Short Research Article

A study on Technological Adoption among sugarcane growers of Surguja district of Chhattisgarh

ABSTRACT

The present study was carried out in the Surguja district of Chhattisgarh and data was collected from 120 respondents from six selected villages. The results indicate that the majority of respondents belonged under the medium category level of overall socio-economic attributes followed by the lower and higher category under the study. A majority of respondents completely adopted land preparation, setts treatment, recommended varieties, irrigation for critical stages, weeds, termites and red rot management, whereas, the remaining practices of the study were observed to the partial level of adoption. The study reveals that the coefficient of correlation between the socio-economic attributes of sugarcane growers and their technological level of adoption was found to be significant in 1-5 levels except for the size of the family and experience in sugarcane cultivation.

Keywords: Technological Adoption, Socio-economic attributes, Sugarcane, Respondents, Significant and Coefficient of correlation.

1. INTRODUCTION

Agriculture is one of the most significant sectors of the Indian economy and it is the only means of living for almost two third of the Indian workers. In India, the total area under sugarcane cultivation is 48.57 Lakh hectares and 2nd largest producer of sugar in the world having 399.25 million tons of production with average productivity of 82.20 tons/hectare (Source: Annual report 2021-22 of Ministry of Agriculture & Farmers Welfare, Government of India). Chhattisgarh comprises three agro-climatic regions: the northern hills zone, plains zone and Bastar plateau zone. The future scope and area expansion of sugarcane is bright in the northern hills zone of Chhattisgarh where the production recorded 11.04 lace metric tons with average productivity of 49.96 tons/ha. The major problem in the sugarcane growing area of the northern hill zone of Chhattisgarh is a lack of marketing and means of transportation facilities.

2. METHODOLOGY

The study was carried out in the Surguja district under the northern hill zone of Chhattisgarh state, in the periphery of Maa Mahamaya Co-operative Sugar Factory Ambikapur during the years 2021–2022. Out of seven blocks, two blocks; Lundra and Batauli considered in which six maximum sugarcane growing areas of villages were purposively selected with twenty respondents from each selected village randomly taken. Thus, 120 respondents were finally selected, and data was collected with the help of a well-developed structured interview schedule.

3. RESULTS AND DISCUSSIONS

Table-1: Distribution of socio-economic attributes and their different levels of sugarcane grower respondents (n=120).

~~(n=120)~~

S.N.	Socio-economic attributes	Socio-economic level (%)			Total
		Lower	Medium	Higher	
1.	Age	31.67	55.83	12.50	100
2.	Caste	79.17	18.33	2.50	100
3.	Education	45.83	39.17	15.00	100
4.	Size of family	38.33	52.50	9.17	100
5.	Occupation	35.00	56.66	8.34	100
6.	Social participation	20.00	75.00	5.00	100
7.	Landholding	22.50	49.17	28.33	100
8.	Area under sugarcane crop	14.16	69.17	16.67	100
9.	Experience in sugarcane cultivation	18.33	67.50	14.17	100
10.	Productivity of sugarcane	16.67	68.33	15.00	100
11.	Source of irrigation	5.00	25.00	70.00	100
12.	Cropping intensity	6.67	56.67	36.66	100
13.	Annual income	11.67	72.50	15.83	100
14.	Contribution of sugarcane to annual income	15.83	67.50	16.67	100
15.	Innovativeness	10.83	67.50	21.67	100
16.	Source of information	16.67	65.00	18.33	100
	Overall	18.33	68.33	13.34	100

Table 1 reveals that the majority of respondents belonged to a medium (55.83%) category of age group followed by the young (31.67%) and old age (12.50%) group, similarly, the majority of respondents belonged to the medium category in respect of their size of family, occupation, social participation, landholding, the area under sugarcane, experience in sugarcane cultivation, productivity, cropping intensity, annual income, the contribution of sugarcane to annual income, innovativeness and source of information and their percentages as 52.50, 56.66, 75.00, 49.17, 69.17, 67.50, 68.33, 56.60, 72.50, 67.50, 67.50 and 65.00 respectively were observed. However, the case of a source of irrigation was found in the higher category of respondents and their percentage was 70.00 observed and the remaining per cent of respondents belonged in the category of lower or higher levels under various dimensions of socio-economic attributes were found. The results concluded that the majority of respondents belonged under the medium category level of overall socio-economic attributes followed by the lower and higher category under the present study.

Table-2: Distribution of different levels of adoption in recommended sugarcane cultivation practices of sugarcane grower respondents (n=120).

~~(n=120)~~

Sl.No.	Recommended practices of sugarcane cultivation	Technological adoption level (%)		
		Complete (>66)	Medium (33-66)	Low (<33)
I	**Planting method**			
1.	Land preparation	63.34	31.66	5.00
2.	Method of planting	30.83	66.67	2.50
3.	Spacing	36.67	33.33	30.00
4.	Seed rate	31.67	27.50	40.83
5.	Setts treatment	55.83	0.00	44.17
II	**Variety and seed replacement**			
6.	Variety	70.00	30.00	0.00
7.	Seed replacement	20.83	4.17	58.33
III	**Manures and fertilizers**			
8.	Manures application	3.33	21.67	75.00
9.	Fertilizer application	26.67	39.17	34.17
IV	**Method of irrigation**			
10.	Times of irrigation	40.83	28.33	30.84
11.	Irrigation at critical stages	67.50	20.00	12.50
12.	Method of irrigation	40.83	56.67	2.50
V	**Cultural operation**			
13.	Earthing up	46.67	6.66	46.67
14.	Detrashing	45.00	5.00	50.00
15.	Propping/tying	48.33	10.00	41.67
16.	Flower control	4.17	1.67	94.16
17.	Pre-emergence of weed management	74.17	12.50	13.33
18.	Post-emergence of weed management	34.17	12.50	53.33
VI	**Plant protection measures**			
A	**Insect pest management**			
19.	For pyrilla management	16.67	22.50	60.83
20.	For shoot & root borer management	16.66	20.00	63.34
21.	For white fly management	14.17	15.83	70.00
22.	For termite management	78.33	11.67	10.00
B	**Disease management**			
23.	For red rot management	53.33	9.17	37.50
24.	For smut disease management	10.83	12.50	76.67
25.	For sugarcane rust management	12.50	13.33	74.817
	Overall adoption	25.00	57.50	17.50

Table 2 revealed the existing cultivation practices of sugarcane growers in which planting method, variety and seed replacement, application of manures and fertilizers, method of irrigation, cultural operation and plant protection measures subhead were taken.

In the planting method, the majority of respondents (64%) had adopted a complete level of recommended land preparation practice followed by a medium (31.66%) and low (5.00%) level of extent of adoption. ~~(31&5%).~~ Further, the sugarcane planting method was adopted as recommended at complete (30.83%), moderate (69.00%) and low (2.50%) levels of adoption. Similarly, in the case of both, spacing and setts treatment technique was adopted by respondents in complete (37 & 56%) and partial levels (63 & 44%). However, in the case of seed rate, 32 per cent of respondents adopted as per recommended rate and the remaining about 68 per cent were partially and high seed/setts used due to close spacing.

In variety and seed replacement, the majority of the respondents (70.00%) had a complete level of adoption in recommended varieties of the sugar factory and the remaining 30 per cent were partially adopted. Further, in the case of seed replacement 20.83 per cent of respondents were completely and partly (40.00%) adopted as per recommended interval and the remaining 20.00 per cent were not replaced with the sugarcane variety, they have used very old varieties (Ankapalli).

Application of manures and fertilizers, the majority of respondents (65.00%) had either not adopted or low level of adoption in the manures/compost application followed by partially adopted (35.00%) and the remaining 3.33 per cent only completely adopted as per recommendation rate in their sugarcane cultivation. In the case of fertilizer application, cent per cent of respondents adopted either complete (26.66%) and (73.34%) partially adopted.

In the method of irrigation, 40.83 per cent of respondents had completely adopted the time of irrigation scheduled, remaining 59.16 per cent partially adopted it. However, the majority of respondents (67.50%) had completely irrigated as per recommended critical stages and 32.50 per cent partially adopted it. About 40.83 per cent of respondents had completely adopted the proper irrigation method and the remaining 59.17 had partially used it.

In cultural operation, a majority of the respondents (46.67%) had completely adopted earthing operation as per recommendation and the remaining 53.33 per cent partially adopted it. Similarly, 45.00 per cent of respondents had completely adopted the detrashing practice in their sugarcane cultivation with 55 per cent partly adopting it. Further, 48.33 per cent of respondents completely adopted the propping/tying practices in their cultivation and the remaining 51.67 per cent partially adopted it. Further, only 4.17 per cent of respondents completely adopted flower control and a majority (95.83%) of respondents had not adopted or some extent used flower control management practices in sugarcane, it might be due to lack of ignorance and interest. In the case of weed management, the majority of respondents had adopted the pre-emergence (74.17%) and post-emergence (34.17%) weedicide. Whereas 25 per cent partially adopted pre and post (60.83%) emergence weedicide and the remaining 5.83 per cent had a low level of the extent or not used weedicide in their sugarcane cultivation.

In plant protection measures, in the case of pest management, a majority (60.83%) of respondents had a low level of adoption in pyrilla management followed by a medium and complete level of adoption (22.50 & 16.67%). Similarly, the shoot and root borer management in sugarcane was adopted as per recommended at a low level (63.34%) followed by moderate (20.00%) and complete level of the extent of adoption. Similarly, in the case of management of white flies, the majority of respondents (70%) had a low level of extent of adoption followed by medium (15.83%) and complete (14.17%) levels of the extent of adoption. However, the majority of 78.33 per cent of respondents had completely adopted the recommended management practices in the control of termites' management followed by medium (11.67%) and low (10.00%) levels of the extent of adoption. The majority of

respondents had a low level of extent of adoption in pyrilla, shoot & root borer and white fly control measures due to the low severity of pests in their sugarcane crop were observed.

In the case of disease management, 53.33 per cent of respondents had completely adopted red rot management followed by a medium and low level of extent of adoption (9.17 & 37.50%). Further, 76.67 per cent of respondents had low levels adopted in smut disease management in sugarcane followed by moderate (12.50%) and complete levels of the extent of adoption. Similarly, in the management of sugarcane rust, a majority of respondents (74.81) came under low levels followed by medium and complete levels of the extent of adoption in sugarcane cultivation. Overall adoption of recommended practices of sugarcane had observed as 57.50 per cent of respondents had a medium level of adoption followed by 25.00 per cent had a high level of adoption and the remaining 17.50 per cent of respondents had a low level of adoption in their cultivation of sugarcane.

Table-3: Coefficients of correlation between the socio-economic attributes of the respondents (n-120) with their technological level of adoption.

~~(n-120)~~

Sl.No.	Socio-economic attributes	r' value
1.	Education	.252**
2.	Size of family	-0.005NS
3.	Occupation	.347**
4.	Social participation	.519**
5.	Land holding	.270**
6.	Area under sugarcane crop	.221*
7.	Experience in sugarcane cultivation	-0.108NS
8.	Productivity	.453**
9.	Source of irrigation	.187*
10.	Cropping pattern	.281**
11.	Cropping intensity	.203*
12.	Annual income	.342**
13.	Contribution of sugarcane to annual income	.269**
14.	Innovativeness	.381**
15.	Source of information	.444**

*~~significant~~Significant at the 0.05 level, **significant at the 0.01 level, NS-Non-significant

Table 3 revealed the relationship between independent and dependent variables where education, occupation, social participation, land holding, productivity, cropping pattern, annual income, the contribution of sugarcane to annual income, innovativeness, and source of information and the relationship between the technological level of adoption of sugarcane growers were obtained highly significant with 0.01 level of probability. However, the area under sugarcane crop, source of irrigation and cropping intensity were found significant with a 0.05 level of probability. Whereas, the size of family and experience in sugarcane cultivation found a non-significant relationship with the technological level of adoption of sugarcane growers.

4. CONCLUSIONS

The results concluded that the majority of respondents belonged under the medium category level of overall socio-economic attributes followed by the lower and higher category under the present study. Further, a majority of respondents completely adopted land preparation, setts treatment, recommended varieties, irrigation for critical stages, weeds, termites and red rot management. Whereas remaining practices like the method of planting, spacing, seed rate, replacement of seed, fertilizer application, time and method of irrigation, earthing up, detrashing, propping/tying, flower controls and pest and disease management were partially adopted. However, the majority of respondents had low or not adopted the application of manures in their field due to misunderstanding of low yield and quality of jaggery of sugarcane and the majority of the respondents had a medium level of adoption followed by a high and low level of adoption in the cultivation of recommended practices of sugarcane crop. It can also be concluded that the coefficient of correlation of socio-economic attributes such as education, occupation, social participation, land holding, productivity, cropping pattern, annual income, the contribution of sugarcane in annual income, innovativeness and source of information was observed to highly significant relationships with the technological level of adoption of sugarcane growers.

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