Agri Express: **03** (03), *Article No.* V03I03.12, July - September, **2025** *E - ISSN No. 2584 – 2498*

ECONOMIC ANALYSIS OF VARIETAL DIVERSIFICATION OF PADDY IN BIJAPUR DISTRICT OF CHHATTISGARH

Dinesh Kashyap[1], Anil Divya[2], Rupali[3], Arti Dhurw[4] and Ankur Jaiswal[5]

[1]PG Scholar, [2]Assistant Professor and [3,4&5]Ph.D. Scholar

Department of Agricultural Economics, College of Agriculture

Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India, 492012

Corresponding author dkkashyap33758@gmail.com

https://doie.org/10.10346/AE.2025547301

ABSTRACT

The present study was conducted to work out the varietal diversification in the Bijapur district of Chhattisgarh. The survey for a specific objective was conducted to assess agricultural diversification in Bijapur District of Chhattisgarh, focusing on three agro-climatic zones: Northern hills, Chhattisgarh plains, and Bastar plateau. The study involved 95 farmers from two blocks, Bhairamgarh, Bhopalpatnam, four villages, Mirtur Fulgatta, Madded, and Bhatpalli, with 15 varieties under study of cultivated. Swarna MTU-1001, MTU-1010 IR-64, Bamleshwari, and HMT Chudhi Gudma Mahar Chakava Renje Kalamli were the most widely grown types, and some higher-yielding varieties like Bayer gold, Tata dhanya VNR- 2245. With 217 farmers involved in the study, the total area under paddy cultivation is 160.9 hectares. While the medium farmer had the highest diversity at 0.86, very high, the small farmer 0.82, very high large farmer 0.76, higher, and last one is the marginal farmer 0.72, moderate. The overall diversity was 0.79. was found in the study.

Keywords: Paddy variety, diversification, seeds, Simpson index, Higher category of farmer

INTRODUCTION

Rice production plays a vital role in the agricultural sector and the overall economy of India. As the world's second-largest producer of rice, India accounts for a significant share of global rice output. The country's vast agricultural lands. Rice occupies a substantial area in India, with millions of hectares dedicated to its cultivation across various states. This staple crop holds immense economic importance as it provides livelihood opportunities for millions of farmers, contributes to food security, and serves as a crucial source of income through exports. The staple grain of

In Indian cuisine, rice is a fixture in practically every Indian home. In India, it is the most widely consumed food grain. India is the world's second-largest producer of rice. Rice is grown extensively in India in an area of about 434.18 lakh hectares with an annual production of 1206.79 lakh ton and average yield of 2779 kilogram per hectare (Unified Portal for Agriculture Statistics DA&FW 2024-25). The country's production of food grains has been rising annually. A large portion of the population in Asia eats rice at every meal. More than 70 per cent of the calories consumed by people are found in rice in several different countries.

Roughly thirty per cent of the calories in Asia come from rice (Department of Agriculture and Cooperation, Directorate of Economics and Statistics). The state of Chhattisgarh is the 16th most populous and 10th largest in terms of area in India. It is also recognized as a major producer of rice. 43. per cent of the state's total arable land is under cultivation, and about 70 per cent of the population works in agriculture. One of the main crops is paddy. With a population of more than 2.55 million, the geographical area is approximately 136 lakh hectares, with 46.51 lakh hectares of cultivable land and 60.76 lakh hectares of forest land. Chhattisgarh is a state in central India that is well-known for its rice farming. Rice is grown in an area of 3.7 million hectares with a production of 10.7 million ton and a productivity of 3212 kilograms per hectare (Siya ram *et al.* 2023) numerous rice varieties have been released by pioneering organizations for the commercial production of rice growers, but only a small number of these varieties have been made available to rice growers for production.

METHODOLOGY

For the current study, 95 respondents from four villages and two blocks in the Bijapur District's Bhairamgarh and Bhopalpatnam districts participated in a survey using an interview schedule to gather primary data on a variety of parameters using a personal interview/enquiry method during the 2023–2024 period. The participants were divided into four size groups: (i) marginal (less than one hectare), (ii) small (one to two hectares), (iii) medium (two to four hectares), and (iv) large (4 hectares and more).

The primary data were collected from the paddy growers through a personal interview method with the help of a well-prepared questionnaire for the production and marketing year 2023-2024. The secondary data was collected through different government publications, such as the Department of Agriculture, the Directorate of Economics and Statistics, the Government of Chhattisgarh, and other published sources. Analytical tools were used the Simpson diversification Index and Cost of cultivation.

Simpson Diversification Index

The Simpson index measures the number of varieties cultivated over the sample area. it is defined as 1 minus the sum of squares of the proportional area planted to each variety. It is calculated as:

$$DIj=1-\sum_{i=1}^{n} p1^2$$

Where

DI_j = DI of the j^{th} component (j= crop area in n) $^{P}{}_{i}$ = proportion of the i^{th} variable crop in their respective for the district diversity index is constriction for the year i.e from.

RESULT AND DISCUSSION

Varietal diversification of rice in the study area.

Table No. 1: Number of varieties used by Sampled Farmers in the study area

No. of variety used by Farmers			
One variety (24)	**Two variety (30)**	**More than two variety (41)**	
Varietal diversification of paddy in the study area			
One variety	**Two variety**	**More the two variety**	**Total No of farmer (95)**
swarna(8)	swarna (11)	swarna (4)	Swarna (23)

MTU-1001 (9)	MTU-1001 (6)	MTU-1001(7)	MTU-1001(22)
MTU-1010 (7)	chuddi (6)	Gudma (10)	MTU-1010 (7)
	Gudma (7)	Chudhi (7)	Chudhi (13)
		kalamali (6)	Gudma (14)
	\	Renje (7)	Renje (7)
			Kalamali (6)

Table No. 1 Index of Diversity Based on the study's findings, it was determined that medium-sized and large farmers, who own three different types of land holdings, low, medium, and upland, cultivated the largest number of varieties. After variety Swarna, MTU-1001, MTU-1010 was the next most popular variety. High-yielding varieties like Hira, Moti, etc were not adopted quickly because of their low adaptability. From the findings, it was observed that 'higher yield' was the most desirable trait. It is implied that suitable rice cultivars be developed to withstand waterlogging and flash flood situations through participatory rice breeding on a priority basis. There were up to 15 varieties, primarily traditional ones, cultivated by the farmers. There were three types of land: upland, medium land, and lowland. Analysis was conducted based on land type. This table no 1 highlights the distribution of various rice varieties among farmers, showing that "Swarna" is the most widely cultivated variety, followed closely by MTU-1001 lower area coverage of smaller varieties like Bamleshwari and HMT. With 217 farmers involved, the total area under paddy cultivation is 160.9 hectares.

Table No. 2: varietal diversification of paddy in the study area as per area

SN	Particular	Number of farmer	Total area
1	Swarna	37 (17.05)	**24.86 (15.45)**
2	MTU-1001	32 (14.75)	**24.17 (15.02)**
3	MTU-1010	22 (10.14)	**21.49 (13.36)**
4	Bamleshwari	6 (2.76)	**1.93 (1.2)**
5	IR-64	13 (5.99)	**10.6 (6.59)**
6	HMT	5 (2.30)	**3.33 (2.07)**
7	Bayer gold	12 (5.53)	**4.3 (2.67)**

8	Tata dhanya	14	**6.06**
		(6.45)	**(3.77)**
9	VNR2245	15	**8.02**
		(6.91)	**(4.98)**
10	Chudhi	13	**5.38**
		(5.99)	**(3.34)**
11	Gudma	17	**22.43**
		(7.83)	**(13.94)**
12	Mahar	8	**4.5**
		(3.69)	**(2.8)**
13	Chakava	6	**4.77**
		(2.76)	**(2.96)**
14	Renje	7	**4.62**
		(3.23)	**(2.87)**
15	Kalamli	10	**14.46**
		(4.61)	**(8.99)**
	Total	**217**	**160.9**
	Percentage (%)	**(100)**	**(100)**

Table No. 2 presents a structured overview of the paddy's varietal diversification in the study area. With the greatest number of farmers and arable land, Swarna 37 (15.45) percent and MTU-1001, 32 (15.02) percent of the total area.The most widely grown variety. Gudma, although having fewer farmers than Swarna and MTU-1001, also takes up a sizable portion of the land. A niche cultivation or specialist farming method is shown by the significantly.

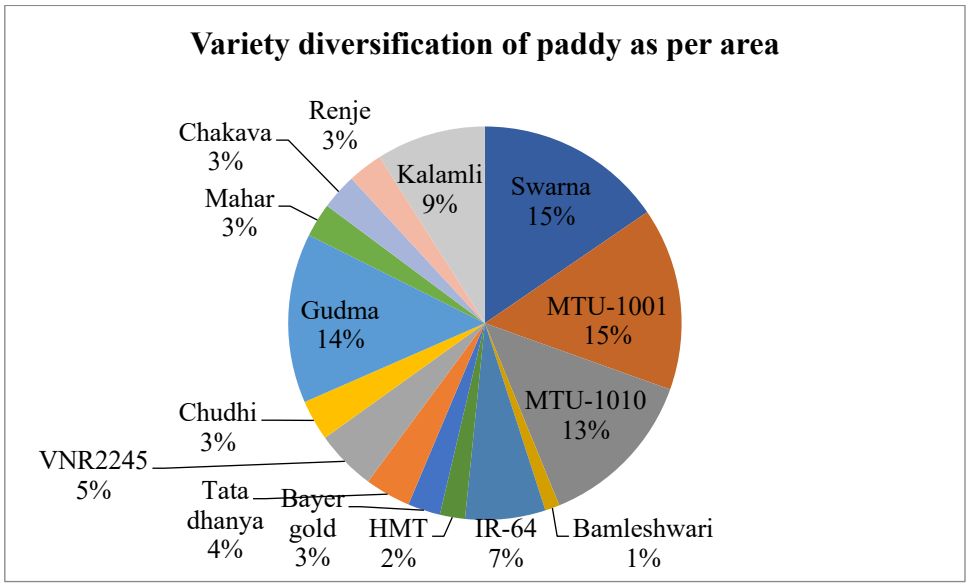

Fig. 1 Paddy variety diversification of paddy as per area

Table No. 3: Paddy diversification by using Simpson's index

	Land holding	Simpson value	Diversity index
1	Marginal	0.72	Mode rate
2	Small	0.83	Very higher
3	Medium	0.82	Very higher
4	Large	0.76	Higher
5	Over all	0.79	Higher

Table 3 shows that results of varietal diversification of paddy using Simpson's Diversification Index. Simpson's index is a measure of diversity that considers the relative abundance of different varieties of paddy grown by sampled farmers. Farmers with small size of holdings (1.0 - 2.0 ha) have the highest diversity the value of Simpson value was (0.86 and 0.82), which indicates that high diversity in paddy varieties. Farmers with medium size of holdings (2.0 – 5.0 ha) and large land holdings (>5.0 ha) have lower diversity the value of Simpson index was (0.71 and 0.75, respectively), indicating moderate diversity in paddy varieties. The overall Simpson index value of all land holdings was 0.78, which can also be interpreted as moderate diversity.

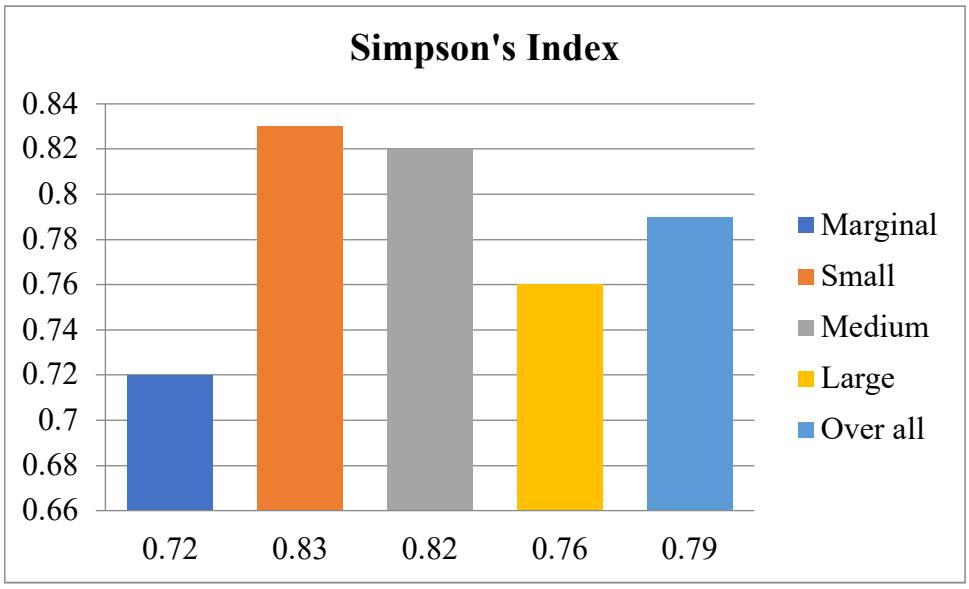

Fig. 2 Paddy diversification by using Simpson's index

CONCLUSION

Result showed that diversification of Paddy over all 95 farmer in the study area are categorized by Size of land holding marginal, small medium and large among the farmers which are grow of single variety 8, two variety 11, and more the two variety 4, farmers in study all 15 type variety was cultivate by the farmers some major variety which has been highest area cover, swarna (24.86 ha), 15.45 percent MTU1001 (24.17 ha), 15.02percent MTU 1010 (21.49 ha), 13.36 percent. Varietal diversification under different categories, small farmers have the highest diversity, 0.86 on Simpson's

Diversity Index. Marginal farmer, Lower diversity 0.71. Moderate diversity is indicated by a medium farmer of 0.82. Moderate diversity is also indicated by a large farmer 0.76 average diversity 0.79. was found in the study.

REFERENCE

Anonymous. (2021). Directorate of Agriculture. (Attached in ANNEXURE- II)

Churpal, D., Koshta, A. K., and Choudhry, V.K.,2015. An economic analysis of rice cultivation and constraints in Dhamtari district of Chhattisgarh, *India. Plant Archives* 15. 651- 656.

Jaiswal, A, Tegar, A and Choudhary, V K 2023 An economic study of production and marketing of demand led rice variety in Raipur district of Chhattisgarh.. *The Pharma Innovation Journal SP*-12(7): 2293-2301

Jangde, C. Shrey R, Verma. P. K and Choudhary.V.K 2025 An economic analysis of varietal diversification, market share and paddy cultivation on household farms in Raipur district of Chhattisgarh. *Int. J. Adv. Biochem. Res.*;9:645-652.

Netam, O.K., Pathak, H. and Chandrakar, M.R., 2019. Economic analysis of paddy cultivation in Rajnandgaon district of Chhattisgarh, India. *Journal of Pharmacognosy and Phytochemistry,* 8(6), pp.1358-1361

Prasanna, L. and Rao, L.S., 2019. Rice production in India-varietal dynamics and diversity: Insights from empirical analysis of breeder seed indents. *Journal of Rice Research*, 12(2).7.

Patel, V. K., Jain, BC., and Govind 2019 Constraint of paddy grower farmers a study with special reference to Chhattisgarh state. *Journal of pharmacognosy and phytochemical* 8(6)1165-1166

Patel. U, Joshi S.K., Pathak H. and Gauraha A.K. 1015 An economic analysis of varietal diversification of paddy in Dhamtari district of Chhattisgarh *Agri Express*: 03 (01).V 03I01.10

Ram S, Sahu, T. K., Bhagat, R. K, & Singh, S. 2023. An Economic Analysis of Paddy Cultivation and Constraits in Surguja District of Chhattisgarh, India. *International Journal of Plant & Soil Science*, *35*(21), 854-862

Sahu, R., Gauraha, A.K., Verma, P.K. and Pradhan, M.K., 2019. An economic analysis of varietal diversification of paddy in Bilaspur district of Chhattisgarh. *Agri Express*, 2, p 2019.

Sinha. H 2016 Rediscovring the Traditional Paddy Varieties In Jharkhand Conservation Priority In Hybrid Rice Era *Journal of Rural Development*. 35 (2),285-307

Tionogco, M., and Mahabub Hossain 2015 adoption of modern varieties and rice varietal diversity on house hold farms in Bangladesh. *Gate opneres* 13 (3)233

Yawen, Z., Shiquan, S., Zichao, L., Zhongyi, Y., Xiangkun, W., Hongliang, Z. and Guosong, W.2003. Ecogeographic and genetic diversity based on morphological characters of indigenous rice (Oryza sativa L.) in Yunnan, China. *Genetic Resources and Crop Evolution, 50*, 567-577.

*****