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Growth and Export Performance of Rice from India

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Growth and Export Performance of Rice from India

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I. Introduction

Economic reforms and trade liberalization policies have been widely adopted by developing countries to improve their position in world trade. Since 1991, India entered the Liberalization-Privatization-Globalization (LPG) phase to overcome its debt crisis, food shortage and at the same time to gain from net agricultural exports, as it enjoys comparative advantage for majority of the agricultural commodities. With the advent of this LPG phase, more focus is now given towards export promotion through enhancing both domestic and export competitiveness of agricultural commodities. Emphasis on cost-effective and quality production of agriculture gained more significance. With the emergence of World Trade Organization (WTO) in 1995, it was expected that India would be benefited through multilateral trade, as it enjoys comparative advantage with reference to majority of the agricultural commodities and also fulfil the import requirements like pulses, edible oils, technology etc. In this context, a number of studies investigated the effects of trade liberalization on export performance of agricultural commodities in India. Many studies have identified positive effects of trade liberalization on export performance of majority of the agricultural commodities. In the post-WTO regime, Indian agricultural commodities exports performance has undergone paradigm shift through the tremendous structural and qualitative changes (Kehar Singh and InderSain, 2003).

India is the second most populous country with the fifth largest economy occupying only 13th position in world trade and earning 623 billion dollars of merchandise trade and 294 billion dollars of services trade. In India, agriculture exports have significantly increased by multiple folds from Rs. 60.12 billions to Rs. 2266 billion and registered impressive growth rates during 1990-91 to 2016-17. However, there is huge trade deficit of US$184 billion (US$330 billion of exports and US$514 billion of imports) in 2018. It is now exporting 7500 products to 190 countries and importing 6000 products from 140 countries, enjoying trade surplus with USA, UK, Bangladesh, Sri Lanka, Nepal, UAE, Hongkong, Singapore, Netherlands, Germany, Belgium, Vietnam, Malaysia, Italy etc., and having trade deficit with China, Saudi Arabia, Iraq, Iran, Switzerland, South Korea, Indonesia, Australia, Qatar, Nigeria etc. India's agricultural exports in 2018 were valued at 38.74 billion US dollars and they accounted for 11.76 per cent of the total exports from India. Main agricultural exports were marine products, basmati rice, beef, non-basmati rice, cotton, oilseed meal, spices etc. The agricultural imports into the country in 2018 were valued at 20.35 billion US dollars and they constituted only four per cent of total imports. Main imports were edible oils, pulses, spices, cashews etc. India's share of world exports was 0.53 per cent in 1994 before the WTO came into existence and this share was increased to 1.71 per cent in 2019.

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India's share of world imports in 2019 reached 2.5 per cent from about 0.7 per cent in 1994. India enjoys competitive advantage in several commodities for agricultural exports because of near self-sufficiency of inputs, relatively low labour costs and diverse agro climatic conditions. These factors have enabled export of several agricultural commodities over the years. In the basket of agricultural exports, rice is one of the major exporting commodities from India. While India holds an important position in the export market for rice, in the next decade, India is likely to witness changes in its export pattern due to both internal and external constraints. One of the major internal constraints is mounting cost of production. Similarly, one of the most important external constraints include excessive subsidization by importing countries makes Indian rice less competitive in the international market. So, the important research questions in this study include: to analyse the growth dynamics of exports, imports, Minimum Support Prices (MSPs), Domestic Market Prices (DMPs) and International Prices (IPs) of rice, to analyse the export competitiveness of rice across major importing countries during both pre and post-WTO regimes and to study the changes in size and direction of exports of rice from India.

II. Methodology

In this study, the researcher examines the computation of Compound Growth Rates (CGRs) for exports, imports, MSPs, DMPs and IPs of rice, computation of Nominal Protection Coefficients (NPCs) to analyse the export competitiveness and first order Markov process was employed to analyse dynamic nature of trade pattern to examine the gains and losses in respect of export shares of Indian rice across major importing countries. The secondary information on exports, imports, DMPs, IPs, exchange rates, export trade data, trade destinations, transportation and storage costs, port charges, freight charges, exchange rates etc, are collected from different authentic sources such as Directorate of Economics and Statistics (DES), Statistical Year Book (2018), Director General of Foreign Trade (DGFT), Food and Agriculture Organization (FAO), State Agriculture Produce, Processing and Export Corporation Ltd, Container Corporation of India etc.

III. Statistical Techniques Employed

The following techniques are employed to arrive at the realistic conclusions from the study:

- *Compound Growth Rates (CGRs):* CGR analysis is employed through fitting the exponential function to the variables of interest viz., exports, imports, MSPs, DMPs, and IPs of rice at All-India level during both pre and Post-WTO regimes. The CGRs are calculated by fitting the exponential function: $Y_t = Y_O (1 + r)^t$
- *Nominal Protection Coefficient (NPC):* The NPCs were estimated for rice under exportable hypothesis during both pre and post-WTO regimes in order to measure the extent to which DMPs diverge from border equivalent prices (IP). That is, under exportable hypothesis, the domestic goods compete with a foreign product at the foreign port or in foreign market. It was estimated as follows:
  $NPC = P_d/P_b$
  Where, P_d = DMP; and
  P_b = the border equivalent producer price.
  An NPC greater than one would show that the DMP of the commodity exceeded the border price, which discouraged the export of rice.
- *Markov Chain Analysis:* The changes in the exports of rice to different countries was analyzed by employing a first order finite Markov chain model which captured the net effect in changes in its exports over a period of time. There is a growing awareness of the usefulness of this technique for analysis and forecasting in many areas including exports, particularly when the process is constant but has a gradual change (Eswarprasad *et al*., 1997).

In this report, the structural change in the exports of selected commodities from India in terms of market retention and market switching was examined by using the Markov chain approach. The estimation of the Transitional Probability Matrix (TPM, (P)) was central to this analysis. The element P_{ij} of the matrix indicated the probability that the exports would switch from the i^{th} country to j^{th} country over a period of time. The diagonal elements P_{ij} indicated the probability that the export share of a country would be retained in the successive time periods, which in other words, measured the loyalty of an importing country to a particular exporting country. In the context of the current application, eleven major importing countries (including all other countries grouped under 'others') are considered for rice. The average exports to a particular country was considered to be a random variable which depended only on its past exports to that country and which was denoted algebraically by the following equation:

$$E_{jt} = \sum_{i=1}^{r} E_{it-1} P_{ij} + e_{jt}$$

Where,
E_{jt} = Exports from India to the i^{th} country during the year 't'
E_{it-1} = Exports to the i^{th} country during the year 't – 1'
P_{ij} = Probability that exports will shift from the i^{th} country to j^{th} country

e_{jt} = Error-term which is statistically independent of e_{jt-1}, and

r = Number of importing countries

The transitional probabilities P_{ij}, which can be arranged in a (c × r) matrix, had the following properties:

$$0 \leq P_{ij} \leq 1$$

$$\sum_{i=1}^{r} P_{ij} = 1 \text{ for all i}$$

The expected export-share of India during a particular period, 't' was obtained by multiplying the quantity of exports to the selected countries(eleven in the present study) during the previous period (t–1) with the estimated TPM (P). There are several approaches to estimate the transitional probabilities of the Markov chain model such as un weighted restricted least squares, weighted restricted least squares, Bayesian maximum likelihood, unrestricted least squares, *etc.* In the present study, Minimum Absolute Deviations (MAD) estimation procedure was employed to estimate the transitional probability, which minimizes the sum of absolute deviations. The conventional Linear Programming (LP) technique was used, as this satisfies the properties of transitional probabilities of non-negativity restrictions and row sum constraints in estimation (Mandana *et al.,*1998 and Hugar, 2002). The LP formulation on analysis was stated as per expression given below:

$$\text{Min } O P^* + I_e$$

Subject to,

$$XP^* + V = Y$$

$$GP^* = 1$$

$$P^* \geq \phi$$

where, P* is a vector of the probabilities P_{ij}; O is a null vector; I is an appropriately dimensional vector of areas; e is the vector of absolute errors (|U|); Y is the vector of exports to each country; X is a block diagonal matrix of lagged values of Y; V is the vector of errors; and G is a grouping matrix to add the row elements of P arranged in P* to unity.

P* vectors were arranged to obtain the transitional probability matrix which indicated the overall structure of the transitions that had taken place in the system. Essentially, the transitional probability matrix captures the dynamics of the changes in raw cotton exports from India. The individual probabilities P_{ij} indicate the probability of the shift from the country i to country 'j'.

IV. Results and Discussion

a) Destination-wise exports of rice

Rice is exported from India to many countries in the world. In fact, India is facing stiff competition in the international market for the export of (non-basmati) rice. India is the world's largest rice exporting country. Thailand is another large exporter of rice, but currently the demand for Thailand rice has steeply declined in the international market due to which India is likely to the world's largest exporter of rice. However, rice exports have been facing stiff competition from some of the neighboring Asian countries like Thailand and Vietnam majorly. Total India's exports of rice registered at 8.68 lakh tonnes during 1992-94 (pre-WTO regime) which increased by multiple folds to 106 lakh tonnes during 2014-2016. While in post-WTO regime, major rice importing countries from India include Saudi Arabia (10.03%), Iran (7.87%), UAE (6.73%), Senegal (6.69%), Benin (5.74%), Nepal (4.76%), Bangladesh (4.53%), Iraq (4.37%), Guinea (3.82%) etc (Table 1). In pre-WTO regime, about 94 countries imported rice from India and out of this, around 55 per cent of rice exports from India are concentrated in Saudi Arabia, United Kingdom and UAE, whereas in post -WTO regime, the rice exports from India spread to around 143 countries in the world. India emerged as the largest exporter of rice during last decade in the global market over Thailand and Vietnam. Lifting the ban on exports of rice by the Government of India, increased international demand after declined supply from the major exporting countries viz., Thailand and Vietnam and depreciating currency are the major factors contributed India for being the largest exporter of rice in the global market in recent times.

The recent developments in the Indian rice (non-Basmati rice) segment in the domestic as well as the international markets are not encouraging for the Indian rice millers, since the MSP hike has been significant during 2018-19, as against a range bound hike in the past. The increase in the MSP could result in an increase in the acreage for sowing, thus ensuring higher availability of rice for exports, on the other hand this sharp increase of MSP would increase the DMP, thereby making Indian rice costlier in the global markets, which could impact adversely on rice exports. Moreover, with the imposition of the higher import duties by the member nations (say, Bangladesh imposed a duty of 28%), the exports to member nations are likely to decline. India is facing stiff competition in the international market from Thailand, Vietnam, USA and Pakistan. There was a considerable growth in the export of rice from India during the post-WTO regime (Table 2).

Table 1: Country wise rice exports from India during Pre and Post-WTO regimes

Pre-WTO regime TE (1992-94)			Post-WTO regime TE (2014-16)		
Countries	Export Quantity (lakh tonnes)	% share in total rice exports from India	Countries	Export Quantity (lakh tonnes)	% share in total rice exports from India
Saudi Arabia	3.19	36.80	Saudi Arabia	10.74	10.03
United Kingdom	0.90	10.42	Iran (Islamic Republic of)	8.42	7.87
United Arab Emirates	0.63	7.27	United Arab Emirates	7.20	6.73
Netherlands	0.51	5.88	Senegal	7.16	6.69
Kuwait	0.45	5.21	Benin	6.14	5.74
Bangladesh	0.42	4.83	Nepal	5.09	4.76
Sri Lanka	0.24	2.74	Bangladesh	4.85	4.53
Iran (Islamic Republic of)	0.22	2.56	Iraq	4.68	4.37
Kenya	0.20	2.35	Guinea	4.09	3.82
Malaysia	0.17	1.94	Côte d'Ivoire	3.26	3.05
Germany	0.16	1.87	South Africa	3.03	2.83
USA	0.14	1.60	Turkey	2.68	2.51
Togo	0.14	1.57	Somalia	2.54	2.38
Singapore	0.13	1.51	Sri Lanka	2.42	2.26
Oman	0.12	1.32	Liberia	2.37	2.22
Bahrain	0.11	1.30	Yemen	2.25	2.10
Others	0.93	10.75	Others	30.07	28.10
Total	8.68	100.00	Total	106.99	100.00

Raw Data Source: www.fao.org

b) Growth rates of exports and imports

CGRs of exports and imports both in terms of quantity and value (Table 2) are worked out for rice during both pre and post-WTO regimes, so as to ascertain the trends and prospects in international trade. It is heartening to note that the exports both in terms of quantity and value had shown positive and significant growth rates during post-WTO regime. Further, the growth in exports both in terms of quantity and value are higher during post-WTO regime compared to pre-WTO regime. As expected, rice being the staple food crop in India, the imports both in terms of quantity and value showed declining trend. On the whole, during overall reference period 1980-2016, the growth rates of exports outweigh the growth rates of imports for rice.

Table 2: Growth rates (%) of Exports and Imports of Rice from India

Particulars		Growth Rate (%)
Pre-WTO regime (1980-1994)	Export quantity	10.22NS
	Export value	17.13**
	Import quantity	-6.48NS
	Import value	-2.03NS
Post-WTO regime (1995-2016)	Export quantity	18.16**
	Export value	32.74**
	Import quantity	-18.35NS
	Import value	-1.79NS
Overall period (1980-2016)	Export quantity	18.16**
	Export value	26.87**
	Import quantity	-36.76**
	Import value	-30.23**

*Note: ** - Significant at 1% level; NS – Non-significant Raw Data Source: www.fao.org*

In the recent period, as cheaper rice from countries such as China and Thailand begins to enter into India's traditional markets in Africa, the concerned rice exporters in India are looking to the Government for incentives to sustain their markets. This is because, an increase in MSP for paddy, coupled with strengthening rupee against the dollar, has turned the Indian rice expensive in the world market and consequently the rice shipments got affected. The rice shipments fell to 7.11 lakh tonnes during April-May, 2019 from 15.25 lakh tonnes in the corresponding period last year, 2018. In value terms, the shipments slumped to $294 million from last year's $652 million during this reference period. In July, 2019, the Indian rice is expensive by 5-10 per cent compared with other traditional competitors such as Thailand, Vietnam, Pakistan and Myanmar. However, the entry of Chinese rice into the markets in 2019 has compounded the problem for Indian exporters. Chinese State agency, China Oil and Foodstuffs Corporation (COFCO) is out in the market to liquidate old stocks of 3-4 m. tonnes and is targeting markets in Africa, including Egypt. India has around 50 per cent share in African rice market, estimated at around 15 m. tonnes annually. So, India's rice shipments slowed down during October-December, 2018 due to the impact of the higher paddy MSP, which saw an increase of 13 per cent for the kharif 2018 season. The announcement of five per cent Merchandise Exports from India Scheme (MEIS)* helped offset the impact of higher MSP. A further increase of 3.7 per cent in MSP for kharif 2019 has added to the exporters' challenge. The Government should look at a scheme such as Bhavantar Bhugtan Yojana (which sought to provide relief to farmers by providing the differential between MSPs and DMPs) ie., direct cash transfer instead of increasing MSP.

c) Growth in MSPs, DMPs and IPs

In all the three reference periods, MSPs, DMPs and IPs of rice recorded positive and significant growth rates (at 1% level), except for IPs during pre-WTO regime (recorded negative growth rate, though non-significant (Table 3). It is interesting that, the growth rates of MSPs and DMPs are much higher than IPs during the three reference periods. Further, the growth rate of MSPs is higher than growth rate of DMPs during the pre-WTO regime, unlike post-WTO regime and overall reference period. This highlights three important aspects: Firstly, the rise in MSPs of paddy by the Government of India has escalated its COP and hence, its DMPs (during pre-WTO regime). Secondly, there is slow pace of increase in MSPs of paddy during post-WTO regime compared to pre-WTO regime (with a view to reduce the cultivation of paddy as a second crop in rabi season and also considering mounting buffer stocks in Food Corporation of India (FCI) godowns), but this is sufficient enough to escalate the DMPs at a faster pace over and above its IPs. Thirdly, the higher growth rates of MSPs of paddy over and above its IPs is a warning signal for losing the export competitiveness in the international market. Further, the positive and significant growth rates of MSPs of paddy during overall reference period and also during the sub-periods imply that, the farmers are encouraged to escalate the COC and COP of these crops. This price movement from MSP to COP and to DMP for rice will have a direct relation with its export competitiveness. That is, rise in MSPs of rice have an indirect influence on their export performance from the country.

* - MEIS was introduced in the Foreign Trade Policy (FTP) for the period 2015-2020. The MEIS was launched as an incentive scheme for the export of goods. The rewards are given by way of duty credit scrips to exporters. The MEIS is notified by the DGFT (Directorate General of Foreign Trade) and implemented by the Ministry of Commerce and Industry. Under the FTP 2015-20, MEIS intends to incentivize exports of goods manufactured in India or produced in India. The incentives are for goods widely exported from India, industries producing or manufacturing such goods with a view to making Indian exports competitive. The MEIS covers goods notified for the purpose of the scheme.

Table 3: Growth in MSPs, DMPs and IPs of Indian rice

Period	Prices	Growth Rate (%)
Pre-WTO - regime (1990-1994)	DMP#	4.07**
	MSP#	14.00**
	IP	-1.97 NS
Post-WTO - regime (1995-2017)	DMP	8.61**
	MSP	7.24**
	IP	5.60**
Overall reference period (1990-2017)	DMP	7.90**
	MSP	7.43**
	IP	3.99**

*Note 1: ** - Significant at 1% level; NS – Non-significant;*
Note 2: # - DMPs correspond to Telangana State, IP is an average price of major exporting countries in respective periods
Raw Data Source: Directorate of Economics and Statistics, Government of India;
Commission for Agricultural Costs and Prices Reports
Food and Agriculture Organization (FAO)

d) Export Competitiveness of Indian rice

The export competitiveness of Indian rice was examined by using NPC. This is a measure of actual divergence or distortion DMP and IP or border price. The NPCs were calculated under exportable hypothesis (implying the domestic good competes at a foreign port)for three years viz., pre-WTO regime (1992-93) and post-WTO regime (2005-06 and 2017-18). These NPCs are estimated for three major exporting counties under each commodity and this highlights the comparative advantage the commodity that enjoys in the international market. If NPC is less than 0.5, the commodity is highly competitive, if it is between 0.5 to 0.1, it can be judged as moderately competitive and if the NPC is more than, then the commodity is not competitive for export into the international market. The NPCs for rice are estimated to the three major export destinations viz., Saudi Arabia, Iran, UAE for the above said three years (Table 4). It is evident that, rice is moderately competitive in Saudi Arabia (0.619) and UAE (0.800) from Telangana and not export competitive in Iran (1.813) during pre-WTO period, 1992-93. However, during the recent post-WTO period (2017-18), this commodity gained export competitiveness across all the above three countries.

Table 4: NPCs of Indian rice from Telangana to major importing countries during pre and post-WTO regimes

Countries	Pre-WTO period	Post - WTO period	
	1992-93	2005-06	2017-18
Saudi Arabia	0.619	0.973	0.841
Iran	1.813	1.065	0.841
UAE	0.800	1.000	0.842

Note: DMPs correspond to Telangana, IP is an average price of major exporting countries in respective periods
Raw Data Source: Commission for Agricultural Costs and Prices Reports,
Food and Agriculture Organization (FAO),
Container Corporation of India, Hyderabad

The trends in the NPCs during post-WTO regime indicated that Telangana's comparative advantage has improved for rice compared to pre-WTO regime. So, Telangana enjoy a great advantage to specialize in the production and export of rice to earn the valuable foreign exchange. The country also needs to capitalize this advantageous position thereby, ensuring its position in the international market as a stable and dependable source of low-price good-quality produce in the world. It is to be noted that the NPC values are often influenced by the individual countries' internal and external trade policies like Government interventions, import restrictions, subsidies and high tariffs, etc. Even the quality of produce also affects the trade prospects of a commodity in the international market.

e) Trade Direction of rice from India

The dynamics of changes in the export trade of rice from India was studied through the estimation of a Markov probability matrix. The probability of retaining the previous period market share (gain or loss) is interpreted by studying the diagonal and off diagonal elements of TPM. The major importing countries taken for the analysis of trade in rice exports during the post-WTO regime (2006-07 to 2016-17) were Benin, Côte d'Ivoire, Iran, Nepal, Saudi Arabia, Senegal, South Africa, UAE, Iraq, Guinea, Somalia and along with the remaining importing countries grouped under 'others'. That is, there are eleven major countries importing Indian rice in large quantity and rest of countries are pooled under 'others' category. The diagonal elements in the TPM (Table 5) for rice exports provide the information on the probability of retention of the trade, while row elements indicate the probability of loss in trade on account of competing countries. The column elements indicate the probability of gain in trade from the competing countries. TPM revealed that Saudi Arabia was found to be the most stable importer of Indian rice, as it retained its original share of around 30.40 percent which was the highest among the importing countries. It lost its remaining share of 69.60 percent to UAE, Iran and Nepal. That is, Saudi Arabia was the largest buyer of Indian rice followed by other traditional buyers like UAE, Iran, Nepal, Benin, Senegal and South Africa. UAE was also found to be stable with 5.60 percent retention of its shares, while losing major share of 94.40 percent to Saudi Arabia, Iran, Benin, Côte d'Ivoire and other countries. Côte d'Ivoire was also found to be stable with 7.20 percent of retention of its shares, while losing major share of 92.80 percent to Saudi Arabia, South Africa, Somalia, UAE and other countries. Other countries were also found to be stable with 35.70 percent of retention of their shares, while losing a share of 64.30 percent to Saudi Arabia, UAE and Benin. Superior quality of grain has made Indian rice more acceptable across the countries in the international market. The launch of paddy pledging scheme (under which 50% more price was offered than the open market price for boosting the farmers' income) by other major producers like Thailand has helped India to achieve record performance in rice exports in recent times. The higher exports to Saudi Arabia, UAE, Nepal etc., and retentions by major countries could be due to high export competitiveness of Indian rice across these countries.

It is also revealed from Table 5 that 'other' countries and Saudi Arabia were the stable markets for Indian rice among the importing countries, as reflected by high retention probability of 35.70 and 30.40 percents respectively. This was reflected in fact that India's share in total import of rice by Saudi Arabia would be on increasing trend in the future years. Next to 'other' countries and Saudi Arabia, Côte d'Ivoire is also a major importer of rice, as its retention probability is 7.2 per cent. India could not retain the previous export shares to Senegal and hence, this is an unstable market for rice, as it is having probability of retention of zero.

Table 5: TPM of rice exports from India (2006-07 to 2016-17)

Countries	Benin	Côte d'Ivoire	Iran	Nepal	Saudi Arabia	Senegal	South Africa	UAE	Iraq	Guinea	Somalia	Others
Benin	0.022	0.054	0.002	0.055	0.193	0.027	0.066	0.056	0.000	0.008	0.032	0.484
Côte d'Ivoire	0.023	0.072	0.004	0.034	0.133	0.028	0.083	0.049	0.002	0.021	0.034	0.516
Iran	0.019	0.097	0.002	0.036	0.118	0.020	0.043	0.078	0.003	0.032	0.016	0.535
Nepal	0.004	0.002	0.069	0.010	0.211	0.001	0.003	0.192	0.002	0.002	0.000	0.503
Saudi Arabia	0.002	0.002	0.170	0.010	0.304	0.000	0.001	0.291	0.005	0.000	0.000	0.214
Senegal	0.000	0.000	0.168	0.014	0.279	0.000	0.011	0.297	0.009	0.000	0.000	0.221
South Africa	0.017	0.025	0.116	0.013	0.146	0.018	0.037	0.171	0.026	0.001	0.010	0.422
UAE	0.045	0.065	0.083	0.027	0.081	0.083	0.037	0.056	0.025	0.024	0.008	0.465
Iraq	0.121	0.027	0.161	0.037	0.086	0.070	0.041	0.039	0.022	0.020	0.010	0.367
Guinea	0.054	0.019	0.092	0.048	0.098	0.062	0.030	0.042	0.021	0.030	0.017	0.487
Somalia	0.050	0.037	0.076	0.047	0.109	0.082	0.026	0.070	0.043	0.035	0.023	0.401
Others	0.069	0.036	0.067	0.047	0.093	0.055	0.029	0.092	0.07	0.052	0.032	0.357

Raw Data Source: www.fao.org

V. Summary and Conclusions

From study, it was concluded that though India is the world's largest rice exporting country, it has been facing stiff competition from some of the neighboring Asian countries like Thailand and Vietnam majorly. Recently, as cheaper rice from countries such as China and Thailand begin to enter into India's traditional markets in Africa, it is posing severe threats to Indian rice exports. Though the growth rate in MSP of paddy is on the decline during post-WTO regime compared to pre-WTO regime, but this is sufficient enough to escalate the DMPs at a faster pace over and above its IPs. This rise in MSPs of rice have an indirect influence on their export performance from the country. However, as rice being the staple food crop in India, the imports both in terms of quantity and value showed declining trend and on the contrary, the exports both in terms of quantity and value showed significant increasing trend during both pre and post-WTO regimes. The NPCs estimated to the three major export destinations viz., Saudi Arabia, Iran, UAE revealed that rice is moderately competitive across these countries during post-WTO regime. The TPM of rice revealed that Saudi Arabia is its loyal destination among the various importing countries. An increasing demand for Indian rice is found in countries like Saudi Arabia and Côte d'Ivoire. So, it is high time that the consumer preferences in newer markets, market intelligence and impediments for augmenting exports need to be researched. Further, it is essential to make available to exporters the new markets' requirement of SPS restrictions.

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