



## A study on extent of adoption of recommended Chilli (*Capsicum annum* L.) production technology among the farmers of Patharia in Madhya Pradesh

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ARTICLE INFO	ABSTRACT
<p><b>Original Research Article</b> Received on May 22, 2020 Revised on May 28, 2020 Accepted on June 04, 2020 Published on June 13, 2020</p> <p><b>Article Authors</b> Brajesh Singh Thakur, Richa Sharma, Kota Chakrapani <b>Corresponding Author Email</b> <a href="mailto:kotachakrapani2@gmail.com">kotachakrapani2@gmail.com</a></p>	<p>The present study on extent of adoption of chilli growers was conducted in Damoh district of Madhya Pradesh covering one block. A total of 120 respondents were selected by simple random sampling method from six randomly selected villages. Pre-tested well structured interview schedule was used for collecting the relevant information's. The study inferred that majority of the respondents were of middle aged, belonged to medium size of family, other backward class, illiterate, having low annual income between Rs. 35,001 to 60,000, no membership in any organization indicating poor social participation and farming (chilli cultivation) as the main occupation. Most of the respondents were having medium level of knowledge have medium level of adoption. It was found that villagers do not get other vegetable for their commercial income, through chilli they at least filling this gap of income, although they are producing chilli at low level. Majority of the respondents reported that reasons of adoption of this crop due to chilli needs, less hard work with high benefits and income and it is good for soil also.</p>
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India has always been the largest producer, consumer and importer of pulses. The same trends follow in the context of chilli (*Capsicum annum* Linn). Chilli has been one of the important spice/vegetable/cash crops grown in India. The chilli plant is a white flowered, dark green or purple leaved plant that grows up to 1.5 m in height. It is also called as red pepper, an important condiment crop, grown for its pungent fruits which are used both as green and ripe to impart pungency to food. chilli is a good source of vitamin C, A, E, flavour and aroma. Chilli is considered as one of the commercial spices crop. It is most widely used universal spice, named as wonder spice.

Different varieties are cultivated for various uses like vegetable, pickles, spice and condiments. In daily life, chillies are the most important ingredient in many different cuisines around the world as it adds pungency, taste, flavor and colour to the dishes. Indian chilli is considered to be world famous for two important commercial qualities namely, its colour and pungency levels. There are more than 400 different varieties of chillies found all over the world. It is also called as hot pepper, cayenne pepper, sweet pepper, bell pepper, etc (Thamaraikann *et al.*, 2011). The red chillies have the following composition per 100 g of edible matter calories 45, protein 2.0g, fat 0.8g,

carbohydrate 9.0g, calcium 1.1 mg, phosphorus 47 mg, iron 0.9 mg, thiamine 0.009 mg, niacin 0.4 mg, ascorbic acid 86 mg. In Madhya Pradesh region total spices area is 0.29 m ha with production of 0.41 MT. Chilli is the important spice/vegetable crop of the Madhya Pradesh with area and production of 47031 ha and 12.99 lakh tonnes respectively and productivity 1.4 T/ha during 2013-14. The increase area under chilli production in Patharia block has brought change in the social as well as economic condition of the farmers. The area under chilli production in the Patharia block 195 ha with production 0.88 lakh tonnes and productivity 1.15 T/ha (Anonymous 2013-14).

Adoption of any improved technology involves a process in which awareness is created, attitude is changed and favorable condition for adoption is provided. The adoption behavior of the farmers depends on education, knowledge, attitude, and risk orientation and innovation proneness (Patel, 2005, Ram *et al.*, 2010). Considering these factors, a study of adoption behavior was carried out to determine the selected socio-personal, socio-economic, socio-psychological and communication characteristics of the farmers in relation to knowledge, adoption of some selected practices, and the key variables that influence the adoption of improved practices.

Keeping above facts in view, the present study was under taken to study the extent of adoption of chilli grower's among the farmers of Patharia block of Damoh district in Madhya Pradesh with the following specific objectives:

1. To find out the socio-personal and educational profile of the respondents.
2. To find out the extent of adoption of chilli growers regarding recommended chilli production technology.

## Methodology

The present investigation was conducted in purposively selected Patharia block of Damoh District of Madhya Pradesh covering six villages (Bansakalan, Botrai, Imalia Ghona, Khejralalan, Lakhroni, Sukha) were selected purposively. From the selected each village 20 respondents were selected randomly, thus a total of 120 respondents were constituted the sample size for the investigation.

A pre-structured interview schedule was prepared to collect data by personal interview method. Necessary information was also collected from secondary sources. The collected data were coded, tabulated, classified and further categorized for systematic statistical analysis. The relationship between the knowledge, extent of adoption and certain socio-personal, socio-economic, socio-psychological and communication variables was computed through correlation co-efficient.

## Results and Discussion

The study revealed that most of the respondents (37.50%) were illiterate belonged to middle age (65.83%) other backward class (40.83%) had medium size of family (79.17%) with six to twelve members and had no membership in any organization (50.00%) indicating poor social participation. The study revealed that 32.16 per cent respondents had marginal sized (up to 1 ha.) land holding. The majority of the respondents (56.87%) practiced farming (chilli cultivation) occupation with 32.50 per cent recording an annual income between Rs. 35,001 to 60,000, When credit acquisition was analyzed it was found that 84.71 per cent respondents had acquired credit among them short term credit (73.36%), 62.40 per cent of the respondents utilized cooperative society as their main source of credit and 100.00 per cent of respondents believed that the availability of credit was very easy.

As regards the overall use of sources of information sources it was found that the majority the respondents (67.50%) utilized medium level of sources of information they were used 4 to 10 sources *i.e.* neighbors/ friends/relatives, progressive farmers, training and visit, RAEOs/ADOs, radio, T.V., newspaper/ pamphlet, village panchayat, Krishi Vigyan Kendra and Agriculture University. On source wise analysis it was found that the majority of the respondents (65.83%) always contacted neighbors/friends/relatives, 49.17 per cent contacted progressive farmers, information regarding recommended chilli production technology. Whereas, 45.83 per cent of the respondents occasionally watch T.V. and attended training and visit program followed by 45.00 per cent of the respondents occasionally attended the kisanmelas, for obtaining the information regarding recommended chilli production technology.

The 44.17 per cent of the respondents occasionally listing radio and 41.67 per cent of the respondents used others always as a source of information regarding recommended chilli production technology. While 46.67, 85.83, 84.17, and 80.00 per cent of the respondents never contacted RAEs, krishi vigyan kendra, subject matter specialist and kisan call centre for obtaining the information regarding recommended chilli production technology.

The data also revealed that 41.67 per cent respondents had medium contacted with extension agencies and on detailed analysis it was found that 40.00 per cent respondents had contacted two to three times in year with govt. agriculture department, 10.83 per cent respondent weekly contacted with krishi vigyan kendra, 18.30 per cent respondents had monthly contacted with non govt. organization, 75.83 percent of the respondents had no contacted with agriculture university head quarter respectively.

On analyzing the data it was found that majority of the respondents (49.17%) had medium level of scientific orientation followed by 28.33 percent low level of scientific orientation and 22.50 percent high level of scientific orientation.

### **Socio-economic Characteristics of the Respondents**

**Table 1. Age**

S. N.	Characteristics	Frequency	Percentage
1.	Young (up to 30)	12	10.00
2.	Middle (31 to 50)	79	65.83
3.	Old (above 50)	29	24.17
Total		120	100.00

As regards to age the majority of the respondents (65.83%) belonged to middle age, followed by 24.17 per cent who belonged to old and 10 per cent of the respondents belonged to the young age. It can be concluded that majority of the respondent's belonged to middle age group. Verma (2009) concluded that higher percentages of respondents (49.17) belonged to middle age group. Raghuwansi (2010) concluded that higher percentage of chilli growers (37.5%) belonged to middle age group.

**Table 2. Education**

S. N.	Characteristics	Frequency	Percentage
1.	Illiterate	45	37.50
2.	Primary school	30	25.00
3.	Middle school	25	20.83
4.	High school	10	8.33
5.	Higher secondary	06	5.00
6.	College and above	04	3.33
Total		120	100.00

Education builds the ability of an individual to seek knowledge, understand and utilize things better and hence assessment of respondent's educational attainment was essential. The data presented in table 2 showed that 37.50 per cent of the respondents were illiterate and 25.00 per cent were educated up to primary school level, followed by 20.83 per cent of the respondents were educated up to middle school level. Whereas, 8.33 per cent respondents were educated up to high school level, 5.00 per cent of the respondents were educated up to higher secondary school level and only 3.33 per cent of the respondents were educated up to college and above.

It can be concluded that maximum numbers of the respondents were illiterate. Kushwaha and Pandey (1998) revealed that the maximum number of the respondents (35.00%) were illiterate.

**Table 3. Caste**

S. N.	Characteristics	Frequency	Percentage
1.	Schedule tribes	23	19.17
2.	Schedule caste	26	21.67
3.	Other backward caste	49	40.83
4.	General	22	18.33
Total		120	100.00

As regards to caste, the majority of the respondents 40.83per cent belonged to other backward caste, followed by 21.67 per cent who belonged to scheduled caste, 19.17 per cent of the respondents belonged to the scheduled tribes and 18.83 per cent of the respondents were found in the category of general. It can be concluded that majority of the respondent's belonged to other backward caste. Singh (2007) revealed that the majority of the respondents (68.3%) belonged to other backward caste.

**Table 4. Size of Family**

S. N.	Characteristics	Frequency	Percentage
1.	Small (up to 5 members)	14	11.67
2.	Medium (6 to 12 members)	95	79.17
3.	Big (> 12 members)	11	9.17
Total		120	100.00

The result indicates that majority of the respondents (79.17%) had medium size of family (6 to 12 members), followed by 11.67 per cent with small size of family (up to 5 members). Rest of the respondents (9.17%) belonged to big size of family (more than 12 members). It can be concluded that the majority of the respondents belonged to medium size of family. Kavitha and Reddy (2007) revealed that the more than half of the farm women (55.00%) belonged to medium family size. Singh (2007) revealed that the majority of the respondents (62.5%) had 6-10 members in their family. Lanjewar (2009) revealed that the majority of the respondents (66.43%) had medium size of family (7 to 12 members).

**Table 5. Social Participation**

S. N.	Characteristics	Frequency	Percentage
1.	No membership	60	50.00
2.	Membership in one organization	25	20.83
3.	Membership in two and more than two organizations	16	13.33
4.	Executive/office bearer	19	15.83
Total		120	100.00

As regard to social participation the majority of the respondents (50.00%) had no membership in any organization, followed by 20.83 per cent of respondents who were having membership in one organization, 15.83 per cent respondents who belonged to executive/office bearer category and 13.33 per cent of the respondent had membership in two and more than two organizations. It can be concluded that the majority of the respondents had no membership in any organization. Rabari (2006) revealed that the majority of tomato growers (62.00%) had membership in more than one organization. Lanjewar (2009) revealed that the majority of the respondents (53.58%) had no membership in any organization.

**Table 6. Size of Land Holding**

S. N.	Characteristics	Frequency	Percentage
1.	Marginal (up to 1 ha)	47	39.16
2.	Small (1.1 to 2 ha)	38	31.66
3.	Medium (2.1 to 4 ha)	09	7.50
4.	Large (above 4 ha)	26	21.26
Total		120	100.00

The data depicted in table 6 shows that maximum number of the respondents (39.16%) had marginal size of land holding (up to 1 ha), followed by 31.66 per cent of the respondents who had small size of land holding (1.1 to 2 ha), 21.66 per cent of the respondents had large size of land holding (above 4 ha) and 7.5 per cent of respondents had medium size of land holding (2.1 to 4 ha). It could be concluded from the table that maximum number of the respondents had marginal size of land holding. Roy and Chowdhary (2007) revealed that the majority of the vegetable growers (96.67%) belonged to the marginal farmer category having up to 1 ha land. Singh and Bishnoi (2010) revealed that the maximum number of respondents (50.00%) had small size of land holding.

**Table 7. Occupation**

S. N.	Characteristics	Frequency	Percentage
1.	Farming	13	10.83
2.	Farming (chilli cultivation)	68	56.87
3.	Farming (chilli cultivation) + Labours	24	20.00
4.	Farming (chilli cultivation) + Service	06	5.00
5.	Farming (chilli cultivation) + Others	9	7.50
Total		120	100.00

Regarding the distribution of the respondents according to their occupation, it is observed from the table 7 that the majority of the respondents (56.87%) were involved in farming (chilli cultivation), followed by farming (chilli cultivation) + labours (20.00%), farming (10.83%), farming (chilli cultivation) + others (07.50%), farming (chilli cultivation) + service (5.00%), and none of the respondents were found in farming (chilli cultivation) + occupation + service and farming (chilli cultivation) + animal husbandry + service. It can be concluded that majority of the respondents were involved in farming (chilli cultivation). This finding is in conformity to the findings reported by (Singh and Bishnoi, 2010).

**Table 8. Annual Income**

S. N.	Characteristics	Frequency	Percentage
1.	Up to Rs.35,000	36	30.00
2.	Rs. 35,001-60,000	39	32.50
3.	Rs. 60,001-1,00,000	11	9.17
4.	More than Rs. 1,00,000	34	28.33
Total		120	100.00

Annual income of respondents is given in table 8 which shows that 32.50 per cent of the respondents were having their annual income ranged between Rs. 35,001- 60,000, followed by 30.00 per cent of the respondents who were having their annual income up to Rs 35,000. Whereas 28.33 and 9.17 per cent of the respondents were having their annual income more than Rs.1,00,000 and Rs 60,001 to 1,00,000, respectively. The results clearly indicated that maximum number of the respondents belonged to Rs. 35,001- Rs. 60,000 thousand annual income group. Kavitha and Reddy (2007) revealed that the just below the half of women (43.38%) belonged to medium family income category. Yadav (2008) revealed that the 26.67 per cent of the respondents had annual income ranged between Rs. 35,001 to 60,000.

**Dependent Variable**

**Table 9. Extent of adoption of recommended chilli production technology**

N= 120			
S. N.	Extent of Adoption	Frequency	Percentage
1.	Low ( up to 17 scores)	17	14.17
2.	Medium (18-24 scores)	79	65.83
3.	High (25 and above scores)	24	20.00
Total		120	100.00

Note: X=21.24, S.D. =3.74

It can be seen from the above table 9 that the majority of the respondents (65.83%) showed medium level of adoption regarding recommended chilli production technology. Whereas 20.00 per cent respondents had high level of adoption and 14.17 per cent respondents had reported low level of adoption. Meena *et al.* (2005) revealed that the majority of the respondents (51.33%) belonged to medium level of adoption. Singh and Bishnoi (2010) revealed that, the majority of the respondents (82.00%) belonged to low to medium adoption category. Lanjewar (2009) revealed that the majority of the respondents (63.57%) had medium level of adoption.

**Table 10. Distribution of respondents according to their practice wise extent of adoption regarding recommended chilli production technology**

S. N.	Selected Practices of Chilli Production Technology	Extent of Adoption			Total (%)	Rank (Basis of High Adoption)
1.	Selection of land	07 (5.83)	18 (15.00)	95 (79.17)	120 (100)	I
2.	Preparation of land	03 (2.50)	63 (52.50)	54 (45.00)	120 (100)	VII
3.	Crop rotation	04 (3.33)	46 (38.33)	70 (58.33)	120 (100)	V
4.	Selection of improved variety	31 (25.83)	77 (64.17)	12 (10.00)	120 (100)	XIII
5.	Seed rate	42 (35.00)	60 (50.00)	18 (15.00)	120 (100)	XII
6.	Time of sowing	03 (2.50)	55 (45.83)	62 (51.67)	120 (100)	VI
7.	Preparation of nursery	05 (4.17)	59 (49.17)	46 (38.33)	120 (100)	VIII
8.	Time of transplanting	02 (1.67)	74 (61.67)	44 (36.67)	120 (100)	IX
9.	Distance between row to row and plant to plant	23 (19.17)	86 (71.67)	11 (9.17)	120 (100)	XV
10.	Intercultural operation (Earthing and weed control and their management)	02 (1.67)	42 (35.00)	76 (63.33)	120 (100)	IV
11.	Irrigation	23 (19.17)	87 (79.50)	10 (8.33)	120 (100)	XVI
12.	Use of manures	23 (25.83)	79 (65.83)	10 (8.33)	120 (100)	XVII
13.	Use of fertilizers	02 (33.75)	41 (48.75)	77 (17.50)	120 (100)	III
14.	Identification of Insect and their control measures	30 (25.00)	86 (71.67)	04 (3.33)	120 (100)	XVIII
15.	Identification of diseases and their control measures	54 (45.00)	40 (33.33)	26 (21.67)	120 (100)	XI
16.	Harvesting (Time of picking)	31 (25.83)	78 (65.00)	11 (9.17)	120 (100)	X
17.	Storage	02 (1.67)	40 (33.33)	78 (65.00)	120 (100)	II
18.	Marketing	31 (25.83)	77 (64.17)	11 (9.17)	120 (100)	XIV

The high level of adoption by the chilli growers was reported in practices like selection of land (79.17%), storage (65.00%), use of fertilizers (64.17%), earthing (63.33%), crop rotation (58.33%), time of sowing (51.67%), preparation of land (45.00%), preparation of nursery (38.33%), time of transplanting (36.67), harvesting (time of picking) and identification of diseases and their control measures (21.67%), seed rate (15.00%), variety (10.00%), marketing and distance between row to row and plant to plant (9.17%) irrigation and use of manures (8.33%) and identification of insects and their control measures (3.33%).

**Table 11. Correlation analysis of independent variables with the knowledge of recommended chilli production technology**

S. N.	Independent Variables	Coefficient of Correlation "r" Value
1.	Age	-0.06752 <sup>NS</sup>
2.	Education	0.2289*
3.	Caste	-0.01302 <sup>NS</sup>
4.	Size of Family	-0.02502 <sup>NS</sup>
5.	Social participation	0.2771**
6.	Size of land holding	0.2905*
7.	Occupation	0.2623**
8.	Annual income	0.2670**
9.	Credit acquisition	0.07184 <sup>NS</sup>
10.	Source of information	0.2205*
11.	Contact with extension agencies	0.2461**
12.	Scientific orientation	0.0484 <sup>NS</sup>

Note: \*\*Significant at 0.01 level of probability, \*Significant at 0.05 level of probability, NS- Non significant

This finding clearly indicates that most of the selected independent variables had significant relationship with knowledge regarding recommended chilli production technology.

**Table 12. Correlation analysis of independent variables with the adoption of recommended chilli production technology**

S. N.	Independent Variables	Coefficient of Correlation "r" Value
1.	Age	-0.03045 <sup>NS</sup>
2.	Education	0.2356*
3.	Caste	0.0267 <sup>NS</sup>
4.	Size of Family	-0.1465 <sup>NS</sup>
5.	Social participation	0.1837*
6.	Size of land holding	0.2346**
7.	Occupation	0.3129**
8.	Annual income	0.1959*
9.	Credit acquisition	0.0420 <sup>NS</sup>
10.	Source of information	0.2415**
11.	Contact with extension agencies	0.1987*
12.	Scientific orientation	-0.0027 <sup>NS</sup>

Note: \*\*Significant at 0.01 level of probability, \*Significant at 0.05 level of probability, NS- Non significant

The data furnished in the variables age, caste, size of family, credit acquisition, irrigation availability and scientific orientation were found to have none significant relationship with adoption of recommended chilli production technology. While education, social participation, contact with extension agencies and annual income were found positively and significantly related with adoption at

0.05 per cent level of significance. However, the variables size of land holding, occupation, sources of information were found positively and highly significantly correlated with adoption at 0.01 per cent level of significance. The above result shows that when the level land holding, occupation, sources of information of the respondents increases than the adoption of respondents correspondingly increase.

## Conclusion

The findings of the study indicated that majority of the chilli growers were having medium range categories in respect to their extent of adoption regarding recommended chilli production technology. Thus, there is urgent need to increase the adoption of recommended chilli production technology, through proper utilization of sources of information, extension contact, exhibition, kisanmelas and training programme should be conducted in different aspects of chilli production by concerned agencies. Majority of chilli growers were having medium level of knowledge regarding recommended chilli production technology. Hence, extension efforts should be done to increase the level of knowledge of chilli growers about recommended chilli production technology.

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