

## A critical study on factors influencing the adoption of sustainable sugarcane initiatives (SSI)

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### Abstract

Sugarcane is one of the main cash crops of India. From its juice, sugar, gur, alcohol etc. are produced. After the extraction of the juice the fibrous mass left behind is used for making paper and sound insulating board. In villages it is also used as fuel. India ranks second in the world in sugarcane production. Tamil Nadu ranks first in India in highest yield per hectare, followed by Karnataka. SSI is the best tool in the hands of cane growers and is an innovative set of agronomic practices that involves using less chipped buds, raising seedlings in a nursery and following new planting methods with wider spacing, better water and nutrient management to increase cane yields significantly. The profile characteristics of the SSI farmers play a vital role in determining their knowledge level on recommended practices.

The zero-order correlation co-efficient and linear multiple regression analysis were employed to study the relationship and contribution of characteristics with knowledge level in SSI practices. The study was taken up in the sugarcane predominant district of Cuddalore in Tamil Nadu State (India) with a sample size of hundred and twenty cane growers selected based on the random sampling method. The findings revealed that out of fifteen independent variables, eight variables were found to be positive and significant relationship with knowledge level in both correlation and regression analysis.

**Keywords:** SSI, cane growers, adoption level

### Introduction

The sugar industry is the second largest agro-based industry, next only to textiles, in the country. There are 435 sugar mills installed which utilize around 40-50 % of the cane produced manufacturing around 15 million tonnes of sugar. About 5 lakh workmen are directly employed by the industry besides a host of others gaining employment in industries that utilize by-products of sugar industry as raw material.

The sugar industry contributes over Rs. 1000 crores to the Central Exchequer as excise duty and taxes annually. Besides, almost an equal amount is realized by the state Governments through purchase taxes, cess etc. At the present sugarcane price, the total value of sugarcane produced in the country is around Rs. 15,000 crores per year.

Thus sugarcane is the only raw material for all the major sweeteners produced in the country. The total cane currently produced in the country is able to meet our requirements besides having potential for some exportable surplus of sugar.

Sugar factories, being located in the rural areas, support huge economic activities in the rural India. In addition to improving the economic condition of the farmers and agricultural labourers engaged in sugarcane farming, they also support several others like transport operators, agro-service agencies, input dealers, petty businessmen and financial institutions. Most of the factory workers are drawn from the surrounding areas. Thus sugar factories generate rural employment. Many sugar factories also promote education and co-operative movement in their areas of operation.

To meet the future demand for sugar, the production of sugarcane has to be increased and sustained. The possibility of increasing sugarcane area is limited due to various factors like

lack of water availability and failure of periodical favourable monsoon condition. As a result, smallholder farmers are shifting to more profitable crops, leading to short fall in cane area. The only way to step up supply side is to increase productivity per acre. It could be achieved only if concentrated efforts are taken in the improved method of sugarcane cultivation. SSI is the best tool in the hands of cane growers and is an innovative set of agronomic practices that involves using less chipped buds, raising seedlings in a nursery and following new planting methods with wider spacing, better water and nutrient management to increase cane yields significantly. Unfortunately majority of the farmers are still practicing primitive and traditional techniques in Sugarcane Production. An understanding of appropriate season, high yield varieties, positive agronomical practices and adoption of rewarding initiatives are very much needed to adopt SSI method.

The personal, socio-economic and psychological characteristics of the cane growers may play a role in determining their knowledge level on recommended SSI practices. Keeping this in view, the present study has been made to know the relationship and contribution of characteristics with knowledge level in SSI practices.

### Methodology

The present study was taken up among the cane growers in the area of Cuddalore district. Totally 120 registered SSI growers under MRK Co-op Sugar Mill, EID Parry Sugars (P) Ltd and Ambiga Sugars (P) Ltd were selected from all the eight taluks of the district by proportionate random sampling method. The data were collected from the respondents with the help of well

structured and pre tested interview schedule. Fifteen variables, viz., age, educational status, occupational status, annual income, farm size, experience in sugarcane cultivation, social participation, extension agency contact, mass media exposure, innovativeness, risk orientation, scientific orientation, economic motivation, training undergone and decision making pattern and an dependent variable knowledge were included in the study. The statistical tools used in the study were percentage analysis, zero order correlation and multiple regression analysis.

## Results and Discussion

The results of the association of the characteristic with

knowledge level of SSI practices are being presented in subsequent tables.

### Relationship between personal, socio-economic and psychological characteristics of respondents and their knowledge level of SSI practices

The personal, socio-economic and psychological characteristics of the cane growers may play a role in determining their knowledge level on recommended SSI practices. In order to assess the relationship between personal, socio-economic and psychological characteristics of the cane growers and their knowledge level on recommended SSI practices, zero order correlation co-efficient was worked out and the results are presented in Table 1.

**Table 1:** Relationship between personal, socio-economic and sychological characteristics of respondents and their knowledge level (n=120)

Variable No.	Independent Variables	Correlation– coefficient ‘r’ value
X <sub>1</sub>	Age	0.071NS
X <sub>2</sub>	Educational status	0.166**
X <sub>3</sub>	Occupational status	0.104NS
X <sub>4</sub>	Annual income	0.067NS
X <sub>5</sub>	Farm size	0.099NS
X <sub>6</sub>	Experience in sugarcane cultivation	0.162**
X <sub>7</sub>	Social participation	0.057NS
X <sub>8</sub>	Extension agency contact	0.134*
X <sub>9</sub>	Mass media exposure	0.186**
X <sub>10</sub>	Innovativeness	0.207**
X <sub>11</sub>	Risk orientation	0.144*
X <sub>12</sub>	Scientific orientation	0.139*
X <sub>13</sub>	Economic motivation	0.013NS
X <sub>14</sub>	Training undergone	0.237**
X <sub>15</sub>	Decision making pattern	0.047NS

\*\* - Significant at 1% level, \* - Significant at 5 % level, NS – Non-significant

The results in Table 1 exhibited that out of fifteen independent variables viz., educational status, experience in sugarcane cultivation, extension agency contact, mass media exposure, innovativeness, risk orientation, scientific orientation and training undergone had shown positive and significant relationship with knowledge level of the respondents. Among the significant variables, educational status, experience in sugarcane cultivation, mass media exposure, innovativeness and training undergone were found to be significant association at one per cent level of probability, whereas the remaining variables namely extension agency contact, risk orientation and scientific orientation had significant at five per cent level of probability. The correlation values for the rest of the seven variables showed non-significant association with knowledge level of respondents.

Educational status was positively and highly significantly related to knowledge level. Education increases the ability to understand facts and facilitates proper analysis and interpretation. Educated respondents may have better extension agency contact, mass media exposure. It had increased access to communication sources. These may be the reasons for the positive relationship between educational status and knowledge level. This finding derives support from the findings of Prasanthakumar (2007).

Experience in sugarcane cultivation had shown positive and highly significant relationship at one per cent level of probability. This may be due the fact that the respondents with more experience in farming are mostly middle aged persons. It

may be stated that more experience in sugarcane farming would enhanced the higher knowledge in package of practices and technical aspects. Hence, the experience in sugarcane cultivation of the respondents resulted in positive and significant relationship with knowledge level. This is in line with the findings of Mathaiya (1997) [2].

There was positive influence of extension agency contact with the knowledge level. Extension agency contact might have provided them the opportunities to get the authenticated information. Those who had better exposure to mass media might have the opportunity to receive information in many modes and which would have resulted in better knowledge level. This might be the probable reason for positive and significant relationship of extension agency contact with the knowledge level of the respondents. A similar finding was also reported by Saravanakumar (2000) [5].

Mass media exposure is found to have positive and highly significant relationship with the knowledge level SSI practices. Farmers get the information from various sources like, official of sugar mills and also from radio, television, newspaper etc., which might have resulted in greater knowledge of the respondents. There was a positive and highly significant relationship between innovativeness and knowledge level of the respondents. Those who are willing to adopt new technologies would search for more information, which in turn would have resulted with higher knowledge level of the respondents. This finding delivers support from the findings of Punitha (2005) [4].

The variable risk orientation had showed positive and significant relationship with knowledge level at five per cent of probability. Respondents with higher risk orientation would have high risk bearing tendency increased the knowledge level in SSI practices for getting higher production. This may be the reasons for the reported relationship between risk orientation and knowledge level. This finding is in line with the findings of Sujatha (2009) [6].

Scientific orientation had exhibited a positive and significant association at five per cent level of probability. It is obvious because the respondents who had higher scientific orientation scores would have naturally acquired knowledge about the practices. This result is in agreement with the result of Jeyalakshmi (2008) [11].

There was a positive and highly significant relationship between training undergone and knowledge level of the respondents. Generally trained farmers would be having more knowledge about the recommended practices than the untrained farmers. Hence, a positive relationship had resulted.

### Contribution of personal, social-economic and psychological characteristics of respondents towards their knowledge level of SSI practices

Multiple regression analysis was undertaken to determine the contribution of each characteristics towards the knowledge level of recommended SSI practices. The results are presented in Table 2.

**Table 2:** Contribution of personal, social-economic and psychological characteristics of respondents towards their knowledge level (n=120)

Variable No.	Impendent Variables	Regression co-efficient	Standard error	't' value
X <sub>1</sub>	Age	0.427	0.352	1.207NS
X <sub>2</sub>	Educational status	1.863	0.752	2.577**
X <sub>3</sub>	Occupational status	-1.681	1.404	-1.206NS
X <sub>4</sub>	Annual income	0.713	0.647	1.108NS
X <sub>5</sub>	Farm size	2.004	1.602	1.252NS
X <sub>6</sub>	Experience in sugarcane cultivation	0.507	0.244	2.065*
X <sub>7</sub>	Social participation	-0.113	0.298	0.374NS
X <sub>8</sub>	Extension agency contact	1.213	0.614	1.999*
X <sub>9</sub>	Mass media exposure	0.691	0.315	2.221*
X <sub>10</sub>	Innovativeness	1.513	0.813	1.845*
X <sub>11</sub>	Risk orientation	0.714	0.256	2.696**
X <sub>12</sub>	Scientific orientation	0.429	0.202	2.147*
X <sub>13</sub>	Economic motivation	0.049	0.108	0.453NS
X <sub>14</sub>	Training undergone	0.584	0.254	2.542**
X <sub>15</sub>	Decision making pattern	0.279	0.256	1.081NS

R<sup>2</sup> = 0.572 F = 7.460\*\* a =9.932, \*\* - Significant at 1% level, \* - Significant at 5 % level, NS – Non-significant

The data in Table 2 indicate that the R<sup>2</sup> value was 0.572 which revealed that 57.20 per cent of variation in the knowledge level of cane growers about SSI practices was explained by fifteen variables selected for the study. Since the 'F' value was significant at one per cent level of probability, the prediction equation was fitted for knowledge level of the respondents as given below.

$$Y = 9.932 + 0.427 (X_1) + 1.863 (X_2) - 1.681 (X_3) + 0.713 (X_4) + 2.004 (X_5) + 0.507 (X_6) - 0.113 (X_7) + 1.213 (X_8) + 0.691 (X_9) + 1.513 (X_{10}) + 0.714 (X_{11}) + 0.429 (X_{12}) + 0.049 (X_{13}) + 0.584 (X_{14}) + 0.279 (X_{15})$$

It could be seen from the above equation that the regression co-efficient of the variables viz., educational status (X<sub>2</sub>), experience in sugarcane cultivation (X<sub>6</sub>), extension agency contact(X<sub>8</sub>), mass media exposure(X<sub>9</sub>), innovativeness(X<sub>10</sub>), risk orientation (X<sub>11</sub>) scientific orientation(X<sub>12</sub>) and training undergone (X<sub>14</sub>) were found to be positive significant contributing towards the knowledge level of the respondents. Among the significant variables, educational status (X<sub>2</sub>) risk orientation (X<sub>11</sub>) and training undergone (X<sub>14</sub>) were found to be significant at one per cent level of probability whereas the remaining variables viz., experience in sugarcane cultivation (X<sub>6</sub>), extension agency contact(X<sub>8</sub>), mass media exposure(X<sub>9</sub>), innovativeness(X<sub>10</sub>) and scientific orientation(X<sub>12</sub>) were significant at five per cent level of probability.

The strength of contribution of these variables revealed that a unit increase *ceteris paribus* in educational status (X<sub>2</sub>), experience in sugarcane cultivation (X<sub>6</sub>), extension agency contact(X<sub>8</sub>), mass media exposure(X<sub>9</sub>), innovativeness(X<sub>10</sub>), risk orientation (X<sub>11</sub>) scientific orientation(X<sub>12</sub>) and training undergone (X<sub>14</sub>) would increase knowledge level by 1.863, 0.507, 1.213, 0.691, 1.513, 0.714, 0.429 and 0.584 units respectively. This meant that SSI practicing farmers who possessed educational status, experience in sugarcane cultivation, extension agency contact, mass media exposure, innovativeness, risk orientation, scientific orientation and training undergone would have higher knowledge level in SSI practices.

The other variables did not show significant effect on the knowledge level in SSI practices.

### Conclusion

Among the fifteen independent variables, eight variables viz., educational status, experience in sugarcane cultivation, extension agency contact, mass media exposure, innovativeness, risk orientation, scientific orientation and training undergone had shown positive and significant relationship with knowledge level of the respondents. Similarly the same variables showed positive and significant contribution towards knowledge level of the respondents. Other than these variables such as age, occupational status, annual income, farm size, social participation, economic

motivation, decision making pattern belonged to non-significant.

### References

1. Jeyalakshmi M. An Analytical Study on Knowledge and Adoption of Farm Women on Sustainable Agricultural Technologies in Paddy and Onion in Dindigul Districts of Tamil Nadu, Unpublished Ph.D. (Ag.) Thesis, Annamalai University, Annamalainagar, 2008.
2. Mathaiya K. Knowledge and Adoption of Mango Growers, Unpublished M.Sc. (Ag.) Thesis, A.C&RI., Tamil Nadu Agricultural University, Madurai, 1997.
3. Prashanthakumar TVRR. A Study on Knowledge and Adoption of Agricultural Market Committee (AMC) level Trained and Untrained Farmer in Mahaboobnagar district of Andhra Pradesh,” Unpublished M.Sc (Ag) Thesis, Acharya N.G.Ranga Agricultural University, Rajendranagar, Hyderabad, 2007.
4. Punitha P. Adoption of Herbicide Technology in Paddy and Sugarcane Cultivation in perambalur District, Unpublished M.sc. (Ag.) Thesis, Annamalai University, Annamalai Nagar, 2005.
5. Saravanakumar M. Impact of TANWA in the Empowerment of Farm Women, Unpublished M.Sc. (Ag.) Thesis, Tamil Nadu Agricultural University, Coimbatore, 2000.
6. Sujatha P. Knowledge and Adoption Behaviour of Trained Farm Women in Agricultural, Unpublished Ph.D. Thesis, Annamalai University, Annamalainagar, 2009.