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## A study on growth of major Crops and socio-economic status of the farmers in Janjgir-Champa district of Chhattisgarh

**Meenakshi Chandra, Sumit B Wasnik, Sneha Pandey and Mamta Patel**

**Abstract**

An attempt has been made in this study with the specific objective to determine the economic analysis of growth in area, production and productivity of major crops in Janjgir-Champa district of Chhattisgarh. The major crop under this study was paddy, wheat and mustard. For the study a sample of hundred and fifty farmers from different categories of land holdings were selected randomly from five villages namely Chikhalraunda, Malni, Bhothia, Dngia And Salni. The primary data was collected by interviewing the crop growers of the sampled household with the help of well prepared questionnaire for growth rate analysis for the year 2017-18. Secondary data for area, production and productivity was collected from Directorate, Land Record, Raipur, Directorate of Economics and Statistics. Exponential method is used to analyse the growth rate. Per farm total cultivated area at marginal, small, medium and large farms is observed about 1.99 hectares, 2.63 hectares, 2.97 hectares 4.6 hectares respectively along with 3.04 hectares as an overall average. The findings of this study revealed that the area covered under different crops in kharif is more than that from rabi in the study area which is observed as an overall area of 53.60 per cent in kharif and 46.39 per cent area in rabi. The results on compound growth rate of paddy, wheat and mustard was obtained in detail under the study.

**Keywords:** Crops and socio-economic, Janjgir-Champa, farmers

**Introduction**

Agriculture is considered as the principal occupation of the human population in Chhattisgarh state. Chhattisgarh State is also known for the Rice bowl of India and produces 19116 varieties of rice. As per the estimate done by the government, net sown area of the state is about 4.828 million hectares and the gross sown area is about 5.788 million hectares. About 80 per cent of the population of the state is the rural one, and the main livelihood of the villagers is agriculture and agriculture based small industries.

Rice is the widely consumed staple cereal grain for a large part of the human population in the world and belongs to the grass species *Oryza sativa* (Asian rice) or *Oryza glaberrima* (African rice). There are three different types of rice namely japonica, javanica, and indica which have specific characteristics. Wheat is the most widely grown seed and is considered as staple cereal food grain around the world belonging to species *Triticum*. It is used to prepare chapattis, bread, pasta, biscuits, noodles, semolina, etc. and also to prepare ethanol, beer, wheat based raw material for cosmetics, polymers, adhesives, resins etc. In Chhattisgarh, mustard is being grown in an area of about 49.17 thousand hectares, with average production around 21.82 thousand tons annually. Mustard plant belongs to family Brassicaceae. Rapeseed (*Brassica campestris*) commonly called is Sarson or Toria is herbaceous annual plant shorter than mustard between 45-150 cm whereas the common name of Mustard (*Brassica juncea*) is rai. Apart from the several domestic uses, recent researches have studied several mustard varieties with high oil contents which is used for the production of biodiesel, a renewable liquid fuel, similar to diesel fuel. The oil content of these seeds is 25-45% which is used as a cooking medium, preservative for pickles, lubricants, etc.

Globally, European Union is the leading producer of mustard seed with contribution of 36 per cent followed by China, Canada and India with contributions of 22 per cent, 24 per cent and 13 per cent respectively in the world.

**Materials and Methods****Sampling procedure**

By taking the Triennium Ending (TE) averages of area, production as well as productivity of major crops grown in Janjgir-Champa, top three major crops *viz.* paddy, wheat and mustard are selected.

The district consists of 9 blocks and 10 tehsils, out of these 9 blocks, Jaijaipur block constitutes about 12.84 per cent area of the total area under paddy crop which is highest among the areas of other blocks under paddy, so this block is selected purposively. The area under wheat and mustard in the selected block constitutes about 12.29 per cent and 9.26 per cent area of the total area under wheat and mustard in the district respectively.

Jaijaipur block consists of 72 villages out of which Chikhalraunda, Malni, Bhothia, Dongia, Salni are selected for the study purpose. Primary data is collected by using separate specifically designed questionnaires and having direct contact to the farmers. It includes the basic questions regarding social groups of the sampled households along with their land holdings. A proportionate number of respondents are selected from each village and from each category to make a sample of 150. About 38.66 per cent of respondents are under marginal category, 30.66 per cent under small, 26 per cent under medium and 4.66 per cent under large category.

**Table 1:** Number of households under different categories in Jaijaipur block

S. No.	Category	Number of households
1.	Marginal (Below 1.0 ha.)	58 (38.66)
2.	Small (1.0-2.0 ha.)	46(30.66)
3.	Medium (2.0-4.0 ha.)	39(26)
4.	Large (Above 4.0 ha.)	7(4.66)
	Overall	150(100)

The secondary data on study area is collected from the office of Deputy Director of Agriculture of Janjgir-Champa district and Commissioner of Land Record and Settlement, Chhattisgarh which includes information about demography and the year wise agricultural statistics of the district.

#### Analytical tool

The simple average and percentage statistical tools will be applied to represent the results of study to examine the pattern of growth in area, production as well as productivity of major crops in study area, Compound Growth Rate (CGR) will be computed. The details of the formulae are given as under:

#### Compound Growth Rate (CGR)

$$Y = AB^t$$

Taking logarithms on both sides

$$\log Y = \log A + t \log B$$

Assuming,

$$\log Y = y$$

$$\log A = a$$

$$\log B = b$$

We get,  $y = a + bt$

#### Where

$t = 1, 2, 3 \dots \dots n$

$y =$  area/production/productivity of crops.

After regression between  $y$  and  $t$

We have value for  $a$  and  $b$

#### Where

$a =$  Constant

$b =$  regression coefficient

$$As, b = 1 + r$$

Hence,

$$r = b - 1$$

Therefore,

$$r = (Anti - \log \text{ of } b - 1) \times 100$$

Where,

$r =$  Compound growth rate

## Results and Discussion

### General characteristics of sampled households

The demographic characteristics of the sampled farmers in the study area shows that out of the total selected households, 38 per cent comes under marginal category, 30.66 per cent under small category, 26 per cent under medium and 4.66 per cent consists of large households. 52.07 per cent consists of male population whereas 47.92 consists of female. The average family size is estimated as 5, 6, 4 and 6 members in numbers in the respective categories with an overall average of 5 members in a family. About 18.96 per cent of the population comes under the age group of below 14 years while 75.58 between 14-60 years and 5.45 per cent of the population are above 60 years of age group. About 9.22 per cent of the total population is observed as illiterate.

Land use pattern of sampled farm is observed in table 4.2. The table shows per farm total cultivated area and is estimated to be 1.99 ha., 2.63 ha., 2.97 ha. and 4.6 ha. for marginal, small, medium and large farms respectively. About 70.85 per cent and 40.68 per cent of the land at sampled farm is leased in by the marginal and small farmers respectively whereas 17.50 and 33.47 per cent of the land is leased out by the marginal and large farmers respectively. The irrigated area in both kharif and rabi seasons is also observed and is estimated as an overall of 26.90 per cent in kharif and 86.54 per cent in rabi.

Canals the major source of irrigation in the study area which accounts for about 76.70 per cent of the area covered by marginal category, 47.31 per cent by small, 1.7 per cent by medium and 47.68 per cent by large farms with an overall 50.90 per cent area respectively. Tube well is another source of irrigation followed by canal which accounts for about 43.52 per cent area of the total irrigated area.

Maximum area is covered under different crops in kharif season than that from rabi. The total cropped area is observed about 3.41 ha., 4.82 ha., 5.63 ha. and 8.88 ha at marginal, small, medium and large farms respectively out of which an overall average of 53.60 per cent area is covered in kharif season and about 46.39 per cent area is covered in rabi season. The cropping intensity shows an increasing trend from marginal to large farms which is estimated about 171.35 per cent, 183.27 per cent, 189.56 per cent and 193.04 per cent at marginal, small, medium and large farms respectively.

### Growth rates of area, production and productivity of major crops

#### Area, production and productivity of major crops in Janjgir-Champa district

From table 2. it is observed that area under paddy crop increased at negligible rate i.e. from 254050 ha. in 2007-08 to 254371 ha. in 2016-17 whereas production shows an increasing trend of about 423290 metric tons in the year 2007-08 to 834223 metric tons in 2016-17.

Similarly, the area, production and productivity of wheat and mustard respectively. It is observed from the table that area under both the crops decreased in the year 2016-17 than the year 2007-08 i.e. to 1765 ha. from 2780 ha. in case of wheat whereas to 909 ha. from 1600 ha. in case of mustard. The

production of wheat in the year 2007-08 was 3660 metric tons which came down to 3334 metric tons in year 2016-17 while the production of mustard also decreased from 610 metric tons to 402 metric tons in the respective years.

**Table 2:** Area, production and productivity of paddy, wheat and mustard in Janjgir-Champa district (2007-08 to 2016-17)

S.N O.	Year	PADDY			WHEAT			MUSTARD		
		Area(ha.)	Production (metric tons)	Productivity	Area(ha.)	Production (metric tons)	Productivity	Area(ha.)	Production (metric tons)	Productivity
1	2007-08	254050	423290	1666.16	2780	3660	1316.54	1600	610	381.25
2	2008-09	249780	547910	2193.57	2480	3030	1221.77	1330	460	345.86
3	2009-10	250200	633420	2531.65	2810	4200	1494.66	1570	680	433.12
4	2010-11	248550	654500	2633.27	2710	4030	1487.08	1480	530	358.1
5	2011-12	248730	710930	2858.23	2600	4200	1615.38	1680	710	422.61
6	2012-13	249147	761543	3056.6	2210	3610	1633.48	1680	500	297.61
7	2013-14	257816	798017	3095.29	2135	3840	1798.59	1050	590	561.9
8	2014-15	253667	802349	3163	2074	3540	1706.84	1169	516	441.4
9	2015-16	253832	716366	2822.2	1826	3349	1834.06	1185	665	561.18
10	2016-17	254371	834223	3279.55	1765	3334	1888.95	909	402	442.24

*Source:* Directorate, Land Record, Raipur, Directorate of Economics and Statistics 2012-13.

**Table 3:** Area, production and productivity of paddy, wheat and mustard in Chhattisgarh (2007-08 to 2016-17).

S.NO .	Year	PADDY			WHEAT			MUSTARD		
		Area(ha.)	Production (metric tons)	Productivity	Area (ha.)	Production (metric tons)	Productivity	Area(ha.)	Production (metric tons)	Productivity
1	2007-08	3788210	4506390	1189.58	95040	104560	1100.16	51390	20660	402.02
2	2008-09	3752340	4229820	1127.24	94850	97410	1026.98	52020	19730	379.27
3	2009-10	3787730	6159020	1626.04	109190	118930	1089.2	53380	21690	406.33
4	2010-11	3793020	6028300	1589.31	103710	121760	1174.04	50270	20790	413.56
5	2011-12	3810160	6716360	1762.75	104830	135130	1289.03	49170	21820	443.76
6	2012-13	3871004	6962115	1798.52	102230	143230	1401.05	49170	23870	485.45
7	2013-14	3987721	6725746	1686.61	105033	140750	1340.05	47540	26990	567.73
8	2014-15	4035700	7977746	1976.79	103195	153321	1485.74	46564	24586	528
9	2015-16	3959746	5154328	1301.68	105785	142329	1345.45	46280	25963	560.99
10	2016-17	4052587	8793273	2169.79	102114	151078	1479.5	42918	18433	429.49

*Source:* Directorate, Land Record, Raipur, Directorate of Economics and Statistics 2012-13.

#### Compound growth in area, production and productivity of major crops in Chhattisgarh state and Janjgir-Champa district

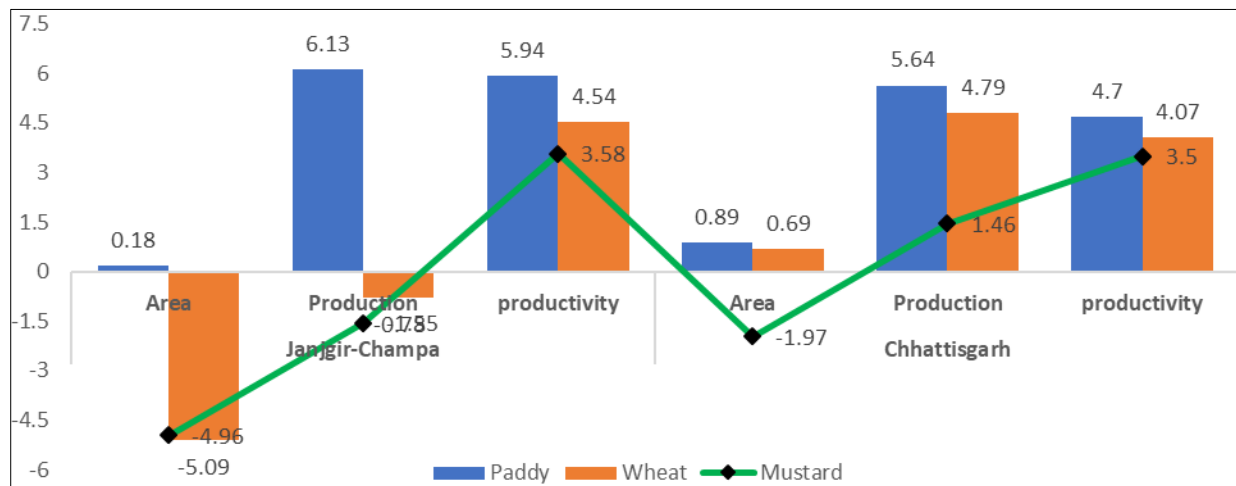
It is clear from table 4 that the compound growth rate of production and productivity of paddy crop in Janjgir-Champa district in last ten years is highly significant than area which is

estimated as 6.13 per cent and 5.94 per cent respectively. In Chhattisgarh, area is significant under paddy crop. In case of wheat crop the compound growth rate of production and productivity in Chhattisgarh state is significant whereas area under mustard in both Chhattisgarh and the selected district is significant which is computed as -1.97 and -4.96 respectively.

**Table 4:** Compound growth rates of area, production and productivity of major crops in Janjgir-Champa district and Chhattisgarh state. (2007-08 to 2016-17).

Crops	Janjgir-Champa			Chhattisgarh		
	Area	Production	productivity	Area	Production	productivity
Paddy	0.18	6.13**	5.94**	0.89**	5.64*	4.7*
Wheat	-5.09**	-0.78	4.54	0.69	4.79**	4.07**
Mustard	-4.96**	-1.55	3.58	-1.97**	1.46	3.5*

(\*\* Significant at 1% level and \* Significant at 5% level).



**Fig 1:** Showing CGR of area, production and productivity of paddy, wheat and mustard in Janjgir-Champa district and Chhattisgarh state

### Conclusions

The education level of the sampled population up to higher secondary school. Agriculture is the main occupation of the sampled farmers. The per farm total cultivated area at marginal, small, medium and large farms is observed about 3.04ha as an overall average. Canal is the major source of irrigation followed by tube well. The area covered under different crops in kharif is more than that from rabi in the study area. The cropping intensity in the study area is computed as 171.35 per cent, 183.27 per cent, 189.56 per cent and 193.04 per cent at the respective farms in study area. The growth rate in production and productivity of paddy crop in Janjgir-Champa district in last ten years is highly significant while in the state area is significant by 0.89 per cent. The production and productivity of wheat is significant at 4.79 per cent and 4.07 per cent rate in the state while the area under mustard is negatively significant.

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