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Adoption of BSRIAkh 42 among the Char Dwellers' of Nilphamary District

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ABSTRACT

The study was conducted in the Joldhaka Upazilla of Nilphamary District. The objectives of the study were to determine the extent of adoption of BSRIAkh 42 and to find out the relationships between socio-economic profile of the farmers and their adoption. Data were collected from randomly selected 90 household's heads using pre-tested interview schedule during 2015. Findings revealed that majority (71.1 %) of the respondent had medium adoption of BSRIAkh 42 whereas 21.1 per cent of the respondents were in high adoption category and only few 7.8 per cent under low category. Though most of the farmers were benefited and decided to continue cultivation of BSRIAkh 42. Benefit cost ratio (BCR) of BSRIAkh 42, BSRIAkh 41 and Co 208 was found 2.67, 1.78 and 2.31, respectively which revealed that cultivation of Co 208 and BSRIAkh 42 were more profitable than that of BSRIAkh 41. Farmer's education, extension contact, innovativeness, training experience and knowledge on improved sugarcane cultivation technology showed significant and positive relationship with their adoption of BSRIAkh 42. Age of the respondent but negative significant relationship but family size, farm size and annual income showed no significant relationship with their adoption of BSRIAkh 42.

Key words: Adoption, akh, benefit cost ratio, innovativeness

INTRODUCTION

Sugarcane is one of the most important cash crop in Bangladesh, is cultivated in the tropical and subtropical regions of the world. It is not only the major cash crop but also a food and industrial crop. Although it is grown throughout Bangladesh, its commercial cultivation for industrial supply is mostly concentrated in the northern districts and for chewing purpose it is mostly concentrated in southern and southern-west districts (Rahman *et al.*, 2013). But now a day some sugarcane varieties for chewing purpose is being cultivated commercially in northern part of Bangladesh. Especially a project "Create Employment Opportunities of Char Dwellers in Greater Rangpur Districts through Sugarcane Cultivation" was at northern region. In case of chewing cane the rind was removed and the internal tissues sucked or chewed. In Bangladesh, sugarcane is not

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only used for sugar and goor production but also used for chewing purposes. Bangladesh is producing on an average 6.8 million metric tons of sugarcane out of which 2.3 million metric tons are used by sugar mills to produce 0.20 to 0.21 million metric tons of sugar and 3.10 million metric tons to produce 0.30 million metric tons of goor and the remaining 1.40 million metric tons for seed and chewing (Alam *et al.*, 2005). Currently, on average sugarcane is grown in 0.16 million hectares of land out of which half of area is located in the sugar mills zone and the rest in the non-mills zone where goor and juice is produced. Sugarcane crop contributes 0.81% to the national GDP (BBS, 2012). The highest contribution comes from goor sector (0.39%) followed by sugar (0.15%), chewing and juice (0.04%), seed (0.03%), cattle feed and fuel (0.3%) and by-product (0.03%), respectively (Rahman and Mondal, 2010). The future prospect for chewing cane cultivation in Nilphamary district of Rangpur region appears bright as its suitable climate and soil condition. As why farmers are highly motivated to cultivate chewing cane. BSRI Akh 42 is one of the best latest chewing variety with its vigorous growth, soft, high yielding, non flowering and moderately resistant to red rot disease. Its maximum yield was found 212 tha^{-1} and the average was 169 tha^{-1}. In a study conducted by Hussen (2001) on adoption of modern sugarcane production technology practices by the farmers of Dewangonj upazilla in Jamalpur district observed that about 91.00 per cent of the respondents had medium level of adoption of modern sugarcane production technology compared to 7.00 per cent having low and only 2.00 percent having high adoption level of modern sugarcane production technology practices. But earlier no study was conducted on adoption of chewing cane in Bangladesh. So, this has inspired the researchers to conduct this study with following objectives: (i) to determine the extent of adoption of BSRIAkh 42 and (ii) to find out the relationships between socio - economic profile of the respondents and their adoption with BSRIAkh 42.

MATERIALS AND METHODS

The study was conducted in Joldhaka Upazzila of Nilphamary district during 2015. Joldhaka Upazila of Nilphamary district was selected as because BSRIAkh 42 is widely cultivated in this area. A pre-structured and pre-tested interview schedule was used as data gathering instrument. Total number of the BSRIAkh 42 cultivators in the Joldhaka Upazilla was 224 that constituted population of the study. In this study, 90 farmers (40.2%) were selected randomly followed by simple random sampling technique.

Extent of adoption of BSRIAkh 42

Extent of Adoption was estimated by using the following formula:

$$= \frac{\text{Area under BSRIAkh 42 cultivation by a respondent}}{\text{Total area under sugarcane cultivation by a respondent}} \times 100$$

Based on their extent of adoption respondents were classified in three categories. These are: low adoption (up to 33), medium adoption (34 to 66) and high adoption (above 66).

Comparative profitability analysis of BSRIAkh 42

Enterprise costing was followed in calculating cost and return. An economic performance as well as comparative profitability of BSRIAkh 42 compared to other

sugarcane varieties of the study area was computed by calculating BCR (Benefit Cost Ratio).

Benefit cost ratio

Benefit cost ratio of BSRIAkh 42 was estimated as a ratio of total return to total cost. Where,

$$BCR = \frac{\text{Total return}}{\text{Total cost}}$$

Coefficient of correlation was computed in order to explore the relationship between the selected characteristics of the farmers and their adoption of BSRIAkh 42. The selected characteristics constituted the independent variables and adoption of BSRIAkh 42 by the farmers constituted the dependent variable. In order to determine the relationship between nine selected characteristics (independent variables) of the farmers viz., age, education, family size, farm size, annual family income, extension media contact, innovativeness, training experience, knowledge on improved sugarcane cultivation technology and the dependent variable i.e., adoption of BSRIAkh 42. Pearson's product moment was used. Co-efficient of correlation (r) was used to test the hypothesis concerning the relationship among the variables. Five per cent level of significance was used for rejection of any null hypothesis. The collected data were complied, tabulated and analyzed in accordance with the objectives of the study. Data were analyzed followed by SPSS (Statistical Package for Social Sciences) and PC program. Descriptive statistical measures such as range, mean, number and percentage distribution, standard deviation were used to interpret the data.

RESULTS AND DISCUSSION

Characteristics of the sugarcane farmers

Nine socio-economic characteristics of the respondents are presented in Table 1. Major portion (52.2 %) of the farmers in young aged category compared to middle (35.6 %) and ware (12.2 %) old aged categories. The highest number (43.3%) of farmers having secondary level of education followed by primary level of education (30.0%), no education (15.6%) and above secondary level (11.1%). About half (47.8%) of the respondents' families were found to be small size where medium and large ware (34.4 %) and (17.8%), respectively. More than fifty percent (56.7 %) respondents had small farm size while 31.1% medium and 12.2% had large farm size. About 56.7% of the respondents had medium annual family income while 26.6% low and 16.7% having high annual family income. Half of the respondent (50.0%) had medium level of extension contact followed by low level of extension contract (28.9%). Three fourth (75.5%) of the respondents had medium to high level of innovativeness. Two fifth (40.0 %) of the respondent had low training experience compared to 32.2% medium, 20.0% no training and 7.8% having high training experience. More than half of the respondent 51.1% medium level of knowledge about acquired improved sugarcane production technology.

Table 1. Salient features of the selected characteristics of the sugarcane farmers

SL No.	Characteristics	Categories	Respondents		Mean	SD
			No.	%		
1	Age	Young aged (up to 33 years)	47	52.2	39.56	8.34
		Middle aged (34- 50 years)	32	35.6		
		Old aged (> 50 years)	11	12.2		
2	Level of education	No education (0 or 0.5 no read/sign)	14	15.6	8.15	3.89
		Primary education (1-5 class)	27	30.0		
		Secondary education (6-10 class)	39	43.3		
		Above secondary (>10 class)	10	11.1		
3	Family size	Small family (up to 4)	43	47.8	5.60	2.40
		Medium family (5 -7)	31	34.4		
		Large family (>7)	16	17.8		
4	Farm size	Small farm (0.2 -1.0 ha)	51	56.7	1.04	3.96
		Medium farm (1.01-3.0 ha)	28	31.1		
		Large farm (>3.0 ha)	11	12.2		
5	Annual family income	Low income (up to 50'00 0 only)	24	26.6	74'000	42.33
		Medium income (50.1- 1.0 lac only)	51	56.7		
		Large income (>1.0 lac only)	15	16.7		
6	Extension media contact	Low contact (up to 11)	26	28.9	13.80	5.97
		Medium contact (11 to 19)	45	50.0		
		High contact (>19)	19	21.1		
7	Innovativeness	Low innovativeness (up to 15)	22	24.5	24.21	6.29
		Medium innovativeness (16-30)	41	45.5		
		High innovativeness (>30)	27	30.0		
8	Training experience (Days)	No training experience (0)	18	20.0	13.72	9.41
		Low training experience (1-30)	36	40.0		
		Medium training experience (31-60)	29	32.2		
		High training experience (.>60)	07	7.8		
9	Knowledge on improved sugarcane cultivation technology (Scores)	Little knowledge (up to7)	31	34.4	11.68	2.35
		Medium knowledge (8- 15)	46	51.1		
		High knowledge (>15)	13	14.5		

Extent of adoption of BSRIAkh 42

The possible range of extent of adoption of BSRIAkh 42 by the farmers ranged from 0 to 100, while the observed range was 7.69 to 76.92. The mean adoption score was 59.32 and the standard deviation was 11.87. Based on observed range of extent of adoption, the respondents were classified into three categories as presented in Figure 1.

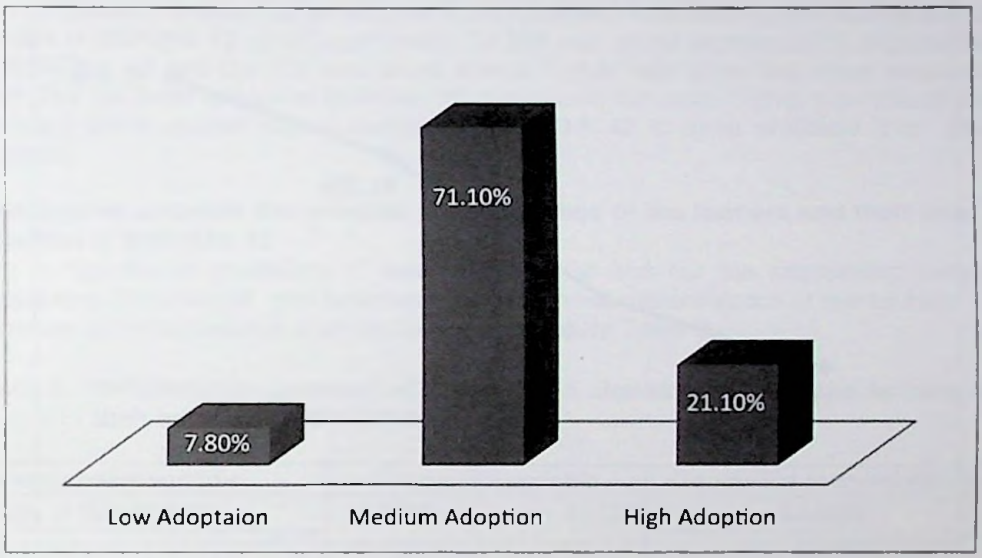

Figure 1. Distribution of the respondents according to adoption of BSRIAkh 42

Information displayed in Figure 1 reveals that majority (71.1%) of the respondents had medium adoption of BSRIAkh 42 compared to 21.1 percent of them had high level of adoption and only few portion (7.8 %) having low adoption of BSRIAkh 42. Findings clearly indicate that above ninety percent (92.2 %) of the farmers had medium to high adoption of BSRIAkh 42 cultivation. Though the initiation of BSRIAkh 42 is new but its expansion is satisfactory. Thus, it may be mentioned that farmers are progressing comparatively speedy towards the adoption of BSRIAkh 42 variety.

Trend of adoption decision

Concerning the 90 respondents' year of first practice of BSRIAkh 42 a statistics have been provided in the following:

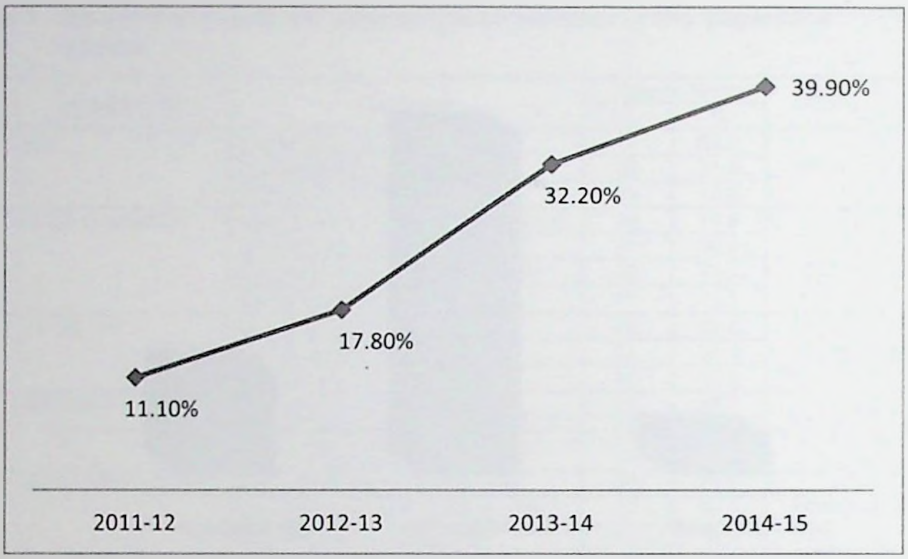

Figure 2. Distribution of the respondents according to their trend of adoption decision

Considering Rogers' (1995) innovation decision process, all respondents' action could be trend as continued adoption which means the respondents will continue. From the technology in Figure 2 it reveals that adoption rate of BSRIAkh 42 is increasing trend. But in future, many farmers will hesitate to adopt due to its susceptibility of red rot disease although they agreed on its higher yield and more BCR.

Comparative profitability of cultivation of different chewing cane varieties

Profitability of chewing cane cultivation was determined through gross margin analysis i.e. total return on variable cost as because farmers of Bangladesh are eager to know the ultimate benefit of cultivation. Comparative profitability of different chewing cane varieties are presented in Table 2.

Table 2. Comparative statement of yield, cost, return, net profit and BCR of different chewing cane varieties

Item	BSRIAkh 42	BSRIAkh 41	Co 208
Yield (tha^{-1})	162	179	153
Cost per ha (taka)	333450.00	350210.00	330670.00
Total return per ha (taka)	891000.00	626500.00	765360.00
Net profit per ha (taka)	557550.00	276290.00	434690.00
BCR	2.67	1.78	2.31

Table 2 reveals that among the three cultivated varieties, highest BCR was found in case of BSRIAkh 42 (2.67) and variety Co 208 was found second (2.31). Highest BCR of BSRIAkh 42 and Co 208 was found due to higher sale price and lower production cost. The net profit in case of BSRIAkh 42 was found too much higher than that of other varieties which reveals that cultivation of BSRIAkh 42 is more profitable than other varieties.

Relationship between the selected characteristics of the farmers and their level of adoption of BSRIAkh 42

Correlation coefficient 'r' was calculated to find out the relationship between adoption of BSRIAkh 42 and selected socio economic characteristics of the farmers. The summary of the correlation analysis has been shown in Table 3.

Table 3. **Relationships between of the selected characteristics of the farmers and their adoption of BSRIAkh 42**

Independent variable	Dependent variable	Coefficient of correlation (r)
Age of farmer	Adoption of BSRIAkh 42	-0.85**
Education		0.206*
Family size		0.07^{NS}
Farm size		0.118^{NS}
Annual income		0.09^{NS}
Extension contact		0.134*
Innovativeness		0.340**
Training experience		0.236*
Knowledge		0.270**

** Correlation is significant at 0.01 levels
* Correlation is significant at 0.05 levels

Table 3 shows that age of the farmers had significant negative relationship with their adoption of BSRIAkh 42 at 1 % level of significance. It indicates that the young aged respondents' higher rate of adoption. Whereas innovativeness and knowledge of the farmers showed significant positive relationship with their adoption of 1 % level of significance. It indicates that more innovativeness and knowledge of farmers results more level of adoption. Farmers' education, extension contract and training experience showed significant and positive relationship with their adoption at 5 % level of significance of BSRI Akh 42 but family size, farm size and annual income showed no significant relationship with their adoption of BSRIAkh 42.

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