Adoption of Improved Paddy Cultivation Practices among the Farmers in Durg District, Chhattisgarh

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Abstract

The present study was conducted in Durg district of Chhattisgarh state during the years 2022–23 to study the adoption of improved paddy cultivation practices by the farmers. A total of 120 respondents were randomly selected based on the criteria that no previous study had been undertaken there till date. Farmers were personally interviewed using a pre-tested interview schedule. The majority of respondents had a high (15.83%), medium (53.34%) to low (30.83%) adoption levels, hence there is a necessity to provide training programmes through KVKs and the Agricultural Departments for the improvement of paddy cultivation methods to the farmers in order to enhance their adoption levels of paddy production technology. The independent variables, namely age, gender, education, annual income, farming experience, sources of information, social participation, extension contacts, land holding, economic motivation and risk orientation were positively and significantly correlated with adoption behaviour of paddy growers towards improved paddy production practices.

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Keywords: Adoption, Improved cultivation, Paddy

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1. Introduction

Rice *(Oryza sativa)* is the most sustainable food, accounting for more than half of the world's population[ ]. The importance of rice as a staple food stems from the recognition that rice-based industries are essential for food security, poverty reduction, and health improvement […]. Rice is grown during summers and winters in India and other countries [..] Rice is the most important food in terms of human nutrition and caloric intake, accounting for more than one-fifth of all calories consumed by people worldwide […]. Rice is a monocotyledonous plant that is usually grown as an annual plant, but it can also survive as a perennial plant in tropical regions […] .World cultivation reaches 164.19 million hectares and annual production reaches approximately 505.4 million tons. Asia is the world's largest continent and produces and consumes more

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than 90% of the world's rice. **[4.]** Chhattisgarh, one of the largest paddy producer state in India, has ideal climate conditions and soil for developing paddy. The central plains of Chhattisgarh are known as Rice Bowl of Central India. With an average yearly precipitation of around 1,207 mm, the entire cultivated zone (all crops) of the state is 47.75 lakh hectares, which is 34 percent of the state's total geographical area. **[3.]**

It must be understood that only one-third of the rice zone within the nation has irrigation facilities. Few information exist on the water necessities of the crop, but this knowledge is more experimental and a great deal of investigation is required to understand the soil-water-plant relationship. Also, the productivity of the state is quite low as compared to other states. Thus, the farmers live in tough conditions; they lack any kind of facilities.

The present investigation was subsequently planned to think about the adoption behaviour of the farmers towards improved paddy production practices. Such an examination will be valuable for agricultural colleges, research stations, state government, marketing departments and district administration, as well as for better production and to create a conducive environment for paddy cultivation within the state of Chhattisgarh.

2. Materials and Methods

The research methodology must have a theoretical foundation for its success. The present study was conducted in Durg district of Chhattisgarh state during the years 2022–23. There are 3 blocks in Durg district and out of those, Durg and Patan blocks were chosen. A total of 20 villages were chosen form these two blocks randomly for primary data collection. A total of 120 respondents were selected randomly from the selected villages. A pre-tested interview schedule was used for the collection of data. The collected data were classified, tabulated and analysed in light of the objectives. Descriptive research design was followed and the variables were measured by utilising appropriate scales and methods adopted by different researchers in the past with few adjustments. Suitable statistical tools were utilized to draw the inferences.

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2.1 Adoption

Adoption is a decision to make full use of an innovation as the best course of action available.

In this study, the adoption of different paddy cultivation practices were listed. A total of 14 statements from land preparation up to harvesting were recorded by consulting with experts. The responses were measured by giving 3–1 scores for fully adopted, partially adopted and not adopted separately for each practice. Hence, the maximum possible score of the respondent that could be ideal was 42 and the least score was 14. Based on respondents for each statement, frequency and percentage were calculated to clarify things about adoption. The overall adoption of the respondents was grouped into three categories: low, medium, and high, using mean and standard deviation as a degree of the check. The results were explained in frequency and percentage. According to these data, adoption levels such as low, medium and high were described.

3. Results and discussion

The results of the present research study have been presented on the basis of the analysis of data using suitable statistical tools and techniques and in relation to the specific objective of the research study.

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1. **Socio-economic profile of the respondents.**

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Table 1.Distributionof respondents according to their socio-economic profile.

Category	Frequency	Percentage
Age		
Young age(<35 years)	26	21.67
Middle age(36-63 years)	73	60.83
Old age(>64 years)	21	17.50
Gender		
Male	97	80.83

Female	23	19.17
Caste		
General	75	62.50
OBC	20	16.66
ST	16	13.33
SC	9	7.51
Occupation		
Farming only	52	43.33
Farming and farm labour	36	30.00
Farming and other occupation	32	26.67
Education		
Illiterate	41	34.17
Primary	35	29.17
Secondary	28	23.34
High school	8	6.67
Above high school	5	4.17
Graduate and above	3	2.50
Annual income		
Low (<75,000 rs)	29	24.16
Medium(75,001 – 2,00,000rs)	59	49.18
High (> 2,00,000 rs)	32	26.66
Land holding		
Marginal (<1 ha)	27	22.50
Small (1-2 ha)	39	32.50
Medium (2-4 ha)	35	29.17
Semi- medium (4-10 ha)	11	9.17
Large (> 10 ha)	8	6.66
Family type		
Nuclear	46	38.33
Joint	74	61.67

Farming experience		
Low (<10 years)	11	9.17
Medium (10-20 years)	75	62.50
High (> 20years)	34	28.33
Social participation		
Non member	40	33.34
Member of one organization	61	50.83
Member of two organization	13	10.83
Member of more than two organization	6	5.00
Sources of information		
Low	18	15.00
Medium	77	64.17
High	25	20.83
Extension contact		
Low	44	36.67
Medium	64	53.33
High	12	10.00
Economic motivation		
Low	20	16.67
Medium	54	45.00
High	46	38.33
Risk orientation		
Low	44	36.67
Medium	54	45.00
High	22	18.33

Table 1 shows that:

a. **Age:** It was found that the majority (60.83%) of respondents belonged to the middle-aged group, i.e. between 36-63 years of age.
b. **Gender:** It was found that the majority (80.83%) of the respondents were males.

c. **Caste:** It was found that the majority (62.50%) of the respondents belonged to the general category.

d. **Occupation:** It was found that the majority (43.33%) of the respondents were engaged in only farming activities.

e. **Education:** It was found that the majority (34.17%) of respondents were classified as illiterate.

f. **Annual income:** It was found that the majority (49.18%) of respondents were found to be in the medium income earning group, with annual earnings ranging between 75,001- 2,00,000 rupees.

g. **Land holding:** It was found that the majority (32.50%) of respondents belonged to the small land holding group.

h. **Family type:** It was found that the majority (61.67%) of respondents belonged to joint families.

i. **Farming experience:** It was found that the majority (62.50%) of respondents had medium farming experience ranging between 10-20 years.

j. **Social participation:** It was found that the majority (50.83%) of respondents were members of any one of the organisations.

k. **Sources of information:** It was found that the majority (64.17%) of respondents had medium-level sources of information.

l. **Extension contact:** It was found that the majority (53.33%) of respondents had a medium level of extension contact.

m. **Economic motivation:** It was found that the majority (45.00%) of respondents had a medium level of economic motivation.

n. **Risk orientation:** It was found that the majority (45.00%) of respondents had a medium level of risk orientation.

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2. Activity wise adoption level of respondents.

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Table 2.Activity wise distribution of respondents according to their level of adoption.

S.No.	Particulars	FA	PA	NA
		F (%)	F (%)	F (%)
Farming Practices				
1.	Crop Rotation Method	34 (28.33)	28 (23.33)	58 (48.34)

2.	Hybrid Varieties	25 (20.83)	41 (34.17)	54 (45.00)
3.	Organic farming	32 (26.67)	36 (30.00)	52 (43.33)
4.	Integrated Farming System	33(27.50)	42(35.00)	45(37.50)
New Technology				
5.	Precision Agriculture	26(21.67)	21(17.50)	73(60.83)
6.	Rice Transplanter	34(28.33)	35(29.17)	51(42.50)
7.	SRI Method of Planting	34(28.33)	33(27.50)	53(44.17)
Management Practices				
8.	Bio-fertilizers	27(22.50)	53(44.17)	40(33.33)
9.	Mulching	26(21.67)	49(40.83)	45(37.50)
10.	Bio-pesticides	23(19.17)	48(40.00)	49(40.83)
Post-Harvest Technology				
11.	Machine Thresher	31(25.83)	42(35.00)	47(39.17)
12.	Parboiling Method	18(15.00)	37(30.83)	65(54.17)
13.	Mechanical Dryer	27(22.50)	40(33.33)	53(44.17)
14.	Milling	38(31.67)	35(29.17)	47(39.16)

FA= Fully Adopted, PA= Partially Adopted, NA= Not Adopted, F= Frequency, % = Percent

Table 2 represents the distribution of respondents according to their level of adoption.

a. **Crop rotation**: Majority (48.34%) of the respondents had not adopted the practice, it was followed by 28.33% who had fully adopted the practice, and finally 23.33% of the respondents who had partially adopted the practice.
b. **Hybrid varities:** Majority (45.00%) of the respondents had not adopted the practice, it was followed by 34.17% who had partially adopted the practice, and finally 20.83% of the respondents who had fully adopted the practice.
c. **Organic farming:** Majority (43.33%) of the respondents had not adopted the practice, it was followed by 30.00% who had partially adopted the practice, and finally 26.67% of the respondents who had fully adopted the practice.
d. **Integrated farming system:** Majority (37.50%) of the respondents had not adopted the practice, it was followed by 35.00% who had partially adopted the practice, and finally 27.50% of the respondents who had fully adopted the practice.

e. **Precision agriculture:** Majority (60.83%) of the respondents had not adopted the practice, it was followed by 21.67% who had fully adopted the practice, and finally 17.50% of the respondents who had partially adopted the practice.

f. **Rice transplanter:** Majority (42.50%) of the respondents had not adopted the practice, it was followed by 29.17% who had partially adopted the practice, and finally 28.33% of the respondents who had fully adopted the practice.

g. **SRI method:** Majority (44.17%) of the respondents had not adopted the practice, it was followed by 28.33% who had fully adopted the practice, and finally 27.50% of the respondents who had partially adopted the practice.

h. **Bio-fertilizers:** Majority (44.17%) of the respondents had partially adopted the practice, it was followed by 33.33% who had not adopted the practice, and finally 22.50% of the respondents who had fully adopted the practice.

i. **Mulching:** Majority (40.83%) of the respondents had partially adopted the practice, it was followed by 37.50% who had not adopted the practice, and finally 21.67% of the respondents who had fully adopted the practice.

j. **Bio-pesticides:** Majority (40.83%) of the respondents had not adopted the practice, it was followed by 40.00% who had partially adopted the practice, and finally 19.17% of the respondents who had fully adopted the practice.

k. **Machine thresher:** Majority (39.17%) of the respondents had not adopted the practice, it was followed by 35.00% who had partially adopted the practice, and finally 25.83% of the respondents who had fully adopted the practice.

l. **Parboiling:** Majority (54.17%) of the respondents had not adopted the practice, it was followed by 30.83% who had partially adopted the practice, and finally 15.00% of the respondents who had fully adopted the practice.

m. **Mechanical dryer:** Majority (44.17%) of the respondents had not adopted the practice, it was followed by 33.33% who had partially adopted the practice, and finally 22.50% of the respondents who had fully adopted the practice.

n. **Milling:** Majority (39.16%) of the respondents had not adopted the practice, it was followed by 31.67% who had fully adopted the practice, and finally 29.17% of the respondents who had partially adopted the practice.

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3. Overall adoption level of the farmers on paddy

cultivation practices

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Table 3. Overall distribution of respondents according to their level of adoption.

S.No.	Category	Frequency	Percentage
1.	Low	37	30.83
2.	Medium	64	53.34
3.	High	19	15.83
	Total	**120**	**100.00**

Table 3 clearly represents the overall distribution of the respondents according to their level of adoption. The majority of the respondents had a medium level of adoption, i.e., 53.34%, followed by 30.83% of the respondents who had a low level of adoption, and finally 15.83% of the respondents who had a high level of adoption.

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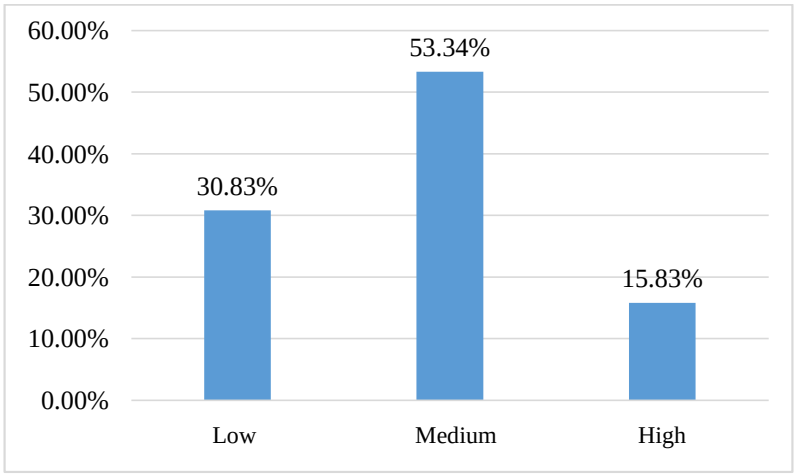

Figure 1. Overall Distribution of respondents according to their level of adoption.

4. Associationbetweenselectedindependentvariableswithadoption level ofrespondents.

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Table 4. Associationbetweenselectedindependentvariableswithadoptionlevel ofrespondents.

S.No.	Variables	Correlationcoefficient(r)
1.	Age	0.948*
2.	Gender	0.803*
3.	Caste	-0.195 ^{NS}
4.	Occupation	0.075 ^{NS}
5.	Education	0.989*
6.	Annual income	0.877*
7.	Land holding	0.552**
8.	Family type	-0.265^{NS}
9.	Farming experience	0.717*
10.	Social participation	0.993*
11.	Sources of information	0.869*
12.	Extension contact	0.969*
13.	Economic motivation	0.335**
14.	Risk orientation	0.946*
*=Correlationissignificantatthe0.01levelofprobability		
**= Correlation is significant at the 0.05 level of probability		
NS=Non-significant		

From this above Table 4, we can conclude that the independent variables, namely age, gender, education, annual income, farming experience, sources of information, social participation, extension contacts and risk orientation were positively and significantly correlated with the adoption behaviour of paddy growers towards improved paddy production practices at 0.01% probability, while the independent variables, land holding and economic motivation were significantly correlated at 0.05% probability. Therefore, the null hypothesis was rejected for these variables. The independent variables such as occupation were found to be non-significant, while independent variables such as caste and family type were found to be negatively and non-significantly correlated with the adoption level of paddy growers at both 0.01% and 0.05% of probability, respectively. Therefore, the null hypothesis was accepted for these variables.

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4. Conclusion

It was concluded that the socio-economic profile of the sample group was medium level. It was concluded that the adoption of improved paddy production practices by the farmers was at a medium level. The majority of the farmers had partially adopted most of the practices. Hence, universities, agricultural departments, KVKs, and other institutes have the responsibility to motivate the farmers to better adopt the cultivation practices, leading to a better income and, in turn, an improved standard of living for the paddy farmers. The independent variables, namely age, gender, education, annual income, farming experience, sources of information, social participation, extension contacts, land holding, economic motivation, and risk orientation, were positively and significantly correlated with the adoption behaviour of paddy growers towards improved paddy production practices.

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