

## FACTORS INFLUENCING ATTITUDE OF SUGARCANE GROWERS TOWARDS SUGARCANE CULTIVATION

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### ABSTRACT

*The present investigation was conducted in Bharuch, Surat and Tapi districts of South Gujarat during the year 2023-25 using ex-post facto research design. After the purposive selection of districts, multistage random sampling method was adopted for selection of talukas, villages and respondents. The total sample size was 240 respondents. Data was collected with a well-structured interview schedule through personal interview method. Softwares namely, OPSTAT, SPSS and MS Excel were used for the statistical analysis of data. The study revealed that 73.75 per cent of sugarcane growers had favorable attitude towards sugarcane cultivation, 20.83 per cent and 5.42 of them had negative attitude and neutral attitude, respectively. The results of path analysis indicated that experience in farming, land holding and age were the key variables exerting maximum direct, total indirect and substantial effect on attitude towards sugarcane cultivation, respectively. Education, experience in farming, extension contact, credit orientation, mass media exposure, information seeking behaviour, use of ICT for farming and social media utilization had positive and significant direct effect on attitude of sugarcane growers towards sugarcane cultivation at one per cent level of significance whereas, extension participation had positive and significant direct effect at five per cent level of significance.*

**Keywords:** attitude, direct effect, total indirect effect, substantial effect, sugarcane cultivation, sugarcane growers

### INTRODUCTION

Sugarcane is a significant cash crop in tropical and subtropical regions contributing to 80.00 per cent of sugar production and 40.00 per cent of bioethanol production in the world (Wu *et al.*, 2024). India has the major area under sugarcane cultivation and holds second place in global sugarcane production. According to National Food Security Mission (NFSM), sugarcane is an important cash crop of India involving less risk and farmers are assured to get some return even in adverse condition. Sugarcane and its products contribute to 1.1% of India's GDP and the contribution of sugarcane to the agricultural GDP has increased steadily in the last two decades (Arun and Premkumar, 2022). With 48.57 lakh hectare of area under cultivation, 399.25 million tonnes production and productivity of 82,205 kg/ha, sugarcane holds a prominent position in India's agricultural landscape (Anonymous, 2022). Gujarat accounts for 3 per cent of India's sugarcane production. The major sugarcane growing districts in Gujarat include Surat, Navsari, Bharuch, Tapi, Narmada, Valsad, Gir Somnath and Vadodara (Chaudhari and Trivedi, 2023).

Attitude plays a significant role in determining

behaviour and responsiveness towards cultivation practices. It is generally shaped by a combination of personal, social, economical, communication and psychological attributes/factors (Patel *et al.*, 2018, Vinaya *et al.*, 2018). Sugarcane growers with positive attitude are most likely to adopt scientific practices, invest in resources efficiently and proactively respond to the extension interventions. On the other hand, negative attitude hinder adoption of innovation and thereby, productivity. Understanding these factors is therefore crucial for agricultural extension systems, policy makers, researchers and other stakeholders to ensure farm level adoption and improve the productivity of sugarcane crop. Extension services from education, research and extension wings, should prioritize regular workshops, field demonstrations and use of mass media to showcase best practices in sustainable sugarcane farming (Vegad *et al.*, 2021; Sanjay, 2024). Farmers need to be educated, convinced about the importance of recommended sugarcane cultivation technologies (Chauhan *et al.*, 2025). Sugarcane is cultivated in almost all the districts of south Gujarat state but still a wide gap between exist the production potential and the actual production realized by the sugarcane growers (Patel and Vyas, 2014). Sustainability and profitability of sugarcane

cultivation are not only influenced by physical and economic factors but also by the attitude of sugarcane growers towards sugarcane cultivation (Aparna *et. al.*, 2025)

Research in the discipline of agricultural extension has recognized the importance of studying attitude of farmers as an outcome of multiple factors. Path analysis provides a more in depth understanding about the complex relationships among variables by partitioning direct, total indirect and substantial effect. This method not only shows the strength of relationship but also explains the casual linkages between variables in a systematic manner.

With this background, the present study was undertaken to analyze the profile of sugarcane growers influencing their attitude towards sugarcane cultivation. By employing path analysis, the study provided empirical insights into relative contribution of different factors, thereby providing valuable implications for extension strategies and policy interventions promoting sustainable sugarcane production.

## OBJECTIVES

- (1) To measure the attitude of growers toward sugarcane crop cultivation
- (2) To ascertain the relationship between profile and attitude of sugarcane growers towards sugarcane crop cultivation

## METHODOLOGY

The present investigation was conducted in South Gujarat region of Gujarat state during the year 2023-25. *Ex-post facto* research design was employed. Purposive sampling technique and multistage random sampling technique were adopted for the study. First, Bharuch, Surat and Tapi districts were selected purposively as these districts were having maximum area under sugarcane cultivation in South Gujarat region. Second, multistage random sampling technique was employed for the selection of talukas, villages and respondents. In the first stage, two talukas were selected randomly from each selected district. In the second stage, four villages were selected randomly from each taluka. In the final stage, 10 sugarcane growers were chosen randomly from each village. Thus, the total sample size comprised 240 respondents.

Considering the objectives of the study, attitude towards sugarcane cultivation was selected as the dependent variable. To measure this, the Likert type summated rating scale developed by Rathod (2014) with 14 items was used with slight modification as followed by Prajapati (2017). The responses were obtained against a five-point continuum

with a scoring pattern of 2,1,0,-1,-2 for positive statements and reversed for negative statements. The total possible score ranged from -28 to 28. Based on the total score, respondents were classified into three categories – negative (score range: -28 to -1), neutral (score: 0) and favourable attitude (score range: 1 to 28). Age, education, experience in farming, family size, occupation other than farming, social participation, extension contact, extension participation, cosmopolitanness, group cohesiveness, annual income, area under sugarcane cultivation, farm resource possession, land holding, credit orientation, mass media exposure, information seeking behavior, use of ICT for farming, social media utilization, negotiation skills, scientific orientation, risk orientation, management orientation, change proneness and decision making ability were selected as independent variables. For measuring the independent variables appropriate measuring techniques developed by other scientists were used. On the other hand, pre tested structured schedule were used for those independent variables for which appropriate measuring techniques are not available. A pre-tested and structured interview schedule was used to collect the data through personal interview method. The data collected were statistically analysed using frequency, percentage, mean score and path analysis. Softwares including OPSTAT, SPSS and MS EXCEL were used to draw the results.

## RESULTS AND DISCUSSION

### Statement wise attitude towards sugarcane cultivation

The results presented in Table 1 indicated that the highest mean score of 0.75 was obtained for the statement - scientific sugarcane cultivation provides better returns than traditional methods with Rank I. This suggests that sugarcane growers hold a favourable attitude towards scientific cultivation practices and believe these methods are more profitable than traditional ones. Similarly, the statement - sugarcane cultivation helps farmers in getting rational returns obtained mean score 0.73 (Rank - II). This might be due to the assured market price offered by sugar factories. Sugarcane cultivation gives maximum returns with minimum cost of cultivation had secured mean score of 0.70 with rank III. These results imply that sugarcane cultivation is generally perceived to provide reasonable economic returns at a relatively low cost.

The eighth statement - sugarcane cultivation is not advisable due to pest and disease problems secured mean score 0.68 and rank IV. Additionally, the statements - cultivation of sugarcane is difficult for non-experienced farmers and sugarcane cultivation is like a gambling obtained mean score of 0.64 and rank V. Other statements *viz*; Adoption of sugarcane cultivation is beyond the reach of poor farmers

(Mean score of 0.61), even less educated farmers can cultivate sugarcane successfully (Mean score 0.59), sugarcane

**Table 1: Statement wise attitude towards sugarcane cultivation**

(n=240)

| Sr. No. | Statements                                                                                              | Mean score | Rank |
|---------|---------------------------------------------------------------------------------------------------------|------------|------|
| 1       | I believe that sugarcane cultivation helps farmers in getting rational return                           | 0.73       | II   |
| 2       | I think that adoption of sugarcane cultivation is out of the reach of poor farmers                      | 0.61       | VI   |
| 3       | I believe that cultivation of sugarcane is more complex                                                 | 0.53       | IX   |
| 4       | I feel that scientific sugarcane cultivation gives better return than traditional sugarcane cultivation | 0.75       | I    |
| 5       | Cultivation of sugarcane is risky venture.                                                              | 0.01       | XIII |
| 6       | Cultivation of sugarcane is difficult for non-experienced farmers                                       | 0.64       | V    |
| 7       | I believe that cultivation of sugarcane is a practical course of action.                                | 0.55       | VIII |
| 8       | I feel that sugarcane cultivation is not advisable due to problems of pest and diseases                 | 0.68       | IV   |
| 9       | I think sugarcane cultivation is difficult because of complex plant protection measure.                 | 0.49       | XI   |
| 10      | There is no risk in adoption of sugarcane cultivation                                                   | 0.43       | XII  |
| 11      | I feel that sugarcane cultivation is like a gambling                                                    | 0.64       | V    |
| 12      | Even lower educated farmers can cultivate sugarcane successfully                                        | 0.59       | VII  |
| 13      | Sugarcane cultivation doesn't require any specific training                                             | 0.52       | X    |
| 14      | Sugarcane cultivation gives maximum returns with minimum cost of cultivation                            | 0.70       | III  |

cultivation is a practical course of action (Mean score 0.55), sugarcane cultivation is more complex (Mean score 0.53), sugarcane cultivation does not require any specific training (Mean score 0.52) and sugarcane cultivation is difficult because of complex plant protection measures (Mean score 0.49), there is no risk in adopting sugarcane cultivation (Means score 0.43), were ranked VI, VII, VIII, IX, X, XI and XII, respectively.

Further, the statement - cultivation of sugarcane is a risky venture (Mean score of 0.01) secured rank XIII. This may be due to familiarity of sugarcane growers with the crop and the assured market provided by sugar factories, which reduce their perception of risk.

#### Attitude towards sugarcane cultivation

The results in Table 2 and Fig. 1 indicates that

majority (73.75%) of sugarcane growers had favorable attitude towards sugarcane cultivation followed by 20.83 per cent of sugarcane growers had negative attitude had negative attitude. Only, 5.42 per cent of sugarcane growers had neutral attitude towards sugarcane cultivation. The results are in line with the findings of Prajapati (2017) and Kumar *et al.* (2018).

Majority of the sugarcane growers had a favourable attitude towards sugarcane cultivation. This might be attributed due to the fact that sugarcane is cash crop giving high return with relatively low cost. Moreover, sugarcane is grown with financial assistance from cooperative sugar factories. Also sugarcane crop requires relatively lesser human labour which allow the family members of sugarcane grower to engage in other economic activity for generating income for their livelihood.

**Table 2: Distribution of sugarcane growers according to their attitude towards sugarcane cultivation**

(n=240)

| Sr. No. | Categories                          | Frequency (f) | Percentage (%) |
|---------|-------------------------------------|---------------|----------------|
| 1       | Negative attitude (-28 to -1 score) | 50            | 20.83          |
| 2       | Neutral attitude (0 score)          | 13            | 5.42           |
| 3       | Favourable attitude (1 to 28 score) | 177           | 73.75          |

**Table 3: Path coefficient showing direct, total indirect and substantial indirect effects of independent variables on attitude towards sugarcane cultivation** (n=240)

| Sr. No.           | Variables                        | Direct effect | Total indirect effect | Substantial indirect effect |
|-------------------|----------------------------------|---------------|-----------------------|-----------------------------|
| X <sub>1</sub>    | Age                              | -0.042        | 0.036                 | 0.245 (X <sub>3</sub> )     |
| X <sub>2</sub>    | Education                        | 0.229**       | -0.011                | 0.045 (X <sub>19</sub> )    |
| X <sub>3</sub>    | Experience in farming            | 0.415**       | -0.241                | 0.026 (X <sub>12</sub> )    |
| X <sub>4</sub>    | Family size                      | 0.043         | -0.045                | 0.015 (X <sub>3</sub> )     |
| X <sub>5</sub>    | Occupation other than farming    | -0.053        | 0.047                 | 0.035 (X <sub>15</sub> )    |
| X <sub>6</sub>    | Social participation             | 0.012         | 0.149                 | 0.034(X <sub>19</sub> )     |
| X <sub>7</sub>    | Extension contact                | 0.148**       | 0.050                 | 0.029 (X <sub>19</sub> )    |
| X <sub>8</sub>    | Extension participation          | 0.134*        | 0.070                 | 0.038 (X <sub>12</sub> )    |
| X <sub>9</sub>    | Cosmopoliteness                  | 0.004         | 0.037                 | 0.034 (X <sub>3</sub> )     |
| X <sub>10</sub>   | Group cohesiveness               | -0.024        | -0.022                | 0.029 (X <sub>19</sub> )    |
| X <sub>11</sub>   | Annual income                    | -0.078        | 0.075                 | 0.158 (X <sub>12</sub> )    |
| X <sub>12</sub>   | Area under sugarcane cultivation | 0.224         | -0.171                | 0.048 (X <sub>3</sub> )     |
| X <sub>13</sub>   | Farm resource possession         | -0.014        | 0.033                 | 0.030 (X <sub>19</sub> )    |
| X <sub>14</sub>   | Land holding                     | -0.114        | 0.207                 | 0.197 (X <sub>12</sub> )    |
| X <sub>15</sub>   | Credit orientation               | 0.183**       | -0.040                | 0.031 (X <sub>18</sub> )    |
| X <sub>16</sub>   | Mass media exposure              | 0.232**       | 0.025                 | 0.031 (X <sub>18</sub> )    |
| X <sub>17</sub>   | Information seeking behaviour    | 0.285**       | -0.100                | 0.024 (X <sub>3</sub> )     |
| X <sub>18</sub>   | Use of ICT for farming           | 0.172**       | 0.071                 | 0.042 (X <sub>16</sub> )    |
| X <sub>19</sub>   | Social media utilization         | 0.203**       | 0.068                 | 0.051 (X <sub>3</sub> )     |
| X <sub>20</sub>   | Negotiation skills               | -0.046        | 0.019                 | 0.026 (X <sub>23</sub> )    |
| X <sub>21</sub>   | Scientific orientation           | 0.102         | 0.061                 | 0.044 (X <sub>3</sub> )     |
| X <sub>22</sub>   | Risk orientation                 | 0.031         | 0.112                 | 0.044 (X <sub>16</sub> )    |
| X <sub>23</sub>   | Management orientation           | 0.09          | 0.044                 | 0.042 (X <sub>3</sub> )     |
| X <sub>24</sub>   | Change proneness                 | 0.078         | 0.092                 | 0.053 (X <sub>19</sub> )    |
| X <sub>25</sub>   | Decision making ability          | 0.007         | -0.069                | 0.013 (X <sub>16</sub> )    |
| Residual: 0.53313 |                                  |               |                       |                             |

### Path analysis of attitude of sugarcane grower towards sugarcane cultivation

Statistically, path analysis is a series of multiple regression analysis and it has an additional advantage to examine the tentative cause and effect in a way that regression analysis cannot. It helps in evaluating the causal relationships between a group of independent variables and dependent variables. Direct and indirect effects of individual independent variables on dependent variables can be well known from path analysis results. The result of path analysis of attitude of sugarcane growers towards sugarcane cultivation is presented in Table 3 and Fig.2.

#### Direct effect

The data presented in Table 1 and Fig. 1 revealed that experience in farming (0.415) had exerted highest direct positive effect on attitude towards sugarcane cultivation, followed by information seeking behaviour (0.285), mass media exposure (0.232), education (0.229), social media utilization (0.203), credit orientation (0.183), use of ICT

for farming (0.172), extension contact (0.148), extension participation (0.134), area under sugarcane cultivation (0.224), scientific orientation (0.102), management orientation (0.090), change proneness (0.078), family size (0.043), risk orientation (0.031), social participation (0.012), decision making ability (0.007), and cosmopoliteness (0.004). On the other hand, farm resource possession (-0.014) had exerted highest negative direct effect on attitude towards sugarcane cultivation, followed by group cohesiveness (-0.024), age (-0.042), negotiation skill (-0.046), occupation other than farming (-0.053), annual income (-0.078) and land holding (-0.114). Further, independent variables including education, experience in farming, extension contact, credit orientation, mass media exposure, information seeking behaviour, use of ICT for farming and social media utilization had direct effect on attitude of sugarcane growers towards sugarcane cultivation which is positive and significant at a 1 per cent level of probability. The independent variable, extension participation had direct effect on the attitude of sugarcane growers which is positive and significant at 5 per cent level of probability. The results are in line with the findings of Archana

(2021) suggesting that education, extension contact and mass media utilization had positive significant relationship with attitude towards sugarcane cultivation. The findings are also in agreement with the results of Kumar *et al.* (2020), Chauhan *et al.* (2025); Pawar *et al.* (2025); Agarwal *et al.* (2024); Sanjay *et al.* (2024) suggesting positively significant relationship of education, experience and extension contact with attitude.

### Total indirect effect

From the Table 1 and Fig 1, it can be observed that land holding (0.207) had highest positive total indirect effect on attitude towards sugarcane cultivation followed by social participation (0.149), risk orientation (0.112), change proneness (0.092), annual income (0.075), use of ICT for farming (0.071), extension participation (0.070), social media utilization (0.068), scientific orientation (0.061), extension contact (0.050), occupation other than farming (0.047), management orientation (0.044), cosmopoliteness (0.037), age (0.036), farm resource possession (0.033), mass media exposure (0.025) and negotiation skill (0.019). As far as negative indirect effect is concerned had education (-0.011) exerted highest total indirect negative effect on attitude towards sugarcane cultivation followed by, group cohesiveness (-0.022), credit orientation (-0.040), family size (-0.045), decision making ability (-0.069), information seeking behaviour (-0.100), area under sugarcane cultivation (-0.171) and experience in farming (-0.241).

### Substantial indirect effect

A careful observation of Table 1 and Fig. 1 revealed that out of 25 independent variables, six routed through social media utilization, four each routed through education, experience in farming and area under sugarcane

cultivation, three routed through mass media exposure, two routed through use of ICT for farming and, one each routed through management orientation and credit orientation. With respect to substantial indirect effect, the first substantial indirect effect on attitude of sugarcane growers towards sugarcane cultivation was put forth by age (0.245) through experience in farming followed by, land holding (0.197) and annual income (0.158) through area under sugarcane cultivation, change proneness (0.053) through social media utilization, social media utilization (0.051) through education, area under sugarcane cultivation (0.048) through experience in farming, education (0.045) through social media utilization, scientific orientation (0.044) through education, risk orientation (0.044) through mass media exposure, management orientation (0.042) through education, use of ICT for farming (0.042) through mass media exposure, extension participation (0.038) through area under sugarcane cultivation, occupation other than farming (0.035) through credit orientation, cosmopoliteness (0.034) through education, social participation (0.034) through social media utilization, mass media exposure (0.031) and credit orientation (0.031) through use of ICT for farming, farm resource possession (0.030) and group cohesiveness (0.029) through social media utilization, extension contact (0.029) through social media utilization, experience in farming (0.026) through area under sugarcane cultivation, negotiation skill (0.025) through management orientation, information seeking behaviour (0.024) and family size (0.015) through experience in farming, and decision making ability (0.013) through mass media exposure.

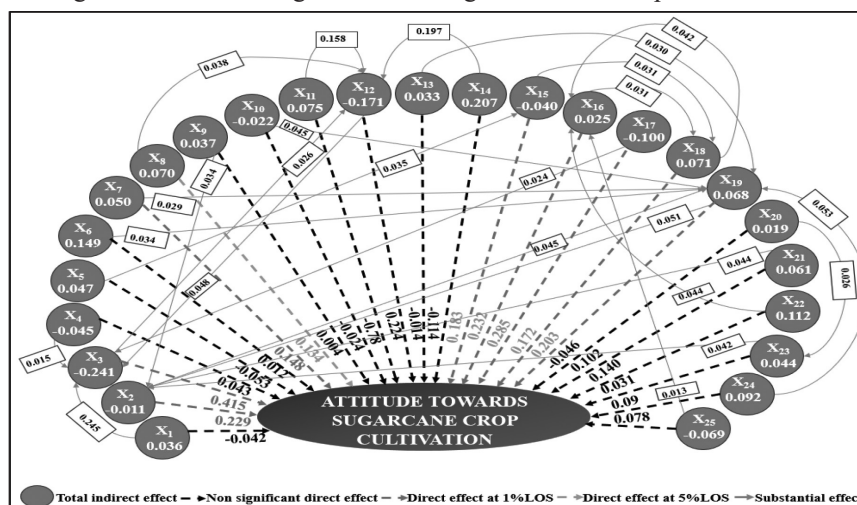


Fig 1: Path coefficients showing direct, total indirect and substantial indirect effect of independent variables on attitude towards sugarcane cultivation

## CONCLUSION

Sugarcane is one of the most significant cash crop of India. The findings indicated that most of the sugarcane growers had favourable attitude towards sugarcane cultivation. The results of path analysis indicated that experience in farming had exerted highest direct positive effect and farm resource possession had exerted highest negative direct effect on attitude towards sugarcane cultivation, respectively. Additionally, land holding had highest positive total indirect effect and education exerted highest total indirect negative effect on attitude towards sugarcane cultivation, respectively. Furthermore, age exerted the highest substantial indirect effect through experience in farming. The direct effect of independent variables including education, experience in farming, extension contact, credit orientation, mass media exposure, information seeking behaviour, use of ICT for farming, social media utilization, and extension participation on attitude of sugarcane growers towards sugarcane cultivation was observed to be positive and significant. This naturally suggests that positive increase in education, experience in farming, extension contact, credit orientation, mass media exposure, information seeking behaviour, use of ICT for farming, social media utilization and extension participation would bring favourable attitude towards sugarcane cultivation.

## POLICY IMPLICATIONS

Government policies and extension programmes should focus on improving functional and agricultural literacy through farmer field schools, adult education and skill based training. Experience in farming shows highest direct positive effect, therefore, extension systems should give more emphasis to hands on training, demonstrations and experiential learning models like on-farm trials and farmer to farmer learning. Strengthening extension services by regular visits and advisory support and encouraging active participation in extension activities can develop positive attitude. Exposure to mass media and ICT to 32323232320ls like mobile applications, agri portals should be supported through digital extension strategies. Government and institutions should use platforms like WhatsApp, YouTube and Facebook for dissemination of best practices. Policies addressing efficient resource utilization, input management training and cost optimization strategies should be developed for achieving the goals of sustainable agriculture.

## CONFLICT OF INTEREST

There is no conflict of interest among any authors regarding publication of the research paper in the journal as well as in the content.

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