continue to make profits in the international market and the competitive advantage of developing international trade, especially export trade.

Bones and Fertő [17] pointed out that agri-products export competitiveness is the most crucial aspect in the long-term. There are many factors that could determine the agri-product export competitiveness. As yet, there is no consensus about the implications for the determinant of competitiveness. Determinants of competitiveness can be split into internal and external components. This study has considered

a few major factors which are influencing India's agro-products competitiveness.

Fig. 2 illustrate the identified significant determinants for India's agri-products competitiveness. World market size is a crucial indicator of a product's competitiveness. It represents the global demand for the agricultural commodity. A larger market size promotes economies of scale which will improve the product's competitiveness in the world market. The market size and competition level can be enhanced by globalization and trade openness. Further, Yield is the classical and standard unit of measurement for a product's productivity. An increasing yield will significantly positively impact the agri-product's export competitiveness while a declining yield can reduce its competitiveness. The yield of a product is contingent upon climatic conditions. Indeed, yield is most important factors in case of agri-products export competitiveness.

Similarly, the exchange rate is an important determinant of export competitiveness where depreciation of the domestic currency may enhance the agri-product's export competitiveness. Favourable exchange rates attract foreign investment in the agriculture sector, which will improve infrastructure and production capabilities. This can lead to more competitive products in terms of quality and cost.

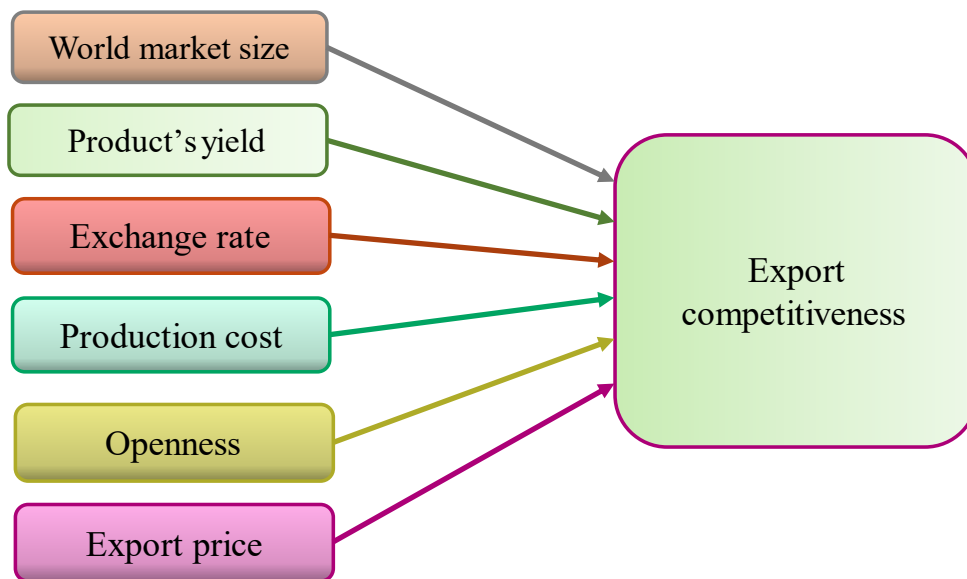


Fig. 2. Conceptual framework of the factors influencing agriculture export competitiveness
(Here, we would like to put both figures in black and white)

Based on classical trade theories, the production cost is a fundamental factor in the specialization of a commodity which ultimately improves competitiveness. Production cost may also be influenced by the exchange rate due to imported inputs and raw materials for the agriculture sector. To maintain profit margins and competitiveness, relevant stakeholders should more focus on optimum input costs in the agriculture sector. Efficient technology and increasing yield may reduce agricultural production costs. As, higher yields can improve export competitiveness by reducing production costs and increasing supply, while favourable exchange rates can make exports cheaper for foreign buyers, stimulating demand and enhancing agri-products competitiveness in international markets. Singh [44] believed that low yields, costs of cultivation, and low prices were the most important concerns in India.

Further, agri-product export competitiveness is greatly impacted by trade openness, which is the degree to which a nation participates in international trade by removing trade barriers like tariffs, quotas, and restrictions. Openness is estimated as $\text{export} + \text{import}/\text{GDP}$ [45]. Based on the comparative advantage, trade openness encourages a more efficient allocation of resources. In summary, trade openness positively impacts agri-product export competitiveness by expanding market access, enhancing efficiency, and allowing better resource allocation. Finally, export price is the one of the most important factors in encouraging sales and determining competitiveness in international trade. In order to foster better export competitiveness, efforts should be put in place to optimize export prices for agri-products in international trade. Competitive export prices can increase large market size which will ultimately improve the profit margins and economies of scale [46-53]. The above identified factors are deeply intertwined which may collectively enhance agri-products competitiveness.

5. CONCLUSION AND FUTURE DIRECTION

Export and competitiveness are important forces shaping economic outcomes around the world, and they are deeply intertwined. It is important to note that several factors contribute to competitiveness of agri-product exports. This study aimed to identify the factors that contribute towards export competitiveness in the context of agricultural products. The study thus helped to

lend a lot of clarity on competitiveness of India's agri-products in the world market. Through extensive literature survey and discussion, this study found that world market size, a product's yield, production cost, export price along with country's exchange rate, trade openness are amongst the main factors that can increase India's agri-products competitiveness. To summarize, the factors that influence India's agricultural exports are intricately linked and have multiple dimensions, indicating a complex interaction between distinct factors. This study provides deep insights into the factors that affect agri-products export and suggests key measures to enhance export competitiveness. Moreover, coordinated actions by the government, private sector, and relevant agri-stakeholders can address these determinants, fostering a robust and potential agri-products export that will contribute to economic growth and farmer prosperity. Further, the present study not only helped to identify the factors that affect India's competitiveness in agri-products, it also throws lights on the drives of product level competitiveness, in general. Moreover, this article lends a foundation for undertaking empirical research on competitiveness by identifying the significant factors of export competitiveness through the application of suitable econometric tools.

The present study will open the future scope for discussion on how to improve agri-products export competitiveness, either at a specific product level or the sector, as a whole. It is necessary to conduct further study to determine how consumer behaviour, real interest rate, producer pricing, product quality, and marketing initiatives may boost India's agri-products' competitiveness and expand exporters' opportunities. As achieving competitiveness is not a one-time activity, there has been an emphasis on sustainable competitiveness. This study has also shed light on several dimensions of sustainable competitiveness in agri-products. This study can also be helpful for government agencies, farmers, exporters, research scholars, policymakers, etc., all of whom can make use of the study framework and collect data/information, findings etc. on the identified factors for facilitating more effective decision-making.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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