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Production and Productivity Trends of Paddy Cultivation in Jammu & Kashmir

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ABSTRACT

Agriculture even at the present times is overwhelmingly important as it provides livelihood for more than half of total work force and supplies food to the whole population. Hence, agriculture growth performance has become a serious issue of concern for both academicians and policy makers as it is subject to various fluctuations. Rice is the most important cereal crop grown in the state of Jammu & Kashmir covering about 38 percent of the total gross cropped area. This paper investigates the trends in area, production and yield of paddy in different districts of J&K by using component analysis model and Compound annual growth rate. The aggregate results for paddy shows that in some districts the output growth is due to the yield effect; whereas in other districts the output growth is due to the area effect and thus revealing that the area and yield effects although not equal, but had contribution to total change in output growth.

KEYWORDS Agriculture, Paddy, Growth Rates, Decomposition Analysis, Jammu & Kashmir

Introduction

Jammu and Kashmir is basically an agrarian economy. The dependence of rural labour force on agriculture and allied activities is quite substantial as it directly or indirectly, supports about 70 percent of population. As per census 2001, 18.38 lakh persons comprising 15.92 lakh cultivators and 2.46 lakhs as agricultural labourers depend directly on agriculture for their livelihood forming about 49 percent of the total working force (37.54 lakh persons). Among the principal crops, rice is an important principal crop grown in almost all districts of J&K barring Leh & Kargil where climatic conditions are not suitable for paddy cultivation. The current production of paddy in Jammu & Kashmir is about 538 thousand tons during 2010-2011 and occupies about 38 percent of the total gross cropped area. Anantnag, Jammu, Baramulla and Pulwama are the major paddy growing districts of Jammu & Kashmir. Paddy production of J&K is not keeping pace with the rising population resulting in huge procurement of rice from north western states of India. Thus in this paper an attempt has been made to discuss the spatial and temporal changes in area, production and productivity of paddy in Jammu & Kashmir during 2000-2010.

Methodology

Time series data on area, production and productivity of paddy has been collected from various secondary sources such as Ministry of Agriculture, Government of India, New Delhi; Directorate of Economics and Statistics, Government of Jammu & Kashmir; and Office of the Financial Commissioner, Government of Jammu and Kashmir. Compound growth rate of area, production and productivity of paddy was estimated to examine the temporal changes. The compound growth rates were estimated by using the following exponential model:

$$Y_t = ab^t \text{ ----------(1)}$$

Where 'a' and 'b' are the two constants, and 't' represents the value assigned to time. As the exponential trend gives the constant per cent rate rate of growth in the time series data per unit of time, the rate is given by (b-1). Taking logarithms on both sides of the exponential trend, it takes the form:

$$\ln(Yt) = \ln(a) + t \ln(b) \text{----------(2)}$$

The values of two constants, 'a' and 'b' are estimated by the method of least square. To measure the relative contribution of area and yield towards the total output change with respect of individual crops, decomposition analysis as suggested by minhas and vaidyanathan (1965) has been used. In the literature, several researchers have used this model to study growth performance of the crops (Bastine and Palanisami, 1994; Bhatnagar and Nandal, 1994; Mundinamani et al., 1995; Gupta and Saraswat, 1997; Singh and Ranjan, 1998; Siju and Kombairaju, 2001; Kakali and Basu, 2006). In the decomposition analysis, the change in production is taken as the effect of three factors such as yield effect, area effect and interaction effect as follows.

$$\Delta P = A_0 \Delta Y + Y_0 \Delta A + \Delta A \Delta Y \text{---------- (3)}$$

Change in production = Yield effect + Area effect + Interaction effect

Where ΔP, ΔY and ΔA are the change in production, Yield and Area and A_0, Y_0 are the base year's area and yield respectively.

District Wise Area, Production and Productivity Trends of Paddy cultivation in Jammu & Kashmir.

Considering the fact that states are large geographical entities consisting of several non-homogenous agro economic sub regions with widely varying yield levels and output growth rates, it would be more meaningful to undertake district level analysis. In India, districts or zilas are much smaller administrative units and are likely to be agro-climatically more homogenous than states. In this section performance of J&K agriculture at the district level has been studied by first taking the production and productivity trends of all the districts and then by looking at the compound growth rates. Secondly the Decomposition Analysis Model has been used to assess the change in production which is taken as the effect of three factors such as yield effect, area effect and interaction effect.

Area under paddy during the study period has almost remained stagnant except in Anantnag, Kupwara and Jammu where a marginal increase in area has been registered (Table 1.1). Production of paddy has also registered a increase in few districts only like Anantnag and Jammu whereas other districts have either registered a very marginal increase or have stagnated around the production figures of year 2000. Productivity of paddy has also remained stagnant in most of the districts except Anantnag and Pulwama where a significant increase in comparison to other districts has been registered during the study period (Table 1.1).

Districts Wise Growth Trends of Paddy cultivation in J&K.

The compound growth rate of area, production and productivity of paddy during 2000-2010 has been summarized in table 1.2. Area under paddy in Kupwara, Jammu and udhampur have registered an annual compound growth rate of

3.9 percent, 3.2 percent and 2.4 percent respectively whereas districts like Anantnag and Poonch have registered a marginal increase of 1.3 percent and 1.1 percent respectively. All other districts have registered a negative annual compound growth rate in area under paddy during the study period with Pulwama witnessing a highest annual decline of 4.4 percent during 2000-2010 (Table 1.2). The production of rice has grown in most of the districts with Anantnag at the top (6.9 percent per annum) followed by Doda (6.2 percent per annum), Pulwama (4.4 percent) and udhampur (4.8 percent) in 2000-2010. Other districts has also shown a increasing trend in this period except Budgam and Kathua where a declining trend was registered in their total output. Productivity of rice in 2000-2010 was highest in Pulwama followed by Anantnag, Doda , Rajouri (Table 1.2). Srinagar and udhampur whereas Budgam , Jammu, Kupwara and Poonch has registered negative annual compound growth rates in this time period (Table 1.2).

District wise Decomposition analysis of Paddy Cultivation in J&K

In the following lines, decomposition of growth output has been used to explain the district wise agricultural growth in terms of area and yield components. The major contribution in the increase of rice output was brought by the yield in majority of districts except Budgam, Kupwara, Jammu and Poonch. The positive contribution of yield varied from about 25 to 647 percent. In case of some districts like Pulwama, Srinagar, Rajouri, yield effect is the only factor for increasing the production because area did not contribute anything and contribution of cropping pattern was also negative (Table 1.3). It is interesting to note that here that although yield has contributed significantly but area has also contributed to the increased production in some districts as well like Kupwara, Jammu and Poonch while as in other districts both the yield and area has contributed positively. On the other hand districts which witnessed a decline in total production like Budgam, Baramulla, Kathua was mainly contributed by yield although area has also contributed but less than yield effect. State as whole has witnessed a decline in total production contributed equally by yield and area (Table 1.3).

Conclusion

The role of agricultural development in overall economic growth, food security, generation of employment opportunities through numerous direct and indirect linkages, alleviation of rural poverty, and in improving overall quality of life of the population is well accepted. Since paddy cultivation is one of the most important crops grown in the state of Jammu & Kashmir and is mainly cultivated in District Anantnag, Jammu, Baramulla, Pulwama, Budgam and Srinagar. District Anantnag, Jammu, Baramulla and Pulwama are the four major paddy growing districts of J&K. These four districts together produces about 65.39 percent of total paddy production and occupies about 59.87 percent of total area under paddy in J&K. During the last ten years increase in total production has mainly been contributed by yield whereas the districts where decline in total production has been witnessed is mainly contributed by area. High variability in growth performance across districts has been observed because of differential level of crop, inputs use, area under different crops. A comparison of crop production in terms of value of output per net sown area for the year 2000 to 2010 reveals the extend of this variability. The rate of increase in both area and production has not remained very impressive during the study period. Thus in the present context, there is an urgent need to increase the net return per unit area by way increasing the productivity of paddy otherwise it is very difficult to sustain the paddy cultivation over a period of time.

Table: 1.1 District Wise Five Yearly Average of Area Production and Productivity of Paddy in Various Districts of J&k

	Area (000'Ha)		Production (000Mt)		Productivity(in qt)	
District	2000-05	2005-2010	2000-05	2005-10	2000-05	2005-10
Anantnag	39.92 (15.9)	42.56 (16.56)	84.25 (18.5)	121.86 (22.93)	2231.2 (10.5)	2925.4 (11.71)
Budgam	24.52 (9.77)	24.11 (9.3)	45.22(9.83)	43.98 (8.27)	1845.2 (8.7)	1833.4 (7.34)
Baramulla	30.90 (12.31)	30.84 (12.00)	60.84 (13.67)	60.18 (11.32)	1973.8 (9.3)	1953.2 (7.8)
Pulwama	23.11 (9.20)	17.36 (6.75)	50 (10.86)	62.44 (11.75)	2164.8 (10.2)	3600.8 (14.4)
Srinagar	11.57 (4.61)	10.35 (4.02)	29.02 (6.30)	29.66 (5.58)	2511.8 (11.8)	2874.2 (11.5)
Kupwara	12.25 (4.88)	15.72 (6.11)	18.88 (3.93)	23.54 (4.43)	1551 (7.3)	1497 (5.9)
Jammu	53.3 (21.2)	62.06 (24.16)	88.8 (19.5)	102.98 (19.39)	1658.8 (7.8)	1668 (6.6)
Kathua	31.59 (12.5)	30.48 (11.86)	53 (11.04)	47.5 (8.94)	1674.8 (7.9)	1565.4 (6.2)
Rajouri	6.53 (2.60)	5.58 (2.17)	11.4 (2.37)	13.64 (2.56)	1763.2 (8.3)	2462.8 (9.8)
Poonch	3.45 (1.37)	3.65 (1.42)	5.22 (1.08)	5.72 (1.07)	1537.4 (7.2)	1588.6 (6.3)
Dooda	4.01 (1.59)	4.09 (1.59)	4.8 (1.03)	6.8 (1.28)	1209 (5.7)	1691.2 (6.7)
Udhampur	9.78 (3.89)	10.07 (3.92)	10.34 (2.15)	13.1 (2.46)	1065.97 (5.03)	1301.86 (5.2)
Leh	-	-	-	-	-	-
Kargil	-	-	-	-	-	-
J&k	250.93	256.87	461.77	531.4	21186.97	24961.86

Source: Computed by the reseacher on the basis of data obtained from office of the Financial Commissioner Revenue, Government of Jammu and Kashmir.

Table: 1.2 Compound Growth Rates of Area, Production and Productivity of Paddy

(in Per cent)

Districts	Area	Production	Yield
Anantnag	1.3	6.9	5.6
Baramulla	-0.2	0	0.1
Budgam	-0.2	-1.2	-1.0
Doda	0.7	6.2	5.5
Jammu	3.2	2.8	-0.5
Kargil	.....	.....	.....
Kathua	-0.90	-.2.3	-1.4
Kupwara	3.9	2.5	-1.4
Leh	……..	……..	…….
Poonch	1.1	0.9	-0.1
Pulwama	-4.4	4.4	8.9
Rajouri	-2.0	3.0	5.1
Srinagar	-1.7	0.5	2.1
Udhampur	2.4	4.8	2.5

Source: Computed by the Researcher on the basis of data obtained from office of the Financial Commissioner Revenue, Government of Jammu and Kashmir.

Table:1.3 Decomposition Analysis of Paddy in Various Districts of J&K

Districts	Change in	Yield Effect	Area Effect	
Anantnag Actual	43.93	32.87	7.76	3.31
Percentage	100	74.81	17.67	7.53
Pulwama Actual	16.5	38.28	-11.64	-10.14
Percentage	100	232.03	-70.55	-61.48
Srinagar Actual	0.56	3.6	-2.74	-0.36
Percentage	100	647.42	-483.74	-63.68
Budgam Actual	-5.06	-4.39	-0.73	0.07
Percentage	100	-86.66	-14.41	1.32
Baramulla Actual	-1.56	-0.61	-0.96	0.01
Percentage	100	-39.04	-61.58	0.63
Kupwara Actual	3.33	-1.78	5.64	-0.53
Percentage	100	-53.27	169.2	-15.96
Leh Actual	-	-	-	-
Percentage	-	-	-	-
Kargil Actual	-	-	-	-
Percentage	-	-	-	-
Jammu Actual	15.03	-3.83	19.73	-0.87
Percentage	100	25.45	131.27	5.82
Udhampur Actual	3.9	1.87	1.68	0.34
Percentage	100	-48.02	-43.19	-8.79
Doda Actual	1.6	1.33	0.27	0.07
Percentage	100	79.95	16.40	4.28
Kathua Actual	-7.7	-6.21	-1.72	0.20
Percentage	100	-80.27	-22.28	2.54
Rajouri Actual	1.86	4.94	-2.19	-0.18
Percentage	100	264.40	-117.23	-47.17
Poonch Actual	0.33	0.12	0.47	-0.01
Percentage	100	-37.41	140.74	-3.33
Jammu and Kashmir	-49	-25.04	-25.04	1.09

Source: Computed by the researcher on the basis of data obtained from office of the Financial Commissioner Revenue, Government of Jammu and Kashmir.

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