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Anupama Jain

Department of Agricultural
Economics and Farm
Management Jawaharlal Nehru
Krishi Vishwa Vidyalaya
Jabalpur, Madhya Pradesh,
India

Dr. RM Sahu

Department of Agricultural
Economics and Farm
Management Jawaharlal Nehru
Krishi Vishwa Vidyalaya
Jabalpur, Madhya Pradesh,
India

Yogita Kashyap

Department of Agricultural
Economics and Farm
Management Jawaharlal Nehru
Krishi Vishwa Vidyalaya
Jabalpur, Madhya Pradesh,
India

Growth performance of major cereal crops in different agroclimatic regions of Chhattisgarh

Anupama Jain, Dr. RM Sahu and Yogita Kashyap

Abstract

The present investigation relates to different agro climatic regions of Chhattisgarh, where paddy is the competing crop to other kharif crops. The entire Chhattisgarh state is studied, considering its three agro climatic zones which includes 18 districts of Chhattisgarh (At present 27 districts, have merged and made 18 districts) as units of Investigation. Secondary data collected from different sources were used for the research work, for the period 2000-01 to 2014-15. Paddy is the principal crop in Chhattisgarh and along with paddy, maize and wheat are also studied in this investigation, so as to know the position of these crops at present as compared to paddy. This study examines the trend using linear and exponential model for three major cereal crops paddy, maize and wheat and assess its variation in area, production and productivity. Efforts should also be made to intensify cereal crop production especially in those agro climatic regions where the productivity levels at present is poor.

Keywords: Agro climatic regions, Chhattisgarh, trend, paddy.

Introduction

Chhattisgarh is a state in central India; with a geographical area of 137.90 lakh hectares. It is known for rice cultivation and called “rice bowl of India” and is necessary to examine its trend and growth rate and have an estimate of likely supply of this crop in the state. In Chhattisgarh rice occupies average of 3.6 million hectare with the productivity of the state ranging between 1.2 to 1.6 tonne per hectare depending upon the rainfall (Status Paper on Rice for Chhattisgarh).

Paddy is an important crop grown in nearly 44 million hectare of land in the country with the productivity of 2.2 tonne per hectare which is less than the productivity of many countries (Status Paper on Rice for Chhattisgarh). The huge demand for cereals in the global market is creating an excellent environment for the export of Indian cereal products. India occupy the major share in India’s total cereal export with 64.40 percent during the year 2014-15. Whereas, other cereals including wheat represent 35.60 percent share in total cereals exported from India during this period (APEDA). Rice covers one third of total cultivated area of India. It provides food to more than half of the Indian population. Wheat is the second most important crop of India after paddy.

The diagnoses of trend necessitate the prescriptive measure and needed technological development for higher level of productivity.

It was made an attempt to find the trends in area, yield and production of rice in Orissa. The results of the present study indicated that the output of rice during the post- green revolution period grew at an annual rate of 1.43 percent and this was contributed solely by per hectare yield. Area under rice experienced deceleration due to diversion of area to oilseeds and pulses (Tripathy (1996). Shankar *et al.* (2010). The growth rate of production was found to be positive for all selected kharif crops except sorghum and kodo that highest positive showed negative trend in production mainly due to declining trend under area. Maize exhibited high yield performance which was mainly due its area and production.

Research Methodology

The study is carried out in the state of Chhattisgarh. The state comprises of three agro climatic regions, which are Chhattisgarh Plains, Bastar Plateau and Northern Hills, which includes 18 districts of Chhattisgarh (At present 27 districts have merged and made 18 districts covering all 27 districts). A marked variation prevails in soil and climate which divided the state in three distinct agro climatic regions, which have resulted in great variation in farming patterns and growth rates in area, production and productivity in different parts of the state. Chhattisgarh state was selected purposively for the present study due to some special purpose as to know the growth performance and trend of major cereal crops.

Correspondence

Anupama Jain

Department of Agricultural
Economics and Farm
Management Jawaharlal Nehru
Krishi Vishwa Vidyalaya
Jabalpur, Madhya Pradesh,
India

The data used for the study is entirely based on secondary source from different published sources and websites. Time series data of area, production and productivity of major cereal crops viz. Paddy, Maize and Wheat were obtained from various publications and records published by Directorate of Land Records, Chhattisgarh. The study covers 15 years from 2000-01 to 2014-15.

The general form of formula can be written as

Linear model

$$Y = a + bx$$

Where,

Y = dependent variable (area, production and productivity)

X = independent variable (years)

A = intercept/Constant

B = regression co-efficient

Exponential model

$$Y = ab^x$$

$$\text{Or, } \log Y = \log a + x \log b$$

Results and Discussion

Paddy

The Trend coefficient for area was positive, significant and highest for Chhattisgarh plains than other two regions Bastar plateau and Northern hills. Trend rate for production was positive in all the three regions but significant only in Chhattisgarh plains, confirming the facts that the total production increased significantly and this indicated that producers allot more area under paddy. In Chhattisgarh Plain, the productivity trend was positive and significant and in view of the production trends, it could be concluded that paddy is an important crop in this area and in whole state.

Table 1: Agro climatic region wise Trend in area, production and productivity of Paddy

Agroclimatic Regions	Area		Production		Productivity	
	Constant A	Coefficient B	Constant A	Coefficient B	Constant A	Coefficient B
Chhattisgarh Plains	2572.710	13.655**(4.116)	3014.568	141.219*(52.855)	1186.063	44.424*(19.892)
Bastar plateau	624.968	0.868(0.486)	740.376	28.400(18.348)	1188.801	42.340(28.473)
Northern Hills	563.105	-0.437(0.262)	587.661	15.241(11.277)	1041.119	28.368(20.017)
Chhattisgarh	3760.791	14.086**(4.207)	4342.606	184.86*(80.437)	1164.999	41.846(20.742)

*And **denotes level of significance at 5 percent and 1 percent respectively
Figures in parentheses shows Standard error of coefficients.

Maize

As regards the slope of area, it was positive in all the agro climatic regions, but significant only in Bastar Plateau. In case of production, the positive and significant slope was observed in all the agro climatic regions and the state as whole. Similarly in relation to productivity, the slope was found to be positive and significant in all the agro climatic

regions. The trend values for all the agro climatic regions were positive. The trend coefficient of productivity was found to be positive in all the agro climatic regions but high in the case of Bastar Plateau, followed by Northern Hills and Chhattisgarh Plains. Therefore it could be concluded that maize is an important crop and producers should allot more area under maize.

Table 2: Agro climatic region wise Trend in area, production and productivity of Maize

Agro climatic Regions	Area		Production		Productivity	
	Constant A	Coefficient B	Constant A	Coefficient B	Constant A	Coefficient B
Chhattisgarh Plains	16.570	0.392(0.347)	6.833	2.221**(0.422)	631.754	76.014**(11.642)
Bastar Plateau	22.466	1.396**(0.066)	17.675	5.066**(0.414)	1011.308	81.790**(10.513)
Northern Hills	51.483	0.044(0.073)	37.698	4.071**(0.737)	744.213	76.070**(13.263)
Chhattisgarh	87.622	2.036**(0.278)	62.208	11.358**(1.301)	813.947	78.698**(10.860)

*And **denotes level of significance at 5 percent and 1 percent respectively.
Figures in parentheses show Standard error of coefficients.

Wheat

The positive slope of area at Chhattisgarh was highest in Chhattisgarh Plains followed by Northern Hills and both were significant. Trend coefficients for area was negative and non-significant only in Bastar Plateau. In case of production at whole Chhattisgarh level, Chhattisgarh Plains and Northern Hills showed increasing trend whereas Bastar Plateau indicated a tendency to fall in successive years. The trend

coefficients for production were found positive and significant in case of Chhattisgarh Plains and Northern Hills. The trend coefficient of productivity was found to be positive in all the agroclimatic regions but high in Chhattisgarh Plains followed by Northern Hills and Bastar Plateau. The trend coefficients for area and production were negative in Bastar Plateau.

Table 3: Agro climatic region wise Trend in area, production and productivity of Wheat

Agro climatic Regions	Area		Production		Productivity	
	Constant A	Coefficient B	Constant A	Coefficient B	Constant A	Coefficient B
C. G Plains	62.731	1.050**(0.347)	45.751	3.688**(0.590)	755.118	36.491**(6.332)
Bastar Plateau	2.454	-0.095(0.015)	4.616	-0.165(0.074)	1812	18.440(35.983)
Northern hills	25.22	0.103*(0.047)	25.72	0.923**(0.292)	1032	29.414*(10.192)
Chhattisgarh	89.654	0.492(1.172)	76.089	4.446**(0.768)	888.83	53.457(44.864)

*And **denotes level of significance at 5 percent and 1 percent respectively
Figures in parentheses show Standard error of coefficients.

Summary and Recommendations

Trend analysis showed that paddy crop gained highly

significant with respect to area in Chhattisgarh Plains. The trend analysis also shows that all the agro climatic regions

were positive except Northern Hills in case of area. In whole Chhattisgarh, area was highly significant.

It was found that maize crop gained highly significant with respect to area, production and productivity in Bastar Plateau. All the agro climatic regions were positive and production and productivity gained highly significant in all the agro climatic regions. In whole state, area, production and productivity were highly significant.

In Chhattisgarh Plain trend analysis showed that wheat gained highly significant with respect to area, production and productivity, and for production and productivity Northern Hills showed the same result. In whole Chhattisgarh production was highly significant for wheat.

When a very substantial portion of the population is dependent on agriculture, a situation where nearly 80% of a state's area is covered only by one crop, immediate attention to turn them into double crop area is needed. It's downward trend in area allocation and production than productivity. Therefore, all attempts should be required to extend the available improved technology to the farmers and change its adoption. Intensive need oriented researches should be done and on that basis planning and designing should be made in such a way which will ideally be fruitful. A comprehensive survey may be undertaken by the competent agencies to identify the problem faced in cultivation of paddy, wheat and especially maize crop whose increase in percent shows's producers interest in this crop.

Reference

1. Agricultural statistics at a Ganceagri@nic.in APEDA. Cereals, apeda. gov. in, 2015.
2. Deka N, Saramah Ak. Growth trends in area, production and productivity of Banana in Assam. Agricultural situation in India. 2004; LXI(3):131-132.
3. Department of Agriculture and Cooperation. Annual Report. Ministry of agriculture, Government of India, 2014, 5-6.
4. Lin M, Huybers P. Reckoning wheat yield trends. Environmental Research Letters, 024016.32. 2012; 7:12.
5. Olubodun OO, Patidar P. Districts wise of Maize Production Forecast in Madhya Pradesh, 2015, 5.
6. Singh G, Chandran H. Growth trends in area and productivity of total food grain production in Madhya Pradesh. Agriculture situation in India. 2001; 57(1):597-602.
7. Toncheva R, Samalieva A, Klevtzov A. Trends of wheat yield variability by planning region of Bulgaria for 1960-2006. 2008; 45(4):297-301.
8. Tripathy S. Growth and Trends in Area, Yield and Production of Rice in Orissa, Agricultural Situation of India. 1996; 2(10):661-664.