SHORT COMMUNICATION

STUDIES ON SOCIO-ECONOMIC CHARACTERISTICS AND ADOPTION LEVEL OF CONTROL MEASURES OF INSECT PESTS BY CHICKPEA GROWERS IN KABIRDHAM, CHHATTISGARH

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Abstract: The present study was conducted during the year 2020-21 in the Kabirdham district of Chhattisgarh state to find out the socio-economic characteristics and adoption level of chickpea cultivators regarding control measures of major insect pests. There are 28 districts in the state. out of which Kabirdham district was selected purposively. Information was obtained with the help of pre-tested structured interview schedule by personal interview. Collected data were analyzed by using suitable statistical tools. The results of the study revealed that most (62.00%) of the chickpea growers were in the middle age group, the majority (71.00%) belonged to other backward class, most of them (31.00%) were educated up to primary school level, (55.00%) under the category of medium size of family, (65.00%) of the respondents had participated in one organization, among the chickpea growers majority (40.00%) having small size of landholding, (61.00%) of respondents as their main occupation was agriculture, (73.00%) had annual income up to 1.40 lakh per year, (46.00%) required credit facility, (70.00%) utilized medium level of sources of information, (67.00%) had a medium level of scientific orientation. The overall knowledge index regarding control measures in chickpea was found that most of (66.92%) of cultural practices, followed by (49.92%) chemical practices and maximum adoption index among control measures found that most of (50.37%) of cultural practices, followed by (34.39%) of chemical practices.

Keywords: Chickpea, Socio-economic characteristics, Control measures, Adoption

INTRODUCTION

Chickpea (*Cicer arietinum* L.) is the most important food legume crop in the world. Chickpea is grown in the drier and irrigated areas of the country as they are best suited for its production. The crop has originated in Southeast Turkey and spread west and south via the Silk road. It has Rhizobium bacteria, capable of fixing atmospheric nitrogen, are present in the symbiotically, nodules developed by bacteria on the roots. Chickpea is a highly acidic fluid containing malic, oxalic and citric acids are produced by the glandular trichomes present of the entire surface of the plant except for the corolla. The seeds are large, salmon-white in color, and contain a high level of carbohydrate (41.10 – 47.42%), protein is (21.70 – 23.40%) and starch is the major carbohydrate fraction, representing about 83.9% of the total carbohydrates. Chickpea contains about 6% fat that is important in vegetarian diets. India is the single largest pulse producing country in the world, it has the first rank in both area and production during cropping session 2017-18 an area of chickpea is about 105.73 (lakh ha.) 36.01% area of all pulses, producing 111.58 (lakh tones) 45.53% production of all pulses with the productivity of 1056 kg/ha. Chickpea producing states in India are Madhya Pradesh (41.18%), Maharashtra (15.78%), Rajasthan (13.19%), Karnataka (7.39%), Uttar Pradesh (6.13%), Andhra Pradesh (6.06%), Gujarat (3.24%), Jharkhand (2.33%) and Chhattisgarh in the ninth position. In Chhattisgarh status of chickpea 2017-18

area, production and productivity 335.03, 331.68, 990 respectively (area 000, ha. production 000, Mt. productivity 000, kg/ha.) there major districts of Chhattisgarh based on the cultivated area of chickpea are Bemetara, Rajnandgaon, Kabirdham, Dhamtari, Balod, Mungeli, Durg and Raipur. 2017-18. Bemetara has the first position in both cultivated area and production of chickpea 96.22 thousand ha., production 106.46 thousand metric tons and Kabirdham has the third position in both area and production of chickpea with a cultivated area of 72.57 thousand ha., production of 56.02 thousand metric tons with the productivity of 772 kg/ha. out of 4 blocks of Kabirdham district, Pandariya block has a maximum area under chickpea with an area of 18.24 thousand ha., production of 11.85 thousand tones and productivity of 650 kg/ha.

MATERIALS AND METHODS

The present study was done during the year 2020-21 in Kabirdham district of Chhattisgarh state. Chhattisgarh state is divided into 28 districts namely Koriya, Balrampur, Surajpur, Jaspur, Surguja, Bilaspur, Mingeli, Korba, Janjgir-Champa, Raigarh, Gaurella-Pendra-Marwahi, Kabirdham, Bemetara, Durg, Balod, Rajnandgaon, Mahasamund, Baloda Bazar, Gariaband, Raipur, Dhamtari, Kanker (Uttar Baster), Narayanpur, Kondagaon, Baster, Dantewada (Dakshin Baster), Bijapur and Sukma. Out of these, Kabirdham district was selected for the present study, Kabirdham comprises 4 blocks in which only one block Pandariya was selected purposively

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because this block has a maximum area of chickpea but low productivity that is the main reason for the selection of this area for the study to know why productivity is low. Among the villages of Pandariya block, only 10 villages were selected to study, 10 chickpea growers were selected randomly from each selected village in this way, total of 100 (10x10=100) chickpea growers were selected as respondents. The data were collected personally by the researcher in co-operation with RAEOs and other officials of the block by using a pre-tested structured interview schedule.

RESULTS AND DISCUSSION
Socio-economic characteristics of the chickpea growers Age
Table 1 It was shown that the majority of respondents (62.00%) were 36-55 years of age. Followed by 22.00% and 16.00% belonging to the up to 35 years age group and under 56 and over age group, respectively. It was found that 36-55 years-old respondents were the single largest group. This result shows that middle age group is more dominant towards control measures and farming practices of chickpea crop.

Table 1. Distribution of the chickpea cultivators according to their socio-economic characteristics. (n = 100)

Sl. No.	Variables	Categories	Frequency	Percentage	Mean	S.D.
1.	Age	Young (Up to 35 years)	22	22.00	41.7	11.53
		Middle (36 to 55 years)	62	62.00		
		Old (56 years and above)	16	16.00		
2.	Caste	Scheduled Caste	13	13.00	2.68	0.76
		Scheduled Tribe	11	11.00		
		Other Backward Class	71	71.00		
		General	5	5.00		
3.	Education	Illiterate	20	20.00	1.71	1.35
		Primary school	31	31.00		
		Middle school	22	22.00		
		High school	15	15.00		
		Higher secondary school	9	9.00		
		Graduation and above	3	3.00		
4.	Size of family	Small (Up to 5)	30	30.00	7.4	3.52
		Medium (6 to 10)	55	55.00		
		Large (11 and above)	15	15.00		
5.	Social participation	No participation	20	20.00	0.99	0.68
		Participation in one org.	65	65.00		
		Participation in two/more org.	11	11.00		
		Member cum office bearer	4	4.00		
6.	Size of landholding	Marginal (<1 ha.)	30	30.00	1.71	1.77
		Small (1 to 2 ha.)	40	40.00		
		Semi-medium (2 to 4 ha.)	20	20.00		
		Medium (4 to 10 ha.)	7	7.00		
		Large (10 ha. and above)	3	3.00		
7.	Occupation	Agriculture	61	61.00	2.14	1.80
		Agriculture + labor	15	15.00		
		Agri. + animal husbandry	3	3.00		
		Agriculture + service	3	3.00		
		Agriculture + business	6	6.00		
		Agriculture + other	12	12.00		
8.	Annual income	(Up to Rs 1,40,000)	73	73.00	1,31,520	1,33,168
		(Rs 1,40,001 to 3,00,000)	14	14.00		
		(Rs 3,00,001 to 4,00,000)	8	8.00		
		(Rs 4,00,001 or above)	5	5.00		
		Low (Up to 4 score)	14	14.00		

9.	Source of information	Medium (5 to 10 score)	70	70.00	7.28	2.94
		High (above 10 score)	16	16.00		
10.	Scientific orientation	Low (Up to 19 score)	21	21.00	21.54	2.68
		Medium (20 to 24 score)	67	67.00		
		High (above 24 score)	12	12.00		

Caste

Table 1 showed that the majority of the respondent (71.00%) were belonged to other backward class, followed by 13.00% who had belonged to the scheduled caste, 11.00% of respondents were from the scheduled tribe and only 5.00% of the respondents belonged to general. The reason may be OBC category is a more dominated caste in Chhattisgarh state.

Education

Table 1 showed that most (31.00%) of the respondents had a primary level of education, followed by 22.00% of respondents were having a middle school level of education and 20.00% were having illiterate. However, very few percentages of the respondents were observed in the case of higher secondary school education level 9.00% and only 3.00% of the respondents had up to graduation and above level of education. Finally, the result indicated that the majority of the rural people had low education qualifications which are responsible for the technological gap in the adoption of various technologies.

Size of family

Table 1 showed that the majority (55.00%) of respondents had the medium size of family 6 to 10 members, followed by 30.00% of the respondents with a small size of the family up to 5 members and 15.00% of the respondents belonged to the large size of family 11 members and above. This shows the dominance of joint families in rural areas.

Social participation

Table 1 reveals that the majority (65.00%) of the respondents had participated with one organization, followed by 11.00% of the respondents participated with two or more organizations and only 4.00% respondents had member cum office-bearer among the respondents 20.00% had no participated with any organization. It can be assumed that most of the respondents are interested in social involvement. This result was consistent with Kerketta (2015).

Size of landholding

Table 1 shows that the majority of respondents (40.00%) had a small size of landholding 1 to 2 ha., followed by 30.00% respondents had a marginal size of landholding less than 1 ha., 20.00% of the respondents were having a semi-medium size of landholding 2 to 4 ha., 7.00% of the respondents were having a medium size of landholding 4 to 10 ha. and only 3.00% of the respondents comes under the category of large farmer 10 ha. and above. This result shows that most of them had less landholding which is reflected in their annual income.

Occupation

Table 1 indicates that the maximum (61.00%) of the respondents were involved in agriculture, followed by 15.00% agriculture + labor, 12.00% agriculture + other, 6.00% agriculture + business, 3.00% agriculture + animal husbandry and only 3.00% of the respondents involved in agriculture + service. This finding shows that rural people are mostly engaged in agriculture as their main occupation for their livelihood.

Annual income

Table 1 showed that the majority (73.00%) were having an annual income (Up to Rs 1,40,000), followed by 14.00% were in the category of annual income (1,40,001 to 3,00,000), whereas 8.00% of respondents found in the category of (3,00,001 to 4,00,000) and 5.00% were in the category of annual income (4,00,001 or above). These results are consistent with the findings of Bunkar (2015). The result depicts the low annual income of the respondents which is due to their less landholding.

Source of information

From table 1 it was observed that the majority (70.00%) of respondents had a medium level of utilization of source of information, followed by 16.00% of the respondents who were found to have a high level of utilization of source of information and 14.00% of them had a low level of utilization of source of information regarding control measures of major insect pests of chickpea crop.

Scientific orientation

Table 1 revealed that the majority (67.00%) of the respondents had a medium level of scientific orientation, followed by 21.00% of respondents who had a low level of scientific orientation and 12.00% of the respondents had a high level of scientific orientation. This finding shows that the respondents were medium to low oriented towards the techniques of control measures of major insect pests of chickpea which is responsible for a technological gap.

Table 2. Distribution of the respondents according to their overall adoption regarding control measures of major insect pests of chickpea crop. (n = 100)

Sl. No.	Adoption level	Frequency	Percentage	Mean	S.D.
1.	Low (Up to 25 score)	17	17.00		
2.	Medium (26 to 35 score)	67	67.00		
3.	High (above 35 score)	16	16.00	30.00	5.49
	Total	100	100.00		

Table 2 showed that the majority (67.00%) of respondents had a medium level of adoption, followed by 17.00% had a low level of adoption and 16.00% of the respondents had a high level of adoption regarding control measures of major insect pests of chickpea crop.

The medium level of adoption might be attributed to a relatively good number of literate farmers with a friendly attitude, but due to low extension contact and training exposure, farmers may have found it difficult to fully adopt the technology. Periodic training and regular visit of extension agents may help increase the overall adoption of control measures of major insect pests of chickpea crop.

Table 3: Adoption index of the control measures towards major insect pests of chickpea crop by chickpea growers.

Sl. No.	Insects	Adoption index (%)			
		Cultural practices	Mechanical practices	Chemical practices	Biological practices
1.	Gram pod borer (*Helicoverpa armigera*)	66.27	10.67	46.50	0.0
2.	Cutworm (*Agrotis ipsilon*)	50.00	6.39	39.26	0.0
3.	Termite (*Odontoterms obesus*)	42.12	0.0	15.00	0.0
4.	Semilooper (*Autographa nigrisigna*)	31.15	5.00	28.73	0.0
5.	Pulse beetle (*Callosobruchus chinensis*)	62.32	0.0	42.50	2.50
	Overall	50.37	4.41	34.39	0.5

Table 3 clearly shows that the adoption index of cultural practices regards gram pod borer (*Helicoverpa armigera*) was (66.27%), followed by mechanical practices (10.67%), chemical practices (46.50%) and (0.0%) of biological practices of gram pod borer. In the case of cutworm (*Agrotis ipsilon*) adoption index of cultural practices (50.00%), followed by mechanical practices (6.39%), chemical practices (39.26%) and (0.00%) of biological practices of cutworm. As regard termite (*Odontoterms obesus*) adoption index cultural practices (42.12%), followed by (0.0%) mechanical practices, (15.00%) chemical practices and (0.0%) biological practices of termite. In the case of semi looper (*Autographa nigrisigna*) adoption index of the cultural practices (31.15%), followed by mechanical practices (5.00%), chemical practices (28.73%) and (0.0%) of biological practices of semi looper. As regard pulse beetle (*Challosobruchus chinensis*) adoption index of the cultural practices (62.32%), followed by (0.0%) mechanical practices, (42.50%) chemical practices and (2.50%) biological practices of pulse beetle. Overall adoption index of the cultural practices of insect pests was (50.37%), followed by (4.41%) mechanical practices, (34.39%) chemical practices and (0.5%) biological practices of major insect pests of chickpea crop. Timely training and regular visit of the extension agents may help increase the adoption index of the control measures.

CONCLUSION

On the basis of the findings of the study, it can be concluded that most of the respondents were middle-aged, other backward class, literate, medium family size, participated in one organization, small size of landholding, and the main occupation was agriculture, up to Rs 1,40,000 annual income, medium level of utilization of information sources, medium level of scientific orientation, medium level of overall adoption regarding control measures of major insect pests and overall adoption index of control measures of major insect pests of chickpea crop was 50.37% of cultural practices, 34.39% of chemical practices, 4.41% of mechanical practices and 0.5% of biological practices. So, there is a need

to focus on enhancing farmer's knowledge about recommended practices of control measures by regular field visits and conducting periodic training by extension functionaries.

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