



## **Growth and Stability of Basmati and Non-basmati Rice Export in India**

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### **Authors' contributions**

This work was carried out in collaboration between both authors. Author MU designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author KRK managed the analyses of the study and managed the literature searches. Both authors read and approved the final manuscript.

### **Article Information**

DOI: 10.9734/CJAST/2020/v39i4031107

#### **Editor(s):**

(1) Dr. Michael Ignatius Ferreira, Western Cape Department of Agriculture, South Africa.

#### **Reviewers:**

(1) Kanu, Ifeanyi Moses, Michael Okpara University of Agriculture, Nigeria.

(2) Khorntawatt Sakhonkaruhatdej, Thailand National Sports University, Thailand.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/63657>

**Original Research Article**

**Received 02 October 2020**

**Accepted 07 December 2020**

**Published 15 December 2020**

### **ABSTRACT**

International trade plays an important role in the economic development of a country. India stands as a world's largest producer and exporter of basmati rice. During 2017-18 the country has exported globally about 40.56 Lakh tonnes of Basmati Rice and 86.48 Lakh tonnes for Non-Basmati rice, the worth of ₹ 268.70 billion and ₹ 229.68 billion respectively. India is the leading exporter of the rice as there is a strong demand for Indian rice in the international markets. So, the present study is to assess the trend and instability in terms of export of basmati and non-basmati rice in India. The study has revealed that Indian rice exports performance during the study period 1980-81 to 2017-18. Further, the study period will be divided into three sub-periods. In overall period, the basmati rice export value is highest (16.45 per cent per annum) when compared to the export quantity (8.35 per cent per annum) and unit value (7.48 per cent per annum). In overall period, compound growth rate shows positive growth rate for quantity, value, and unit value of non-basmati rice with 1 per cent level of significance. The compound growth rate total rice shows positive growth rate for quantity (11.06 per cent), value (17.87 per cent), and unit value (6.13 per cent) of total rice with 1 per cent level of significance. Based on the result of the analysis, the instability index was found to be higher for export quantity (51.86%) of basmati rice than its value (88.07%) and unit value (31.23%).

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Overall, the rice export analysis indicates positive signals for the export of basmati and non-basmati rice from India. Which is confirmed through increasing growth in III period after 2010 and also having stability in the rice export price both basmati and non-basmati rice in the international markets.

*Keywords: Basmati; export; growth rate; instability and rice.*

## 1. INTRODUCTION

Rice (*Oryza sativa*) is one of the important cereal food crops of India. Rice contributes about 43 per cent of total food grain production and 46 per cent of total cereal production in the country [1]. It continues to play vital role in the national exports. In the international market rice is traded under two main categories such as Fragrant and Non-Fragrant food grains. In case of fragrant rice, India stands as a world's largest producer and exporter of basmati rice [2].

Among the aromatic rice varieties, extra-long with twice of their original size, soft, fluffy, superior aroma and distinct flavor while cooking makes basmati rice as a unique. Basmati rice has got a good export demand and fetches good export price in international markets due to such uniqueness. The higher price of basmati rice in international market made basmati rice as export competitive product [3].

70% of the total world basmati rice is produced in India followed by Pakistan [4]. Basmati rice Production in India is 5.1 Million metric tonnes (mt) from 1.5 Million hectares during 2017-18, and the Non-Basmati rice Production is 107.8 mt from 42.2 Million hectares during 2017-18 [5].

Increasing demand for rice as well as the capacity of producing rice in India, which is supported by export policy have created scope for the export of rice from India. Owing to price competitiveness, nowadays, African countries have also changed to Indian non-basmati rice. India is the leading exporter of the rice as there is a strong demand for Indian rice in the international markets. The Indian rice export value has increased from ₹33.70 billion to ₹503.07 billion between 1997-98 to 2017-18, mainly to China, Benin, USA, UK, France, Malaysia and Japan. During 2017-18 the country has exported globally about 40.56 Lakh tonnes of Basmati rice and 86.48 Lakh tonnes for Non-Basmati rice, the worth of ₹268.70 billion and ₹229.68 billion respectively [6].

The above facts relating to basmati rice exports from India indicate that there is enough potential to grow more of basmati rice and can be a major exporter as well. There exist vast potential to bring more area under basmati rice production and increase in productivity levels. Through scale economy, India's basmati can effectively compete in the global market. Increased exports of basmati rice can be justified since it does not adversely affect domestic food security.

In order to assess the future trend in rice export, it is essential to work out its export potential and challenges. Rice export from India is determined by various factors and therefore, reliable estimates of determinants of export are essential for the formulation of appropriate policies suit the Indian rice export.

### 1.1 Objectives

1. to assess the trend in export quantity and value of basmati and non-basmati rice in India
2. to assess the instability of exports in basmati and non-basmati rice in India.

## 2. DATA AND METHODOLOGY

Time series data on export quantity, value and unit value were used in the study, which were collected from different sources for 38 years (1980-81 to 2017-18). Considering the recent drift in Indian rice export trend performance after 2010-11, the trend analysis will be done for the period of 1980-81 to 2017-18. Further, the study period will be divided into three sub-periods; 1980-81 to 1994-95 (period I), 1995-96 to 2009-10 (period II) and 2010-11 to 2017-18 (period III) corresponding broadly to pre- and post-reform periods and shifting period respectively. Data will be collected from Agricultural and Processed Food Products Export Development Authority (APEDA) and The All-India Rice Exporters' Association (AIREA).

## 2.1 Trend Analysis

Time series data on export quantity, value and unit value were used in the study, which were collected from different sources for 38 years (1980-81 to 2017-18). For trend analysis, Growth rates were calculated by fitting exponential growth function to the time series data. Compound growth rate analysis will be done using the following formula

$$Y_t = ab^t U_t$$

Where,  $Y_t$ =Dependent variable for which growth rate will be estimated (export quantity and value in year 't');  $a$ =Intercept;  $b$ =Regression coefficient;  $t$ =Year which takes values 1, 2,...,n;  $U_t$ =Disturbance term in year 't'.

The equation is transformed into log-linear and written as

$$\ln Y_t = a + t \ln b + U_t$$

Where  $\ln Y$  is natural logarithm of  $Y$ ,  $a$  and  $\ln b$  are similarly defined. The compound growth rate was computed by using the relationship

$$CGR = \{ \text{Exp}(b) - 1 \} \times 100$$

The significance of the regression coefficient was tested using the student's 't' test. The export markets for non-basmati rice are highly unstable and there is a year to year fluctuation in export markets (Anup Adhikari et al., 2011) [7].

## 2.2 Cuddy-Della Valle (Instability Index)

Instability index is a simple analytical technique to find out the fluctuation or instability in any time series data [8,9,10]. The formula suggested by Cuddy-Della Valle was used to measure instability, which is used as measure of instability in time series data [11,12]. This method corrects the coefficient of variation, if data are scattered around the negative or positive trend line. The Cuddy-Della Valle Index is given follows.

$$I = CV \cdot (1 - R^2)^{0.5}$$

Where,  $CV$  is coefficient of variation defined as the ratio of sample standard deviation to its mean and  $R^2$  is the corrected coefficient of determination of the log linear trend function that fits the time series. If the F-test is significant at 5 per cent level of significance, then the Index is calculated by using  $R^2$ . When test statistics is not significant or  $R^2 < 0$ , then  $CV$  is chosen to measure instability index.

## 3. RESULTS AND DISCUSSION

### 3.1 India's Rice Export (1980-81 to 2017-18)

India has been exporting rice to various parts of the world. Total production of rice was around 112mt in 2017-18, of which around 12.7mt was exported (Fig. 1). Total quantity of rice exported from India was 3.38 lakh tonnes in 1980-81, which increased to 47.48 lakh tonnes in 2006-07. Besides various ups and downs, in 2017-18 it reached 127 lakh tonnes. In the aspects of value, the rice export was of ₹ 223.86 crore in 1980-81 which increased to ₹ 7035 crore in 2006-07. During the period of 1980-81 and 2008-09, there was a fluctuating pattern in earnings from the rice export due to fluctuating domestic production, inconsistent export policies, frequent bans on export of non-basmati rice, currency devaluation, and volatility in the international market (Anup Adhikari et al., 2011). As there was a fall in the price of rice in the international markets, lowest earning from the export of rice was recorded in 2000-01. The exports of rice gradually increased from 2010-11 and reached ₹ 49,808.94 crore in 2017-18.

### 3.2 Trend Analysis of Rice Export

The export performance of rice (basmati rice, non-basmati rice and total rice) for quantity, value and unit value were analyzed by computing compound growth rate, in order to measure sustainability of export in future.

### 3.3 Growth Analysis of Basmati Rice Export

The exponential function was used to arrive at the growth rates in quantity, value and unit value of exports of basmati rice for the three sub periods and it clearly indicated that there was a significant increase in rice export.

It could be seen from the Table 1 that during period I, the quantity of basmati rice export recorded a positive growth rate but insignificant as of till 1991, there was restriction on minimum export and also lower production. Traditionally, the export of only basmati rice of small quantity started in 1978-79 i.e.67,000 tonnes of basmati rice [13]. In contrary, the export value registered a positive growth rate of 13.74 per cent per annum. The higher positive growth rate was mainly due to the increase in export unit value driven by higher demand. Likewise, the unit

value of basmati rice exports had represented a significant compound growth rate of 13.48 per cent per annum shown in Fig. 2. The coefficients of value and unit value of basmati rice exports were statistically significant at 1 per cent level of probability.

Liberalization policies adopted in early 1990s, subsequently followed by formation of WTO in 1995 helped to boost up trade of basmati rice as well as non-basmati rice exports from India. During II period, the basmati rice export quantity and export value shows an increasing rate of 9.97 and 14.76 per cent per annum respectively with 1 per cent level of significance. The export unit value is reduced to 4.35 per cent per annum when compared to period I.

With respect to period III, the export quantity and value shows a significant growth rate of 5.92 and 10.11 per cent per annum respectively. The export unit value showed insignificant compound growth rate of 3.95 per cent per annum. The coefficients for quantity and value of basmati rice exports were statistically significance at 1 per cent and 5 per cent level respectively. In overall period, the basmati rice export value is highest growth (16.45 per cent per annum) when compared to the export quantity (8.35 per cent per annum) and unit value (7.48 per cent per annum) The coefficients for quantity, value and unit value of basmati rice exports were statistically significant with 1 per cent level of significance.

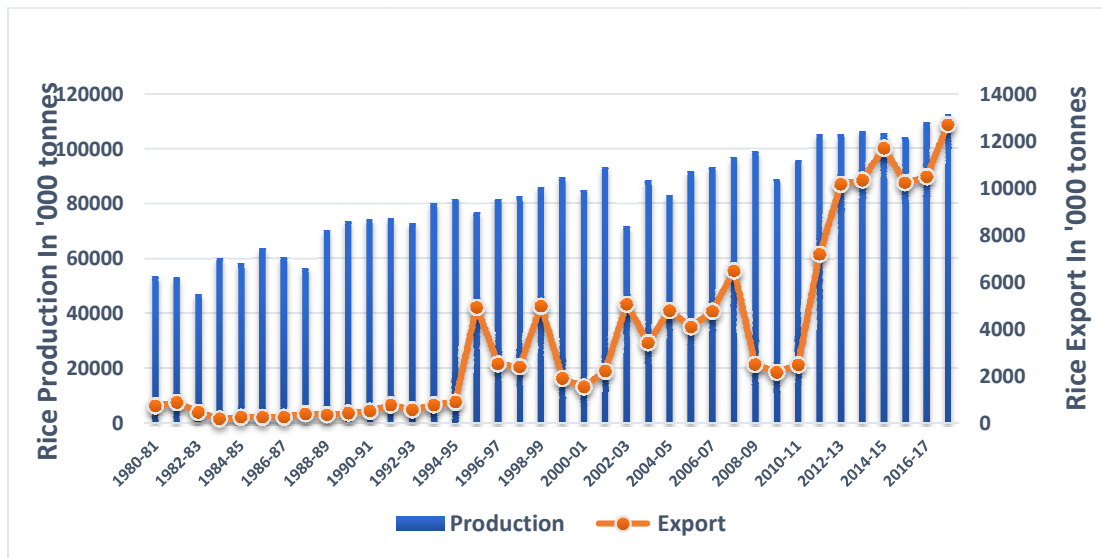
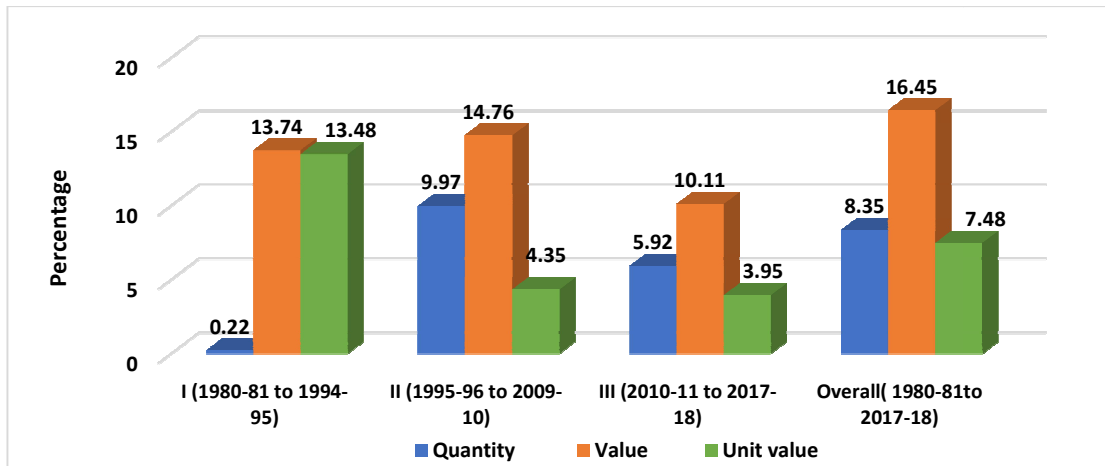


Fig. 1. Rice production vs rice export (quantity In '000 tonnes)

Table 1. Compound growth rates of basmati rice and non-basmati export from India, 1980- 81 to 2017-18 (percentage)

Particulars Periods	Basmati rice			Non-basmati rice			Total rice		
	Quantity	value	Unit value	Quantity	Value	Unit value	Quantity	value	Unit value
I (1980-81 to 1994-95)	0.22 <sup>ns</sup> (2.05)	13.74 <sup>**</sup> (1.93)	13.48 <sup>**</sup> (0.72)	36 <sup>ns</sup> (14.07)	44.34 <sup>ns</sup> (15.42)	7.59 <sup>*</sup> (3.24)	4.07 <sup>ns</sup> (3.04)	14.96 <sup>**</sup> (2.46)	10.47 <sup>**</sup> (0.96)
II (1995-96 to 2009-10)	9.97 <sup>**</sup> (0.87)	14.76 <sup>**</sup> (1.81)	4.35 <sup>**</sup> (1.33)	-6.16 <sup>ns</sup> (5.68)	-1.23 <sup>ns</sup> (4.79)	5.25 <sup>**</sup> (1.33)	1.44 <sup>ns</sup> (2.72)	9.17 <sup>**</sup> (1.84)	7.62 <sup>**</sup> (2.10)
III (2010-11 to 2017-18)	5.92 <sup>**</sup> (1.36)	10.11 <sup>*</sup> (3.67)	3.95 <sup>ns</sup> (3.47)	49.62 <sup>ns</sup> (18.85)	53.29 <sup>*</sup> (18.52)	2.45 <sup>*</sup> (0.71)	17.42 <sup>*</sup> (5.90)	16.63 <sup>*</sup> (5.19)	-0.67 <sup>ns</sup> (2.09)
Overall (1980-81 to 2017-18)	8.35 <sup>**</sup> (0.54)	16.45 <sup>**</sup> (0.49)	7.48 <sup>**</sup> (0.37)	20.51 <sup>**</sup> (3.28)	29.14 <sup>**</sup> (2.82)	6.69 <sup>**</sup> (0.53)	11.06 <sup>**</sup> (0.84)	17.87 <sup>**</sup> (0.61)	6.13 <sup>**</sup> (0.43)

Note: Figures within the parentheses indicate standard error in respective values <sup>\*\*</sup> and <sup>\*</sup> denote significance at 1 per cent, and 5 per cent levels, respectively



**Fig. 2. Growth rate of export quantity, value and unit value of basmati rice in India**

Indian basmati rice is well recognized in the international market because of its quality. There is a continuous increase in the demand of basmati rice and at the same time new markets are emerging. In order to maintain prime position in world basmati rice trade, India would have to take effective steps to enhance domestic production through expansion of area as well as improving productivity. Considering basmati rice as gift to India by nature and available manpower, there exist vast potential for production as well as export of basmati rice from India. Keeping in view the export potential of basmati rice, the government of India should launch various export promotion policies to further develop the basmati rice export.

### 3.4 Growth Analysis of Non-basmati Rice Export

An exponential growth function was used to analyse the compound growth rates for export of non-basmati rice from India, and results are presented in Table 1.

During period I, the non-basmati rice export quantity (36.00 per cent) and value (44.45 per cent) shows a positive growth rate but non-significant and unit value (7.59 per cent) shows a positive growth rate with 5 per cent level of significance. Until 1991, exports of non-basmati rice were subjected to canalization, minimum export price, and export quota. Erratic domestic production and large consumption of rice also attributed to non-significant growth rate in period I. Also, frequent ban in exports of non-basmati rice due to food security issue reduced the quantity of non-basmati rice exports. The export

price of non-basmati rice was also non-competitive during period I. The share of common rice in the total rice was below 10 per cent till 1989-90.

However, a major policy changes occurred during 1994 on export front of rice, boost the exports of non-basmati rice, but on later stages it gives negative results due to inconsistent policies. WTO had removed export barriers on non-basmati rice, major boost in export of rice was occurred during the same period. Production shortfall, decreasing stock in government central pool and raising internal price forced the government to ban export of non-basmati rice in 2007 [14]. But, due to bumper production of rice during 2011-12, government removed exports ban on non-basmati rice, and India during 2012 became the leading exporter in global markets. While in Period II, owing to changes in policy over periods, the non-basmati rice export quantity and value shows an insignificantly negative growth rate 6.16 and 1.23 per cent respectively, while unit value shows a positive growth rate of 5.25 per cent per annum (Fig. 3). In III Period, the non-basmati rice export quantity shows positive growth but non-significant while the export value and unit value shows positive growth rate 53.29 and 2.45 per cent per annum respectively with 5 per cent level of significance.

In overall period, compound growth rate shows positive for quantity, value, and unit value of non-basmati rice with 1 per cent level of significance. Growth in value of exports was higher than its quantity of exports mainly because of growth in unit value realization.

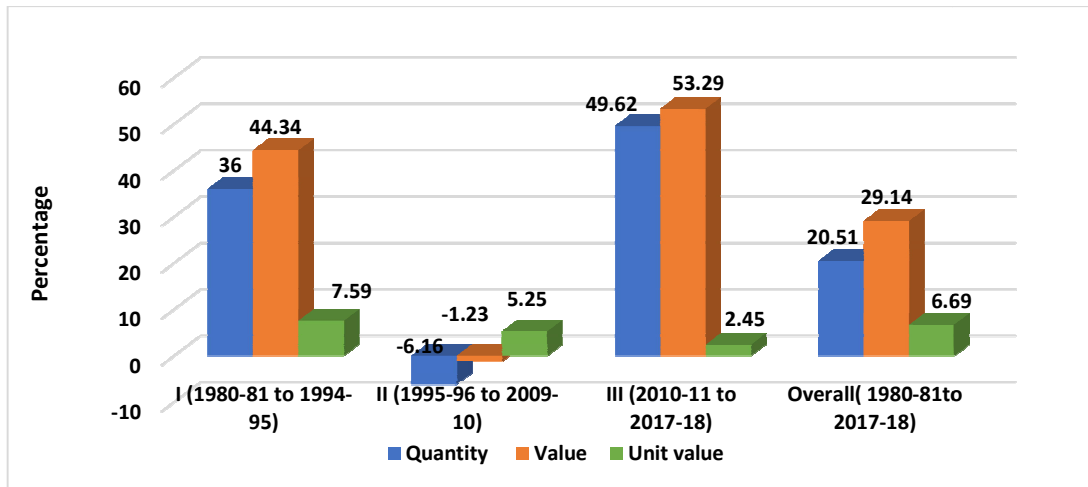


Fig. 3. Growth rate of export quantity, value and unit value of non-basmati rice in India

### 3.5 Growth Rate in Export of Rice

The exponential growth function was used for estimation of growth in exports of total rice from India in terms of quantity, value, and unit value realization, and results are presented in Table 1.

In total rice export, during I period export quantity shows positive growth rate (4.07 per cent) but non-significant, while export value (14.96 per cent) and unit value (10.47 per cent) shows significantly positive growth rate with 1 per cent level of significance. With respect to II period export quantity shows positive growth rate (1.44 per cent) but non-significant, while export value (9.17 per cent) and unit value (7.62 per cent)

shows significantly positive growth rate with 1 per cent level of significance. In III period, export quantity (17.42 per cent) and value (16.63 per cent) shows positive growth rate (4.07 per cent) with 5 per cent level of significance, while unit value is negative and non-significant.

In overall period, compound growth rate shows positive growth rate for quantity (11.06 per cent), value (17.87 per cent), and unit value (6.13 per cent) of total rice with 1 per cent level of significance (Fig. 4). The total rice export shows positive growth rate as the demand of Indian basmati rice in international market and export of the same is increasing over the period.

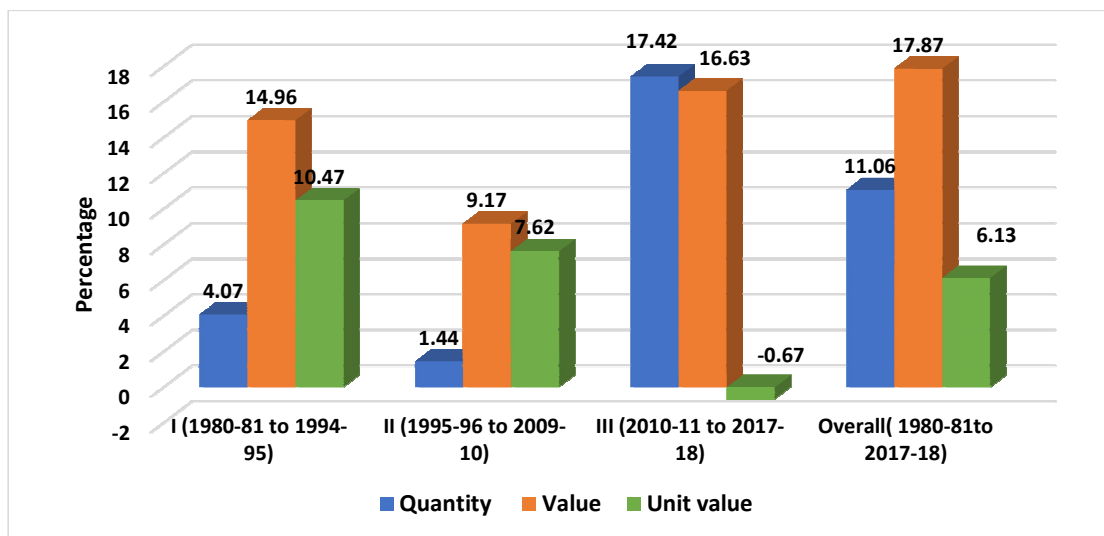


Fig. 4. Growth rate of export quantity, value and unit value of rice in India

Gangwar and Rai, [15] and Shende et al., [16] also found a significant and positive growth rate of rice export in terms of quantity and value. Therefore, in order to sustain positive and significant growth in rice exports, it is necessary to develop suitable governmental policies, considering the country's varied agro-climatic condition and large manpower, for production and exports.

### **3.6 Instability in Export of Rice**

Instability index is a simple analytical technique to find out the fluctuation or instability in any time series data. The formula suggested by Cuddy-Della Valle was used to measure instability. The export performance of a country for any commodity during any given period is not only measure to sustain exports in future, but an analysis of instability is also utmost important. Hence, instability in export were analyzed by constructing Cuddy Della Valle index in order to understand the pattern of rice export.

### **3.7 Instability in Exports of Basmati Rice**

India being largest producer and exporter of basmati rice have earned more through foreign trade. Over the years, there was a fluctuation in quantity, value and unit value realization in export of basmati rice. The instability indices were employed for export quantity, value and unit value of basmati rice and the results are presented in Table 2.

It could be seen from Table 2 that, for basmati rice, instability indices for export quantity, value and unit value were 33.16 per cent, 40.22 per cent and 19.55 per cent, respectively during period I. While during period II, the stability of export quantity (19.85 per cent) of basmati rice was improved. And with respect to export value and unit value the stability was decreased to 55.64 per cent, and 26.17 per cent respectively. Whereas, in period III the stability of export quantity, value and unit value of basmati rice were improved. During overall period, the instability for the basmati rice export value is very high (88.07 per cent) followed by export quantity (51.86 per cent) and unit value (31.23 per cent) due to inconsistent in basmati rice export.

The consistent exports policy, international demand and domestic production for basmati rice during period II may be another cause. Besides, variability in quantity imported by different countries during different years may be another cause. Similarly, variability in quantum of

export along with unit price was the dominant cause of the variability in export earnings. During period III, export earnings showed more stable than period II. Unit value realization, exhibited more unstable during period II, than period III and overall period, may be due to impact of devaluation of rupees after 1991. The instability in unit value is attributed to different quality and quantity of rice exported to different countries during different years. A country may import one year a particular quality/grade of rice and the same country may import another quality/grade of rice during next or subsequent years. Thus, different quality and quantity of rice exported to different countries at different export price rate may be the reason for instability of unit price of basmati rice.

### **3.8 Instability in Export of Non-basmati Rice**

India has been exporting substantial quantities of non-basmati rice to various countries in the world yet the export of non-basmati rice has been fluctuating year to year due to governmental policies. Mean and instability in export of non-basmati rice in terms of quantity, value and unit value are presented in Table 3.

It could be seen from Table 3 that, for non-basmati rice, very high instability indices for export quantity, value and unit value were 85.37 per cent, 81.15 per cent and 35.86 per cent, respectively during period I. While during period II, the stability of export quantity (58.05 per cent) of non-basmati rice was improved. And with respect to export value and unit value the stability was improved to 62.72 per cent, and 28.02 per cent respectively. Whereas, in period III the more stable in export quantity (26.78 per cent), value (25.17 per cent) and unit value (3.90 per cent). During overall period, the instability for the non-basmati rice export value is very high (99.87 per cent) followed by export quantity (70.38 per cent) and unit value (26.83 per cent) due to inconsistent in non-basmati rice export.

The export of non-basmati rice has been fluctuating year to year due to domestic production, international demand, price competitiveness, governmental policies and also weather condition for the production of non-basmati rice in the importing countries, if good harvest is there in importing countries, they reduce their import accordingly. Non-basmati rice export have also suffered much due to the competition from exporting countries like-

Thailand, Vietnam and Pakistan because of their low cost of production. The instability in unit value is attributed to different quality, and quantity of non-basmati rice exported to different countries during different years. A particular country may import one year a particular quality/grade of rice and the same country may import another quality/grade of rice during next or subsequent years. Thus, different quality and quantity of rice exported to different countries at different export price rate may be the reason for instability of unit price of non-basmati rice.

### 3.9 Instability in Export of Rice from India

India is the leading exporter of rice in international market. The mean and instability index of total rice exports in terms of quantity, value and unit value presented in Table 4.

It could be seen from Table 4 that, for total rice, instability indices for export quantity, value and unit value were 44.03 per cent, 44.69 per cent and 15.76 per cent, respectively during period I. While during period II, the stability of export value (29.00 per cent) of total rice was improved followed by export quantity (40.37 per cent). For total rice export unit value, the stability was decreased (48.27 per cent). Whereas, in period III more stable for total rice export quantity (18.60 percent), value (20.97 per cent) and unit value (11.84 per cent) were improved. During overall period, the instability for the total rice export value is very high (88.62 per cent) followed by export quantity (55.78 per cent) and unit value (39.06 per cent) due to inconsistent in total rice export.

**Table 2. Instability index for basmati rice export, 1980-81 to 2017-18**

Particulars	Mean	SD	CV (%)	Instability index
<b>Quantity (in 000 tonnes)</b>				
I (1980-81 to 1994-95)	329.59	109.28	33.16	33.16
II (1995-96 to 2009-10)	923.81	423.81	45.88	19.85
III (2010-11 to 2017-18)	3393.63	474.16	13.97	6.31
Overall (1980-81to 2017-18)	1209.21	1210.41	100.10	51.86
<b>Value (₹ crores)</b>				
I (1980-81 to 1994-95)	379.53	271.59	71.56	40.22
II (1995-96 to 2009-10)	3258.26	2842.21	87.23	55.64
III (2010-11 to 2017-18)	21772.10	5822.73	26.74	19.40
Overall (1980-81to 2017-18)	6019.57	8840.95	146.87	88.07
<b>Unit Value (₹. per tonnes.)</b>				
I (1980-81 to 1994-95)	11403.44	6243.65	54.75	19.55
II (1995-96 to 2009-10)	31396.71	10795.28	34.38	26.17
III (2010-11 to 2017-18)	63688.27	14370.34	22.56	21.24
Overall (1980-81to 2017-18)	30302.85	21931.31	72.37	31.23

**Table 3. Instability index of non- basmati rice export from India, 1980-81 to 2012-18**

Particulars	Mean	SD	CV (%)	Instability index
<b>Quantity (in 000 tonnes)</b>				
I (1980-81 to 1994-95)	178.24	168.08	94.30	85.37
II (1995-96 to 2009-10)	2649.83	1546.68	58.37	58.05
III (2010-11 to 2017-18)	6005.53	2583.13	43.01	26.78
Overall (1980-81to 2017-18)	2380.66	2658.91	111.69	70.38
<b>Value (₹ crores)</b>				
I (1980-81 to 1994-95)	101.21	115.50	114.12	81.15
II (1995-96 to 2009-10)	2801.07	1773.52	63.32	62.72
III (2010-11 to 2017-18)	14606.42	6718.60	46.00	25.17
Overall (1980-81to 2017-18)	4220.67	6399.40	151.62	99.87
<b>Unit Value (₹. per tonnes.)</b>				
I (1980-81 to 1994-95)	4883.60	2348.73	48.09	35.86
II (1995-96 to 2009-10)	11778.28	4564.29	38.75	28.02
III (2010-11 to 2017-18)	23920.25	1623.97	6.79	3.90
Overall (1980-81to 2017-18)	11612.9	7792.99	67.11	26.83



**Table 4. Instability index of rice export from India, 1980-81 to 2017-18**

Particulars	Mean	SD	CV (%)	Instability index
<b>Quantity (in 000 tonnes)</b>				
I (1980-81 to 1994-95)	507.83	234.72	46.22	44.03
II (1995-96 to 2009-10)	3573.64	1459.66	40.85	40.37
III (2010-11 to 2017-18)	9399.16	3005.59	31.98	18.60
Overall (1980-81 to 2017-18)	3589.88	3690.40	102.80	55.78
<b>Value (₹. crores)</b>				
I (1980-81 to 1994-95)	480.73	365.65	76.06	41.69
II (1995-96 to 2009-10)	6059.33	3000.60	49.52	29.00
III (2010-11 to 2017-18)	36378.52	12286.94	33.78	20.97
Overall (1980-81 to 2017-18)	10240.24	14957.31	146.06	88.62
<b>Unit Value (₹. per tonnes.)</b>				
I (1980-81 to 1994-95)	9035.55	3833.14	42.42	15.76
II (1995-96 to 2009-10)	18802.73	11979.70	63.71	48.27
III (2010-11 to 2017-18)	39223.62	4719.62	12.03	11.84
Overall (1980-81 to 2017-18)	19246.40	13870.53	72.07	39.06

The variability of rice exports was due to the changes in the composition of exports of rice. The export instability of rice in terms of quantity as well as in value term may be due to increasing domestic demand as well as international demand, volatility of world prices, change in export policy and situation in international markets.

#### 4. CONCLUSIONS

The study has shown that Indian rice export performance during the study period 1980-81 to 2017-18. Growth rate for the export value of basmati rice in overall period is about 16.45 per cent per annum. For the non-basmati rice, during the III period the export value is about 53.29 per cent. While the same for the total rice is 17.87 per cent which is in overall period. The growth rate in export of basmati rice increased over a period and is export competitive product. It has registered positive growth rates in terms of quantity, value and unit value for basmati rice and total rice. The instability index has been found higher for export quantity (51.86 %) of basmati rice than its value (88.07 %) and unit value (31.23 %). Above the rice export analysis early indicate the positive signals of export in both its basmati and non-basmati rice from India. Which is confirmed through increasing growth in III period after 2010 and also having stability in the rice export price both basmati and non-basmati rice in the international markets. Hence the suitable basmati and non-basmati rice export effect may be taken to improve the processing the transport and logistics facilities with the constitute policy support to favor the rice export from major ports in India.

#### ACKNOWLEDGEMENT

Authors express their gratitude to Indian Council of Social Science Research (ICSSR), New Delhi, India for providing Doctoral fellowship to carry out research to the first author.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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