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# Adoption of Selected Modern Agricultural Practices by the Tribal Farmers in Hilly Regions of Mymensingh District

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**Abstract—***The main objectives of the study were to determine and describe the adoption of selected modern agricultural practices of the tribal farmers. In addition, their agricultural knowledge was also computed. Furthermore, attempt was also made to explore the relationships among the selected characteristics of the tribal farmers with their adoption of selected modern agricultural practices. Moreover, problems confronted by them in adoption of selected modern agricultural practices were also identified. The study was carried out at nine (9) selected villages of Gazirbhita union in Haluaghat upazila under Mymensingh district. A sample of 95 farmers (11%) was randomly selected from a total population of 860 farm families. Data were collected from the sampled farmers throughout July 2011using interview schedule. More than eighty percent farmers' had medium to high level of agricultural knowledge. In case of adoption, more than half percent (56.84 percent) of the respondents fell in medium category. Pearson's Product Moment Correlation Co-efficient (r) was used to ascertain the relationship between the concerned variables. Correlation analysis indicated that farm size, annual income, agricultural training experience, social participation, cosmopoliteness and media contact of farmers had significant positive relationship with the adoption of selected modern agricultural practices of the tribal farmers. "Transportation creates problems in water-melon marketing", "low price of watermelon in harvesting time", "inadequate knowledge about modern crop varieties", were the major problems of tribal farmers to adopt selected modern agricultural practices.*

**Keywords***: Adoption, Modern Agricultural Practices, Tribal farmer.*

## 1. INTRODUCTION

Bangladesh is a densely populated country of South East Asia that has a rich tribal presence. There are about 58 tribes living in different parts of the country. Bangladesh has 1.2 million tribal people, which constitute 1.13% of the total population (Mullah, et.al. 2007). Tribal population of our country usually lives in hilly areas. They are purely agricultural people and depend entirely on their crops for the means of subsistence. In hilly areas, suitable plots of land are cleared in December and January and the fallen jungle is allowed to remain dry until March, when it is fired. Rice, potato, jute, groundnut, vegetables, pulses, oilseeds and fruits are grown in the plain land. Most of the tribal families cultivate vegetables in their homestead areas. In the hilly areas land is poor and difficult to bring under improved crop cultivation. So tribal farmers usually followed traditional practices and failed to harvest desired yield.

There is an immense scope of agriculture in hilly regions and Bangladesh has made substantial progress towards developing different varieties of crops suitable for hilly regions. Those crops yield higher if recommended production technology is followed. Different GOs and NGOs especially, World Vision, PROSHIKA, CARITAS are trying to motivate tribal farmers in adopting those modern agricultural technologies. World Vision imparts training to them on winter and summer vegetables cultivation, poultry rearing and other field crops. CARITAS imparts training to sericulture while PROSHIKA is helping them imparting training on agroforestry which helped to enrich their agriculture. During the first stage there was a strong resistance from the tribal communities, as they feared with changes, but in the long run, they failed to keep the doors of the villages closed for the development programs of the NGOs and GOs. It is essential to drive the tribal farmers to uplift their livelihood by adopting modern agricultural technologies effectively. But unfortunately, there is a dearth of information about these people, their adoption practices and their agricultural status in Bangladesh. Lack of researches especially tribal studies on the trend of agricultural development, lack of sources for conducting agricultural activities and similar other reasons might have been responsible for inadequate of studies.

Under these circumstances stated above, the present study was conducted with the following objectives: 1. To ascertain agricultural knowledge of the tribal farmers. 2. To determine and describe the extent of adoption of selected modern agricultural practices by the tribal farmers 3. To identify the problem faced by the tribal farmer related to adoption of modern agricultural practices.

## 2. METHODOLOGY

**Study area, population and sampling:**

Nine villages namely Surjyapur, Bhutiapara, Lamukta, Uttar Nalkura, Gazirbhita, Sumaniapara, Katabari, Dumnikura and Char-Bangalia of Gazirbhita union in Haluaghat upazila under Mymensingh district were selected as the locale of the study. Gazirbhita union is a hilly area with 28 villages. Data for this study were collected from a sample rather than the entire population. Two steps sampling method was used in this study. Firstly, 9 villages were randomly selected from the 28 villages of the union. While selecting villages from the union care was taken to include such number of the village as would include about one-third of the total numbers of tribal farmers of the union. Nine villages include 860 farm families which was the population. In the second step eleven (11%) percent of the population of each of the nine villages were selected by using a table of random numbers. Thus, 95 farmers were finally selected in this way constituted the sample for this study. Male and female farmers were selected as a respondent, because in tribal community male and female both were involved in agricultural activities. The researcher also prepared a reserve list of 17 tribal farmers so that the tribal farmers of this list could be used if any respondent were not available during the interview. Distribution of tribal farmers constituting population, sample and reserve list may be seen in Table 1.

**Table 1: Distribution of tribal farmers constituting the population, sample and reserve list in the selected village of Gazirbhita union**

| Name of the villages | Numbers of tribal farmers | | Reserve list |
|---|---|---|---|
| | Population | Sample | |
| 1. Surjyapur | 124 | 14 | 2 |
| 2. Bhutiapara | 56 | 6 | 1 |
| 3. Lamukta | 28 | 3 | 1 |
| 4. Uttar Nalkura | 99 | 11 | 2 |
| 5. Gazir Bhita | 87 | 10 | 1 |
| 6. Sumania para | 233 | 25 | 4 |
| 7. Kata bari | 24 | 3 | 1 |
| 8. Dumnikura | 111 | 12 | 2 |
| 9. Char Bangalia | 98 | 11 | 2 |
| Total | 860 | 95 | 17 |

**Variables of the study and their measurement:**

Specific nine (9) characteristics of the tribal farmers were considered as the independent variables of the study. The characteristics were age, educational qualification, family size, farm size, annual income, agricultural training experience, social participation, cosmopoliteness and media contact.

**Agricultural knowledge:**

Agricultural knowledge score of a respondent was computed on the basis of his responses to 25 questions. The questions covered different aspects of agriculture namely field crops, vegetables crops, fruit crops, livestock and fisheries and 2-point was assigned for correct responses to each questions. Thus agricultural knowledge of the respondents could range from 0 to 50 where zero (0) indicated no agricultural knowledge and 50 indicated very high agricultural knowledge.

Adoption of selected modern agricultural practices of the tribal farmers was the dependent variable of this study. A total of 15 practices were identified to measure the extent of adoption of each respondent. Adoption score was measured by multiplying time score and practices use score in respective practices. Final adoption score was measured by adding all the practices score.

**Time score:**

Time score referred to a score computed on the basis of the period of years during the selected modern agricultural practices was cultivated. In order to calculate time score, scoring was made as follows:

1 score for a practice which was adopted within one to three years.

2 score for more than three years to six years.

3 score for more than six years.

**Practices use score:**

Practice use score referred to score computed on the basis of use. Scoring was made as follows:

0 = not at all

1 = Irregular

2 = Regular

Problems in adoption of selected modern agricultural practices was measured in one way such as using 15 selected closed from of questions which were identified during pre-testing of the questionnaire along with their extent of confrontation in use of agricultural technologies. A four point scale was used for computing the problem confrontation score of a respondent. The weights were assigned 0 for 'not at all', 1 for 'low', 2 for 'high' and 3 for 'very high'. The weights of responses of all the problems they faced were added together to obtain the problem confrontation score. Thus, the problem confrontation score of the respondents could range from 0 to 45, zero indicating no problem and 45 indicating very high problem.

**Data Collection and analysis:**

An interview schedule was prepared in order to collect related, valid and reliable information from the selected respondents. The interview schedule was carefully designed and prepared with open and closed forms of questions in Bengali keeping the objectives of the study in mind. In order to give the final shape, the interview schedule was pre-tested with 10 farmers. Based on the pretest results necessary correction, modification, alternation and adjustment were made and then finalized the interview schedule. Data were collected throughout July 2011. The collected data were coded in numerical numbers, compiled, tabulated and analyzed keeping the objectives of study in mind. In order to categorize and explain the data, some statistical measures were used such as range, mean, percentage and standard deviation. To explore the relationship between the selected personal characteristics of the tribal farmers with their adoption of selected modern agricultural practices, Pearson's Product Moment correlation coefficients were used. To accept or reject any null hypothesis five percent (0.05) level of probability was used throughout the study as the basis for statistical significant.

## 3. RESULTS AND DISCUSSION

**Agricultural knowledge:**

Agricultural knowledge score of the respondents ranged from 5 to 38. The average and standard deviation were 21.86 and 7.76 respectively. Based on these scores, the respondents were classified into three categories. Data contained in Table 2 showed that the highest proportion (70.5 percent) of the respondents had medium agricultural knowledge compared to 18.9 percent low and 10.6 percent high agricultural knowledge. Medium agricultural knowledge level is suitable for adopting modern agricultural practices. Ali (1993) also found similar findings in their studies.

**Table 2: Distribution of farmers based on their agricultural knowledge**

| Range | | Categories | Farmers (N=108) | | Mean | Standard Deviation (SD) |
|---|---|---|---|---|---|---|
| Possible Score | Observed Score | | No. | % | | |
| 0-50 | 5-38 | Low (up to 15) | 18 | 18.9 | 21.86 | 7.76 |
| | | Medium (16-30) | 67 | 70.5 | | |
| | | High (>30) | 10 | 10.6 | | |

**Tribal Farmers' adoption of modern agricultural practices:**

The adoption of modern agricultural practices by the tribal farmers ranged from 6 to 61 against the possible range of 0 to 90. The average adoption score was 37.73 with a standard deviation of 10.58. On the basis of observed range the adoption score of the respondents were classified into three categories.

**Table 3: Distribution of tribal farmers according to their adoption of selected modern agricultural practices**

| Range | | Categories | Farmers (N=108) | | Mean | Standard Deviation (SD) |
|---|---|---|---|---|---|---|
| Possible Score | Observed Score | | No. | % | | |
| 0-90 | 6-61 | Low (up to 20) | 35 | 36.84 | 37.73 | 10.58 |
| | | Medium (21-40) | 54 | 56.84 | | |
| | | High (>40) | 6 | 6.32 | | |

Data in Table 3 revealed that about 56.84 percent of the respondents had medium adoption of modern agricultural practices compared to 36.84 percent having low and only 6.32 percent having high adoption. Rahman (2001) and Aurangozeb (2002) also observed the similar findings.

**Relationship between the characteristics of the tribal farmers and their adoption of modern agricultural practices:**

Pearson's product moment correlation co-efficient (r) was computed in order to explore the relationship between the selected characteristics of the farmers and their adoption of selected modern agricultural practices. A summary of the correlation analysis is presented in Table 4.

**Table 4: Observed correlation coefficient 'r' between independent and dependent variables of the study**

| Independent variables | Observed correlation co-efficient 'r' value | Table value of 'r' with 93 degrees of freedom | |
|---|---|---|---|
| | | at 5% | at 1% |
| 1. Age | 0.145 | 0.202 | 0.263 |
| 2. Academic qualification | 0.178 | | |
| 3. Family size | 0.154 | | |
| 4. Farm size | 0.358** | | |
| 5. Annual income | 0.211* | | |
| 6. Agricultural training experience | 0.436** | | |
| | 0.536** | | |
| 7. Social participation | 0.496** | | |
| 8. Cosmopoliteness | 0.242* | | |
| 9. Media contact | | | |

N = 95, Degree of freedom = 93

* = Significant at 0.05 level of probability

** = Significant at 0.01 level of probability

The findings indicate that farm size, annual income, agricultural training experience, social participation, cosmopoliteness and media contact had significant positive relationship with their adoption of selected modern agricultural practices. Hussen (2001) and Rahman (2001) also

found similar result in adoption of modern sugarcane cultivation practices and Aalok 6201 hybrid rice.

## 4. PROBLEMS FACED BY THE TRIBAL FARMERS IN ADOPTION OF SELECTED MODERN AGRICULTURAL PRACTICES:

Problems confronted by the farmers in adoption of selected modern agricultural practices are ranked in the table 5. Data presented in Table 5 indicate that "transportation creates problems in water-melon marketing" was the most severe problem faced by the tribal farmers. The next five problems based on the descending order of severity were: i) low price of watermelon in harvesting time ii) inadequate knowledge about modern crop varieties iii) lack of storage facilities for potato storing and iv) non availability of necessary advice in time from the field level Extension worker and v) lack of proper knowledge about the modern production technology.

**Table 5: Problem faced by the tribal farmers related to the adoption of selected modern agricultural practices**

| SI No. | Problems | Rank order |
|---|---|---|
| 1. | Transportation creates problems in water-melon marketing. | 1 |
| 2. | Low price of watermelon in harvesting time. | 2 |
| 3. | Inadequate knowledge about modern crop varieties. | 3 |
| 4. | Lack of storage facilities for potato storing. | 4 |
| 5. | Non availability of necessary advice in time from the field level Extension | 5 |
| 6. | Lack of proper knowledge about the modern production technology | 6 |
| 7. | Lack of appropriate agricultural training | 7 |
| 8. | High price of improved seeds | 8 |
| 9. | High amount of fertilizers requires in HYV crops | 9 |
| 10. | High price of fertilizer in peak period | 10 |
| 11. | Non-availability of improved seed in the locality. | 11 |
| 12. | Non-availability of printed materials about the cultivation of crops | 12 |
| 13. | Non-suitability of transportation system. | 13 |
| 14. | Lack of irrigation water in dry season. | 14 |
| 15. | Lack of co-operative attitude among the farmers due to village factions | 15 |

The Table also shows that the least severe problems were: i) lack of co-operative attitude among the farmers due to village factions ii) lack of irrigation water in dry season iii) non-suitability of transportation system and iv) non availability of printed materials about the cultivation of crops.

## 5. CONCLUSION:

Adoption level of the tribal farmers was satisfactory as more than fifty percent of them moderately adopted selected modern agricultural practices. Among them majority of the tribal farmers' had medium to high level of agricultural knowledge. Farmers' characteristics like farm size, annual income, agricultural training experience, social participation, cosmopoliteness and media contact had significant positive relationship with their adoption of selected modern agricultural practices. They mostly faced infrastructural, economical and technical problems.

Tribal farmers' should be regularly trained with modern agricultural technologies and media contact specially extension media contact should be enhanced. To increase the adoption of modern agricultural practices of the tribal farmers at the desired level their specific problems should be noticed otherwise problem may influence them to form unfavorable attitude. Furthermore, government organizations like Department of Agriculture Extension (DAE) and non-government organizations should arrange more need based programs to disseminate modern agricultural practices among the tribal farmers to utilize the immense potentiality of agriculture in hilly region.

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