



A STUDY ON INTER-DISTRICT ANALYSIS OF PADDY PRODUCTION IN SOUTH CHHOTANAGPUR DIVISION ACROSS THE STATE OF JHARKHAND

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Jharkhand, the 28th State of the Indian Union is best known for its rich mineral resources. For approximately 59% of the workforce, agriculture serves as their main source of income. Agriculture contributes around 15% of the state's gross domestic product (GSDP). One of the most important staple foods is paddy, which is also a lucrative business for many farmers in Jharkhand. South Chotanagpur division is one of the five divisions in the Indian state of Jharkhand. The division comprises the following districts: Gumla, Khunti, Lohardaga, Ranchi and Simdega. The study is attempt to analysed the association between Area-Production and Yield-Production in South Chhotanagpur Division across the Jharkhand and also estimate the inter-district growth rates of area, production and yield of paddy in South Chhotanagpur Division across the Jharkhand

Keywords: Growth, Association, Paddy and AAGR

INTRODUCTION

Jharkhand, the 28th State of the Indian Union is best known for its rich mineral resources. South Chotanagpur division is one of the five divisions in the Indian state of Jharkhand. The division comprises the following districts: Gumla, Khunti, Lohardaga, Ranchi and Simdega. Jharkhand's importance as an agricultural state makes it suitable for the growth of the industry and related industries. "Although the majority of the population (around 59%) depends on activities connected to agriculture for their livelihood. Agriculture contributes around 15% of the state's gross domestic product (GSDP). Despite its low contribution and slight reduction in recent years, the agricultural sector remains vital to the rural economy. Agriculture must advance and diversify if the state is to guarantee food security, boost farmer incomes, and build a viable rural economy" (Kumar, D 2021; Kumar, D. 2021 a).

Food is the most valuable item in a person's life. In Jharkhand's economy, rice is significant. The majority of jobs in the state are found in agriculture, which is the primary crop and occupation of the people of Jharkhand. In Jharkhand, paddy agriculture is primarily important for food and livelihood, as well as for creating the majority of jobs and money. High yield paddy planting in Jharkhand helps to alleviate the state's food grain and capital shortages as well as economic inequalities (Kumar, D 2019).

REVIEW OF LITERATURE

Deogharia P C (2020), The research revealed that the implementation of crop diversification has resulted in alterations to the cropping pattern. The cultivated area, production, and productivity of cereals have remained stable, whereas the area, production, and productivity of horticultural crops have experienced an increase from 2009-10 to 2016-17. Currently,

there is a growing trend towards diversifying agricultural practices in order to focus on crops that exhibit higher levels of productivity. The phenomenon of diversifying the agricultural sector by focusing on crops that have demonstrated significant increases in yield is sometimes referred to as technology-led diversification. A significant portion of the region's agricultural land was allocated to the cultivation of high-value food-grain crops such as rice, wheat, and maize.

Karunakaran N (2014), The author of the research "Paddy Cultivation in Kerala - Trends, Determinants and Effects on Food Security" examined the trends, determinants, and consequences of paddy cultivation in Kerala on food security. The study made use of secondary information that was gathered from a variety of Keralan government publications, including the Economic Review, Statistics for Planning, and Agricultural Statistics. The performance of rice in terms of increase of area, output, and productivity was shown by time series analysis of acreage, production, and productivity data for rice in Kerala throughout the five decades from 1960-1961 to 2009-2010. They discovered that the diminishing trend in their region led to negative growth rates for the production of rice, an important food crop.

Singh, U (2020) An analysis of the agricultural sector in Jharkhand reveals that agriculture holds significant importance for the rural people, including almost eighty percent of the state's inhabitants. The average productivity of Jharkhand in the four major crops, namely rice, wheat, maize, and pulses, is lower compared to both national and global averages, except for pulses. The sector commonly referred to as the 'Agriculture, forestry, and fisheries industry' contributes around 14.5% to the Gross State Value Added (GSVA) of the state. The agricultural sector has experienced a notable average growth rate of 16.02% in its contribution to the Gross State Domestic Product (GSDP) throughout the period spanning from 2011-12 to 2017-18. In order to address the existing challenges, it is imperative to prioritize agricultural sector diversification and the development of sustainable agriculture.

Kumar, D. (2021) In their research article titled "Inter-district analysis of Rice cultivation in Jharkhand," the authors establish that Rice holds significant prominence as a staple food-grain within the region of Jharkhand. Moreover, they emphasize the pivotal role played by this crop in enhancing the economic well-being of farmers in Jharkhand. The successful cultivation of rice is contingent upon several factors, including the fertility of the land, prevailing climate conditions, the use of high-yielding seed varieties, and the availability of effective irrigation systems. There are two primary types of land utilized for the cultivation of rice: highland, often referred to as Tanr, and lowland, locally known as Don. Based on their fertility and slopes, both upland and lowland areas can be further classified into three subgroups. Rice holds paramount significance as the primary staple crop in India, encompassing a vast expanse of 44.0 million hectares. Specifically, the state of Jharkhand contributes approximately 1.62 million hectares to the cultivation of rice. From the period of 2017-18 to 2019-20, the five districts with the highest Compound Annual Growth Rate (CAGR) for rice cultivated area were Sahebganj (-1%), Latehar (-2%), Gumla (-3%), Gumla (-3%), and Pakur (-5%). Conversely, the five districts with the lowest CAGR for rice

cultivated area were Bokaro (-32%), Godda (-29%), Hazaribag (-25%), Saraikela (-25%), and Deoghar (-19%).

Kumara, Pramod and Singh (1996) The researchers divided the study period into three parts: 1959-68 (period I), 1969-79 (period II), and 1980-90 (period III), and looked at the growth rates of rice acreage, production, and productivity in the Indian state of Bihar from 1959 to 1990. The study found that across all zones in the region, the yield growth rate was positive during the green revolution era and negative before the green revolution period. In both times, all zones saw negative area growth rates.

Kumar, D (2021) this paper examines the growth of paddy production in India over the past two decades, with a specific focus on the state of Jharkhand. The compound growth rates of paddy area in Jharkhand and India are found to be 1% and 0% respectively. Additionally, the compound annual growth rates (CAGR) of paddy production in Jharkhand and India are determined to be 5% and 1% respectively. Furthermore, the CAGR of paddy productivity in Jharkhand and India are observed to be 4% and 1% respectively. Both Jharkhand and India exhibit negative growth rates in the initial two phases of area compound annual growth rate (CAGR), whereas the latter two phases experience either increases or reductions. During the second phase of production, the Compound Annual Growth Rate (CAGR) exhibits negative values in both Jharkhand and India. However, in the first and last two phases, there is a growth in CAGR. The productivity of Compound Annual Growth Rate (CAGR) exhibits positive growth in both Jharkhand and India across all phases.

OBJECTIVE OF THE STUDY

This paper has to study following objectives

- ♦ To analyse the association between Area-Production and Yield-Production in South Chhotanagpur Division across the Jharkhand
- ♦ To estimate the inter-district growth rates of area, production and yield of paddy in South Chhotanagpur Division across the Jharkhand

DATA AND METHODOLOGY

The data was gathered from secondary sources. For analysis, secondary data on area, production, and yield were used. Average annual growth rates (AAGR) and regression analysis are used as the standard statistical measurements.

$$\text{Average Annual Growth Rate (AAGR)} = \sum \frac{(X_t - X_{t-1})}{X_{t-1}} / t_n$$

The simple regression model may be specified as

$$Y = a + bX + u$$

Where,

Y is the dependent variable,

X is the independent or explanatory variables,

a and b = parameter to be estimated.

ANALYSIS AND DISCUSSION

Table-01: Association Between Production and Area of Paddy in South Chhotanagpur Division

Year	Area (X)	Production (Y)	Estimated Production (Y=a+bX)
2015-16	370056	254055	428891.83
2016-17	550378	1136055	1240540.68
2017-18	556325	1124497	1267308.77
2018-19	505037	1041180	1036455.93
2019-20	477396	1329451	912040.79

Sources: Department of Agriculture, Government of Jharkhand

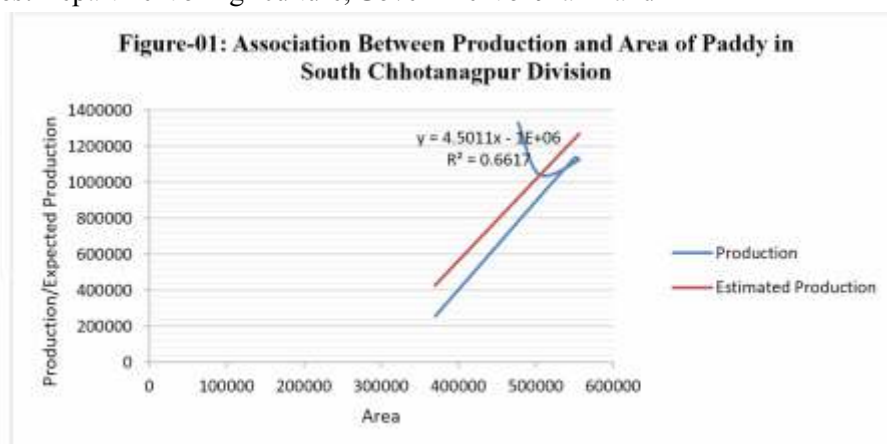


Fig-01 Shows that the estimation of regression between area and production of paddy in South Chhotanagpur division across the Jharkhand state. It also evident ($B=4.50$) paddy production has registered positive association with dependent variable. The R^2 value 0.6617 clearly shows that the effect of area on production and the variation in production are explained by area as explanatory variable.

Table-02: Association Between Production and Yield of Paddy in South Chhotanagpur Division

Year	Yield (X)	Production (Y)	Estimated Production (Y=a+bX)
2015-16	3.24	254055	314813.55
2016-17	11.35	1136055	1131528.60
2017-18	9.92	1124497	987520.89
2018-19	10.3	1041180	1025788.67
2019-20	14.27	1329451	1425586.30

Sources: Department of Agriculture, Government of Jharkhand

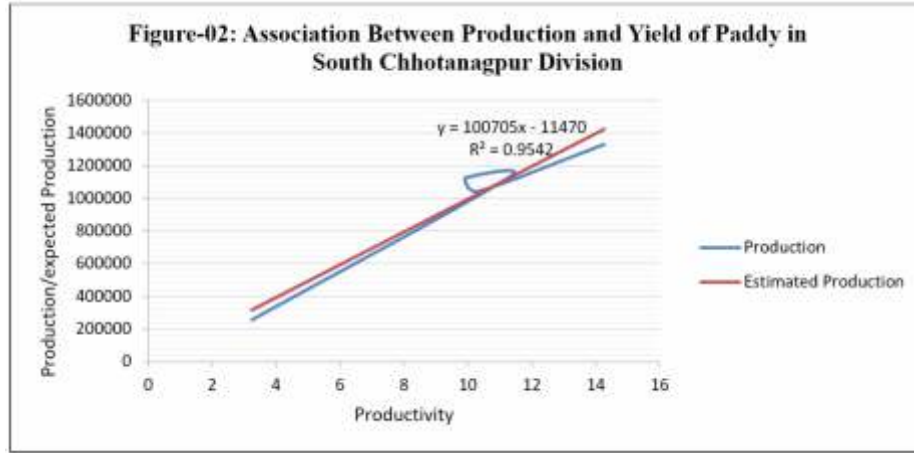


Fig-02 Shows that the estimation of regression between Yield and production of paddy in South Chhotanagpur division across the Jharkhand state. It also evident ($B=100704.7$) paddy production has registered positive association with dependent variable. The R^2 value 0.9542 clearly shows that the effect of yield on production and the variation in production are explained by yield as explanatory variable.

Table-03: Growth of Cultivated Area of Paddy in South Chhotanagpur Division

District	2018	2019	2020	AAGR
Gumla	-15%	-3%	-4%	-7%
Khunti	37%	-24%	6%	4%
Lohardaga	54%	-1%	-11%	12%
Ranchi	-12%	-15%	-12%	-11%
Simdega	38%	-2%	-3%	10%

Sources: Author Calculation Based on Department of Agriculture, Govt. of Jharkhand

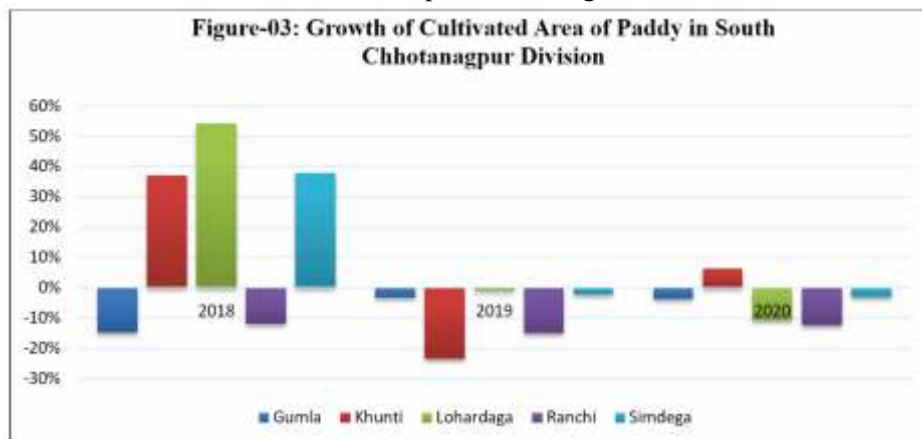


Figure-03 shows that growth of area of paddy in Shouth Chhotanagpur division across the Jharkhand state. In 2018 Khunti (37%), Lohardaga (54%), and Simdega (38%) has positive growth and Gumla (-15%), and Ranchi (-12%) has negative growth.

Growth of area of paddy in 2019 all five district Gumla (-3%), Khunti (-24%), Lohardaga (-1%), Ranchi (-15%), and Simdega (-2%) has registered negative growth.

In 2020 only Khunti (6%), has positive growth and Gumla (-4%), Lohardaga (-11%), Ranchi (-12%) and Simdega (-3%) has negative growth.

Table-04: Growth of Paddy Production in South Chhotanagpur Division

District	2018	2019	2020	AAGR
Gumla	-17%	-15%	38%	-1%
Khunti	1%	-48%	197%	19%
Lohardaga	10%	2%	20%	12%
Ranchi	-13%	-15%	18%	-4%
Simdega	176%	47%	-8%	91%

Sources: Author Calculation Based on Department of Agriculture, Govt. of Jharkhand

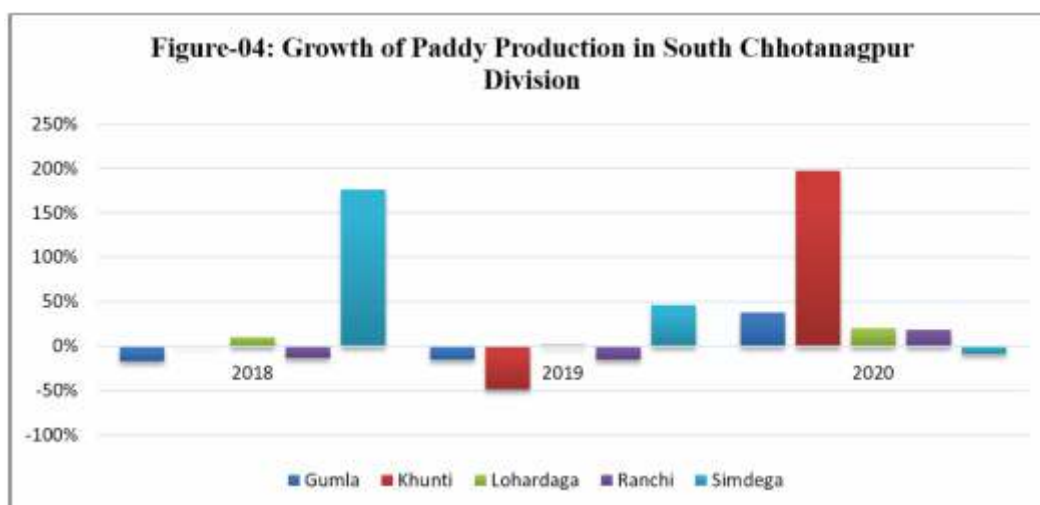


Figure-04 shows that growth of production of paddy in Shouth Chhotanagpur division across the Jharkhand state. In 2018 Khunti (1%), Lohardaga (10%), and Simdega (176%) has positive growth and Gumla (-17%), and Ranchi (-13%) has negative growth.

Growth of paddy production in 2019 Lohardaga (2%) and Simdega (47%) has positive growth and Gumla (-17%), Khunti (-48%), and Ranchi (-15%) has registered negative growth.

In 2020 Gumla (38%), Khunti (197%), Lohardaga (20%), and Ranchi (18%) has positive growth and Simdega (-8%) has negative growth.

Table-05: Growth of Yield of Paddy in South Chhotanagpur Division

	2018	2019	2020	AAGR
Gumla	-3%	-12%	43%	7%
Khunti	-26%	-32%	179%	14%
Lohardaga	-28%	3%	35%	0%
Ranchi	-1%	0%	35%	11%
Simdega	2%	50%	-5%	15%

Sources: Author Calculation Based on Department of Agriculture, Govt. of Jharkhand

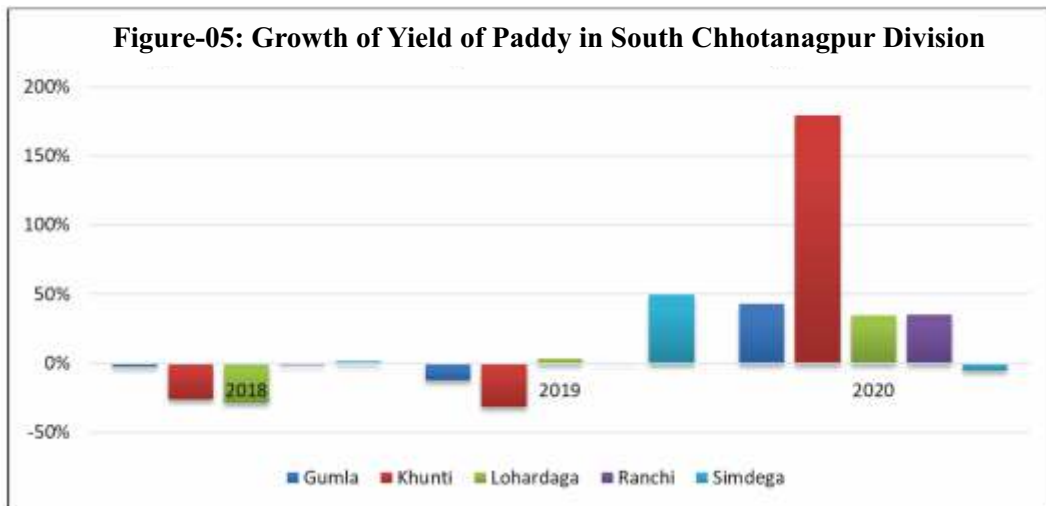
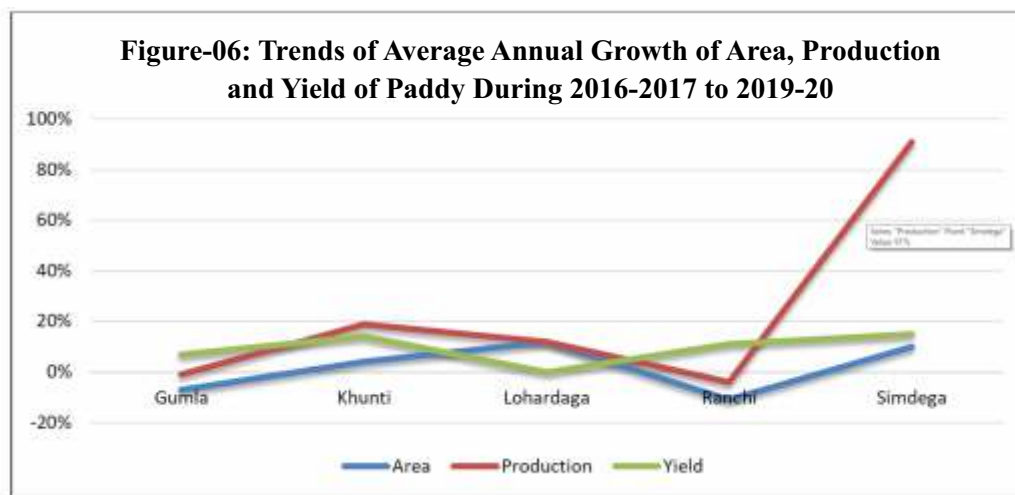


Figure-05 shows that growth of yield of paddy in Shouth Chhotanagpur division across the Jharkhand state. In 2018 Gumla (-3%), Khunti (-26%), Lohardaga (-28%), and Ranchi (-1%) has negative growth and only Simdega (176%) has positive growth.

Growth of yield of paddy in 2019 Lohardaga (3%), Ranchi (0%) and Simdega (50%) has positive growth and Gumla (-12%), Khunti (-32%), has registered negative growth.

In 2020 Gumla (43%), Khunti (179%), Lohardaga (35%), and Ranchi (35%) has positive growth and Simdega (-5%) has negative growth.



The figure 06 shows the average annual growth rate (AAGR) of area, production and yield of paddy Shout Chotanagpur division across the Jharkhand state during 2016-17 to 2019-20. The AAGR of area of paddy in Gumla, Khuti, Lohardaga, Ranchi, and Simdega district has -7%, 4%, 12%, -11, and 10% respectively during 2016-17 to 2019-20.

The AAGR of production of paddy in Gumla, Khuti, Lohardaga, Ranchi, and Simdega district has -1%, 19%, 12%, -4, and 91% respectively during 2016-17 to 2019-20. The AAGR of yield of paddy in Gumla, Khuti, Lohardaga, Ranchi, and Simdega district has 7%, 14%, 0%, 11, and 15% respectively during 2016-17 to 2019-20.

CONCLUSION

Agriculture plays an important role in Jharkhand that is why, it has huge potential to development of agriculture and allied sectors. One of Jharkhand's most important staple foods is paddy, which is also a significant crop for the state's farmers in terms of improving their economic standing. The cultivation of paddy often depends on the soil's fertility, the climate, high-yielding seed kinds, and irrigational capabilities.

These are many fluctuations in area, production and yield of paddy during 2016-17 to 2019-20 in South Chhotanagpur division. It is clear from the study of analysis that the area, production and yield of paddy increases and decreases during 2011-12 to 2016-17. So, this study recommends that both the State and the federal government must take positive action. Investment in technology, higher capital formation, opening of better markets, improved processing sector efficiency, better cropping system, improved extension activities, pest and disease control, encouraging scientific methods, and effective and efficient implementation of all strategies shall go a long way in boosting the growth of paddy and will without a doubt produce some long-lasting results in newly created South Chhotanagpur division as well as Jharkhand

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