



DECADE TREND ANALYSIS OF AREA, PRODUCTION AND PRODUCTIVITY OF PADDY IN BASTAR REGION OF CHHATTISGARH STATE

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Abstract

The growth rates of rice for three distinct administrative like district, regions and by State of Chhattisgarh were studied using the time series data from 2000-01 to 2011-12. The growth pattern was examined by fitting on exponential function ($Y=ABt$). The growth pattern in area, of rice showed a downward trend at state regional level and district level; in production of rice it was showed an upward trend at state and regional level and a downward in district level, in the yield, the growth pattern was an upward at state, regional and district level. At state level showed highest growth rates in production and yield during the study period and in area, it was showed decline trend.

Key words : Trend analysis, area, production and productivity, growth rates.

Introduction

Chhattisgarh are known as rice bowl of central India. Chhattisgarh the newly emerged state in the eastern part of India is relatively under developing with regards to agricultural productivity as compared to most of the Indian states. This state has varied soil types, large tribal population, surplus manpower and favorable agro-ecological conditions through which we can attain sustainability in the agriculture sector. In Chhattisgarh, rice is grown in 3.77 m. ha its cover 8.58% to all India area, with average yield of 1597 kg/ha and production is 6.03 million tonnes (Anonymous, 2012). About 80 per cent of the population in the State is engaged in agriculture and 43 per cent of the entire arable land is under cultivation. Paddy is the principal crop of the State.

Rice is grown predominantly during kharif season as rain fed crop having 2.39 lakh hectare area but the productivity of this crop is very low 08.53 qt/ha in Bastar region of Chhattisgarh, India. The irrigated area (1.67%) and fertilizer use (4.6 kg/ha.) in the Bastar district are very less, which is insufficient to supply adequate nutrient to the crop. In Bastar district, the area under *kharif* paddy was about 137.60 thousand hectare, production is 244.70 thousand tones and productivity is 1778 kg/ha. Rice is an important food crop of India and stands first in

area and second in total food production.

Among the rice growing countries, India has the largest area under rice in the world (43.97 million ha) with a total production of 94.87 million tonnes during 2011-12 and it stood next only to China in the world with respect to production. But, the yield levels in India are low at 2.37 tonnes per ha compared to other major rice producing countries *viz.*, Japan (6.52 t/ha), China (6.24 t/ha) and Indonesia (4.25 t/ha). About 67 per cent of the area under paddy in India is under HYVs (Anonymous, 2012). The production and productivity levels of rice in India are expected to reach respectively 130 million tonnes and 3 tonnes/ha by 2010, and 160 million tonnes and 3.5 tonnes/ha by 2020. Rice is consumed both in urban and rural areas and its consumption is growing due to high income elasticity of demand. To meet the growing demand a rapid increase in paddy production is needed. But, there is little scope to increase the area under paddy and hence increase in production has to come from increase in productivity with an improvement in efficiency of production.

Materials and Methods

The district wise data on area, production and productivity of paddy of the state was collected from the State Agriculture department, Raipur (C.G.), India. In order to calculate the compound growth rate, 10 years

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data from 2001-02 to 2012-13 were collected.

Computation of compound growth rate

To compute the growth rate of area, production and productivity of paddy in the state the exponential function of the following form were used:

$$Y = A B^t$$

Taking log on both sides

$$\text{Log } Y = \text{log } A + t \text{ log } B$$

Assuming $\text{log } Y = y$

$$\text{log } A = a$$

$$\text{log } B = b$$

We get

$$Y = a + b t \quad (t = 1, 2, \dots, n)$$

After regression between y and t , we have value of a and b .

a = Constant

b = Coefficient

$$\text{As } b = 1 + r$$

Hence, $r = b - 1$

r = Compound growth rate

$$= (\text{antilog of } b-1) * 100$$

t = Time variable ($t = 1, 2, \dots, n$)

b = Regression coefficient

y = Index number of area, production and productivity of paddy.

Results and Discussion

Growth in area, production and productivity of paddy just provide the status of the crop and computed by district, by Bastar plateau and by state from 2000-01 to 2011-12. The significant growth of area and productivity of paddy was observed in Chhattisgarh State as well as in Bastar district and Bastar Plateau during the period of study 2000-01 to 2011-12. It was found to be (-3.1*), (-3.19*) and (-1.26) per cent growth in area of paddy in the State, Bastar Plateau and Bastar District in 2000-01 to 2011-12, which was significant 5 per cent level of probability. Table 1 shows that and detail insight picture of paddy was understood through estimation of compound growth rate of area, production and productivity over the period of 2000-01 and 2011-12.

Growth in area of paddy

Growth in area of paddy was -3.1 in bastar district, -3.19 in bastar plateau and -1.26 in Chhattisgarh State, which was observed to be significant at 5 per cent level

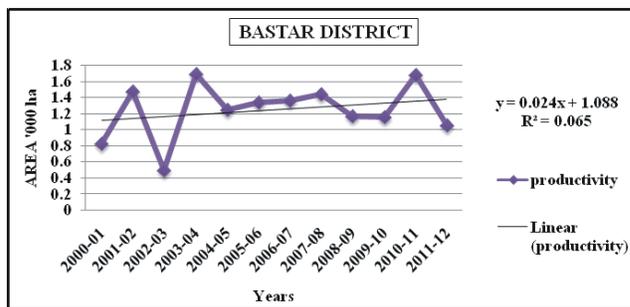


Fig. 1 : Trend of area of paddy in Bastar district.

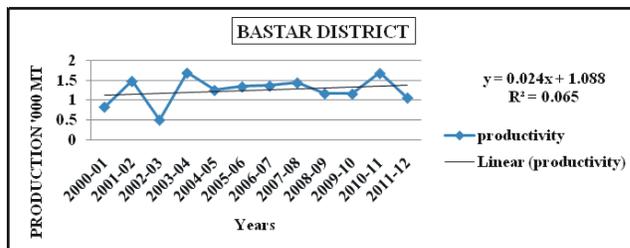


Fig. 2 : Trend of production of paddy in Bastar district.

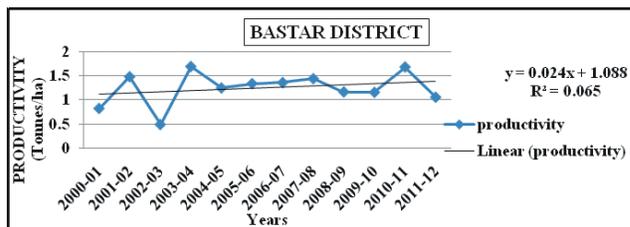


Fig. 3 : Trend of productivity of paddy in Bastar district.

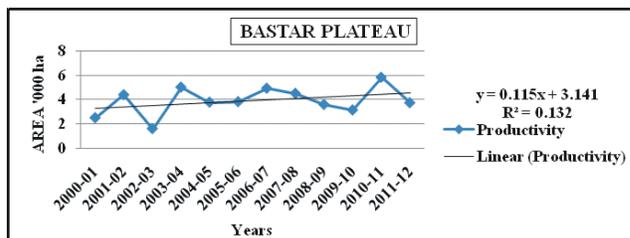


Fig. 4 : Trend of area of paddy in Bastar plateau.

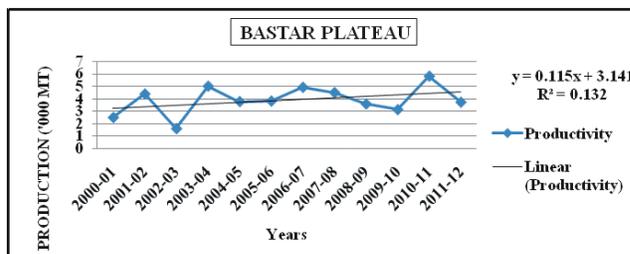


Fig. 5 : Trend of production of paddy in Bastar Plateau.

of probability. The growth was highest in bastar plateau followed by bastar district and Chhattisgarh State. The growth pattern in area was showed a downward trend at state level, regional level and distict level.

Growth in production of paddy

In production of paddy, significant growth was noticed

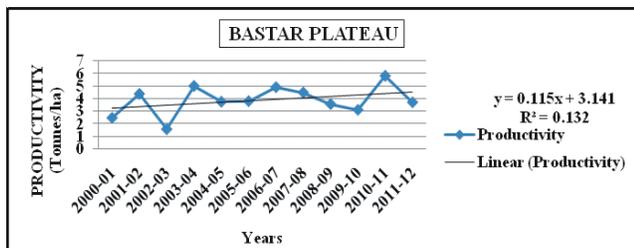


Fig. 6 : Trend of productivity of paddy in Bastar Plateau.

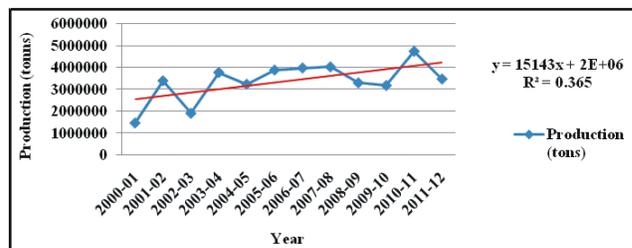


Fig. 8 : Trend of production of paddy in Chhattisgarh State.

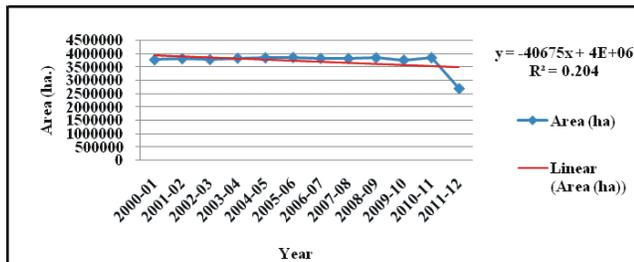


Fig. 7 : Trend of area of paddy in Chhattisgarh State.

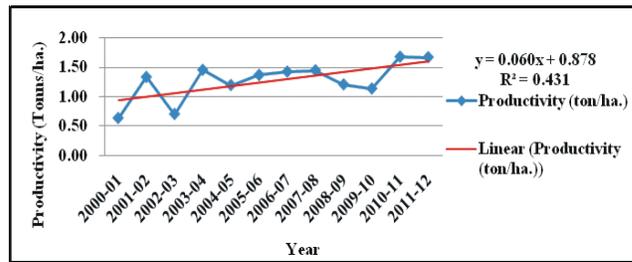


Fig. 9 : Trend of productivity of paddy in Chhattisgarh State.

Table 1 : Compound growth rate of area, production and productivity of paddy crop in Bastar district, Bastar plateau and Chhattisgarh State (in per cent).

Particulars	Area	Production	Productivity
Bastar District	-3.1*	-0.22	2.95
Bastar Plateau	-3.19*	0.62	3.8
Chhattisgarh State	-1.26	4.38	5.7*

(-0.22), (0.62) and (4.38) per cent for the state, Bastar Plateau and Bastar district, respectively. The growth pattern in production of paddy was showed an upward trend at state level and regional level of bastar plateau and decline trend at district level.

Growth in productivity of paddy

Growth rate of productivity of paddy was significant in the district and found to be (2.95), Bastar Plateau (3.8) and state (5.7*) per cent, respectively. The growth pattern in yield of paddy was showed an upward trend at state, regional and district level. The highest growth rates were notice at state level followed by regional level and district level.

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