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ANALYSIS OF FARMERS' AGRICULTURAL KNOWLEDGE IN SUGARCANE CULTIVATION[1]

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ABSTRACT

The main purpose of this study was to assess farmers' agricultural knowledge in sugarcane cultivation. The specific objectives of the study were to i) describe the selected characteristics of the farmers, ii) determine the extent of farmers agricultural knowledge in sugarcane cultivation, and iii) determine the relationships between the selected characteristics of the farmers and their agricultural knowledge in sugarcane cultivation. Data were collected from a randomly selected 140 farmers through interview schedule. Results indicated that 37 percent of the farmers had low knowledge in sugarcane cultivation as compared to 36 percent with medium knowledge and 27 percent having high knowledge in the same. Findings revealed that age, education, farm size, extension contact, organizational participation and training of farmers had significant relationships with their agricultural knowledge in sugarcane cultivation.

I. INTRODUCTION

Sugarcane is one of the main cash crop in our country. It is cultivated on about 0.162 million hectares of land and the produced amount of sugar and gur are 0.17-0.20 million tons and 0.30 million tons, respectively. The present demand for sugar and gur are 0.30 million tons and 0.60 million tons, respectively. Therefore, it is evident that the production of sugar and bur is about 50 percent of our demand (Ali et. al., 1989). The average yield per hectare of sugarcane in Bangladesh is about 45 tons (Imam, et al., 1992), whereas it is 148-173 tons in Hawaii and 124-148 tons in Java. In our country, many farmers are able to produce 148-147 tons per hectare (Islam, 1988). But they are now getting only 20-25 tons yield per hectare. There might be some reasons for these differences in yield. Lack of farmers agricultural knowledge in sugarcane cultivation may be one of the main causes. Farmer's agricultural knowledge in different innovations vary according to their characteristics. Hoque and Halim (1985) reported that age, education, farm size, organizational participation and extension contact of the cane growers significantly influenced their adoption of three improved

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practices, namely early time of planting, planting method and use of recommended doses of fertilizers. Amin (1983) found a positive and significant relationship between the farm size of the farmers and their adoption of multiple cropping. Ahmed (1974) found a positive and significant relationship of the farmers age, education, farm size, organizational participation and extension contact with their agricultural nowlccJge. Marsh and Coleman (1955), Rahim (1963), Karim (1973), Reddy and Kilvin (1968) Cfound a positive relationship between organizational participation and agricultural knowledge. Karim (1973), Reddy and Kilvin (1968) found a positive relationship between year of schooling and farmers agricultural knowledge. So it is evident that the agricultural knowledge of a farmer in sugarcane cultivation could be influenced by their characteristics. An understanding of the influence of the characteristics of farmers on their level of knowledge in sugarcane cultivation is necessary to plan and implement adoption-diffusion efforts. With this end in view this study was designed to assess the farmer's agricultural knowledge in sugarcane cultivation. The specific objectives were to: i) describe the selected characteristics (age, education, farm size, extension contact. organizational participation and training) of die farmers; ii) determine the extent of farmers agricultural knowledge in nine different aspects (varieties of sugarcane, land preparation, seed bed preparation, seedling preparation, use of' fertilizer, plantation and transplantation, intercultural operation, insect pest and diseases control and harvesting) of sugarcane cultivation: and iii) examine tile relationships between the selected characteristics of farmers and their agricultural knowledge in sugarcane cultivation. Apart from this introductory section, methodology of the study is discussed in section II. Results are presented and discussed in section Ill. Conclusions are made in the last section of this paper.

II. METHODOLOGY

The design of this study was descriptive in nature. Sugarcane growers of Jagati union of Kushtia district constituted the population of the study. One hundred and forty farmers were proportionately selected through random sampling method from 220 sugarcane growers of three villages, namely, Kaburhat, Chechua and Jagati. An interview schedule was used to collect data from tile sample farmers. The validity of the instrument was established by a panel of experts. The instrument was pilot tested with a similar group of respondents and thus its reliability and suitability were confirmed. The entire process of data collection took 33 days from August 5 to September 7, 1993. The SPSS/PC+ computer programs were used to analyze the data. Descriptive statistics (numbers, percentages, means, standard deviation, range) were used to summarize (lie data pertaining to the characteristics of the farmers and their agricultural knowledge in sugarcane cultivation. The Pearson-product-moment correlation coefficients were calculated to examine the relationship between the concerned variables.

III. STUDY RESULTS

Characteristics of the farmers

Data presented in Table 1, indicate that more than four-fifths (83%) of the farmers were young and middle aged. One-half (50%) of the respondents had secondary and above education whereas 36 percent were illiterate and only 14 percent had primary level of education. Highest proportion (43%) of the farmers had medium size of farm and 20 percent had large farm. More than three-fifth (61%) of the farmers had low extension contact in the study area. More than one-half (53%) of the farmers had low organizational participation and 42 percent of them had no participation in any organization and only 5 percent had medium level of participation. The largest proportion (76%) of the respondents did not receive any training on sugarcane cultivation and only 24 percent had received such training.

Table 1. Distribution of farmers according to their characteristics

Categories	Number	Percent
Age:		
Young	49	35
Middle	67	48
Old	24	17
	140	100
Education:		
Illiterate	51	36
Primary education	20	14
Secondary education	54	39
Higher Secondary and above	15	11
	140	100
Farm Size:		
Marginal	20	14
Small	32	23
Medium	60	43
Large	28	20
	140	100
Extension contact:		
Low extension contact	87	61
Medium ext. contact	38	27
High extension contact	15	11
	140	100
Organizational Participation:		
No organ. participation	59	42
Low organ. participation	74	53
Medium organ. participation.	7	5
	140	100
Training:		
Received	34	24
Not received	106	76
	140	100

Farmers Agricultural Knowledge in sugarcane cultivation

Agricultural knowledge scores ranged from 0 to 50 and based on the calculatd scores the respondents were classified into the following categories.

Category	Score
No knowledge	0
Low knowledge	0.01 - 18.00
Medium knowledge	18.01 - 36.00
High knowledge	36.01 - 50.00

As shown in Table 2, the higher proportion (64%) of farmers had low and medium level of knowledge in different varieties of sugarcane cultivation as compared to 36 percent having high knowledge. More than one-half (52%) of the respondents had medium knowledge as compared to 39 percent having high and only 9 percent having low knowledge in land preparation. The larger proportion (78%) of the farmers had no knowledge in seed bed preparation and about three-fourth (74%) of them had no and low level of knowledge in seedling preparation. Higher proportion (65%) of the farmers had medium and high level of knowledge in use of fertilizers in sugarcane cultivation whereas the majority (81%) of the farmers had low and medium level of knowledge in plantation and transplantation. Almost similar number of farmers had low, medium and high levels of knowledge in intercultural operation. The higher (64%) proportion of the farmers had low level of knowledge in insect-pest and diseases of sugarcane and (97%) of them had medium and high level of knowledge in harvesting of sugarcane.

Table 2. Distribution of farmers according to their level of agricultural knowledge in sugarcane cultivation

	Level of knowledge				
Category	Nil	Low	Medium	Iligh	Total
Varieties	-	44 (32)	44 (32)	52 (36)	140
Land preparation	-	13 (9)	73 (52)	54 (39)	140
Seed bed preparation	109 (78)	0 (0)	2 (1)	29 (21)	140
Seedling preparation	39 (28)	65 (46)	18 (13)	18 (13)	140
Fertilizer use	-	49 (35)	62 (44)	29 (21)	140
Plantation and transplantation	-	57 (41)	56 (40)	27 (19)	140
Intercultural operation	-	40 (28)	50 (36)	50 (36)	140
Insect-pests and diseases control	-	90 (64)	33 (24)	17 (12)	140
Harvesting	-	4 (5)	95 (65)	50 (30)	140

(Figures within parentheses indicate the-percentages of row totals)

For comparing the extent of agricultural knowledge in nine selected aspects of sugarcane cultivation of the farmers, it was necessary to compute knowledge index for each of the nine aspects. The knowledge index for a certain aspect of sugarcane cultivation was computed by using the following formula:

Knowledge Index = $k_n x_0 + k_1 x_1 + k_m x_2 + k_h x_3$

Where, k_n = Percentage of farmers having no knowledge in sugarcane cultivation;

k_1 = Percentage of farmers having low knowledge in sugarcane cultivation;

k_m = Percentage of farmers having medium knowledge in sugarcane cultivation; and

k_h = Percentage of farmers having high knowledge in sugarcane cultivation.

Possible knowledge indices could range from 0 to 300, where 0 indicated no knowledge in sugarcane cultivation and 300 indicated high knowledge.

Table 3 shows that farmers had the highest knowledge indices in land preparation (230) and harvesting (229) of sugarcane. The knowledge index of farmers in intercultural operation (208) was in the third position. Agricultural knowledge indices of variety, use of fertilizer, and plantation and transplantation were 204, 186 and 178, respectively. Insect-pest and disease control knowledge index was 148 followed by that of seedling preparation (111). The lowest knowledge index was in seed bed preparation (65).

Table 3. Rank order of the selected aspects of sugarcane cultivation according to farmers agricultural knowledge indices

Aspects	Agricultural Knowledge Index	Rank
Land preparation	230	1
Harvesting	229	2
Intercultural operation	208	3
Variety	204	4
Use of fertilizer	186	5
Plantation and transplantation	178	6
Insect-pest and diseases control	148	7
Seedling preparation	111	8
Seed bed preparation	65	9

Overall agricultural knowledge of the farmers in sugarcane cultivation

Thirty seven percent (37%) of the respondents had low agricultural knowledge in sugarcane cultivation as compared to 36 percent having medium and 27 percent having high agricultural knowledge in sugarcane cultivation (Table 4).

Table 4. Overall agricultural knowledge of farmers in sugarcane cultivation

Categories	Number	Percent
Low	52	37
Medium	50	36
High	38	27
Total	140	100

Relationship Between Selected Characteristics of the Farmers and Their Agricultural Knowledge in Sugarcane Cultivation

Age and agricultural Knowledge

Data presented in Table 5 show the relationships between selected characteristics of the farmers and their agricultural knowledge in sugarcane cultivation. Using the Davis (1971) convention a moderately significant negative relationship was found between age of the farmers and their agricultural knowledge in sugarcane cultivation (r = -0.38). This indicates that younger farmers had higher agricultural knowledge than the old aged farmers. This might be due to the reason that the younger farmers are usually venturesome, innovative and energetic having a modern outlook and potentiality to provide leadership in the society. On the other hand, the aged people lack energy and enthusiasm due to decline in health and having a traditional outlook. Ahmed (1974) also found that younger farmers had higher level of agricultural knowledge than the aged farmers.

Education and agricultural knowledge

Data in Table 5 indicate a strongly significant positive relationship between education of the farmers and their agricultural knowledge in sugarcane cultivation (r = .74). Karim (1973), Reddy and Kilvin (1968), and Ahmed (1974) also found a positive relationship between year of schooling of the farmers and their agricultural knowledge. The observed phenomenon can be explained in this way, higher academic achievement helps the individuals to acquire technical and extension knowledge. It is said that "the more you read the more you learn." That is, higher the level of education of the farmers higher was their level of agricultural knowledge in sugarcane cultivation.

Farm size and agricultural knowledge

The calculated correlation coefficient (r = 0.42) as shown in Table 5 indicated a

moderately significant positive relationship between farm size of the farmers and their agricultural knowledge in sugarcane. That is, the farmers with larger farm size had higher level of agricultural knowledge in sugarcane cultivation. This is probably due to the fact that they are economically solvent, can purchase different production inputs, make higher contact with change agents, can take risk and make credit available for sugarcane cultivation. On the other hand, the farmer with small farm may be afraid of taking risk, may have less contact with various information sources and having a limited ability to make investment for use of the inputs necessary for adoption of improved practices in sugarcane cultivation. Ahmed (1974) in his study also found a positive relationship between farm size of the farmers and their agricultural knowledge.

Table 5. Relationship between selected characteristics of the farmers and their agricultural knowledge in sugarcane cultivation.

Relationship	Correlation coefficient (r value)
Agricultural knowledge in sugarcane cultivation and age of the farmers	-.38**
Agricultural knowledge in sugarcane cultivation and education of the farmers	.74**
Agricultural knowledge in sugarcane cultivation and farm size of the farmers	.42**
Agricultural knowledge in sugarcane cultivation and extension contact of the farmers	.87**
Agricultural knowledge in sugarcane cultivation and organizational participation of the farmers	.59**
Agricultural knowledge in sugarcane cultivation and training of the farmers	.87**

** Significant at .001 level of probability

Extension contact and agricultural knowledge

Data presented in Table 5 indicate a strongly significant positive relationship between the variables (r=.87). Higher the extension contact of the farmers, higher was their level of agricultural knowledge. The reason for such a relationship might be the fact that contact with extension workers and other sources of information help the growers to become aware of the improved practices and to understand the principles and procedures of their use. This finding is in conformity with that of Ahmed (1974). However, in the present study more than three-fifth (61%) of the farmers had low extension contact. So the extension workers need to pay more attention to increase the level of farmers' extension contact to a greater extent.

Organizational participation and agricultural knowledge

The calculated correlation coefficient (r=.59) showed a substantially significant positive relationship between the variables. That is, higher the organizational participation of the farmers, higher was their level of agricultural knowledge in sugarcane cultivation. This is probably due to the fact that organizational participation brings an individual in contact with other people and new ideas and broadens his knowledge and out look. Ahmed (1974), Marsh and Coleman (1955), Rahim (1963), Reddy and kilvin (1968) and Karim (1973) also found a positive relationship between organizational participation of the farmers and their agricultural knowledge. However, the average organizational participation score was very low (1.61) and 95 percent of the farmers had very low organizational participation.

Training and agricultural knowledge

Data presented in Table 5 indicate a strongly significant positive relationship between training received by the farmers and their agricultural knowledge in sugarcane cultivation (r = .87). Training on different aspects of sugarcane cultivation helps the farmers to acquire necessary knowledge, skills, expertise, and hands on education. This might be the reasons for the differences in knowledge level between the farmers who received training and who did not. However, more than three-fourth (76%) of the farmers had no training on, "how to prepare seed bed, seedling, set treatment, identifying insect-pest and diseases, appropriate time of plantation, and harvesting.

IV. CONCLUSIONS

Farmers have higher level of knowledge in land preparation and harvesting of the crop, however, they have very low level of knowledge in plantation and transplantation, insect-pest and disease control, and seedling and seed bed preparation. Emphasis should be given on the young and middle aged farmers by the extension workers and community developers to improve their knowledge level, so that the adoption of improved technologies in sugarcane cultivation increase to a great extent.

Arrangements made to involve the higher educated farmers in providing leadership to adopt improved practices in sugarcane cultivation will be helpful for increasing the sugarcane production in the country. Involving sugarcane growers of medium and large farm categories may be helpful to the extension workers in their efforts to introduce improved practices in sugarcane cultivation among the farmers.

Arrangements made for establishing adequate contact of the sugarcane growers with various sources of information will have a congenial effect on the levels of agricultural knowledge of the farmers and their adoption of improved practices of sugarcane cultivation. Steps should be taken to increase organizational participation of the farmers.

There is a need for training farmers to enhance their agricultural knowledge in sugarcane cultivation.

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