**Trade Performance of Major Agricultural Commodities in India**

**ABSTRACT**

Subsistence agriculture is central to the goal of Atmanirbhar Bharat. This is why agricultural exports are extremely important, apart from earning valuable foreign exchange for the country, exports support exporters to increase return from inclusive international marketplace, which in turn has increased their income. India is among the top ten in the world in the rankings and exports of most agricultural products (except related products) are free without restrictions. Seed exports are limited and mustard oil is allowed to be exported only in commercial containers with a maximum weight of 5 kg and a minimum export price (MEP) of $900/tonne. This study shows the trade performance and instability of India's agricultural exports over the study (2000-2022 to April-June), with recent years agreeing with the COVID-19 pandemic. The study was based on secondary data and data collected from FAO, DGCIS, APEDA, and Agricultural Outlook 2021. During the study period (2000-2022), total agricultural export imports increased at a CAGR of 11.71 percent and 13 percent respectively. The study also found that the balance of trade remains positive for entire agricultural trade for all the years under analysis. The research also covers the main agricultural products, which account for the largest share of all imported and exported agricultural products from 2009-2022. The study finds that India's agricultural exports have increased but on the other hand, the share of agricultural exports in the country's total exports has also decreased. These results include important policy recommendations that should focus on diversifying agricultural exports and focusing on more land along with horticulture, better housing and education for people.

**Keywords:** Agriculture, Export, CAGR, Instability, COVID-19 pandemic, Atmanirbhar Bharat

**INTRODUCTION**

India is a largely agrarian country. Two-thirds of its population is engaged in agricultural work. Most of the food we eat is produced by agriculture, which is the main industry. As per the available census (2011), about 54.6 percent of the total workforce is involved in agriculture and allied sectors activities. India captures a leading position in the international trade of agricultural goods.

**Agri-Exports**

Though, India has risen as a remarkable exporter of agricultural products such as rice, spices, cotton, oil meal cake, castor oil, coffee, cashewnuts, tea, fresh and delicious vegetables. According to the World Trade Organization’s Business Survey(2021) India’s agricultural and industrial exports and imports accounted for 2.2 percent and 1.4 percent of global agricultural trade in 2020, respectively, placing India in the top ten in global agriculture. The share of agriculture in India’s total exports increased from 11.40 percent in 2019-2020, to 14.40 percent in 2020-2021.

India’s Agri and allied commodities top destinations of export were the United States of America, China, Bangladesh, United Arab Emirates, Saudi Arabia, Iran, Vietnam, Malaysia, Nepal, Indonesia, Hong Kong, Iraq, Netherlands, United Kingdom, Japan, Sri Lanka, and Thailand.

**Agri-Imports**

Looking at imports, around 52 percent of India’s agricultural products are edible oils, with other major agricultural products being fruits, beans, spices, and cashew nut. Together these five products account for 79.4 percent of India’s total agricultural production. Similarly, total imports have also increased more, with exports of agricultural and related products rising from 4.39 percent in 2019-2020 to 5.30 percent in 2020-2021. The Major importers of agricultural and related products in India are Indonesia, Argentina, Ukraine, Malaysia, the US, Brazil, Canada, Afghanistan, Myanmar, Nepal, China, Singapore, Vietnam, Thailand, Sri Lanka, and Bangladesh. At the same time, the fact that different agricultural products exported by India operate independently of each other and their contribution to India’s total exports suggests that the pressure is greater. Indian agriculture, in its traditional form, also contributes to the global economy. As agriculture enters the global market, its benefits are linked to growth in exports. Over the past seven decades, the Indian government has taken many steps to develop agricultural exports. Agriculture has grown by about 2.7 percent in the last 50 years. According to the Economic Survey 2021, the agriculture and industrial sectors is expected to grow by 3.9 percent.

the following objectives were determined in this study.

* To study trends in the export and import of agricultural commodities in India.
* To measure instability in the export, and import of agricultural commodities in India.
* To study different policies to increase the export of agricultural products.

**MATERIALS AND METHODS**

This study analysed the trends and performance of agricultural sector in India**.** This study has been compiled from various sources based on Secondary data, Sources year -wise data on agricultural exports and imports & national import-export were extracted from Agriculture Statistics at a Glance 2021, APEDA, Ministry of Agriculture & Farmers Welfare, GOI. This study aims to analyse the trends and performance of agriculture trade during 2000-2022. Compound Growth rates were calculated using the semi-log growth model, growth rates were analysed to estimate the growth of the export and import by changing to time series data in an exponential function of the following form:

Xt = abt

Log Xt = Log a + t log b

Compound growth rate (r) = (antilog b-1) \* 100

Where,

Xt = Export/Import as the dependent variable;

t = Time element which takes the value 1, 2, 3 … N as the independent variable;

a = Constant

b = Regression coefficient

Balance of Trade: The Balance of trade is the difference between the value of exports and the value of imports. The Balance of trade is an important in calculating a country’s gross domestic product. A country that exports more than it imports creates a positive balance of trade and this situation is called a trade surplus, when the opposite is true the country is said to have a trade deficit, and it has a negative balance of trade. The resulting formula used to compute the Balance of trade is:

Balance of trade = Export value – Import value

**Measurement of Instability**

Instability can be measured with the help of the Coefficient of variation. The coefficient of variation (CV) is a statistical measure of the dispersion of data points in a data series around the mean.

 The following formula is used to compute the CV:-

CV= (Standard Deviation) /(mean) \* 100

**RESULT & DISCUSSION**

**Export, Import and Balance of Trade for Agricultural products**

India’s agricultural exports reached Rs. 28,657.37 crores in 2000-2001. Last year it increased to Rs. 262778.54 crore in 2014 and increased except for slight decrease of 9 and 10 percent in 2014-2015 & 2015-2016 respectively. Rupee saw a huge increase in 2011 (2011-2012) with an average value of **237990.577 crore.** Thisvalue is significantat five percent level. Adjusted R2 is 0.71 which shows the difference in agricultural exports during this period. The growth rate of Agriculture export rise in the first decade (2000-2010) was 14.30 per cent. While the growth rate of the linkage between 2011-2022 is negative value (-0.059) percent. The compound growth rate in the study period from 2000-2022, is 11.71 percent.

The agricultural imports of India were **Rs. 12086.23** **crores** in 2000-01 increasing year on year to Rs**. 54365.29 crores** in 2009-10 growth in production and import business only during different periods like 2005-06, 2007-08, 2010-2011, 2013-2014, 2017-2018, 2018-2019 the agricultural products have shown negative growth. While the average value of agriculture over a decade (2000-2010) was **23534.856 crores per annum,** it increased five-times per annum (2011-2022), with a compound growth rate of **13 percent** during the study period 2000-2022. The value is significant at five percent level. The adjusted R2 value is 0.76 and which shows the linear pattern in agricultural imports during this time. (Table 1 )

Balance of Trade: During the study period from 2000-2022, the export price was higher than the import price. The Balance of trade remained positive. The figures increased from 2000-01 to 2009-10 and the ten-year average was Rs 27,937 crores per year. The Balance of trade is decreasing in five different periods, with the lowest level in 2009-10, but increased by Rs. 61,571 crores in 2010-11, and the compound growth rate was 10.36 percent during the study period (Table 1).

**Table1: Agricultural Export, Import, and Balance of Trade for Agricultural Products in India (Rs . Crores)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Agricultural Exports** | **Agricultural Imports** | **Balance of Trade** |
| **2000-01** | **28657.37** | **12086.23** | **16571.14** |
| **2001-02** | **29728.61** | **16256.61** | **13472** |
| **2002-03** | **34653.94** | **17608.83** | **17045.11** |
| **2003-04** | **36415.48** | **21972.68** | **14442.8** |
| **2004-05** | **41602.65** | **22811.84** | **18790.81** |
| **2005-06** | **45710.97** | **15977.75** | **29733.22** |
| **2006-07** | **57767.87** | **23000.28** | **34767.59** |
| **2007-08** | **74673.48** | **22549.81** | **52123.67** |
| **2008-09** | **81064.52** | **28719.24** | **52345.28** |
| **2009-2010** | **84443.95** | **54365.29** | **30078.66** |
| **2010-2011** | **113046.58** | **51073.97** | **61972.61** |
| **2011-2012** | **182801.00** | **70164.51** | **112636.49** |
| **2012-2013** | **227192.61** | **95718.89** | **131473.72** |
| **2013-2014** | **262778.54** | **85727.30** | **177051.24** |
| **2014-2015** | **239681.04** | **121319.02** | **118362.02** |
| **2015-2016** | **215396.32** | **140289.22** | **75107.10** |
| **2016-2017** | **226651.91** | **164726.83** | **61925.08** |
| **2017-2018** | **251563.94** | **152095.20** | **99468.74** |
| **2018-2019** | **274571.28** | **137019.46** | **137551.82** |
| **2019-2020** | **252976.06** | **147445.81** | **105530.25** |
| **2020-2021** | **305469.00** | **157788.16** | **147680.84** |
| **2021-2022** | **65768.07** | **37936.49** | **27831.58** |
| **Total** | **3,132,614.79** | **1,596,653.42** | **1,535,961.77** |
| **Average(2000-2010)** | **51,471.884** | **23,534.856** | **27,937.028** |
| **Average(2011-2022)** | **237990.577** | **123,754.987** | **114,235.59** |
| **CAGR Percent** | **11.71** | **13** | **10.36** |
| **R2** | **0.71\*\*** | **0.76\*\*** | **0.57\*\*** |
| **CV** | **69.72** | **77.52** | **72.43** |

 **Source: *APEDA***

**Where,**

**CAGR: compound annual growth rate**

**CV: coefficient of variation**

**\*\*: Indicates significant at five percent level of significance**

**Fig. a: Agricultural Export, Import, and Balance of Trade for Agricultural Products in India**

**Agricultural Export-Import share in Exports- Imports**

**Agricultural Exports share to Total Exports:** Agricultural exports as percentage of total exports during 2000-2022. In 2000-01, agricultural exports Agriculture accounted for to 14.23 percent of total exports. It started declining and reached a peak of 9.64 percent in 2008-09 and has been increasing since them. The ten year average share (2000-2010) was 11.65 percent. The share in 2000-01 was the highest at 14.23 percent, and the share in 2008-09 was the lowest 9.64 percent. In 2012-13, this rate increased to 13.90 per cent, the average share for the 2011-2022 period is 12.27 per cent. The highest rate was in 2012-13 at 13.90 per cent. The lowest share rate was 9.35 per cent in 2021-22. During the study period (2000-2022), the annual growth rate of agricultural exports was 11.71, while total exports were 9.13 per cent.

**Agricultural Import to Total Imports ratio:**

The agricultural imports to total imports was 5.24 percent in 2000-01. It changed in the decade 2000-01. The average share of agricultural products imported during the decade 2000-2010 was 4.24 percent and the average share for agricultural products imported during the period 2011-2022 was 4.35 percent. The highest ratio was 6.63 percent in 2001-02 and the lowest ratio was 2.09 percent in 2008-09. The CAGR of agricultural products from (2000-2022) was 13 percent, which accounts for 12.89 per cent of the total country.

**Table2: Import and export of agricultural products as a share of Total Export and Import of India (Rs. Crores)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Agricultural Imports**  | **Total Imports** | **Share of Agri. imports to total imports (Percent)** | **Agricultural Exports** | **Total Exports** | **ShareofExport to totalExports**  |
| 2000-2001 | 12086.23 | 230872.75 | 5.24 | 28657.37 | 203571.00 | 14.08 |
| 2001-2002 | 16256.61 | 245199.71 | 6.63 | 29728.61 | 209017.96 | 14.22 |
| 2002-2003 | 17608.83 | 297205.86 | 5.92 | 34653.94 | 255137.26 | 13.58 |
| 2003-2004 | 21972.68 | 359107.61 | 6.12 | 36415.48 | 293366.74 | 12.41 |
| 2004-2005 | 22811.84 | 481371.53 | 4.74 | 41602.65 | 375339.51 | 11.08 |
| 2005-2006 | 15977.75 | 574190.89 | 2.78 | 45710.97 | 456417.85 | 10.02 |
| 2006-2007 | 23000.28 | 840506.30 | 2.74 | 57767.87 | 571779.27 | 10.10 |
| 2007-2008 | 22549.81 | 1012311.69 | 2.23 | 74673.48 | 655863.51 | 11.39 |
| 2008-2009 | 28719.24 | 1374435.37 | 2.09 | 81064.52 | 840755.05 | 9.64 |
| 2009-2010 | 54365.29 | 1363735.54 | 3.99 | 84443.95 | 845533.63 | 9.99 |
| 2010-2011 | 51073.97 | 1683466.96 | 3.03 | 113046.58 | 1136964.25 | 9.94 |
| 2011-2012 | 70164.51 | 2345463.23 | 2.99 | 182801.00 | 1465959.39 | 12.47 |
| 2012-2013 | 95718.89 | 2669161.95 | 3.59 | 227192.61 | 1634318.28 | 13.90 |
| 2013-2014 | 85727.30 | 2715420.78 | 3.16 | 262778.54 | 1905011.08 | 13.79 |
| 2014-2015 | 121319.02 | 2736676.99 | 4.43 | 239681.04 | 1896348.42 | 12.64 |
| 2015-2016 | 140289.22 | 2490303.76 | 5.63 | 215396.32 | 1716384.39 | 12.55 |
| 2016-2017 | 164726.83 | 2577671.14 | 6.39 | 226651.91 | 1849433.54 | 12.26 |
| 2017-2018 | 152095.20 | 3001028.71 | 5.07 | 251563.94 | 1956514.52 | 12.86 |
| 2018-2019 | 137019.46 | 3594674.22 | 3.81 | 274571.28 | 2307726.19 | 11.90 |
| 2019-2020 | 147445.81 | 3360954.45 | 4.39 | 252976.06 | 2219854.17 | 11.40 |
| 2020-2021 | 157788.16 | 2909830.00 | 5.42 | 305469.00 | 215177.00 | 14.20 |
| 2021-2022 | 37936.49 | 930961.10 | 4.35 | 65768.07 | 703545.37 | 9.35 |
| Total | 1,596,653.42 | 37,794,550 |  | 3,132,614.79 | 23,714,018.4 |  |
| Average(2000-2010) | 23,534.856 | 677,893.725 | 4.248 | 51,471.884 | 470,678.178 | 11.651 |
| Average(2011-2022) | 123,754.987 | 2,584,634.44 | 4.35 | 237990.577 | 1,583,936.38 | 12.27 |
| CAGR | 13 | 12.89 |  | 11.71 | 9.13 |  |
| R2 | 0.76\*\* | 0.73\*\* |  | 0.71\*\* | 0.43\*\* |  |
| CV | 77.52 | 66.21 |  | 69.72 | 68.74 |  |

**Source: Ministry of Commerce, General Directorate of Commercial Intelligence & Statistics,**

**Fig. b: India’s Agricultural Imports as a share of total Import**

**Fig. c:**  **India’s Agricultural Export as a share of total Export**

**Table 3 Explanation:** In terms of price, the top five exported items in 2020-2021 includeBasmati rice, non-basmati, spices, beef and Tea. Basmati rice exports showed a slight decline of 3.7 per cent from 2009-2010 to 2020-2021 is 9.48 per cent and 39.77 per cent respectively.

**Table 3: Commodity Wise Export of Agricultural Commodities (Rs. Crores)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Basmati Rice** | **Rice** | **Cashew** | **Coffee** | **Sugar** | **Spices** | **Buffalo Meat** | **Pulses** | **Tea** |
| **2009-10** | **10889.6** | **365.3** | **2801.58** | **2032.06** | **110.21** | **5948.73** | **5481.43** | **408.32** | **2943.53** |
| **2010-11** | **11354.6** | **231.29** | **2819.39** | **3009.91** | **5472.79** | **7886.51** | **8613.31** | **870.04** | **3354.34** |
| **2011-12** | **15449.6** | **8659.13** | **4390.16** | **4534.62** | **8766.78** | **13102.5** | **13741.11** | **1067.93** | **4078.53** |
| **2012-13** | **19409.39** | **14448.81** | **4067.21** | **4711.07** | **8576.32** | **15176.75** | **17408.99** | **1284.99** | **4718.79** |
| **2013-14** | **29291.82** | **17795.21** | **5095.49** | **4799.1** | **7178.5** | **15146.36** | **26457.82** | **1748.81** | **4873.34** |
| **2014-15** | **27586.71** | **20441.55** | **5565.85** | **4973.25** | **5328.83** | **14847.74** | **29282.58** | **1218.31** | **4171.25** |
| **2015-16** | **22718.6** | **15483.39** | **5027.99** | **5125.45** | **9824.52** | **16630.14** | **26684.22** | **1655.9** | **4719** |
| **2016-17** | **21512.91** | **16929.88** | **5278.61** | **5646.43** | **8659.54** | **19111.25** | **26161.38** | **1277.7** | **4905.64** |
| **2017-18** | **26870.67** | **23437.23** | **5945.28** | **6245.36** | **5225.6** | **20084.91** | **26035.19** | **1469.63** | **5396.65** |
| **2018-19** | **32804.3** | **21171.17** | **4579.17** | **5721.98** | **9523.14** | **23217.77** | **25091.43** | **1801.51** | **5828.34** |
| **2019-20** | **31026.33** | **14400.32** | **4018.35** | **5236.76** | **13981.36** | **25642.04** | **22661.12** | **1511.8** | **5851.11** |
| **2020-21** | **29849.89** | **35476.61** | **3112.22** | **5339.62** | **20671.55** | **29535.64** | **23459.89** | **1978.36** | **5603.35** |
| **CAGR (%)** | **9.48** | **39.77** | **2.31** | **6.93** | **25.65** | **12.80** | **11.37** | **9.53** | **5.53** |

**Source: Ministry of Commerce, General Directorate of Commercial Intelligence & Statistics, Agricultural Statistics outlook, 2020**

**Table 4 Explanation**: looking at agri imports, vegetable oil accounts for nearly 52 Per cent of India’s agricultural production. India’s vegetable oil imports in 2020-21 are worth Rs. 82115.8 crores. Other important industries include fresh fruits, pulses, spices, and cashew nuts, and these five products together account for 79.4 per cent of India’s total agricultural production. In other products, India’s sugar imports could increase by 91 per cent , tea imports by 60 per cent, and pulses by 17 per cent in 2020-2021.

**Table 4: Commodity Wise Import of Agricultural Commodities (Rs . Crores)**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Pulses** | **Spices** | **Cashew** | **Vegetable Oil** | **Wheat** | **Fresh fruits** | **Coffee** | **Tea** | **Sugar** | **Sesame seeds** |
| **2009-10** | **10629.1** | **1476.0** | **3047.5** | **22316.6** | **231.9** | **2843.4** | **297.3** | **276.5** | **5965.8** | **53.2** |
| **2010-11** | **7512.49** | **1595.9** | **2649.0** | **25919.5** | **255.8** | **3586.5** | **295** | **202** | **2789.5** | **37.6** |
| **2011-12** | **9448.35** | **2284.8** | **5381.4** | **38909.0** | **0.08** | **4610.8** | **469.5** | **218.9** | **313.8** | **3.9** |
| **2012-13** | **13344.6** | **2715.7** | **5433.9** | **53561.6** | **6.0** | **6180.4** | **795.7** | **274.5** | **3094.3** | **296.0** |
| **2013-14** | **11036.7** | **3451.6** | **4667.8** | **44038.0** | **26.9** | **7715.9** | **729.0** | **291.6** | **2286.8** | **808.6** |
| **2014-15** | **17062.9** | **4393.2** | **6599.7** | **64889.6** | **61.3** | **9566.8** | **930.4** | **388.6** | **3668.2** | **379.9** |
| **2015-16** | **25619** | **5399.9** | **8701.2** | **68676.6** | **872.5** | **11071.5** | **801.8** | **377.4** | **4037.8** | **179.6** |
| **2016-17** | **28523.1** | **5760.2** | **9027.0** | **73038.9** | **8509.0** | **11290.6** | **926.8** | **338.3** | **6868.6** | **442.1** |
| **2017-18** | **18748.5** | **6385.2** | **9134.3** | **74995.9** | **2357.8** | **12524.5** | **996.5** | **356.9** | **6035.8** | **176.7** |
| **2018-19** | **8035.3** | **7932.7** | **11162.3** | **69023.7** | **5.4** | **13931.6** | **958.5** | **417.9** | **3175.3** | **875.1** |
| **2019-2020** | **10221.4** | **10186.** | **9026.34** | **68558.1** | **4.6** | **11137.0** | **962.1** | **411.0** | **2473.2** | **1450.** |
| **2020-21** | **11937.5** | **8014.2** | **7491.2** | **82115.8** | **0.01** | **15764.8** | **900.5** | **658.8** | **4720.0** | **910.7** |
| **CAGR****(Per cent)** | **2.79** | **19.11** | **11.4** | **11.20** | **-20.9** | **16.53** | **10.8** | **8.07** | **6.97** | **40.2** |

**Source: Ministry of Commerce, General Directorate of Commercial Intelligence & Statistics, Agricultural Statistics outlook, 2020**

**POLICY MEASURES**

The government of India has taken many steps to increase agricultural exports as follows :

* The Export Trade System (TIES) was launched in 2017 in order to eliminate import and export trade differences in the country.
* Merchandise Exports from India scheme, was launched in 2015 by GOI to boost the export of notified goods that are produced or manufactured in the country this scheme introduces through foreign trade policy.
* Organizations like Agricultural and Processed food products export Development Authority (APEDA), and The Marine Products Export Development Authority (MPEDA), are approved with promoting export of various agriculture related products. APEDA, MPEDA, and commodity council have also extended the validity of various accreditations.
* Krishi Udaan scheme launched by the Ministry of Civil Aviation on international and domestic routes. This plan aims to help farmers move their produce to increase their profits, especially in the northeast and tribal areas.
* Kisan Rail project, the main objective of running Kisan Rails trains is to increase the income of agriculture by connecting the production area to the market and consumption area.
* Single District Single Primary Product Scheme (ODOFP), under the Pradhan Mantri Micro Food Processing Enterprises Regulatory Scheme which includes agriculture and food processing units in 728 districts across the country, to create employment in agricultural production, utilise services and products and businesses.

**CONCLUSION**

India is an agrarian country. Two-thirds of its population is involved in agricultural work. India is among the top ten agricultural exporters in the world. The agricultural exports to GVA ratio increased from 7.45 percent in 2019-20 to 8.59 percent in 2020-21. At the same time, the share of agricultural products in GDP has decreased from 4.34 percent to 4.27 per cent. The major exported products are Basmati rice, other than Basmati rice, oil meals, spices, and sugar. India’s agricultural export has a huge potential and demand in the global market. Therefore, it can be concluded that the country’s export will increase in the future. During the period of study, the balance of trade in agricultural goods maintained positive, and there is a trade surplus situation. From the period (2000-01) to (2008-09), it rises from 16571.14 crores to 52345.28 after that it slightly decreases in 2009-10 and again it was fluctuating and reaches up to 27831.58 in 2021-22. The percentage of agricultural products exported increased from 4.24 per cent to 4.35 per cent and the percentage of agricultural products exported increased from 11.65 per cent to 12.27 per cent, indicating that India’s agricultural products accounted for a share of total imports and agricultural products exports accounted for a share of all exports, with a slight increase. In the overall period, from 2000-2022 agriculture exports reported a CAGR of 11.71 percent and agriculture imports 13 percent respectively. India ranks as the second-largest producer of rice, wheat, sugarcane, and other cereals widely. While the biggest import products are edible oil and pulses. Although, on the other hand, the Coronavirus disease 19 (COVID-19), originated in Wuhan city of China, and is now seen as a challenge, showing various remarkable impacts, and its trickle-down impact on the world economy.

All in all, it is concluded that agriculture trade is unstable. In the medium and long term, effective global supply chains need to be established and agricultural contracts need to be supported (Gulati, 2018). There is a need to improve infrastructure, and agricultural resources.

**DISCLAIMER (ARTIFICIAL INTELLIGENCE)**

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

**COMPETING INTERESTS**

Authors have declared that no competing interests exist.

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