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Factors Affecting the Adoption of Modern Farm Practices in the Farmers of Mandla-Dindori Region, M.P.

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ABSTRACT

The present study examined the extent of adoption of Modern Farm practices by the farmers of Mandla-Dindori region and determined the influencing factors for adopting these practices. For this purpose, the data were collected from randomly selected 635 farming households through pre-tested interview schedule and the collected data have been analysed with the help of various descriptive and statistical techniques for getting meaningful result. Finding portray that most of the respondents use chemical fertilizers and improved seeds. The result of the multiple regression of the level of adoption of modern farm practices shows that the farmers age, education level, households size, farmers income and farm size have positively and significantly influenced with the level of modern farm practices. Finally, we can say that the socio-economic factors influencing the adoption of modern farm practices in farmers of the study region.

KEYWORDS: Adoption Level, Farming household, Modern farm practices.

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INTRODUCTION

There is a lot of discussion on the need to increase productivity and sustainable agriculture in the world. But, there is very less information available on specific tools to achieve this objective. Increasing agricultural productivity is important for meeting the expected demand and, in this way; it is to check the recent performance in the cases of modern agricultural technologies.[1]It is no longer possible to meet the needs of the growing number of world population and to achieve food security objectives by expanding the areas under cultivation, because fertile land is not growing over time.But this problem can be solved by the increasing of domestic agricultural production.However, it would not be possible to achieve agricultural productivity growth without the growth and spread of the growing technologies and applications in the agricultural production.[2]

Improvement in agricultural research and technology is crucial for the increase in agricultural productivity as it reduces poverty and meets the demands of food without the irreversible degradation of the natural resources.[3]Barriers to the Adoption of farm technology, interruption of initial assets and barriers to market access can reduce the increase in agricultural productivity.Agricultural productivity can also be increased by the improved agricultural technologies, which include improved seeds, fertilizers and water facilities.[4]

The main objective of this study is to analyzethe level of adoption of modern farm practices in the farmers and to analyze the determinants of modern farm technology adoption by farmers in the study region.

MATERIALS AND METHODS

This study was carried out in Mandla-Dindori Region of Madhya Pradesh where the agricultural development is adversely affected by the socio-economic status of farmers. For this study, the total 32 villages were selected through using stratified random sample and 635 sample household were selected randomly for interview survey.

For the analysis of collected data, various descriptive and statistical techniques have been used i. e. percentage, mean and Regression. The adoption quotient of modern farm practices were analysed which is developed by Sengupta.[5] Adoption quotient for individual farmers was calculated based on the adoption score gained by the farmers for the adoption of improved form practices. Total 9 improved farm practices were used for calculation of the adoption quotient.

$$\text{Adoption Quotient} = \frac{\text{Total Adoption Score gained by farmers}}{\text{Maximum Adoption Score}} \times 100$$

STUDY REGION

Mandla –Dindoriregion has an area of 14899 Square Kilometre,the most tribal dominated region in Madhya Pradesh. The principal town and administrative headquarters are Mandla and Dindori situated in the littoral of the Narmada River and lies almost entirely in the catchment of the Narmada River.Its extent between the latitude of 22^012` to $23^022$` North and 80^018` to $81^051$` East longitude.

Which covered 4.83 percent of total geographical area of the state. The region is bounded on the North by Umaria and Jabalpur, North-East by Anuppur, South by Seoni, West by Balaghat and East by Kabirdham district of Chhattishgarh state.

According to Census 2011, the region have 2145 villages with the population of 1759429 persons out of 877185 (49.86 %) are males and 882244 (50.14 %) are females, which is 2.42 per cent of total population of Madhya Pradesh. The density of population is 138 person/km^{2}and average literacy rate of the region is 66.9 per cent, where male and female literacy rate is 78.55 % and 55.35 % respectively. The Baiga are very primitive tribes which are mainly found in the study region known as the National Human.[6] The study region accommodates about 60.5 percent of Scheduled Tribes and 5.0 percent of Scheduled Caste population.
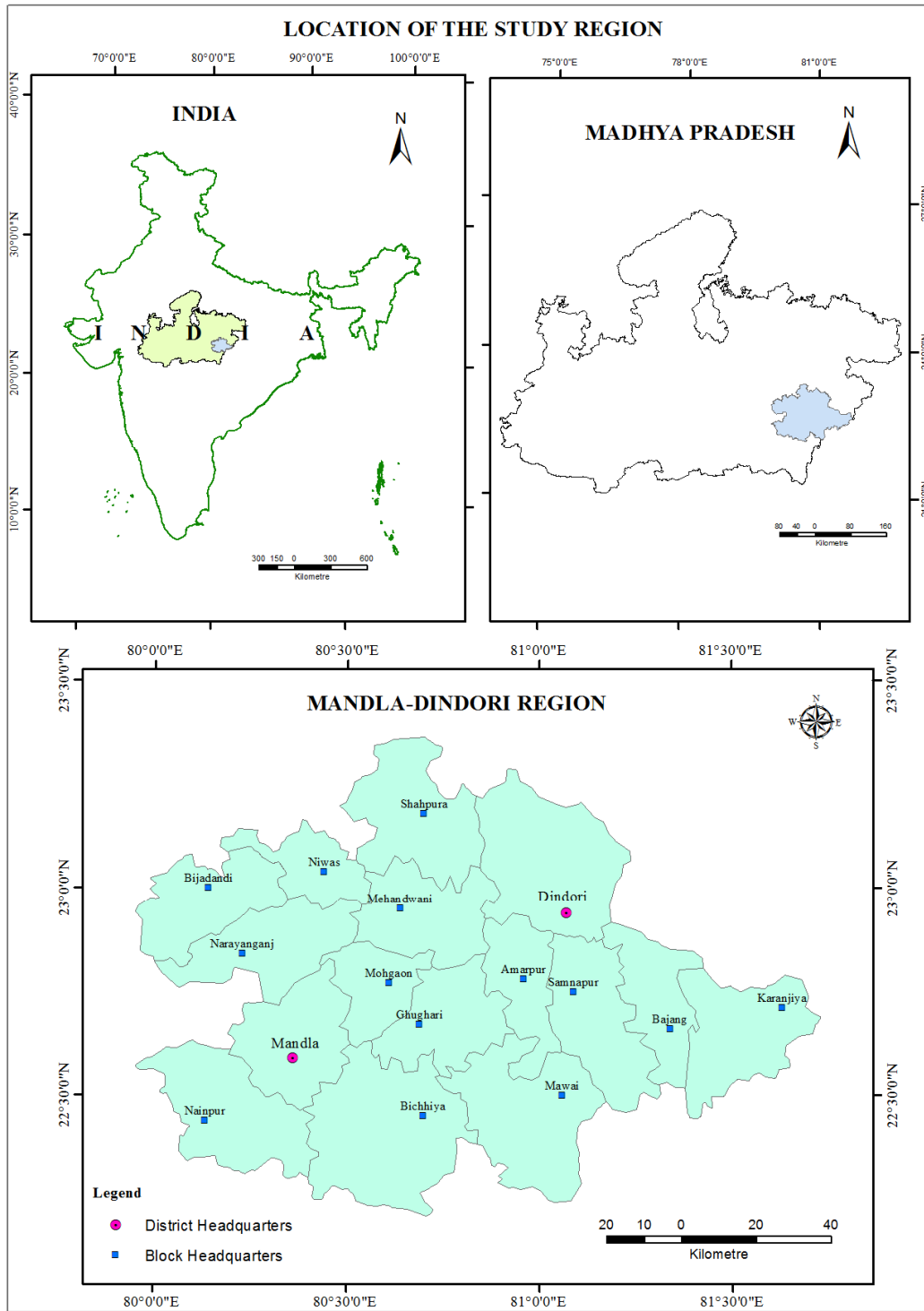
Figure 1: Location of the Study Region

SOCIO-DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS OF THE RESPONDENTS

The socio-demographic and economic characteristics are the important indicators to determine the level of adoption of modern farm practices. Table 1 shows that almost 52.44 percent respondents of the study region belong to the age group of 31 to 45 ages with the mean age of 45.62 year. The highest 28.19 percent respondents no any education qualification and about 22.20 percentrespondent complete primary education, 23.78 percent Middle school, 16.85 percent higher secondary, 7.72 percent are graduate and only 1.26 percent respondent are complete post graduate level of education. In the surveyed households, about 57.61 percent of households have a family size of 5-8 while 41.42 percent households have 4 or less than 4 family members in a household. About 31.34 percent respondents have small size of land holdings followed by semi-medium (31.02 percent), medium (18.74 percent), marginal (17.17 percent) and only 1.73 percentis large size of land holdings with mean size of holdings 2.56 hectare.

Table 1 Socio-Demographic and Economic Characteristics of Respondents

Characteristics	Categories	No. of Respondents	Percentage
Education of Household Head	Illiterate	179	28.19
	Primary	141	22.20
	Middle	151	23.78
	Higher Secondary	107	16.85
	Graduate & Post Graduate	57	8.98
Monthly Income of Household	<2500	242	38.11
	2501-5000	243	38.27
	5001-7500	26	4.09
	7501-10000	26	4.09
	>10000	98	15.43
Age of HH Head	<30	31	4.88
	31-45	333	52.44
	46-60	207	32.60
	>60	64	10.08
Household Size	<4	263	41.42
	5-8	362	57.01
	>8	10	1.57
Farm Size (Hectare)	Marginal (<1 Hect)	109	17.17
	Small (1-2 Hect)	199	31.34
	Semi-Medium (2-4 Hect)	197	31.02
	Medium (4-10 Hect)	119	18.74
	Large (>10 Hect)	11	1.73

Source: Based on Field Survey, 2015-16

STATUS OF ADOPTING IMPROVED FARM PRACTICES

The adoption of modern agricultural implements is directly related to the socio-economic condition and awareness of farmers. Awareness about modern agricultural implements promotes demands and spread of agricultural innovations. In order to determine the level of adoption of modern agricultural practices, 9 indicators (Table 2) were considered and adoption score have been calculated as the number of implements adopted by a particular farmers.[7]On the basis of adoption quotient of particular farmers, adoption level is classified into three categories (Table3).

Table2 Distribution of farmers by their adoption of farm practices

Implements	Adopters	
	Frequency	Percentage
Use of Chemical Fertilizer	385	60.6
Use of improved seeds	385	60.6
Electric Pump	102	16.1
Diesel Engine	143	22.5
Iron Plough	54	8.5
Tractors	73	11.5
Sprinkler	25	3.9
Plant protection	281	44.3
Spraying machine	242	38.1

Source: Field Survey, 2015-16

The distribution of adoption level of farmers that the maximum respondents adopted chemical fertilizer (60.6 %) and improved seeds (60.6%), followed by Plant protection (44.3%), Spraying machine (38.1), Diesel engine (22.5%), Electric pump (16.1%), Tractors (11.5%), Iron plough (8.5%) and Sprinkler (3.9%) respectively. There are only two implements had adoption and use level above 50 per cent, while most of the farmers do not adopt and use of improved implements of their farm production.

LEVEL OF ADOPTION OF FARM PRACTICES

In this order, table no. 2 shows the distribution of adoption rate of improved implements that the majority of farmers (57.2%) are under the low adopters' category this means the majority of farmers use 3 or less than 3 modern agricultural implements, while 30.7 per cent farmers have moderate adopter (4-6) and only 1.7 per cent farmers have under the category of high adopters (7 and above). This is indicates that the adoption level of improved implements is affected by awareness as well as socio-economic status of farmers. As a result of low level of improved agricultural

implements adopted employed by most small farmers, the desirable level increase agricultural production has been difficult to achieve.

Table 3Adoption Score of Farmers in the Study Region

Adoption Quotient	Adoption Level	Adopters	
		Frequency	Percentage
Below 33.33	Low Adopter	363	63.79
33.33-66.66	Moderate Adopter	195	34.27
66.66 and above	High Adopter	11	1.93
	Total	569	100

Source: Field Survey, 2015-16.

DETERMINANTS OF ADOPTION OF MODERN FARM PRACTICES

The socio-economic condition of farmers is directly related to the use of modern agricultural implements. For this purpose, the estimation of relationship between the level of adoption of improved technology by the farmers and their socio-economic status; multiple regression model was carried out.

For this estimation, five variables were selected i.e. Farmers age, Education of Farmers, Household size, Farmers Income and farm Size in context with adoption level of modern farm practices.

Table 4 Regression Estimate for the Determination of Socio-Economic Factors

Independent variables	B	t	Sig.	F	R^2
(Constant)	0.437	1.420	0.156		
Age of Household Head	-0.001	-0.191	0.849		
Education of Household Head	0.022	0.457	0.648	83.348	0.399
Household Monthly Income	0.220	4.431	0.000		
Farm Size	0.838	16.402	0.000		
Household Size	-0.061	-1.482	0.139		

Source: Calculation is based on sample survey, 2015-16

The multiple regression analysis is employed to determine the relative influence of each independent variable in explaining the variation in the dependent variable. Table 4 reveals that two out of five selected independent variables such as, household monthly income and farm size have significant influence on extent of adoption. Surprisingly, age of household head by household size is negatively related with farmer's adoption. The coefficient of determination (R^2)is 0.399 which implies that all the five independent variables fitted together in the regression model could explain

about 39.90 percent of the total variations in the extent of factors influencing adoption of modern farm practices of the farmers.

CONCLUDING OBSERVATION

Adoption of the modern farm practices is influenced by many factors. These factors are different economic environments with different farmers living in different geographical environments and different social-cultural point of view with various agricultural investment capitals. On the other hand, by adopting modern farm practices, improving their income and consumption expenditure has a positive effect on the life of farmers, thereby improving their level of food security and poverty reduction.In this study, the factors that influence the adoption of modern farm practices by the farmers have been determined.Empirical results indicate that adopting of some improved agricultural practices has a positive or negative effect on agricultural productivity.Several factors such as Education of Household Head, Household Monthly Income and Farm Size have positive effect on adoption of the farmers and Age of Household Head and Household Size has negative effect on adoption of the farmers.

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