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Absolute and relative changes of major cereal crops in different agroclimatic regions of Chhattisgarh

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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 absolute and relative change for three major cereal crops paddy, maize and wheat and assess its variation in area, production and productivity. The result shows that although, paddy occupies the highest area and production in all the agroclimatic regions and state, but the relative change of maize area, production and productivity is found to be higher than paddy and wheat in all agro climatic regions and in the whole state. 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, absolute, relative, increase, 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 absolute and relative changes and have an estimate of likely supply of this crop as well as other cereal crops such as maize and wheat 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.
Looking to the high area and production of paddy and less of maize and wheat and its potential and future requirement, the present investigation is carried out for different agroclimatic regions of the state. The diagnoses of absolute and relative changes necessitate the prescriptive measure and needed technological development for higher level of productivity. Swaminathan (1977) [9] in his presidential address delivered at the annual conference of Indian Society of Agricultural Economics, pointed out that area and yield increased to the absolute gain in production in 1975-76 as compared to 1964-65 were 34.40 and 65.60 percent respectively in wheat on all India basis. Ahmad *et al*. (1998) [3]. The paper examines the change in cropping pattern in districts of Mahakoshal region; Madhya Pradesh, India. Paddy showed a positive absolute change in the area, in all districts expect Narsinghpur with maximum relative change of 48.92 percent in chhindwara. Among pulses and oilseeds, soybean area is increasing rapidly with relative change between 307.62 to 3484.61 percent in different districts. The component analysis revealed that soybean; paddy, maize and tur have demonstrated increase in technological adoption. Consequently their area and yield have increased significantly in Mahakoshal region. Olubodund and Patidar (2015) [8]. Carried out an investigation to study different districts of agroclimatic region of Madhya Pradesh. The study examines the relative position of maize and asses its adjustment in the cropping pattern.

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 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 absolute and relative changes of major cereal crops. 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

Absolute change=Yn-Yo

Where,

Yn = Mean value (area, production and productivity) for the last triennium ending.

Yo = Mean value (area, production and productivity) for the first base triennium ending.

Relative change =Yn – Yo/ Yo × 100

Results and Discussion

Paddy

The absolute and relative changes in area of Paddy in different agro climatic regions of Chhattisgarh have revealed an increasing trend over the last 15 years except in the Northern hill regions of Chhattisgarh. It may be noted from the table that there has been a tendency to bring more areas under cultivation by 216.02 thousand ha in the state. Thus there was a increase of 5.70 percent in the current period over the base period in the Chhattisgarh. In case of production, the data show that all the agro climatic regions reported an increasing trend as with a net increase of 3256.51tonnes and relative change of 74.24 percent, in Chhattisgarh. In Chhattisgarh state yield of paddy has gone up from 1158.27 kg/ha to 1909.60kg/ha between the two periods a rise of 751.33 kg/ha or nearly 64.86 percent.

Table 1: Absolute and Relative change in area, production and productivity of paddy in different agro climatic regions of Chhattisgarh

Agroclimatic Regions	Area'000 ha		Absolute change	Relative Change (%)	Production 000 tonnes		Absolute Change	Relative Change (%)	Yield Kg/ha		Absolute Change	Relative Change
	Current Period	Base Period			Current Period	Base period			Current period	Base period		
Chhattisgarh Plains	2802.621	2597.436	205.185	7.899	5389.276	3030.905	2358.371	77.810	1922.720	1166.866	755.854	64.776
Bastar Plateau	642.416	628.640	13.776	2.191	1328.087	736.339	591.747	80.363	2067.299	1169.029	898.270	76.839
Northern Hills	556.827	559.764	-2.936	-0.524	925.596	619.196	306.399	49.483	1661.964	1105.66	556.301	50.314
Chhattisgarh	4001.864	3785.840	216.025	5.706	7642.956	4386.441	3256.518	74.241	1909.609	1158.273	751.336	64.867

Maize

The area, production and yield under maize increased by 28.06 thousand ha, 150.37 tonne and 1019.40 kg/h in absolute terms whereas 29.95, 171.44, 108.97 percent in relative terms. Between the two periods. It is remarkable to note that all the agro climatic regions have registered an increase in the yield of maize in the current period over the base period. Although, the area and production of paddy is more in current period and base period, but the percent increase is registered more in area, production and yield of maize than paddy.

Table 2: Absolute and Relative change in area, production and productivity of maize in different agro climatic regions of Chhattisgarh

Agroclimatic regions	Area '000ha		Absolute change	Relative Change (%)	Production 000 tonnes		Absolute change	Relative Change (%)	Yield Kg/ha		Absolute Change	Relative Change
	Current period	Base Period			Current Period	Base period			Current period	Base Period		
Chhattisgarh Plains	26.023	16.487	9.537	57.845	46.204	14.716	31.489	213.981	1770.471	893.429	877.042	98.166
Bastar Plateau	42.175	25.007	17.169	68.656	90.212	28.214	61.998	219.738	2138.781	1126.689	1012.092	89.829
Northern Hills	53.582	52.220	1.363	2.609	101.669	44.780	56.889	127.042	1896.823	857.263	1039.560	121.265
Chhattisgarh	121.781	93.713	28.068	29.951	238.086	87.71	150.376	171.446	1954.864	935.457	1019.406	108.974

Wheat

As regards absolute change in area, production and yield of wheat in agro climatic regions of Chhattisgarh; it is observed that there was a tendency towards increase in area from 89.85 thousand ha to 103.48 thousand ha, 94.59 tonne to145.76 tonnes in production and 1047.27to 1408.95 kg/ha in yield at Chhattisgarh. Thus, there was a net increase of 13.636 thousand ha, 51.17 tonnes and 361.68kg/ha on absolute change basis and percentage increase came to 15.17, 54.09,34.53 percent in area, production and productivity.

Table 3: Absolute and Relative change in area, production and productivity of wheat in different agro climatic regions of Chhattisgarh

Agroclimatic regions	Area '000ha		Absolute change	Relative Change (%)	Production 000 tonnes		Absolute change	Relative Change (%)	Yield Kg/ha		Absolute Change	Relative Change
	Current period	Base period			Current period	Base period			Current period	Base period		
Chhattisgarh Plains	75.359	62.358	13.000	20.848	99.496	58.604	40.892	69.777	1320.508	930.788	389.720	41.870
Bastar Plateau	1.003	2.095	-1.092	-52.132	2.033	4.240	-2.207	-52.052	2049.275	1944.452	104.823	5.391
Northern Hills	27.125	25.397	1.727	6.801	44.239	31.751	12.488	39.330	1632.033	1250.589	381.444	30.501
Chhattisgarh	103.486	89.850	13.636	15.176	145.768	94.595	51.173	54.097	1408.957	1047.270	361.687	34.536

Summary and Recommendations

It was observed from the analysis that among the three major cereal crops paddy, maize and wheat largest area brought under paddy followed by maize and wheat in the state. Among the different agro climatic regions, Chhattisgarh Plain ranks first in terms of absolute increase in the area and production of paddy whereas Northern Hills showed the lowest increase in area and production. In relative term, Chhattisgarh Plains had the maximum increase in area whereas Bastar Plateau ranks first and Northern Hills are lowest in production. In case of productivity, Bastar Plateau registered the highest increase and Northern Hills lowest both in absolute and relative position.

In terms of absolute and relative change in maize, the highest increase was found in Bastar Plateau and lowest in Northern hills in area. In production, Bastar Plateau occupies the highest increase and Chhattisgarh Plains lowest in absolute term. Whereas in relative term, Bastar Plateau had the maximum increase and Northern Plains lowest. In case of yield, in absolute term, the highest net increase was found in Northern hills and lowest in Chhattisgarh Plains whereas, in relative term, the maximum increase was observed in Northern Hills and lowest in Bastar Plateau.

The highest increase in the area, production and productivity of wheat was observed in Chhattisgarh Plains in both absolute and relative term. Although area and production were negative in Bastar Plateau in both absolute and relative term but in respect of yield both in absolute and relative term all the three regions registered the positive value.

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. 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 producers interest in this crop.

Reference

1. Abid S, Shah NA, Hassan A, Farooq A, Masood MA. Growth and Trend in Area, Production and Yield of Major Crops of Khyber Pakhtunkhwa, Pakistan. Asian Journal of Agriculture and Rural Development. 2014; 4(2):149-155.
2. Agricultural statistics at a Glanceagri@nic.in APEDA. 2015. Cereals, apeda.gov.in
3. Ahmad MS, Mishra RS, Bhagat DV, Yadava HS. Shift in cropping pattern in Mahakoshal region of Madhya Pradesh over two decades. J of soils and crops. 1998; 8(2):134-138.
4. Bhatnagar S, Saxena KK. An estimate of area and production of wheat in Haryana. Agricultural situation in India. 2000; 56(2):665-667.
5. Department of Agriculture and Cooperation. Annual Report. Ministry of agriculture, Government of India, 2014, 5-6.
6. Dhillon PK, Jabir Ali. Productivity Growth in the Agriculture Sector of Punjab. Economic Research. Rev. 2002; 15(2):201-2016.
7. Elgilany Ahmad, Jamalludin Sulaiman, Saidatulakmal Mohd. Wheat Production and Economics. American Journal of Agricultural and Biological Sciences. 2011; 6(3):332-338.
8. Olubodun OO, Patidar P. Districts wise of Maize Production Forecast in Madhya Pradesh, 2015, 5.
9. Swaminathan M.S. 1977. Indian agricultural at cross roads Presidential address, thirty seventh
10. All India Agricultural Economics Conference, New Delhi, December, 27.