

Trend and growth rates of rice in India

M Ramakrishna and M Srikala*

S.V.Agricultural College, Tirupati-517502

*Email: srikalamedikonda@gmail.com

ABSTRACT

India had the largest share in acreage under rice in the world during pre-WTO regime. It was 28.60 per cent, but during the post-WTO regime its share in area was slightly decreased from 28.60 to 28.25 per cent. There was significant increasing trends of area (0.62 per cent) and productivity (2.79 per cent), which ultimately resulted in 3.44 per cent growth in production during the post-WTO period. Rice exports (quantity) from India were encouraging, in the sense that, they account for more than 70 per cent and 55 per cent in terms of total cereals and food grain exports respectively during the pre-WTO period. In terms of value the exports share account for more than three-fourth of the total cereal exports, more than 70 per cent of the total food grain exports and around 10 per cent of total agricultural products export. During the pre-WTO period there was significant growth of 13.77 per cent in rice exports in terms quantity and in terms of value it was 10.22 per cent. India was the chief importer of rice from the international market during the pre-WTO period. The imports were irregular during post-WTO period but showed positive growth and turned non-significant. The growth in net trade of rice revealed that in terms of quantity the growth was positive, but turned non-significant, but in terms of value there was significant growth of 8.44 per cent indicating a healthy net trade in growth of India's trade.

Key words: Rice growth rate, rice export, rice share, rice area and rice production

The dependence of rural labour force on agriculture and allied activities is quite substantial as it directly or indirectly supports about 70 per cent of population. As per census of 2011, 263 million people were engaged in agricultural sector and half of them were agricultural labourers. India has the world's largest area devoted to rice cultivation and it is the second largest producer of rice after China. Rice is one of the most important food crops of India in terms of area, production and consumer preference. Rice production in India crossed the mark of 100 million tonnes in 2011-12 accounting for 22.81 per cent of global production. The productivity of rice has increased from 1984 kg per hectare in 2004-05 to 2372 kg per hectare in 2011-12. Indian share in global rice production has been hovering in the range of 19.50 to 24.52 per cent. Indian share dipped below 20 per cent only in 2009-10. This paper analyses the growth rate of rice in terms of area, production, productivity, exports and imports in pre-WTO as well as post-WTO periods.

MATERIALS AND METHODS

The present study utilizes the time series data (1985 to 2011) on area, production, productivity, imports and exports of rice in India. The entire data has divided in to two periods namely pre-WTO (1985-94) and post-WTO period (1995-2011).

The compound growth rates of area, production, productivity, exports and imports of rice crop were worked out using exponential function of the form,

$$Y_t = ab^t$$

The above equation was transformed into log linear form and written as:

$$\log Y = \log a + t \log b + \log \mu_t$$

where,

Y_t : Area / Production / Productivity/ Exports / Imports of rice during the selected reference period,

't' : Years which takes value 1, 2,.....n,

μ_t : Disturbance term in year 't',

'a' and 'b' are constant and parameters to be estimated

respectively.

The above equation will be estimated by using Ordinary Least Squares (OLS) technique.

$CGR = \text{antilog of } (\log b - 1) \times 100$

Where, $\log b$ is the parameter estimated

RESULTS AND DISCUSSION

India has the largest share in acreage under rice in the world during pre-WTO regime. It was 28.60 per cent as shown in Table 1, but during the post-WTO regime its share in area was slightly decreased from 28.60 to 28.25 per cent. This was due to the increase in area under rice cultivation by the competing countries like China, Pakistan etc. Coming to production, even though India's share in area was decreased, but its production share in the world was slightly increased during the post-WTO regime due to contribution from the productivity side by adopting new technologies and regarding the productivity share, there was positive growth but compared to world's productivity it was 24.25 per cent less.

Today India is self sufficient in rice due to contributions from both area and productivity. There was significance increasing trends of area (0.62 per cent) and productivity (2.79 per cent), which ultimately resulted in 3.44 per cent growth in production during the post-WTO regime as shown in Table 2. The rice

Table 1. India's average share (per cent) of rice area, production and productivity in world before and after WTO

Item	Period	World (%)
Area	1985-1994	28.60
	1995-2011	28.25
Production	1985-1994	21.13
	1995-2011	21.41
Productivity comparison (%)	1985-1994	-26.34
	1995-2011	-24.25

Source: www.fao.org

Table 2. Growth (per cent) in Area, production and productivity of rice at all-India level before and after WTO

Period	Area	Production	Productivity
1985-1994	-0.05NS	1.36**	1.42**
1995-2011	0.62*	3.44**	2.79**

Note: **: Significant at 1 per cent level; *: Significant at 5 per cent level; NS: Non – Significant.

Source: www.fao.org

production was increased mainly due to significant contribution from productivity rather than area under cultivation because of use of modern technologies.

Rice exports occupy a major share in terms of total rice, cereals and food grains production (Table 3), as indicated by the share values of less than one per cent during pre-WTO period. However, it was interesting to note that, during post-WTO regime, the shares of exports were increased in terms of rice and selected commodity groups compared to the pre-WTO regime, this was mainly due to superior quality of produce and the reputation of the country as a regular supplier of rice into the international market. Still there is scope to boost the exports of rice from the country through paying serious attention on cost effective production, as several countries like Thailand, Pakistan, Vietnam, USA etc., are posing severe competition to Indian rice both in terms of cost effectiveness and quality.

Rice exports (quantity) from India were encouraging, in the sense that, they account for more than 70 per cent and 55 per cent in terms of total cereals and food grain exports respectively during the pre-WTO period. In terms of value the exports share account for more than three-fourth of the total cereal exports, more than 70 per cent of the total food grain exports

Table 3. Average share (per cent) of rice exports in total rice, cereals and food grains production at all-India level before and after WTO (quantity)

Item	Period	Average Share (%)
Total Rice production	1985-1994	0.27
	1995-2011	1.48
Total cereals production	1985-1994	0.16
	1995-2011	0.89
Total food grains production	1985-1994	0.26
	1995-2011	1.40

Source: www.fao.org

Table 4. Average share of Rice exports in total cereals and food grains exports at all-India before and after WTO

Item	Period	Average Share (%)	
		Quantity	Value
Total cereal exports	1985-1994	70.33	92.02
	1995-2011	59.42	78.76
Total food grain exports	1985-1994	68.34	88.29
	1995-2011	57.68	74.51

Source: www.fao.org

and around 10 per cent of total agricultural products export. This signifies the importance of rice exports. But compared to earlier period, the share of exports of rice in total cereals and food grain exports were slightly declined during post-WTO regime, mainly due to increase in demand for other products like maize and wheat in the international market. However, rice still plays a major role in the export basket of cereals and food grains from India.

A comparative picture across pre-WTO and post-WTO regime revealed that, the share of exports of rice from India in the world showed an increasing trend during post-WTO regime (Table 5). This was an encouraging aspect, as open market environment favoured India in exporting rice into the international market. Similar trends were also obtained regarding share of rice exports in terms of value in the World.

During the pre-WTO period there was significant growth of 13.77 per cent in rice exports in terms quantity and in terms of value it was 10.22 per cent as shown in Table 6. But in the post-WTO period there is significant growth in terms of value and in terms of quantity growth is non-significant. This might be due to drastic increase in cost of production of rice and post harvest costs and consequent fall in demand of rice in the international market.

As exports, rice imports were also regular into the country from the international market (Table 7). In

Table 5. Average share (per cent) of rice exports from India in the international market before and after WTO

Period	World (%)	
	Quantity	Value
1985-1994	3.65	6.35
1995-2011	12.87	14.27

Source: www.fao.org

Table 6. Growth in exports of rice from India in the international market before and after WTO

Item	Period	CGR (%)	
		Quantity	Value
Rice	1985-1994	13.77**	10.22**
	1995-2011	1.15NS	8.44**

Note: **: Significant at 1 per cent level; *: Significant at 5 per cent level; NS: Non – Significant. Source: www.fao.org

pre-WTO period the share of imports (value) in total cereals and food grains imports were 33.05 and 12.84 per cent respectively. Coming to post-WTO regime, the share of rice imports in different commodity groups selected was declined both in terms of value and quantity due to increased domestic production. But, on the export side, the share was relatively higher during post-WTO regime. This reflected a healthy net trade of rice in the international market during post-WTO regime.

Similarly the share of rice imports into India from the international market was declined during the post-WTO period when compared to pre-WTO regime (Table 8) both in terms of quantity and value. India was leading importer of rice during pre-WTO regime, but during post-WTO regime, the imports were declined. This was mainly due to significant contributions from increase in productivity of rice in the country and the imports were nil during 2004.

India was the chief importer of rice from the international market during the pre-WTO period. The imports were irregular during post-WTO period but showed positive growth and turned non-significant. This indicates that, in case of rice, India got the net exporter status during the post-WTO regime and the imports were mainly done to maintain trade relationship with the other countries.

The growth in net trade of rice revealed that in terms of quantity the growth was positive, but turned

Table 7. Average share of rice imports in total cereals and food grains imports at all-India before and after WTO

Item	Period	Average Share (%)	
		Quantity	Value
Total cereal imports	1985-1994	25.75	33.05
	1995-2011	0.38	0.42
Total food grain imports	1985-1994	12.88	12.84
	1995-2011	0.12	0.08

Source: www.fao.org

Table 8. Average share (per cent) of rice imports from India in the international market before and after WTO

Period	World (%)	
	Quantity	Value
1985-1994	0.11	0.80
1995-2011	0.01	0.007

Source: www.fao.org

Table 9. Growth in imports of rice at all-India level before and after WTO

Item	Period	CGR (%)	
		Quantity	Value
Rice	1985-1994	-5.40 NS	-3.56 NS
	1995 -2003	56.12 NS	34.45 NS
	2005 -2011	9.33 NS	33.73 NS

Note: **: Significant at 1 per cent level; *: Significant at 5 per cent level; NS: Non – Significant.

Source: www.fao.org

Table 10. Growth in net trade of rice at all-India level in the international market after WTO

Commodity	Period	CGR%	
		Quantity	Value
Rice	1995-2011	1.175NS	8.4**

Note: **: Significant at 1 per cent level; *: Significant at 5 per cent level; NS: Non – Significant.

Source: www.fao.org

non-significant, but in terms of value there was significant growth of 8.44 per cent this shows that there is a healthy net trade in growth of India's trade.

The main objective of the present study was to analyse the growth rate of rice in terms of area, production, productivity, exports and imports in pre-WTO as well as post-WTO periods. The results indicated that, there was significance increasing trends of area (0.62 per cent) and productivity (2.79 per cent),

which ultimately resulted 3.44 per cent growth in production during the post-WTO regime. Rice exports occupy a major share in terms of total rice, cereals and food grains production, as indicated by the share values of less than one per cent during pre-WTO period. Rice exports (quantity) from India were encouraging, in the sense that, they account for more than 70 per cent and 55 per cent in terms of total cereals and food grain exports respectively during the pre-WTO period. The comparison of pre-WTO and post-WTO regime revealed that, the share of exports of rice from India in the world showed an increasing trend during post-WTO regime. India's export share in international market showed an increasing trend during post-WTO period but the share of imports was declined during the same period compared to pre-WTO period both in terms of quantity and value. There was a healthy net trade of rice in the international market.

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