Relationship Between Profile Characteristics and Impact Indicators of Sugarcane Farmers

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ABSTRACT
The research study was conducted to know the relationship between selected profile characteristics of sugarcane farmers and the impact of sugarcane production technologies as perceived by sugarcane farmers in chittoor district of Andhra Pradesh. The study revealed the selected profile characteristics like education, land holding, extension contact, trainings undergone, social participation, mass media exposure, achievement motivation, management orientation, scientific orientation and innovativeness were found to be positively significant while age and farming experience were found to be negatively significant with impact of sugarcane production technologies of sugarcane farmers. Innovativeness, Management orientation, Mass media exposure, Land holding were the major variables to explain the impact of sugarcane production technologies. The combined effect of these four variables might change the behaviour pattern of the sugarcane farmers towards achieving high economic returns and also towards perceiving the impact of technologies as better in terms of impact indicators .

Key words : Correlation, Profile characteristics, Sugarcane farmers.

Sugarcane is the world's largest crop and is grown in over 110 countries. In 2009, an estimated 1,683 million metric tons were produced worldwide which amounts to 22.4 per cent of the total world agricultural production by weight (FAO, 2009). India ranks second in Sugarcane area and sugar production after Brazil. The states of Uttar Pradesh, Maharashtra, Karnataka, Tamil Naidu and Andhra Pradesh together produce nearly 90 per cent of the cane and sugar in the country. Andhra Pradesh ranks fifth in sugar crop area of the country with a share of 4.83 per cent (Rao, I.V.Y.R. and Sunil, K.B.G. 2010). The average production of Andhra Pradesh is about 20.30 million tons contributing to 5.83 per cent of the total production of the country. In Andhra Pradesh, the major sugarcane growing districts in Telangana, coastal Andhra and Rayalaseema regions are Nizamabad, Visakhapatnam and Chittoor districts respectively.

The significant contribution of researchers, extension functionaries and farming community plays pivotal role in achieving the above success. On one side, the researchers developed sustainable technologies to meet the production requirements of the farmers followed by effective dissemination of technologies by the extension functionaries so

as to bring the technologies to the farmers for adoption. On the other side, the farming community successfully adopting those technologies so as to increase the productivity levels of sugarcane. Depending on the socio-psychological and personnel characteristics, the variation can be observed among the farming community in terms of their perceived impact of different sugarcane production technologies. As the farmers are the key contributors of farm production, the present study was taken up to study the relationship between the profile characteristics and perceived impact of sugarcane production technologies by the sugarcane farmers.

MATERIAL AND METHODS

Ex-post-facto research design was followed for the study. The investigation was carried out in Chittoor district of Rayalaseema region of Andhra Pradesh. Four mandals namely Bangarupalem, Tavanampalli, Karvetinagaram and Srirangarajapuram were selected in chittoor district purposively having highest area under sugarcane. From each mandal 3 villages were selected purposively. From each village 10 sugarcane farmers were selected randomly thus making a

total of 120 respondents for the study. The data were collected with the help of by personal interview method through structured interview schedule.

Impact of sugarcane production technologies was operationalized as the extent of influence of different sugarcane production technologies as perceived by the sugarcane farmers in terms of increased productivity, reduced cost of cultivation and improvement in net income. A list of thirty six technologies were screened by consulting the scientists of sugarcane crop and the perception of the farmers towards the impact of those thirty six technologies was measured on three point continuum *viz.,* Highly effective, Moderately effective and Less effective with the scores of 3, 2, 1 respectively for each technology in terms of increased productivity, reduced cost of cultivation and improvement in net income. The total score of each farmer was taken as the Impact of sugarcane production technologies for that farmer. The impact was correlated with the profile characteristics of sugarcane farmers. The collected data was tabulated and analyzed by correlation coefficient and step wise regression analysis.

RESULTS AND DISCUSSION

Relationship between profile characteristics and the impact of sugarcane production technologies as perceived by sugarcane farmers

In order to study the nature of relationship between the selected independent variables and the impact of sugarcane production technologies as perceived by sugarcane farmers, correlation coefficients (r) were computed and the values were presented in Table 1.

Age Vs Impact of sugarcane production technologies

Age was found negative and significantly related with the impact of sugarcane production technologies of the respondents ('r' = -.4839). The probable reason might be that old farmers were more traditionalistic not showing interest towards latest sugarcane production technologies and they were afraid of taking risks in farm production. On the other side, the young and medium aged farmers might be updating their knowledge by interacting with extension personnel and mass media and they

were ready to accept new technology in their farm by taking rational risk.

Education Vs Impact of sugarcane production technologies

From Table-1 it was found that, the computed coefficient of correlation value ('r' = 0.7321) of education was positively and significantly related with impact of sugarcane production technologies of the respondents. Hence, null hypothesis was rejected and empirical hypothesis was accepted. Therefore, it could be inferred that there was a positive and significant relationship between education and the impact of sugarcane production technologies on sugarcane farmers.

It is known fact that the knowledge is the symbol of farm production and acquired through proper educational system. The education will explore the opportunities to the farmers and provide the skill of rationality. This facilitates the farmers to update his knowledge and choose the right technology at the right time. Hence the farmers with high education might have perceived high impact on sugarcane production technologies. The results are in line with Lakshminarayana *et al.,* (2001)

Land holding Vs Impact of sugarcane production technologies

From Table-1 it is evident that, the computed coefficient of correlation value ('r' =0.6372) of land holding was found positive and significantly related with the impact of sugarcane production technologies of the respondents.

The probable reason might be that the small and marginal farmers might be adopting of technologies and perceiving their influence on sugarcane production because of their feasibility for adoption in their holdings. The impact of the technologies also might be visible with their holdings. On the other side the marginal farmers might not have the practicability to adopt some technologies on very small scale.

Farming experience Vs Impact of sugarcane production technologies

From Table-1 it is evident that, the computed coefficient of correlation value ('r' =-

Table 1. Relationship between selected independent variables and the impact of sugarcane production technologies as perceived by sugarcane farmers.

(n=120)

S.No.	Variable	Independent variables	Correlation coefficients ('r'value)
1.	X_1	Age	-0.4839**
2.	X_2	Education	0.7321**
3.	X_3	Land Holding	0.6372**
4.	X_4	Farming Experience	-0.5033**
5.	X_5	Extension contact	0.6868**
6.	X_6	Trainings undergone	0.6723**
7.	X_7	Social participation	0.8234**
8.	X_8	Mass Media exposure	0.7870**
9.	X_9	Achievement Motivation	0.8144**
10.	X_{10}	Scientific orientation	0.8228**
11.	X_{11}	Management orientation	0.8330**
12.	X_{12}	Innovativeness	0.8494**

* : Significant at 0.05 level of probability

** : Significant at 0.01 level of probability

0.5033) of farming experience was negatively and significantly related with impact of sugarcane production technologies of the respondents. Hence, null hypothesis was rejected and empirical hypothesis was accepted. Therefore, it could be inferred that there was a positive and significant relationship between farming experience and impact of groundnut production technologies on groundnut farmers.

The probable reason for this trend might be that the perceived impact on groundnut production technologies is increasing with farming experience as the farmers might be adopting latest production technologies from time to time and perceiving the impact of technologies regularly. The results are in line with Nagaraja (2002).

Extension contact Vs Impact of sugarcane production technologies

From Table-1 it could be inferred that, the computed coefficient of correlation value ('r' = 0.6868) of extension contact was positively and significantly related with Impact of sugarcane production technologies of the respondents. Hence, null hypothesis was rejected and empirical hypothesis was accepted. Therefore, it could be inferred that there was a positive and significant relationship between extension contact and Impact of sugarcane production technologies on sugarcane farmers.

In agriculture, the role of extension functionaries is vital as they are always tiring in transforming the technologies to the farming community. They had the skill of influencing the farmers to adopt latest sugarcane production technologies in sugarcane cultivation. Once the technology is in the farmer's field, the farmer will be able to assess its impact in terms of its contribution to its impact indicators.

Training undergone Vs. Impact of sugarcane production technologies

From Table-1 it could be inferred that, the computed coefficient of correlation value ('r' =0.6723) of training undergone was positively and significantly related with Impact of sugarcane production technologies of the respondents. Hence, null hypothesis was rejected and empirical hypothesis was accepted. Therefore, it could be inferred that there was a positive and significant relationship between training undergone and Impact of sugarcane production technologies on sugarcane farmers.

The reason for this trend might be that, training is an opportunity to the farmers to upgrade their skills and knowledge which in turn visualize the farmers about the latest production technologies. Through the acquired knowledge and skills farmers might have adopted and realize the impact of latest sugarcane production technologies.

Social participation vs. Impact of sugarcane production technologies

From Table-1 it could be inferred that, the computed coefficient of correlation value ('r' =0.8234) of social participation was positively and significantly related with Impact of sugarcane production technologies of the respondents. Hence, null hypothesis was rejected and empirical hypothesis was accepted. Therefore, it could be inferred that there was a positive and significant relationship between social participation and Impact of sugarcane production technologies on sugarcane farmers.

This trend might be due to the reason that, higher the social participation better to had the opportunity to interact with the neighbors, fellow farmers, farmers of other villages and officials of other departments. This might have facilitated the farmers to better equipped with the latest production technologies and also gained the confidence in adopting those technologies. To be a member in a group, the group dynamics had played a vital role in boosting the farmers potentially for better adoption of production technologies in turn results in better impact.

Mass media exposure Vs Impact of sugarcane production technologies

From Table-1 it could be inferred that, the computed coefficient of correlation value ('r' =0.7870) of mass media exposure was positively and significantly related with Impact of sugarcane production technologies of the respondents. Hence, null hypothesis was rejected and empirical hypothesis was accepted.

Therefore, it could be inferred that there was a positive and significant relationship between mass media exposure and Impact of sugarcane production technologies on sugarcane farmers. It was a known fact that one of the major reason for non adoption of technology is lack of awareness. Once the technology was known to the farmer then

he develops an urge to acquire the knowledge of the technology which led to adoption and ultimately had given chance to perceive the impact on sugarcane production technologies. The results are in line with Singh *et al.*, (2009)

Achievement motivation Vs Impact of sugarcane production technologies

From Table-1 it was evident that, the computed coefficient of correlation value ('r' = 0.8144) of achievement motivation was positively and significantly related with Impact of sugarcane production technologies of the respondents. Hence, null hypothesis was rejected and empirical hypothesis was accepted. Therefore, it could be inferred that there was a positive and significant relationship between achievement motivation and Impact of sugarcane production technologies on sugarcane farmers.

The above trend clearly indicates that, majority of the respondents had medium achievement motivation. This is because of the fact that most of the farmers were always striving for good results from their farm and also aiming at getting more income through sugarcane cultivation. This condition might have resulted in such trend.

Scientific orientation Vs Impact of sugarcane production technologies

From Table-1 it is evident that, the computed coefficient of correlation value ('r'=0.8228) of scientific orientation was positively and significantly related with Impact of sugarcane production technologies of the respondents. Hence, null hypothesis was rejected and empirical hypothesis was accepted. Therefore, it could be inferred that there was a positive and significant relationship between scientific orientation and Impact of sugarcane production technologies on sugarcane farmers.

The probable reason might be that farmers with high scientific orientation will prefer to cultivate the crops as per the production recommendations given by the scientists and extension personnel and perceiving the impact of production technologies. This will give the ample scope for the farmers to think logically and scientifically so as to view the technologies in terms of impact indicators.

Management orientation Vs Impact of sugarcane production technologies

From Table-1 it is evident that, the computed coefficient of correlation value ('r'=0.8330) of management orientation was positively and significantly related with Impact of sugarcane production technologies of the respondents. Hence, null hypothesis was rejected and empirical hypothesis was accepted.

Therefore, it could be inferred that there was a positive and significant relationship between management orientation and Impact of sugarcane production technologies on sugarcane farmers. Scientists will be developing the technologies keeping in view the impact indicators in crop production. Each technology will have its own impact on farm production.

It is the decision on the part of the farmer to utilize the technologies as per their crop requirement. In this juncture the management orientation will play managerial skills on the part of the farmer to select and adopt appropriate technologies at appropriate time so as to obtain maximum out turn from each technology.

Innovativeness Vs Impact of sugarcane production technologies

From Table-1 it is evident that, the computed coefficient of correlation value ('r' = 0.8494) of innovativeness was positively and significantly related with Impact of sugarcane production technologies of the respondents. Hence, null hypothesis was rejected and empirical hypothesis was accepted. Therefore, it could be inferred that there was a positive and significant relationship between innovativeness and impact of sugarcane production technologies on sugarcane farmers.

Farmers with high innovativeness will seek change in their farm production. In course of time, he tried to interact with extension personnel and scientist and also go through the mass media so as to identify day to day updates in sugarcane production technologies. Meanwhile he will also develop interest to test it on trail basis for its assessment. Because of this, an innovative farmer might be exploring all the latest production technologies and assessing its influence on sugarcane production

Effect of all selected independent variables on perceived impact of sugarcane farmers

In explaining the variation in the perceived impact of sugarcane farmers, Multiple Linear Regression (MLR) analysis was carried out to find the relationship of perception score with all other variables and to identify the important explanatory factors of perception. Regression was run on SPSS 15.0 and the following model was arrived with the stepwise regression equation.

$$Y = -30.129 + 2.640X_{12} + 2.542X_{11} + 4.689X_8 + 3.752X_3$$

Where Y=Perceived impact of sugarcane farmers.
X_{12} =Innovativeness
X_{11}=Management orientation
X_8 =Mass media exposure
X_3=Land holding

Negative Constant indicates that a positive impact can be found only if the influencing variables operate at certain minimum levels.

It is evident from the table 2 that the variables age, education, farming experience, extension contact, trainings undergone, social participation, achievement motivation and Scientific orientation were not selected into the model since their contribution was insignificant. The model has R^2=0.827 which means 82.70% of perception score is explained by the model.

The model is also significant by F-test with F=137.584 (significant at 1% level) F critical at (4,11.5) d.f.=3.513.

All the regression coefficients are significant at 5 per cent level of significance. This model can be used to estimate the average perception score for a farmer for whom the four variables are specified.

Innovativeness, Management orientation, Mass media exposure, Land holding were the major variables to explain the impact of sugarcane production technologies. The combined effect of these four variables might change the behaviour pattern of the sugarcane farmers towards achieving high economic returns and also towards perceiving the impact of technologies as better in terms of impact indicators .This result indicates the emphasis of these four variables in assessment on sugarcane production technologies.

Table 2. Step wise regression analysis of the selected Independent variables with the perceived impact of sugarcane farmers.

(n=120)

S.No.	Variable Number	Independent Variables	Partial regression coefficients (b)	Beta Weight (b')	't' value on the partial (b')
1.	X_{12}	Innovativeness	2.640	0.276	3.456*
2.	X_{11}	Management orientation	2.542	0.376	5.381**
3.	X_8	Mass media exposure	4.689	0.236	3.700**
4.	X_3	Land holding	3.752	0.146	2.828*

R^2=.827   F=137.584**

R=.909   d.f=4, 11.5

**=Significant at 0.01 probability level

*=Significant at 0.05 probability level

CONCLUSION

The selected profile characteristics like education, land holding, extension contact, trainings undergone, social participation, mass media exposure, achievement motivation, management orientation, scientific orientation and innovativeness were found to be positively significant at 0.01 level of probability while age and farming experience were found to be negatively significant at 0.05 level of probability with impact of sugarcane production technologies on sugarcane farmers.

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