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Direction of India's rice exports in the post-liberalization era

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ABSTRACT

Rice continues to play an important role in the national exports of India. It accounts for 2.1 percent of India's overall export earnings and accounted for 18.3 percent of agriculture and allied products exports. India ranks first in the export of rice in the world. The increased demand for rice on the world market is providing a magnificent environment for this. The country observed remarkable increase after the new economic policy. The present study attempted to examine the pattern of growth, structure, instability and concentration of India's rice exports to different destinations.

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1. Introduction

In the Indian economy, agriculture is the most significant sector. It is the oldest and largest occupation, and is also the backbone of the economy. It is one of the most important economic sectors, especially in rural areas (Ramakrishna B and Chaya K Degaonkar, 2016).¹⁻¹⁰ 19.9 percent of India's GDP in 2020-21 is from agriculture and employs more than half of the country's workforce. Even after more than seven decades of independence, the economy remains largely an agrarian in terms of population dependence and labour force participation. Rice is one of India's most important food crops. It provides food for more than half of the world's population. Most people in South-East Asia eat it as their primary source of nutrition. Asia accounts for about 90 percent of the world's rice area and production. There are many different varieties of rice in India (Karunakaran N, 2013).^{1,4,5}

Among rice growing countries, India having the largest area under rice in the world and in case of production it

is next to China. Rice contributes 42 percent of total food grains production and 45 percent of cereal production in the country. West Bengal, Odisha, Andhra Pradesh, Tamil Nadu and Bihar are the major cultivators and which together constitute over 80 percent of the rice production in India. The production of rice was increased from 74.3 million tons in 1990-91 to 120 million tons in 2020-21. Most of this increase was the result of an increase in yields. India is the world's leading rice exporter, followed by Thailand and Vietnam. On the global market, Indian rice is in high demand. The increased demand for rice on the global market is creating a favourable atmosphere for Indian rice exports. Indian agriculture made a significant contribution to world food production, with rice having the biggest percentage of export value among agricultural products (Karunakaran N, 2013).⁵ India has been a significant exporter of rice since the early 80's, but the country has observed a remarkable increase only after the implementation of new economic policy (Kumar M, 2019).⁷

India's rice exports have benefited from trade liberalization measures. Before the new economic policy, rice exports were primarily of the Basmati variety, however

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the government of India periodically eased the restriction on non-basmati rice exports during the liberalized economic policy regime. Following the implementation of trade liberalization policies, rice exports include both Basmati and non-Basmati rice. The actual spurt in India's rice exports occurred with the implementation of the trade liberalization policies in early 1990s.

1.1. Objectives

The main objectives of the study includes: (i) to evaluate the direction of India's rice export to different destinations; and (ii) to analyze market concentration and instability of India's rice exports to different destinations.

1.2. Review of literature

Udhayakumar M, et al. (2021)¹¹⁻¹⁶ analyzed the production performance of rice in India. Srikala M, et al. (2017)¹⁵ studied trade direction and competitiveness of rice in India. Ramakrishna B and Chaya K Degaonkar (2016)¹⁰ examined the rice exports from India and indicated that there is excellent market for Indian rice varieties in world market. Pinky Bains (2019) evaluated the performance and concentration of directions of rice export from India and to Saudi Arabia, UAE and UK. Anup Adhukari and Sekhon M K (2014) studied the trade direction of export of Basmati rice. Karunakaran N (2014), Shrabanti Maity and Tanushree Dey (2014) also worked out the growth and instability of rice exports. Anup Adhikari, et al. (2016)², Shailza, et al. (2015)¹³, Paramalkshmi Devi E and Kalabarani S P (2016)⁸ and Satishkumar, et al. (2016)¹² examined the export performance and competitiveness of rice from India.

2. Materials and Methods

The study used time series data on export value of rice from India during the period of 1991-92 to 2019-20. For analysis of direction of rice exports, six major importing countries were considered namely, Saudi Arabia, UAE, Kuwait, USA, Bangladesh and Yemen. Secondary data were collected from DGCIS, various issues of handbook on Statistics of Indian economy by RBI, and the Economic Surveys of government of India. Compound growth rate, Coppok's Instability Index and Gini-Hirschman Index of geographical concentration were used for analysis.

The compound growth rate (CGR) is calculated by using the formula:

$$Y_t = a(\sqrt[n]{V \log - 1})$$

Where, Y_t = Value of rice exports in year t, a = constant, t = time element in year, b = regression coefficient which shows the rate of change or growth rate.

$$\log Y_t = \log a + t \log b$$

The CGR (Compound growth rate) (r) is worked out by using: $[\text{Antilog}(b)-1] * 100$.

Instability in export earnings was estimated by using Coppok's Instability Index (CII); the CII with higher numerical value represents, higher instability and vice versa. It is calculated as the antilog of the square root of logarithmic variance using the formula:

$$\text{CII} = \text{Antilog}(\sqrt{V \log - 1}) * 100$$

$$\text{Log V} = \frac{\sum(\log \frac{X_{t+1}}{X_t} - m)^2}{n-1}$$

Where, Log V = Logarithmic variance of the series, X_t = export earnings, t = year, n = number of years, M = mean of the difference between logs of X_{t+1} and X_t . For analyzing the market or geographical concentration on India's rice exports, the Gini-Hirschman concentration index (GHI) is used. A higher Gini-Hirschman concentration index shows greater concentration of exports to few countries and greater the index shows greater diversification of exports to various countries. It is calculated using the formula:

$$\text{GHI} = \sqrt{\sum_{i=1}^n \left(\frac{X_{it}}{X_t}\right)^2}$$

Where, X_{it} shows the export value rice to country i in year t and X_t shows the total rice export of the year t.

3. Results, Analysis and Discussion

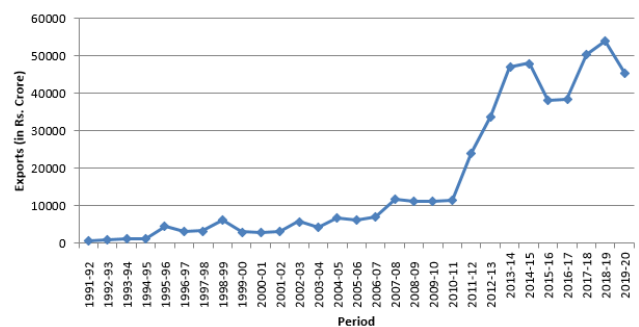


Fig. 1: Rice exports from India during the period of 1991-92 to 2019-20

3.1. Export performance of Rice

India's export earnings of rice were only Rs. 756 crores in 1991-92; increased to Rs. 3174 crores in 2001-02, Rs.24109 crores in 2011-12 and Rs. 45426 crores in 2019-20. In the first two decades of reform era, export was almost static with only slight fluctuations over the previous years. The percentage share of rice exports to total exports was 1.72 percent in 1991-92, increased to 4.49 percent in 1998-99; in 2019-20, it was 2.1 percent. In total agriculture and allied products exports, the export earnings of rice accounted by 9.6 percent in 1991-92, increased to 18.3 percent in 2019-20. The average annual growth rate of export earnings of rice was 21.19 percent during the period of 1991-92 to 2019-20. The compound growth rate of export earning of rice was 12.4 percent during the period of study (Figure 1).

Table 1: Share of India's rice exports to major destinations (in Rs. Crore)

| Year | Saudi Arabia | UAE | Kuwait | USA | Yeman | Bangladesh |
|---------|--------------|-------------|------------|------------|------------|-------------|
| 1991-92 | 278 (36.8) | 56 (7.4) | 19 (2.5) | 42 (5.6) | 0 (0) | 2 (0.3) |
| 1992-93 | 472 (48.4) | 94 (9.6) | 64 (6.6) | 47 (4.8) | 0 (0) | 0 (0) |
| 1993-94 | 695 (54.0) | 145 (11.3) | 86 (6.7) | 41 (3.2) | 0 (0) | 0 (0) |
| 1994-95 | 519 (43.0) | 103 (8.5) | 128 (10.6) | 40 (3.3) | 0 (0) | 89 (7.4) |
| 1995-96 | 492 (10.8) | 183 (4.0) | 90 (2.0) | 103 (2.3) | 27 (0.6) | 952 (20.8) |
| 1996-97 | 896 (28.2) | 152 (4.8) | 119 (3.8) | 318 (10.0) | 21 (0.7) | 145 (4.6) |
| 1997-98 | 1071 (31.8) | 142 (4.2) | 207 (6.1) | 129 (3.8) | 56 (1.7) | 361 (10.7) |
| 1998-99 | 1523 (24.2) | 155 (2.5) | 100 (1.6) | 21 (0.3) | 42 (0.7) | 2251 (35.8) |
| 1999-00 | 1270 (40.6) | 149 (4.8) | 141 (4.5) | 73 (2.3) | 57 (1.8) | 366 (11.7) |
| 2000-01 | 1309 (44.6) | 113 (3.9) | 239 (8.2) | 135 (4.6) | 33 (1.1) | 298 (10.2) |
| 2001-02 | 1245 (39.2) | 84 (2.6) | 209 (6.6) | 104 (3.3) | 49 (1.5) | 81 (2.6) |
| 2002-03 | 1098 (18.8) | 141 (2.4) | 182 (3.1) | 150 (2.6) | 48 (0.8) | 565 (9.7) |
| 2003-04 | 1236 (29.7) | 237 (5.7) | 152 (3.6) | 106 (2.5) | 69 (1.7) | 904 (21.7) |
| 2004-05 | 1893 (28.0) | 369 (5.5) | 266 (3.9) | 101 (1.5) | 154 (2.3) | 837 (12.4) |
| 2005-06 | 1874 (30.1) | 400 (6.4) | 266 (4.3) | 136 (2.2) | 141 (2.3) | 553 (8.9) |
| 2006-07 | 1434 (20.4) | 542 (7.7) | 335 (4.8) | 150 (2.1) | 11 (0.2) | 489 (6.9) |
| 2007-08 | 2451 (20.9) | 1518 (12.9) | 473 (4.0) | 215 (1.8) | 232 (2.0) | 2648 (22.5) |
| 2008-09 | 3106 (27.8) | 2903 (26.0) | 735 (6.6) | 275 (2.5) | 176 (1.6) | 988 (8.8) |
| 2009-10 | 3347 (29.7) | 3137 (27.9) | 1032 (9.2) | 172 (1.5) | 302 (2.7) | 0 (0) |
| 2010-11 | 3138 (27.1) | 2845 (24.6) | 1092 (9.4) | 253 (2.2) | 297 (2.6) | 12 (0.1) |
| 2011-12 | 3661 (15.2) | 3932 (16.3) | 1423 (5.9) | 576 (2.4) | 579 (2.4) | 272 (1.1) |
| 2012-13 | 4094 (12.1) | 2071 (6.1) | 1183 (3.5) | 647 (1.9) | 1030 (3.0) | 84 (0.2) |
| 2013-14 | 7242 (15.4) | 1895 (4.0) | 1621 (3.4) | 1006 (2.1) | 1346 (2.9) | 1555 (3.3) |
| 2014-15 | 7910 (16.5) | 2697 (5.6) | 1657 (3.5) | 948 (2.0) | 1492 (3.1) | 2770 (5.8) |
| 2015-16 | 6001 (15.7) | 3858 (10.1) | 1495 (3.9) | 1079 (2.8) | 1015 (2.7) | 872 (2.3) |
| 2016-17 | 4923 (12.8) | 4039 (10.5) | 1130 (2.9) | 938 (2.4) | 820 (2.1) | 211 (0.5) |
| 2017-18 | 5816 (11.6) | 3782 (7.5) | 1290 (2.6) | 1175 (2.3) | 1374 (2.7) | 5411 (10.8) |
| 2018-19 | 7234 (13.4) | 3088 (5.7) | 1408 (2.6) | 1421 (2.6) | 1778 (3.3) | 1507 (2.8) |
| 2019-20 | 7230 (15.9) | 2418 (5.5) | 1568 (3.5) | 1508 (3.3) | 1564 (3.4) | 106 (0.2) |
| Average | 2878 (26.3) | 1422 (8.8) | 645 (4.8) | 411 (2.9) | 438 (1.7) | 839 (7.7) |

Source: Computed Data based Handbook of Statistics on Indian Economy (various issues), RBI. Figures in the parenthesis indicate percentage share of rice imported by different countries from India

Table 2: Growth and instability of export share of India's rice among major importers

| Country | Growth Rate | Instability Index |
|--------------|-------------|-------------------|
| Soudi Arabia | 10.7 | 35.8 |
| UAE | 19.1 | 52.8 |
| Kuwait | 14.1 | 37.4 |
| YR | 21.8 | 64.6 |
| USA | 14.2 | 53.4 |
| Bangladesh | 1.5 | 137.5 |

3.2. Direction of India's rice exports

India exports rice to numerous countries around the world, in 2019-20 to 234 countries. There was a structural change in the direction and magnitude of rice exports recently. To analyze the direction and growth performance of India's rice exports, six major destinations (Saudi Arabia, UAE, Kuwait, USA, Yemen and Bangladesh) were considered. The major destinations and their share during the period of 1991-92 to 2019-20 from India are presented in (Table 1).

During the study period, Saudi Arabia had the highest market share of rice exports from India, followed by UAE

and Kuwait. Even though the market share of rice exports to Saudi Arabia has declined over the years, Saudi Arabia has been the top importer. In 1991-92, the market share of Saudi Arabia was 36.8 percent and it has declined to 15.9 percent in 2019-20. The absolute value of India's rice exports to Saudi Arabia was Rs.278 crores in 1991-92 and it has increased to Rs.7230 crores in 2019-20. The market share of India's rice exports to UAE was 7.4 percent in 1991-92, increased to 27.9 percent in 2009-10 and declined to 5.5 percent in 2019-20. The absolute value of rice exports to UAE has increased from Rs. 56 crores to Rs. 2418 crores. The market share of India's rice exports

Table 3: Degree of market concentration of India’s rice exports

| Year | Concentration Index |
|---------|---------------------|
| 1991-92 | 0.40 |
| 1992-93 | 0.51 |
| 1993-94 | 0.56 |
| 1994-95 | 0.46 |
| 1995-96 | 0.25 |
| 1996-97 | 0.32 |
| 1997-98 | 0.36 |
| 1998-99 | 0.44 |
| 1999-00 | 0.44 |
| 2000-01 | 0.48 |
| 2001-02 | 0.41 |
| 2002-03 | 0.25 |
| 2003-04 | 0.38 |
| 2004-05 | 0.33 |
| 2005-06 | 0.33 |
| 2006-07 | 0.25 |
| 2007-08 | 0.34 |
| 2008-09 | 0.40 |
| 2009-10 | 0.42 |
| 2010-11 | 0.38 |
| 2011-12 | 0.24 |
| 2012-13 | 0.15 |
| 2013-14 | 0.17 |
| 2014-15 | 0.19 |
| 2015-16 | 0.20 |
| 2016-17 | 0.17 |
| 2017-18 | 0.18 |
| 2018-19 | 0.16 |
| 2019-20 | 0.18 |

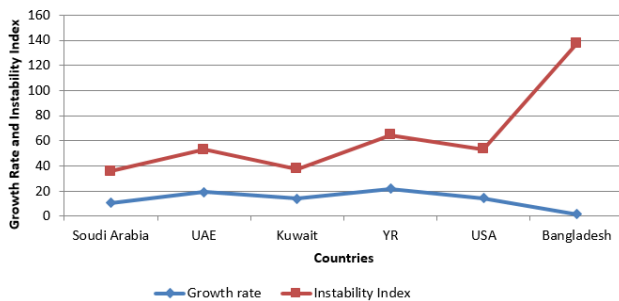


Fig. 2: Growth and instability of export share of India’s rice among major importers

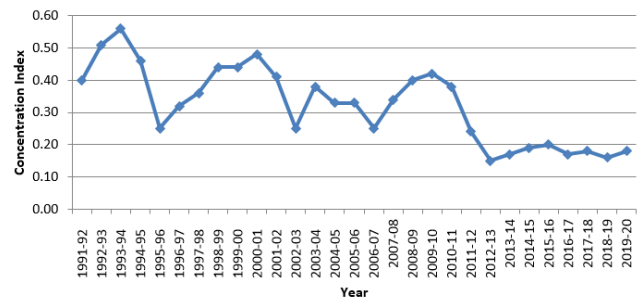


Fig. 3: Market concentration Index of India’s rice exports

to Kuwait was 2.5 percent in 1991-92 and it has increased to 4.8 percent in 2019-20. The market share of India’s rice exports to Bangladesh was 0.2 percent in 1991-92. It was increased to 22.5 percent in 2007-08 and in 2019-20 it has declined to 0.2 percent. The average market share of India’s rice exports to Saudi Arabia was 26.3 percent. During the period of study, the UAE, Bangladesh, Kuwait, the United States, and Yemen had average export share of 8.8 percent, 7.7 percent, 4.8 percent, 2.9 percent, and

1.7 percent, respectively (Table 1). This shows that Saudi Arabia, UAE and USA have decline in their market share and Kuwait, Bangladesh and Yemen have increase in their market share of India’s rice exports.

3.3. Growth and instability

The growth and instability of market share of India’s rice exports among major destinations shows that Yemen has experienced the highest growth rate (21.8 percent) in the export share of rice from India, followed by UAE

(19.1 percent), USA (14.2 percent) and Kuwait (14.1 percent). The compound growth rate of the market share of India's rice exports to Saudi Arabia was 10.7 percent during the period of study. The lowest growth rate has been experienced by Bangladesh (1.5 percent). Bangladesh (137.5) experienced the most volatility in its export share, followed by Yemen (64.6 percent), USA (53.4 percent) and UAE (52.8 percent). The instability index of the market share of India's rice exports to Kuwait was 37.4 percent during the period. Saudi Arabia has the lowest instability index and a comparatively stable market for rice exports from India during the period of 1991-92 to 2019-20 (Table 2).

It is seen that Bangladesh and Yemen were the more unstable markets and Kuwait and Saudi Arabia were the more stable markets for exports of India's rice during the period under study. During 1991-92 to 2019-20, Bangladesh experienced the high instability and least growth in its market share of India's rice exports. Saudi Arabia was the largest importer of rice from India and has moderate amount of growth rate and the lowest degree of instability in rice exports (Figure 2).

3.4. Market concentration of Rice Exports:

Despite the fact that India exports rice to more than 200 countries, the major importers are Saudi Arabia, UAE, Kuwait, USA, Yemen, Bangladesh, UK, South Africa, Singapore and France. These countries were considered in estimating the geographical concentration index and the remaining countries were included among others. (Table 3) shows the degree of market concentration of India's rice exports for all the years during the period of study. The geographical concentration index was 0.40 in 1991-92, declined to 0.18 in 2019-20, revealing that the amount of concentration declines and diversification increases over the years. The lowest amount of concentration was experienced in 2012-13 and the highest degree of concentration in 1993-94. The concentration index of the level of rice exports ranged between 0.56 and 0.15 during the period of study.

4. Conclusion

There had been a noticeable change in the direction and volume of rice exports of India. Among the major importers of rice, Saudi Arabia was the largest one and had a moderate amount of compound growth rate and lowest degree of instability. The degree of market concentration of India's rice export has been declining and diversification has increased over the years. The lowest degree of concentration was in 2012-13 and the highest in 1993-94.

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None.

6. Conflict of Interest

None.

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