International Journal of Natural and Social Sciences
Print: 2617-6637 < ISSN > Online: 2313-4461

# Problem faced by the farmers in adapting climate change effect on crop production in Barishal region

**Md. Jahidul Islam[1]*, Md. Golam Robbani Akanda[2]**

[1]Assistant Manager, Product Development, Fertilizer Division, Advanced Chemical Industries Limited, 245, Tejgoan Industrial Area, Dhaka-1208
[2]Department of Agricultural Extension and Rural Development, Patuakhali Science and Technology University, Dumki, Patuakhali

**ARTICLE INFO**

**Article history**

Received: 07 January 2022
Accepted: 30 January 2022

**Keywords**

Climate change, Adaptation, Crop production, Barishal

***Corresponding Author**

Md. Jahidul Islam
jahidkhanpstu@gmail.com

**ABSTRACT**

A study was conducted in Barisal region to ascertain the extent of problem faced by the farmers in adapting climate change effect on crop production and to explore relationships between selected characteristics of the farmers and their problem faced in 2014. Multistage random sampling technique was used in this study. There were a total of 1191 farmers (except landless) which constituted the sampling population. Finally, 10 percent of the farmers from each village were randomly selected as sample by using a Table of Random Numbers. From the study it is revealed that the observed overall problem scores of the farmers ranged from 34 to 49 against the possible scores range of 15 to 60. The mean and the stander deviation were 42.20 and 3.419 respectively. Highest proportion (58.8 percent) of the farmers faced medium problem, while 22.7 percent of them faced low problem and 18.5 percent of them faced high problem in adapting climate change effect on crop production. The problem which ranked first was 'lack of improved seeds followed by second ranked 'high cost of improved variety' and third ranked 'lack of supplying improved seeds in proper time'. Low effectiveness of agro chemicals' was the least important problem faced by the farmers in adapting climate change effect on crop production. Correlation results indicated that cosmopoliteness, annual income and agricultural knowledge had significant negative relationships with their problem. Farm size had significant positive relationships with their problem. The characteristics, namely age, education, farming experienced, agricultural training, extension media contact and risk orientation had no significant relationships with their problem.

## INTRODUCTION

Agriculture is the main sector of our economy. Total of 13.02 percent GDP comes from agriculture in our country (BBS, 2020). GDP growth rate of Bangladesh mainly depend only the performance of the agricultural sectors. Bangladesh is one of the most vulnerable countries to climate change due to global warming. Agricultural crops of Bangladesh are sensitive to the different variables of climate such as temperature, rainfall, humidity, day-length etc. as well as different natural disasters like floods, drought and salinity etc. The variability of climate change has become a challenging issue for agricultural. There is an urgent need for advocacy on problem of climate change in order to enlighten people on the dynamics problem of climate change. So it is essential to identify problem faced by the farmer in adapting climate change effect and suitable solution to solve this problem for sustainable agriculture. This cannot be done effectively without any evidence. Research on problem faced by the farmer in adapting climate change effect will therefore promote evidence-based proclamation. By identifying problem in adapting climate change effect the vulnerability to climate change will be minimized. Although the issue of climate change and crop production is not a recent development, there has been little or no efforts aimed at scientifically documenting the existing situation in Bangladesh as regards the various indigenous innovative technologies and adaptation measures to minimize the negative effects of climate change. For this reasons we require baseline information, such as problem faced by the farmer in adapting climate change effect. This work will provide vital information on

**How to cite this article:** Islam MJ and Akanda MGR (2021). Problem faced by the farmers in adapting climate change effect on crop production in Barishal region. International Journal of Natural and Social Sciences, 8(3): 58-66. DOI: 10.5281/zenodo.6127361

what are the problems faced by the farmer in adapting climate change effect. The results of the study will give hope and confidence to farmers how they adapt their crops to climate change by avoiding problems of climate change effect. So, this study was under taken to identify farmer's problem in adapting climate change effect on crop production in Barishal region.

## Materials and Method

The study was conducted at Mirzaganj upazila under Patuakhali district in Barishal region of Bangladesh which covers a portion of interior coastal region of the country in 2014. Every year various climatic hazards like flood, hailstorms, and river bank erosion and salinity etc.' occur in the village and cause human sufferings and damages to agricultural resources. A map of the study area has been presented in Fig.1. All the farmers (except landless and absentee farmers) of Mirzaganj upazila constituted the population of the study.

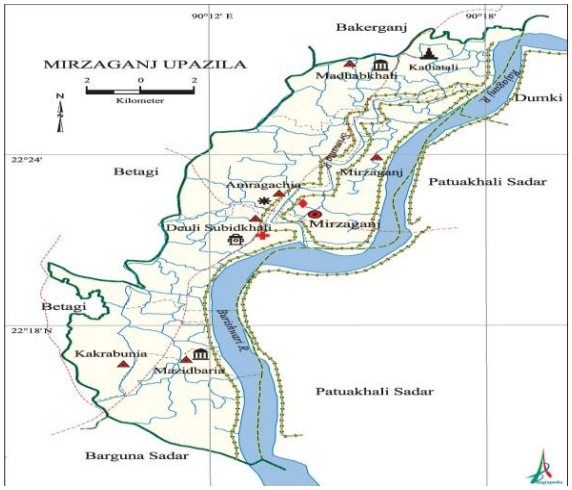


**Figure 1:** A Map of the study area

However, data were collected from a sample rather than the whole population. For this purpose, multistage random sampling technique (upazila-union-village- sampling population-sample) was used to have a suitable sample. Mirzaganj upazila consists of 6 unions, from which one union namely Mirzaganj union was selected randomly at first stage. Mirzaganj union consists of 11 villages, out of which 5 villages were selected randomly at this second stage. The villages were Kapalvera, Vajna Monoarkhali, Kalagacia, Vajna Kadamtola and Piprakhali. All the farm household heads (except landless and absentee farmers) of these 5 villages constituted sampling population. An updated list of above mentioned farm house hold heads from these 5 villages was prepared with the help of Sub-Assistant Agriculture Office, union parishad office, and local leaders of the locality. Thus, there were a total of 1191 such farmers which constituted the sampling population for this study. At the final stage, 10 percent of the farmers from each village were randomly selected as sample by using a Table of Random Numbers. Thus, the sample size stood at 119. A reserve list of 10 percent of the sample size was also prepared to replace any respondent who could not be made available during data collection despite all attempts. The distribution of sampling population and sample size according to the selected villages are presented in Table 1.

Table 1: Distribution of Population and Sample Farmers

| Union | Villages | Sampling Population | Sample | Reserve List |
|---|---|---|---|---|
| Mirzagonj | Kapalvera | 392 | 39 | 4 |
| | Vajna Monoarkhali | 173 | 17 | 1 |
| | Kalagacia | 179 | 18 | 2 |
| | Vajna Kadamtola (Mansurabad) | 229 | 23 | 2 |
| | Piprakhali | 218 | 22 | 2 |
| | Total | 1191 | 119 | 12 |

Ten characteristics of the farmer were selected as independent variables. These were: age, level of education, farming experience, annual income, farm size, extension media contact, cosmopoliteness, agricultural knowledge, agricultural training and risk orientation. Problem faced by farmers in adapting climate change effect on crop production was the dependent variable of this study.

Age and annual income of a respondent was measured according to Jalal (2009). Education of a respondent was measured by the years of

schooling completed as indicated by his response to item two of the interview schedule. A score of one (1) was assigned for his each year of schooling completed. If a respondent did not know how to read and write, his education score was taken as zero (0). If the respondent could not go to school but his level of educational standard may equal to any class than he got one for each class. 1 for class one, 2 for classes two and so on. The farming experienced of a respondent was measured in terms of actual years of experienced. A score of one (1) was assigned for his each year of experienced. The farm size of the respondents was computed in hectares. Question on this variable may be seen in item four in the interview schedule. It was measured by using following formula**:**

Farm size =A+B+(C+D)/2+E+F
Where,
A=Homestead area
B=Land under own cultivation
C=Land taken from and or given to other on borga
D=Land taken from and or given to other on borga
E= Land taken from and or given to other on lease
F= Land taken from and or given to other on mortgage

Training experience was measured on the basis of taking training on agriculture. A score of one (1) was assigned for his each day of training received. The total score obtained by a respondent was considered as the training experience score of the respondents. Extension media contact score was computed for each respondent on the basis of his extent of contact with twenty selected communication media as ascertained from his responses slightly modified the scale used by Akanda (2006). Cosmopoliteness score was computed for each respondent on the basis of his extent of visit with six selected places as ascertained from his responses. Cosmopoliteness score was determined by summing the scores of all the 6 cosmopolite's sources. Cosmopolite's sources score could range from 0 to 24, where zero (0) indicated no cosmopoliteness source contact and 24 indicated the highest cosmopoliteness. Agricultural knowledge was measured by using twenty (20) questions in a prescribed form. Score 2 was assigned for each of the questions. The total assigned score of all the questions was 40. If a respondent was able to provide a correct answer to a question, he could receive full score for that particular question. Accordingly, a respondent could receive zero (0) for wrong answer. The total score obtained by a respondent was considered as the knowledge score on agriculture of the respondents. Risk orientation of a respondent was measured by using ten (10) statements in prescribed form. Some are high risk taking statement and some are low risk taking statement. If the respondent were totally agreed with high risk taking statement he could receive five (5), four (4) for agree, three (3) for no opinion, two (2) for not agree, and (1) for totally disagree. If the respondent were totally agreed with low risk taking statement he could receive five (5), four (4) for no agree, three (3) for no opinion, two (2) for agree, and one (1) for totally agreed.

Problem in adapting climate change effect on crop production of a respondent was measured by using fifteen (15) statements. If the respondent faced high problem he could receive four (4), three (3) for medium, two (2) for low, and (1) for no problem. Problem in adapting climate change effect score was determined by summing the scores of all the 15 statement. It could range from 15 to 60; where fifteen (15) indicated no problem and 60 indicated the highest problem in adapting climate change effect on crop production. The solution analysis was done by adapting the methodology of Sagar (1983).

Valid and reliable information from the farmers were collected through using an interview schedule. Secondary information was collected from the agriculture office records and union porisad records. Primary data were collected from the farmers.

A usual descriptive statistical method for determining range, mean, percentage distribution and standard deviation etc. were followed in describing the dependent and independent variables. Pearson's Product Moment Co-efficient of Correlation (r) was used to test the null hypothesis concerning the relationships between two variables. Five percent (0.05) level of probability was used as the basis for rejecting the null hypothesis.

## RESULTS AND DISCUSSION

The characteristics profile of the farmers was studied (Table 2). The observed age score of the farmers ranged from 25 to 70 years with an average of 44 years and standard deviation of 9.70 (Table 2). Two-thirds (67.2 percent) of the farmers were middle-aged while 11.8 percent and 21.0 percent of them were young and old respectively. The middle aged farmers are involved in diversified agricultural activities and the old are skeptical in nature.

The observed education score of the farmers varied from 0-16 with an average of 4.64 and standard deviation of 4.30 (Table 2). Among them 36.1 percent were illiterate, and the rest of the farmers had education at varying extent via. 33.6 percent had primary, 27.8 percent had secondary and 2.5 percent had above secondary level of education. Over than three-fifths (63. 9 percent) of the farmers had various level of education i.e. primary to secondary and above secondary level of education. Education of the farmers in the study area seems improved. This might be due to the reasons of various interventions from GOs and NGOs for uplifting education. However, the illiterate farmers due to their lack of education might face more problems emerging from climate change effect on agriculture.

The observed farming experience score of the respondents varied from 5 to 55 years while their average farming experienced was 34.58 with a standard deviation of 11.22 (Table 2). Though the variation among the farmers regarding farming experience was high, a significant proportion (59.7 percent) of them had high farming experience, whereas 31.1 percent had medium farming experience. Most of the experience farmers would like to cultivate their land in traditional ways. As a result they faced many problems in adapting climate change effect on crop production. The observed farm size score of the respondents varied from 0.28 to 4.3 hectares while their average farm size was 1.41 hectares with a standard deviation of 0.69 (Table 2). A significant proportion (57.18 percent) of them had medium farm size, whereas 29.4 percent had small, 10.92 percent had large and 2.5 percent had marginal farm size. In rural Bangladesh, the family type is mostly nuclear. The farm land is being divided among the descendants by inheritance. Thus, farm size is being gradually decreased. The observed annual income score of the farmers varied from Taka 39 to 275.20 thousand (Bangladeshi currency) and their average income was Taka 78.71 thousand with a standard deviation of 210.30 (Table 2). About 10.9 percent of the respondents had low annual family income, while 70.6 percent and 18.5 percent of them had medium and high annual income respectively. Most of them had small to medium farm land, they cultivate others land as share cropping. The observed agricultural training receive score of the respondent farmers ranged from 0 to 45 years with an average of 6.39 and standard deviation of 7.15 (Table 2). Most (65.58 percent) of the farmers had short agricultural training whereas 19.3 percent had no training, 8.40 percent had medium and 6.72 percent had long training. The observed extension media contact score of the respondents ranged from 2 to 51 with an average of 30.34 and standard deviation of 6.998 (Table 2).

**Table 2:** Characteristics of the farmers

| Characteristics(measuring unit) | Range | | Farmers (N=119) | | | Mean | SD |
|---|---|---|---|---|---|---|---|
| | Possible | Observed | Categories | No. | Percent | | |
| Age (years) | Unknown | 25-70 | Young(<35) | 14 | 11.8 | 44 | 9.70 |
| | | | Middle age(35-50) | 80 | 67.2 | | |
| | | | Old(>50) | 25 | 21.0 | | |
| Education (year of schooling) | Unknown | 0-16 | Illiterate(0) | 43 | 36.1 | 4.64 | 4.30 |
| | | | Primary(1-5) | 40 | 33.6 | | |
| | | | Secondary(6-10) | 30 | 27.8 | | |
| | | | Higher(11-16) | 6 | 2.5 | | |
| Farming Experienced (year) | Unknown | 5-55 | Low(<20) | 11 | 9.2 | 34.58 | 11.219 |
| | | | Medium(20-30) | 37 | 31.1 | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | High(>30) | 71 | 59.7 | | |
| Farm size(ha) | Unknown | 0.28-4.30 | Marginal (<0.5)<br>Small(0.51-1.0)<br>Medium(1.01-2.50)<br>Large (>2.50) | 3<br>35<br>68<br>13 | 2.5<br>29.4<br>57.18<br>10.92 | 1.41 | 0.69 |
| Annual income (000"Tk) | Unknown | 39-275.20 | Low(<117)<br>Medium(117.01-195)<br>High(>195) | 13<br>84<br>22 | 10.9<br>70.6<br>18.5 | 78.71 | 210.30 |
| Training experience (Score) | Unknown | 0-45 | No training(0)<br>Short(1-10)<br>Medium(11-20)<br>High(>20) | 23<br>78<br>10<br>8 | 19.3<br>65.58<br>8.40<br>6.72 | 6.39 | 7.15 |
| Extension media contact(Score) | 0-80 | 2-51 | Low(<25)<br>Medium(25-38)<br>High(>38) | 19<br>86<br>11 | 16.0<br>72.2<br>11.8 | 30.34 | 6.998 |
| Cosmopoliteness (Score) | 0-24 | 0-21 | Low(<8)<br>Medium(8-14)<br>High(>14) | 29<br>78<br>12 | 24.37<br>65.55<br>10.08 | 9.64 | 3.577 |
| Agricultural knowledge(Score) | 0-40 | 18-34 | Poor(<24)<br>Moderate (24-29)<br>High(>29) | 23<br>81<br>15 | 19.3<br>68.08<br>12.62 | 25.61 | 2.949 |
| Risk orientation | 10-50 | 25-42 | Less(<30)<br>Medium(30-35)<br>High(>36) | 18<br>81<br>20 | 15.1<br>68.1<br>16.8 | 32.66 | 13.128 |

Among the farmers, 16.0 percent had low extension media contact, 72.2 percent had medium and 11.8 percent had high extension media contact. The observed cosmopoliteness score of the respondents ranged from 0 to 21 with an average of 9.64 and standard deviation of 3.577 (Table 2). Among them 24.37 percent had low cosmopoliteness, 65.55 percent had medium cosmopoliteness and 10.08 percent high cosmopoliteness. The observed agricultural knowledge score of the respondent farmers ranged from 18 to 34 with an average of 25.61 and standard deviation of 2.949 (Table 2). Most (68.08 percent) of the farmers had moderate agricultural knowledge, whereas 19.3 percent had poor and 12.62 percent had high agricultural knowledge. The observed risk orientation score of the respondent farmers varied from 25 to 42 years with an average of 32.66 and standard deviation of 3.128 (Table 2). Most (68.1 percent) of the farmers had medium risk orientation, whereas 15.1 percent had less risk orientation and 16.8 percent had high risk orientation.

Problem faced by the farmers in adapting climate change effect was measured by computing problem score, which could range from 15 to 60. However, the observed score ranged from 34 to 49 with an average of 42.20 and a standard deviation of 3.419. Based on their possible problems scores, the farmers were classified into three categories: "Low problem"(<40), "Medium problem" (40-45) and "High problem" (>45). The categories and distribution of the respondents were shown in the Table 3. Data indicate that the majority (58.8 percent) of the respondents had medium problem while 22.7 percent of them had low and 18.5 percent had high problem in adapting climate change effect on crop production. The range and standard deviation of the scores were small. This means that almost all of the respondents faced similar problems to similar extent. This was might be due to the similar socio-economic background of the respondents.

In order to have an understanding of the importance of the problems faced, Problem Facing Index (PFI) was calculated for each problem individually. Based on the PFI values the problems were ranked and presented in Table 4.

**Table 3:** Distribution of the farmers according to their problem faced in adapting climate change effect on crop production

| Range of problem quotient | | Farmers(N=119) | | | Mean | SD |
|---|---|---|---|---|---|---|
| Possible | Observed | Categories(score) | Number | Percent | | |
| 15-60 | 34-49 | Low(<40) | 27 | 22.7 | 42.20 | 3.419 |
| | | Medium(40-45) | 70 | 58.8 | | |
| | | High(>45) | 22 | 18.5 | | |
| | | Total | 119 | 100 | | |

**Table 4: Rank order to the problems faced by the farmers**

| **Problems** | **Total score** | **Rank order** |
|---|---|---|
| Lack of improved seeds | 367 | 1 |
| High cost of improved variety | 362 | 2 |
| Lack of supplying improved seeds in proper time | 359 | 3 |
| Lack of early variety | 354 | 4 |
| Lack of saline tolerant variety | 351 | 5 |
| High cost of fertilizers and other inputs | 343 | 6 |
| Poor extension services | 338 | 7 |
| Lack of financial resources | 336 | 8 |
| Lack of proper information | 331 | 9 |
| Lack of knowledge | 327 | 10 |
| Lack of laborer and high cost of labor | 323 | 11 |
| Lack of suitable water for irrigation and drainage system | 317 | 12 |
| High cost of irrigation facilities | 313 | 13 |
| Lack of access to weather forecast | 303 | 14 |
| Low effectiveness of agro chemicals | 298 | 15 |

Data furnished in the Table indicate that the problem which ranked in the first was ‘Lack of improved seeds followed by second ranked 'high cost of improved variety' and third ranked 'Lack of supplying improved seeds in proper time'. 'Low effectiveness of agro chemicals ' was the least important problem among those faced by the farmers in adoption of technologies for climate change adaptation. Our findings were supported by the others (Alam et. al. 2000 and Rahman, 2008).

**Relationships between the independent and dependent variables**

The results of correlation of co-efficient test between the dependent and independent variables have been shown in the Table 5.

The correlation coefficient (r = .066) between age and problem faced in adapting climate change effect by the farmers was not significant at 0.05 level (Table 5). These types of results were obtained by other workers (Salam, 2003; Rahman, 1995 and Islam, 1987).

So, the concerned null hypothesis could not be rejected' where age and problem in adapting climate change effect had not followed a positive trend, this means that increase age may not increase the rate of problem in adapting climate change effect.

**Table 5:** Relationships between independent and dependent variables

| Dependent variables | Independent variables | 'r' value with 117df |
|---|---|---|
| Problem faced by the farmers in adapting climate change effect on crop production | Age | .066$^{NS}$ |
| | Level of education | .081$^{NS}$ |
| | Farming experience | -.034$^{NS}$ |
| | Farm size | .248** |
| | Annual income | -.213* |
| | Training experience | .023$^{NS}$ |
| | Extension media contact | -.066$^{NS}$ |
| | Cosmopoliteness | -.250** |
| | Agricultural knowledge | -.373** |
| | Risk orientation | -.161$^{NS}$ |

** Correlation is significant at 1% level of probability

* Correlation is significant at 5% level of probability, NS- Non Significant

The correlation coefficient for education (r = .081) being not significant at 0.05 level and thus the concerned null hypothesis could not be rejected. So, it was concluded that level of education of the participant did not play vital role on their problem in adapting climate change effect. Education enables individuals to attain knowledge and thus increase their power of understanding. The main reason of this result might be that the educated respondents wanted to take various ways and that is why the respondent faced many problems. Our results are supported by Salam (2003), Rahman (1995), Mansur (1989), Islam (1987) and Ali (1978).

The correlation coefficient (r = -.034) between farming experience and problem in adapting climate change effect by the farmers was not significant at 0.05 level (Table 5). Hence, the null hypothesis could not be rejected. So, it was concluded that farming experience of the participant did not play vital role on their problem in adapting climate change effect.

The correlation coefficient (r =.248**) between farm size and problem in adapting climate change effect was significant at 0.01 level (Table 5). Hence, the null hypothesis was rejected. This means that the farmers having higher farm size were likely to have more problems in adapting climate change effect. Thus, it could be said that farm size of the farmers related to their problem in adapting climate change effect. The main reason of this result might be that the respondents having large and medium farm need more agricultural inputs but they did not get it and that is why the respondent faced many problems.

The correlation coefficient (r = -.213*) between annual income and problem in adapting climate change effect by the farmers was negatively significant at 0.05 level (Table 5). Hence, the null hypothesis was rejected. This means that the farmers having higher annual income were likely to have fewer problems in adapting climate change effect. Thus, it could be said that annual income of the farmers highly related to their problem in adapting climate change effect. This result was supported by Rahman (1995).

The correlation coefficient (r = .023) between training experience and problem in adapting climate change effect by the farmers was not significant at 0.05 level (Table 5). So, the concerned null hypothesis was not rejected. The finding seems logical because, with the increase of training experience the respondents wanted to take new technologies as a result the farmers faced various problem adapting climate change effect. Similar findings were obtained by Saha (1983) and Ali (1978) in their study.

The correlation coefficient (r = -.066) between extension media contact and problem in adapting climate change effect by the farmers was not significant at 0.05 level (Table 5). So, the concerned null hypothesis was not rejected. Media exposure enables an individual to gain knowledge

and broaden his outlooks. High media exposure means more farmers being enlightened and consequently having broader outlooks and progressive attitudes.

The correlation coefficient (r = -.250**) between cosmopoliteness and problem in adapting climate change effect by the farmers was negatively significant at 0.01 level (Table 5). Hence, the null hypothesis was rejected. This means that the farmers having lower cosmopoliteness were likely to have more problems in adapting climate change effect. Thus, it could be said that cosmopoliteness of the farmers highly related to their problem in adapting climate change effect. Because the more cosmopolite's visited various place and saw many adaptive measures in relation to problem. Similar findings were obtained by Kashem (1977) and Rashid (1975) in their study.

The correlation coefficient (r = - 0.373**) between agricultural knowledge and problem in adapting climate change effect by the farmers was significant at 0.01 level (Table 5). Hence, the null hypothesis was rejected. There is a reciprocal relationship between agricultural knowledge and problem in adapting climate change effect by the farmers. The people having more knowledge in relation to agriculture faced fewer problems. Therefore, with the increase of agricultural knowledge of the farmers, problem in adapting climate change effect will be greatly decreased. Similar findings were obtained by Sarker (1983), Rahman (1995) and Mansur (1989) in their study.
The correlation coefficient (r = - 1.61) between risk orientation and problem in adapting climate change effect by the farmers was not significant even at 0.05 level (Table 5). Hence, the null hypothesis was not rejected. So, it was concluded that risk orientation of the participant did not play vital role on their problem in adapting climate change effect.

Farmers opined that their problems might be reduced by taking some necessary steps like increasing necessary training facilities by the GOs and NGOs collaboration, establishing training and loan centers to increase their capacity in adoption of technologies which can be possible through creating special programs by the known GOs and NGOs. Necessities of the farmers can be met with easy and low interest credit availability for adoption of technologies through proper motivation and taking necessary steps by different GOs and NGOs.

## CONCLUSION

The results of the study would be helpful for adaptation measures to minimize the negative effects of climate change. It will be baseline information, such as problem faced by the farmer in adapting climate change effect.

## REFERENCES

Akanda MGR (2006). Technological Gap in Modern Rice Production at Farmers' Level. Ph.D Dissertation. Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh, Bangladesh.

Alam ATM, Choudhury MR and Chowdhury MZA (2000). Jute production at Farmers level: Practices and problems. Bangladesh Journal of Training and development, 13 (1&2): 229-236.

Ali MA (1978). Cattle Problems of the Farmers in Tarakanda Union of Phulpur Thana under Mymensingh District. M.Sc. (Ag. Ext. Ed.) Thesis. Department of Agricultural Extension and Teachers' Training, Bangladesh Agricultural University, Mymensingh.

BBS (2020). Statistical year Book of Bangladesh. Bangladesh Bureau of Statistics Diversion, Ministry of Planning, Government of the People's Republic of Bangladesh.

Islam MN (1987). Artificial insemination problem confrontation of the farmers in two selected union of Madhupur upazila under Tangail District. M.S. (Ag. Ext. Ed.) Thesis. Department of Agricultural Extension and Teachers' Training. Bangladesh Agricultural University, Mymensingh.

Jalal MS (2009). Farmers' Awareness of the use of Indigenous Technical Knowledge (ITK) for Sustainable Agricultural Development, M.Sc. (Ag. Ex. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Keshem MA (1977). A study on the Landless Laborers of Barakhata Union of Rangpur District. M.Sc. (Ag. Ex. Ed.) Thesis. Department of Agricultural Extension and Teachers' Training. Bangladesh Agricultural University, Mymensingh.

Mansur MAA (1989). Farmer's Problem Confrontation in Feeds and Feeding Cattle in Sonapur union of Kaipur upazila under Lakshmipur District. M.Sc.

Ag.(Ext. Ed.) Thesis. Department of Agricultural Extension Education. Bangladesh Agricultural University, Mymensingh.

Rahman MM (2008). Problem Confrontation of the Farmers in Vegetable Cultivation. M.Sc. (Ag. Ext. and R.D.) Thesis, Department of Agricultural Extension and Rural Development, Patuakhali Science and Technology University, Patuakhali.

Rahman MH (1995). Constrains Faced by the Farmers in Cotton Cultivation. M.S. (Ag. Ext. Ed.)Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Rashid MH (1975). "Agricultural Problems of the Farmers in 'Madhupur Union of Tangail District. M. Sc. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension and Teachers' Training, Bangladesh Agricultural University, Mymensingh.

Sagar RL (1983). Study of Agro-economic, Socio-psychological and Extension Communication Variables Related with the Farmers' Productivity of Major Field Crops in Haringhata Block. Unpublished Ph.D. Thesis. Department of Agricultural Extension, Bidhan Chandra Krishi Viswavidyalaya, West Bengal.

Salam MA (2003). Constraints Faced by the Farmers in Adopting Environmentally Friendly Farming Practices M.S. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension Education, Bangladesh Agricultural University, Mymensingh.

Sarker GC (1983). Relationships of Selected Characteristics of the Poultry Farmers in Tarundia Union of Mymensingh District with Their Poultry Problem Confrontation. M.S. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension and Teachers' Training, Bangladesh Agricultural University, Mymensingh.

Saha BK (1983). Farmers Problem Confrontation in Respect of Breeding of Poultry through Cockrel Exchange Program and other related aspects in Dewkhali Union of Phulbaria Thana under Mymensingh District. M.Sc. (Ag. Ext. Ed.) Thesis, Department of Agricultural Extension and Teachers' Training. Bangladesh Agricultural University, Mymensingh.