AN ECONOMETRIC ANALYSIS OF AGRICULTURAL TRADE IN RICE CROP OF ANDHRA PRADESH

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ABSTRACT
Among the various states of the country, Andhra Pradesh is an agriculturally important state in India. It is the third largest producer of rice and groundnuts while it is second in cotton and sunflower. It has been one of the front-runners in reaping the benefits of green revolution. However, its vast dry land tracts could not keep pace with the better-endowed regions resulting in wide inter-regional disparities. In order to address the problems of agriculture, the State has been implementing various schemes from time to time. Despite this, agriculture in the state has been exhibiting stagnation in growth and is seeking innovative policy and technology interventions. International trade promotes the economic development of a country. It widens the market and increases the inducement to invest income and saving through more efficient allocation. India has comparative advantage in agriculture, so that there is considerable scope for raising farm income and employment by stepping up agro-based exports without jeopardising and indeed by consolidating the food security already achieved (Naseeruddin and Sundaresan 1999). Agriculture export can thus serve as the bigger safety net in the process of structural adjustment in India. In view of this, an attempt has been made to study the trends in area, production and productivity of rice and also competitiveness of Andhra Pradesh agriculture in the wake of trade liberalization and implementation of WTO agreements to analyze the global competitiveness of rice crop of Andhra Pradesh.

KEY WORDS: Agriculture, Growth rate, Rice, production, Trade and WTO

INTRODUCTION
Agriculture plays a crucial role in the development of the Indian economy. About two thirds of the population is dependent on the agriculture sector. Agriculture is the engine of economic growth whether a country is developed, less developed or under developed. Agricultural development is necessary to feed the increasing population. Improvement in agriculture can be in two directions, namely, extensive and intensive. Since the total
geographical area is fixed, it is not possible to increase the cultivable landed area substantially without upsetting ecological balance. Whether the development is intensive or extensive, investment on agriculture must increase to meet ever increasing demand for food. Agriculture in India is predominantly rainfed. Agricultural production fluctuates with the vagaries of rainfall in addition to the socio-economic factors. Low yield per unit area across major crops has become a regular feature of Indian agriculture in recent years. Some of the reasons for the low agricultural productivity in our country are (i) lack of sufficient irrigation facilities in major parts of the cultivated land; (ii) lack of timely availability of quality seeds, fertilizers for the major crops in many parts of the country. Productivity of Indian agriculture is low as compared to the productivity at the global level. Estimates of yield of rice as of April 2011 in India was 3.2 tonnes per hectare as against 7.5 tonnes per hectare in the United States, 6.7 tonnes per hectare in China and an average of 4.3 tonnes per hectare for the World. Also many studies revealed that there is wide variation in productivity of major crops across the States/ Regions in India.

Average annual growth of the agriculture and allied sector during the Eleventh Five year Plan at 3.6 per cent fell short of the 4 per cent growth target. Realized growth, however, has been much higher than the average annual growth of 2.5 and 2.4 per cent achieved during the Ninth and Tenth Plans, respectively. Growth has also been reasonably stable despite large weather shocks during 2009 (deficient South West monsoon), 2010-11 (drought/deficient rainfall in some states)). Average annual growth of private investment at 12.5 per cent during Eleventh Plan (first four years) was significantly higher as against nearly stagnant investment during the Tenth Plan. Although agriculture, including allied activities, accounted for only 14.1 per cent of the GDP at constant (2004-05) prices in 2011-12, its role in the country's economy is much bigger with its share in total employment according to the 2001 census, continuing to be as high as 58.2 per cent.

During the Eleventh Plan period, food grains production in the country recorded an increasing trend, except in 2009-10 when total food grains production declined to 218.1 million tonnes due to severe drought experienced in various parts of the country. During 2011-12, total food grains production reached an all-time high of 259.32 million tonnes. The overall area coverage at 665.0 lakh ha under food grains during kharif 2012-13 shows a decline of 55.8 lakh ha compared to 720.86 lakh ha during kharif 2011-12. As a result the output also declined in all major crops.
Trade:

International trade promotes the economic development of a country. It widens the market and increases the inducement to invest income and saving through more efficient allocation. India has comparative advantage in agriculture, so that there is considerable scope for raising farm income and employment by stepping up agro-based exports without jeopardising and indeed by consolidating the food security already achieved (Naseeruddin and Sundaresan 1999). Agriculture export can thus serve as the bigger safety net in the process of structural adjustment in India.

The strategies for agricultural development constituted an integral part in overall planning of the Indian economy. Trade policy under planning was highly restrictive and inward oriented. Earlier agricultural policies aimed at achieving self-sufficiency in agriculture with little emphasis on agricultural exports (Pursell and Gulati, 1993).

India has traditionally been following two distinct strategies for agricultural exports. For traditional commodities such as tea, coffee, tobacco and spices, the trade regime has been relatively open and on the other hand, for food-grains, cotton and sugar the policy regime favoured import substitution. Besides enlarging markets for commodities, expansion of export trade facilitates economic development without requiring much investment in social overheads like transport and communication. Exports promote the economy with an increase in national income, the level of output and growth of the country’s economy. The expansion of export sector helped India to percolate into the world economy as a supplier of cheap agricultural commodities and raw materials (Kaushik and Paras, 2006).

Indian agriculture is undergoing a perceptible structural transformation due to economic reforms. The decade of 1990s witnessed two very significant developments that have had profound impact on agricultural trade. The first development relates to liberalization of the economy initiated in 1991. The second development relates to the new international trade regime following Uruguay round agreement and formation of WTO.

The economic environment for trade in agricultural commodities is changing fast in the wake of implementation of WTO agreement. The agreements that have an impact on agricultural trade are Agreement on Agriculture (AoA), Agreement on Sanitary and Phytosanitary measures (SPS), Agreement on Technical Barriers to Trade (TBT) and Agreement on Trade Related Intellectual Property Rights (TRIPS). The agreements are aimed at promoting trade, by reducing level of protection and by removing various kinds of technical barriers and distortions in agricultural trade resulting from domestic policies.
According to Nayyar and Sen (1994) and Bhalla (1995), the trade policy regime has undergone a considerable change during the last few years and it has implications on growth, welfare and inter-regional inequalities.

In the beginning of 1990’s, when India initiated economic reforms, agricultural exports hovered around $3.2 billion. As at that time international prices of most of the farm commodities were quite above the domestic prices, relaxation of export restriction provided a big boost to agricultural exports which moved close to $7billions in 1996-97. These achievements generated lot of euphoria for trade liberalization and also led to conclude that Indian agriculture is highly export competitive.

The situation, however, changed dramatically in the post-WTO period. Farm exports, which were more than doubled in $ terms during four years between 1992-93 to 1996-97, declined by about 20 per cent in the next three years, surplus of agricultural exports over the imports has dwindled to less than half since 1996-97. Domestic prices of most of agricultural commodities have turned out to be higher than the international prices and India has become attractive market for imports.

The globalization of Indian economy has created a favourable climate for a number of agricultural commodities to record an increase in exports. A production strategy based on comparative advantage, supported by a progressive export policy would help India consolidate her position in global market.

India's merchandise trade increased exponentially from US$ 95.1 billion in 2000-01 to US$ 620.9 billion in 2010-11 and further to US$ 793.8 billion in 2011-12. While India's total merchandise trade as a percentage of the gross domestic product (GDP) increased from 28.2 per cent in 2004-5 to 43.2 per cent in 2011-12 as per provisional estimates, India's merchandise exports as a percentage of GDP increased from 11.8 per cent to 16.5 per cent during the same period.

India's export growth in 2010-11 reached an all time high since Independence of 40.5 per cent. Though it decelerated in 2011-12 to 21.3 per cent, it was still above 20 per cent and higher than the compound annual growth rate (CAGR) of 20.3 per cent for the period 2004-5 to 2011-12. After registering very high growth of 56.5 per cent in July 2011, export growth started decelerating with a sudden fall to single digit in November 2011 as a result of the emerging global situation and then to negative figures from March 2012. Monthly export growth rates in 2012-13 (April-December) were negative except for a marginal positive growth in April 2012. For three months in 2012-13, exports declined YOY by double digits.
with the largest decline recorded in July 2012 at -15.1 per cent. In January, 2013, there is a marginal positive growth of 0.8 per cent.

Role of Agriculture in Andhra Pradesh
Andhra Pradesh is an agriculturally important state in India. It is the third largest producer of rice and groundnuts while it is second in cotton and sunflower. It has been one of the front-runners in reaping the benefits of green revolution. However, its vast dry land tracts could not keep pace with the better-endowed regions resulting in wide inter-regional disparities. In order to address the problems of agriculture, the State has been implementing various schemes from time to time. Despite this, agriculture in the state has been exhibiting stagnation in growth and is seeking innovative policy and technology interventions.

Of the total geographical area of 27.5 million hectares in the state, 39 per cent is net sown area with a cropping intensity of 124 per cent. The net irrigated area of the state is 4.4 million hectares, while the area under rainfed agriculture is 6.4 million hectares. The state receives an average rainfall of 840 mm. Out of the state’s 11.5 million land holdings, 61 per cent is marginal and 22 per cent is small.

Andhra Pradesh has a prominent position in the agricultural economy of India. The state has eight agro-climatic zones suited for growing a wide range of export oriented crops comprising the fields of plantation, commercial and horticultural crops. The contribution of agriculture in state gross domestic product was 31.46 per cent in 1999-2000 which reduced to 24.7 per cent in 2009-10. Its contribution to the SDP in recent years though declining, still it continues to be the major sector in terms of its contribution to employment creation, export earnings and supply of raw materials to various industries in the state. Agriculture provides employment to 65 per cent of the population in the state.

A substantial proportion of the cultivated area in the state is devoted to the production of principal crops. They are paddy, maize, groundnut, cotton etc. These crops account for around 40 per cent of the cultivated area in the state.

With agriculture now having been brought under the realm of WTO, freedom of government to support agriculture sector beyond a point is limited. Production pattern will be decided by considerations of comparative advantage of crops. It is in this context that this study has been undertaken. This study is contemplated to address trade issues in Rice crop of
Andhra Pradesh based on performance of the crop during the two time periods viz., pre-WTO (1985-86 to 1994-95) and post-WTO period (1995-96 to 2010-2011)

Limitations of the study:

The study was mostly based on the secondary data collected from various published sources. Often data from various sources may not agree with each other and some efforts to choose the better among them are inevitable. Care has been taken up to avoid personal bias in such decisions. However, the limitations in the secondary data are to be recognized. There may be variations in cost of cultivation of the crop. The competitiveness of the crop was also studied within the specified period though the competitiveness is subject to changes due to fluctuations in prices.

Methodology:

For this study the following tools and techniques are employed. It includes database, sources and analytical tools employed in analyzing the objectives of the study. In the present study, the analysis was carried out to find the growth and export competitiveness of rice in Andhra Pradesh. The study is based on secondary data covering a period of 25 years from 1985-86 to 2009-10. Compound growth rates of area, yield and production of rice were calculated for Andhra Pradesh as well as for India for two sub periods, namely, pre-WTO period (1976-77 to 1994-95) and post-WTO period (1995-96 to 2012-2013) as well as for the overall period (1976-77 to 2012-13).

The growth in area, yield and production of rice in A.P., integration of domestic and international markets, competitiveness of these crops and implications of WTO on A.P. agriculture were analyzed and the analytical tools employed in the study are discussed below.

Data:

To study the competitiveness of exports of rice from A.P, the free on board (FOB) prices, cost insurance freight (CIF) prices and domestic wholesale prices that prevailed in major A.P. markets were collected. Also the analysis is based on the secondary data collected from various sources such as the Center for Monitoring Indian Economy, publications and official web sites of government of Andhra Pradesh (www.aphorticulture.com, www.aponline.com).
In order to assess integration of markets in the state with international markets, monthly wholesale prices were collected for the period from 1985-86 to 2009-10. Information on domestic prices of selected crops and other agricultural statistics were compiled from various issues of Season and Crop report and Statistical abstract of A.P. published by Directorate of Economics and Statistics, Hyderabad. Data on cost of cultivation of rice was obtained from Cost of Cultivation scheme, Hyderabad. The markets selected for the study are as follows. In this paper for rice, Nizamabad is selected as the local market and Thailand for the international market. Destination wise exports were collected to study the structural change in exports. The major importing countries considered for analysis of trade in rice were Kuwait, Saudi Arabia, U.K, USA, Yemen and UAE. For policy analysis matrix, the data on cost of cultivation for the rice crop was collected for the study period.

Tools of Analysis:

The study demands the analytical tools like compound growth rates, Instability Analysis and Markov Chain Analysis (Raghavendra (2004) and Ajjan et al. (1998)) to draw the valid conclusions.

Results and Discussions

Analysis was carried out within the framework of the specified methodology, the statistical methods were employed to obtain the estimates of the parameters and based on these estimates the valid/meaningful conclusions were made and are presented in the following manner.

i) Trends in area, production and yield of rice in Andhra Pradesh

ii) Trade competitiveness of Basmati Rice

Trends in Area, Production and Yield of Rice

The globalized trade environment has put a greater onus on the countries to be competitive in their trade endeavours. Growth should be both in quantity in order to capture a significant share of the world market and in productivity to enhance efficiency and competitiveness. In order to derive the maximum benefits from the new world trade environment, it is essential to properly assess the available export surpluses of various commodities in the country and to give greater emphasis to production strategy for the commodities for which the country has greater comparative advantage. Hence growth in area, production and productivity of the rice of Andhra Pradesh state was assessed.
Table-1: Growth rates of Area, Production and Yield of rice in A.P for selected periods

<table>
<thead>
<tr>
<th>Description</th>
<th>R²</th>
<th>CGR</th>
<th>t-value</th>
<th>Instability index (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I Period (1976-77 to 1994-95)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>0.012</td>
<td>0.1</td>
<td>0.452</td>
<td>7.81</td>
</tr>
<tr>
<td>Production</td>
<td>0.626</td>
<td>2.9</td>
<td>5.329</td>
<td>19.66</td>
</tr>
<tr>
<td>Yield</td>
<td>0.803</td>
<td>2.7</td>
<td>8.332</td>
<td>16.15</td>
</tr>
<tr>
<td><strong>II Period (1994-96 to 2012-13)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>0.012</td>
<td>0.3</td>
<td>0.438</td>
<td>13.36</td>
</tr>
<tr>
<td>Production</td>
<td>0.270</td>
<td>1.8</td>
<td>2.432</td>
<td>17.63</td>
</tr>
<tr>
<td>Yield</td>
<td>0.695</td>
<td>1.5</td>
<td>6.041</td>
<td>9.36</td>
</tr>
<tr>
<td><strong>Overall Period (1976-77 to 2012-13)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>0.018</td>
<td>0.1</td>
<td>0.808</td>
<td>10.87</td>
</tr>
<tr>
<td>Production</td>
<td>0.689</td>
<td>2.0</td>
<td>8.800</td>
<td>25.11</td>
</tr>
<tr>
<td>Yield</td>
<td>0.875</td>
<td>1.9</td>
<td>15.640</td>
<td>20.02</td>
</tr>
</tbody>
</table>

Compound growth rates of area, yield and production of rice were calculated for Andhra Pradesh as well as for India. The growth rates were calculated for two sub periods, namely, pre-WTO period (1976-77 to 1994-95) and post-WTO period (1995-96 to 2012-2013) as well as for the entire study period. The results and discussions are presented below. The compound growth rates of area, production and productivity of rice for Andhra Pradesh state are presented in table -1.

In Andhra Pradesh the area under rice crop had increased from 35.65 lakh hectares (1976-77) to 36.28 lakh hectares (2012-13). For the same period the production increased from 49.30 lakh tones to 115.10 lakh tones at a compound growth rate of 2.0 per cent with a higher instability of 25.11 per cent. Whereas the yield of rice has increased at the rate of 1.9 per cent with instability of 20.02 per cent per annum during the above said period.

In the pre-WTO period the growth in area was almost stagnant (0.1%) with instability of 7.81 per cent, whereas in post-WTO period there was a slight increase in the area with a growth rate of 0.3 with a high degree of instability of 13.36. In pre-WTO period the growth rates in yield and production were higher when compared to the post-WTO period.

The compound growth rates of area, production and productivity of rice in India are presented in Table-2. During the period 1976-77 to 2012-13, the area of rice in India had increased from 38.51 million hectares to 42.75 million hectares with a compound growth rate of 0.30 per cent. Production had increased from 76.98 million tonnes to 105.24 million...
tonnes at a rate of 2.20 per cent and productivity increased from 1088 kilograms to 2462 kilograms per hectare at the rate of 1.90 per cent per annum.

Growth in area in pre-WTO period was 0.50 per cent, but it was negative (-0.10%) in post-WTO period, but whereas the instability is 3.46 in pre-WTO and 2.80 in post WTO. There is no much difference in instabilities of both the periods. Growth in production and yield were higher in pre-WTO period than in post-WTO period. Instabilities are higher in pre-WTO period than in pre-WTO period.

Table-2: Growth rates of Area, Production and Yield of rice in India for selected periods

<table>
<thead>
<tr>
<th>Description</th>
<th>R²</th>
<th>CGR</th>
<th>t-value</th>
<th>Instability index (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I Period(1976-77 to 1994-95)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>0.560</td>
<td>0.5</td>
<td>4.647</td>
<td>3.46</td>
</tr>
<tr>
<td>Production</td>
<td>0.842</td>
<td>3.3</td>
<td>9.526</td>
<td>19.94</td>
</tr>
<tr>
<td>Yield</td>
<td>0.867</td>
<td>2.9</td>
<td>10.522</td>
<td>16.95</td>
</tr>
<tr>
<td>II Period(1994-96 to 2012-13)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>0.022</td>
<td>-0.1</td>
<td>-0.603</td>
<td>2.80</td>
</tr>
<tr>
<td>Production</td>
<td>0.584</td>
<td>1.5</td>
<td>4.740</td>
<td>10.07</td>
</tr>
<tr>
<td>Yield</td>
<td>0.769</td>
<td>1.5</td>
<td>7.302</td>
<td>9.43</td>
</tr>
<tr>
<td>Overall Period(1976-77 to 2012-13)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>0.551</td>
<td>0.3</td>
<td>6.549</td>
<td>4.38</td>
</tr>
<tr>
<td>Production</td>
<td>0.873</td>
<td>2.2</td>
<td>15.528</td>
<td>23.58</td>
</tr>
<tr>
<td>Yield</td>
<td>0.898</td>
<td>1.9</td>
<td>17.547</td>
<td>20.40</td>
</tr>
</tbody>
</table>

The analysis revealed that both in India and Andhra Pradesh rice registered decreasing growth in production and productivity in the post-WTO period than in the pre-WTO period.

**Trade competitiveness of Basmati Rice**

The transitional probabilities presented in Table-3 depict a broad indication of the changes in the direction of basmati rice trade over a period of fourteen years. The time period considered for the analysis was 1996-97 to 2009-10. The six major importing countries considered for the analysis of trade in Indian basmati rice were Kuwait, Saudi Arabia, UK, USA, Yemen and UAE. The export to remaining countries was pooled under other countries.
Table - 3: Transition probability matrix for basmati rice (1995-96 to 2009-10)

<table>
<thead>
<tr>
<th>Country</th>
<th>Kuwait</th>
<th>Saudi Arabia</th>
<th>UK</th>
<th>U.S.A</th>
<th>Yamen</th>
<th>UAE</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kuwait</td>
<td>0.043</td>
<td>0.249</td>
<td>0.134</td>
<td>0.187</td>
<td>0.000</td>
<td>0.00</td>
<td>0.394</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>0.016</td>
<td>0.674</td>
<td>0.085</td>
<td>0.036</td>
<td>0.001</td>
<td>0.071</td>
<td>0.111</td>
</tr>
<tr>
<td>UK</td>
<td>0.542</td>
<td>0.074</td>
<td>0.304</td>
<td>0.072</td>
<td>0.021</td>
<td>0.00</td>
<td>0.000</td>
</tr>
<tr>
<td>U.S.A</td>
<td>0.174</td>
<td>0.569</td>
<td>0.004</td>
<td>0.103</td>
<td>0.000</td>
<td>0.00</td>
<td>0.153</td>
</tr>
<tr>
<td>Yamen</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.00</td>
<td>1.000</td>
</tr>
<tr>
<td>UAE</td>
<td>0.202</td>
<td>0.803</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.00</td>
<td>0.000</td>
</tr>
<tr>
<td>Others</td>
<td>0.000</td>
<td>0.514</td>
<td>0.056</td>
<td>0.000</td>
<td>0.103</td>
<td>0.044</td>
<td>0.292</td>
</tr>
</tbody>
</table>

As could be seen from the table-3, the transitional probability matrix indicated that exports to Saudi Arabia had been retained to the tune of about 67 per cent of previous year share in the current period. About nine per cent was directed to UK, seven per cent to UAE and eleven per cent to other countries. Saudi Arabia gained 80 per cent of UAE market, 57 per cent of USA market share and 51 per cent of ‘others’ market share.

Regarding other countries, India retained 29 per cent of its previous exports to these importing countries and the remaining 71 per cent was captured by the major destinations of Indian basmati rice exports namely Saudi Arabia, Yamen and UK. About 51 per cent was lost to Saudi Arabia and 10 per cent to Yamen. Others gained 100 per cent of Yamen’s share, 39 per cent of Kuwait’s share, 15 per cent of USA’s share and 11 per cent of Saudi Arabia’s share.

During the current period, India’s basmati rice exports to UK were retained to the tune of about 30 per cent. On the other hand nearly 54 per cent was lost to Kuwait and 7 per cent each to USA and Saudi Arabia. But it gained 13 per cent of Kuwait’s share and 8 per cent of Saudi Arabia’s share.

India retained 10 per cent of its previous year’s basmati rice exports share to USA. Of the remaining 90 per cent, a major share (57%) was diverted to Saudi Arabia, 17 per cent to Kuwait and 15 per cent of ‘others’ share.
India’s basmati rice exports to the Kuwait market were retained to the tune of four per cent. Of the remaining 96 per cent, 54 per cent was diverted to UK, 20 per cent to UAE and 17 per cent to USA. However, Kuwait gained 25 per cent of Saudi Arabia’s share, 39 per cent of other’s share, 18 per cent of USA’s share and 13 per cent of UK’s share.

Conclusions

In India, the slow / stagnant growth in agriculture is considered to be a drag on the overall economic growth. Among the various states of the country, Andhra Pradesh is an agriculturally important state in India. It is the third largest producer of rice and groundnuts while it is second in cotton and sunflower. It has been one of the front-runners in reaping the benefits of green revolution. However, its vast dry land tracts could not keep pace with the better-endowed regions resulting in wide inter-regional disparities. In order to address the problems of agriculture, the State has been implementing various schemes from time to time. Despite this, agriculture in the state has been exhibiting stagnation in growth and is seeking innovative policy and technology interventions.

In Andhra Pradesh the trend of growth shows that in future years also there may be only a slight increase in area, whereas in India the trend of growth shows a negative and it indicates that the area of rice is in decreasing trend. However, the area under rice in India and also Andhra Pradesh is being gradually replaced by less water intensive crops such as chickpea, maize and sunflower as reflected in the acreage under these crops, probably due to shrinking water resources. Though such a shift is desirable as far as the conservation of groundwater is concerned, the large-scale transfer of area from rice deserves more critical analysis with respect to implications to food security.

The analysis revealed that both in India and Andhra Pradesh rice registered decreasing growth in production and productivity in the post-WTO period than in the pre-WTO period. The results (Table-3) indicated that the Indian export markets, which remained stable over the period, were Saudi Arabia and ‘others’. The Saudi Arabia has indeed been a growing market for Indian basmati rice. The high retention of this market was further reinforced by high probability of transfers from UAE, USA and ‘others’ countries. ‘Others’ countries had moderate probability retention of 0.28 a high transfer probability of 0.519 to Saudi Arabia, 0.012 to Yamen and 0.058 to UK. They had gained from Yamen and UAE highly. USA and UK had moderate rates of retention and Kuwait had a poor rate of retention. Kuwait retained only a proportion of 0.04 from its previous years. However, this
was reinforced by high probability of transfers from UK, UAE and USA. But there was a strong tendency to lose its market share to ‘others’ and Saudi Arabia.

Despite USA’s poor retention, it was strengthened by moderate probability of transfer from Kuwait. But there was a strong indication of loss of its market share to Saudi Arabia and Kuwait. UAE and Yamen are not stable markets for Indian basmati rice export as revealed by very poor retention rates. UAE had lost its total share to Saudi Arabia and Kuwait. Yamen had lost its entire share to ‘others’. Thus, Saudi Arabia is the major growing market for Indian basmati rice. But, it should be noted that India losing Kuwait and USA markets. Hence, proper steps need to be taken to strengthen exports to these countries.

References

12. www.aphirticulture.com
13. www.aponline.com