

A TREND ANALYSIS ON AREA, PRODUCTION AND PRODUCTIVITY OF RICE IN SOUTHERN STATES OF INDIA

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ABSTRACT

Agriculture has played a crucial role in the economic growth of any nation. Productivity is a key factor that influences the earnings and profitability of agriculture. It is probably also accurate in the instance of rice. This study employed secondary data along with descriptive and inferential statistical methods such as ANOVA and Scheffe tests. It has been observed that the rice cultivation area has considerably expanded in Karnataka, followed by Tamil Nadu and Andhra Pradesh, while the area of rice cultivation in Kerala remains unchanged. It has been shown that the rice cultivation area is considerably larger in AP and smaller in Kerala. Rice production has seen a notable rise solely in Karnataka, while other Southern states have experienced no change in their rice output. It has been discovered that rice production is considerably greater in AP and lower in Kerala. Rice productivity has risen substantially in Karnataka, while it has declined solely in AP, and during this period, there has been no change in rice productivity in Kerala and TN states. It has been discovered that the rice yield is considerably greater in AP and TN, and lower in Karnataka and Kerala. It has also been noted that rice yield is greater in the Southern states than the average productivity in India. Therefore, the declining productivity in Andhra Pradesh must be tackled, and productivity in Kerala and Karnataka should be elevated to boost farmers' incomes and make a substantial impact on the economies.

Keywords: Rice, Production, Productivity, Agriculture and States

INTRODUCTION

Agriculture has played an important part in the economic growth of every nation. Productivity is a key factor that influences the income and profitability of farming. It is probably true for rice as well (Kraft, 1978). Change has been observed in India's agricultural sector. Agriculture has progressively transitioned from conventional methods to modern practices of farming (Yingxu & Rong, 2025). Various methods are employed in agriculture; organic, inorganic, sustainable, natural, traditional technology, modern technology, diverse irrigation systems, quantity of fertilizers applied, data on diseases, pesticides, and others significantly influence rice productivity specifically and agricultural productivity overall (Dixit, 2012). The agricultural productivity yield in India is significantly lower than that of developed and agriculturally advanced nations (Cengiz Sayin.M. Nisa Mencet, 2005). The Southern states do not dominate rice production. Nonetheless, these Southern states have greatly aided in ensuring food security for India (Malthus, 2024). Simultaneously, variations exist in rice productivity across the Southern rice-producing states of India. In this context, the current paper analyzes the condition of rice production and productivity, as well as changes in productivity over time in the Southern states of India.

REVIEW OF LITERATURE

The previous studies have been focused on understanding the trends in the production of agriculture crops and also the production paddy (Wang & Yuyan, 2011), (Thippeswamy, 2014). Some of the previous works also examined the productivity of agriculture (Bijesh, 2017). Few studies have discussed the price and market issues, use of technology (Chandra, 2021), government policies (Jean-Jacques & Alexandra, 2011), (V Basil, 2019) and sustainable agricultural development and linking the agriculture with development (Lin, 2025). Further studies have also discussed the inputs used in the agriculture (Somayah, Shahrzad, & Jasemi, 2023), (Yingxu & Rong, 2025). However, the previous studies have hardly discussed variation in paddy productivity (A. Amarender, 2013). There are very limited studies on comparing the paddy productivity among the major paddy producing states of India (Amreen, Mohd, Bablu, Rajesh, & Shah, 2025). In this background the present article will examine change and variation in paddy production and productivity among the Southern states of India.

METHODOLOGY

The present article used secondary data culled from the website of Ministry of Agriculture and Farmers Welfare for area of rice production, rice production and productivity in Southern states of India. The data collected for the period from 2017-18 to 2021-22. For the analysis 4 rice producing Southern states of India namely; Karnataka, Tamil Nadu (TN), Andhra Pradesh (AP) and Kerala are considered. Data processed and presented in the form of tables. The descriptive techniques like minimum, maximum and averages are used to explain the status of area, production and productivity of rice. The Compound Annual Growth Rate (CAGR) computed to explain the growth of area, production and productivity. The ANOVA F test and Scheffe tests are used for multiple comparisons of variables.

**Table 1: Status and Growth of Area of Rice Production in Southern States of India
(In Thousand Hectares)**

Year	Karnataka	TN	AP	Kerala	All India
2017-18	2156.00	993.00	189.10	1828.91	43774.07
2018-19	2208.00	1139.05	198.03	1721.26	44156.45
2019-20	2300.10	1185.00	198.18	1907.41	43662.30
2020-21	2323.50	1397.10	205.04	2036.24	45768.69
2021-22	2289.00	1397.90	195.74	2217.27	46278.68
Minimum	2156.00	993.00	189.10	1721.26	43662.30
Maximum	2323.50	1397.90	205.04	2217.27	46278.68
Average	2255.32	1222.41	197.22	1942.22	44728.04
CAGR	1.71	8.88	1.04	5.53	1.47
t-value	2.877	6.413	1.185	3.468	2.969
p-value	0.063	0.007	0.321	0.040	0.059
ANOVA F: 230.482, df: (3,16), Sig: 0.000					
Scheffe Test created 4 subsets: 1. Kerala, 2. Karnataka, 3. TN and 4. AP					

Source: Ministry of Agriculture and Farmers Welfare, GOI. Note: Subsets moves from lowest to highest.

Area of rice production in the Southern rice producing states of India is presented above. It is found that AP, Karnataka, Kerala and TN are the Southern states significantly contribute for

India's food security. The average area of rice production in AP is 2255.32 thousand hectares, it is 1222.41 in Karnataka, 197.22 in Kerala and 1942.22 hectares in TN. The total area of rice grown in India is 44728.04 hectares. The area of rice grown has been significantly increased in Karnataka followed by TN and AP and at the same time; there is no change in the area of rice grown in Kerala. It has been revealed from ANOVA F-test and Scheffe multiple test that the area of rice grown significantly high in AP and less in Kerala.

**Table 2: Status and Growth of Rice Production in Southern States of India
(In Thousand Tonnes)**

Year	AP	Karnataka	Kerala	TN	All India
2017-18	8166.20	3017.11	521.30	6638.86	112757.61
2018-19	8234.67	3431.01	578.26	6130.93	116477.82
2019-20	8658.88	3634.48	605.57	7171.14	118870.32
2020-21	7882.86	4291.75	633.77	6881.16	124368.32
2021-22	7763.63	4318.38	486.98	7906.62	129471.42
Minimum	7763.63	3017.11	486.98	6130.93	112757.61
Maximum	8658.88	4318.38	633.77	7906.62	129471.42
Average	8141.25	3738.55	565.18	6945.74	120389.10
CAGR	-1.44	9.41	-0.44	4.64	3.42
t-value	-1.106	7.298	-0.112	2.166	13.750
p-value	0.349	0.005	0.917	0.118	0.001
ANOVA F: 264.862, df: (3,16), Sig: 0.000					
Scheffe Test created 4 subsets: 1. Kerala, 2. Karnataka, 3. TN and 4. AP					

Source: Ministry of Agriculture and Farmers Welfare, GOI. Note: Subsets moves from lowest to highest.

Rice production in the Southern rice producing states of India is presented above. The average rice production in AP is 8141.25 thousand tonnes, it is 3738.55 in Karnataka, 565.18 in Kerala and 6945.74 thousand tonnes in TN. The total rice production in India is 120389.10 thousand tonnes. The rice production has been significantly increased in Karnataka only and at the same time; there is no change in the rice production in other Southern states. It has been revealed from ANOVA F-test and Scheffe multiple tests that the rice production is significantly high in AP and less in Kerala.

**Table 3: Status and Growth of Rice Productivity in Southern States of India
(In Kg/Ha)**

Year	AP	Karnataka	Kerala	TN	All India
2017-18	3788	3038	2757	3630	2576
2018-19	3729	3012	2920	3562	2638
2019-20	3765	3067	3056	3760	2722
2020-21	3393	3072	3091	3379	2717

2021-22	3392	3089	2488	3566	2798
Minimum	3392.00	3012.00	2488.00	3379.00	2576.00
Maximum	3788.00	3089.00	3091.00	3760.00	2798.00
Average	3613.40	3055.60	2862.40	3579.40	2690.20
CAGR	-3.15	0.53	-1.48	-0.88	1.95
t-value	-3.196	2.657	-0.474	-0.671	6.771
p-value	0.049	0.076	0.667	0.550	0.006
ANOVA F: 23.238, df: (3,16), Sig: 0.000					
Scheffe Test created 2 subsets: 1. Kerala and Karnataka, and 2. TN and AP					

Source: Ministry of Agriculture and Farmers Welfare, GOI. Note: Subsets moves from lowest to highest.

Rice productivity in the Southern rice producing states of India is presented above. The average rice productivity in AP is 3613.40 kilogram per hectare, it is 3055.60 in Karnataka, 2862.40 in Kerala and 3579.40 kg/ha in TN. The rice productivity in India is 2690.20 kg/ha. The rice productivity has been significantly increased only in Karnataka and decreased only in AP and at the same time; there is no change in the rice productivity in Kerala and TN states. It has been revealed from ANOVA F-test and Scheffe multiple tests that the rice productivity is significantly high in AP and TN, and less in Karnataka and Kerala. It has been also observed that rice productivity is high in the Southern states compared to Indian average productivity.

CONCLUSION

The present paper examined the area, production and productivity of rice in Southern rice producing states of India. It has been found that the area of rice grown has been significantly increased in Karnataka followed by TN and AP and at the same time; there is no change in the area of rice grown in Kerala. It has been revealed that the area of rice grown significantly high in AP and less in Kerala. The rice production has been significantly increased in Karnataka only and at the same time; there is no change in the rice production in other Southern states. It has been revealed that the rice production is significantly high in AP and less in Kerala. The rice productivity has been significantly increased only in Karnataka and decreased only in AP and at the same time; there is no change in the rice productivity in Kerala and TN states. It has been revealed that the rice productivity is significantly high in AP and TN, and less in Karnataka and Kerala. It has been also observed that rice productivity is high in the Southern states compared to Indian average productivity. Hence, the decreasing productivity in AP needs to be addressed and rise productivity in Kerala and Karnataka need to improved to enhance the income of farmers and to significantly contribute to the economies.

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