

## **Influence of few Selected Factors on Adoption Behaviour of Sugarcane Growers of a Sugar Mills Zone**

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### **ABSTRACT**

A study was undertaken in Carews & Co. Sugar Mills in 1981 to know and isolate the factors significantly correlated to the adoption of improved cane production practices. Five independent variables such as age, levels of schooling, family land holding size, levels of contact with extension agents and levels of cane production knowledge of cane growers were selected to search relationship of these factors to adoption. Of five selected factors, family land holding size, levels of contact with extension agents and levels of cane production knowledge were found to be significantly correlated with adoption of improved cane cultivation practices.

### **INTRODUCTION**

The per acre yield of sugarcane in Bangladesh is about 15.00 TCA (Tons Cane Per Acre) as compared to 19.34 TCA of India, 41.14 TCA of Peru and 40.00 TCA of Taiwan (Anonymous, 1978). The Soil and climatic conditions of Bangladesh are quite equivalent to or even better than that of Hawaii and Peru (Anonymous, 1978). Existing technology available in the country, if used partially or fully, there are evidence of yields ranging from 20 to 30 TCA, highest being the 61 TCA in the farmers field under rainfed condition (Anonymous, 1977-78). There are many factors said to be responsible for such low per acre yield. Higher per acre yield is directly related to higher adoption of improved crop production practices. It is the growers who decide to adopt or not to adopt the improved practices. There are many social, personal and economic factors blamed for low or no adoption of improved practices. Researchers all over the world have already uncovered the important factors explaining variances in adoption. Rogers and Shoemaker (1971) listed an excellent account of such research results from 1956 to 1969. The list started with citing research results of Fliegel (1956) who isolated factors contributing 32% of total variance in adoption of improved practices. The amount of explained variance reached its peak to 81% in 1966 by Moulik *et. al.* (1966).

All these researches were undertaken in other countries to quantify the influence of different variables on adoption of improved practices. In Bangladesh, this kind of studies have not yet been undertaken. Extension research on adoption and diffusion of innovations in Bangladesh centered mainly on identifying the characteristics of farmers that influence adoption rather to determine the individual and total influences (Rahim, 1961). Still these studies have been concentrated mainly on HYV rice technologies. Sugarcane is a long duration crop (1 to 1½ years duration) and requires heavy capital investment in the form of seed, fertilizers, land preparation, planting of seeds, plant protection chemicals, inter-cultural operation and harvesting.

The adoption decision behaviour of sugarcane growers appears to be more complex in nature than that of growers of other crops. Therefore, the present study has been aimed at identifying and determining the influence of five selected factors on adoption behaviour of sugarcane growers of Carew & Company areas.

## MATERIALS AND METHODS

For the present study 250 sugarcane growers were randomly selected from the Purji gazett list. Data were collected from these growers by using structured interview schedules. Out of 250 data schedules, 190 growers were subjected to statistical analysis and were considered to have contained required information needed to fulfil for statistical analysis.

The adoption of improved cane cultivation practices consist of the followings :

- (1) Selection of High and Medium Land.
- (2) Planting of sugarcane setts in October-November.
- (3) Use of recommended varieties and good quality seeds.
- (4) Planting sugarcane setts in deep trenches.
- (5) Recommended row to row spacing.
- (6) Use of recommended dose of fertilizers with approved method of application.
- (7) Recommended practices for controlling insect pests and diseases.

Adoption of each innovation was given a score of 1, and 0 for no adoption. So the adoption score of a growers may be from 0 to 7. The questionnaires also included few simple basic questions for each innovation. Knowledge against each innovation was given a score of 6 for all correct answers. So, the knowledge score for a grower may be from 0 to 42 (6x7).

Analysis of data was primarily done by using simple and multiple correlation analysis. With adoption of improved cane production practices scores (Y) as the dependent variable, the following function was tested for establishing relationship :

$$Y=f(X_1, X_2, X_3, X_4, X_5)$$

Where  $X_1$ =Chronological age of the respondents (in years)

$X_2$ =Size of family land holding (in acres)

$X_3$ =Levels of schooling (years spent in formal Educational Institutes)

$X_4$ =Levels of contact with extension agents (total number of visits received by a respondent from extension workers within a cropping year).

$X_5$ =Levels of cane production knowledge (Score between 0 to 42).

## RESULTS AND DISCUSSION

Out of the five independent variables subjected to present study, three factors namely, levels of contact with extension agent, levels of cane production knowledge and family land holding size were found to be significantly correlated with the adoption of improved practices. The influence of these three independent variables are described here.

Table 1 : Simple Correlation Analysis Results.

| Sl. No. | Independent variables                    | Correlation coefficients (r) | Percent influence ( $r^2 \times 100$ ) |
|---------|------------------------------------------|------------------------------|----------------------------------------|
| 1.      | Age                                      | ** -0.2853                   | 8.14                                   |
| 2.      | Family Land Holding Size                 | ** 0.3473                    | 12.06                                  |
| 3.      | Levels of Schooling                      | ** 0.3057                    | 9.35                                   |
| 4.      | Levels of contact with Extension workers | ** 0.4030                    | 16.24                                  |
| 5.      | Levels of cane production knowledge      | ** 0.6187                    | 38.28                                  |

(\*\* Significant at 1% level )

### Family Land Holding Size

Family land holding size contributed significantly in influencing the adoption behaviour of sugarcane growers. Increased family land holding is the indication of increased family income which means that such growers can afford to utilize costly innovations like trench planting, fertilizer applications, etc. Similar research



results were also reported by Rahim (1961), Bose and Sexena (1935) and Chowdhury *et. al.* (1967). Mahboob and Muhammad (1981) found no significant relationship between farm size and adoption of insect control measures. Still they noted a trend of adoption being the highest in the medium farm category and lowest in the small farm category. Fliegel (1956) did not observe any significant relationship between adoption and farm size. Assaduzzaman and Islam (1976) noted that extent of adoption of HYV rice is high among farmers having small holding. They speculated that because of subsistence, small farmers will devote more land to the risky but high-yield crop. Lomte and Bhilegaonkar (1980) observed significantly negative relationship between 'adoption' and 'farm size' while studying adoption of improved vegetable growing practices in India.

Table 2. Multiple Correlation Analysis Results.

| Sl. No. | Independent Variables                    | Partial Correlation coefficients (r) | Percent influence ( $r^2 \times 100$ ) |
|---------|------------------------------------------|--------------------------------------|----------------------------------------|
| 1.      | Age                                      | -0.0664                              | 0.44                                   |
| 2.      | Family Land Holding size                 | **0.2409                             | 5.80                                   |
| 3.      | Levels of Schooling                      | 0.0143                               | 0.02                                   |
| 4.      | Levels of contact with Extension workers | **0.2782                             | 7.74                                   |
| 5.      | Levels of cane production knowledge      | **0.5284                             | 27.92                                  |

$$R^2 = **0.4841$$

(\*\* indicates significant at 1% level)

#### Levels of Contact with Extension Agents :

Levels of contact with extension agent is positively correlated to adoption. The main reasons for such a relation is the result of persuasive influence of the extension agents in developing positive attitudes of the sugarcane growers toward innovations. Similar significant relationship were also reported by Fliegel (1956), Rahim (1961), Hardee (1965), Rao (1976), Grewal (1980), Bezborra (1980) and Mahammad and Mahboob (1979), exception being Halim (1982) who observed no relationship either positive or negative.

#### Levels of Cane Production Knowledge :

Cane production knowledge of sugarcane growers explain greatest amount of total variance in adoption (27.92% out of total 48.41%). Knowledge as a function of adoption of improved practices was identified by many researchers. Rogers

and Shoemaker (1971), while describing the model of innovation-decision process, considered knowledge as a function or stage of the decision process when "the individual is exposed to an innovation's existence and gains some understanding of how it functions". Significant positive relationship was also identified by Hoffer and Stangland (1958), Moulik *et. al.* (1966), Ernest (1973), Ramachandran (1974), Somasundaram and Singh (1978), Grewal (1980) and Bezborra (1980).

The results of the study has two implications. Firstly, it has uncovered the urgency and need to undertake further studies with more independent variables so that the variance in adoption behaviour of sugarcane growers can mostly be explained under different situations. Secondly, the study has already isolated three factors contributed significantly to adoption. Levels of cane production knowledge, contact with extension agents and family land holding size contributed 27.92%, 7.74% and 5.80% of the total variance of adoption respectively.

We can do little about the farm size but can do a lot for the other two factors. As contact with extension agent and cane production knowledge are found positively correlated to adoption of improved practices, the following measures are suggested to exploit these two factors for increasing the adoption and cane production.

- (a) The frequency of formal personal contacts by the extension workers should be increased through farm and home visits and group meetings.
- (b) The extension agents who are living with the growers should be equipped with low cost communication media such as flip charts, photographs, printed handouts, booklets etc., so that they can use these materials effectively at their leisure time.
- (c) The current farmer training programme should be strengthened giving priority to small growers. This will help in increasing the knowledge level of the growers.

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