



TRENDS OF PADDY PRODUCTION AND PRODUCTIVITY IN JHARKHAND

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Paddy is one of the most important staple food-grains in Jharkhand and this is an important crop which helps to increase the economic condition of the farmers in Jharkhand. It is the main crop and main occupation of the people of Jharkhand and provides maximum employment in the state. The present study is to analysed the trends of paddy production and productivity in Jharkhand.

Keyword : Production, Productivity & Paddy

INTRODUCTION

Agriculture plays an important role in Jharkhand that is why, it has huge potential to development of agriculture and allied sectors. Majority of the population (About 59%) for their livelihood depend on agriculture related activities, it contributes only 15% to the state Gross Domestic Product (GSDP).

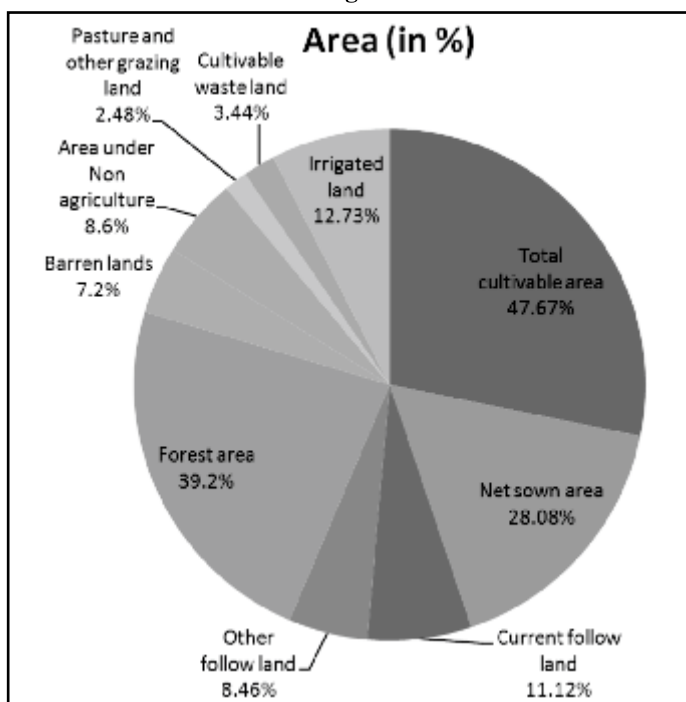
Paddy is one of the most important staple food-grains in Jharkhand and this is an important crop which helps to increase the economic condition of the farmers in Jharkhand. The cultivation of paddy is generally depending on fertility of land, climate condition, high yielding varieties of seeds and irrigational potentials. Therefore the production of paddy varies between region to region and even district to district. Paddy is a major source of protein and carbohydrate. Rice is an integral part of main soup and dishes with fish, poultry and other types of meat, when cooked paddy is saturated with water, usually to the point that it disintegrates. Paddy porridge is commonly eaten as a breakfast meal and is also a traditional meal for the sick.

The most precious thing in the life of people is food. Rice plays an important role in Jharkhand's economy. It is the main crop and main occupation of the people of Jharkhand and provides maximum employment in the state. The main importance of paddy cultivation in Jharkhand is for food and livelihood, in employment generation, maximum income's share. Paddy cultivation with high yielding variety in Jharkhand is helpful to reduce income inequality in the state and relief from shortage of food grains and capital etc.

Land Use Pattern in Jharkhand

Out of the total land in Jharkhand around 47.67 percent is the total cultivable area, 28.08 percent is the net sown area, 11.12 percent is current follow land, 8.46 percent is other follow land, 39.20 percent is forest area, 7.20 percent is barren land, 2.48 percent is pasture and other grazing land, 3.44 percent cultivable waste land and 12.73 percent is irrigated land. Land utilization pattern in Jharkhand can be shown as:

Fig - 1



Source: Annual plan (2016-17) Govt. of Jharkhand.

Jharkhand consist of two major plateau namely Chotanagpur Plateau and Santhal Pargana plateau which includes Rajmahal hill. Two kinds of land are used for paddy cultivation namely, upland commonly called Tanr and low land locally known as Doin. Both upland and low land, according to the fertility and slopes are sub divided into three sub groups.

Upland or Tanr is sub divided Tanr I, II, III. Tanr I land is the lowest portion of upland and most fertile among the upland. Tanr II is situated just above Tanr I. This is comparatively less fertile than Tanr I. Tanr III is highest steep of upland mostly used for human habitation and not so suitable for cultivation. Tanr I lands are mostly used for rice cultivation (i.e. sown by broadcasting or directly).

Low land or Doin is also subdivided into three categories - I, II, III. Doin I is the lowest most land segment/strip of plateau land scape and most fertile land. Above this lies Doin II. This is also very fertile, between Doin II and Tanr I lies doin III. Doin land are mostly used for paddy cultivation.

OBJECTIVE OF THE STUDY

To study the trends of production and productivity of paddy in Jharkhand.

LITERATURE REVIEW

Karunakaran N (2014) in his paper entitled "Paddy Cultivation in Kerala - Trends, Determinants and Effects on Food Security" analyzed the trends and determinants of paddy cultivation in Kerala and the effects on food security. The study used secondary data which was collected from various publications of the Government of Kerala like Economic Review, Statistics for Planning and Agricultural Statistics. Time series analysis of acreage, production and productivity data of rice in Kerala during

the five decades from 1960-61 to 2009-10 has revealed the performance of rice in terms of growth of area, production and productivity. They found that production of major food crop, rice, reached negative growth rates due to the declining trend of their area

Thomas (1996) Examined trends in area, productivity of paddy in Kerala and economic causes of decline in paddy cultivation and tried to identify current problems of paddy for the period 1960-61 to 1991-92 using both secondary time series data and primary data to study current problems. - 10 villages were collected, 5 in each Kuttanad regions in Alapuzha and Kottayam districts in June 1996. The study found that none of the sources of productivity had affected productivity of paddy.

Sau (1990) Analysed the productivity differentials in rice across the major rice producing states of India and in rice and food grains across the districts of West Bengal. It uses econometric method. Productivity in agriculture as measured by the output per hectare depends mainly on two factors: the level of inputs used and resource base and infrastructure development of the region. The indicators of inputs used are: Percentage of gross area irrigated to gross cropped area.

Fertilizer used per hectare of cropped area; Percentage of HYV area to gross cropped area and credit availability per hectare or per capita. Infrastructure, in its broad sense covers the items that provide external economies to the farmers as a whole. Its indicators are: Road mileage per square kilometer; percentage of electrified villages and Literacy rate.

Kumar and Rosegrant (1994) attempt to assesses total factor productivity growth for rice in different regions in India and examine the sources of Productivity growth. The study revealed that increase in area production and productivity of crops was highly associated with their relative profitability, rice area increased slowly since 1980. Mainly through substitution from coarse Cereals market infrastructure, research Canal irrigation, balanced sources of TFP. Future Productivity gains in rice production would have to be achieved from the eastern and southern regions of India.

Scaria Richard et al (2014) in their paper "Paddy land conversion as a threat to floristic biodiversity - a study on Karrimpuzha watershed, Kerala state, south India" understand the changes in cropping pattern and impacts of paddy fields declination upon the floristic diversity of Karrimpuzha watershed, which is situated on the north western parts of Palakkad District of Kerala State. The study revealed that there would be a considerable variation in the cropping pattern of paddy fields and are transformed into different land use system.

Telu Visalakshi(2015) Concluded that owing to the resources in Andhra Pradesh it is the fourth largest Producer of rice in India. And about one fourth of the total cropped area of the state is under rice cultivation. After Green revolution the Producer and yields have considerably increased with the trend in packaging Technology. According to state analysis in 2002-03, Andhra Pradesh recorded the yield of 26.2 quintals/hectare against India's average of 18 quintals/hectare. The Godavari and Krishna delta and the adjoining coastal plains from one of the most outstanding rice producing tracts of the country.

C. Leelavathi and V.Balakrishnama Naidu(2014) revealed that both in india and Andhra Pradesh rice registered decreasing growth in production and productivity in the post WTO period than in the pre-WTO period. The results indicated that the Indian export market, which remained stable over the period, were Saudi Arabia and 'other'. The Saudi Arabia has indeed been a growing market for Indian basmati rice. The high retention of this market was further reinforced by high probability of transfers from UAE, USA and other countries.

Sabbaiah Choudary. P.V. (2011) observed that there was a wide price gap between the whole and

milled/processed rice in the chain of producer to consumer, vulnerability to stored grain pests due to lack of scientific storage facilities at domestic level of governmental support to value addition (like packaging etc).

Sita Devi.K. and Ponnarasi. T.(2009) in their study revealed that adoption of SRI technique would help increase rice production without increasing the area under cultivation. It has proved to serve as an alternative method for rice cultivation. The increased productivity and net profit would attract the farmers, and saving in water-use for rice cultivation is an important advantage for efficient water management.

Narasimham et al. (2003) estimated the cost and returns of paddy in ynam region of Union territory of Pondicherry. They found that the cost of production of paddy per hectare was highest among all the size group. The total cost per hectare were high in large farms in both crop I(kharif) and crop II(rabi) with 18094.26 and 19071.29 respectively. Rental value on own land in the cost of production of crop II was more than crop I in all size groups. Gross returns per hectare were the highest on large farms followed by medium and small farms in both crop I and crop II. Net return also showed direct relation with the farm size.

Gupta et al.(1985) examined the economics of paddy cultivation on different size groups of Haryana. It was observed that the use of human labour generally decline with increase. The share of fixed costs in the total cost of cultivation was higher on large farms than that on small farms. Use of yield augmenting inputs and yield per hectare increased with the increase in farm size and so did the return over variable costs.

Ernest Moula. L(2010) remark that the rice sector is shown to be influenced by yield expectations, irrigation and relative global market price as well as governmental expenditure on agriculture. As shown in the response to relative global price for rice, the presence of market power exerted by imported rice, impacts on producer supply response. The magnitude of the effect on producers may be due to the structure of production unit and the characteristics of domestic markets.

Deogharia, P C (2013) provided a formal definition of technical efficiency: a producer is technical efficient if an increase in any output requires in at least one other output or an increase in at least one input, and if a reduction in any input requires an increase in at least one other input or a reduction in at least one output. this paper attempts to measure the level of technical efficiency under alternative tenurial contracts. It has been found that the level of technical efficiency varies under alternative tenurial contract. Fixed rent tenancy is found to be technically most efficient mode of cultivation. The analysis also shows that the small farms belonging to both owner and tenants are more efficient than others.

Mythili and Shanmugam (2000) Measured farm level technical efficiency for rice in Tamil Nadu using farm level data for 1990-91, 91-92, 92-93. Frontier Production Function Technique was applied using the Cobb-Douglas production function type applying Maximum Likelihood method of estimation. Total output in quintals is regressed on human labour in man hours, area in hectares, fertilizer in kg., capital expenditure incurred on bullock labour, machinery and pesticides in money terms. It concludes that technical efficiency ranged between 46.5 and 96.7 mean TE being 82 percent. Extension services and training programmes do contribute to TE.

Rao and Coelli (2004) to examine level and trends in agricultural output and productivity for 1980-1995. For 97 countries treating crops and livestock as output variable. Time series data provided by the FAO and the ILO have been used to estimate total factor productivity. The study found that TFP was growing at rate of 2.7% percent annually. China witnessed spectacular performance recording 6.8percent TFP growth.

India posted a total factor productivity growth of 1.6 percent. Asia is the major performance with TFP growth rate of 3.1% and Africa registered the weakest performance with 0.9% growth.

Wiehe et al (2001) examined the measurement of agricultural productivity and investment of productivity in Sub- Saharan Africa especially in Zimbabwe and South Africa results indicated that land productivity grew in countries. South Africa demonstrates the potential benefits of investment in infrastructure human capital and research.

Velazco (2001) examined trends in agricultural production growth for the period 1950-95. Identified factors that affect agricultural growth and investigated and underlying constraints. The study looked at how changes in land, Labor and Fertilizers, the role of public and private investment technological changes, policy and political violence influenced Peru's agricultural sector.

METHODOLOGY

This study is based on the analysis with the help of secondary data on area, production and productivity of paddy in the state of Jharkhand. The time series data from 2011-12 to 2017-18 is used to analyze the trend in production and productivity of paddy in Jharkhand. Trend equation in the time series analysis is based upon least squar method. The basic formulas of trend projection method is:

$$Y_t = b_0 + b_1t$$

Where,

Y_t = trend forecast for time period t

b_1 = slope of the trend line

b_0 = trend line projection for time 0.

$$b_0 = Y_t - b_1t$$

PRESENT POSITION OF PADDY IN JHARKHAND

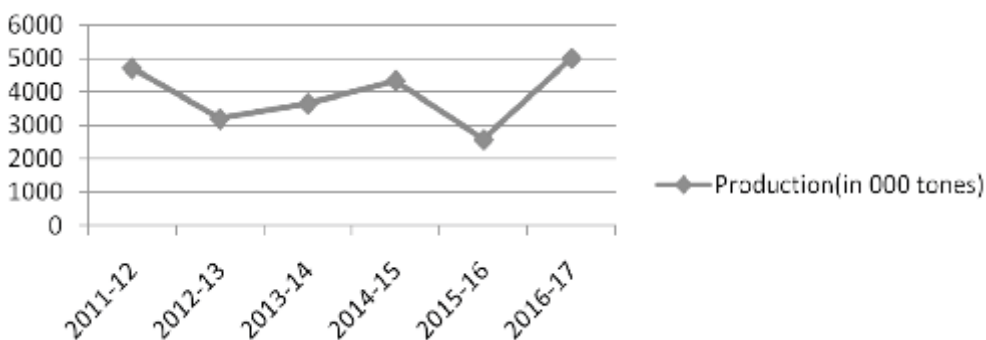
Paddy is the first important crop of Jharkhand. Paddy is grown in three seasons in India. Where, kharif season account for 88% production while Rabi covered only 12% production, paddy is the single most important food crop in India and occupies 44.0 million hectare while Jharkhand contributes about 1.62 million hectare under paddy cultivation. Jharkhand is currently consists of twenty four district. Out of these fifteen district officially recognized as scheduled five area. These district together contributed 76.4% area of rice cultivation and 73.8% of rice production of Jharkhand during 2013-14. In the tribal district, highbred rice was grown in 34.4% area, HYV in 47.8% area and traditional varieties in only 17.8% area. However production wise, highbred contributed 45.7% of production followed by HYV rice 42.9% and traditional varieties 11.4%.

Table:01- Production of Paddy in Jharkhand

Year	Production(in 000 tones)
2011-12	4695.873
2012-13	3191.222
2013-14	3637.447
2014-15	4324.456
2015-16	2569.411
2016-17	4988.665

Source : www.sameti.org

**Fig : 02 - Trend Line of Paddy Production
(in 000 tones)**



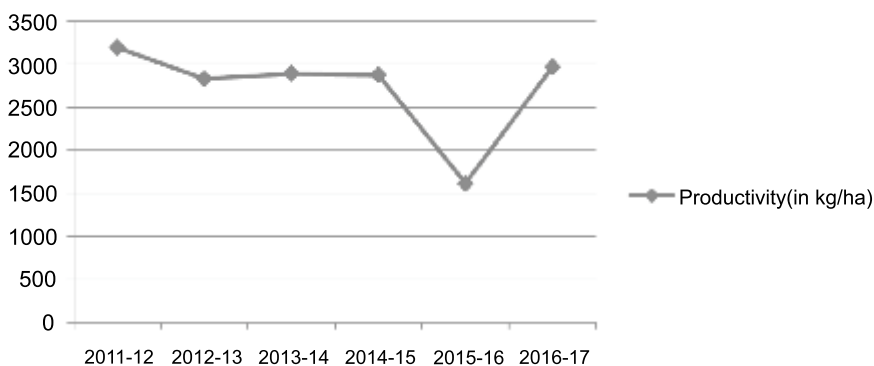
The above figure shows the production of paddy from year 2011-12 to 2016-17. The total rice production was 4695.873, 3191.222, 3637.447, 4324.456, 256.411 and 4988.665 thousand tones in the year of 2011-12, 2012-13, 2013-14, 2014-15, 2015-16 and 2016-17 respectively.

Table:02- Productivity of Paddy in Jharkhand

Year	Productivity(in kg/ha)
2011-12	3197
2012-13	2833
2013-14	2896
2014-15	2879
2015-16	1617
2016-17	2971

Source : www.sameti.org

**Fig : 03- Trend Line of paddy Productivity
(in kg/ha)**



The above figure shows the productivity of paddy was 3197, 2833, 2896, 2879, 1617 and 2971 kg/ha in the year of 2011-12, 2012-13, 2013-14, 2014-15, 2015-16 and 2016-17 respectively.

CONCLUSION

Agriculture plays an important role in Jharkhand that is why, it has huge potential to development of agriculture and allied sectors. Paddy is one of the most important staple food-grains in Jharkhand and this is an important crop which helps to increase the economic condition of the farmers in Jharkhand. The cultivation of paddy is generally depending on fertility of land, climate condition, high yielding varieties of seeds and irrigational potentials. Two kinds of land are used for paddy cultivation namely, upland commonly called Tanr and low land locally known as Doin. Both upland and low land, according to the fertility and slopes are sub divided into three sub groups. Paddy is the single most important food crop in India and occupies 44.0 million hectare while Jharkhand contributes about 1.62 million hectare under paddy cultivation. The total rice production was 4695.873 and 4988.665 thousand tones in the year of 2011-12 and 2016-17 respectively, and the productivity of paddy was 3197 and 2971 kg/ha in the year of 2011-12 and 2016-17 respectively.

These are many fluctuations in production of paddy and productivity of paddy during 2011-12 to 2016-17 in Jharkhand. It is clear from the study of analysis that the production of paddy increases and decreases as well as productivity of paddy also increases and decreases during 2011-12 to 2016-17.

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