

Trends in Area, Production and Productivity of Paddy Crop: an Overview

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ABSTRACT: India is endowed with land and water resources with conducive agro-climatic advantages for cultivation of paddy. Paddy is mainly grown in rain-fed areas which receive heavy annual rainfall. That is why it is fundamentally a Kharif crop in India. Paddy is also grown through irrigation in those areas which receive comparatively less rainfall. Paddy is one of the most important food crops of India in terms of area, production and consumer preferences. Thus, paddy occupies a prominent place in Indian agriculture. India is the second largest producer and consumer of paddy in the world. India is also the fourth largest exporter of paddy in the world. The paddy crop provides employment to majority of farming population in India. The technological change and favorable government policies has helped in increasing paddy production in India for the last 65 years (1950-51 to 2014-15) and made India not only self-sufficient in Paddy production but also the big exporter of paddy in the world. Paddy is cultivated in almost all the states in India. The major paddy producing states are West Bengal, Uttar Pradesh, Andhra Pradesh, Punjab, Tamil Nadu, Bihar, Chhattisgarh, Odisha, Assam, Karnataka, and Kerala and they together contribute over 95 per cent of the country's paddy production. In India, West Bengal occupies first place in paddy production. The present paper discusses the area under paddy crop and its productivity trends in different crop periods.

KEY WORDS: Agriculture, Paddy Crop, Production and Productivity.

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I. INTRODUCTION

Agriculture sector plays a vital role in Indian economy and is the backbone of the country. Around 55 per cent of population is engaged in agriculture and allied activities and it contributes around 17 per cent to the country's Gross Value Added (Annual Report, 2016-17). Agriculture is the only means of employment for almost all two-thirds of rural people in India and provides food grains to all the raising population in the country. It also provides fodder to sustain livestock comprising of cattle, buffaloes, sheep and poultry etc. Agriculture sector in India is mostly dependent up on rainfall season. The seasonal conditions and monsoon play an important role in the agriculture production.

Agricultural production includes two components. They are food grains and non-food grains. All food grains like Paddy, Wheat, Maize, Bajra, Jowar, Ragi, Bengal gram are the main food grain crops in India. All commercial crops are under the category of non-food grains. Paddy crop is the one of the main food grain crop. The production of food grains constitute the most significant role in agricultural production of any country which is being recognized as having an urgent need to raise production in view of the large gap between demand and supply of food grains. As a matter of fact, sustained and accelerated development of Indian agriculture is the key to acceleration in economic development and eradication of poverty by supplying food grains to all the sections of the country including the poor. Moreover, a large number of industries like rice, textiles, silk, sugar, flourmills and milk products get raw material from agriculture. It has strongly forward and backward linkages within the rural sector and with the strategy of overall economic growth and development. However, the paddy crop is being neglected in India in recent years by the both of the Government policies and individual interests of the formers, it is highly needful to analyse the trends in paddy crop and taking the necessary steps to improve the paddy productivity and production in India.

II. REVIEW OF LITERATURE

P.Mahesh and N.R.Deepa (2016) declared that the declining trend in the area, production and productivity of paddy has the root cause of worry and are emphasized as threat to food security in India. Area under paddy increased from 228938 ha in 2007-08 to 234265 ha in 2008-09 and sharply declined by 2, 02,109 Ha in 2014-15. If compared to 2001-02, total area under food grains has decreased by 40 per cent. No doubt, among the Indian States Kerala is in big trouble and it is very difficult for the state to conserve the existing resources to future generation in this context. The significant changes in the society put pressure on the land and gradually paved the way to change the land use pattern. The factors such as high growth rate of

population, engulfing precious land for settlement, scarcity of land for ever increasing demand for food, development of industrial sector, urbanization, conversion of paddy lands for non-agricultural purposes etc. contribute for the change in land use pattern of the society. The other major reasons for the changing agricultural land is found to be increasing cost of cultivation, shortage of labour, high price for input etc.,. So there is a need to encourage of cultivation and supply and encourage judicious use of inputs, link MGNREGS with farming activity, provide low interest loans with insurance coverage to the farmers, promote mechanization and management technique depending on the case.

Teluvialakshi (2015) witnessed that owing to the resources in Andhra Pradesh it is the fourth largest producer of paddy in India and about one fourth of the total cropped area of the state is under paddy cultivation. After Green Revolution, the production and yield have considerably increased with the trends in packaging technology. According to state analysis in 2002-03, Andhra Pradesh recorded yield of 26.2 quintals/hectare against India's average of 18 quintals/hectare. The Godavari and Krishna delta and the adjoining coastal plains form one of the most outstanding Paddy production tracts of the country.

Chandra Guptha. B, Prabhakaranad Raghu. T, (2014) studied to understand that the cost of cultivation at the project sites and gain some insights for seeking pathways for action. In this study they analysis the profitability of paddy cultivation over the year's show that farmers have either received very little profit or have encountered losses. The cost of cultivation has been increasing over the years at a higher rate than the increase in the value of produced output. However, after the global food crisis and increase in food prices profitability seems to have marginally increased. They concluded that in many years' farmers face losses, not only because of lack of monsoons or drought but also due to overall decline in profits from farming and hence they preferred for transforming to non-agriculture sector instead of farming activity.

Objectives

1. To study the trends in area of paddy crop in the global level
2. To analyze the trends in area of paddy crop in India
3. To analyse the growth rates of production and productivity of paddy crop in India

III. RESEARCH METHODOLOGY

The present study is primarily based on the secondary data only. The secondary data was collected from the relevant publications of government, seasonal crop reports, Annual reports, and publications of Ministry of Agriculture, USDA- Agricultural Outlook and Situation Analysis Report and Agricultural Statistics at a glance, Govt. of India and Department of Agriculture & Cooperation, Govt. of India. To analyse the growth rates for 25 years (1991 – 2016) Linear Growth Rates, Compound Growth Rates and t-value are used in this study.

Paddy Production In The Global Scenario

The production of paddy globally exhibited a fluctuating trend in the past few decades. In 2014-15, the global production of paddy was 479 million tones and decreased to 473 million tons in the following year of 2015-16, registering a year on year decline of 1.2 per cent. The 2016-17 global paddy projection is seen at a new peak driven mainly by improved crops in Asia and particularly in India. In 2016-17, the global paddy production is projected was increase to 486million tons. This is an increase of 2.6 per cent when compared to the previous year of 2015-16 and 1.4 per cent increase when compared to 2014-15. Based on current weather and planting indicators as latest as 2016, according to the FAO market indicator, forecast of world paddy production in 2016 is 746.8 million tons. Table 1 shows the trends in paddy production in the world during 1991-92 to 2015-16.

Table-1 Trends in Paddy Production in the World during 1990-91 to 2015-16

Sl. No	Year	Area (Million hectares)	Production (Million Metric Tons)	Productivity (Metric tons per hectare)
1	1991-92	147.6	353.3	3.5
2	1992-93	146.4	353.9	3.6
3	1993-94	145.3	354.7	3.6
4	1994-95	147.3	364.1	3.7
5	1995-96	148.3	368.8	3.7
6	1996-97	150.2	380.4	3.8
7	1997-98	151.7	387.4	3.8
8	1998-99	153.3	394.9	3.8
9	1999-00	155.8	409.3	3.9
10	2000-01	152.8	399.2	3.9
11	2001-02	151.6	399.4	3.9
12	2002-03	147.6	378.1	3.8
13	2003-04	149.5	392.5	3.9
14	2004-05	151.4	400.8	3.9

15	2005-06	154.2	417.9	4.0
16	2006-07	154.6	420.1	4.0
17	2007-08	154.9	433.6	4.2
18	2008-09	158.5	449.9	4.2
19	2009-10	155.8	440.0	4.2
20	2010-11	158.3	450.1	4.2
21	2011-12	159.8	467.4	4.4
22	2012-13	159.6	473.5	4.4
23	2013-14	161.9	478.5	4.4
24	2014-15	161.0	479.2	4.4
25	2015-16	159.5	472.6	4.4

Source: Foreign Agricultural Service/USDA

From the above table it is clear that the area under paddy crop lowest at 145.3 Million Hectares in 1993-94 and highest at 161.9 Million Hectares in 2013-14. There is variation in area under paddy cultivation during the study period due to various reasons such as climatic conditions and availability of inputs including good seeds, fertilizers and irrigation facility etc. The production of paddy was minimum as 353.3 MMTs in 1991-92 and maximum as 479.2 MMTs in 2014-15 shows erratic production. For the same reporting period the productivity also varies and rises from 3.5 MT in 1991-92 to 4.4 MT in 2015-16.

Year wise Linear Growth Rates of Global Area, Production and Productivity of Paddy

The Year wise Linear Growth Rates of Area, Production and Productivity of Paddy in Global during 1991-92 to 2015-16 are presented in the Table 2.

Table – 2 Year wise Linear Growth Rates of Area, Production and Productivity of Paddy in Global during 1991-92 to 2015-16

Sl. No	Year	Area	Production	Productivity
1	1991-92 to 1999-00	0.77 (5.77)**	1.91 (11.22)**	1.21 (10.72)**
2	2000-01 to 2009-10	0.51 (3.18)*	1.61 (5.16)**	1.09 (5.41)**
3	2010-11 to 2015-16	0.21 (1.16) N.S	0.93 (2.34)*	0.65 (1.73) N.S
4	1991-92 to 2015-16	0.39 (9.89)**	1.33 (17.76)**	0.94 (19.99)**

Source: Table – 1

Note: 1. Figures in brackets are t-values

2. *Significant at 5 per cent level of Significant
3. **Significant at 1 per cent level of Significant
4. N.S (Not Significant)

The table shows that the compound growth rate of the area under Paddy during 1991-92 to 1999-2000 is 0.77 per cent and the t value is significant at 1 per cent level. But the compound growth rate of area under Paddy during 2000-01 to 2009-10 decreased to 0.51 per cent and the t value is significant at 5 per cent level and ever since the compound growth in the area under food grains drastically declined and the t value is not significant. But during 1991-92 to 2015-16, the compound growth rate of the area under Paddy is 0.39 per cent and the t value is significant at 1 per cent level.

The table also shows that the compound growth rate of the production of Paddy during 1991-92 to 1999-2000 is 1.91 per cent and the t value is significant at 1 per cent level. Similarly, it is 1.61 during 2000-01 to 2009-10 and the t value is significant at 1 per cent level. But the compound growth rate of area under Paddy during 2010-11 to 2015-16 declined to -0.93 per cent and yet the t value is significant at 5 per cent level. In the period 1991-92 to 2015-16, the compound growth in the area under Paddy is 1.33 and the t value is significant at 1 per cent level.

The table shows that the compound growth rate of the productivity of the Paddy during 1991-92 to 1999-2000 is 1.21 per cent and the t value is significant at 1 per cent level. But it decreased to 1.09 per cent during 2000-01 to 2009-10 yet the t value is significant at 1 per cent level. Ever since the compound growth in the productivity of Paddy drastically declined 0.65 and the t value is not significant. During the entire study period the compound growth in the productivity of Paddy is 0.94 per cent and the t value is significant at 1 per cent level.

Year wise Compound Growth rates of Global Area, Production and Productivity of Paddy

The details of year wise Compound Growth Rates of Area, Production and Productivity of Paddy in Global during 1991-92 to 2015-16 are furnished in the Table 3.

Table – 3 Year -wise Compound Growth Rates of Area, Production and Productivity of Paddy in Global during 1991-92 to 2015-16

Sl. No.	Year	Area	Production	Productivity
1	1991-92 to 1999-00	0.77 (5.78)**	1.91 (11.94)**	1.22 (10.52)**
2	2000-01 to 2009-10	0.51 (3.16)*	1.61 (5.07)**	1.08 (5.40)**
3	2010-11 to 2015-16	0.21 (1.17) N.S	0.94 (2.33)*	0.67 (1.73) N.S
4	1991-92 to 2015-16	0.39 (9.84)**	1.33 (18.31)**	0.94 (20.60)**

Source: Table – 1

Note: 1. Figures in brackets are t-values

2. *Significant at 1 per cent level of Significant

3. **Significant at 5 per cent level of Significant

4. N.S (Not Significant)

The table shows that the compound growth rate of the area under Paddy during 1991-92 to 1999-2000 is 0.77 per cent and the t value is significant at 1 per cent level. But the compound growth rate of area under Paddy during 2000-01 to 2009-10 decreased to 0.51 per cent and the t value is significant at 5 per cent level and ever since the compound growth in the area under Paddy drastically declined and the t value is not significant. But during 1991-92 to 2015-16, the compound growth rate of the area under Paddy is 0.39 per cent and the t value is significant at 1 per cent level.

The table shows that the compound growth rate of the production of Paddy during 1991-92 to 1999-2000 is 1.91 per cent and the t value is significant at 1 per cent level. Similarly, it is 1.61 during 2000-01 to 2009-10 and the t value is significant at 1 per cent level. But the compound growth rate of area under Paddy during 2010-11 to 2015-16 declined to 0.94 per cent and yet the t value is not significant. In the period 1991-92 to 2015-16, the compound growth in the production of Paddy is 1.33 and the t value is significant at 1 per cent level.

The table shows that the compound growth rate of the productivity of the Paddy during 1991-92 to 1999-2000 is 1.22 per cent and the t value is significant at 1 per cent level. But it decreased to 1.08 per cent during 2000-01 to 2009-10 yet the t value is significant at 1 per cent level. Ever since the compound growth in the production of Paddy drastically declined 0.67 and the t value is not significant. During the entire study period the compound growth in the productivity of Paddy is 0.94 per cent but the t value is significant at 1 per cent level.

Paddy Production In Major Countries

Paddy is the most widely grown cereal in the world and is staple food for more than 60 per cent of world's population. China is the largest producer of rice contributing for over 30 per cent of the world's rice output. India occupies the second position accounting for about 22 per cent followed by Indonesia with Eight per cent, Bangladesh with Seven per cent and Vietnam with Six per cent of total paddy production in the world. The following Table No – 4 shows that the major Ten paddy producers in the world.

Table – 4 Top ten Paddy Production Countries in Global during 2012-13 to 2015-16 Production in MTs)

Sl. No	Country	2012-13	2013-14	2014-15	2015-16
1	China	143.0	142.5	144.6	145.8
2	India	105.23	106.65	105.48	104.32
3	Indonesia	36.6	36.3	35.6	36.2
4	Bangladesh	33.8	34.4	34.5	34.5
5	Vietnam	27.5	28.2	28.2	27.5
6	Thailand	20.2	20.5	18.8	15.8
7	Burma	11.7	12.0	12.6	12.2
8	Philippines	11.4	11.9	11.9	11.4
9	Brazil	8.0	8.3	8.5	7.1
10	US	6.3	6.1	7.1	6.1
11	Others	68.7	71.6	71.5	71.9
World Total		472.5	478.4	478.8	472.8

Source: USDA, Agricultural Outlook and Situation Analysis Report 2016, GOI, p-27

It is quite obviously observed from the table that China is the largest paddy producer in the world with the production ranging from 143 MT in 2012-13 to 145.8 MT in 2015-16. But US is the least producer of paddy at single digit production varying from 6.3MT in 2012-13, 7.1 MT in 2014-15 and again fall in to 6.1 MTs in 2015-16. India is the second largest producer of paddy with 105.23MT in 2012-13 and 104.32 MT in 2015-16. For this period the total world production also having slight fluctuations as it is recorded as 472.5 MT in 2012-13 and reached the maximum level by 478.8 MT in 2014-15 and again falling down to 472.8 MTs.

Linear Growth Rates of top ten Paddy Production Countries

The Linear Growth Rates of top ten Paddy Production Countries in Global during 2012-13 to 2015-16 are shown in the Table 5.

Table – 5 Linear Growth Rates of top ten Paddy Production Countries in Global during 2012-13 to 2015-16.

Sl. No	Country	Linear Growth Rate	t-value
1	China	0.73	2.87*
2	India	-0.37	0.87
3	Indonesia	-0.52	1.02
4	Bangladesh	0.64	2.22
5	Vietnam	0.004	0.004
6	Thailand	-7.92	2.84*
7	Burma	1.73	1.46
8	Philippines	-0.00	0.00
9	Brazil	-3.13	0.86
10	US	0.62	0.15
11	Others	1.34	2.04
World Total		0.03	0.07

Source: Table No – 4

The table presents that the t value is significant at 5 per cent level and the linear growth rate of the production of paddy by China and Thailand and hence it can be inferred that the paddy productions substantially significant in both the countries. The t value is insignificant for the linear growth rate of production of paddy in the remaining countries of the world.

Compound Growth Rates of top ten Paddy Production Countries

The Compound Growth Rates of top ten Paddy Production Countries in Global during 2012-13 to 2015-16.

Table – 6 Compound Growth Rates of top ten Paddy Production Countries in Global during 2012-13 to 2015-16

Sl. No	Country	Compound Growth Rate	t-value
1	China	0.73	2.87*
2	India	-0.37	0.87
3	Indonesia	-0.52	1.01
4	Bangladesh	0.65	2.21
5	Vietnam	0.00	0.00
6	Thailand	-7.90	2.76*
7	Burma	1.76	1.49
8	Philippines	0.00	0.00
9	Brazil	-3.29	0.90
10	US	0.36	2.03
11	Others	1.36	2.03
World Total		0.03	0.07

Source: Table No – 4

The table presents that the t value is significant at 5 per cent level and the compound growth rate of the production of paddy by China and Thailand and hence it can be inferred that the paddy productions substantially significant in both the countries. The t value is insignificant for the compound growth rate of production of paddy in the remaining countries of the world.

Paddy Crop Growing Seasons In India

In India paddy crop is grown under widely varying conditions of loftiness and climate. Therefore, the paddy cultivation growing seasons vary in different parts of the country depending upon temperature, rainfall, soil types, water availability and other climatic conditions. Two or three crops of paddy are grown in a year in eastern and southern states due to moderate mean temperatures. In northern and western parts of the country, where rainfall is high and winter temperature is fairly low, only one crop of paddy is grown during the months

from May to November. There are three seasons for growing paddy in India, viz. Kharif, Rabi and Zaid. These three seasons are named according to the season of harvest of the crop. Autumn paddy which is known as pre-kharif paddy is taken up during May - August. However, the time of sowing slightly differs from state to state according to weather condition and rainfall pattern. It is harvested in September to October. In west Bengal autumn paddy crop is known as Aus, in Assam autumn paddy crop is known as Ahu, in Odisha autumn paddy crop is known as Beali, in Bihar autumn paddy crop is known as Bhadai, in Kerala autumn paddy crop is known as Virippu and in Tamil Nadu autumn paddy crop is known as Kuruvai. About Seven per cent of paddy production is grown in this season. The varieties grown during this season are mostly short duration ranging from 90 to 110 days.

The Rabi rice production is also known as summer paddy production. In West Bengal and Assam the summer paddy production is known as Boro, in Odisha summer paddy crop is known Dalua, in Andhra Pradesh summer paddy crop is known as Dalwa, in Kerala summer paddy crop is known as Punjab, in Tamil Nadu state summer paddy crop is known as Navarai and in Bihar summer crop is known as Garma. The sowing time of summer paddy is November to February and harvesting time is March to June. The area under summer paddy is only Nine per cent and early maturing varieties are mostly grown in Rabi season. The main Paddy growing season in the India is the Kharif. It is known as winter Paddy as per the harvesting time. The sowing time of kharif Paddy is June – July and it is harvested in November – December. This season Paddy is known as Aman in West Bengal, winter paddy is known as Sali in Assam, in Odisha state winter paddy crop is known as Sarrad, in Uttar Pradesh and Bihar winter paddy crop is known as Agahani, in Andhra Pradesh winter paddy is known as Sarava, Samba in Tamil Nadu and Mundakan in Kerala. About 84 per cent in the India paddy production is grown in kharif season.

Trends Of Paddy Production In India

As well as in the world countries in India also the priority for agricultural sector has been decreased and especially the paddy crop is being neglected in India in recent years by the both of the Government policies and individual interests of the formers, it is highly needful to analyse the trends in paddy crop and taking the necessary steps to improve the paddy productivity and production in India. The following Table No. – 6 explained about the area under the paddy crop in India and its production and productivity trends for a period of 25 years i.e. from 1991-92 to 2015-16.

Table – 6 Year wise Area, Production and Productivity of Paddy in India during 1991-92 to 2015-16

Sl. No	Year	Area (Million Hectare)	Production (Million Tons)	Productivity (Kg/Hectare)
1	1991-92	42.65	74.68	1751
2	1992-93	41.78	72.86	1744
3	1993-94	42.54	80.30	1888
4	1994-95	42.81	81.81	1911
5	1995-96	42.84	76.98	1797
6	1996-97	43.43	81.73	1882
7	1997-98	43.45	82.54	1900
8	1998-99	44.08	86.08	1921
9	1999-00	45.16	89.68	1986
10	2000-01	44.71	84.98	1901
11	2001-02	44.90	93.34	2079
12	2002-03	41.18	71.82	1744
13	2003-04	42.59	88.53	2079
14	2004-05	41.91	83.13	1984
15	2005-06	43.66	91.79	2102
16	2006-07	43.81	93.36	2131
17	2007-08	45.91	96.69	2202
18	2008-09	45.54	99.18	2178
19	2009-10	41.92	89.09	2125
20	2010-11	42.86	95.09	2239
21	2011-12	44.01	105.30	2393
22	2012-13	42.75	105.23	2461
23	2013-14	44.14	106.65	2416
24	2014-15	44.11	105.48	2391
25	2015-16	43.39	104.32	2404

Source: Directorate of Economics & Statistics, DAC&FW

The table shows that the area under paddy cultivation was lowest as 41.78 MHs in 1992-93 and highest as 45.91 MHs in 2007-08 and further decreased to 43.39 by the end of the reporting year 2015-16. There is variation in area under paddy cultivation during the study period due to various reasons such as climatic

conditions. The production of paddy was lowest as 71.82MTs in 2002-03 and highest as 106.65 MTs in 2013-14 and further decreased to 104.32 MTs in the reported year 2015-16. The productivity of paddy was lowest as 1744 Hectares in 1992-93 and highest as 2461 Hectares in 2012-13 and further decreased to 2404 hectares in the reported year 2015-16. All these shows an erratic production and productivity trends of paddy crop in India.

Year wise Linear Growth Rates of Area, Production and Productivity of Paddy in India

The details on the Year wise Linear Growth Rates of Area, Production and Productivity of Paddy in India during 1991-92 to 2015-16 are presented in the Table 7.

Table – 7 Year - wise Linear Growth Rates of Area, Production and Productivity of Paddy in India during 1991-92 to 2015-16

Sl. No	Year	Area	Production	Productivity
1	1991-92 to 1999-00	0.75 (5.39)**	2.15 (5.21)**	1.31 (3.69)**
2	2000-01 to 2009-10	0.12 (0.27) N.S	1.53 (1.75) N.S	1.56 (2.70)*
3	2010-11 to 2015-16	0.28 (0.78) N.S	1.33 (1.50) N.S	0.93 (1.31) N.S
4	1991-92 to 2015-16	0.09 (1.20) N.S	1.44 (9.01)**	1.38 (11.44)**

Source: Table - 6

Note: 1. Figures in brackets are t-values

2.*Significant at 1 per cent level of Significant

3. **Significant at 5 per cent level of Significant

4. N.S (Not Significant)

The table shows that the linear growth rate of the area under Paddy during 1991-92 to 1999-2000 is 0.75 per cent and the t value is significant at 1 per cent level. But the linear growth rate of area under Paddy during 2000-01 decreased drastically to 0.12 and the t value is insignificant but again during 2010-11 to 2015-16 increased to 0.28 per cent but the t value is not significant. Moreover, the linear growth in the area under Paddy during 1991-92 to 2015-16 is 0.09 and the t value is not significant.

The table shows that the linear growth rate of the production of Paddy during 1991-92 to 1999-2000 is 2.15 per cent and the t value is significant at 1 per cent level. But the linear growth rate of area under Paddy during 2000-01 decreased to 1.53 and the t value is insignificant but again during 2010-11 to 2015-16 decreased to 1.33 per cent but the t value is not significant. Moreover, the linear growth in the area under Paddy during 1991-92 to 2015-16 is 1.44 and the t value is significant at 1 per cent level

The table shows that the linear growth rate of the productivity of the Paddy during 1991-92 to 1999-2000 is 1.31 per cent and the t value is significant at 1 per cent level. But it decreased to 1.56 per cent during 2000-01 to 2009-10 and yet the t value is significant at 5 per cent level. Ever since the compound growth in the production of Paddy drastically declined 0.93 and the t value is not significant. During the entire study period, the linear growth in the production of Paddy is 1.38 per cent and the t value is significant at 1 per cent level.

Year wise Compound Growth Rates of Area, Production and Productivity of Paddy in India

The details on the Year wise Compound Growth Rates of Area, Production and Productivity of Paddy in India during 1991-92 to 2015-16 are presented in the Table 8.

Table - 8 Year wise Compound Growth Rates of Area, Production and Productivity of Paddy in India during 1991-92 to 2015-16

Sl. No	Year	Area	Production	Productivity
1	1991-92 to 1999-00	0.75 (5.43)**	2.17 (5.16)**	1.33 (3.67)**
2	2000-01 to 2009-10	0.11 (0.26) N.S	1.58 (1.70) N.S	1.60 (2.60)*
3	2010-11 to 2015-16	0.28 (0.79) N.S	1.39 (1.51) N.S	0.96 (1.33) N.S
4	1991-92 to 2015-16	0.09 (1.20) N.S	1.44 (8.66)**	1.38 (11.35)**

Source: Table – 6

Note: 1. Figures in brackets are t-values

2.*Significant at 1 per cent level of Significant

3. **Significant at 5 per cent level of Significant

4. N.S (Not Significant)

The table shows that the compound growth rate of the area under Paddy during 1991-92 to 1999-2000 is 0.75 per cent and the t value is significant at 1 per cent level. But the compound growth rate of area under Paddy during 2000-01 to 2009-10 decreased to 0.11 per cent and the t value is not significant. The compound growth rate of area under Paddy during 2010-11 to 2015-16 increased to 0.28 per cent and the t value is not significant. But during 1991-92 to 2015-16, the compound growth rate of the area under Paddy is 0.09 per cent and the t value is not significant.

The table shows that the compound growth rate of the production of Paddy during 1991-92 to 1999-2000 is 2.17 per cent and the t value is significant at 1 per cent level. Similarly, it is decreased to 1.58 during 2000-01 to 2009-10 and the t value is insignificant. But the compound growth rate of area under food grains during 2010-11 to 2015-16 again declined slightly to 1.39 per cent and at the same time the t value is not significant. In the period 1991-92 to 2015-16, the compound growth in the area under Paddy is 1.44 and the t value is significant at 1 per cent level.

The table shows that the compound growth rate of the productivity of the Paddy during 1991-92 to 1999-2000 is 1.33 per cent and the t value is significant at 1 per cent level. But it decreased to 1.60 per cent during 2000-01 to 2009-10 yet the t value is significant at 1 per cent level. Ever since the compound growth in the production of Paddy drastically declined 0.96 and the t value is not significant. During the entire study period the compound growth in the production of Paddy is 1.38 per cent but the t value is insignificant.

Major Paddy Producing States In India

Almost all states of India produce paddy crop. It is the main food crop in India contributing to more than 40 percent of total food grain production and cultivated area across the country. In India, West Bengal occupies first place in paddy production. In the agriculture year 2016, the state produced 15.75 MTs of paddy over 5.46 million hectare cultivable area. Uttar Pradesh is the second largest paddy producing state with 5.86 million hectare land under paddy cultivation producing about 12.5 MTs of Paddy. Punjab is the third largest paddy producing states in the country is which produced about 11.82 MTs of paddy during the year 2015-16. The area of paddy cultivated in the state accounted to 2.97 million hectares. In India, the three major paddy producing states are Andhra Pradesh, Tamil Nadu, Bihar, Chhattisgarh, Odisha, Assam, Karnataka, and Kerala and they together contribute majority of the country's paddy production. These largest paddy producing states hold about 72 per cent of the total paddy-growing area in India and contribute more than 95 per cent to the total paddy production in the country.

Paddy Varieties In India

There are many Paddy Varieties in India. Some important Paddy varieties are 74 count, Aizon Rice, Ambemohar, Annapoorna, Atop, Basmati Rice, BhutMuri (Keras), Champaa Rice, Clearfield Rice, Dubraj Rice, Gandhasala, GobindoBhog, Hansaraj, HasanSerai, HMT Rice, Idly Rice – Short grain, Jay Shrirama Rice, Joha Rice, Jyothi, Kamini Rice, KattaSambar, LaxmiBhog, Minicate, Super minicate, Molakolukulu, Navara Rice, Patna Rice, Masori, BPT, Fine, No –III, 2716, Coarse, Parmal, Swarna, Super Fine, Patnai Fine, CR 1009 and No-1.

IV. CONCLUSION

In India, after successful implementation of many policies and programmes that are accelerated the Industrial and service sectors development even now also around 55 per cent of population is engaged in agriculture and allied activities and it contributes 17 per cent to the country's Gross Value Added. The studies showed that the paddy production in India for the last 65 years (1950-51 to 2014-15) achieved an abnormal growth in terms quantity of production comparative to the past and post-independent period and made India not only self-sufficient in Paddy production but also the big exporter of paddy in the world. But, the production of paddy exhibited a fluctuating trend in the past few decades i.e. especially in this study period (1991-92 to 2015-16) in the both global and in Indian scenario. In 2014-15, the global production of paddy was 479 million tones and decreased to 473 million tons by the end of 2015-16, registering the total paddy production decline as 1.2 per cent. Apart from the observations it is also clear that the area under paddy cultivation was lowest as 41.78 MHs in 1992-93 and highest as 45.91 MHs in 2007-08 and further decreased to 43.39 by the end of the reporting year 2015-16. Hence it is clear that the paddy crop in India is being threatened in recent years by the both of the Government policies and individual interests of the farmers due to various reasons that may penetrated strongly with Indian agriculture sector. So this study recommends that it is highly needful to take the necessary steps to improve the paddy productivity and production in India. By the observations from the field and the secondary data available we strongly believe that the productivity and the area of production of paddy may increase by

merging of MGNREGS scheme with agriculture sector and efficient monitoring on the supply of seeds and fertilizers in addition to the required irrigation and the other modern inputs of paddy cultivation.

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