

Export Potential of Indian Basmati Rice with Global World: An Analytical Approach

Dr. Naresh Kumar

Associate Professor

Department of Economics

Government P. G. College, Ambala Cantt.

Abstract

The present paper wants to improve understanding of basmati rice exports from India. The overall objective of the paper is aimed at understanding India's basmati rice exports potential with global world. Several statistical techniques like, average, standard deviation, coefficient of variation and Compound Annual Growth Rate (CAGR) have been used to examine the data. Additionally, six indices have been measured. The secondary data served as the sole basis for the study. We found that basmati rice output in India satiated international demand. For a total of Rs. 1841.76 crores, India exported 666713.64 metric tons of basmati rice in 2001-02. The export was 4558972.20 metric tons in 2022-23 of Rs. 38524.15 crores. The Compound Annual Growth Rate (CAGR) of basmati rice exports was 2.96 per cent during the period 2013-14 to 2022-23. According to a country-wise analysis, Nepal with 91.20 per cent CAGR has obtained the top position out of all fifty importing countries of Indian basmati rice during the study period and followed by Bhutan, Comoros, Indonesia and Bangladesh with CAGR 84.11, 57.10, 45.77 and 33.34 per cent, respectively. The paper suggests more incentive should be applied to promote basmati rice exports. The growth rates for India's basmati rice exports to some countries are not very high. Therefore, there must be an increase in demand from importing countries for Indian basmati rice. The paper can be proved to comprehend the real image of Indian basmati rice export potential to the rest of the world.

Key Words: Basmati Rice, Export Potential, CAGR, Concentration, Trade.

Prologue:

A significant portion of India's economic growth is attributed to agricultural trade. At every stage of growth, the agricultural sector has gotten special attention. (Ahamed Kabeer, 2016) India has historically exported basmati rice as an agricultural product. Indian Basmati rice is renowned for its enticing aroma, superior quality and nutrient-dense characteristics. India is the biggest producer and exporter of basmati rice worldwide. About 70 per cent of the world's basmati rice is produced in India, with Pakistan producing the

remaining 30 per cent. Rice is one of the most significant exportable agricultural products from India. The international markets for Indian rice are very active and trade restrictions are being gradually eased everywhere. During 2022-23 the country has exported internationally 4558972.20 metric tons of basmati rice, the worth of Rs. 38524.15 crores. (APEDA 2022-23) Due to its uniqueness, basmati rice enjoys strong export demand and commands a high export price on global markets. India has become a significant rice exporting nation of the globe thanks to a consistent increase

in basmati rice production, the availability of buffer supplies and rising demand for basmati rice in the global market. India is second only to China in terms of global rice production. (Najeeburaahman, 2017) India's exports of basmati rice show that the country has the capacity to produce more of the basmati rice and become a significant exporter. The paper is substantial because it focuses on total exports across all countries. It discusses how the increase of exports to each country and the rest of the nation have changed. The paper examines the India's basmati rice exports potential with global world.

Review of Literature

Joshi, H., and Kaur, N. (2019) investigated the marketing tactics used by Punjabi rice exporters. They placed particular emphasis on the four marketing tactics of product, pricing, promotion and distribution. The book demonstrated that rice exporting companies in India used a variety of methods for setting prices, that products must compete not only on price but also on quality, that rice exporting companies preferred to receive orders directly from foreign buyers and that rice exporting firms can either sell their goods directly to customers or through mediators. Dash, J. P. and Dash, A. (2022) provided an examination of the top-performing developing exporting countries. The largest Indian defense company is revealed in this paper to be undersized compared to other international military manufacturers, which calls for industry consolidation. The paradox is intriguing and merits more investigation. According to Kumar, M. (2019), the basmati export price has fluctuated significantly over the past 20

years and has been steadily dropping since 2013–2014. Risk and uncertainty are increased by the fluctuation in demand and price of basmati rice. The proportion of basmati in the total rice produced in India is close to 5%, but there is only a very slight and indirect connection between the export of basmati and the enormous Indian farming community, which is predominantly centered in only two states. Paramalakshmi, E. D., and Kalabarani, S. P., (2016) looked at the growth and trading patterns of Indian goods from 1990–1991 to 2015–2016 in their 2016 study. The paper analyzed the agricultural trajectory of rice exports from India in particular. Over the past 25 years, rice exports have been increasingly significant to India's economic expansion. Important policy changes that could affect the current trends in these areas are included in the conclusion. According to statistical data, India produces over 46% of the world's food crops, mostly rice. It is also evident that other nations are requesting rice from India. P. Samal, C. Rout, S. K. Repalli, and N. N. Jambhulkar (2018) used secondary data from 1970–1971 to 2015–2016 to assess the growing experience of rice output and profitability. In India and for the various states, the decadal increase in an area, production and yield of rice was calculated and compared during the aforementioned time period. It was shown that area growth had either peaked or dropped in the majority of the states. Therefore, technical advancements must increase yield in order for rice production to increase in the future. S. Chandrasekaran (2020) thoroughly assessed the labeling of agricultural cross-breed varieties as GI Products in comparison to the gold standard of status

and superiority. While carefully examining each GI feature and attribute, the example of basmati rice is used. It explains why the intergenerational social contract has broken down, as evidenced by the traditional basmati rice seems fall and slow march toward extinction. The book also explains in depth why rice farmed in Pakistan cannot bear the basmati name. Shailza, Sharma, L., and Burark, S. S., (2021) examined the structural alterations in Indian exports of basmati rice from 1991 to 2020. First-order Markov chain analysis was used to examine the stability among basmati rice from India importers. The export volume of basmati rice experienced a compound annual growth rate that ranged from 5.74 per cent to 12.65 per cent annually. In comparison, over the course of the three chosen decades, basmati rice export value fluctuated between 4.40 per cent and 21.06 per cent annually. Additionally, the export value of basmati rice displayed greater fluctuation than the export volume. Udhayakumar, M. and Karunakaran, K. R. (2020) explained that India is the world's top producer and exporter of basmati rice. About 70 per cent of the world's basmati rice is produced in India, with Pakistan producing the remaining 30 per cent. They examine the competitiveness of basmati non-basmati rice in India as well as its export performance. The Markov-Chain model was used in this study to quantify the dynamics of the rice trade in terms of variations in the value of basmati and non-basmati rice exports from India to various export countries. Dash, J. P. and Dash, A. (2022) provided an examination of the top-performing developing exporting countries. The largest Indian defense company is

revealed in this paper to be undersized compared to other international military manufacturers, which calls for industry consolidation. The paradox is intriguing and merits more investigation.

Objectives:

The projected paper attempts to examine and evaluate the export potential of Indian basmati rice. In particular, the main objectives of the study are:

- (i) To study potential of India's basmati rice exports with global world.
- (ii) To provide the policy implications for improvement of basmati rice exports.

Data Source and Study Framework

To carry out this study, the current analytical research looked into the growth of basmati rice exports. The study is entirely based on the secondary data collected for the period from 2013-14 to 2022-23. The data on the countries of exports were collected from the Agricultural and Processed Food Products Export Development Authority (APEDA), Ministry of Commerce, Government of India, New Delhi. The data has been assessed with the assist of different statistical techniques including average, Standard Deviation (SD), Coefficient of Variation (CV) and Compound Annual Growth Rate (CAGR). Six indices have also been used in order to decide the attentiveness of the main countries importing Indian basmati rice. The indexes are: (1) Index of Maximum Proportion (D1), (2) Hirschman Herfindhal Index (D2), (3) Entropy Index (D3), (4) Concentration Ratio of CR4 (D4), Concentration Ratio of CR8 (D5) and Concentration Ratio of CR16 (D6). These

indices are based on the percentage share of the importing countries in the study.

Let m stand for the importing countries and q_{it} denotes the imports of i^{th} partner country at time t. Then the sum of q_{it} from 1 to m will be q_t and the share of each country in the import of basmati rice for year t, would thus be revealed as under:

$$S_{it} = \frac{q_{it}}{q_t} \quad \text{and}$$

$$q_t = \sum_{i=1}^n q_{it}$$

where

S_{it} : Share of each

importing country at time t

q_{it} : Imports of each

importing country at time t

q_t : Sum of the total of each

importing country

$i = 1, \dots, m$ and $t = 1, \dots, T$

All the six concentration measures are calculated on the basis of S_{it} .

(1) Index of Maximum Proportion

$$D_1 = \max S_{it}$$

(2) Hirschman-Herfindhal Index

$$D_2 = \sum_{i=1}^n S_{it}^2$$

(3) Entropy Index:

$$D_3 = \sum_{i=1}^n S_{it} \log 1/S_{it}$$

(4) Concentration Ratio (CR_n)

$$CR_n = \sum_{i=1}^n S_{it}, n < m$$

In the majority of cases CR₄ (D₄), CR₈ (D₅) and CR₁₆ (D₆) have been used in the research study.

Results and Discussion

Table-1 demonstrates total Indian basmati rice exports between 2001-02 and 2022-23 in terms of quantity and value as well as their growth indices. The table makes it understandable that India exported 666713.64 metric tons of basmati rice in 2001-02 for a total of Rs. 1841.76 crores. The total export during the year 2002-03 was 710156.20 metric tons, worth Rs. 2062.11 crores.

Table-1 : India's Total Exports of Basmati Rice in terms of Value and Quantity during the Period from 2001-02 to 2022-23

Year	Value (In Rs. Crore)	Growth Index of Value	Quantity (In MT)	Growth Index of Quantity
2001-02	1841.76	100	666713.64	100
2002-03	2062.11	111.9640	710156.20	106.5159
2003-04	1993.03	96.6500	771475.40	108.6346
2004-05	2823.85	141.6862	1162989.15	150.7487
2005-06	3043.06	107.7628	1166562.78	100.3072
2006-07	2792.80	91.7760	1045714.93	89.6406
2007-08	4344.57	155.5632	1183355.76	113.1623
2008-09	9477.05	218.1355	1556411.05	131.5252
2009-10	10889.10	114.8996	2016775.00	129.5785
2010-11	11354.63	104.2751	2370658.41	117.5469
2011-12	15449.61	136.0644	3178174.42	134.0629

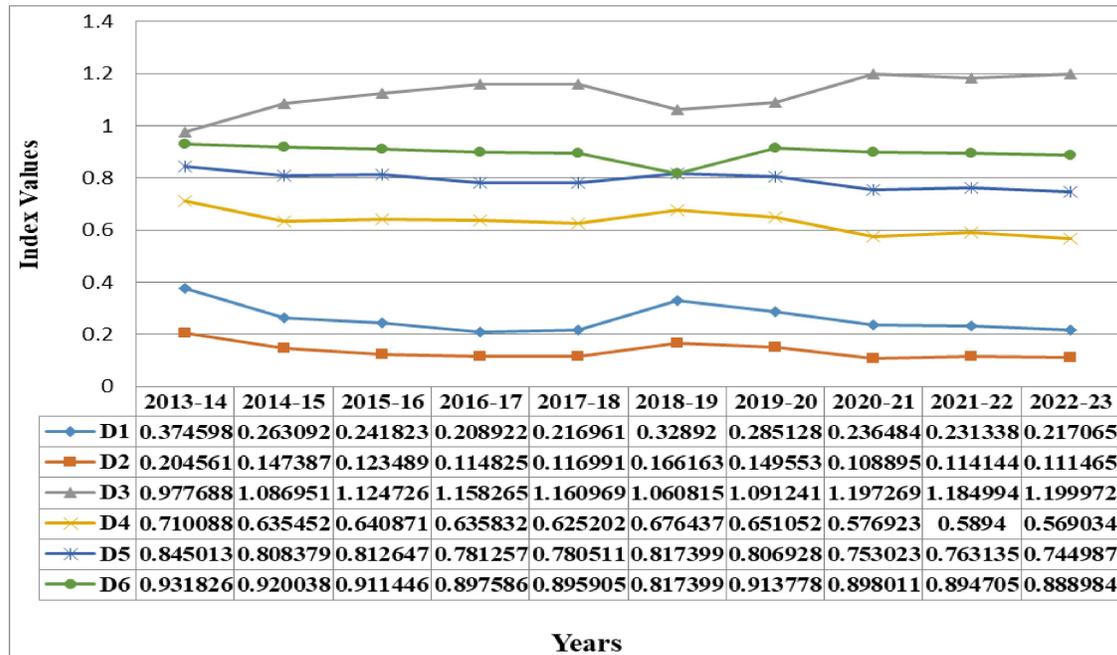
2012-13	19409.38	125.6302	3459898.92	108.8643
2013-14	29299.96	150.9577	3757271.44	108.5948
2014-15	27597.87	94.1908	3702260.13	98.5358
2015-16	22718.52	82.3198	4045822.31	109.2797
2016-17	21512.97	94.6935	3985195.60	98.5014
2017-18	26870.21	124.9023	4056758.62	101.7957
2018-19	32804.35	122.0844	4414584.21	108.8204
2019-20	31025.91	94.5786	4454656.70	100.9077
2020-21	29849.88	96.2095	4630463.10	103.9465
2021-22	26416.49	88.4978	3948161.02	85.2649
2022-23	38524.15	145.8337	4558972.20	115.4707

Source: Agricultural and Processed Food Products Export Development Authority (APEDA).
Ministry of Commerce and Industry, Government of India, New Delhi.

Basmati rice exports demonstrated a rising trend during the period 2001-02 to 2022-23 except the years 2006-07 and 2021-22. The export was 4558972.20 metric tons in 2022-23 of Rs. 38524.15 crores. Furthermore, it is apparent from the table that the relevant growth indices are 111.9640 of value and 106.5159 of quantity

in 2002-03. And, indices are 145.8337 of value and 115.4707 of quantity in 2022-23. All of these expansions are a consequence of the constantly increasing demand of Indian basmati rice, which is hopeful for the country’s basmati exports as well as agricultural sector of India.

Figure-1 : Country Concentration Indices of Basmati Rice Exports during the Period from 2013-14 to 2022-23



Sources: Calculated on the basis of results given in Appendix-II, Appendix-III and Appendix-IV

Figure-1 illustrates the value of six dissimilar measures of concentration of basmati rice exports among the fifty importing countries during the period 2013-14 to 2022-23. These measures of concentration viz., Index of Maximum Proportion (D₁) Herfindhal Index (D₂), Entropy Index (D₃), concentration ratio of four major importing countries CR₄ (D₄), Concentration ratio of eight importing countries CR₈ (D₅), and concentration ratio of sixteen major importing countries CR₁₆ (D₆) ranges from value 0.374598122 to 0.217065399, 0.20456112 to 0.111465223, 0.977687652 to 1.199971722, 0.710088 to 0.569034229, 0.84501344 to 0.744987495 and 0.931825845 to 0.888984182, respectively. Further, in the figure-1 index

D₂ has been revealing fluctuating nature regarding concentration of the group except the year 2018-19 which is illustrating the highest value of index D₂. Index D₃ depicts also the fluctuating information about the concentration except the year 2013-14 which is enlightening the lowly value of index D₃. Apparently, it points out the existence of diversification of the basmati rice exports to different countries of the world. Further, the concentration index D₄ of this group discloses that it has been almost stable nature and slightly fluctuates. Similarly, D₅ has been demonstrating the stable nature except the year from 2020-21 to 2022-23. In addition, D₆ has also been showing the constant nature.

Table-2 : Country-Wise Growth Rates of Total Basmati Rice Exports during the Period 2013-14 to 2022-23

(Values in Rs. Crores)

Category	Name of Country	CAGR	t-value	F-value	R ²
High Potential Category	Nepal	91.20	11.60*	134.75	0.9439
	Bhutan	84.11	3.41**	11.4	0.5927
	Comoros	57.10	8.95*	80.22	0.9093
	Indonesia	45.77	3.02**	9.17	0.5341
	Bangladesh Pr	33.34	10.73*	115.34	0.9351
	Kenya	29.08	7.77*	60.42	0.8830
	Russia	28.36	6.22*	38.79	0.8290
	Algeria	28.20	12.06*	145.57	0.9479
	Maldives	27.41	7.27*	52.93	0.8687
	Malaysia	26.36	12.14*	147.56	0.9484
Middle Potential Category	Somalia	23.2	7.35*	54.13	0.8712
	Egypt A Rp	21.74	8.06*	64.99	0.8904
	Djibouti	20.79	4.59**	21.07	0.7248
	Mauritania	18.25	6.11*	37.43	0.8239
	Israel	16.43	16.03*	257.23	0.9698
	Canada	12.62	7.97*	63.57	0.8882
	Sudan	11.55	2.82**	8.003	0.5001
	Yemen Republic	10.04	0.07	0.0002	0.5210

Low Potential Category	Australia	9.71	5.88*	4.61	0.8122
	New Zealand	9.59	7.40*	54.76	0.8720
	Tanzania Rep	9.51	2.87**	8.24	0.5073
	Other Countries	9.31	7.45*	55.58	0.8741
	Iraq	8.61	0.34	28.59	0.3814
	Spain	7.52	1.18**	1.403	0.1492
	Oman	7.51	3.50**	12.26	0.6052
	South Africa	7.24	5.07*	25.72	0.7627
	Baharain Is	6.78	5.70*	32.59	0.8029
	Qatar	6.64	1.08**	1.18	0.1285
	Singapore	6.62	6.80*	46.33	0.8527
	Reunion	6.60	5.67*	32.19	0.8009
	Jordan	6.28	1.22**	1.49	0.1571
	Seychelles	5.61	2.55**	6.52	0.4492
	Lebanon	4.79	1.85**	3.44	0.3011
	Netherland	4.69	1.53**	2.36	0.2284
	Portugal	2.34	0.45	0.2	0.0249
	Turkey	2.26	0.40	0.16	0.0198
	U K	2.09	1.16**	1.35	0.1446
	Kuwait	1.65	-1.53	2.34	0.2270
	U S A	1.42	6.52*	2.54	0.8417
	Iran	1.15	0.03	0.001	0.0001
	Mauritius	1.11	0.70	0.5	0.0589
	Saudi Arab	1.09	0.48	0.23	0.028
	Germany	0.81	0.58	0.34	0.0410
	UAE	0.06	0.07	0.0002	0.00002
	Syria	-0.67	-0.20	0.04	0.0051
	Sweden	-2.57	-1.14	1.31	0.1415
	Azerbaijan	-5.301	-0.83	0.7	0.0805
	Italy	-5.72	-1.48	2.19	0.2155
Belgium	-15.23	-5.01	25.17	0.7588	
France	-15.26	-2.71	7.34	0.4787	
Georgia	-16.06	-4.27	18.24	0.6952	

Sources: Calculated on the basis of data collected from Agricultural and Processed Food Products Export Development Authority (APEDA), Ministry of Commerce and Industry, Government of India, New Delhi.

Note: * The coefficients are significant at $\alpha = 0.01$.

** The coefficients are significant at $\alpha = 0.10$.

Table-2 reveals the country-wise growth rates of the exports of Indian total basmati rice exports to 50 importing countries during the period 2013-14 to 2022-23. On

the basis of the ranks given for the growth rates, one can conclude that the first ten countries like Nepal, Bhutan, Comoros, Indonesia, Bangladesh, Kenya, Russia, Algeria, Maldives and Malaysia come in the high potential category with CAGR 91.20, 84.11, 57.10, 45.77, 33.34, 29.80, 28.36, 28.20, 27.41 and 26.36 per cent, respectively. It confirms the substantial development of India in the exports of basmati rice among these countries are showing more than 25 per cent Compound Annual Growth Rate (CAGR) which is a signal of a rising trend of the exports of basmati rice from India to the above importing countries. Unquestionably, there is an immense potential for exports of basmati rice in the markets of the above stated countries. Additionally, next eight countries fall in the middle potential

category and rest of the countries are of the low potential category. Noticeably, the t-values of growth rates, it is found that some of countries are having its positive values while others having as negative values. The Table evidently shows that the most of growth rates are statistically significant at one per cent ($\alpha = 0.01$) level of significance. However, the growth rates of Syria, Sweden, Azerbaijan, Italy, Belgium, France and Georgia etc. have been negative and statistically insignificant and all these values are confirmed by t-value, coefficient of determination R^2 and ANOVA (F-value). The demand of Indian basmati rice exports can be increased in low demand importing countries through different methods such as improvement of basmati rice quality, more production and low prices.

Table-3 : Descriptive Statistics of Basmati Rice Exports during the Period from 2013-14 to 2022-23

(Values in Rs. Crores)

I	II	III	IV	V
Sr. No.	Year	Mean	Standard Deviation	Coefficients of Variation
1	2013-14	574.50	1782.02	310.18
2	2014-15	541.13	1395.14	257.81
3	2015-16	545.46	1035.53	232.46
4	2016-17	421.82	938.79	222.55
5	2017-18	526.86	1185.84	225.07
6	2018-19	643.22	1776.01	276.11
7	2019-20	608.35	1581.68	259.99
8	2020-21	585.29	1261.39	215.51
9	2021-22	517.97	1148.65	221.76
10	2022-23	755.37	1651.22	218.59

Source: *Ibid.*, Table-2

Table-3 reveals the descriptive statistics of basmati rice exports to 50 importing countries during the period 2013-14 to

2022-23. The mean values of exports for the study period have been demonstrated in column III. Similarly, standard deviations of

the exports to different countries for the study period have been illustrated in the column IV. The last column of the table offers coefficients of variations. Year-wise mean values of basmati rice exports have increased from 574.50 to 755.37 standard deviation values of basmati rice has decreased from 2013-14 to 2016-17, but it is displaying rising trend from 2017-18 with 1185.84 and has increased 1651.22 in 2022-23. So, standard deviation was of fluctuating nature in these years. The coefficients of variation also during the study period have been of the fluctuating nature. The figure of coefficients of variation in the year 2013-14 was 310.18 and the figure was 218.59 in the year 2022-23.

Policy Recommendations

Many policy recommendations can be made to increase the export potential of Indian basmati rice based on the study and findings of secondary data on the country’s exports of basmati rice.

- To address the multiple challenges associated with rice marketing, rice producers should set up a department dedicated to it.
- In terms of value, India's overall exports of basmati rice have increased at a CAGR of 2.96 percent. The research paper suggests that more incentive is required to increase basmati rice exports because the growth rate appears to be low.
- Growth rates of some importing countries for exports of Indian basmati rice are not high. Therefore, it is imperative that demand for Indian basmati rice among importing nations

rise. There are many actions that can be taken for this aim, including price control, quality enhancement, easy availability, cheap cost and flexible terms of trade.

Scope for Further Research

The state-wise trade analysis might be examined in upcoming studies. Another interesting area of analysis is a comparison of basmati rice imports and exports. A new research topic might be chosen to compare basmati and non-basmati rice. As part of a research study, consumption, area and yield analysis of basmati rice might be considered. The conditions of laborers and rice plantations in India can both be examined. Additionally, the same methods and instruments can be used to compare the trade position of rice before and after independence.

Conclusion:

The paper has studied the country-wise export growth of Indian basmati rice. In country-wise analysis, Nepal with 91.20 per cent CAGR has obtained the top position out of all fifty importing countries of Indian basmati rice during the study period and followed by Bhutan, Comoros, Indonesia and Bangladesh with CAGR 84.11, 57.10, 45.77 and 33.34 per cent, respectively. On the basis of country-wise analysis, it can be concluded that the export concentration is in few nations, so it is an issue of apprehension for the basmati rice sector of India. Indian total basmati rice exports assume an increasing trend and reached to 4558972.20 MT of Rs. 38524.15 crores in the year 2022-23. Thus, total exports of basmati rice in terms of quantity and value has been demonstrated the great potential. Further, the concentration ratio of four major

importing countries CR₄ (D₄), concentration ratio of eight importing countries CR₈ (D₅) and concentration ratio of sixteen major importing countries CR₁₆ (D₆) ranges from value 0.710088 to 0.569034229, 0.84501344 to 0.744987495 and 0.931825845 to 0.888984182, respectively. The mean value of year-wise exports of basmati rice has increased from 574.50 to 755.37 in the ten years only, which is a noticeable indication for India's rice trade. Lastly, above analysis can be proved supportive to recognize the real picture of export potential of Indian basmati rice with global world.

Conflicting Interests Declaration

The author declared no probable conflicts of interest with respect to the study, authorship and/or publication of this paper.

Funding

The author received no economic help for the study, authorship and/or publication of this paper.

References:

1. Agricultural and Processed Food Products Export Development Authority (APEDA), Ministry of Commerce and Industry, Government of India, New Delhi.
2. Ahamed Kabeer M, (2016). Export Competitiveness of Selected Agriculture Products in India in the Global Market: CMS Analysis, *Journal of International Economics*, Volume 7, No.2, pp.64-69
3. Dash, J. P. and Dash, A., (2022). The Paradox of India's Defence Exports, *The Journal of Institute of Public Enterprise*, Vol. 45, No. 2.
4. E. Paramalakshmi Devi and S. P. Kalabarani (2016). Problems and Prospects of Rice (Basmati and Non-Basmati) Production and Exports in India. *Shanlax International Journal of Economics*, Vol. 5, Issue1, pp. 7-16.
5. Imperial Institute Committee for India, (2018). *Indian Trade Enquiry: Reports on Rice*, Forgotten Books, London.
6. Joshi, H. and Kaur, N. (2019). *Marketing Strategies of Rice Exporters in India*, LAP Lambert Academic Publication, New Delhi.
7. Kumar, M., (2019). India's Rice Export: What Is in It for Farmers? *Agrarian South: Journal of Political Economy*, Vol. 8, Issue 1-2, pp. 136-171.
8. Kumar, N., (2016). Empirical Evidence on Indian Exports of Gold Jewellery Products and Its Trade Partners, *Journal of International Economics*, Volume 7, Issue 1, pp.4-16
9. P. Samal, C. Rout, S. K. Repalli and N. N. Jambhulkar, (2018). State-wise Analysis of Growth in Production and Profitability of Rice in India, *Indian Journal of Economics and Development*, Vol. 14, Issue 3, pp. 399-409
10. Paramasivan, C. and Pasupathi, R. (2017). A Study on Growth and Performance of Indian Agro Based Exports. *International Journal of Humanities and Social Science Research.*, Vol. 3, Issue 9, pp. 1-5.
11. Pesala, B., (2014). Indian Manufacturing Sector Exports in the Context of Globalization, *Journal of International Economics*, Volume 5, Issue 2, pp.73-85.

12. S. Chandrasekaran, (2020). *Basmati Rice: The Natural History and Geographical Indication*, Satyam Law International, New Delhi.
13. Shailza, Sharma, L. and Burark, S. S. (2021). Structural Changes in Basmati Rice Exports from India: A Markov Chain Analysis. *Economic Affairs*, Vol. 66, No. 2, pp. 235-243.
14. Udhayakumar, M. and Karunakaran, K. R. (2020). Trade Dynamics of Basmati and Non-Basmati Rice Exports from India. *Journal of Economics, Management and Trade*, Vol. 26, Issue 10, pp. 68-76.
