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# India's Agricultural Trade Potential in Post-WTO Period

**Saghir Ahmad Ansari* and Waseem Khan**

Department of Agricultural Economics and Business Management
Aligarh Muslim University, Aligarh-202 002, Uttar Pradesh

**Abstract**

The paper has analysed the agricultural trade scenario of India including its direction, composition and potential by collecting data from published sources. To find the export potential of India in the international market, Balassa's Index has been computed for various agricultural commodities. The study has revealed that India has comparative advantage in export of some agricultural commodities such as meat and edible meat offal, rice, wheat, oilseed, coffee and tea. Also, India has trading partners from both developing and developed nations. The study has suggested that the government should encourage the production of those commodities in which we have comparative advantage in export like cereals, meat and meat offal, frozen fish, oilseeds, coffee and tea. Commodity specific programs aiming at export development should be initiated. To develop the comparative advantage in export of fruits and vegetables, infrastructure development is required. One of the major constraints in agricultural exports is the lack of transportation facilities. These should be developed as per international standard. Private participation should be encouraged in this sector. EXIM bank should encourage agricultural export by providing adequate credit. Export-oriented farming should be encouraged to meet the international standards.

**Key words:** Agricultural trade, revealed comparative advantage, direction and composition

**JEL Classification:** Q17, F11, O47, F15

## Introduction

In India, more than half of the population directly or indirectly depends on agriculture for livelihood. Also, the growth of other sectors and overall economy in India depends on the performance of agriculture to a considerable extent (Tripathi and Prasad, 2009). Therefore, a vibrant agricultural sector is crucial for reducing poverty through economic growth (Ingco and Nash, 2004). In the Indian economy, agriculture's contribution has been decreasing constantly, but it still contributes 13.7 per cent share to GDP (2012-13). A declining share for agricultural GDP is an inevitable consequence of economic progress (Byerlee *et al.*, 2009). After green revolution, India became self-sufficient in foodgrain production, which has increased from 51 Mt in 1950-51 to 264.8 Mt in 2013-14 (Ministry of Agriculture, Government of India).

Due to increasing population and growing domestic demand, agricultural export from India has declined, but still it has great potential. According to Panchamukhi (1986), agricultural trade in India has shown more fluctuations than the trade in non-agricultural sectors. WTO has created a favourable environment for developing countries to expand their export market in the world. It has taken several measures to reduce agricultural trade barriers and restrictions. However, due to reduction in trade barriers, competition has increased. The present paper has analysed the agricultural trade scenario of India including its direction, composition and potential. It has also suggested some policy measures for agricultural trade development.

* Author for correspondence
Email: saghir63@gmail.com

## Data and Methodology

The study is based on the secondary data, collected from published sources of Directorate of Economics and Statistics, Department of Agriculture and Cooperation, various issue of *Economic Survey*, Directorate General of Commercial Intelligence and Statistics, Agricultural and Processed Food Products Export Development Authority and International Trade Centre, Switzerland. For agricultural composition and direction, two-digit HS code product data from 01 to 24, were taken, while for analysis of revealed comparative advantage, some specific items of two-digits among 01 to 24 HS code and some for four-digit HS code were taken. Data were taken for the period 2001 to 2013.

### Analytical Approach

To analyse the growth of agricultural export and import over time, compound annual growth rate was used. To identify the India's export potential in the international market, Balassa's index of Revealed Comparative Advantage was calculated (Balassa, 1965). The Balassa index identifies whether a country has a "revealed" comparative advantage (RCA) rather than to determine the underlying sources of comparative advantage (Utkulu and Seymen, 2004). A country's comparative advantage is "revealed" by the value of RCA. If RCA is more than unity, then the country has a comparative advantage and there is scope of agricultural trade between India and other countries of the world.

The Compound Annual Growth Rate (CAGR) is calculated by Equation (1):

$$CAGR = \left( \frac{\text{Ending value}}{\text{Initial value}} \right)^{1/n} - 1 \qquad \ldots(1)$$

where, n is the number of years.

Balassa's revealed comparative advantage index (RCA) can be computed by Equation (2):

$$R_{ih} = \frac{X_{in}/X_{it}}{X_{wh}/X_{wt}} \qquad \ldots(2)$$

where,

$R_{ih}$ = Balassa's Index of RCA

$X_{ih}$ = India's export of commodity h

$X_{it}$ = Total export of India

$X_{wh}$ = World's export of commodity h

$X_{wt}$ = Total world export

## Results and Discussion

### Agricultural Trade Performance of India

The green revolution had led to several technological improvements and innovations in the Indian agriculture, leading to a substantial increase in agricultural production, especially of foodgrains. This had a favourable impact on India's exports. From a net importer of foodgrains, India emerged as a net exporter of agricultural commodities. Figure 1 depicts the positive agricultural trade balance since 1990-91 and the rising trend thereafter.

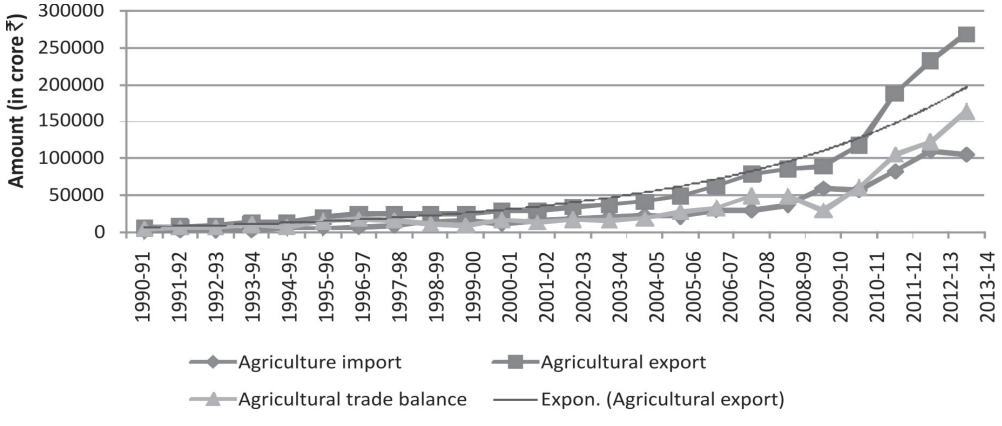


**Figure 1. Agricultural export, import and trade balance, 1990-91 to 2013-14**

***Source:*** Director General of Commercial Intelligence & Statistics, Ministry of Commerce, Government of India

At the time of trade liberalization in 1990-91, India's agricultural export was of ₹ 6012.76 crores, constituting 18.49 per cent of the total exports earnings, while agricultural imports were of ₹ 1205.86 crores, i.e. only 2.79 per cent of total imports .Thus, there was a surplus in agricultural trade amounting to ₹ 4806.90 crores. This scenario changed by 1995-96 when agricultural export increased by more than three-fold, reaching ₹ 20397.74 crores, and agricultural imports increased by about six-times to ₹ 5890.10 crores compared to 1990-91 level. The trade balance also increased by nearly three times to ₹ 14507.64 crores. By 2000-01, the agricultural export and import reached ₹ 28657.37 crores and ₹ 12086.23 crores, respectively. Across the study period 1998-2014, the import was lowest in 2000-01. In the next five years, the agricultural export increased by more than ₹ 20000 crores and was of ₹ 49216.96 crores in 2005-06. However, imports also increased by little less than ₹ 10000 crores and touched ₹ 21499.22 crores. In 2010, the Government of India removed the ban on wheat export and as a result, agricultural exports increased sharply in 2010-11 to ₹ 117483.61 crores, leading to a drastic rise in the agricultural trade balance. The trade balance increased by more than two-times, reaching ₹ 60149.28 crores, as compared to the previous year. In the next two years the agricultural exports and imports both doubled. The exports amounted to ₹ 232041.1 crores and import ₹ 109610.7 crores and trade balance stood at ₹ 122430.4 crores in 2012-13.

During 1990-91 to 2013-14, the compound annual growth rate has been found more of agricultural import (21.44 %) than export (17.96%). This has been due to liberalization of economic policies and opening up of agricultural trade in the post-WTO period. This also reflects the increased global competition in India's agricultural trade. The increasing growth in imports adversely affected the agricultural trade, slowing down the growth in agricultural trade balance to 16.57 per cent.

The CAGR of agricultural export and import in the post-liberalization period is depicted in Table 1 in five sub-periods. The perusal of Table 1 reveals that agricultural export growth rate drastically came down from 21.78 per cent during 1991-95 to 5.55 per cent in 1996-00. However, it picked up subsequently, though slowly, and reached 16.07 per cent during 2006-10, and jumped to 31.71 per cent during 2011-14. It shows that liberalization and globalization adversely affected agricultural export during 1990-2000, but thereafter the Indian agricultural sector became competitive. In the case of import, there was a sharp decline from 49 per cent during 1991-1995 to 17.21 per cent during 2001-05, However, growth in agriculture import picked-up from 2006 onwards.

**Table 1. Five-yearly compound annual growth rates of agricultural export and import**

| Period | Agricultural import (%) | Agricultural export (%) |
|---|---|---|
| 1991-95 | 48.96 | 21.78 |
| 1996-00 | 28.51 | 5.55 |
| 2001-05 | 17.21 | 9.77 |
| 2006-10 | 29.00 | 16.07 |
| 2011-14 | 22.04 | 31.71 |

*Source:* Authors' calculations based on data from Ministry of Agriculture, Government of India, New Delhi

## Commodity-wise Potential and Export Performance

According to the economic survey 2013, India is 10th in global agricultural export, though it is among the top three producers in most of the commodities. Rapidly increasing domestic demand due to rising population and income is the major factor adversely affecting agricultural exports. India is second largest producer of rice, wheat and other cereals in the world and demand of India's wheat in the world has shown a rising trend. The country exported 5.57 Mt of wheat worth of ₹ 9,261.60 crores in 2013-14 (APEDA, 2014). With production of 106.3 Mt rice, 24.2 Mt maize and 9.2 Mt bajra in 2013-14, India is not only the largest producer, but largest exporter also of cereals in the world. India exported cereals worth ₹ 63452.09 crores in the year 2013-14 (Directorate of Economics and Statistics, Department of Agriculture and Cooperation, 2015).

In recent years, floriculture has also emerged as an important sector with good demand in the international market. The country exported 22,485.21 Mt of floricultural products worth of ₹ 455.90 crores in 2013-14. India also exported fruits and vegetable seeds worth of ₹ 410.53 crores during 2013-14. India comes second in term of fruits and vegetable

**Table 2. Major destinations for export of agricultural products from India, 2013**

| Rank | Importing country | Share, % | Rank | Importing country | Share, % | Rank | Importing country | Share, % |
|---|---|---|---|---|---|---|---|---|
| 1 | USA | 11.49 | 10 | China | 2.50 | 19 | Pakistan | 1.29 |
| 2 | Viet Nam | 9.29 | 11 | Japan | 2.46 | 20 | Kuwait | 1.25 |
| 3 | Iran | 8.41 | 12 | Korea | 2.00 | 21 | Nepal | 1.25 |
| 4 | UAE | 4.98 | 13 | UK | 1.80 | 22 | Germany | 1.19 |
| 5 | Saudi Arabia | 4.84 | 14 | Belgium | 1.77 | 23 | Italy | 1.18 |
| 6 | Bangladesh | 3.51 | 15 | Netherlands | 1.71 | 24 | Russia | 1.16 |
| 7 | Malaysia | 3.08 | 16 | Benin | 1.40 | 25 | Yemen | 1.10 |
| 8 | Indonesia | 2.70 | 17 | Egypt | 1.39 | - | Others | 24.36 |
| 9 | Thailand | 2.53 | 18 | France | 1.36 | - | | |

*Source:* Authors' calculations based on International Trade Centre (ITC) database, Geneva, Switzerland

production. As per National Horticulture Database published by the National Horticulture Board, during 2012-13 India produced 81.285 Mt of fruits and 162.19 Mt of vegetables. During 2013-14, India exported fruits and vegetables worth ₹ 8760.96 crores which comprised fruits worth of ₹ 3298.03 crores and vegetables worth of ₹ 5462.93 crores (APEDA).

India has massive production of animal products, such as milk, meat and eggs. The animal products have a significant contribution to the Indian agricultural export. In 2013-14, the export of animal products was of ₹ 32288.57 crores, in which the share of buffalo meat was 86 per cent. The animal products registered 27 per cent growth in export during 2012-13 vis-à-vis the previous year. Huge growth is seen in export of dairy products also. Skimmed milk (in powder) has emerged as the largest item of export from India, accounting for nearly 77 per cent of net milk and milk products exports in the year 2012-13.

India was the second largest producer of tea leaves in the world with a production of 1205 million kg in 2013-14. Its share in the international tea market was 12 per cent in 2013-14. India is ranked fourth in terms of global tea exports, which reached 225 million kg in 2013-14 and were valued at ₹ 4509 crores. India exports coffee to more than 45 countries. Italy was the largest importer of Indian coffee. In the year 2013-14, India exported 298584 tonnes of coffee valued at ₹ 4539 crores (Coffee Board of India).

## Major Destinations and Composition of Agricultural Export from India

A perusal of Table 2 reveals that top 10 agricultural export destinations were the United States of America, Viet Nam, Iran (Islamic Republic of), United Arab Emirates, Saudi Arabia, Bangladesh, Malaysia, Indonesia, Thailand, and China and together these constituted 53.3 per cent of total agricultural export. The main commodities exported to the USA included guargum, basmati rice, cereals preparations, natural honey and several other preparations. Viet Nam is an export market of buffalo meat, groundnuts, maize, wheat and alcoholic beverages. The Islamic Republic of Iran has the 3rd rank in India's agricultural export with a share of 8.41 per cent and commodities exported are basmati rice, other cereals, non-basmati rice and buffalo meat.

Out of the 24 broad agricultural export commodities (HS code 01 to 24), 12 were taken individually and remaining 12 were taken as miscellaneous commodities. A perusal of Table 3 reveals that commodities under HS code 02 (meat and edible meat offal) and HS code 10 (cereals) had a rising trend in export from India. In all other commodities, there was no clear trend between 2001 and 2013.

To examine the potential of export expansion of agricultural products from India, we estimated reveled comparative advantage (RCA). This analysis was done in two parts: (1) broad category-wise, which has HS

**Table 3. Dynamics in export of agricultural commodities from India, 2001-2013**

| Item No. | Commodities | Share, % | | | |
|---|---|---|---|---|---|
| | | 2001 | 2005 | 2010 | 2013 |
| 1 | Meat and edible meat offal | 4.4 | 6.0 | 9.2 | 11.2 |
| 2 | Fish, crustaceans, molluscs, aquatic invertebrates | 19.8 | 15.2 | 11.3 | 11.8 |
| 3 | Dairy products, eggs, honey, edible products of animal | 1.2 | 2.5 | 1.2 | 1.7 |
| 4 | Edible vegetables and certain roots and tubers | 3.8 | 5.6 | 5.0 | 3.3 |
| 5 | Edible fruits, nuts, peel of citrus fruit, melons | 8.7 | 9.0 | 5.7 | 3.9 |
| 6 | Coffee, tea, mate and spices | 13.2 | 9.3 | 10.4 | 6.8 |
| 7 | Cereals | 14.4 | 19.9 | 15.2 | 27.1 |
| 8 | Oilseeds, oleagic fruits, grain, seed, fruit, etc. | 5.1 | 4.2 | 5.7 | 4.4 |
| 9 | Lac, gums, resins, vegetable saps and extracts | 3.8 | 4.2 | 3.4 | 7.2 |
| 10 | Animal, vegetable fats and oils, cleavage products, etc. | 3.1 | 3.3 | 3.7 | 2.3 |
| 11 | Sugars and sugar confectionery | 5.7 | 0.8 | 5.4 | 2.8 |
| 12 | Residues, wastes of food industry, animal fodder | 7.2 | 8.4 | 10.8 | 8.7 |
| 13 | Miscellaneous commodities | 9.8 | 11.5 | 13.0 | 9.0 |

*Source:* Authors' calculations based on International Trade Centre (ITC) database, Geneva, Switzerland

code with 2 digits, and sub-category-wise which has HS code with 4 digits. The commodities under broad categories are listed in Table 4 along with their RCA values for the years 2001, 2005, 2010 and 2013.

It can be seen from Table 4 that in 2001 and 2005, the RCA values of meat and edible meat offal were close to 1. It means during this period India neither had advantage nor disadvantage in export of meat and edible meat offal, but over time, the value of RCA increased to 1.25 in 2010 and further to 2.08 in 2013, it indicates that India had developed comparative advantage in this category. The policy initiatives, such as availability of unwanted male dairy buffalo for meat, modernization of abattoirs, etc. have been the key factors in strengthening the meat industry. The RCA values of dairy produce, birds' eggs, natural honey and edible products of animal origin fluctuated from 0.23 to 0.55 during the study period. It means India is not in a position to export dairy produce.

The RCA of edible vegetables and certain rooks and tubers was 1.47 in 2001, it increased to 1.67 in 2005, and decreased to 1.14 in 2013, but still was more than 1, indicating that India continues to enjoy a comparative advantage in their export. However, more attention will have to be focused on maintaining and improving the comparative advantage. The export of edible fruits and nuts, peel of citrus, fruits and melons are concerned has shown a decreasing trend in their revealed comparative advantage. The poor quality, supply chain issues, lack of food processing units, post-harvest huge wastages are the reasons behind declining RCA of fruits. Indian coffee, tea and spices have always been in great demand in the international market. However, with the beginning of the 21th century, there has been a sharp increase in competition in the world market, leading to a decline in India's RCA of coffee, tea, mate and spices. However, despite declining demand of tea and coffee in the world market, their RCA value is more than unity, which indicates considerable potential in coffee and tea export expansion.

In the case of cereals, India's comparative advantage has increased continuously from 3.68 in 2001 to 5.09 in 2013, except in year 2010 when it declined to 2.37. Thus, India has enormous potential in cereals exports. However, efforts will have to be made to ensure that domestic production of cereals exceeds domestic demand so as to increase export. There has been a decreasing trend in RCA values of oilseeds and oleaginous fruits, miscellaneous grains, but it is still more than 1. A similar decreasing pattern has been noticed for sugar and sugar confectionery.

The revealed comparative advantage was studied at sub-category level and the commodities chosen were

**Table 4. The value of revealed comparative advantage (RCA) for agricultural products (Broad category-wise)**

| Broad category | RCA value | | | |
|---|---|---|---|---|
| | 2001 | 2005 | 2010 | 2013 |
| Meat and edible meat offal | 0.94 | 0.94 | 1.25 | 2.08 |
| Dairy produce; birds' eggs; natural honey; edible products of animal origin | 0.34 | 0.55 | 0.23 | 0.42 |
| Edible vegetable and certain rooks and tuber | 1.47 | 1.67 | 1.17 | 1.14 |
| Edible fruits and nuts, peel of citrus, fruits and melons | 2.60 | 1.82 | 0.98 | 0.93 |
| Coffee, Tea, mate and spices | 9.44 | 4.86 | 3.71 | 3.49 |
| Cereals | 3.68 | 4.45 | 2.37 | 5.09 |
| Oilseeds and oleaginous fruits, miscellaneous grains | 2.17 | 1.39 | 1.09 | 1.01 |
| Sugar and sugar confectionery | 3.02 | 0.33 | 1.59 | 1.24 |

*Source:* Authors' calculations based on International Trade Centre (ITC) database, Geneva, Switzerland

**Table 5. RCA of agricultural product (sub-category-wise)**

| Commodity | RCA value | | | |
|---|---|---|---|---|
| | 2001 | 2005 | 2010 | 2013 |
| Barley | 0.00 | 0.00 | 0.07 | 0.67 |
| Coffee | 3.68 | 1.98 | 1.08 | 1.06 |
| Fish, frozen, whole | 3.87 | 2.02 | 2.25 | 1.73 |
| Maize(corn) | 0.23 | 0.67 | 1.56 | 1.92 |
| Milk and cream, concentrated or sweetened | 0.55 | 1.21 | 0.25 | 1.09 |
| Oilseed | 20.44 | 12.51 | 10.06 | 8.02 |
| Rice | 12.59 | 16.74 | 7.73 | 17.94 |
| Tea | 19.85 | 10.96 | 7.40 | 6.01 |
| Wheat and meslin | 2.59 | 1.01 | 0.00 | 1.38 |

*Source:* Authors' calculations based on International Trade Centre (ITC) database, Geneva, Switzerland

barley, coffee, cotton, live fish, maize (corn), milk and cream (concentrated or sweetened), oilseed, rice, sugar and sugar confectionery, tea and wheat and meslin. Indian coffee has always been in good demand in the international market. The RCA value for coffee was 3.68 in 2001, but due to competition in the international market, it decreased continuously to 1.06 in 2013. This shows that India still enjoys revealing comparative advantage for export of coffee and there is considerable potential for its expansion. The RCA value for fish (frozens & whole) has shown fluctuations during 2001-2013, but it is still 1.73 (2013), reflecting scope for its export expansion. This decline in RCA is probably due to strong competition from countries like China, USA, Norway and Russia. In maize (corn) export, India's position has changed in the positive direction and over time, the value of RCA has increased from the absolute disadvantage level to absolute advantage level, indicating potential for its export. The export of milk and cream (concentrated or sweetened) has been unstable during the study period, but has shown competitive advantage in 2013.

India introduced budgetary subsidies to support export of surplus wheat and rice in 2000, after which the RCA of rice increased from 12.59 in 2001 to 16.74 in 2005. In 2005, the Government of India stopped export subsidies. In 2007, the challenge was to curb inflation in domestic food prices because of the dramatic increase in world grain prices. The government restricted the exports of wheat and some varieties of rice. Consequently the RCA of rice declined to 7.73, but it was on the higher side of the RCA chart of agricultural products in 2010. In September 2011,

when government lifted the ban on export of rice, the RCA again shot up to 17.94 in 2013.

A perusal of Table 5 reveals that India has significant export potential in oilseeds as well. Despite intensive competition in the global market, the RCA of oilseeds in 2013 was 8.02, which is the second best RCA of agricultural products exported from India. The RCA index value of tea was 19.85 in 2001 but declined continuously thereafter to 6.01 in 2013. It shows that India is still highly competent in the global tea market. The trend of stagnant production and increasing consumption has declined the RCA of Indian tea. As calculated from the tea statistics of Tea Board of India, the average domestic consumption of tea was 32.06 per cent of the total production during 1950-1960 which rose to 76.94 per cent in 2001-04 (Nagoor, 2009). Further, the emerging competitors such as East African countries, China, Indonesia, Latin America and Sri Lanka are behind the declining trend in RCA of Indian tea. The RCA value of wheat has been more than 1, except in 2010, which was due to lower production of wheat in 2010. Thus, overall, India has revealed comparative advantage in wheat export.

The analysis of export of agricultural product from India has revealed the value of RCA to be more than 5 for oilseeds, rice and tea. It shows that there is huge potential in export market for these products. There is a need to find sustainable and profitable international markets for these commodities. The agricultural products like coffee, fish (frozen), maize, milk and cream, (concentrated or sweetened), wheat and meslin have RCA values more than 1. Therefore, these commodities are competitive enough for export and there is a need to build strong production mechanism to stay on the comparative advantage chart. The RCA values of agricultural commodities have reflected considerable potential in export expansion and a positive sign for the Indian agrarian economy.

## Conclusion and Policy Implications

The study has revealed that India has comparative advantage in export of some agricultural commodities such as meat and edible meat offal, frozen fish, oilseeds, rice, wheat, coffee and tea. In export, India has trading partners from both developed and developing nations, The USA is the largest export market of Indian agricultural products. Wheat is one of the largest commodities exported to Vietnam. Iran is the third largest destination of Indian agricultural products and it is among the world's top four buyers of wheat, rice and one of the 10 largest importers of raw sugar. Cereals and meat have shown a drastic increment in the export composition. In 2013, cereals and meat and meat offal constituted 27.3 per cent and 11.2 per cent of the total agricultural exports from India. It has also reveals that India does not have comparative advantage in export of several agricultural commodities.

The study has suggested that the government should encourage the production of those commodities in which we have comparative advantage in export like cereals, meat and meat offal, frozen fish, oilseeds, coffee and tea. Commodity specific programs aiming at export development should be initiated. To develop the comparative advantage in export of fruits and vegetables, infrastructure development is required. One of the major constraints in agricultural exports is the lack of transportation facilities. These should be developed as per international standard. Private participation should be encouraged in this sector. EXIM bank should encourage agricultural export by providing adequate credit. Export-oriented farming should be encouraged to meet the international standards.

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