

## Study on Growth of Major Agricultural Crops in Birbhum District

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**Abstract:** The growth of agricultural sector in recent past has been evidenced to be slow. To cope with the fast increasing food and employment demand of the teeming population of the country the growth in agriculture is the crucial need of the hour. So the present state of Indian agriculture is a matter of serious concern and is a need to ponder over its future. In view of this, an effort has been made in this paper to study the growth of major agricultural crops in Birbhum district which is one of the major food grain producing districts in West Bengal. It has been observed that despite the negative growth in net cropped area, the cropping intensity has grown with a stable positive growth as the gross cropped area has been increased over the time. It is implicating the crop diversification of the district has been taken place though the expansion of area under all crops except aus rice. Apart from aus rice, production of all crops during the reference year has also shown positive growth. The productivity of almost all major crops has been showing negative growth trend except aman and aus rice. So there is least possibility to increase area under crops which calls for further adoption of improved technologies in the agricultural sector. Improved agricultural technologies are basically based on seed-fertilizer technology, so attention may be paid for increase and balanced use of fertilizer in different crops in Birbhum district. Steps may be taken to disseminate the latest agricultural technologies in order to arrest the fluctuation in productivity of major crops in Birbhum district.

**Keywords:** Growth, Rice, Wheat, Total Pulses, Total Oilseeds, West Bengal.

### INTRODUCTION

Agriculture is the largest sector of economic activity and enhancement of agriculture is an essential condition for the development of the national economy because it contributes a lion share of gross domestic product which was 21.7 per cent during 2005-06 [1]. Economic reforms initiated since 1991 have put the Indian economy on a higher growth trajectory and annual growth rate in the total GDP has accelerated from below 6 per cent during the initial years of reforms to more than 8 per cent in recent years 2007-08 [1]. On the other hand the growth performance of Indian agriculture was somewhat favourable during the initial years of economic reforms (1991-96), but the post WTO period i.e. 1996 onwards witness a sharp decline in the growth of almost all sub-sectors of agriculture. Only 0.79 per cent growth has been observed in case of crop production during 1997-2005 under agricultural sector [2]. Contextually since the Ninth Five Year Plan, India has been targeting a growth rate of more than 4 per cent in agriculture, but the actual achievement has been much below to the target. Slow growth in agriculture and allied sectors can lead to acute stress in the economy because a large portion of population still dependent upon this sector. The growth of agriculture has been declined to meager 2.8 per cent during 2006-

07 (moneycontrol.com) [3]. So a scrutiny on agricultural growth is prime need of the hour.

Birbhum is one important agricultural crop producing districts of West Bengal in India comprises only 5.12 per cent geographical area of the state. Besides, Birbhum produces 7.03 per cent food grain of the total food grain production of the state. An attempt has been made in this paper to critically examine the growth rate in agriculture of Birbhum district, West Bengal in respect of area, production and productivity of major crops.

### METHODOLOGY

The study has been conducted based on secondary data. Secondary data from 1996-97 to 2005-06 has been collected from Statistical Abstract, Government of West Bengal. To ascertain the trends in the growth of area, production, productivity, gross cropped area, net cropped area, fertilizer consumption etc., the exponential function has been fitted which can be expressed as  $Y = b^t$ , where  $Y =$  area/production/productivity/gross cropped area/net cropped area/fertilizer consumption etc. under the study year  $t = 1, 2, 3, \dots, n$ ,  $a =$  intercept,  $b =$  regression coefficient. Therefore,  $\text{Log } Y = \text{Log } a + t \text{ log } b$ , where  $b = (1+r)/100$  and  $\text{CGR} = (\text{antilog } b - 1) \times 100$

**RESULTS AND DISCUSSION**

Birbhum district, West Bengal has population of 30.15 lakhs among which 91.43 per cent people live in rural areas and 9.23 lakh people (30.61 per cent of total population) is directly engaged in agriculture as agricultural workers. The decadal growth of population on 2001 was 17.66 per cent. So a significant growth rate

must be achieved for the sustenance and meeting the food need of the district. Rice is still the major crop of Birbhum district as it covers 74.38 per cent area of gross cropped area. Keeping this in view major crops of the district have been sub-divided into two groups i.e. rice and other agricultural crops.

**Table 1: Area, production and productivity of rice in Birbhum district during 1996-97 to 2005-06 with the compound growth rate (Area in 000 ha, Production in 00 ton and Productivity in MT/ha)**

Year	Aus Rice			Aman Rice			Boro Rice			Total Rice		
	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1996-97	8.6	26.9	2.34	310.4	743.8	2.4	31.3	94.4	3.02	350.3	858.3	2.45
1997-98	8.3	20.3	2.45	310	840.9	2.71	50.2	158.9	3.17	368.5	1020	2.77
1998-99	8.9	25.4	2.85	312.9	890.3	2.85	77.5	272.9	3.52	399.3	1188	2.97
1999-00	9.4	20.9	2.22	307.1	783.3	2.55	77.6	238.3	3.07	394.1	1043	2.65
2000-01	5	10.5	2.1	261.8	609.1	2.33	51.6	176.9	3.43	318.2	796.5	2.5
2001-02	6.5	15.6	2.4	308	911.9	2.96	79.6	229.9	2.89	394.1	1157	2.94
2002-03	6.3	16.8	2.67	315.7	902.9	2.86	79.5	227.7	2.86	401.5	1147	2.86
2003-04	5.1	12.2	2.39	300.6	878.1	2.92	70.6	220	3.12	376.3	1103	2.93
2004-05	5.2	13.2	2.54	308.7	855.3	2.77	74	219.5	2.97	387.9	1088	2.8
2005-06	5.2	13.0	2.5	314.5	948.4	3.02	48.8	154.9	3.17	368.5	1116	3.03
CGR (%)	-6.74	-6.38	0.40	0.08	1.87	1.79	4.18	3.55	-0.59	0.47	1.90	1.41

(A = Area, P= Production, Y = Productivity)

Source: Statistical abstract, West Bengal, 2004-05 [4-6]

On an average, the area, production and productivity of different crops have been found to be instable over the years in Birbhum district. Rice is the main crop and cultivated in three seasons i.e. aus, aman and boro in Birbhum district, West Bengal. However among the crops, aman rice is the main crop in Birbhum district. This is almost a rainfed crop and covers on an average 93.65 per cent area of the net cropped area and 60.34 per cent of the gross cropped area. The area of aman rice has been found to be static with a very little positive growth of 0.08 per cent (Table 1). The growth rate of production and productivity of aman rice during the period under study are 1.87 and 1.79 per cent respectively (Table 1).

Area under aus rice has attended highest i.e. 8.9 thousand hectares in 1998-99 from 8.6 thousand hectares in 1996-97 and it has drastically reduced to 5.2 thousand hectares in 2005-06 (Table 1). Accordingly, the compound growth rate (CGR) has found to be negative (-6.74 per cent) in respect of area under aus rice. However, the productivity of aus rice has shown a very little positive growth of 0.40 per cent during this period. On the contrary, the production of aus rice has shown a fluctuating trend and the overall production has reduced from 26.9 MT in 1996-97 to 13 MT in 2005-06 which shows a negative growth rate of -6.38 per cent.

Area and production of boro rice has found to be fluctuating over the years. However, the area and production of boro rice has shown a positive growth of 4.18 per cent and 3.55 per cent respectively, during this period. On the contrary, the productivity of boro rice has been found to be negative (-0.59 %) during this period. The overall area, production and productivity of total rice have been found to be positive during the period under study.

Table 2 presents area, production and productivity of wheat, total pulse, total oilseeds and potato in Birbhum district from 1996-97 to 2005-06. The most interesting feature is that the growth in area and production of these crops has been observed to be positive but simultaneously there is negative growth in respect of the productivity of these crops. At the same time, the area (0.75 per cent) and production (0.31 per cent) under potato has shown positive growth. However, the growth in area and production under potato is comparatively lower than that of wheat, total pulses and total oilseeds during the period under study. Similarly, the growth in productivity of potato is also negative (-0.43 per cent) during this period.

**Table 2: Area, production and productivity of wheat, total pulse, total oilseeds and potato in Birbhum district during 1996-97 to 2005-06 (Area in Thousand Hectare, Production in Thousand Ton and Productivity in MT/ha)**

Year	Wheat			Total Pulse			Total Oilseed			Potato		
	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1996-97	19.1	53.3	2.79	12.6	13	1.03	21.7	24.5	1.13	10.7	261	24.4
1997-98	21.0	54.2	2.58	11.6	10.5	0.91	20.7	19.3	0.93	10.0	180.9	18.1
1998-99	21.6	52.6	2.44	9.6	8.6	0.9	28.4	27.7	0.98	12.5	248.3	19.9
1999-00	20.8	57.1	2.75	10.7	10.5	0.98	29.8	27.7	0.93	14.1	329.9	23.4
2000-01	26.9	77.7	2.89	20.2	16.8	0.83	37.4	42.1	1.13	12.8	266.6	20.8
2001-02	27.2	71.8	2.64	18.7	17.9	0.96	39.1	38.8	0.99	12.6	273.2	21.7
2002-03	27.1	80.3	2.96	15.4	13.6	0.88	36.4	36.5	1.00	11.5	279.9	24.3
2003-04	30.2	79.3	2.63	16.5	18.1	1.1	39.5	43.1	1.09	9.8	206.6	21.1
2004-05	29.1	74.8	2.57	15.7	12.4	0.79	42.5	33	0.78	11.2	214.3	19.1
2005-06	30.1	75.6	2.51	18.5	14.5	0.78	36.8	34.3	0.93	13.8	283.0	20.5
CGR (%)	5.5	5.22	-0.28	5.79	4.14	-1.55	7.59	6.08	-1.41	0.75	0.31	-0.43

(A = Area, P= Production, Y = Productivity) Source: Statistical abstract, West Bengal [4-6]

**Table 3: Net cropped area, gross cropped area, cropping intensity and fertilizer consumption in Birbhum district from 1996-97 to 2005-06 (Area in thousand ha) (Fertilizer consumption in thousand MT)**

Year	Net Cropped Area	Gross Cropped Area	Cropping Intensity (%)	N	P	K	Total fertilizer consumption	Total fertilizer consumption/ ha of gross cropped Area (kg/ha)
1996-97	316.74	452.88	142.98	32.98	14.78	8.23	56.0	123.63
1997-98	331.11	474.08	143.17	33.9	16.67	9.8	60.4	127.33
1998-99	339.31	514.32	151.57	35.72	18.64	10.8	65.2	126.69
1999-00	330.62	515.5	155.91	39.23	21.27	13.7	74.2	143.93
2000-01	337.5	458.67	135.90	33.19	16.34	15.07	64.6	140.84
2001-02	320.32	533.68	166.60	34.10	17.67	16.78	68.6	128.44
2002-03	326.85	537.28	164.38	32.39	18.33	17.04	67.8	126.11
2003-04	311.45	516.71	165.90	33.4	16.4	15.3	65.1	125.98
2004-05	320.61	532.99	166.24	34.2	18.5	15.1	67.7	127.01
2005-06	319.96	517.1	161.61	32.2	18.3	13.4	63.9	123.57
CGR (%)	-0.39	1.41	1.81	-0.63	1.01	6.19	1.08	- 0.52

Source: Statistical abstract, West Bengal [4-6]

The growth rates of net cropped area, gross cropped area, cropping intensity during the study period have been presented in Table -3. The annual compound growth rate of net cropped area in Birbhum has been found to be negative (-0.39 per cent). However, the CGR of gross cropped area and cropping intensity has been found to be positive comprising of 1.41 per cent and 1.81 per cent, respectively. The annual compound growth of nitrogenous fertilizer has been found to be negative, where as the growth rates of phosphates and potash fertilizers have been found to be positive during the period under review. Among the fertilizers, the consumption of potash has increased significantly during the period under review.

### CONCLUSION

Birbhum district is one of the major food grain producing districts in West Bengal. Despite the negative growth in net cropped area, the cropping intensity has

grown with a significant extent and the gross cropped area has been increased over the periods of time. It is worthwhile to note that the diversification of crops has been taken place during the period due to the efforts of improved technologies. The growth in area under crops has been found to be positive except aus rice. The productivity almost all major crops has been showing negative growth trend except aman and aus rice. So there is least possibility to increase area under crops which calls for further adoption of improved technologies in the agricultural sector. Improved agricultural technologies are basically based on seed-fertilizer technology, so attention may be paid for increase and balanced use of fertilizer in different crops in Birbhum district. Steps may be taken to disseminate the latest agricultural technologies in order to arrest the fluctuation in productivity of major crops in Birbhum district.

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