
Agricultural Trade with Special Reference to Plantation Crops and International Trade Agreements*

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I

INTRODUCTION

International trade is considered essential for faster economic growth and to reduce poverty as it can help countries to benefit from their comparative advantage, capital accumulation and to develop competitive advantage (IMF, 2001; Dollar 2001). Significant growth that many Asian countries have achieved in the last four decades has been attributed to trade liberalisation. After Independence, India had a restricted trade regime and emphasised on achieving self-sufficiency, particularly in food production as the agricultural sector is the mainstay of livelihood for more than two-thirds of its population. Agriculture also significantly contributes (18 per cent) to the gross domestic product (GDP), provides food security, supplies raw materials to many agro-based industries and generates about 20 per cent of the foreign exchange. Additionally, it has a pre-eminent position in supporting population of the country in a difficult situation like the COVID-19 pandemic. With net sown area of around 140 million hectares and gross cropped area of 198 million hectares, the country has a large and diverse agricultural basket that comprises cereals, pulses, oilseeds, fibres, fruits and vegetables, beverages, spices, dairy, poultry, and seafood products.

The objective of self-sufficiency has dominated India's economic policies since Independence; and even after economic reforms and liberalisation was undertaken in the 1990s, agricultural trade remained restricted, and exports were dominated by a few items of traditional exports such as tea, coffee and spices. India's agricultural trade policies have been characterised by export controls and high import duties. Concerns about food security and farmers' earnings have led to policies pertaining to export controls, high stock holdings and food subsidies. Export controls included quantitative restrictions on export of few commodities (Hoda and Gulati, 2013).

With consistent public investment in irrigation and adoption of modern technology of production such as high yielding varieties of seeds, chemical fertilisers, plant protection chemicals, and extension, India has been able to achieve self-

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sufficiency in food production by the 1980s and also surplus agricultural production. With surpluses generated in the 1990s, India began to seriously explore processing and exporting to the world market. Changing lifestyles, spurt in demand for processed food, abundant supply of raw materials, and policies formulated and incentives offered by both central and state governments have helped to achieve 7.7 per cent growth of the food processing sector during 2011-12 to 2017-18, and accounted for around 8.83 per cent and 10.66 per cent of gross value added in the manufacturing and agriculture sectors, respectively.¹ However, increase in the export of processed food has constraints as a large share of food processing units in India are micro, small and medium enterprises (MSME) and mostly unincorporated/non-registered² with little focus on quality and safety standards (Ministry of Food Processing Industries, 2019). The surplus production also helped India to actively participate in multilateral and bilateral trade agreements. An agreement on agriculture signed in 1994 as part of the WTO agreement forced India to think seriously about the trade in agriculture. India participated in the negotiation of the Agreement on Agriculture(AoA) during the Uruguay Round (1986-1993) that came into effect with the establishment of World Trade Organisation (WTO) in 1995. The agreement aimed at ensuring a more open and competitive agricultural trading system worldwide and consisted of three pillars, namely, market access, domestic support and export subsidies. India kept the bound tariff high; domestic support was below the limit and there was no direct export subsidy. The Doha Development Round, which began in 2001, sought to address distortions in agricultural trade while addressing the social and economic needs of the developing countries. An agreement was reached in November 2015 in Nairobi among the developed countries to eliminate export subsidies immediately and the developing countries would follow suit by the end of 2018. However, due to significant differences among the member countries, the negotiations are still going on. Apart from being an active member of the WTO, India has signed many other Regional Trade Agreements (RTAs) in the last two decades. Some RTAs such as Asia Pacific Trade Agreement (APTA) and Global System of Trade Preferences among Developing Countries (GSTP) existed even before the WTO agreement came into force. A list of RTAs notified since 1990s is reported in Appendix 1(A).

After the WTO came into being, various efforts have been made by the Indian government in terms of infrastructure development, simplification of procedures, and export orientation in production and value addition to promote exports. India has been cautious in terms of trade agreements; particularly in agriculture because any adverse impact is considered difficult to cope with as 86 per cent of the farmers are small and marginal holders. In addition, the agricultural supply chain is highly fragmented with too many intermediaries, poor infrastructure and is devoid of proper quality assessment, with poor storage and transportation management making it difficult to integrate with the global value chain. Trade openness can also bring in the higher volatility of the international market to the domestic market, which can affect

both producers and consumers in the domestic market. While there are studies on the impact of some of these agreements on agricultural trade in India, a comprehensive assessment of the trade agreements has not been done, particularly for the recent years. This paper aims at assessing the performance of agricultural trade and impact of multilateral and regional trade agreements. The specific objectives of the study are: first, to assess the performance of India's agricultural trade in the last three decades; second, to identify the determinants of the performance of agricultural trade; third, to find out whether multilateral and regional trade agreements have made impact on agricultural trade; and fourth, to identify policy measures to strengthen the agricultural trade in India.

II

DATA AND METHODOLOGY

Agricultural Trade Performance and Instability

The performance of agricultural trade has been assessed by examining the overall export and import performance of the agricultural products over time. A broad measure of performance of trade for any country is the change in the share of exports/imports of the country for a particular commodity in the total export/import of that commodity in the world market. To assess the trade performance of the agriculture sector, first, the share of agricultural exports in the total export of the country is analysed. Then, we examine the important commodities contributing to exports and imports and examine the trends in their quantity, value and shares during the last three decades by computing the growth rates using regression method.³ Instability in exports and imports is measured by Cuddy-Della Valle index (CDVI), which corrects for trends in the time series while computing the variation (Cuddy and Della Valle, 1978). The CDVI is computed as

$$CDVI = CV (1 - R^2)^{0.5},$$

where CV is the coefficient of variation and R^2 is the coefficient of determination of the trend regression adjusted by the degrees of freedom.

However, it is also important to consider various factors that influence a country in exporting its commodities.

According to Porter's Theory of Competitive Advantage, trade performance of a country will depend on four important factors. They are factor conditions, demand conditions, related and support industries and company strategy, structure and rivalry. The other two factors he identifies are government policy and exogenous shocks. In the case of agricultural commodities, factor conditions, demand conditions, related and support industries, government policies and exogenous shocks are important determinants of trade performance. Revealed Comparative Advantage is a broad

measure of how a country has been able to create competitive advantage. Trade performance over time will also enable us to explain determinants of trade with the help of economic theory and model.

Revealed Export Competitiveness of Commodities

To assess the competitiveness of the country with respect to individual commodities, relative export competitiveness (REC) was computed as done by Narayan and Bhattacharya (2019). REC uses the concept of relative revealed comparative advantage developed by Balassa (1965). This measures the share of a commodity in a country's total export relative to the share of that commodity in the total world exports. The formula for this index has been modified to avoid double counting issue as suggested by Scott and Vollrath (1992) and Frohberg and Hartmann (1997). The formula is as follows.

$$REC_{ijt} = (X_{ijt} / \sum X_{ilt}) / (\sum X_{kjt} / \sum \sum X_{klt})$$

where X is exports, i is commodity, j represents India, and l represents the world excluding India; therefore $\sum X_{ilt}$ is the export of commodity i for the world excluding India, $\sum X_{kjt}$ is the export of all agricultural commodities except i and $\sum \sum X_{klt}$ is the world export of all agricultural commodities except i and all exports of India.

Determinants of Export Performance and Impact of Trade Agreements

To address the second and third objectives of identifying the determinants of trade performance, a regression model was developed that includes dummy variables for multilateral and relevant RTAs to the commodity competitiveness being analysed. The relevance was assessed through whether a particular RTA included countries, which were major exporters or importers of that commodity. The model includes controls for demand and supply factors in the domestic market and export price. Two important demand factors were per capita income and domestic price. Per capita production and domestic price were included as important supply factors and unit value realisation represents the export price. Therefore, the model specified was as follows.

$$REC_t = f(\ln GDPPC_t, \ln PRICE_t, \ln PCP_t, \ln UVR_t, TAI_t),$$

where GDPPC is the per capita real gross domestic product, PRICE is deflated wholesale price of the commodity in the domestic market, PCP is per capita production, UVR is the unit value realisation for the commodity for India and TAI is dummy variables for i -th multilateral/regional trade agreements and t refers to the time period. Since multiple multilateral and regional trade agreements were

implemented in certain years, the trade agreements were grouped based on the year of implementation as indicated in Appendix 1(B). The agreements relevant to the commodity and countries were included as dummy variable in the regression. For example, in a particular agreement if a commodity was in the exclusion list, that agreement dummy was not included in the regression for the commodity. If any of the dummy variables of trade agreement was significant, its sign indicates the impact of trade agreement on the export performance. A significant positive sign indicates that the trade agreement had been helpful in improving the competitiveness for that commodity. This could be through opening of markets hitherto not available. A negative sign could be due to increased competitiveness in the market due to trade agreement. The variables are first tested for stationarity using Augmented Dickey-Fuller test. Non-stationary variables are used in a first difference form.

Export Price Impact on Domestic Price

Another question that arises with the opening of the trade is whether export prices impact domestic price. The impact of export price on the domestic price was examined with the help of an error correction model. The model is specified as

$$\Delta DP_t = \alpha + \beta \Delta UVR_t + \delta (DP_{t-1} - \theta UVR_{t-1}) + e_t$$

where DP is the deflated domestic price, UVR is unit value realisation from exports computed by dividing export value by export quantity. A significant β indicates short-term relationship between domestic price and unit value realisation from exports; and a significant δ indicates the extent to which there will be adjustments in the domestic price with the changes in the unit value realisation in the short run.

Data Sources

In order to address the objectives, secondary data were collected from various sources for the period 1991-92 to 2019-20 to cover the periods before and after various multilateral and regional trade agreements. The sources include Food and Agriculture Organization, various agriculture and commerce related departments, boards and export promotion agencies of Government of India, Reserve Bank of India, The World Bank, Index Mandi, Indiastat and Centre for Monitoring Indian Economy.

III

RESULTS AND DISCUSSION

Trends in Trade of Agriculture and Allied Products

India's major export destinations in 2018-19 were Vietnam, Iran, Saudi Arabia, United Arab Emirates, the USA, Indonesia, Nepal, Bangladesh, Malaysia, Iraq and

the major export items were non-basmati rice, basmati rice, fresh onions, buffalo meat, maize, fresh vegetables, poultry products, miscellaneous preparations, guar gum, groundnuts and fresh fruits (APEDA, 2020). Although India is a top producer of several agricultural commodities, its agricultural export basket accounts for only about 2.5 per cent of the global agricultural trade. Total agricultural exports and imports values adjusted for inflation show considerable upward trend since the 1990s (Figure 1). Export and imports grew significantly at the rate of 6.55 per cent and 9.58 per cent, respectively, during 1991-92 to 2019-20. In the last decade, we have seen phenomenal increase in the export value, which helped to achieve an agricultural trade surplus in 2013-14 more than thrice the surplus achieved in 2009-10. However, in the recent years, we have seen a declining trend in both exports and imports, though such decline is likely to be part of the long-term trends. The growth rate in imports being larger than the growth rate in exports, the concern is whether the surplus in agricultural trade will continue in the near future. The trend in the large difference between export and import values indicate that the agriculture trade surplus is likely to continue in the coming years. The question, however, is how the country can put this trade surplus on a high growth rate trajectory. It requires, understanding of how individual agricultural commodity/product export has been performing in the country and the potential for growth in their exports.

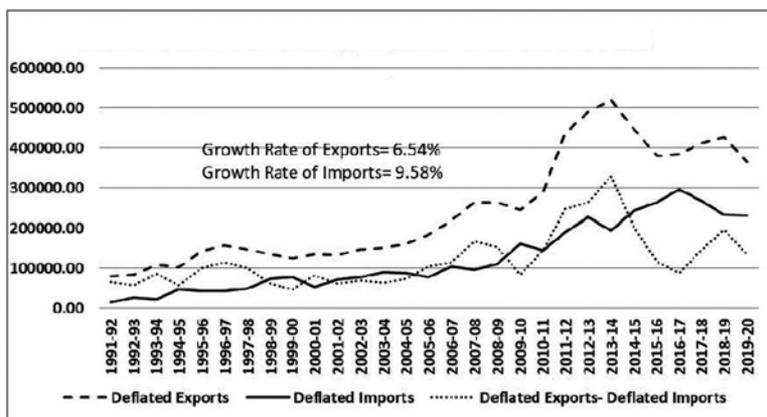


Figure 1. Trends in Indian Agricultural Exports and Imports (Deflated values).

The broad trends in the share of agricultural exports and imports in the total exports and imports of the country since 1961-62 are shown in Table 1. This indicates the sectoral performances given the international trade environment including infrastructure, policies, tariffs, exchange rate, institutional support, etc. in the country. The table indicates that agriculture sector did not do well compared to overall exports of India. Agriculture sector had a share of 39 per cent in the total exports of the country in 1961-62. This share steadily declined till 2010-11 to reach only 7.6 per cent of the total exports. In the last decade, there has been an increase in the share of

agricultural exports in the total exports. The share of agricultural imports also followed a similar trend. The share was 30.5 per cent in the total imports in 1961-62, which increased to 33 per cent in 1971-72. However, since then, the share significantly decreased to 2.7 per cent in 2010-11. The share picked up in 2019-20 to 4.4 per cent.

TABLE 1. SHARE OF AGRI EXPORT AND AGRI IMPORT IN TOTAL EXPORT AND TOTAL IMPORT OF INDIA AND THEIR CAGR FOR THE PRECEDING DECADE

Year	1961-62	1970-71	1980-81	1990-91	2000-01	2010-11	2019-20
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Share of agriexport in total exports	38.9	29.5	27.5	16.6	10.8	7.6	10.0
Share of Agri Import in Total Import in India	30.5	33.0	8.2	4.1	5.4	2.7	4.4
CAGR for Share of Agri Export in Total Export for the preceding decade	-	-3.0	-0.7	-4.9	-4.2	-3.4	3.0
CAGR for Share of Agri Import in Total Import for the preceding decade	-	0.9	-13.0	-6.7	2.7	-6.7	5.6

Source: Author's calculations.

The allied agricultural products such as marine products, meat and meat products, poultry and dairy products had a share of 3.89 per cent in 1991-92, which marginally increased to 4.08 per cent and then decreased substantially to 2 per cent in 2010-11 (Table 2). In the last decade, it has picked up and reached 3.41 per cent share in the total exports in 2019-20.

TABLE 2. SHARE OF ALLIED* AGRICULTURE EXPORTS AND IMPORTS IN TOTAL EXPORTS AND IMPORTS AND CAGR OF EXPORTS AND IMPORTS

Year	1991-92	2000-01	2010-11	2019-20
(1)	(2)	(3)	(4)	(5)
Share of allied agricultural export in total exports	3.89	4.08	2.00	3.41
Share of Allied Agriculture Import in Total Import (per cent)	0.00	0.00	0.00	0.15
CAGR for Share of Allied Agriculture Export in Total Export for the preceding decade (per cent)	-	0.54	-6.88	6.10
CAGR Share of Allied Agriculture Import in Total Import for the preceding decade (per cent)	-	0.00	0.00	0.00

Source: Author's Calculations

*Allied agriculture includes marine products, meat and meat products, poultry and dairy products.

However, in the last two decades, the share of value of agricultural exports in the total export value has not experienced any major change (Figure 2). The share of import also remained the same.

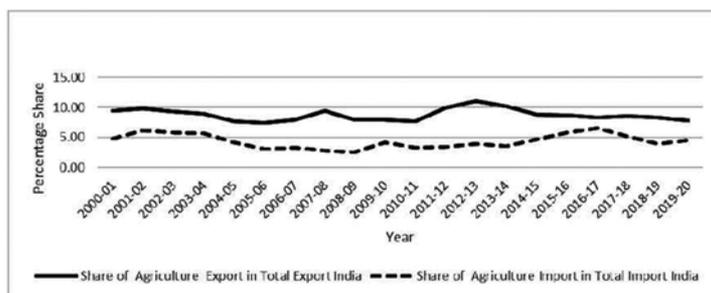


Figure 2. Share of Agri Export and Agri Import in Total Exports and Imports for India during 2000-01 to 2019-20

The growth rate in agricultural production achieved its peak in the decade of 1980s (Table 3), which helped to achieve food self-sufficiency and create surplus in some commodities. Rao (2001) attributed the growth in the 1990s, to improvement in terms of Indian agricultural trade due to liberalisation of the economy, which resulted in increase in private investment in agriculture; and consequently, India became a net exporter of food grain. Since then, there has been a slow-down in the agricultural production growth, attributed mainly to structural factors such as decreasing public investments on research and extension services, poor irrigation expansion due to management issues (Bhalla and Singh, 2009), shrinking of farm size, institutional credit availability and increasing environmental stress (Balakrishna *et al.*, 2008). While the growth rate decelerated for crop agriculture, the growth rate in milk and egg production continued to remain high.

TABLE 3. GROWTH RATE IN PRODUCTION OF AGRICULTURE, MILK AND EGGS DURING 1950 TO 2020

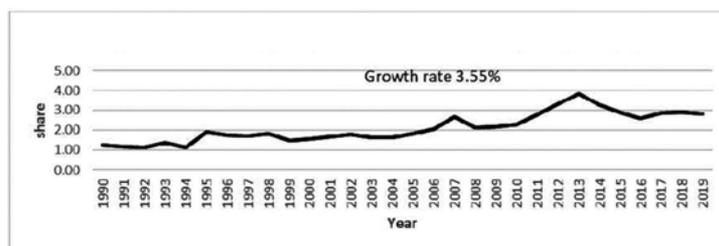
Year (1)	CAGR of Agricultural Production (per cent)+ (2)	CAGR of Milk Production (per cent) (3)	CAGR of Eggs Production (per cent) (4)
1950- 51 to 1960- 61	5.17	1.49	4.20
1960- 61 to 1970- 71	1.68	0.65*	7.01*
1970- 71 to 1980- 81	1.62	3.12**	5.05**
1980- 81 to 1990- 91	3.57	4.97	6.97
1990- 91 to 2000- 01	1.32	3.73	5.14
2000- 01 to 2010- 11	2.09	3.82	5.06
2010- 11 to 2019- 20	1.02++	4.92***	5.65***

Source: Department of Agriculture, Cooperation and Farmers Welfare Department of Animal Husbandry and Dairying

Notes: *: Growth rates have been calculated for the period 1960- 61 to 1968- 69.**: Growth Rates have been calculated for the period 1968-69 to 1980- 81.***: Growth Rates have been calculated for the period 2010- 11 to 2018- 19 based on the available data.+ CAGR of Agricultural production has been calculated by taking into account the following major agricultural crops: foodgrains, pulses, oilseeds, cotton, jute and mesta, and sugarcane.++ Agricultural production data for 2019- 20 is based on the fourth advance estimates released by the Ministry of Agriculture and Farmers Welfare on 19.08. 2020.

India's Share in the World Agriculture Exports

India's agricultural export share in the world agricultural export has more than doubled between 1990 and 2019 (Figure 3). The share was about 1.25 per cent, which increased to nearly 3.9 per cent in 2013; and since then it has declined to 2.8 per cent in 2019. The growth rate in the share during this period had been 3.55 per cent. Surplus agricultural production in the recent years should help increase the share, provided other factors affecting exports are adequately addressed.



Source: Author's calculation.

Figure 3. India's Agri Export Share in World Agri Export (per cent)

Major Agricultural Commodities Exports and Imports and Their Performance

Examining the export share of major commodities in terms of value, we find that there has been significant change in the share of different commodities (Table 4). The exports in 1961 to 1980 were dominated by plantation crops such as tea, cashew and coffee as well as spices, cotton and sugar. The share of the plantation crops had steadily come down from 65.4 per cent in 1961-62 to only 6.1 per cent in 2019-20. Spices, cotton and sugar had been able to more or less retain the share, although with large fluctuations, particularly in the case of sugar and cotton. New commodities that have entered the market and having significant share by 2019-20 are rice, fruits, vegetables and groundnut. The share of rice has increased significantly since 1980-81 to reach 21.5 per cent of the total agricultural exports in 2019-20.

TABLE 4. SHARE (PER CENT) OF MAJOR ITEMS OF AGRICULTURE EXPORTS IN THE TOTAL AGRICULTURE EXPORTS

Year	1961-62	1970-71	1980-81	1990-91	2000-01	2010-11	2019-20
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rice	0.0	0.9	6.9	8.6	13.8	12.0	21.5
Sugar	5.7	1.1	2.0	0.0	0.8	3.2	4.1
Cotton	5.0	3.3	7.0	15.1	0.4	15.8	3.5
Fruits	0.3	0.5	0.8	1.2	2.8	2.6	3.1
Vegetables	1.7	2.7	1.8	2.6	5.3	4.6	3.5
Spices	6.5	8.7	8.1	3.7	5.6	4.9	6.5
Tea	48.0	32.7	25.0	19.8	9.1	3.6	2.6
Coffee	3.7	4.9	11.0	4.2	3.7	2.0	1.6
Cashew shelled	7.2	12.4	6.2	8.2	9.6	2.9	1.9
Groundnut	0.7	1.3	0.8	1.0	1.3	2.0	1.9

Source: Author's calculations.

Allied agriculture consisting of fisheries, poultry and animal husbandry had an average share in the total export of the country of 2.95 per cent without any significant growth during the last two decades (Table 5). In the recent years, the growth rate has been around 3.5 per cent. The share decreased from 4.1 per cent in 2000-01 to 1.7 per cent in 2008-09; and since then, the share has seen an upward trend reaching again 4.1 per cent of the total export in 2017-18 (Appendix 2). Allied sector export was dominated by marine products and meat and meat products (Figure 4). The share of marine products had decreased from 78.9 per cent in 2002-03 to 48.6 per cent in 2008-09, fluctuated around 50 per cent till 2015-16; and since then it had increased to 63 per cent in 2019-20. Overall, marine product share had decreased at the rate of 1.9 per cent annually during 2000-19. On the other hand, meat and meat products export share increased from 17.9 per cent in 2000-01 to 43.7 per cent in 2012-13, remained the same till 2015-16; and since then, the share decreased to 30.9 per cent in 2019-20. Large variability can be seen in the share of dairy and poultry products.

TABLE 5. SHARE (PER CENT) OF ALLIED AGRICULTURE EXPORT IN TOTAL EXPORT AND SHARE (PER CENT) OF DIFFERENT PRODUCT IN TOTAL ALLIED AGRICULTURE EXPORTS DURING 200-01 TO 2019-20

Particular (1)	Share of allied agri export in total export of India (2)	Share (per cent) in the total agricultural export of India			
		Poultry products (3)	Dairy products (4)	Marine products (5)	Meat and preparation (6)
Average	2.95	1.74	3.84	59.83	31.70
Growth Rate	1.18	-6.87***	0.64	-1.90***	4.70***
CVDI	26.49	34.84	54.07	14.34	19.89

Source: Author's calculations.

*** Significant at 1 per cent.

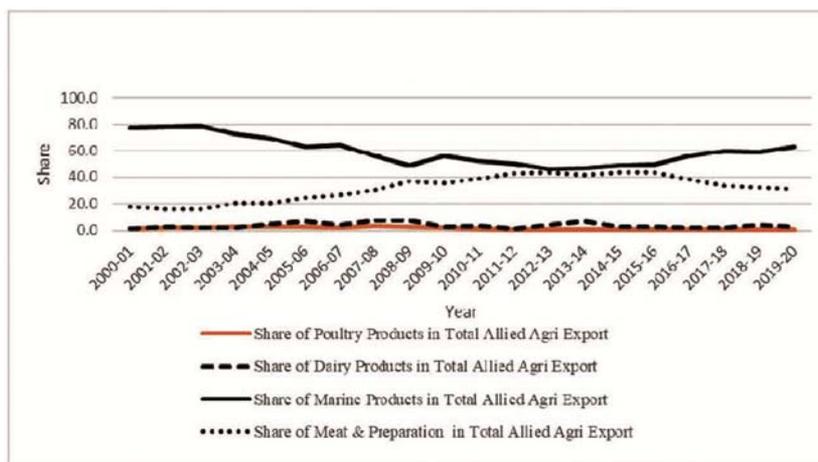


Figure 4. Share of Poultry, Dairy, Marine and Meat Products in Total Allied Agri Export.

Among commodities that were imported, vegetable oil dominated with a share of nearly half of the total agricultural commodity import value in the last two decades (Table 6). It was mere 1.2 per cent of the total agricultural import value in 1961-62, increased to 60 per cent in 1980-81, came down to 19 per cent in the 1990s, and then increased again. Vegetable oil imports increased substantially in 1995-96; and since then, its import share has been large (Appendix 3E). This is a major concern in the imports of the country and the question arises how this trend can be reversed. An interesting development in the imports had been cotton imports. Its share in the total import significantly decreased from 21.4 per cent in 1961-62 to 0 in 1980-81; since then, the share fluctuated and in 2019-20 it had a share of 6.3 per cent. The import share of pulses and fruits increased substantially in 1990-91, 22.5 per cent and 10.5 per cent, respectively, from very small share in earlier periods. In 2019-20, their share decreased to 5.7 per cent and 3.8 per cent, respectively. Cashew in-shell import share also increased from 2.9 per cent in 1961-62 to 7.9 per cent in 2000-01 and decreased to 5.3 per cent in 2019-20. In the early 1990s, it had much higher share (Appendix 3F). Cashew being grown in a large area in the country, there is a need to enhance its production. Spices and beverages shares had increased from 0.4 per cent and 0.1 per cent in 1961-62 to 2.1 per cent and 2.5 per cent in 2019-20, respectively. Increasing imports of vegetable oil, cashew and pulses are of concern as production of these commodities can be easily enhanced within the country.

TABLE 6. SHARE (PER CENT) OF MAJOR COMMODITIES IN THE TOTAL AGRICULTURAL IMPORTS OF INDIA DURING 1961-62 TO 2019-20 (VALUES)

Commodity (1)	1961-62 (2)	1970-71 (3)	1980-81 (4)	1990-91 (5)	2000-01 (6)	2010-11 (7)	2019-20 (8)
Pulses	0.0	0.0	1.6	22.5	2.9	11.4	5.7
Cotton	21.4	17.8	0.0	0.0	9.7	0.8	6.3
Fruits	0.3	0.7	0.4	10.5	1.5	6.0	3.8
Vegetable oil	1.2	4.2	60.3	18.8	49.8	50.4	46.3
Spices	0.4	0.1	1.5	1.0	1.2	1.1	2.1
Rubber Natural-dry	2.0	0.2	0.1	4.5	0.3	5.5	3.5
Cashew In-shell	2.9	5.6	0.4	7.7	7.9	4.5	5.3
Beverages	0.1	0.1	0.0	0.6	0.4	1.3	2.5

Source: Author's calculations.

Recent Export Shares and Growth Rates of Important Commodities

In the last two decades, major commodities having more than 2 per cent share in the value of agricultural exports were rice, oil meal, castor oil, tobacco, spices, sugar, tea, cashew shelled, coffee, cotton, fruits, vegetables and groundnut (Table 7). Rice had an average share of 20.6 per cent dominating the export basket and the share was increasing at a compound growth rate of 2.8 per cent. We can observe from Appendix 3 (A) and (B) that Basmati rice export had nearly doubled, the share of non-basmati rice and its export had been stable and growing; whereas non-basmati rice export between 1993-94 and 2011-12 fluctuated greatly and only in the recent years had

been more stable. The other commodities having significant positive growth rates in shares were spices (3.63 per cent), cotton (13.38 per cent) and groundnut (3.89 per cent). Spices and cotton export shares were steadily increasing (Appendix 3A and D). The commodities having negative and significant growth rates were oil meal (-6.48 per cent), tea (-5.67 per cent), cashew shelled (7.22 per cent) and coffee (-2.3 per cent). All these four commodities had high share in export in the 1990s (Appendix 3C); and since then, their share had been decreasing steadily. Major plantation crops tea, coffee and cashew show clearly downward trends in exports. Castor oil, tobacco, sugar, fruits and vegetables did not have any significant growth rate in the share of the agricultural exports in the last two decades. Sugar and cotton have shown high instability in their share of exports as indicated by the CVDI of more than 50. Analysing post-WTO data, Ghosh (2017) concluded that although there has been an increase in the exports and imports of agricultural commodities, inconsistent trade policies have led to widening inter-temporal fluctuations by creating uncertainty.

TABLE 7. AVERAGE SHARE OF MAJOR COMMODITIES OF EXPORTS, GROWTH RATE AND INSTABILITY INDEX FOR THE YEAR 200-01 TO 2019-20

Commodity (1)	Average Share (per cent) (2)	Growth Rate (per cent) (3)	CVDI (4)
Rice	20.63	2.80***	19.79
Oil Meals	8.95	-6.48***	31.83
Castor oil	3.04	0.14	23.06
Tobacco	3.95	-1.02	21.48
Spices	8.90	3.63***	15.59
Sugar	5.12	2.45	51.77
Tea	4.39	-5.67***	24.74
Cashew shelled	4.84	-7.22***	25.22
Coffee	3.63	-2.73***	18.78
Cotton	7.71	13.38***	54.78
Fruits	2.56	0.71	22.63
Vegetables	2.94	0.18	21.95
Groundnuts	2.09	3.89***	27.77

Source: Author's calculations.

*** indicates the growth rate is significant at 1 per cent. CVDI is Cuddy-Della Valle Index.

Growth rates in export share of commodities reflect relative shares. Negative growth rate in shares does not necessarily mean that export quantity is not growing. It could be due to relatively slow increase compared to the total agricultural export growth of that commodity. We can observe from Table 8 that except for oil meal, the export quantity of all other major export commodities had a significant growth rate. Basmati rice, meat and preparations, sugar, groundnut and cotton export quantity had grown at more than a rate of 10 per cent. Marine products, spices, non-basmati rice, castor oil and fresh fruit export quantity had been growing at a rate between 5 per cent and 10 per cent. Only cashew, coffee and tobacco export quantities had growth rate below 5 per cent. Instability in export quantity and export share was high for sugar, non-basmati rice and cotton. Cashew export quantity has been declining in the recent years (Appendix 4). The growth rates in export value at constant price of

spices, meat and preparations, tobacco, castor oil and fresh fruits were higher than their respective growth rates in export quantities, indicating that the unit value realisation had increased for these commodities. For other commodities like marine products, basmati rice, sugar, non-basmati rice, cotton, tea, coffee, groundnut and cashew, the growth rates in export value were lower than the growth rates in their respective quantities, indicating that these commodities were becoming cheaper over time.

TABLE 8. GROWTH RATE AND INSTABILITY IN EXPORT VALUE, EXPORT QUANTITY AND EXPORT SHARE FOR MAJOR EXPORT COMMODITIES DURING 1991-92 TO 2019-20

Products (1)	Growth rate (per cent)			CDVI		
	Export value (2)	Export quantity (3)	Export share (4)	Export value (5)	Export quantity (6)	Export share (7)
Marine products	4.89***	6.90***	-1.55**	27.17	17.44	25.11
Basmati rice	9.17***	11.24***	2.46***	35.11	29.80	21.69
Spices	9.08***	8.12***	2.38***	26.61	23.99	15.60
Meat and preparations	12.95***	11.60***	6.01***	45.12	32.68	20.63
Sugar and molasses	11.55***	15.75***	4.69*	56.41	67.07	62.86
Non-basmati rice	7.33***	8.33***	0.74	57.35	55.21	65.47
Cotton raw including waste	13.76***	18.19***	6.77**	78.49	68.84	71.85
Tobacco	5.27***	5.00***	-1.20**	23.44	18.28	25.97
Castor oil	6.19***	5.99***	-0.33	25.44	25.63	27.42
Oil meal	0.64	-0.48	-5.55***	49.51	36.96	31.75
Tea	-0.12	1.19***	-6.26***	15.97	8.66	34.53
Fresh fruits	8.74***	9.55***	2.18***	14.57	14.76	25.70
Coffee	2.11***	3.69***	-4.17***	27.36	15.51	30.17
Groundnuts	12.76***	13.04***	5.82***	49.24	39.60	37.26
Cashew	0.07	1.29**	-6.07***	16.37	22.17	23.74

Source: Author's calculations.

*, **, ***Significant at 10, 5 and 1 per cent level.

Among commodities exported by India, wheat, fruits and vegetables had large export markets with average world export shares of 8.2 per cent, 6.64 per cent and 5.59 per cent, respectively in the total world agricultural exports (Table 9). India has been both exporter and importer of wheat. Rice (4.4 per cent), sugar (4.63 per cent) and coffee (3.36 per cent) are the other major Indian export commodities. Except for rubber natural and dry, all other major export commodities had less than 20 CVDI. Low instability index for the major export commodities in the world market indicates that the world market was stable (Appendix 5). Among the major commodities that were exported from India, wheat and vegetable markets share had shrunk at the rate of 0.74 per cent and 0.81 per cent, respectively (Appendix 6). The other world export market that had negative growth rates were cotton at the rate of 3.16 per cent, tobacco at 2.17 per cent, tea at 1.34 per cent and sugar at 1.18 per cent. However, India's share being small and its export quantity had been growing; it can increase its share in the world market.

TABLE 9. SHARE (PER CENT) OF VALUE OF WORLD EXPORT OF COMMODITIES
IN THE TOTAL VALUE OF WORLD AGRICULTURAL EXPORT
AND THEIR GROWTH RATE DURING 2000-01 TO 2019-20

Particular (1)	Average share (per cent) (2)	CVDI (3)	Growth rate (r) (4)
Rice	4.44	8.56	0.63*
Wheat	8.20	5.12	-0.74***
Maize	3.07	9.31	0.54
Pulses	5.34	9.77	2.85***
Sugar	4.63	9.19	-1.18***
Seed cotton	1.76	16.60	-3.16***
Vegetable oil	7.43	11.48	1.34***
Oil seeds	1.83	12.21	2.87***
Spices	1.29	9.62	0.83**
Soybeans	6.92	9.92	2.08***
Cocoa beans & butter	1.83	13.38	0.26
Nuts	2.38	11.92	3.31***
Rubber natural and dry	1.81	38.78	-0.47
Cigarette and Cigar	2.86	14.87	-3.42***
Juice	1.73	6.22	-2.20***
Vegetables	5.59	5.87	-0.81***
Fruits	6.64	7.52	0.37
Coffee	3.36	11.86	1.22**
Tea	0.73	10.15	-1.34***
Beverages	7.70	6.64	-1.05***
Tobacco	1.84	9.57	-2.17***
Malt and Extract	1.03	5.69	-0.37

Source: Author's calculations.

*, **, *** Significant at 10, 5, and 1 per cent level.

World market shares of important commodities considering their related commodities and their growth rates are shown in Figure 5. Vegetable oil, soybean, fruits and pulses were in high share and high growth quadrant. India imports vegetable oil and pulses, and soybean produced being processed within the country for oil and meal, the export prospects had been low. While some fruits such as apple and exotic fruits were imported, India has potential to export large amount of fruits such as banana, mango and pomegranate. Nuts, oilseeds, coffee, spices, maize and cocoa beans were in the high growth and low share markets. Given that India had a very low share in these markets except for spices, there is certainly scope for increasing export of these commodities. Spices and coffee have been the traditional strength of India as its agro-climatic conditions are suitable to produce them. Therefore, strengthening the exports of these commodities would be easier to carry out. Vegetables, sugar, wheat and beverages have large markets. Though their shares are growing at a rate lower than the average growth rate of all agricultural exports, there is still scope for India to increase its export given its small share in the world export, particularly for vegetables. Natural rubber, malt, tea, juice, tobacco and seed cotton had smaller share and poor growth rate of share, indicating that they were not very attractive markets. However, tea being a traditional strength, India should try to consolidate its exports.

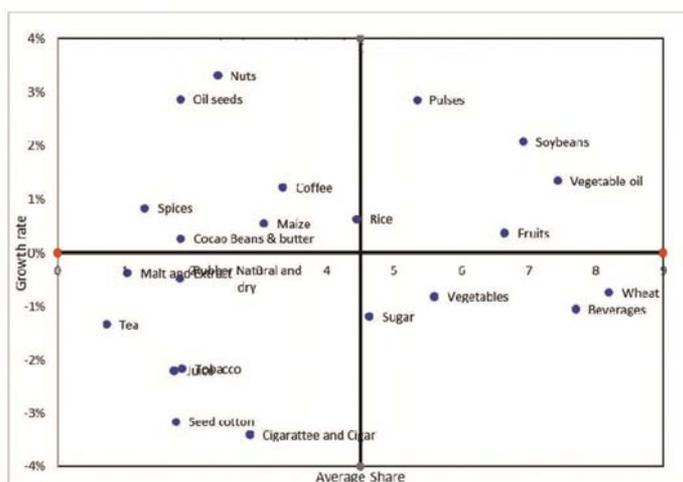


Figure 5. Export Shares of Importance Commodities and their Growth Rate in the World Market during 2000-19.

The average share of major commodities exported by India in the total exports of that commodity in the world is examined indicating India’s share in the world market (Table 10). We find that Indian rice (16.02 per cent), groundnut (18.24 per cent) and cashew shelled (13.61 per cent) had more than 10 per cent share in the world exports during 1991-2019 (Table 9). The share of rice and groundnut were increasing

TABLE 10. AVERAGE SHARE OF INDIA’S EXPORT IN THE WORLD EXPORTS AND GROWTH RATE IN THE SHARE FOR IMPORTANT COMMODITIES EXPORTED FROM INDIA DURING 1991-2019.

Particular (1)	Average Share (per cent) (2)	CV (3)	Growth Rate (per cent) (4)	CVDI (5)
Rice	16.02	53.04	5.28***	37.12
Wheat	0.90	139.38	5.38	139.01
Pulses	0.22	60.84	6.57***	45.89
Vegetable oil	0.71	16.53	0.43	16.39
Cotton	7.75	95.90	12.47***	76.17
Sugar refined	4.42	89.38	14.72***	73.21
Spices	9.82	31.30	3.46***	12.63
Ginger	5.91	77.64	-4.31***	65.04
Groundnut	18.24	68.33	10.68***	45.18
Tobacco	6.06	28.78	2.82**	17.88
Tea	12.72	14.24	-0.67**	13.22
Coffee	2.85	15.66	0.88**	14.50
Cashew shelled	13.61	46.26	-6.29***	15.19
Vegetables	2.88	39.17	4.49***	20.50
Fruits	0.75	43.06	6.05***	19.25
Rubber natural	0.47	90.89	3.22	91.11
Coconut	3.34	122.35	26.59***	57.11
Poultry egg	1.89	70.56	3.46**	65.23
Dairy milk	0.13	104.84	11.97***	72.41

Source: Author’s calculations.

** , ***Significant at 5 and 1 per cent level.

significantly with growth rate of 5.28 per cent and 10.68 per cent, respectively. We also observe that CVDIs for both these commodities were less than 50, indicating more stable shares. However, in the case of tea and cashew shelled, there was a significant negative growth rate in its share in the world market. The magnitude of decrease in the share of cashew shelled was very high at 6.29 per cent. India having a substantially large share in the world market, this high negative growth in the share is concerning. The other commodities having more than 2 per cent share, significant growth rate in the share and stable were spices, tobacco, coffee and vegetables. Coconut had a share of 3.34 per cent with a high and significant growth rate of 26.59 per cent, though the CVDI was 57.11, indicating instability in the share.

India's share of cotton exports show high growth rate in the world market (Figure 6). Bt cotton contributed substantially to cotton production; therefore it had contributed to the growth of exports. In the last decade, share of India's cotton export had increased to 15.9 per cent compared to the previous decade's share of 6.6 per cent and the variability had also reduced. Growth in sugar export had been possible because of the stocks contributed by the introduction of policy of minimum support price. High growth rates in the shares of spices, rice, groundnut, fruits and vegetables were very encouraging. India having potential of increasing production of these commodities, it is important to explore possibilities of increasing shares further in the world market through various strategies such as stable export policy, export facilitation, streamlining value chain, producing new products, strengthening the presence in the existing markets and entering new markets.

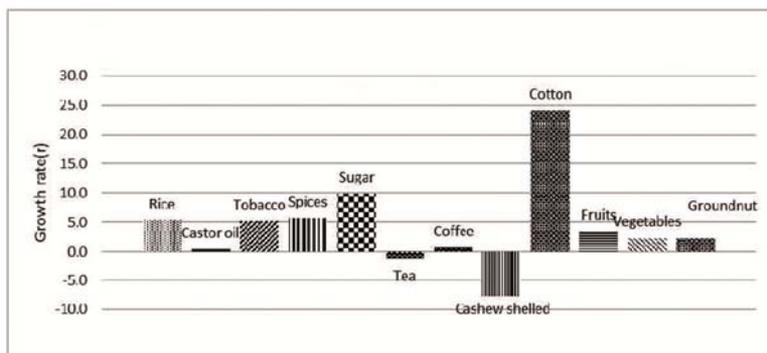


Figure 6. Average Growth Rate (Per cent) of Share of India's Agricultural Export Value in the World Agriculture Exports Value during 2000-01 to 2019-20

Figure 7 shows the share of India's important export commodities in the world market and their share in the last two decades. India's export of rice and groundnut are in the quadrant with high shares and high growth rates and it is important to maintain the growth rate. Exports of fruits and vegetables had low shares but good growth rates. These two markets being very large, it is important to enhance the growth rate of export of these commodities. While coffee and castor had low shares and low growth rates, it is important to improve their growth rates as they were the

traditional strength, and many farmers depend on them for their livelihood. Export share of tea was high but not the growth rate. Again, many plantations workers and small farm owners are dependent on the export of tea, and therefore improving export performance is important.

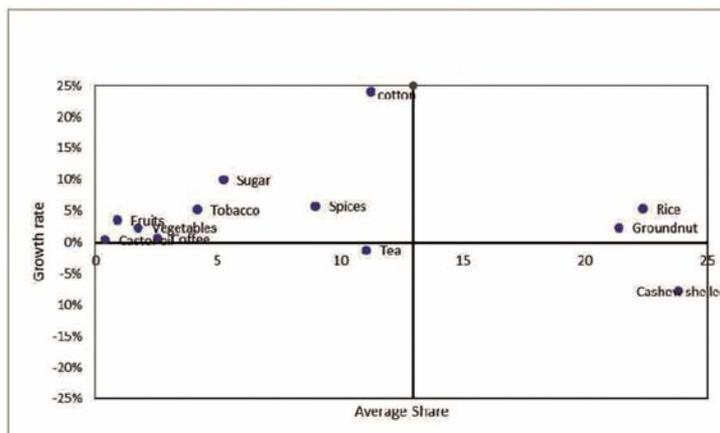


Figure 7. India's Average Export share in the World Export in terms of Value and their Growth Rate during 2000-2019.

Growth rates of import shares increased at more than 4 per cent for vegetable oils (4.27 per cent), spices (4.14 per cent) and natural rubber (5.74 per cent) in the last two decades (Table 11). This was reflected in their growth rate, both in quantity and value. Fresh fruits import share also increased but at a slower rate of 1.07 per cent. Its import quantity increased at 21.51 per cent, whereas value increased by 10.76 per cent. Pulses and cotton did not show any significant growth rates in their imports shares, but their import quantity increased by 10.92 per cent and 8.76 per cent, respectively. Import share of cashew in shell decreased at the rate of 3.36 per cent. However, its import quantity increased by 10.4 per cent and value increased by 5.91 per cent. We observe that import quantity of all these import commodities had been increasing at a high rate.

TABLE 11. GROWTH RATES AND INSTABILITY IN THE IMPORT VALUE, IMPORT QUANTITY AND IMPORT SHARE OF MAJOR COMMODITIES IMPORTED BY INDIA DURING 2000-01 TO 2019-20

Products (1)	Growth Rate (per cent)			CDVI		
	Import value (2)	Import quantity (3)	Import share (4)	Import value (5)	Import quantity (6)	Import share (7)
Vegetable oils	14.27***	16.40***	4.27***	28.82	19.84	29.53
Fresh fruits	10.76***	21.51***	1.07**	30.33	88.1	20.93
Pulses	9.56***	10.92***	-0.02	51.21	43.45	39.44
Spices	13.39***	30.52***	4.14***	35.17	75.68	25.6
Cotton raw	7.80***	8.76***	-1.14	56.26	65.27	70.77
Cashew in shell	5.91***	10.40***	-3.36***	23.8	25.21	32.44
Natural rubber	15.86***	15.79***	5.74***	50.88	53.72	51.11

Source: Author's calculations.

** , *** Significant at 5 and 1 per cent level.

From Table 8 and Table 11, we observe that fresh fruits and spices have high growth rate in their import quantity compared to their growth rate in export quantity. Fresh fruits had a growth rate of 9.55 per cent, whereas imports quantity had a growth rate of 21.51 per cent. In the case of spices, import quantity grew at the rate of 30.52 per cent compared to the 8.12 per cent growth in the export quantity. In the case of cotton, the export quantity growth rate (18.91 per cent) was higher than the import quantity growth rate (8.76).

India had done reasonably well in terms of exports except for few commodities such as tea, coffee and cashew. All these being plantation crops, the sector needs attention. Export performance of rice and of cotton, spices, sugar, meat and preparations had been good. Fruits, vegetables and groundnut had done well and there was considerable scope to increase fruits and vegetables exports as they were large world export markets. Castor oil exports also need greater attention. Import quantity growth rate being higher than the growth in the export quantity for fresh fruits and spices, the avenues for higher growth in the export of these commodities need to be explored.

Examining the five major exporting and importing countries and five major countries that import major commodities from India, we find that for rice, sugar, cotton, spices, castor oil, groundnut, tea and cashew, India was one of the major exporting countries in the world (Table 12). India is not a major exporter of fruits and vegetables in the large markets. Except for rice, cotton, castor oil, tea and to some extent groundnut and coffee, India is not exporting to major importers of that commodity.

TABLE 12. FIVE MAJOR EXPORTING AND IMPORTING COUNTRIES, AND FIVE MAJOR IMPORTING COUNTRIES FROM INDIA FOR MAJOR EXPORTED COMMODITIES OF INDIA

Major commodities exported by India (per cent share in Qty) (1)	Five major exporting countries in the world (Qty) (2)	Five major importing countries in the world (Qty) (3)	Five major importing countries from India (per cent share in Qty) (4)
Rice (25.5)	India, Thailand, USA, Vietnam, Pakistan and China	Iran, Saudi Arabia, China, USA, Philippines	Saudi Arabia (10.2), Iran (9.9), United Arab Emirates (6.9), Benin (6.6), Nepal (5.7)
Sugar including Molasses (9)	Brazil, Thailand, India, Australia, Guatemala	USA, China, Indonesia, Italy, Algeria	Sudan (21), Myanmar (18), Somalia (13), Sri Lanka (8) and Djibouti (7)
Fresh Vegetables (5.4)	China, USA, Germany, Netherlands, and Japan.	USA, Japan, Germany, France, UK.	UAE (16), Malaysia (15), Bangladesh (12), Sri Lanka (10), Nepal (7)
Cotton Raw (2.9)	China, USA, India, Vietnam, Brazil	China, Bangladesh, Vietnam, Turkey, Indonesia.	Bangladesh (34), China (19), Pakistan (18), Vietnam (12), Indonesia (4)
Spices (2.2)	China, India, Netherlands, Iran, Germany.	USA, Germany, Netherlands, UK, Saudi Arabia.	Vietnam (15), USA (7), Sri Lanka (7), Thailand (7), Malaysia (6)
Fresh Fruits (2.1)	China, USA, Thailand, Germany, and Netherlands	Mexico, Chile, Peru, Guatemala, Costa Rica	UAE (14), Netherland (14), Saudi Arabia (12), Nepal (10), Bangladesh (6).

Contd.

TABLE 12. CONCLD.

Major commodities exported by India (per cent share in Qty) (1)	Five major exporting countries in the world (Qty) (2)	Five major importing countries in the world (Qty) (3)	Five major importing countries from India (per cent share in Qty) (4)
Castor Oil (1.5)	India, China	China, Netherlands, France, USA, Thailand.	China (43), Netherlands (14), France (11), USA(10) and Thailand (4)
Groundnut (1.55)	Argentina, USA, India, China, Brazil	Netherlands, Indonesia, China, Russia, Germany.	Indonesia (33), Vietnam (14), Malaysia (9), Philippines (8), Thailand (6)
Tobacco (0.6)	Poland, Germany, Hong Kong, Singapore and Netherlands	Japan, Italy, Spain, Germany, France	Belgium (20), United Arab Emirates (9), Egypt (7), Republic of Korea (4), Nepal (4)
Tea (0.64)	China, India, Sri Lanka, Kenya, Poland	USA, Russia, UK, Vietnam, Saudi Arabia.	Russia (19), Iran (13), UAE (7), UK (7), USA (6).
Coffee (0.76)	Brazil, Switzerland, Germany, Columbia, Vietnam	USA, Germany, France, Italy, Japan.	Italy (26), Germany (11), Belgium (6), Russian Federation (5), South Africa (4)
Cashew shelled (0.24)	Vietnam, Cote d Ivoire, India, Ghana, Nigeria	India, USA, Vietnam, Germany, Netherlands	UAE (21), USA (17), Netherlands (9), Japan (9), Saudi Arabia (9)

Source: Author's calculations.

The share of exports in the total production had been very small for fruits and vegetables, 0.86 per cent and 1.47 per cent, respectively, indicating that there is large potential to increase exports (Table 13). So far, the shares were growing at the rate of 1.87 per cent for fruits and 2 per cent for vegetables, which is an encouraging sign. India needs to be exporting to major importing markets in developed countries. As these markets require quality certificates such as Good Agricultural Certificate, the production needs to be oriented for export purpose and the value chain must be developed to ensure quality and traceability. An important factor constraining the growth in Indian agricultural products, which needs to be addressed, has been rejection. During 2014-19, the United States Food and Drug Administration rejected 12,365 agricultural produce consignments from India, which were mostly spices, basmati and marine products. The European Commission's Rapid Alert System for Food and Feed (RASFF) also issued border rejection notifications for 147 consignments of food items from India, just 12.5 per cent less than the previous year's rejection of 168 consignments (Sen, 2020). The rejection occurs due to labelling issues or adulteration and have a huge impact on the quantity exported, price realisation and country's image. For instance, in 2018, the European Commission reduced the maximum residues level (MRL) of Tricyclazole permitted in all crops from 1 ppm to 0.01 parts per million (ppm). Since then, India's basmati exports to the EU drastically reduced from 38.35 per cent in 2018-19 to 9 per cent in 2019-20.⁴ Similarly, a large share of Indian agricultural produce fails to meet international grading and size standards.⁵

Sugar, cotton, and groundnut had share of 5 per cent to 8 per cent in their total production in the country; and the share was growing at more than a rate of 10 per

cent (Table 13). Understanding the quality requirements of large importers, orienting the production to these requirements, and consistency in policy to develop dependable importer are needed to reduce the variability in the exports. Castor oil, coffee, cashew and tea had high share of exports in the total production indicating production enhancement in order to increase exports.

TABLE 13. SHARE OF EXPORT IN QUANTITY IN TOTAL PRODUCTION IN INDIA AND GROWTH RATES

Particular (1)	Average share (2)	Growth rate (3)	CVDI (4)
Rice	4.03	6.82***	36.83
Tobacco	31.19	1.16	20.23
Spices	13.57	4.06***	26.47
Sugar	5.28	10.56**	53.72
Castor oil	62.45	2.22**	23.14
Seed cotton	6.44	15.58***	50.11
Tea	20.61	-0.55	12.89
Coffee	63.28	2.00***	10.61
Cashew shelled	58.68	-3.45***	14.06
Fruits	0.86	1.87***	14.04
Vegetables	1.47	2.00**	21.68
Groundnuts	7.99	12.24***	36.91

Source: Author's calculations.

Comparing the yield levels of crops between India and competing countries, we observe that the yield levels are low in India for fruits, vegetables, groundnut, coffee and cotton (Appendix 7A, B and C). We also find that the growth rates in yield are also lower in India for coffee, fruits and vegetables (Appendix 8A and B). Therefore, technology development and adoption would be required for improving the competitiveness of these crops.

Competitiveness of Indian Agricultural Exports

Competitiveness of Indian agricultural exports was assessed through relative export competitiveness. An increase in REC indicates that the competitiveness is improving, whereas a decreasing REC indicates loss of competitiveness. Table 14 indicates that except for tea, coffee and cashew, the REC increased during 1990-2019. In case of tea, coffee and cashew, competitiveness had declined during this period. REC of tea and cashew declined significantly from 1990 to 2019. For rice, sugar, cotton, the REC had more than doubled. REC of spices remained the same. REC of fruits and vegetables had shown an upward trend. For groundnut, the increase in REC had been phenomenal.

The growth rates in REC from 1991 to 2019 were positive and significant for rice, sugar, cotton, tobacco, fruits, vegetables, and groundnut (Table 15). However, it is negative and significant for tea, coffee, and cashew.

TABLE 14. FIVE-YEAR AVERAGE REC FOR MAJOR EXPORT COMMODITIES DURING 1990-2019

Year (1)	Average for 1990-94 (2)	Average for 1995-99 (3)	Average for 2000-04 (4)	Average for 2005-09 (5)	Average for 2010-14 (6)	Average for 2015-19 (7)
Rice	8.20	12.58	13.26	10.56	12.99	19.47
Castor oil	153.03	310.22	227.75	169.39	155.67	163.94
Sugar	0.66	0.45	1.93	1.70	1.92	3.45
Seed Cotton	2.03	0.92	0.37	7.32	8.62	5.15
Tobacco	1.64	1.42	1.42	2.10	1.76	1.84
Spices	4.82	4.75	3.29	4.03	4.15	4.88
Fruits	0.19	0.23	0.36	0.40	0.31	0.36
Vegetables	0.49	0.52	0.77	0.87	0.61	0.66
Tea	20.13	10.66	8.99	5.72	4.11	3.96
Coffee	1.83	1.69	1.55	1.12	0.82	0.99
Cashew shelled	84.35	46.96	38.07	18.60	8.37	4.20
Groundnut	2.72	6.87	5.07	10.33	16.78	12.88

Source: Author's calculations.

TABLE 15. GROWTH RATE AND INSTABILITY OF REC DURING 1991-2019

Year (1)	Growth rate (per cent) (2)	CVDI (3)
Rice	2.4***	28.56
Castor oil	-0.7	39.65
Sugar	11.5***	71.96
Seed Cotton	10.5***	80.32
Tobacco	1.0*	26.00
Spices	0.0	19.91
Fruits	2.4***	21.20
Vegetables	1.2**	25.08
Tea	-6.3***	24.76
Coffee	-3.1***	18.77
Cashew shelled	-11.3***	17.52
Groundnut	8.4***	46.57

Source: Author's calculations.

Price competitiveness can be measured by the price India gets for a unit of export compared with the world average export and export of a major competing country. From Table 16, we can observe that for many commodities such as tobacco, spices, coffee, fruits, vegetables and groundnut, India gets a lower price realisation than a major competing country. However, except in the case of spices, the difference is increasing over time. For tea and cashew also, India received lower price, but the difference was not significant. India received lower price than the world average for tobacco, spices, sugar, tea, coffee, cashew and groundnut. Only in the case of rice, India realised higher unit value compared to world average as well as price received by Thailand. This is mainly because of basmati rice, which gets higher prices, constituted a large share of the total rice export. Only other commodities where India got higher price was in the case of sugar, where the price received was higher than Brazil; and in case of castor oil, where India got higher prices than the world average. It is estimated that the share of high value and value added agriculture produce in the export basket is less than 15 per cent compared to 49 per cent in China.⁶

TABLE 16. COMPARISON OF UNIT VALUE REALISATIONS OF INDIAN EXPORT, WORLD EXPORT AND A MAJOR COMPETING COUNTRY EXPORT

Agri Commodities (1)	Compared with (2)	Percentage difference in the unit value (3)	Significant (Yes/No) (4)	Exists, trend in the difference (Yes/No) (5)	If trend exists significant trend (Yes/No) (6)
Rice	World	21.40	Yes	No	
	Thailand	23.10	Yes	No	
Tobacco	World	-62.98	Yes	Yes	Negative, Significant
	Brazil	-35.76	Yes	No	
Spices	World	-23.35	Yes	Yes	Positive, Significant
	Vietnam	-171.17	Yes	Yes	Negative, Significant
Sugar	World	-11.65	Yes	No	
	Brazil	14.06	Yes	No	
	World	3.86	Yes	No	
Castor oil	Brazil	-71.19	Yes	Yes	Negative, Significant
	World	2.41	No	No	
Cotton	USA	-7.51	No	No	
Tea	World	-10.39	Yes	Yes	Negative, Significant
	China	-14.97	No	No	
Coffee	World	-15.05	Yes	No	
	Brazil	-16.69	Yes	No	
Cashew shelled	World	-6.63	Yes	Yes	Negative, Significant
	Vietnam	-0.88	No	No	
Fruits	World	-3.20	No	No	
	China	-28.96	Yes	Yes	Negative, Significant
	World	-101.02	No	No	
Vegetables	China	-93.01	Yes	Yes	Negative, Significant
Groundnut	World	-9.74	Yes	No	
	China	-31.15	Yes	Yes	Negative, Significant

Source: Author's calculations.

Export Price Impact on the Domestic Price

We can observe from Table 17 that for commodities such as tea, coffee, cashew, natural rubber, spices, tobacco, rice, groundnut and sugar, the export price impacted the domestic price in the short run. The extent of adjustment for domestic price was high for natural rubber, whereas for cashew, tobacco, spices, coconut and cotton, the extent of adjustment was low. For tea, coffee, rice, groundnut and sugar, the short-run impact being strong, the adjustment factor was insignificant. Except for coffee, cashew and groundnut, the domestic price and unit value realisation are co-integrated. Mohanakumar (2012) reported that after Indo-ASEAN FTA, there was increased price instability for coffee and reduced price instability for natural rubber. The price of coffee declined, whereas prices of natural rubber increased. Bastineet al. (2010) reported improvement in the transmission of price signals between domestic and international prices after liberalisation.

TABLE 17. ESTIMATED COEFFICIENTS OF ERROR CORRECTION MODEL

Commodity (1)	B (2)	Δ (3)	Co-integrated (4)
Tea	32.05**	-0.11	Yes
Coffee	74.19***	-0.05	No
Cashew	2.87*	-0.19**	No
Natural rubber	19.59***	-0.73***	Yes
Tobacco	11.49*	-0.37***	Yes
Spices	43.00**	-0.25*	Yes
Coconut	-3.83	-0.35***	Yes
Rice	11.09*	-0.053	Yes
Wheat	10.55	-0.18	Yes
Cotton	-2.38	-0.18**	Yes
Groundnut	51.32***	-0.07	No
Sugar	41.00***	-0.07	Yes

Source: Author's calculations.

Determinants of Competitiveness and Impact of Multilateral and Regional Trade Agreements

The model estimated to identify determinants of competitiveness and impact of multilateral and regional trade agreements suggested that multilateral and regional trade agreements had impact on relative competitiveness of coffee, spices, cotton and wheat. In the case of coffee, negative impact of the WTO agreement on India's competitiveness may be due to importing countries broad-basing their imports with the implementation of WTO agreement. Jeromi (2007) observed that before the mid-1990s, the presence of a protected internal market and high export intensity of plantation crops meant that the cultivation of such commodities was highly profitable. However, trade liberalisation led to the inflow of cheap imports and increased competition in international markets.

In the case of spices, while WTO had negative impact, Asia-Pacific trade agreement had positive impact. Since Indo-Sri Lanka FTA also coincides with WTO; negative impact may be due to ISFTA. Kelegama (2017) reported that 70 per cent of the imports from Sri Lanka enjoyed free trade concessions after the ISFTA was signed. In case of cotton, AIFTA had negative impact, whereas SAFTA had positive impact on competitiveness. Bangladesh being an important importing country, SAFTA may have helped in increasing the competitiveness with respect to cotton. Saraswat *et al.* (2018) reported that imports increased more than exports for India after association with ASEAN. In the case of wheat, WTO had negative impact, whereas APFTA had negative impact on the competitiveness of India.

Domestic price was a significant determinant of competitiveness for cotton. Per capita production was important for coffee and rice and export value realisation was important for coffee and tobacco competitiveness.

TABLE 18. ESTIMATED MODEL FOR DETERMINANTS OF COMPETITIVENESS

(1)	Dependent variable											
	REC _t											
	Natural											
	Tea	Coffee	Cashew	Rubber	Tobacco	Spices	Coconut	Rice	Wheat	Sugar	Cotton	Groundnut
(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	
DP _t	-3.28	-0.29	-10.59	0.07	-1.76	-1.68	-1.16	-14.18	-1.71	-3.97	-17.13**	-3.02
PCI _t	0.38	-0.73	-23.42	1.42	-0.19	-1.25	-4.21	-4.34	0.59	0.18	5.31	16.54
PCP _t	19.05	1.51**	20.14	-0.30	1.38	0.53	-0.37	-25.02*	-1.67	5.97	5.47	-3.81
UVX _t	7.72	0.56*	12.45	-0.10	1.91**	1.58	-0.62	-5.31	-0.03	1.87	-1.52	7.26
WTO		-0.41**				-1.48***			0.64**			
APTA						1.17***			-0.91***			
AIFTA											-6.81**	
SAFTA											4.50*	
Constant	-1.77	-6.46	45.19	1.77	-7.41	4.81***	5.00	121.24*	0.22	-18.86	-0.91	13.91
Observations	28	28	28	28	28	28	28	28	28	28	28	28
R ²	0.19	0.25	0.17	0.10	0.29	0.48	0.25	0.39	0.46	0.23	0.39	0.21
Adjusted R ²	-0.09	0.08	-0.12	-0.21	0.09	0.33	0.04	0.22	0.27	0.02	0.14	-0.02

Note: *, **, ***: significant at 10, 5 and 1 per cent level.

IV

CONCLUSION

India has been able to increase its agricultural production and there is potential to further increasing production. Therefore, it must focus on the international trade of agricultural produce. The analysis suggested that the composition of the basket of exports has changed due to increase in the production of several commodities. India has done well in terms of overall agricultural exports, but at the same time, imports are also growing at a faster rate than exports. It is therefore important to understand the competitiveness of India in the international markets. There are a few concerns that we can observe from the trends in export.

First, some of the traditional exports such as tea, coffee, cashew, and castor oil are not doing well in terms of exports. Export shares are going down and the first three being plantation crops, the sector is badly affected, needing immediate measures to prevent further adverse impact on the sector. Second, India has small share of fruits and vegetables in the large markets. Having the required production environment for fruits and vegetables, there is need to strategise the sector to improve exports. Quality production, certification, traceability, and effective value chain development would be required to improve the exports of these produce. Third, the unit value realisation in many commodities is lower than the competing countries, indicating that we are competing on the price not on the quality. Furthermore, increasing differences calls for immediate attention to correct the situation. Competing on quality will enhance value realisation. Fourth, except for few commodities India is mostly present in the Asian and Middle Eastern markets. Most of the Indian exports are raw materials and are bulky, where unit price realisation is less; rather than being specialised or branded products, where unit price realisation is more.⁷ Given that a large section of the global population has changing lifestyles and

is health conscious, India needs to build a brand and market products with value benefits such as organic produce, healthy and easy to prepare. Developed country markets offer higher value realisation and it is important to target these markets with market-oriented production and streamline the value chain. Fifth, while there are positive growth rates in the competitiveness of the exports for many commodities, this may be happening due to lower price than higher quality. Sixth, multilateral and regional trade agreements have both positive and negative impact on the competitiveness and that too for few commodities. There is price transmission from the export market to domestic price if the commodity export has a large share in the total production and there is consistent export of the commodity. Seventh, plantation sector has lost its predominant role in agricultural exports and its performance needs greater attention. Vishwanathan and Shah (2013) reported labour shortage in tea plantations as a major constraint in improving production. Apart from improving the productivity of the sector, Vijayasuryan (2017) argued for greater product differentiation and value addition to enhance competitiveness of the plantation sector.

India must manage well external factors such as subsidies and tariffs in other countries and trade agreements as well as internal factors such as infrastructure, agricultural practices and marketing. The internal factors impacting agricultural exports also impact food processing. Good post-harvest and handling facilities, storage and distribution, processing facilities, roads, testing laboratories, and exit point infrastructure at ports and airport are critical for ensuring smooth and timely handling of agricultural produce and retaining its quality. For instance, it is estimated that owing to lack of processing facilities, less than 4 per cent of our cashew exports are in value-added form. They are exported to other countries which carry out value addition and re-export it. In yet another example, all spices in the north-eastern region must be sent to Kolkata for testing and this is time-consuming. It is estimated that in India, expenses towards logistics handling account for about 14-15 per cent of the total cost of exports; whereas in developed countries, this is only 8 per cent.⁸ Compartmentalisation of responsibilities also results in issues such as delays in documentation, digitisation of land records, geo-mapping of farmlands or registration of Farmer Producer Organizations (FPOs). They create unnecessary hurdles in implementing traceability and market linkages, consolidating land holdings for exclusive export focused cultivation, etc. Documentation and operational procedures at Indian ports are time consuming and cumbersome. While in China, documentary compliance takes 21 days; in India, it requires 41 days.⁹

There is a need to orient policies to strengthen export of agricultural produce in the international market as the production of many commodities has increased substantially. Key requirements for export orientation are consistent policy, negotiation on tariff and non-tariff barriers with the importing countries, developing appropriate market intelligence, market-oriented production, strategic marketing, research support, value addition, standards and certifications, infrastructure to streamline value chain and building strong farmer organisations. In crops such as

coffee, cotton, groundnut, fruits and vegetables, technology development and adoption would be required to enhance production, and hence competitiveness. Greater awareness at the producer level on market orientation in production, quality certification, post-harvest management and traceability system adoption needs to be created. Emphasis on farmer producer organisation, adopting appropriate technology, streamlining production and post-harvest management as well as reducing the number of intermediaries in the value chain could help substantially in improving exports.

NOTES

- 1) Ministry of Food Processing Industries, 2019.
- 2) As per 73rd round Survey of NSSO, 2015-16 the number of unincorporated enterprises manufacturing food and beverages in India stood at 24,59,929 and as per annual survey of industries 2016-17, number of registered food processing units in India stood at 39,748.
- 3) Regressing $\ln Y$ on T , where Y is value and T is time trend and then taking exponential of coefficient on T and subtracting 1 from it.
- 4) <http://agriexchange.apeda.gov.in/news/Newssearch.aspx?newsid=32658&Date=10Jan2020#:~:text=European%20Commission%20reduced%20maximum%20residues,to%20the%20pesticide%20residue%20issue.>
- 5) https://commerce.gov.in/wp-content/uploads/2020/02/NTESCL636802085403925699_AGRI_EXPORT_POLICY.pdf
- 6) https://commerce.gov.in/wp-content/uploads/2020/02/NTESCL636802085403925699_AGRI_EXPORT_POLICY.pdf
- 7) India Brand Equity Foundation, 2019.
- 8) https://www.niti.gov.in/writereaddata/files/document_publication/FTA-NITI-FINAL.pdf
- 9) APEDA, Ministry of Commerce and Industry, Government of India, 2019

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APPENDIX 1A. MULTILATERAL AND REGIONAL AGREEMENTS SIGNED BY INDIA

Name of the agreement (1)	Abbreviation used (2)	Date of signing and implementation (3)
WTO Agreement on Agriculture	WTO	Implemented: January 1, 1995
South Asian Free Trade Area	SAFTA	Signed: January 2004 Implemented: January 1, 2006
ASEAN- India Free Trade Area	AIFTA	Signed: August 2009 Implemented: January 1, 2010.
India- Sri Lanka Free Trade Agreement	ISFTA	Signed: December 1998 Implemented: March 1, 2000
India- Japan Comprehensive Economic Partnership Agreement	IJCEPA	Signed: February 2011 Implemented: August 1, 2011
India- Korea Comprehensive Economic Partnership Agreement	IKCEPA	Signed: August 2009 Implemented: January 1, 2010
India-Chile Preferential Trade Agreement	India-Chile PTA	Signed: March 2006 Implemented (Chile): August 17, 2007 Implemented (India): September 11, 2007
India-MERCOSUR Preferential Trade Agreement	India-MERCOSUR PTA	Signed: January 2004 Implemented: June 1, 2009
India-Malaysia Comprehensive Economic Cooperation Agreement	IMCECA	Signed: October 2010 Implemented: July 1, 2011
Asia- Pacific Trade Agreement	APTA	The Bangkok agreement (1975- 2005) was renamed as the Asia- Pacific Trade Agreement in November 2005. Implemented (third round of trade negotiations): September 1, 2006
Duty Free Tariff Preference Scheme by India for the Least Developed Countries	DFTP	Announced: April 2008 Implemented: August 13, 2008
India- Singapore Comprehensive Economic Cooperation Agreement	ISCECA	Signed: June 2005 Implemented: August 1, 2005
India- Thailand FTA- Early Harvest Scheme	EHS	Signed: October 2003 Implemented: August 31, 2004

Notes: The coding was done based on the year of implementation of the agreement. For SAFTA, the revised sensitive lists, which became operational from January 2012, were also taken into consideration while coding.

Although the schedules under ISCECA and EHS were considered while doing the analysis, they were not found to be important for any of the commodities included in the study, and therefore they have not been included in any of the tables.

APPENDIX 1B. GROUPING OF RTAS FOR CREATING DUMMY VARIABLES

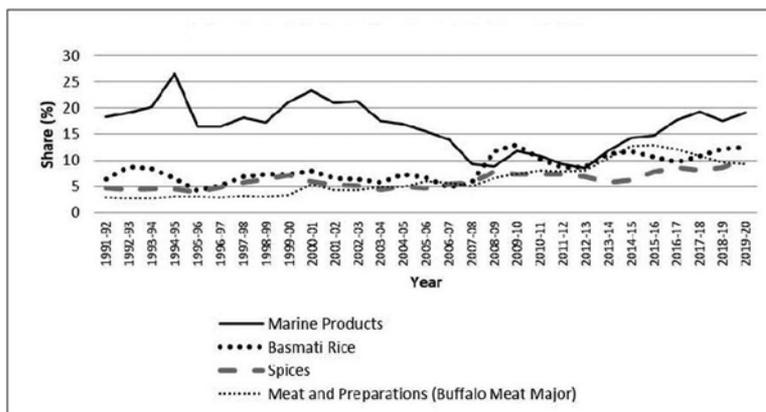
Name of the Agreement (1)	Abbreviation used (2)	Dummy variable from (3)
WTO/Indo-Sri Lanka	WTO/ISFTA	2000
South Asian/India-Chile/Asia-Pacific/India-Singapore/India-Thailand	SAFTA/ICPTA/APTA /ISCECA/EHS	2006
ASEAN/India-Japan/India-Korea/India-Malaysia	AIFTA/IJCEPA/IKCEPA /IMCECA/MERCOSUR	2010

APPENDIX 2. SHARES (PER CENT) OF POULTRY PRODUCTS, DAIRY PRODUCTS, MARINE PRODUCTS
AND MEAT & PREPARATION IN THE TOTAL ALLIED AGRICULTURE EXPORT
FOR INDIA DURING 2000-01 TO 2019-20

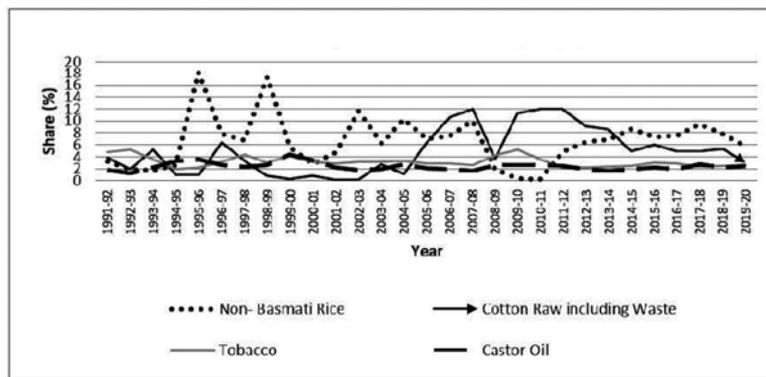
Year (1)	Share of allied agriculture export in total export (2)	Share of poultry products in total allied agri export (3)	Share of dairy products in total allied agri export (4)	Share of marine products in total allied agri export (5)	Share of meat and meat products in total allied agri export (6)
2000-01	4.1	1.3	1.3	77.5	17.9
2001-02	3.6	2.0	2.7	77.9	15.8
2002-03	3.4	2.1	2.0	78.9	15.7
2003-04	2.8	3.0	1.9	73.1	20.5
2004-05	2.5	3.0	5.0	69.9	20.6
2005-06	2.4	2.8	7.1	63.1	24.7
2006-07	2.2	2.5	4.0	64.5	26.7
2007-08	1.9	3.5	7.7	55.8	30.2
2008-09	1.7	2.8	7.8	48.6	37.0
2009-10	2.1	2.1	3.1	55.9	35.5
2010-11	2.0	1.2	3.7	52.1	39.2
2011-12	2.3	1.2	1.8	50.0	42.5
2012-13	2.5	1.1	4.3	46.0	43.7
2013-14	3.4	0.9	6.8	47.0	41.6
2014-15	3.6	0.9	3.1	48.9	43.7
2015-16	3.7	1.2	2.7	49.4	43.5
2016-17	3.8	0.7	2.4	55.9	38.1
2017-18	4.1	0.7	2.5	59.9	33.8
2018-19	3.5	0.9	4.2	59.4	32.4
2019-20	3.4	0.8	2.6	63.0	30.9

Source: Author's calculations.

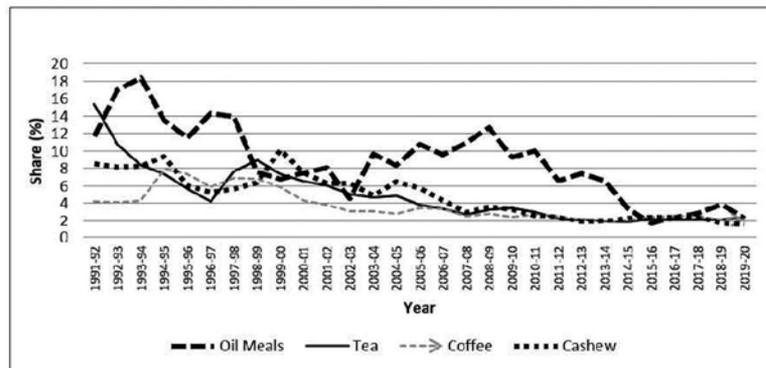
APPENDIX 3A. SHARE IN INDIA'S AGRICULTURAL AND ALLIED EXPORTS (PER CENT)



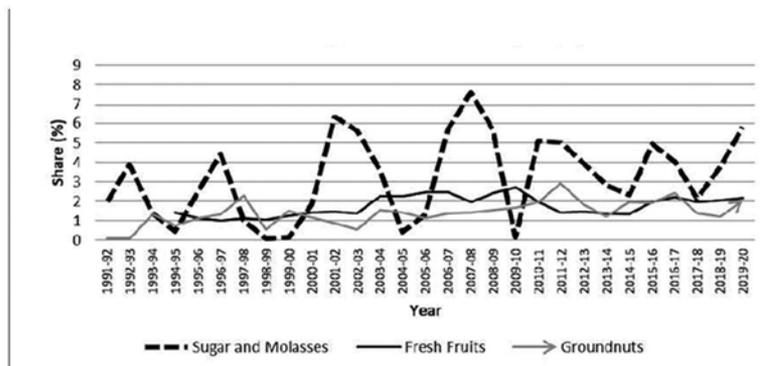
APPENDIX 3B. SHARE IN INDIA'S AGRICULTURAL AND ALLIED EXPORTS (PER CENT)



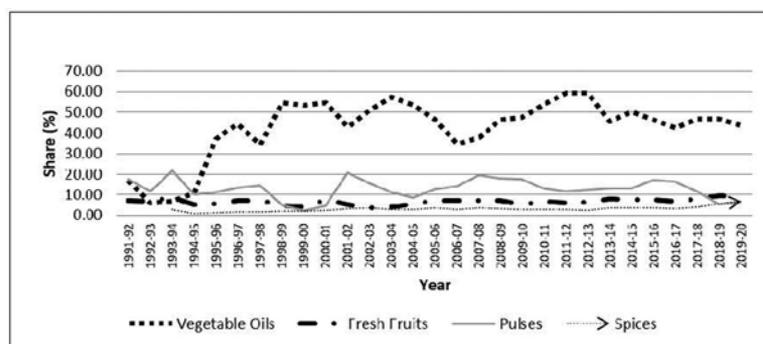
APPENDIX 3C. SHARE IN INDIA'S AGRICULTURAL AND ALLIED EXPORTS (PER CENT)



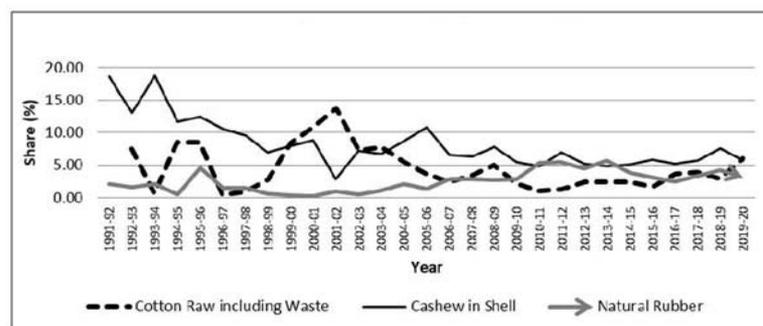
APPENDIX 3D. SHARE IN INDIA'S AGRICULTURAL AND ALLIED EXPORTS (PER CENT)



APPENDIX 3E. SHARE IN INDIA'S AGRICULTURAL AND ALLIED IMPORTS (PER CENT)



APPENDIX 3F. SHARE IN INDIA'S AGRICULTURAL AND ALLIED IMPORTS (PER CENT)



APPENDIX 4. TEN-YEAR AVERAGE OF EXPORT VALUE, EXPORT QUANTITY, AND SHARE IN AGRICULTURAL AND ALLIED EXPORTS OF INDIA FOR MAJOR EXPORT ITEMS OF INDIA DURING 1991-92 TO 2019-20

Time Period (1)	Marine Products			Basmati Rice			Spices		
	DEV (2)	EQ (3)	ES (4)	DEV (5)	EQ (6)	ES (7)	DEV (8)	EQ (9)	ES (10)
1991- 92 to 2000- 01	23617	312530	19.72	8167	506813	6.88	6421	199334	5.23
2001- 02 to 2010- 11	27981	552598	14.71	16937	1264970	7.85	12483	377760	5.83
2011- 12 to 2019- 20	61596	1107281	14.67	45577	3894950	10.66	32696	915462	7.75
Time Period	Meat and Preparations			Sugar and Molasses			Non- Basmati Rice		
	DEV	EQ	ES	DEV	EQ	ES	DEV	EQ	ES
1991- 92 to 2000- 01	4006	148361	3.26	2159	2.24	1.78	9113	1612359	6.82
2001- 02 to 2010- 11	12374	434872	5.76	8760	17.52	4.14	11201	2521591	6.01
2011- 12 to 2019- 20	44473	1267723	10.44	16257	26.69	3.86	30785	6735243	7.19
Time Period	Cotton Raw including Waste			Tobacco			Castor Oil		
	DEV	EQ	ES	DEV	EQ	ES	DEV	EQ	ES
1991- 92 to 2000- 01	3035	4.96	2.49	4182	969770	3.56	3470	182	2.78
2001- 02 to 2010- 11	14433	41.06	6.00	7155	176030	3.40	4671	228	2.25
2011- 12 to 2019- 20	28864	77.17	6.55	10766	239363	2.53	9376	520	2.21
Time Period	Oil Meal			Tea			Fresh Fruits		
	DEV	EQ	ES	DEV	EQ	ES	DEV	EQ	ES
1991- 92 to 2000- 01	14501	3054000	12.23	9354	185	8.23	1596	148677	1.20
2001- 02 to 2010- 11	20031	3968455	9.41	7837	197	4.06	4474	484065	2.14
2011- 12 to 2019- 20	18571	3276895	4.13	9053	230	2.13	7513	759589	1.78
Time Period	Coffee			Groundnuts			Cashew		
	DEV	EQ	ES	DEV	EQ	ES	DEV	EQ	ES
1991- 92 to 2000- 01	7163	173194	5.78	1365	116439	1.03	8853	72029	7.54
2001- 02 to 2010- 11	6065	213419	3.03	2944	231689	1.36	8840	109960	4.66
2011- 12 to 2019- 20	9586	325918	2.25	7975	612487	1.88	9036	95726	2.11

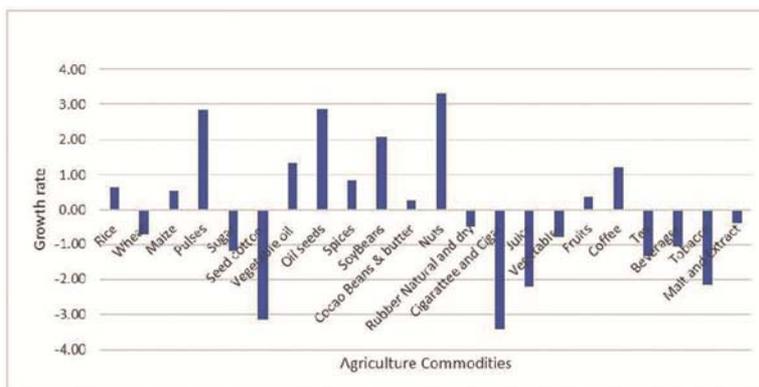
DEV is deflated export value in million Rs.EQ is the export quantities in Tonnes.ES is export share in per cent.

APPENDIX 5. AVERAGE SHARE OF MAJOR AGRICULTURE COMMODITIES EXPORTED FROM THE WORLD IN THE TOTAL VALUE OF WORLD AGRICULTURE EXPORT AND THEIR GROWTH RATE AND INSTABILITY INDEX DURING 1991-2019

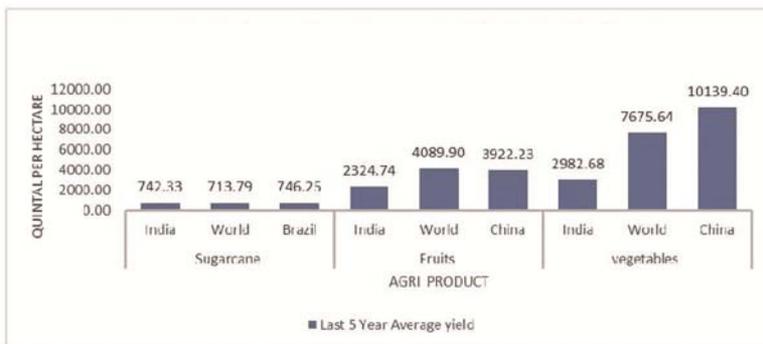
Particular (1)	Average share (per cent) (2)	Growth rate (per cent) (3)	P value (4)	CVDI (5)
Rice	4.44	0.63	0.08	8.56
Wheat	8.20	-0.74	0.00	5.12
Maize	3.07	0.54	0.16	9.31
Pulses	5.34	2.85	0.00	9.77
Sugar	4.63	-1.18	0.00	9.19
Seed cotton	1.76	-3.16	0.00	16.60
Vegetable oil	7.43	1.34	0.01	11.48
Oil seeds	1.83	2.87	0.00	12.21
Spices	1.29	0.83	0.04	9.62
Soybeans	6.92	2.08	0.00	9.92
Cocoa Beans & butter	1.83	0.26	0.63	13.38
Nuts	2.38	3.31	0.00	11.92
Rubber Natural and Dry	1.81	-0.47	0.74	38.78
Cigarette and Cigar	2.86	-3.42	0.00	14.87
Juice	1.73	-2.20	0.00	6.22
Vegetables	5.59	-0.81	0.00	5.87
Fruits	6.64	0.37	0.22	7.52
Coffee	3.36	1.22	0.02	11.86
Tea	0.73	-1.34	0.00	10.15
Beverages	7.70	-1.05	0.00	6.64
Tobacco	1.84	-2.17	0.00	9.57
Malt and Extract	1.03	-0.37	0.12	5.69

Note: Shares of rice, sugar and coffee vary with the shares mentioned in table 9 due to inclusion of related products value here while calculating the shares.

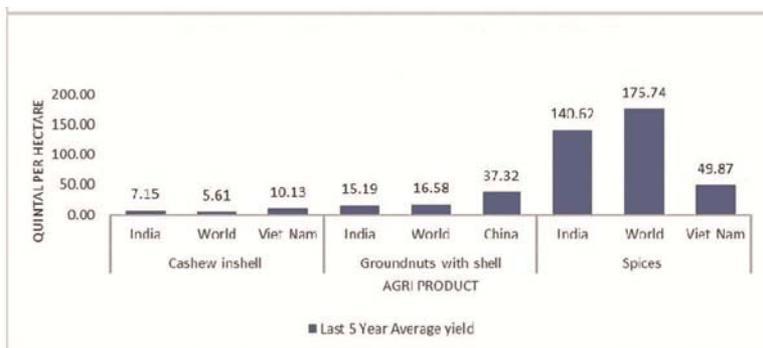
APPENDIX 6. GROWTH RATE OF EXPORT FOR MAJOR AGRI COMMODITIES FROM THEWORLD



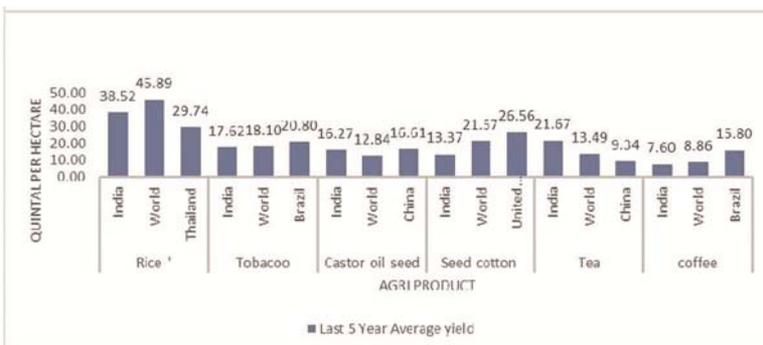
APPENDIX 7A. LAST 5 YEAR AVERAGE YIELD FOR INDIA, WORLD AND COMPETING COUNTRY (2015-19)



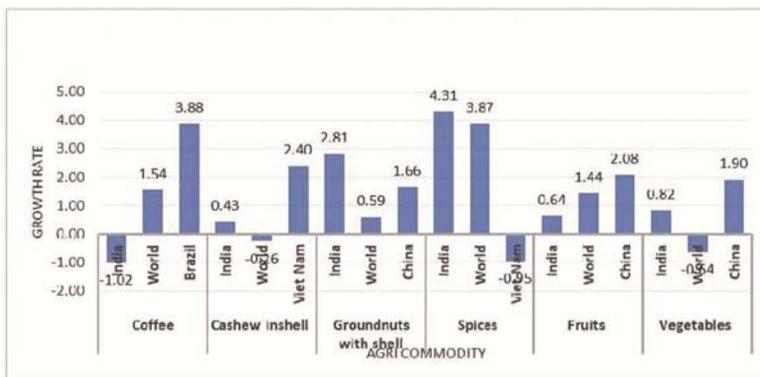
APPENDIX 7B. LAST 5 YEAR AVERAGE YIELD FOR INDIA, WORLD AND COMPETING COUNTRY (2015-19)



APPENDIX 7C. LAST 5 YEAR AVERAGE YIELD FOR INDIA, WORLD AND COMPETING COUNTRY (2015-19)



APPENDIX 8A. YIELD GROWTH RATE FOR INDIA, WORLD AND COMPETING COUNTRY



APPENDIX 8B. YIELD GROWTH RATE FOR INDIA, WORLD AND COMPETING COUNTRY

