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Adoption of Selected Modern Rice Varieties by the Farmers in Some Areas of Mymensingh District

M.N. Haque[1], M.A. Momen Miah[2], M.A. Kashem[3] and M.A. Muttaleb[4]

Abstract

The purpose of the study was to determine adoption of selected modern rice varieties by the farmers and to explore the relationships with their selected characteristics in three villages of Sadar upazila of Mymensingh district. Data were collected from a sample of 100 growers selected randomly by using multistage stage sampling method. Findings indicate that the majority (63% of the farmers had medium adoption while 20% low adoption and 17% had high adoption. Correlation analyses indicate that education, farm size, annual income, farming experience, extension contact, decision sharing ability and agricultural knowledge of the farmers had significant and positive relationship with the adoption on the concerned modern rice varieties. Annual income, education and farming experience of farmers were found important contributing variables in respect of explained variation on adoption of modern rice varieties.

Keywords: *Adoption, modern rice variety*

Introduction

Rice is the staple food crop in Bangladesh occupying 75% of the total cultivable land and its total production is 25.18 million metric ton (BBS, 2004). Rice alone constitutes 95% of the food grains production in Bangladesh (Julfiquar *et al.*, 1988). Currently the average yield of rice in Bangladesh is around 1.8 t/ha (Anonymous, 1999) which is much below than the country average of Korea, Japan and China (HAS, 2004), Boro rice area shows a slow increasing trend and shares about 48.52% of total rice production (BBS, 2003). Bangladesh has to produce more food from the decreasing land and other natural resources to feed the ever growing population. So, the most logical way is to raise the yields and cropping intensity. Rice production will increase in Bangladesh only when the farmers adopt improved technologies. Among these technologies, potential rice varieties play major role for achieving higher yield. But most of the farmers did not possess modern rice cultivation technologies due to many reasons. With this view, an attempt was made to investigate the adoption of selected modern rice varieties by the farmers with the following specific objectives:

1. To determine the adoption of selected modern rice varieties

[1]Former MS student, Dept. of Agricultural Extension Education, Bangladesh Agricultural University (BAU), Mymensingh, [2&3]Professor, Dept. of Agricultural Extension Education, BAU, Mymensingh and [4]Senior Scientific Officer, Bangladesh Rice Research Institute, Regional Station, Habiganj

2. To determine and describe the some of the selected characteristics of the rice growers
3. To explore the relationships between each of the selected characteristics of the rice growers and their adoption of selected modern rice varieties.

Methodology

Data were collected during 01 August to 15 September, 2005 by using a structured interview schedule. Firstly, Mymensingh district was selected purposively as it is one of the representative rice growing area of Bangladesh, sadar Upazila, and three villages namely Fakirakanda, Digharkanda and Sutiakhali were selected randomly at the second and third stages respectively. Farmers cultivating modern rice varieties in these three villages were the population of this study. About ten percent farmers (100 out of 1022) were selected by using multistage random sampling technique. Adoption of selected modern rice varieties was the dependent variable and was measured by computing an adoption score based on cultivated area and duration of use through the formula used by Kashem (2004). The selected varieties were BRRI dhan28 and BRRI dhan29. Independent variables were measured by following the scales developed by the social scientists. Both descriptive and inferential statistics were used to interpret the findings. Pearson's product moment correlation coefficient (r) was computed for exploring the relationships between the selected characteristics of the farmers and their adoption of selected modern rice varieties. Multiple regression analysis was done to determine the contribution of the selected characteristics of the framers on their adoption of selected modern rice varieties.

Findings and Discussion

Selected characteristics of the farmers

The salient features of the farmers with their nine selected characteristics have been presented in Table 1. Data presented in Table 1 indicates that majority (53%) of the farmers was in middle aged and almost equal proportion of them was young (23%) and old (24%). Majority (48%) of the farmers was illiterate or has primary education. Table 1 revealed that the highest proportion (65%) of the rice growers had medium family size while 27% having small family and 8% had large family size. Highest proportion (64%) of the farmers possessed medium farm while 31% possessed small farm and 5% possessed large farm. Data presented in Table 1 indicate that the highest proportion (62%) of farmers had medium annual income while 22% had low annual income and 16% had high annual income. Majority (64%) of the farmers had medium farming experience while 22% having low and 14% had high farming experience. Highest proportion (58%) of the rice growers maintained medium extension contact while 25% high contact and 17% low contact with various extension media. Majority (52%) of the respondents were medium cosmopolite while 38% were low cosmopolite and 10% of the respondents had high cosmopoliteness. Data presented in Table 1 indicate that the majority (77%) of

the farmers had medium decision sharing ability while 13% having low and 10% had high decision sharing ability.

Table l. Distribution of the respondents according to their characteristics

	Categories	Percent	Mean	SD
Age (year)	Young (upto 35)	23	44.21	9.96
	Middle aged (36-50)	53		
	Old (>50)	24		
Education (year of schooling)	Illiterate (0)	19	5.73	4.00
	Primary (1-5)	29		
	Secondary (6-10)	44		
	Above secondary education (>10)	8		
Family size (number)	Small (upto 4)	27	7.37	2.00
	Medium (4-8)	65		
	Large (>8)	8		
Farm size (hectare)	Small (0.20 to 1.0)	31	401.50	8.30
	Medium (1.01 to 3.0)	64		
	Large (>3.0)	5		
Annual income (thousand Taka)	Low (upto 66.00)	22	105.95	35.98
	Medium (66.01-103.00)	62		
	High (>103.00)	16		
Farming experience (year)	Low (upto 17)	22	26.48	9.00
	Medium (18-35)	64		
	High (>35)	14		
Extension contact (scale)	Low (upto 12)	17	18.59	6.19
	Medium (13-24)	58		
	High (>24)	25		
Cosmopoliteness (scale)	Low (upto 13)	38	14.85	3.13
	Medium (14-19)	52		
	High (>19)	10		
Decision sharing ability (scale)	Low (upto 21)	13	24.93	3.20
	Medium (22-28)	77		
	High (>28)	10		

Combined adoption of selected modern rice varieties by the farmers

Adoption of selected modern rice varieties have been presented in Table 2. Observed adoption score of selected modern rice varieties of the farmers ranged from 2.33 to 12.00 with the mean of 7.9. The categories of the farmers according to their combined adoption score is presented in Table 2. The information of Table 2 indicated that the majority (63%) of the respondents fell in medium adoption category while 20% low adoption and 17% in high adoption category. This means that majority of the rice farmers possessed moderate to high adoption behaviour regarding modern rice varieties. The similar findings were reported by Haider *et al.* (2001) and Kashem & Hossain (1992).

Table 2. Distribution of the respondents according to combined adoption of selected modern rice varieties

Category	%	Mean	SD
Low (upto 5.33)	20	7.9	2.4
Medium (5.34 to 10.33)	63		

High (>10.33)	17
Total	100

Relationships between dependent and independent variables

Relationships between the selected characteristics and adoption of selected modern rice varieties were ascertained by Pearson's product moment co-efficient of correlation (r) and presented in Table 3. The Table revealed that education, farm size, annual income, farming experience, extension contact and decision sharing ability of the farmers had significant and positive relationship with the adoption of modern rice varieties. But incase of age, family size and cosmopoliteness, the relationship was not significant.

Table 3. Relationships between dependent and independent variables

Independent variable	'r' values
Age (X_1)	0.021
Education (X_2)	0.412**
Family size (X_3)	0.032
Farm size (X_4)	0.204*
Annual income (X_5)	0.644**
Farming experience (X_6)	0.201*
Extension contact (X_7)	0.378**
Cosmopoliteness (X_8)	0.002
Decision sharing ability (X_9)	0.280**

**= Significant at 5% level*
*** = Significant at 1% level*

The relationship between education of the farmers and their adoption of selected modern rice varieties was positive and significant (Table 3). This relationship might be due to the fact that level of education changes the outlook of the farmers and that ultimately motivated them for adoption of modern rice varieties. This relationship is supported by Muttaleb *et al.* (2003) and Sarker *et al.* (2003). On the contrary, Singh *et al.* (2003) and Yadav *et al.* (2000) found no relationship between these variables. Farm size of the respondents had positive significant relationship with their adoption of selected modern rice varieties. This means that adoption is increased with the increase in farm size. This may be due to reason that larger farm empowers the farmers to invest more resources to the farming business. This finding is consistent with the findings of Muttaleb *et al.* (1998) and Singh *et al.* (2003). The relationship between annual income of the farmers and their adoption of selected modern rice varieties was positively significant. This finding indicates that higher income increases the ability of the farmers to make more investment for adoption of improved practices. This relationship is in conformity with the findings of Kaur and Singh (1991) and Bhatia and Singh (1991). Farming experience of the respondents had positive significant relationship with their adoption of selected modern rice varieties. Farming experience of the farmers enhances their confidence as well as ability to adopt improved farming practices. Rashid (2004) observed similar relationship between farming experience and adoption of rice technology at farm level. Relationship between extension contact of the farmers and their adoption of selected modern rice varieties was positive and significant. This finding indicates that more the extension contact of the farmers, the more was their adoption of modern rice varieties. This finding indicated that farmers' existing level of adoption of modem rice varieties could be improved if they are exposed to different extension agencies. Similar finding was reported by Sarker *et al.* (2003). The relationship between decision sharing ability

of the farmers and their adoption of selected modern rice varieties was positive and significant. It means that increased decision sharing ability of the farmers enhance their adoption of modern rice varieties. This might be due to the fact that decision sharing ability of the farmers influences them to discuss various issues of modem varieties which ultimately motivate them to adoption of improved farming practices.

Factors contributing to adoption of modern rice varieties

In order to find out the relative contribution of independent variables to the adoption of modern rice varieties, multiple regression analysis was computed. Out of nine variables, six variables were included in regression analysis due to their significant values in correlation analysis. The different independent variables had their own units of measurement that did not permit a comparison of the unstandardized regression coefficient values. For this reason, a standardized regression co-efficient value was also computed to avoid the problems of different units of measurement. It was evident that the values of multiple determination coefficients (R^2) for all the six independent variables jointly explained 52.40% of variation in the extent of adoption of modern rice varieties (Table 4). The observed t value for regression co-efficient was significant in case of education, annual income and farming experience. For reaching an optimum model of prediction analysis of selected independent variables with adoption, only significantly contributed variables to R^2 were included. In this case, annual income, education and farming experience, jointly explained 48.90% variation in adoption of modem rice varieties (Table 5). It means that omitted variables jointly contributed only 3.50% variation. The annual income of the farmers contributed 41.14% in predicting their adoption of modern rice varieties while education contributed only 4.40% and farming experience contributed 3.10%.

Table 4. Summary of multiple regression analysis of the independent variables on the adoption of modern rice varieties

Variable	Unstandardized Coefficients (B)	Standardized Coefficients (Beta)	Standard Error	t value
Education (X_2)	0.113	0.183	0.057	1.969
Farm size (X_4)	0.0005763	0.103	0.000	1.390
Annual income (X_5)	0.03159	0.462	0.006	5.617**
Farming experience (X_6)	0.04871	0.179	0.021	2.329*
Extension contact (X_7)	0.05799	0.146	0.036	1.628
Decision sharing ability (X_9)	0.103	0.136	0.058	1.784

R^2 = 0.5240, Constant = -1.214

** = Significant at 5% level*

*** = Significant at 1% level*

$Y = -1.214 + 0.174X_2 + 0.0006X_4 + 0.03159X_5 + 0.04871X_6 + 0.05799X_7 + 0.103X_9$

Table 5. Summary of stepwise multiple regression analysis of the independent variables on the adoption of modern rice varieties

Variable	Unstandardized Coefficients (B)	Standardized Co-efficients (Beta)	Standard Error	t value	F value	% contribution
Education (X_2)	0.174	0.284	0.050	3.480*	69.361**	41.40
Annual income (X_5)	0.03550	0.520	0.005	6.486**	41.055**	4.40
Farming experience X_6)	0.05056	0.186	0.021	2.391*	30.607**	3.10

R^2 = 0.4890, Constant = -1.855
** = Significant at 5% level*
*** = Significant at 1% level*
$Y = -1.855 + 0.174X_2 + 0.0355X_5 + 0.0506X_6$

It was also revealed that only 3 variables finally entered into the stepwise regression model and contribution of these 3 variables were statistically significant (Table 4). Explained variation of annual income of the farmers was 41.40% followed by education (4.40%) and farming experience (3.10%) in predicting the adoption of selected modern rice varieties.

Conclusion

The findings indicates that adoption level of modern rice varieties by the farmers were not promising. So, there is urgent need to disseminate information about these technologies to the farmers through training and demonstration. Annual income, education and farming experience of the farmers were found positive and significant factors of adoption of modern rice varieties. These variables may be considered by the extension agencies for rapid dissemination of modern rice varieties to the farmers.

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