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The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; SP-12(11): 411-414

www.thepharmajournal.com
Received: 02-09-2023
Accepted: 07-10-2023

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Growth, export performance and competitiveness of basmati rice in India

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Abstract
India produces about 70% of the world's basmati rice, and the rest is provided by Pakistan, the Philippines and China. The present study was focused to investigate the "Study on growth, export performance and export competitiveness of Basmati rice in India". The nature of data used for study is entirely based on secondary source of data form 1988-89 to 2017-18. The area of basmati rice in between Period-I and Period-II i.e. 35.79 and 36.98 respectively. The Highest variation has been observed in production for the overall period (1988-89 to 2017-18) with Coefficient of variation been 79.55.Coppock's instability index highest variation is observed in production of basmati rice was 23.39 percent for Overall period followed by 13.92 and 17.02 for Period-I and Period-II. The Coppock's instability index of area and productivity for Period-I was 13.34 percent and 10.96 percent, for Period-II was 16.02 percent and 11.12 percent and for overall period was 17.09 percent and 14.46 percent. The area of basmati rice is very less in between Period-I and Period-II i.e. 35.79 and 36.98 respectively. Variation in Period-II was 121.54. Coppock's instability index highest variation is observed in Export Value of basmati rice was 43.16 percent for Overall period followed by 20.91 and 26.22 for Period-I and Period-II. The Coppock's instability index of Export Quantity and unit Export value for Period-I was 15.21 percent and 14.60 percent, for Period-II was 18.14 percent and 14.95 percent and for Overall period was 25.66 percent and 17.40 percent.
The R2 value (0.2225) for domestic prices, however sign 'b' was positive (0.0293) and sign of quadratic term 'c' was positive. Also R2 value for international prices is (0.6298) and sign of 'b' was positive (0.4682). NPC value for Overall period is 0.67 which states that market is moderately competitive for export competitiveness of Basmati Rice. When the analysis was done using two different periods i.e. Period-I and Period-II average value of NPC ratio was 0.849 and 0.491, respectively which indicates Period-I was moderately competitive and Period – II was less competitive.

Keywords: Coppock's instability, NPC ratio, export competitiveness

Introduction
Rice is the most important food crop in India and plays a vital role in food security. India is the main producer and main exporter of basmati rice. India produces about 70% of the world's basmati rice, and the rest is provided by Pakistan, the Philippines and China (Sindhu *et al*., 2014) [11]. Basmati rice is an important rice variety with important commercial significance. It is the main category of rice that brings higher value in the local market and fare exchange. Basmati rice is an important rice combination with important commercial vitality. This is rice that brings higher value in the local market and channel trade. India transports fragrant rice to various countries similarly to non-fragrant rice. In 1992-93, the transport volume of basmati rice was only 286,000 tons, calculated in rupees. Until then, the trading volume of basmati rice has increased, reaching 710,000 tons in 2002-03, and its value must have reached Rs. The trading volume of 2.06 billion basmati rice has been greatly expanded, reaching the highest level of 34.6 billion tons, and its fixed value reached Rs. It was 19 billion in 2012-13. The development of fees suggests that the exchange of basmati rice has greater potential and hopes to have more new exchanges (Shwetha 2010) [12].

Objectives
1. To work out the instability in area, production, productivity and export of Basmati rice.
2. To study the export competitiveness of Basmati Rice.

Methodology

This study was based on the secondary data. The data were collected from various government publications like, Ministry of Commerce & Industry"-Government of India, Agri India stat, DAC & FW, Directorate of Economics & Statistics, FAO (Food and Agricultural Organization) Stat, APEDA (Agricultural and Process Food Products Export Development Authority) and Agmarknet.

Instability Analysis

Instability in export is expected to hamper the process of economic development. To study the variability in export of Basmati Rice, coefficient of variation (CV) and "Coppock's instability index" will be used as measure of variability.

Coefficient of Variation (CV)

The coefficient of variation (CV) was calculated by the formula.

$$CV = \frac{\sigma}{\bar{X}} \times 100$$

Where,

σ = Standard deviation,

= Arithmetic mean and CV = Coefficient of variation

$$\sigma = \sqrt{\frac{\sum(X - \bar{X})^2}{n}}$$

X = Variable

n = Number of observations.

Coppock's Instability Index (CII)

Coefficient of instability is another measure of instability besides coefficient of

variation. The coefficient of variation measures the variation around the trend. Coppock's Instability Index (CII) is close approximation of the average year to year percentage adjusted for the trend are rose pronounced than the absolute variation.

$$Vlog = \frac{\sum\left(\log \frac{X_{t+1}}{X_t} - m\right)}{N}$$

$$\text{The Instability Index} = [\text{Antilog}(\sqrt{V \log}) - 1] \times 100$$

Where,

X_t = Production/ Export quality/ Unit value of Basmati Rice Export in year t

N = Number of years minus one

m = Arithmetic mean of the difference between the log of X_t and $X_t - 1$, X_{t-2} etc.

V log = Logarithmic variance of the series.

Nominal Protection Coefficient (NPC)

NPC will be computed to determine the extent of competitive advantage enjoyed by the

commodity in the context of free trade. The coefficient shed light on whether a country has comparative advantage in the export of that commodity in the free trade scenario or not. The NPC is defined as the ratio of the domestic price to the world reference price of the commodity under consideration. Symbolically,

$$NPC = \frac{P_d}{P_b}$$

Where,

Pd = Domestic Price of Commodity

Pb = World reference price or border price of the commodity

Results and Discussion

Analysis of coefficient of variation and Coppock's instability index of in Quantity, Value, and unit export value of Basmati rice

In order to analysis of coefficient of variation and Coppock's instability index of in Quantity, Value, and unit export value of Basmati rice in India. The result is presented as follows Overall Period (1988-89 to 2017-18) it was splited into two sub periods *viz*, Period-I (19988-89 to 2002-03), Period-II (2003-04 to 2017-18).

It is has been absorbed from the table 1 that variation in area of basmati rice is very less in between Period-I and Period-II i.e. 35.79 and 36.98 respectively and variation is highest for Overall period (1988-89 to 2017-18) is 53.96.

For the Export Value there is less variation between Period-I and Overall period with Coefficient of variation been 200.58 and 181.31. Variation in Period-II was 121.54. The Variation of unit export value between Period-I and Period-II was 14.60 and 14.95 simultaneously; variation was seen highest for Overall period i.e. 53.53. It can be concluded that variation in Coppock's instability index highest variation is observed in Export Value of basmati rice was 43.16 percent for Overall period followed by 20.91 and 26.22 for Period-I and Period-II. The Coppock's instability index of Export Quantity and unit Export value for Period-I was 15.21 percent and 14.60 percent, for Period-II was 18.14 percent and 14.95 percent and for Overall period was 25.66 percent and 17.40 percent.

Table 1: Instability index of in Quantity, Value, and unit export value of Basmati rice

Periods	Particulars	Export Quantity	Export Value	Unit Export Value
Period-I	SD	886753.06	5365.92	691.16
	Mean	419807.26	2675.20	2210.34
	CV (%)	211.23	200.58	31.27
	CII	15.21	20.91	14.60
Period-II	SD	422550.70	2511.02	1773.22
	Mean	326696.30	2066.08	4907.02
	CV (%)	129.34	121.54	36.14
	CII	18.14	26.22	14.95
Overall Period	SD	262674.08	1584.16	1905.07
	Mean	137084.25	873.75	3558.68
	CV (%)	191.62	181.31	53.53
	CII	25.66	43.16	17.40

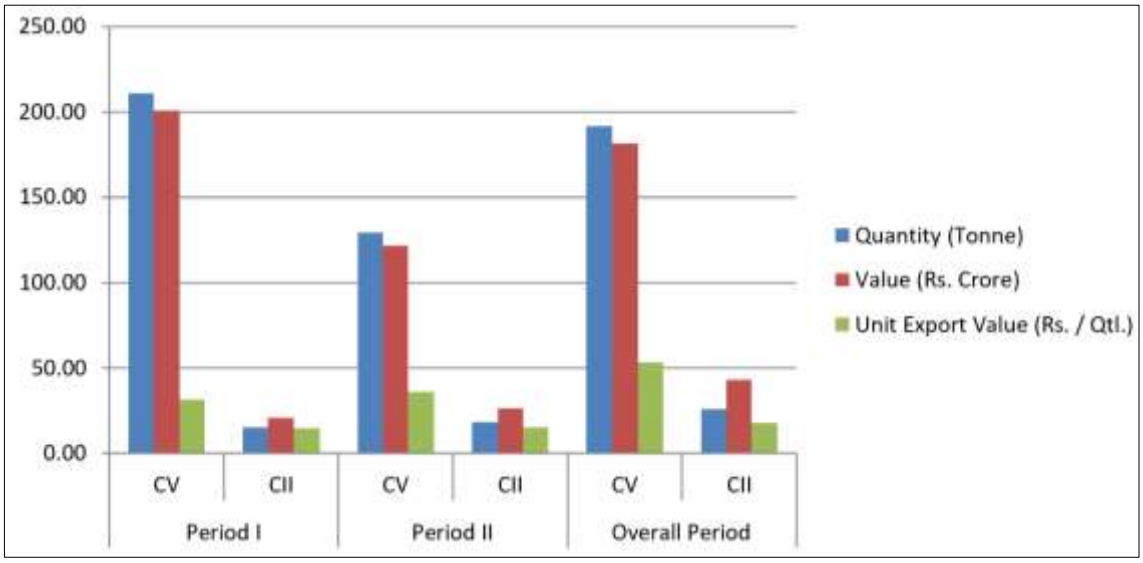

Fig 1: Instability index of in Quantity, Value, and unit export value of Basmati rice

The export competitiveness of Basmati Rice

Analysis of export competitiveness was analyzed by using nominal protection co-efficient. The competitiveness depends on the NPC ratio. When the ratio of NPC is less than 0.5 then the market is highly competitive, when the ratio of NPC is in between 0.5 to 1, the market is moderately competitive and when ratio of NPC is greater than one, then market is said to non-competitive.

It is observed from the table is that NPC value for Overall period is 0.67 which states that market is moderately competitive for export competitiveness of Basmati Rice. When the analysis was done using two different periods i.e. Period-I and Period-II average value of NPC ratio was 0.849 and 0.491, respectively which indicates Period-I was moderately competitive and Period-II was less competitive.

Table 2: The export competitiveness of Basmati Rice

Sr. No.	Particulars	NPC (Pd/Pr)
1	Period I (1988-89 to 2002-03)	0.849
2	Period II (2003-04 to 2017-18)	0.491
3	Overall Period (1988-89 to 2017-18)	0.67

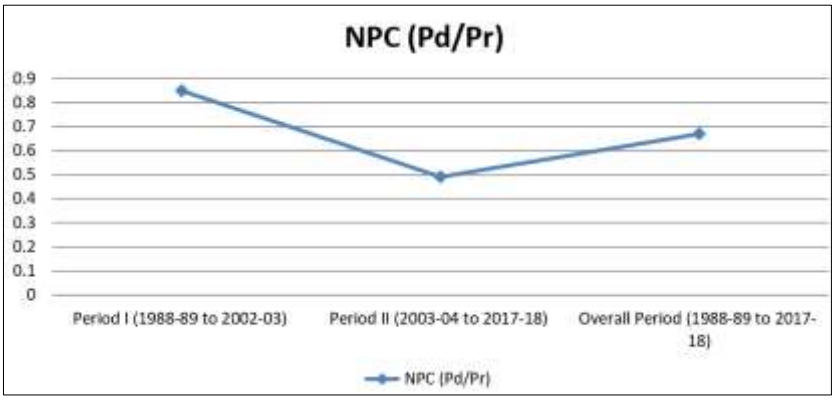

Fig 2: Graphical representation of NPC

Conclusion

The Highest variation has been observed in production for the overall period (1988-89 to 2017-18) with Coefficient of variation been 79.55 and variation between Period-I and Period-II was 44.79 and 40.36 respectively.

It can be concluded that variation in Coppock's instability index highest variation is observed in production of basmati rice was 23.39 percent for Overall period followed by 13.92 and 17.02 for Period-I and Period-II.

The Coppock's instability index of area and productivity for Period-I was 13.34 percent and 10.96 percent, for Period-II was 16.02 percent and 11.12 percent and for overall period was 17.09 percent and 14.46 percent. For the Export Value there is less variation between Period-I and Overall period with Coefficient of variation been 200.58 and 181.31. Variation in Period-II was 121.54.

The Coppock's instability index of Export Quantity and unit Export value for Period-I was 15.21 percent and 14.60 percent, for Period-II was 18.14 percent and 14.95 percent and for Overall period was 25.66 percent and 17.40 percent.

NPC value for Overall period is 0.67 which states that market is moderately competitive for export competitiveness of Basmati Rice. When the analysis was done using two different periods i.e. Period-I and Period-II average value of NPC ratio was 0.849 and 0.491, respectively which indicates Period-I was moderately competitive and Period-II was less competitive.

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