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Adoption of Improved Sugarcane Cultivation Practices by the Farmers in Karnal District of Haryana, India

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Sugarcane (*Saccharum officinarum* L.) is an important commercial crop of India. Sugarcane and sugar beet are used for large scale production of sugar in the world. The present study was conducted in purposively selected Karnal district of Haryana state. There are 8 blocks in Karnal district of Haryana, out of which Indri block were selected on the basis of maximum area under cultivation of sugarcane. From the list so prepared, 12 respondents were selected from 10 villages of the block which constitutes total number of 120 respondents. Majority of the respondents 55.83% fell in the medium adoption level group, whereas 25.00 per cent respondents were observed in the high adoption level group and remaining 19.17 per cent respondents formed low adoption level group. It is hereby concluded that majority of farmers were having medium level of adoption followed by high and low adoption level, respectively. Socio-economic characteristics like Annual income, Land holding, social participation and Extension contact were positively and significantly

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related with extent of adoption of farmers regarding recommended sugarcane cultivation practices. Whereas, positively and non-significant relationship between Age, Education, Family type and Family size and their level of adoption of recommended sugarcane cultivation practices.

Keywords: Adoption; cultivation; improved practices; sugarcane growers.

1. INTRODUCTION

"Sugarcane (*Saccharum officinarum* L.) is an important commercial crop of India. Sugarcane and sugar beet are used for large scale production of sugar in the world. Amongst the sugar producing plants, sugarcane is responsible for about 60.00 per cent of world's sugar production" [1-4]. "Sugarcane is cultivated mainly in the tropics, though in India it is also grown in sub-tropical areas. Sugarcane is the main source of sugar in Asia and Europe. Sugarcane is grown primarily in the tropical and sub-tropical zones of the southern hemisphere. Sugarcane is the raw material for the production of white sugar, jaggery (gur) and khandsari. It is also used for chewing and extraction of juice for beverage purpose". (IISR Lucknow 2019).

Sugarcane (*Saccharum officinarum* L.) also known as noble cane. It is a tall perpetual plant growing upright even up to five or six meters and produce multiple stems [5-7]. The cultivated sugar cane belongs two main groups: (a) thin, hardly north Indian types *Saccharum barberi and* the Chinese *Saccharum sinenses* and (b) bulky juicy noble cane *Saccharum officinarum* is very high-quality cane. The *Saccharum officinarum* is called the *"*noble canes*',* due to solid, juicy, low-fibred canes of high sucrose substance.

"Sustainable Sugarcane Initiative as a technology which provides high productivity with saving of irrigation water, reduce the seed cane cost, increases the farm income through intercrops and facilitating mechanical cane harvesting due to wider spacing. The Sustainable Sugarcane Initiative (SSI) aims to supply practical options to farmers for improving the productivity of land, water, and labour decrease crop period, providing factories a longer serious season and increased service opportunity for workers reduce the overall pressure on water resources and ecosystems". (ICRISAT,2009).

In Haryana, the annual yield of sugarcane amounted to about 86 thousand kilograms per hectare in fiscal year 2021. The yield of sugarcane produced across India was approximately 83 thousand kilograms per hectare that year [8-10]. Sugarcane is an important cash or profit crop in the country [11,12]. Production technology for increasing the level of adoption, farmers need to be convinced about recent knowledge regarding production technologies. In this regard, it is imperative to examine their status of knowledge and the factors which hinder the process of their adoption.

2. METHODOLOGY

For this study, the research design adopted was descriptive research design. Karnal district of Haryana state was selected by purposive sampling methods for the present study, because most of the farmer are growing Sugarcane crop. There are 8 blocks in Karnal districts out of which Indri block were selected through purposive sampling methods on the basis of maximum area under cultivation of Sugarcane. Complete list of all the major sugarcane growing villages was prepared in consultation with the personnel of revenue and agriculture department from the identified blocks. From selected Indri block ten villages namely Kalsaura, Japti chhapra, Syed Chhapra, Nabiabad, Fatehgarh, Rampura, Hanauri, Dhano kheri, Khanpur and Manoharpur were selected on the basis of maximum area under sugarcane cultivation. Out of these 12 respondents from each village was selected randomly. Thus, in all 120 farmers were included in the sample for the present investigation. The primary data was collected with help of structured interview schedule. The secondary data were collected from library, journal and other material. The entire data was further tabulated and analyzed through appropriate statistical tools.

3. RESULTS AND DISCUSSION

3.1 Socio-Economic Characteristics of the Respondents

The data presented in Table 1 revealed that majority 66.66 % of farmers were found in middle age group followed by young age group

(25.83%) and old age group (07.51%) respectively. Most of farmers (28.33%) were intermediate school followed by 26.67 per cent, 21.67 per cent, 15.83 per cent were having higher secondary, primary education, illiterate education respectively, while 7.50 per cent farmers were graduates & above respectively. Majority of the farmers 35.83% possessed medium category of land holding followed by 33.33% with small land holding and rest 25.00 % with marginal land holding, followed by 5.83% with large land holding category. Majority of farmers 43.33 % were in 48,000 to 96,000 level of income group on the other hand 33.33% had below 48,000 level income group remaining 23.33% farmers were in above 96,000 income level group. Majority of farmers 61.67% were large size of family followed by 38.33% with small size of family. Majority of farmers 70.83% were nuclear type of family followed by 29.17% with joint family category. Most of Sugarcane growers 90.00 per cent had medium extension contacts while 8.33 per cent were having high extension contacts and 1.67 per cent farmers were having low extension contacts, respectively. Majority of farmers 48.33 per cent had no participation level of social participation followed by 30.83 per cent, 16.66 per cent and 4.10 per cent with participation in one organization, participation in two organization and participation in more than two organization level of social participation respectively.

Table 1. Socio economic characteristics of the respondents

Characteristics	Frequency (n=120)	Percentage
Age group		
Young (up to 35 years)	31.0	25.83
Middle (From 36 to 55 years)	80.0	66.66
Old (Above 55 years)	9.0	07.51
Education group		
Illiterate	19	15.83
Primary education	26	21.67
Higher secondary	32	26.67
Intermediate	34	28.33
Graduate & above	9	7.5
Land holding group		
Less than 1 hectares (Marginal)	30	25.00
1 to 4 hectares (Small)	40	33.33
4 to 10 hectares (Medium)	43	35.83
More than 10 hectares (Large)	7	5.83
Annual income group		
Below 48,000	40	33.33
48,000 to 96,000	52	43.33
Above 96,000	28	23.33
Family size group		
Small size (up to 5 members)	46	38.33
Large size (Above 5 members)	74	61.67
Family type group		
Nuclear family	85	70.83
Joint family	35	29.17
Extension contacts group		
Low (Below 3)	2	1.67
Medium (From 3 to 9.50)	108	90
High (Above 9.50)	10	8.33
Social participation group		
No Participation	58	48.33
Participation in one organization	37	30.83
Participation in two organization	20	16.66
Participation in more than two organization	05	4.10

3.2 Distribution of Respondents on the Basis of Their Adoption Level

According to Table 2, the majority of the respondent 67 (55.83%) belonged to the medium adoption level group, while 25.00% of respondents belonged to the high adoption level group and the remainder 19.17% to the low adoption level group. The following conclusion states that the majority of farmers had a medium degree of adoption, followed by high and low levels, respectively.

It was found that the overall adoption of Using Seed rate and recommended spacing was ranked first with 80.83 per cent likewise, Using recommended harvesting methods with 79.17 per cent, Following recommended use of high yielding varieties with 78.33 per cent, Using recommended irrigation management with 75.83 per cent, Using recommended fertilizer application, Using recommended time of sowing were ranked Second, Third, Fourth, Fifth and Sixth respectively in adoption level by the sugarcane growers. It was found that sugarcane growers had less adoption regarding using plant protection measures with 52.50 per cent, using weed management with 50.00 per cent, Soil and field preparation with 38.33 and adoption of Using recommended seed treatment with 36.67 per cent and they were ranked Seventh, Eighth, Nineth and Tenth, respectively.

3.3 Association between Selected Independent Variables of Sugarcane Growers and Their Level of Adoption of Recommended Package of Practices

The values of coefficient of correlation furnished in Table 4 clearly shows that level of adoption of recommended package of practices were positively and significantly related at 5% level of significance with Annual income, Land holding, social participation and Extension contact. There was positively and non-significant relationship between age, education, family type and family size and their level of adoption of recommended package of practices.

Table 2. Distribution of respondents on the basis of their adoption level

Sr. No.	Category	Frequency	Percentage
1	Low	23	19.17
2	Medium	67	55.83
3	High	30	25.00
Total		120	100

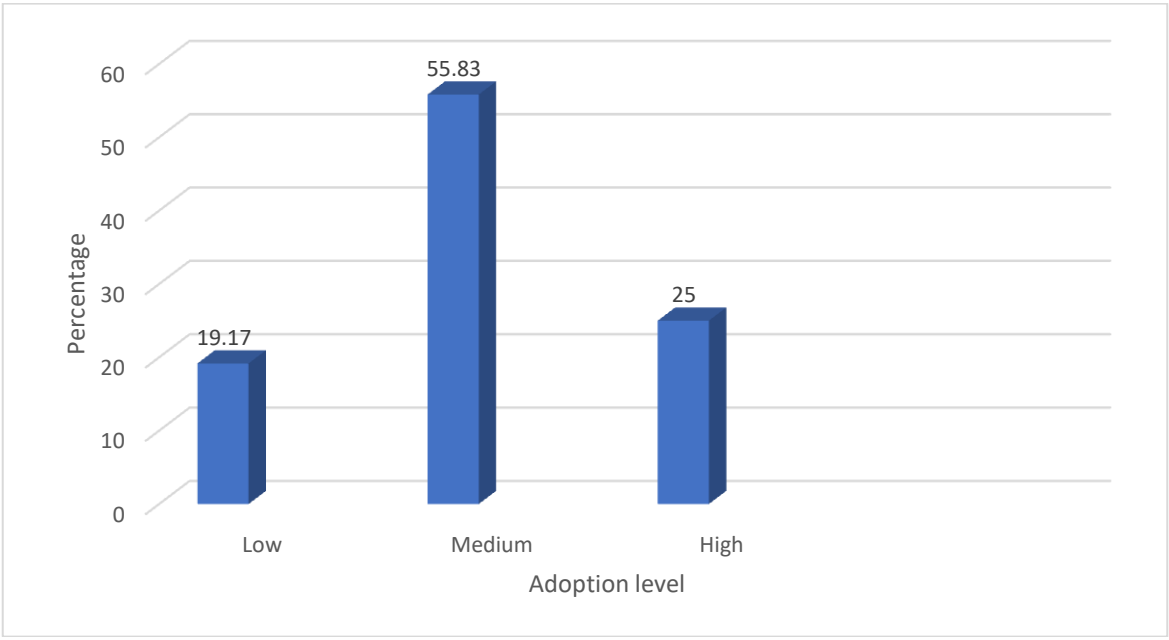

Fig. 1. Distribution of farmers according to their adoption level

Table 3. Extent of adoption of respondents about improved sugarcane cultivation practices

Sr. No.	Package of practices	Frequency	Percentage	Rank
1	Use of HYV	94	78.33	III
2	Soil and field preparation	46	38.33	IX
3	Seed treatment	44	36.67	X
4	Time of sowing	83	69.17	VI
5	Seed rate and recommended spacing	97	80.83	I
6	Fertilizer application	85	70.83	V
7	Irrigation management	91	75.83	IV
8	Weed management	60	50.00	VIII
9	Plant protection measures	63	52.50	VII
10	Harvesting	95	79.17	II

Table 4. Association between selected independent variables of sugarcane growers and their level of adoption of recommended package of practices

Sr. No.	Independent variables	Correlation coefficient (“r”)
1	Age	0.093NS
2	Education	0.044 NS
3	Annual income	0.255**
4	Land holding	0.522**
5	Family size	0.032NS
6	Family type	0.016NS
7	Social participation	0.244**
8	Extension contacts	0.325**

4. CONCLUSION

This present study was conducted in the Karnal district of Haryana. It is concluded that most of the Sugarcane growers were middle age group, educated intermediate education level, had small category of land holding, had 48,000 to 96,000 level of income group, had large size of family size, had nuclear type of family, had medium level of extension contacts and had no participation level of social participation. Meanwhile, most of them had 55.83% medium level of adoption about improved cultivation practices of sugarcane. The results show farmers possessed high adoption practice like “Seed rate and recommended spacing” (80.83 per cent) and “Harvesting” (79.17 per cent) and low adoption practice like “Soil & field preparation” (38.33 per cent) and “Seed treatment” (36.67 per cent).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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