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ADOPTION OF MODERN RICE VARIETIES BY THE FARMERS OF NETRAKONA DISTRICT IN BANGLADESH

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ABSTRACT

The main purpose of the study was to determine and describe the extent of adoption of selected rice varieties by the farmers of Kandiura union of Kendua Upazila under Netrakona district. Attempts were also made to describe some of the selected characteristics of the farmers and to explore the relationships between the selected characteristics and their adoption of selected rice varieties. The study was conducted at Jalalpur and Bishnupur villages of Kandiura union of Kendua Upazila under Netrakona district. Data were collected from 127 farmers who were randomly selected as the sample of the study by using random sampling method. The researcher himself collected data through personal contact with a well-structured pretested interview schedule during the period from 17th February to 30th March, 2008. The findings revealed that highest 54.33 percentof the respondents had medium adoption of selected rice varieties, while 27.56 percent had low adoption and rest 18.11 percent had high adoption of selected rice varieties. Pearson's Product Moment Correlation co-efficient (r) was computed to explore the relationships between the selected characteristics and their adoption of selected rice varieties. The correlation analysis indicated that level of education, farm size, agricultural knowledge, communication exposure, innovativeness and attitude towards agricultural technologies had significant positive relationships with the adoption of selected modern rice varieties. Age, and family size had significantly negative relationship with the adoption of selected modern rice varieties at farm level. On the other hand, farm size, annual income and organizational participation had positive but non-significantly related with the adoption of modern rice varieties in the farm level of study area's farmers.

Key words: Adoption, modern rice varieties, farmers.

Introduction

It is a universal truth that Bangladesh is mainly an agricultural dependent country with an area of 1,47,570 sq.km. Agriculture is the backbone of the country economy. The comprehensive development of the country is largely depended on the success of agriculture. Approximately 51.7 percent of its 145.9 million people directly and indirectly depended on agriculture for subsistence (BBS, 2006). About 79.9 of per her total population lives in rural areas and 51.7 percent of the country's labour force are engaged in agriculture (BBS, 2006). Agriculture has an important contribution in Gross Domestic Product (GDP). According to BES report, agricultural output at current prices has been found to contribute 16,38 percent to the GDP in which 11.72 percent comes from crops, 2.90 percent from livestock and 1.76 percent from forestry (BES, 2007). So, agriculture plays a vital role through employment generation, poverty alleviation, food security, enhance standard of living by increasing income levels of rural population. With a view to achieving these objectives Bangladesh Rice Research Institute (BRRI), Bangladesh Institute of Nuclear Agriculture (BINA), Bangladesh Agricultural University (BAU) and other related organizations developing many modern varieties of rice. On the other hand, Department of Agricultural Extension (DAE) and other related Government and Non-government Organizations (NGOs) taking and executing many programmes to motivate the farmers towards the adoption of developed modern varieties.

Statement of the Problem: A problem is an unsatisfactory situation which is perceived as being undesirable or hindrance to the growth and development of peoples either individually or community. Due to different lacking in agricultural sector in Bangladesh like unavailability of inputs, quality seeds, higher price of inputs, lack of marketing facilities, lack of technical support, low productivity etc lead to know

income from the agriculture. Due to low income, necessary investment cannot be made for improving productivity and procurement of improved quality seed. In view of the foregoing discussion, the researcher undertook the investigation of the problem entitled "Adoption of Modern Rice Varieties by the Farmers of Kandiuara Union of Kendua Upazila under Netrakona District". The main purpose of the study is to determine the extent of adoption of modern rice varieties by the farmers and also to ascertain the extent of adoption. On the basis of problem stated above, the objective would be taken into consideration for giving proper direction to the study was to determine and explore the relationship between the extent of adoption of modern rice varieties by the farmers and their selected characteristics.

Conceptual framework of the study: In scientific research, selection and measurement of variables constitute an important task. The hypothesis of a research while constructed properly contains at least two important elements i.e." a dependent variable" and " an independent variable". A dependent variable is that factors which appears, disappears or varies as the researcher introduces, removes or varies the independent variables (Townsend, 1953). An independent variable is that factor which is manipulated by researcher in his attempt to ascertain its relationship to an observed phenomenon. In view of prime findings of review literature, the researcher constructed a conceptual framework of the study, which is self-explanatory and is presented in Fig. 1.

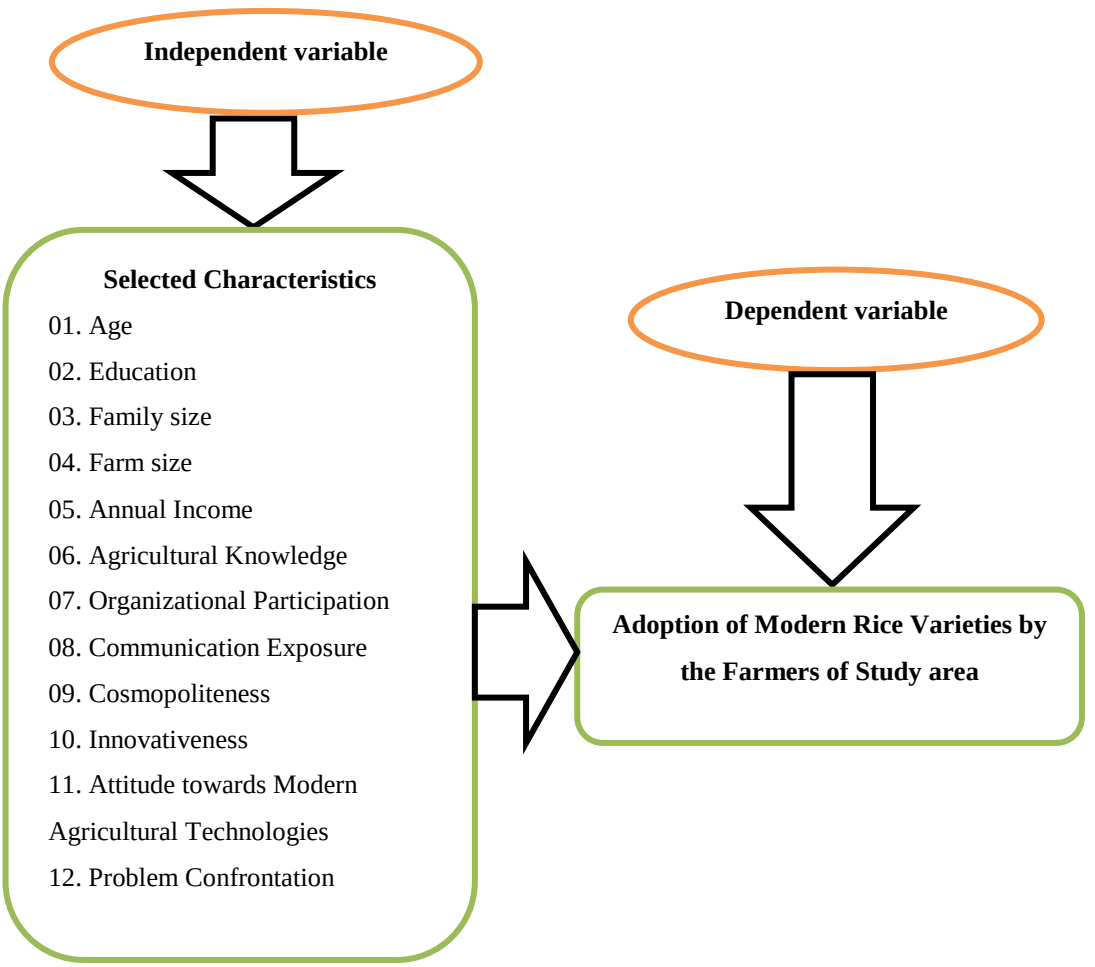

Fig. 1 Conceptual Framework of the Study

Materials and Methods

The study on adoption of modern rice varieties by the farmers was conducted in Netrakona district. At first two villages namely Jalalpur and Bishnupur of Kandiura union were selected randomly. Then, total farmers of two villages were counted with the help of an updated voter list concerned Sub-Assistant Agricultural Officer of this block. Jalapur had 770 farmers where as Bishnupur had 500 farmers. Among these farmers 10 percent were randomly selected as the representative sample of the study by using a table of random numbers (Kerlinger, 1973). Thus, the sample size for Jalalpur village was 77 farmers and that of Bishnupur village was 50 farmers making the total sample size of 127 farmers. For the purpose of data collection, an interview schedule was prepared. Direct and simple questions were included in the schedule to collect data on the selected dependent and independent variables. Appropriate scales were developed to operationalize the selected factors of the respondents. Scales were also developed to ascertain the problems of the respondents in adopting modern rice varieties.

Measurement of dependent variable: Adoption of modern rice varieties was the dependent variable of this study. It was measured on the basis of the extent of adoption of selected modern rice varieties for a period of three (3) years (2005, 2006 and 2007). The simplest amongst them is preparation of indexes. Bose and Saxena (1965) developed an adoption index by asking farmers as how many modern technologies recommended by the extension service they had adopted and how many years. The summation of the number of years and the selected modern agricultural technologies will make the index. A more rigorous and widely used method of measuring adoption by the formula of him, the adoption quotient was developed by Chattapadhyay (1963). According to adoption quotient is the ratio scale designed to quantity the adoption behavior of an individual. The method of adoption quotient is more accurate as it involves all the related concepts like potentiality, extent of time consistency and weightage. However, the overall modern rice varieties adoption index in this study was computed by using the following formula:

$$\text{Adoption of modern rice variety index} = \frac{\Sigma e/p \times 100}{Ps}$$

Where,

Σ = Summation of e/p

e = Extent (i.e actual adoption) of modern rice varieties

p = Potentiality (i.e possible adoption) of modern rice varieties in a particular land in particular year

Ps = Period under study of modern rice cultivation

In this study, it is of three years i.e. 2005, 2006 and 2007. The adoption index was expressed in percentage. Hence, the adoption of modern rice varieties cultivation index of farmer could range from 0 to 100, where 0 indicated no adoption and 100 indicated highest adoption.

Data collection and processing: Data were collected personally by the researcher himself through face-to-face interview of all the selected farmers of the study area. All possible efforts were made to explain the purpose of the study to the respondents by using local language to the extent possible and rapport was established with the farmers to get valid and pertinent information from them. The total period of data collection took from 17th February, 2008 to 30th March, 2008. The collected raw data were examined thoroughly to find out the errors and omissions. Very minor mistakes were detected by doing this, which were corrected properly.

Statistical analysis: The collected raw data were compiled, coded, tabulated and analyzed in accordance with the objectives of the study. In order to explore the relationship between the selected characteristics of the farmers and their adoption of modern rice varieties, the Person's Product Moment Correlation Co-efficient was computed. One percent (0.01) and five percent (0.05) level of significance were used for testing the null hypothesis. If the computed value of co-efficient of correlation (r) was equal to or greater than table value at designated level of significance for the relevant degrees of freedom, the null hypothesis was rejected and it was concluded that there was a significant relationship between the concerned variables.

Results and Discussion

Attitude towards modern agricultural technologies: Attitude towards modern agricultural technologies of the respondents was quantified by computing scores which ranged from 24 to 46 against the deviation were possible score from 11 to 55 with an average of 35.30 and the standard of 5.30. Based on the observed scores, the respondents classified into three categories namely unfavorable attitude (up to 30), neutral attitude (31-38) and favorable attitude (above 38) as shown in Table 1. Results showed that the highest proportion (51.97 percent) of the farmers had neutral attitude compared to 27.56 percent had favorable and 20.47percent had unfavorable attitude.

Table 1. Distribution of the farmers according to their attitude towards modern agricultural technologies

Attitude towards modern agricultural technology category (Score)	Farmers (N) = 127		Mean	SD
	Number	Percent		
Unfavorable attitude (up to 30)	26	20.47	35.30	5.30
Neutral attitude (31-38)	66	51.97		
Favorable attitude (above 38)	35	27.56		
Total	127	100	-	-

Farmers' adoption of modern rice varieties: Adoption of modern rice varieties by the farmers ranged from 53.33 to 98.95 against the possible range of 0 to 100. The average adoption was 79.03 and the standard deviation (SD) of 10.83. On the basis of observed range of adoption scores, the respondents were classified into three categories as shown in Table 2. It revealed that about 54.33 percent of the respondents had medium adoption compared to 27.56 percent having low adoption and 18.11 percent having high adoption. These hybrid seeds are able to give higher yield than the modern rice varieties. Farmers always want to ensure family food security through increasing their crop yield. As hybrid varieties give higher yield, so farmers adopt these hybrid varieties in large extent compared to modern rice varieties. So, adoption of modern rice varieties index was medium in the study area. Podder and Kashem (2000) studied on use of extent of contact media by the farmers in the adoption of Mehersagar banana. They concluded that about half (47 percent) of the growers had medium adoption compared to 14 percent low adoption and 39 percent had high adoption of Mehersagar banana. Hussen (2001) studied on the farmer's knowledge and adoption of modern sugarcane cultivation practices. He concluded that majority proportion (91 percent) of the growers had medium adoption while 7 percent had low adoption and nly 2 percent had high adoption of modern sugarcane cultivation practices.

Table 2. Distribution of the farmers according to their adoption of modern rice varieties

Measuring unit	Probable range	Observed range	Category	Farmers (N) = 127		Mean	SD
				Number	Percent		
Score	0-100	53.33 to 98.95	Low adoption (up to 72)	35	27.56	79.03	10.83
			Medium adoption (72.1-89)	69	54.33		
			High adoption (above 89)	23	18.11		
			Total	127	100	-	-

Relationship between the selected characteristics of the farmers and their adoption of modern rice varieties: This section deals with the relationship between the selected characteristics of the respondents and their adoption of modern rice varieties. The selected characteristics constituted the independent variables, while the dependent variable was the adoption of modern rice varieties by the farmers. One percent (0.01) and five percent (0.05) level of significance were used as the basis for acceptance or rejection of a hypothesis. Table 3 has been used for descriptive interpretation of the meaning of 'r'. The summary of the results of the correlation co-efficient between the selected characteristics of the respondents and their adoption of modern rice varieties has been shown in Table 4.

Table 3. The Meaning of 'r' values (Cohen and Holliday, 1982: 92-93)

r	Meaning
0.00 to 0.19	A very low correlation
0.20 to 0.39	A Low correlation
0.40 to 0.69	A moderate correlation
0.70 to 0.89	A high correlation
0.90 to 1.00	A very high correlation

Table 4. Coefficient of correlation between the selected characteristics of farmers and adoption of modern rice varieties

Dependent variable	Independent variables	Computed 'r' values	Table of 'r' at 125 df	
			0.05	0.01
Adoption of modern rice varieties	Age	-0.434**	0.174	0.228
	Education	0.394**		
	Family size	-0.270**		
	Farm size	0.145^{NS}		
	Annual income	0.145^{NS}		
	Agricultural knowledge	0.371**		
	Organizational participation	0.126^{NS}		
	Communication exposure	0.411**		
	Cosmopoliteness	0.459**		
	Innovativeness	0.287**		
	Attitude towards modern agricultural technologies	0.350**		
	Problem confrontation	-0.330**		

**, *= Significant at 0.01 percent and 0.05 percent level of significance (2 tailed). NS = Not significant.

Correlation analysis indicated that education, agricultural knowledge, communication exposure, cosmopoliteness, innovativeness and attitude towards modern agricultural technologies of the farmers correlated significantly with their adoption of modem rice varieties (dependent variable) in the positive direction i.e. these characteristics showed significant positive relationship with their adoption of modem rice varieties. Three characteristics namely age, family size, problem confrontation by the farmers significantly but negatively correlate with their adoption of modern rice varieties. On the other hand, farm size, annual income and organizational participation were not correlated with their adoption of modern rice varieties i.e. there was no significant relationship between the concerned dependent and independent variables. Islam (2002) found that the attitude towards technology of the farmers had a significant positive relationship with their adoption of modern agricultural technologies. Sarkar (1997) found that potato production knowledge of potato growers had a positive and significant relationship with their adoption of improved potato practices.

Conclusion

In the light of findings of the study and other relevant facts the following conclusions were drawn:

1) It may be concluded that for the promotion of modern rice cultivation, the extension personnel should intensively work with the young farmers.
2) The study showed a significant positive relationship between the education and the adoption of modern rice verities. This fact leads to make conclusion that any attempt to raise literacy and educational level of the farmers would be greatly helpful in diffusing modem rice varieties.
3) Agricultural knowledge of the farmer had a significant positive relationship with their adoption of modem rice varieties. The above content leads to make a conclusion that the necessary arrangement should be taken to increase the agricultural knowledge of farmers which would ultimately increase the adoption of modern rice varieties through increasing agricultural knowledge.

Recommendation for policy implications

1) The farmers having education were likely to have more adoption of modem rice varieties. It is suggested that steps should be taken for motivating the farm families not only for adult literacy programme but also for sending their children to the village schools.
2) Attitude towards technology of the framers had positive significant relationship with their adoption of modern rice varieties. In this study only 20.47 percent farmers' possess low attitude towards technology and the rest of 79.53 percent had medium to high attitude. Considering the above facts, it may be recommended that massive demonstration programmes, training programmes, field trips etc, should be executed to make desirable changes in the farmers' attitude.

Recommendation for further study

1) The relationships of the selected important characteristics of the farmers with their adoption of modern rice varieties have been investigated in this study. Therefore, further research should be conducted to explore the relationships of other characteristics with their adoption of modem rice varieties.
2) The present study was concerned only with the extent of adoption of modern rice varieties. It is therefore, suggested that future studies should include attributes of innovations, adopter categories and use of information sources in relation to adoption stages and adopter categories.

References

BBS, 2006. Statistical Year Book of Bangladesh. Bangladesh Bureau of Statistics. Statistics Division, Ministry of Planning, Government of People's Republic of Bangladesh.

BES, 2007. Bangladesh Economic Survey. Bangladesh Bureau of Statistics, Planning Division, Ministry of Planning, Government of People's Republic of Bangladesh.

Hussen, M. A. 2001. Farmers Knowledge and Adoption of Modern Sugarcane Cultivation Practices. M.S. (Ag. Ext. Ed.) Thesis. Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Islam, M. S. 2002. Adoption of Modern Agricultural Technologies by the Farmers of Sandwip. M.S. (Ag. Ext. Ed.) Thesis. Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Kerlinger, F.N. 1973. Foundations of Behabioural Research. 2nd Edn. Delhi: Surjeet Publications.

Podder. S. K. and M. A. kashem, 2000. Use of Extension Contact Media by the Farmers in the Adoption of Mehersagar banana. Bangladesh J. Ext^{n}. Ed^{n}., 11&12. 1&2:89-94.

Sarker, D. C. 1997. Correlates of Selected Characteristics of Potato Growers with Their Adoption of Improved Potato Cultivation practices in Five Village of Camilla District. M.S. (Ag. Ext. Ed.) Extension Education, Thesis. Department of Agricultural Bangladesh Agricultural University, Mymensingh.

Townsend, J. C. 1953. Introduction to Experimental Methods. New York: McGraw Hill Book Company Inc.