

**ADOPTION OF IMPROVED FARM PRACTICES IN RICE
CULTIVATION BY THE FARMERS**

BY

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Reg. No. 06-01926

A thesis

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Sher-e-Bangla Agricultural University, Dhaka-1207,
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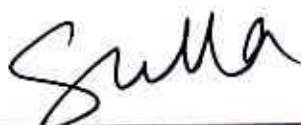
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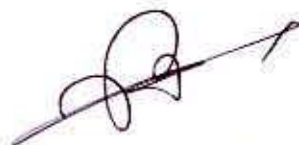
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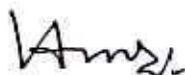
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CERTIFICATE

This is to certify that the thesis entitled “**ADOPTION OF IMPROVED FARM PRACTICES IN RICE CULTIVATION BY THE FARMERS**” submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka-1207, in partial fulfillment of the requirements for the degree of **Master of Science in Agricultural Extension and Information System**, embodies the result of a piece of bona fide research work carried out by **Md. Shium Mahamud Mandal Sumon**, Registration No. **06-01926** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

I further certify that any help or source of information, received during the course of this investigation has been duly acknowledged.

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TABLE OF CONTENTS

CHAPTER	Page
ACKNOWLEDGEMENTS	i
TABLE OF CONTENTS	ii
LIST OF TABLES	v
LIST OF FIGURES	v
LIST OF APPENDICES	v
LIST OF ABBREVIATIONS	vi
ABSTRACT	vii
1. INTRODUCTION	01
1.1 General Background	01
1.2 Statement of the Problem	03
1.3 Justification and Scope of the Study	04
1.4 Specific Objectives of the Study	04
1.5 Assumption of the Study	05
1.6 Limitation of the Study	06
1.7 Definition of Terms	07
2. REVIEW OF LITERATURE	10
2.1 Concept of Diffusion, Adoption and Innovation-Decision process	10
2.2 Review of Literature on General Context of Adoption	15
2.3 Relationship between selected characteristics of the rice farmers with their adoption of improved farm practices	20
2.4 Conceptual Framework of the study	28
3. METHODOLOGY	30
3.1 Locale of the Study	30
3.2 Population and Sampling Design	30
3.3 The Research Design	33



CHAPTER	Page
3.4 Selection of Dependent and Independent Variables	33
3.5 Measurement of Variables	34
3.5.1 Measurement of Independent Variables	34
3.5.2 Measurement of Dependent Variable	38
3.6 Hypothesis of the Study	39
3.7 Data Collection	40
3.8 Data Coding and Tabulation	41
3.9 Categorization of Data	41
3.10 Data Processing and Statistical Analysis	41
4. RESULTS AND DISCUSSION	43
4.1 Characteristics of the Rice Farmers	43
4.1.1 Age	45
4.1.2 Education	45
4.1.3 Family size	46
4.1.4 Farm size	46
4.1.5 Annual income	47
4.1.6 Training exposure	47
4.1.7 Organizational participation	48
4.1.8 Extension media contact	49
4.1.9 Cosmopolitaness	49
4.2 Adoption of Improved Farm Practices	50
4.3 Relationship between Adoption of Improved Farm Practices and Selected Characteristics of the Rice Farmers	51

CHAPTER	Page
5. SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS	59
5.1 Summary of Findings	59
5.1.1 Characteristics of the farmers	59
5.1.2 Adoption of improved farm practices	61
5.1.3 Relationship between adoption of improved farm practices and the selected characteristics of the farmers	61
5.2 Conclusions	61
5.3 Recommendations for Policy Implications	62
5.3.1 Recommendation for further study	64
BIBLIOGRAPHY	65
APPENDICES	75

LIST OF TABLES

	Title	Page
Table 3.1	Distribution of the population, sample and number of farmers in the reserve list	33
Table 4.1	Salient features of the respondents with their characteristics	44
Table 4.2	Distribution of the farmers according to their adoption of improved farm practices	50
Table 4.3	Pearson's product moment co-efficient of correlation showing relationship between adoption of improved farm practices and the selected characteristics of the farmers	51

LIST OF FIGURES

	Title	Page
Figure 1.1	Bangladesh rice production area and quantity (1961-2011)	01
Figure 1.1	Bangladesh average rice yield (1961-2011)	02
Figure 2.1	Rogers' innovation-decision process model	13
Figure 2.2	Adopter categories on the basis of innovativeness (Rogers, 1995)	15
Figure 2.3	Conceptual framework of the study	29
Figure 3.1	Map of Gaibandha District showing the Palashbari Upazila	31
Figure 3.2	Map of Palashbari Upazila showing the study area Mohadipur Union	32

LIST OF APPENDICES

	Title	Page
Appendix-A	English version of the interview schedule	75
Appendix-B	Correlation Matrix	79

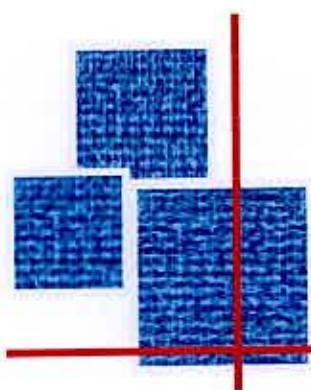
LIST OF ABBREVIATIONS OF SYMBOLS AND TERMS

Abbreviation	Full Word
BBS	Bangladesh Bureau of Statistics
CV	Co-efficient of Variation
d.f.	Degrees of Freedom
DAE	Department of Agricultural Extension
<i>et al.</i>	And others (at elli)
etc.	Etcetera
e.g.	Example
ha	Hectare
i.e.	That is
Km	Kilometer
NGO	Non-Government Organization
Tk.	Taka
r	Pearson's Product Moment Correlation Co-efficient
viz.	Namely
%	Percent

ABSTRACT

The main focus of the present study was to determine the adoption of improved farm practices by the farmers in rice cultivation and to explore the relationships between the adoption of improved farm practices and the nine selected characteristics of the farmers. The study was conducted at Durgapur, Garanata and Bishramgaci villages of Mohadipur Union of Palashbari Upazila under Gaibandha District. The researcher himself collected data through personal contact with a well structured pretested interview schedule. An update list of 1453 rice farmers was prepared with the help of Sub-Assistant Agricultural Officers of the study area. Out of these 1453 rice farmers' 116 farmers were proportionate randomly selected as the sample of the study and data were collected from them. The highest proportion (62.93 percent) of the respondents had medium adoption of improved farm practices, while 20.69 percent had low adoption and the rest 16.38 percent had high adoption of improved farm practices in their rice cultivation. Pearson's Product Moment Correlation co-efficient (r) was also computed to explore the relationships between the dependent and independent variables. The correlation analysis found that, education, training exposure, organizational participation, extension media contact and cosmopolitaness had significant positive relationship with the adoption of improved farm practices. Family size, farm size and annual income had no significant positive relationship with the adoption of improved farm practices. On the other hand, age had no significant negative relationship with the adoption of improved farm practices.





Chapter 1

Introduction

CHAPTER 1

INTRODUCTION

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1.1 General Background

Bangladesh is an agricultural country with a total area of 147570 km². The total population of the country is about 149.77 millions of which about 67% are dependent on agriculture (BBS, 2011). Rice is the staple food of Bangladesh. Bangladesh is not only a rice growing country but also a country of rice eating people (Annon. 1998). About 90 percent of the population in the country depends on rice as their major food (IRRI, 1981). Rice grows in Bangladesh under irrigated, rainfed and deep water conditions in different rice seasons, namely Aus, Transplanted Aman, Broadcast or deep water Aman and Boro. Rice alone constitutes 95 percent of the food grains production in Bangladesh (Julfiquar *et al.*, 1998). The following figures derived from IRRI's website show the Bangladesh rice production area and quantity and the Bangladesh average rice yield.

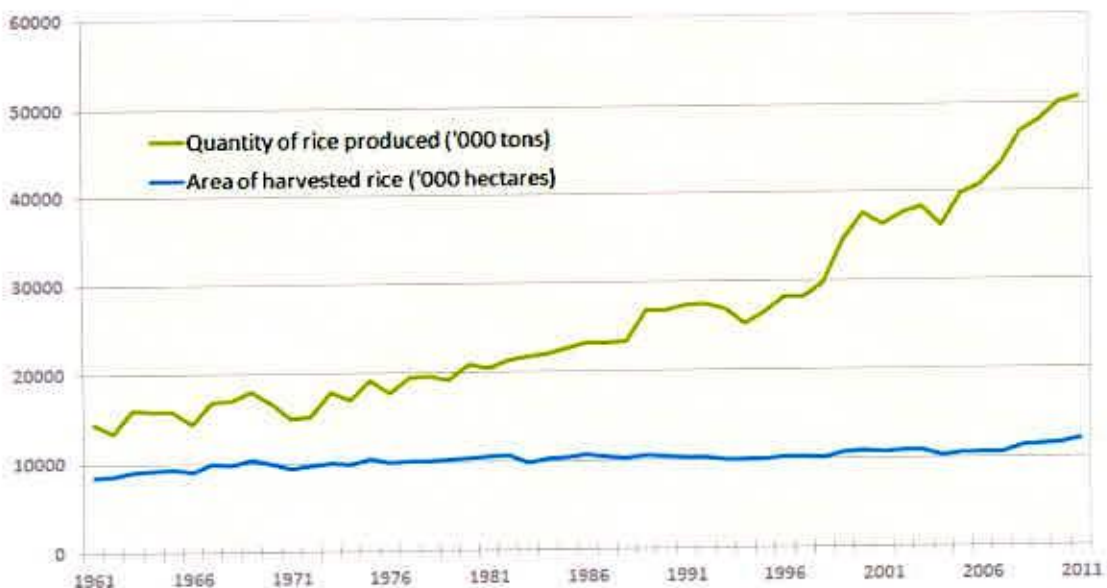


Figure 1.1 Bangladesh rice production area and quantity (1961-2011)

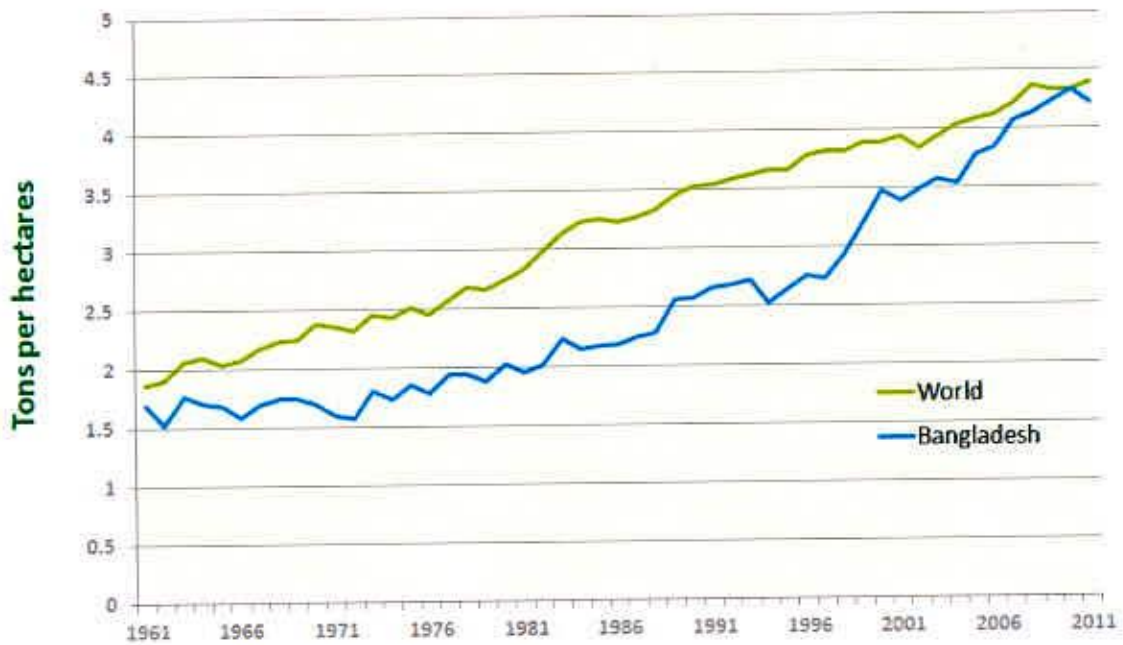


Figure 1.2 Bangladesh average rice yield (1961-2011)

Food security has been and will remain a major concern for Bangladesh as because of her large population. The rice production system in Bangladesh has undergone immense change during the past four decades. The Green Revolution in rice ushered in a period of substantial growth, which resulted in the rice production reached to nearer the national demand for the last few years. But the sustainable secured rice production will be a monumental task because the average land-use intensity in Bangladesh has already reached about 180%, perhaps the highest in the world. Furthermore, agricultural land is increasingly being diverted to other uses such as housing, roads, and industrial development. To be sustainable, future production must be achieved with less land, less labor, and less water, with no harm done to the natural environment. Against this backdrop, the challenge is indeed enormous and only the application of the most appropriate strategies will lead to success.

While more and newer technologies are always in demand, the slow diffusion of existing technologies has been a limitation to accelerated agricultural production growth in

Bangladesh. Although improved seed-based technologies are known to be more readily accepted by the farmers than knowledge-intensive technologies (e.g., integrated pest management), long time lags exist between the release of MV and seed availability for farmers'. Clearly, success in accelerating rice production growth will not be achieved on time without the fast adoption of new technologies by the rice growers.

1.2 Statement of the Problem

The success of any technology depends on its dissemination among the potential users which ultimately is measured by the level of adoption of that technology. It is obvious that notable improvements will take place in Bangladesh agriculture, if the available technologies are accepted and adopted by the farmers. Among various technologies, use of improved seeds, use of balanced fertilizer, use of IPM (Integrated Pest Management) practices and use of irrigation are quite suitable for our sustainable agriculture.

After introduction of an innovation, the farmers readily accept, partly accept, completely or partly reject or sometimes it also happens that the adoption is discontinued. These happen for several factors related to farmers demographic and socio economic position. Very little is known about the adoption of improved farm practices in rice cultivation by the farmers in the country. For wider adoption of improved rice cultivation technologies, it is necessary to have a clear understanding of the present status of adoption of improved farm practices in rice cultivation by the farmers. This made the researcher interested to undertake a research study entitled "**Adoption of Improved Farm Practices in Rice Cultivation by the Farmer**". In light of above discussions and the background information, the present study has been undertaken with the following research questions:

1. What are the characteristics of rice farmers that are related to their adoption of improved farm practices in rice cultivation?
2. At what extent the farmers adopted improved farm practices in rice cultivation?

3. Are there any relationships between the adoption of improved farm practices in rice cultivation by the farmers and their selected characteristics?

1.3 Justification and Scope of the Study

It is obviously true that farmers are the key elements of adoption of improved farm practices in rice cultivation. At present, there is a lack of adequate understanding as to how the characteristics of the farmers influence their adoption of improved farm practices in rice cultivation. These facts indicate the need for an investigation to ascertain the relationships of the characteristics of the farmers with their adoption of improved farm practices in rice cultivation by the farmers. Findings of this study, therefore, will be helpful to the planners and extension workers in planning and execution of programmes for enhancing the yield as production of rice. The findings of the study will manifest the extent of adoption of improved farm practices in rice cultivation by the farmers and will be able to give a hypothetical thought all over the nation. It is expected that this study will inspire other researchers to conduct same sorts of research in other parts of the country. Lastly, it is assumed that recommendation of this study will be helpful in formulating effective extension programs that will increase the rate of adoption of improved farm practices in rice cultivation.

1.4 Specific Objectives of the Study

Considering the research questions and justification of the study the following specific objectives were formulated for giving proper direction to the study:

- 1) To determine and describe the following selected characteristics of rice farmers:
 - ❖ Age
 - ❖ Education
 - ❖ Family size
 - ❖ Farm size

- ❖ Annual income
 - ❖ Training exposure
 - ❖ Organizational participation
 - ❖ Extension contact
 - ❖ Cosmopolitanness
- 2) To determine the extent of adoption of improved farm practices in rice cultivation by the farmers
 - 3) To explore the relationships between the adoption of improved farm practices in rice cultivation by the farmers and their selected characteristics.

1.5 Assumptions of the Study

An assumption is the supposition that an apparent fact or principle is true in the light of available evidence (Goode and Hatt, 1952). The researcher had the following assumptions in his mind while undertaking this study:

1. The respondents included in the sample were competent to furnish proper responses to the items included in the interview schedule.
2. The researcher who also acted as the interviewer was well adjusted to the social environment of the study area. The researcher collected data with utmost care and can be treated as reliable.
3. The responses furnished by the respondents were reliable and they truly expressed their opinion on adoption of improved farm practices in rice cultivation and their selected characteristics.
4. The sample size was representative of the whole population of the study area.
5. The findings of the study will have general application to other parts of the country with similar socio-economic and cultural characteristics of the farmers of the study area.

6. The findings of the study would be useful for planning and execution of the programs in connection with diffusion of improved farm practices in rice cultivation.
7. The measures of the adoption of improved farm practices in rice cultivation by the farmers are normally and independently distributed with their respective means and standard deviation.
8. The adoption of improved farm practices in rice cultivation by the farmers was linearly related with their selected characteristics.

1.6 Limitations of the Study

Considering the time, money and other necessary resources available to make the study manageable and meaningful, it was necessary to consider the following limitations:

1. The study was confined to three villages namely; Durgapur, Garanata and Bishramgaci of Mohadipur Union of Palashbari Upazila under Gaibandha district.
2. There were many farmers in the study area, but only the farmers who were involved in rice cultivation were considered for this study.
3. Characteristics of the farmers were many and varied but only nine characteristics were selected for investigation in this study.
5. During data collection the researcher had to depend on data furnished by the respondents. As none of the farmers kept records of their farming activities, they furnished information to the different questions by recall.
6. Conceptually, extents of adoption of the farmers were determined from their statements.
7. Adoption of the farmer could be measured in various ways. However in this study these were measured by using some specific point rating scale.

8. The present study highlights a new dimension of research in the field of agricultural extension in Bangladesh and so the researcher could not provide sufficient evidence in equipping his study report with relevant literature reviews.

1.7 Definition of Key Terms

Certain terms have been used in this research which are defined and interpreted as follows for clarity of understanding:

Adoption: According to Rogers (1995), “Adoption is a decision to make full use of an innovation as the best course of action available”. When an individual takes up a new idea as the best course of action and practices it, the phenomenon is known as adoption (Ray, 1991). In this study adoption means, a decision to use improved farm practices in rice cultivation by the rice farmers.

Improved farm practices: improved farm practices in respect of cultivation of any crop refer of those practices, which are advocated by some competent authority. The technologies, if used, are helpful for improving the yield and/or quality of the crop. Examples; improved seeds, balanced fertilizer, IPM (integrated pest management) practices, irrigation management etc.

Farmers/cultivators: The persons who were involved in farming activities are called farmers. They participated in different farm and community level activities like crops, livestock, fisheries, other farming activities etc.

Age: It refers to the period of time from the date of birth to the date of interview counted by the rice farmers. Age is an important innovation-decision correlate. Many adoption researchers found significant relationship between age and adoption of innovation.

Education: Empirically it was defined to the development of desirable changes in knowledge, skill and attitudes in an individual through reading, writing, working, observation and other selected activities. It was measured on the basis of classes passed from a formal educational institution by the rice farmers.

Family size: Family size of a rice farmer was defined as the number of individuals in his family including himself, his wife, children and other dependent members. Generally family size of a farm family is compared with average family size of the nation. The average family size of Bangladesh consists of 4.4 members (BBS, 2011).

Annual Income: This refers to the yearly income of a rice farmer from cultivation and trading of rice. In this study only last year income from rice was taken into consideration.

Annual income: Annual income referred to the total annual earnings of all the family members of a respondent from agriculture, livestock, fisheries and other accessible sources (business, service, daily working etc.) during a year.

Farm size: The term related to the hectarage of land owned by a farmer on which he carried his farming and family business, the area being estimated in terms of full benefit to the farmer. A farmer was considered to have full benefit from cultivated area either owned by himself or obtained or, lease from others and half benefit from the area which *was* either cultivated on borga or given to others for cultivation on borga basis.

Training exposure: It referred to the total number of days that a respondent received training in his entire life from different organizations under different training programs.

Organizational Participation: Organizational participation of the respondent is referred to his participation in different organizations in his life.

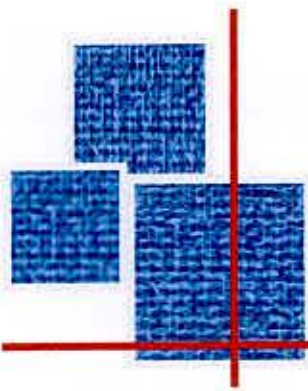
Extension Contact: Extension contact referred to the channel through which various information are diffused among the farmers who become informed about different aspects of agricultural activities.

Cosmopolitaness: Cosmopolitaness of a respondent is measured by computing a cosmopolitaness score. The cosmopolitaness score is assigned on the basis of different places and frequency of his visit external to and outside his own social system.

Integrated Pest Management (IPM): IPM (Integrated Pest Management) is the selection, integration and implementation of pest control based on predicted economic, ecological, biological and sociological consequences.

Improved Seed: Seeds, which fulfil the field and seed standard i.e. standard of certain components of seed quality is the quality seed. For more improved seed means only those seeds whose individual quality components are high standards. Among the various characteristics user for evaluation of seed quality varietal purity, germination capacity, physical purity, moisture content, size, shape, colour, health status, luster etc. core especially important.

Balanced fertilizer: Fertilizer refers to chemical products which are applied to the soil for supplying plant nutrients. Balanced fertilizer refers to that dose of fertilizer which includes all types of nutrient element in adequate amount needed by a particular crop.



Chapter 2

Review of Literature

CHAPTER 2

REVIEW OF LITERATURE

The present study was conducted to assess the adoption of improved farm practices in rice cultivation by the farmers. The purpose of this chapter is to review the past studies and findings related to the present study. The reviews were conveniently presented based on the major objectives of the study. The researcher, therefore, made exhaustive effort to review the previous research works directly or indirectly related to the present study conducted by different researchers of home and abroad. This chapter comprises of four sections. The first section dealt with concept of diffusion, adoption and innovation-decision process. The second section reviewed the literature of findings of researches on adoption. Third section dealt with relationship between selected characteristics of the farmers with their adoption of innovation. And the final section dealt with the conceptual framework of the study.

2.1 Concept of Diffusion, Adoption and Innovation-Decision process

The concept of diffusion was first studied by the French sociologist Gabriel Tarde (1890) and by German and Austrian anthropologists such as Friedrich Ratzel and Leo Frobenius. Its basic epidemiological or internal-influence form was formulated by H. Earl Pemberton, who provided examples of institutional diffusion such as postage stamps and standardized school ethic codes.

In 1962 Everett Rogers, a professor of rural sociology published his work: "Diffusion of Innovations". In this seminal piece, Rogers synthesized research from over 508 diffusion studies and produced a theory applied to the adoption of innovations among individuals and organizations.

Roger's work asserts that 4 main elements influence the spread of a new idea: the innovation, communication channels, time, and a social system. These elements work in conjunction with one another: diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. Rogers adds that central to this theory is process.

Difference between Diffusion and Adoption

Adoption is an individual process detailing the series of stages one undergoes from first hearing about a product to finally adopting it. The diffusion process, however, signifies a group of phenomena, which suggests how an innovation spreads among consumers. Overall, the diffusion process essentially encompasses the adoption process of several individuals over time.

Adoption process

Rogers and Shoemaker (1971) stated the adoption process as – the traditional view of the innovation decision process, called “adoption process” was postulated by a committee of rural sociologists in 1955 as consisting of five stages:

- I. **Awareness stage:** The individual learns of the existence of the new idea but lacks details information about it.
- II. **Interest stage:** The individual develops interest in the innovation and seeks additional information about it.
- III. **Evaluation stage:** The individual makes mental application of the new idea to his present and anticipated future situation and decides whether or not try it.
- IV. **Trail stage:** The individual actually applies the new idea on a small scale in order to determine its utility in its own situation.
- V. **Adoption stage:** Te individual uses the new idea continuously on a full scale.

Innovation-Decision process

Diffusion of an innovation occurs through a five-step process. This process is a type of decision-making. In later edition of the "Diffusion of Innovations" Rogers (1995) changed the terminology of the five stages to: knowledge, persuasion, decision, implementation and confirmation. The descriptions of five stages of the adoption process are as follows:

i. Knowledge Stage

In this stage the individual is first exposed to an innovation but lack of information about the innovation. During this stage of the process the individual has not been inspired to find more information about the innovation.

ii. Persuasion Stage

In this stage the individual is interested in the innovation and actively seeks information/detail about the innovation.

iii. Decision Stage

In this stage the individual takes the concept of the change and weighs the advantages/disadvantages of using the innovation and decides whether to adopt or reject the innovation. Due to the individualistic nature of this stage Rogers notes that it is the most difficult stage to acquire empirical.

iv. Implementation Stage

In this stage the individual employs the innovation to a varying degree depending on the situation. During this stage the individual determines the usefulness of the innovation and may search for further information about it.

v. Confirmation Stage

In this stage the individual finalizes his/her decision to continue using the innovation. This stage is both intrapersonal (may cause cognitive dissonance) and interpersonal, confirmation the group has made the right decision.

The model presented of the innovation-decision process is depicted in Figure 2.1 presented below:

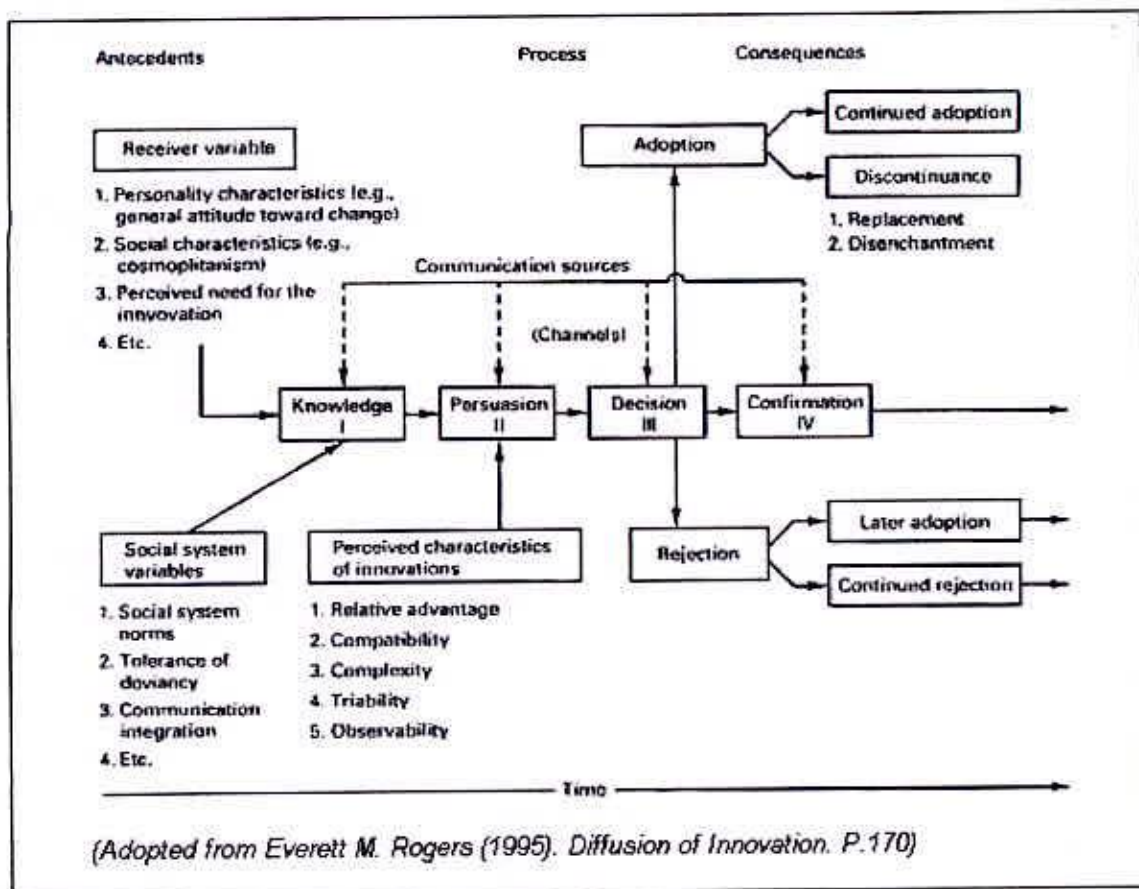


Figure 2.1 Rogers' innovation-decision process model

2.1.1 Adopter Categories

The five adopter categories set forth are ideal types (Rogers, 1995):

Innovators: Venturesome

Venturesome is almost an obsession with innovators. They are very eager to try new ideas. This interest leads them out of local circle of peer networks and into more cosmopolite social relationship. Communication patterns and friendship among a clique of innovators are common, even though the geographical distance between the innovators may be considerable. The salient value of the innovator is venturesome, due to a desire



for the rash, the daring and the risky. The innovator plays a gate keeping role in the flow of new ideas into a social system. They are 2.5 percent in the society.

Early adopters: Respectable

Early adopters are a more integrated part of the local social system than are innovators. Early adopters are localities and this category has the greatest degree of opinion leadership in most social systems. Potential adopters look to early adopters for advice and information about the innovation. The early adopters are considered by many as “the individual to check with” before using the new idea. This adopter category is generally sought by change agents to be a local missionary for speeding the diffusion process. The early adopter is respected by his or her peers and is the embodiment of successful, discrete use of new ideas. The early adopters are approximately 13.5 percent in the society.

Early majority: Deliberate

The early majority adopt new ideas just before the average member of a social system. The early majority interact frequently with their peers but seldom hold positions of opinion leadership in a system. They provide interconnectedness in the system’s interpersonal networks.

They early majority may deliberate for sometime before completely adopting new idea. Their innovation decision period is relatively longer than that of the innovator and the early adopter. They are approximately 34 percent in the society.

Late majority: Skeptical

The late majority adopt new ideas just after the average member of a social system. Adoption may be both an economic necessity for the late majority and the result of increasing network pressures from peers. Innovations are approached with a skeptical

way and the majority do not adopt until most others in their social system have done so. They are approximately 34 percent in the society.

Laggards: Traditional

Laggards are the last in a social system to adopt an innovation. They possess almost no opinion leadership. They are the most locality in their outlook of all categories; many are near insulates in the social networks of their system. Decisions are often made in terms of what has been done in previously and these individuals interact primarily with others who also have relatively traditional values. Laggards tend to be suspicious of innovations and change agents. The innovation-decision process is relatively lengthy, with adoption and use lagging far behind awareness-knowledge of a new idea. They are approximately 16 percent in the social system. The adopter categories are depicted in Figure 2.2.

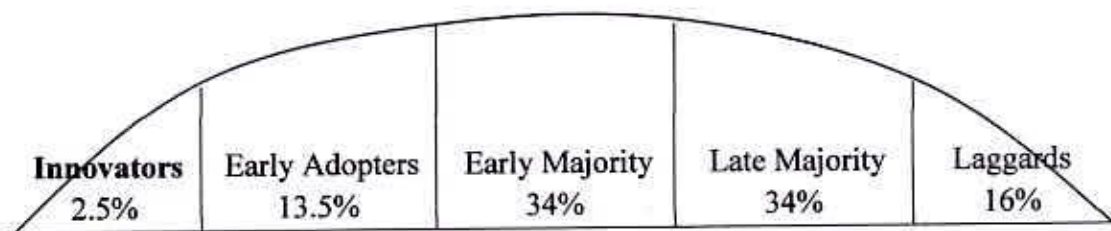


Figure 2.2 Adopter categories on the basis of innovativeness (Rogers, 1995)

2.2 Review of Literature on General Context of Adoption

Hossain (2004) studied Adoption of Selected Modern Boro Rice Cultivation Technologies by the Farmers of Homna Upazila in Comilla District. He found that, the highest proportion (60 percent) of farmers fell under the medium adoption category, while 21 percent had high adoption and 19 percent had low adoption.

Haque (2003) found that the majority (47 percent) of the maize growers had medium adoption of modern maize cultivation technologies while 28 percent had high adoption and 25 percent low adoption.

Rahman (2003) found that ninety seven percent of the pineapple growers adopted 2-4 intercrops viz, Zinger, turmeric, sweet ground and aroid in pineapple cultivation.

Salam (2003) found that an overwhelming majority (94 percent) of the respondents were found having high constraints in adopting environmentally friendly farming practices while 6 percent had medium constraints. No farmer was found having low constraint.

Hasan (2003) found that majority (60 percent) of the farmers had adoption while 33 percent had low adoption and 7 percent had high adoption, recommended potato cultivation practices.

Rahman (2003) revealed that about half (47 percent) of the growers had medium adoption, 44 percent had low and 9 percent had high adoption of year-round homestead fruit cultivation practices.

Zegeye et al. (2002) studied the determinants of adoption of improved maize technologies in major maize growing region of Ethiopia. He found that the rate of adoption of improved maize varieties and chemical fertilizer, factors affecting the adoption of improved maize varieties and the determinant factors affecting adoption of chemical fertilizers are also highlighted.

Gebre (2002) conducted a study on Maize technology adoption in Ethiopia. This study presents the results of the Sasakawa-Global 2000 Agriculture program in Ethiopia and its influence on agricultural research and maize production in the region. The Sasakawa-Global 2000 is an international non-government organization initiated in 1986 because of the 1984-85 famine in Ethiopia, with the aim of empowering Africa to produce its own food through the adoption improved agricultural technologies.

Alexander and Goodhue (2002) conducted the study on pricing of innovation. They evaluate the producer's returns to planting patented seed innovation, using a calibrated optimization model of a south-central maize producer's adoption decision in Iowa, USA. Their results suggest that patented seed innovations do not increase the market power of biotechnology firm in the relevant market of production system.

Swinkeles *et al.* (2002) studied assessing the adoption potential of hedgerow intercropping for improving soil fertility, in western Kenya. They conducted that, the average cost of hedgerow intercropping was 10.5% (SD = 5.5) when based on returns to land and 17.5% (SD = 6.5) based on returns to labour. Fifth planted additional hedges and only 14% did so to improve soil fertility. It thus appears that the potential for its adoption as a soil fertility practices. Hedgerow intercropping appears to have greater adopter potential if its aim is to provide feed for an intensive dairy operation or for curbing soil erosion.

Sardar (2002) studied on "adoption of IPM practices by the farmers under PETRRA Project of RDRS. He observed that majority (45.9 percent) of the farmers had medium, 38.3 percent had low and 15.8 percent had high adoption of IPM practices.

Haider *et al* (2001) observed that one-third (37 percent) of the farmers fell in low adopter category compared to 32.5 percent falling in optimum adopter 23.5 percent above optimum adopter and only 7 percent had non-adopter on Nitrogenous fertilizer. In respect of extent of phosphoric fertilizer two thirds (68 percent) of the farmers had non adopter category compared to 23 percent having above optimum adopter, 5 percent optimum adopter and only 4 percent had below optimum adopter of phosphoric (P) fertilizer. In respect of extent of potassic fertilizer three quarters categories compared to 10 percent

falling below optimum adopter, 8 percent optimum adopter and only 3 percent above optimum adopter of potassic (K) fertilizer.

Mostafa (1999) studied the adoption of recommended mango cultivate practices by the mango growers of Nawabganj Sadar thana. He found that at half (49 percent) of the mango growers had "low adoption", 31 percent had "very low adoption" and 20 percent had "medium adoption" of fertilizers.

Muttaleb *et al.* (1998) found that over all adoption of plant protection practices was medium. Among the plant protection practices high adoption were observed in fungicides, insecticide and soil treatment and low adoption were found that treatment and low adoption were found in suberization of cut tuber hand picking of cutworm and rouging of diseased plant.

Islam (1996) carried out a study on farmer's use of indigenous technical knowledge (ITK) in the context of sustainable agricultural development. He found the extent use of ITK by individual farmers that, the highest proportion (42.73 percent) of the respondents belonged to the lower user category as compared to 41.82 percent in the moderate user category and 15.45 percent in the higher user category, respectively.

Hasan (1996) found in his study that the highest proportion (44 percent) of the respondents perceived the existence of medium adoption, compared to 26 percent low adoption and 3 percent high adoption in respect of selected agricultural technologies.

Nikhade *et al.* (1995) found that the adoption gap about the use of recommended technology of cotton among cotton growers was found to be about 30 percent which was quite high.

Juliana *et al.* (1991) undertook a study on adoption of integrated management practices in five villages of vasusdevanallar block in Tirunelvi district, Tamilnaru, India. They found that about 50 percent of marginal farmers, 47.50 percent of small farmers and 52.50 percent of big farmers had medium adoption and 42.50 percent of big farmers, 22.50 percent of small farmers and percent of the marginal farmers had high level of adoption. In both adopts level of big farmers' participation was higher in comparison to other categories of farmers.

Gogoi and Gogoi (1989) conducted a study on adoption of recommended Pi protection practices in rice in Zorhat district of Assam state in India. The study revealed that among the respondents, 50 percent had low level of 35.36 percent medium level of adoption and 13.64 percent had high adoption of recommended plant protection practices.

Rahman (1986) conducted a research study on the extent of adoption of four improved practices, which were use of fertilizers, line sowing, irrigation and use of insecticides in transplanted aman rice cultivation in two village of Mymensingh district. It revealed that 22 percent of the farmers adopted all the four practices compared to 49 percent adopted three practices, 22 percent adopted two practices, 5 percent adopted one practices and only 2 percent adopted of the four practices.

Sobhan (1975) studied on the extent of adoption often winter vegetables namely tomato, radish, lettuce and potato in Boilar union of Mymensingh district. Over all winter vegetable adoption scores of the farmers could range from 0 to 140. Over all adoption scores indicated that 27 percent of the farmers did not adopted winter vegetables cultivation while 28 percent had low adoption and 55 percent high adoption.

Mohammad (1974) studied the extent of adoption of insect control measures by the farmers in Khamar union of Rajshahi district. He found that among the respondent farmers, 25 percent did not adopt insect control measure; 28 percent had high level of adoption; 32 percent had medium level of adoption and 25 percent had low level of adoption.

Karim (1973) conducted a study on the adoption of fertilizers by transplanting aman growers in former Keyotkhali union of Mymensingh district. He studied the adoption of three fertilizers urea, Triple super phosphate (TSP) and muriate of potash (MP). He found that 4 percent of the respondent growers had high adoption of fertilizers while 9 percent had medium adoption and 41 percent low adoption. Remaining forty six percent of the respondent growers did not use any of the three fertilizers.

Hossain (1971) carried out a research study on the adoption of four improved practices in Gouripur of Mymensingh District. The practices were (i) plant protection measure, (ii) recommended variety of paddy, (iii) line transplanting and (iv) recommended dose of fertilizers. It revealed that among the responded farmers 57.40 percent adoption plant protection measure, 35.51 percent adoption recommended variety of paddy, 25.36 percent adoption line transplanting and 11.52 percent adoption recommended dose of fertilizers.

2.3 Relationship between selected characteristics of the rice farmers with their adoption of improved farm practices

2.3.1 Age and adoption of improved farm practices

Talukder (2006) found that the age of the farmers had a significant positive relationship with their adoption of selected rice production practices.

Hossain (2004) found that the age of the farmers had no significant negative relationship with their selected modern Boro rice cultivation technologies.

Sardar (2002) found that the age of the farmers had positive significant negative correlation with their adoption of IPM practices.

Aurangozeb (2002) observed that there was significant negative relationship between age and adoption of integrated homestead farming technologies.

Sarker (1997) observed that there was no significant relationship between ages of the farmers with their adoption of improved potato cultivation practices.

Islam (1993) observed that there was no relationship between the ages of potato growers with their adoption of improved practices in potato cultivation. Similar results were observed by Karim and Mahaboob (1986), Rahman (1986), Singh (1991), Kher (1992), Pathak and Samal (1992).

Kashem (1991) observed that there was positive and significant relationship between the ages of the marginal farmers with their adoption of jute technologies. Similar results were found by Ali *et al.* (1986), Singh and Rajendra (1990), Okoro *et al.* (1992), Narwal *et al.* (1991) and Hossain (1991).

2.3.2 Education and adoption of improved farm practices

Hossain (2004) concluded that education of the farmers had a significant and positive relationship with their adoption of modern Boro rice cultivation practices.

Sardar (2002) found that the education of the farmers had significant positive relationship with their adoption of IPM practices.

Aurangozeb (2002) studied on the extent of adoption of integrated homestead farming technologies by the rural women in RDRS. He observed that there was positive relationship between education and adoption of integrated homestead farming technologies.

Sarker (1997) conducted a study to determine the relationship between selected characteristics of potato cultivation practices in five villages of Comilla District. He found that education of potato growers had significant relationship with their adoption of improved potato cultivation practices. Similar results were found by Kashem (1991).

Bavalatti and Soundaarswamy (1990) observed no significant relationship between education of the farmers and their adoption of dry land farming practices.

Kaur (1988) found that education influenced the opinion of the women about adoption of vegetable gardening, animal husbandry etc.

2.3.3 Family size and adoption of improved farm practices

Talukder (2006) found that the family size of the farmers had no significant and negative relationship with their adoption of selected rice production practices.

Hossain (2003) revealed that family size of the farmers had a significant and positive relationship with their knowledge and adoption of modern Boro rice cultivation practices.

Sardar (2002) found that the family size of the farmers had significant positive relationship with their adoption of IPM practices.

Hossain (1999) conducted a study to determine the farmers' perception of the effects of agro-chemicals on environment. He found no relationship between the farmer's family sizes with their adoption of fertilizer.

Chowdhury (1997) conducted a research study on adoption of selected BINA technologies by the farmers of Boira union in Mymensingh District. He observed that family size of the farmers had positive and significant relationship with the adoption of selected BINA technologies.

Hossain (1991) in his study in sadar thana of Jamalpur observed that family size of the farmers had no significant effect on their adoption of improved farm practices. Similar results were observed by Sobhan (1975), Haque (1993), Bashar (1993).

Hossain (1999) found that family size of the farmers had positive significant relationship with the adoption of agro-chemical. Similar results were also observed by Pal (1995), Muttaleb (1998), Sarker (1997), Chowhdury (1997), Rahman (1986), Haque (1993) and Khan (1993).

2.3.4 Farm size of and adoption of improved farm practices

Hossain (2006) found that farm size of the farmers had no significant and positive relationship with their adoption of selected high yielding varieties of rice.

Hossain (2004) concluded that farm size of the farmers had significant and positive relationship with their adoption of modern Boro rice cultivation practices.

Rahman (2001) conducted a study on knowledge, attitude and adoption of the farmers regarding Alok 6201 hybrid rice in Sadar upazila of Mymensingh district. He found that farm size of the farmers had significant and positive relationship with their adoption of Alok 6201 hybrid rice.

Alam (1997) studied the use of improved farm practices in rice cultivation by the farmers. The findings of the study showed that the farm size had a significant relationship with their use of improved farm practices in rice cultivation.

Hossain (1983) found that size of the farm of transplanted aman farmers in Bhabakhali union of Mymensingh district had a negative relationship with their adoption of HYV T-aman rice.



2.3.5 Annual income and adoption of improved farm practices

Hossain (2006) found that annual income of the farmers had significant and positive relationship with their adoption of selected high yielding varieties of rice.

Hossain (2004) revealed that annual income of the farmers had significant and positive relationship with their adoption of modern Boro rice cultivation practices.

Hossain (2003) revealed that annual family income of the farmers had a significant and positive relationship with their knowledge and adoption of modern Boro rice cultivation practices.

Sarder (2002) found that the farmers' belief had significant relationships with their adoption of IPM practices.

Bari (2000) observed that the belief of the farmers had significant relationship with their attitude towards the hybrid Rice Aalok 6201.

Koch (1985) conducted a study in the north-west organic free, state South Africa concerning perception of agriculture innovativeness, belief, knowledge and innovation adoption. He observed that there was a strong positive relationship between perception, knowledge and practice adoption. This finding is very much in agreement with that of Rogers and Shoemaker (1971).

2.3.6 Training exposure and adoption of improved farm practices

Haque (2003) found a positive relationship with training exposure and adoption of modern technologies.

Rahman (2001) observed in study that training received of the farmers had a significant and positive relationship with their adoption regarding Aalok 6201 hybrid rice.

A positive relationship was also found between training exposure and adoption of improved practices in transplanted Aman rice by Rahman. M. M. (1986).

2.3.7 Organizational participation and adoption of improved farm practices

Hossain (2006) found that organizational participation of the farmers had no significant but positive relationship with their adoption of selected high yielding varieties of rice.

Rahman (2001) conduct a study on knowledge attitude and adoption of the farmers regarding Aalok 6201 hybrid rice in Sadar upazila of Mymensingh district. He found that organizational participation of the farmers had a significant and positive relationship with their adoption regarding Aalok 6201 hybrid rice.

Mostafa (1999) conducted a study on adoption of recommended mango cultivation practices by the mango growers of Nawabganj Sadar Thana. He found that organizational participation of mango growers had a significant positive relationship with their adoption of recommended mango cultivation practices.

2.3.8 Extension media contact and adoption of improved farm practices

Hossain (2004) revealed that extension media contact of the farmers had significant and positive relationship with their adoption of modern Boro rice cultivation practices.

Haque (2003) concluded that extension contact of the farmers had significant positive relationship with their adoption of modern maize cultivation technologies.

Sardar (2002) concluded that the extension contact had positively significant, relationship with their adoption of IPM practices.

Aurangozeb (2002) observed that there was significant relationship between contact with extension media and adoption of integrated homestead farming technologies.

Osunloogun *et al.* (1996) studied adoption of improved Agricultural practices by co-operative farmers in Nigeria. The findings of the study indicated a positive relationship between extension contact and adoption improved practices.

Bezborra (1980) studied adoption of improved agricultural technology by the farmers of Assam. The study indicated a positive relationship between extension contact and adoption of improved cultivation practices.

2.3.9 Cosmopolitanism and adoption of improved farm practices

Hossain (2004) revealed that cosmopolitanism of the farmers had no significant and negative relationship with their adoption of modern Boro rice cultivation practices.

Aurangozeb (2002) conducted a study on adoption of integrated homestead farming technologies by the rural women in RDRS. He found that there was a significant relationship between cosmopolitanism and adoption of integrated homestead farming technologies.

Hossain (2001) found a positive significant relationship between cosmopolitanism of the farmers and their adoption of pesticides. Pal (1995), Halim (1985), Khan (1993), Haque (1993) and Islam (1996) observed similar results.

Hussen (2001) conducted a study on farmers' knowledge and adoption of modern sugarcane cultivation practices. He found that cosmopolitanism of the growers had significant positive relationship with their adoption of modern sugarcane cultivation practices.

Rahman (2001) conducted a study on knowledge, attitude and adoption of the farmers regarding Aalok 6201 hybrid rice Sadar upazila of Mymensingh district. He found that cosmopolitanism of the farmers had a significant and positive relationship with their

adoption regarding Aalok 6201 hybrid rice.

Chowdhury (1997) conducted a study on the adoption of selected BINA technologies by the farmers of Bona union in Mymensingh district. He found that there was no significant relationship between the cosmopolitanism of the farmers and their composite adoption of selected BINA technologies. Similar findings were observed by Mannan (1972), Mohammad (1974), Sobhan (1975), Hossain (1991) and Islam (1996).

Pal (1995) conducted a research on the adoption of recommended sugarcane cultivation practices by the farmers. He observed that the cosmopolitanism of the farmers had significant positive relationship with their adoption of recommended sugarcane cultivation practices. Similar results were found by Halim (1985), Khan (1993), Haque (1993) and Islam (1996).

Haque (1993) observed in his study, a strong positive relationship between cosmopolitanism of sugarcane growers and their adoption of improved practices in sugarcane cultivation.

Islam (1993) found a significant relationship between cosmopolitanism of the farmers and their adoption of recommended dose of fertilizer and plant protection measures in potato cultivation.

Khan (1993) observed in his study on adoption of insecticide and related issues by the farmers, a positive relationship between cosmopolitanism of the farmers and their adoption of insecticides.

Hussain (1991) conducted a study on the Adoption Behaviour of Contract Growers in Sadar Upazilla of Jamalpur District. He found that there was no significant relationship between cosmopolitanism of the farmers and their overall adoption of improved farm

practices. Similar findings were observed by Mannan (1972), Mohammad (1974), Sobhan (1975) and Islam (1996).

2.4 The Conceptual Framework of the Study

In scientific research, selection and measurement of variables constitute an important task. Properly constructed hypothesis of any research contain at least two variables namely, “dependent variable” and “independent variable”. Selection and measurement of those variables is also crucial. A dependent variable is that which appears, disappears or varies as the researcher introduces, remove or varies the independent variables (Townsend, 1953). An independent variable is that factor which is manipulated by the researcher in his attempt to ascertain its relationship to an observed phenomenon.

This study concerned with dependent variable, adoption of improved farm practices and the selected characteristics of the farmers as independent variables, *i.e.* age, education, family size, farm size, annual income, training exposure, organization participation, extension media contact and cosmopolitaness.

Based on these above discussion and the review of literature, the conceptual framework of this study has been formulated and shown in figure 2.3.

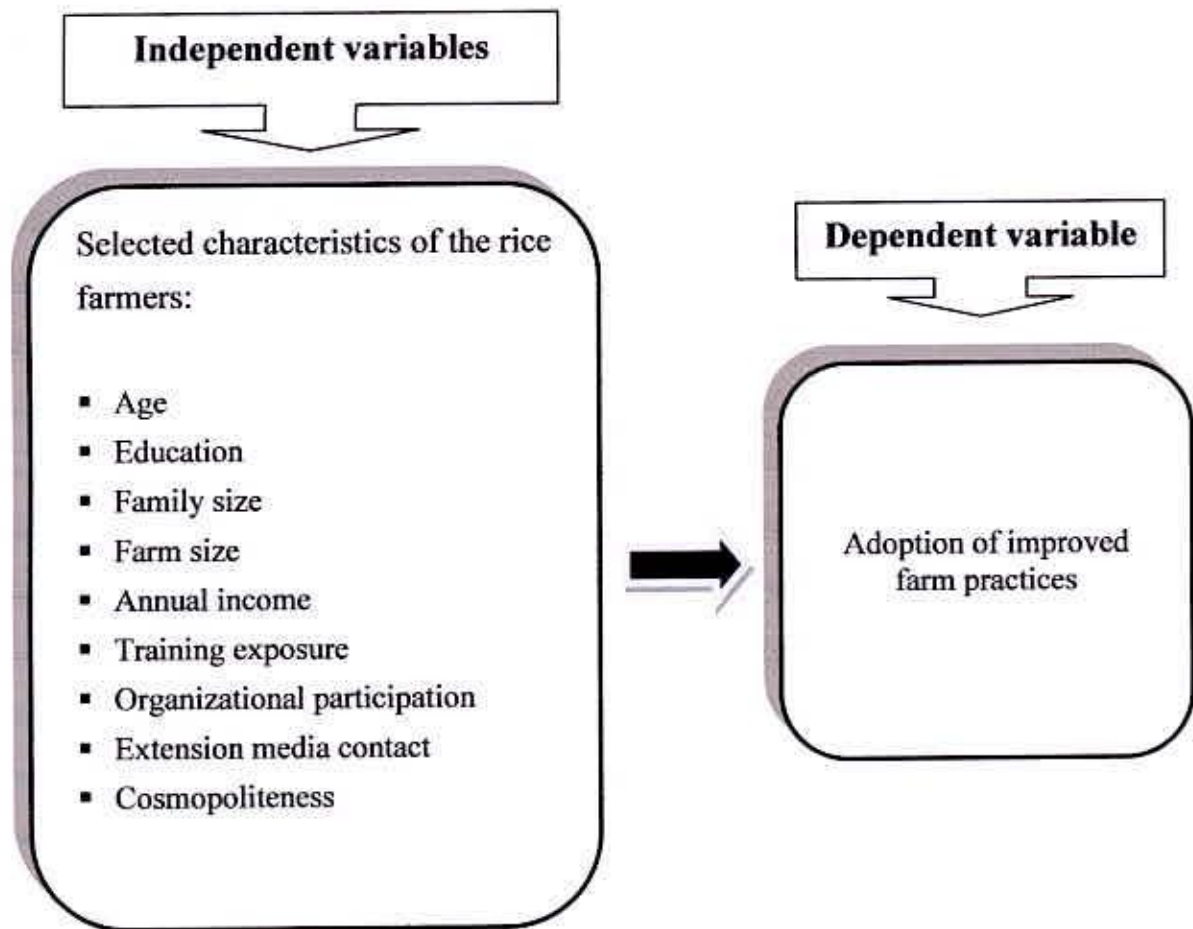
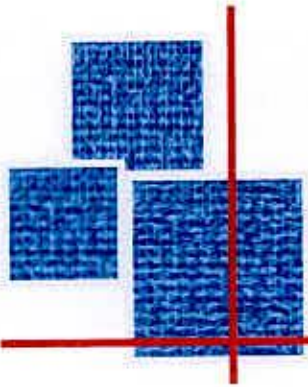


Figure 2.3 Conceptual framework of the study



Chapter 3

METHODOLOGY

CHAPTER 3

METHODOLOGY

The methodology used in conducting any research is critically important and deserves careful consideration. It enables the researcher to collect valid and reliable information in terms of hypothesis or research instrument and to analyze the information properly to arrive at valid results.

3.1 Locale of the Study

The villages namely; Durgapur, Garanata and Bishramgaci of Mohadipur Union of Palashbari Upazila under Gaibandha District were randomly selected as the locale of this study. The Upazila was selected purposively and the Union was selected randomly from nine unions of this Upazila. The Upazila is 22 km west to District Headquarters. The educational institutions of the Upazila are; college 9, technical college 2, secondary school 40, primary school 178, community primary school 33, madrasa 69. A map of Gaibandha District showing Palashbari Upazila and a map of Palashbari Upazila showing the study area Mohadipur Union have been presented in Figures 3.1 and 3.2 respectively.

3.2 Population and Sampling Design

All the rice farmers of three villages of Palashbari Upazila under Gaibandha District constituted the population of the study. An up-to-date list of the farmers was prepared with the help of Sub Assistant Agriculture Officer (SAAO) of that area. A total of 1453 farmers were comprised in the list of the selected three villages. Eight percent farmers had selected from each villages using the random sampling method. Thus a total of 116 rice farmers constituted the sample size for this study. A reserve list of 10 respondents was also prepared as eight percent of the sample of each village for covering the positions in case of the absence of the selected respondents during interview. The distribution of the population and the sample size has presented in table 3.1.

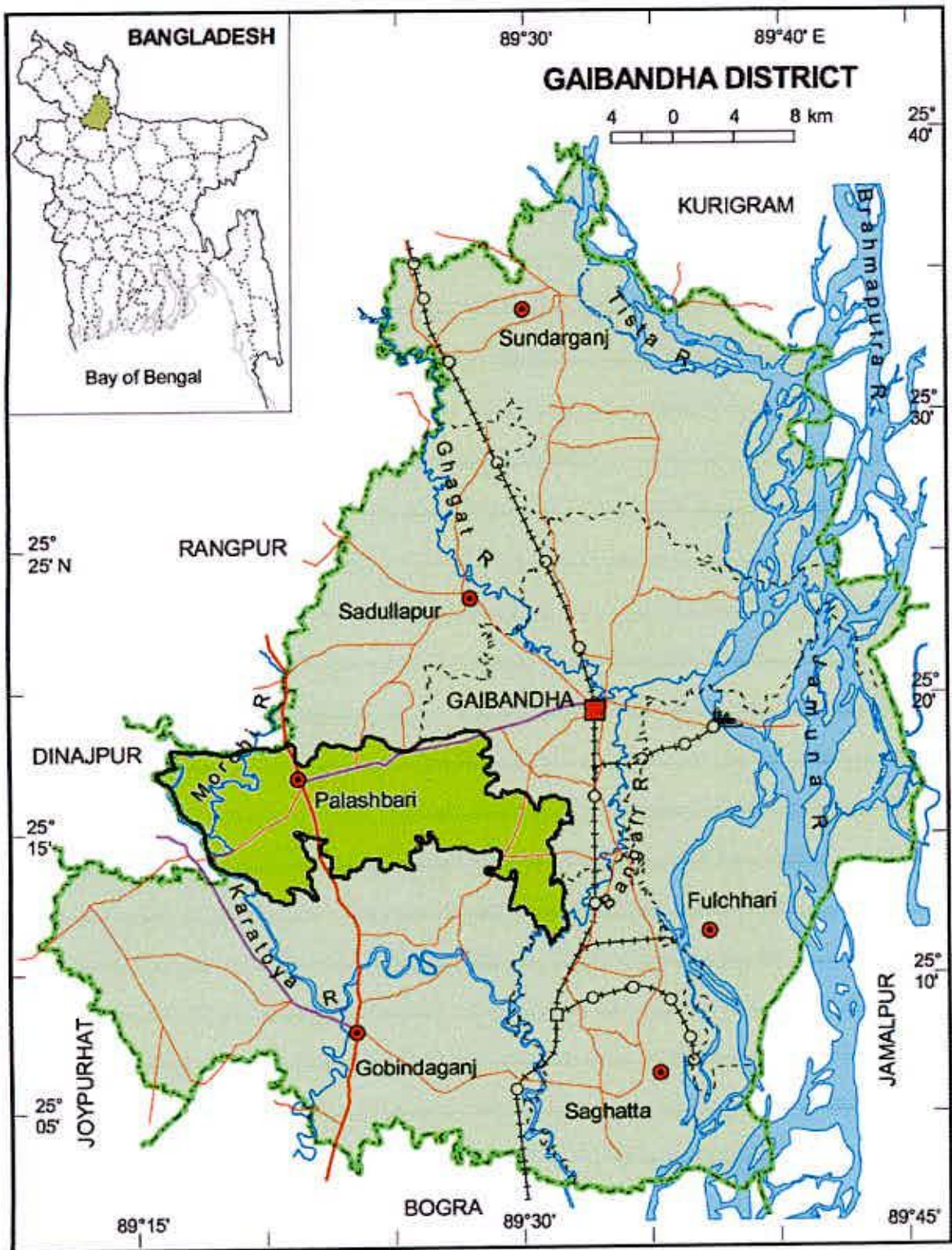


Figure 3.1 Map of Gaibandha District showing the Palashbari Upazila



Figure 3.2 Map of Palashbari Upazila showing the study area Mohadipur Union

Table 3.1 Distribution of the population, sample and number of farmers in the reserve list

Name of villages	Population size	Sample size	Reserve list size
Durgapur	476	38	3
Garanata	508	41	4
Bishramgaci	469	37	3
Total	1453	116	10

3.3 The Research Design

The research design has followed in the present study. An interview schedule was prepared for data collection from the rice farmers of Mohadipur Union. The simultaneous measurements on independent and dependent variables were recorded with great care.

3.4 Selection of Dependent and Independent Variables

The researcher employed adequate care in selecting the variables of the study. Considering personal, economic, social and psychological factors of the rural community, time and resources availability to researcher, reviewing relevant literature and discussing with relevant expert, the researcher selected the variables for the study.

A variable is any characteristic which can assume varying or different values in successive individual cases (Ezekiel and Fox, 1959). A well organized piece of research usually contains at least two variables, independent and a dependent variable. An independent variable is that factor which is maintained by the researcher in his/her attempt to ascertain its relationship to an observed phenomenon. A dependent variable is that factor which appears, disappears or varies as the researcher introduces, removes or varies the independent variable (Townsend, 1953). Adoption of improved farm practices was the main focus of this study and it was considered as the dependent variable. The

researcher selected 9 characteristics of the respondents as the independent variables. These were: age, education, family size, farm size, annual income, training exposure, organization participation, extension media contact and cosmopolitaness.

3.5 Measurement of the Variables

In order to conduct the study in accordance with the objectives it was necessary to measure the independent and the dependent variables. The procedure for measuring the variables described below.

3.5.1 Measurement of Independent Variables

Nine selected characteristics of the farmers were considered as independent variables. . The procedures of measurement of the selected variables were as follows:

3.5.1.1 Age

Age of a farmer referred to the period of time from his/her birth to the time of interview. It was measured in terms of actual years on the basis of his/her statement. One score was assigned for each year of his/her age.

3.5.1.2 Education

Educational level of the respondent farmers was measured on the basis of completed years of schooling in an academic institute. One score was assigned for each completed year of schooling. If a respondent did not know reading and writing, his/her education score was assigned as zero (0). A score of 0.5 was assigned to a respondent who only could sign his/her name. Besides, the respondent got actual score of his/her every year of schooling i.e. 1 for class one, 2 for class two and so on.



3.5.1.3 Family size

Family size of a rice farmer's family was measured on the basis of total number of family members and assigned score one for each member of the family. For example, if a respondent had 6 members in his family, then his/her family size score was 6.

3.5.1.4 Farm size

Farm size was measured as the size of the respondent's farm on which he/she continued his/her farming operations during the period of study. The area was being estimated in terms of full benefit to the growers. The data were first recorded in terms of local unit i.e; *bigha, katha or pakhi* and then were converted to hectare and the size was measured by using the following formula:

$$FS = A_1 + A_2 + 1/2(A_3 + A_4) - A_5 + A_6 + A_7 + A_8$$

Where, FS = Farm size

A₁ = Homestead land

A₂ = Land under own cultivation

A₃ = Land given to others on share cropping (borga)

A₄ = Land taken from others on share cropping (borga)

A₅ = Land given to others on lease

A₆ = Land taken from others on lease

A₇ = Pond

A₈ = Garden

3.5.1.5 Annual income

The income of a farmer is an important indicator of how much he can invest in his wheat cultivation. Annual income of a respondent was measured in taka on the basis of total yearly earnings from rice cultivation and other sources in which the respondent as well as his family members were involved. The method of ascertaining income from farming involved different aspects. The aspects are: agriculture, poultry rearing, domestic animal, fish, service, business and others. In calculating the annual income of the respondents, the

total yield from all the sources making in the preceding year were converted into cash income according to the prevailing market price and added together to obtain total income of a respondent.

3.5.1.6 Training exposure

Training exposure of a respondent was measured on the basis of number of days of training received on rice cultivation from different sources in the last five years. The score of a respondent was measured in terms of number of days for receiving training. For example, if a farmer received no training his/her score was zero (0) and score one was assigned for receiving one day training.

3.5.1.7 Organizational participation

The organizational participation score was computed for each respondent on the basis of his/her membership of different types of organizations. The following scale was used for computing the organizational participation score.

Categories of participation:	Score
No participation	0
Participation as ordinary member	1
Participation as executive member	2
Participation as executive officer	3

If a respondent had membership in two or more organizations his scores were computed by adding the scores obtained for each organization according to the categories of his membership. Finally, organizational participation score was measured by summation of the scores obtained from all the selected organizations.

3.5.1.8 Extension media contact

It was measured on the basis of a respondents' extent of exposure to 13 selected information sources related to agricultural extension. A respondent was asked to choose

one answer among five option of contact for each medium, namely: regularly, often, occasionally, rarely and not at all. Weight was assigned for all extension media in the following manner:

Extent of contact	Weighting system
Not at all	0
Rarely	1
Occasionally	2
Frequently	3
Regularly	4

The extension contact score of a respondent was, therefore, determined by adding the total responses against 13 selected extension media. Thus, the extension contact score could range from 0 to 52, where 0 indicating no extension contact and 52 indicating the highest extension contact.

3.5.1.9 Cosmopolitanness

Cosmopolitanness of a respondent was measured in terms of his/her nature of visits to the seven different places external to his/her own social system. The scale used for computing the cosmopolitanness score was presented below:

Extent of visit	Assigned score
Not at all	0
Rarely	1
Occasionally	2
Oftenly	3
Regularly	4

The cosmopolitanness score of a respondent was determined by adding together the scores obtained from visit to each of the seven (7) types of places. The cosmopolitanness score of the respondents could range from 0 to 28, where, 0 indicating no cosmopolitanness and 24 indicating very high cosmopolitanness.

3.5.2 Measurement of Dependent Variable

Adoption of improved farm practices was the dependent variable of the study. The selected technologies were: Modern Mechanical Cultivation (MC), High Yielding Variety (HYV) practice, Line and/or spacing of seedling (LS), Urea Super Granular (USG), Controlled irrigation (CI), Integrated Pest Management (IPM), Leaf colour chart (LC), Organic fertilizer and/green manure (OG). Adoption can be measured in various ways. A review of literature indicates that researcher in India used at least eight different measures of adoption. They are as follows:

Sl. No.	Measurement of Adoption
01.	Adoption and non-adoption
02.	Number of practices adopted
03.	Percent of Applicable practices adopted
04.	Years of use of adopted practices
05.	Innovativeness scale
06.	Guttman scale of adoption
07.	Trace line scale of adoption
08.	Adoption quotient

For this study years of use of adopted practices (No. 4) was chosen for measuring the adoption of improved farm practices.

3.5.2.1 Years of use of adopted farm practices

For this study the length of the period of use of the innovation was taken into consideration. For example, if a farmer has adopted few technologies for 2,3,4 and 5 years respectively then his adoption score (AS) will be $(2+3+4+5) = 14$. Following this procedure, the adoption score for this study was measured by using the following formula:

$$AS = AP_{MC} + AP_{HYV} + AP_{LS} + AP_{USG} + AP_{CIM} + AP_{IPM} + AP_{LC} + AP_{OG}$$

Where,

AS = Adoption Score

AP_{MC} = Adoption Period for Modern Mechanical Cultivation

AP_{HYV} = Adoption Period for High Yielding Variety

AP_{LS} = Adoption Period for Straight-row and/or proper Spacing of seedlings

AP_{USG} = Adoption Period for Urea Super Granular

AP_{CIM} = Adoption Period for Controlled Irrigation Method

AP_{IPM} = Adoption Period for Integrated Pest Management

AP_{LC} = Adoption Period for Leaf Colour Chart

AP_{OG} = Adoption Period for Organic fertilizer and/Green manure

3.6 Hypothesis of the Study

The following research hypotheses were put forward to test the relationships between selected independent and dependent variables. The independent variables were; age, education, family size, farm size, annual income, training exposure, organization participation, extension media contact and cosmopolitaness. The dependent variable was adoption of improved farm practices.

As defined by Goode and Hatt (1952) "A hypothesis is a proposition, which can be put to a test to determine its validity. It may see contrary to, or in accord with common sense. It may prove to be correct or incorrect. In any event, however, it leads to an empirical test".

According to Kerlinger (1973) a hypothesis is a conjectural statement of the relation between two or more variables. Hypothesis are always in declarative form of sentence and they are related, either generally or specifically from variables to variables. In broad sense hypotheses are divided into two categories: (a) Research hypothesis and (b) Null

hypothesis. In studying relationships between variables an investigator first formulates research hypothesis which states anticipated relationships between the variables. However, for statistical test it becomes necessary to formulate null hypothesis. A null hypothesis states that there is no relationship between the concerned variables.

The following null hypothesis would be formulated to explore the relationship of the selected characteristics of the farmers with their adoption of rice cultivation:

“There are no relationships between each of the selected characteristics of the rice farmers and their adoption of improved farm practices”.

3.7 Data Collection

The researcher himself collected data with the help of an interview schedule from the sample respondents through face to face interview using the pre-scheduled leisure period of respondent from 01 to 30 June, 2013.

The researcher made all possible efforts to establish rapport with the respondents so that they could feel to respond to the questions contained in the schedule. Rapport was established with the farmers prior to interview and the objectives were clearly explained by using local language as far as possible. Interviews were conducted with the respondents at homes and tea shops during their off time. During the visit the objectives of the study were explained to most of the respondents. Brief information regarding the nature and purpose of the study was given to the respondents before actual interview. Questions were asked systematically and explanations were made whenever it was necessary. The information was duly checked in order to minimize errors. Some data were recorded in local unit. These were subsequently converted to appropriate standard units. The respondents were interviewed at their off time so that they could give accurate

information in a cool mind. The researcher in collecting data faced no serious problem. Excellent co-operation was obtained from the respondent during the data collection.

3.8 Data Coding and Tabulation

Data were coded into a coding sheet. Data collected thus from the respondents were compiled, tabulated, analyzed in accordance with the objectives of the study by using computer system. The qualitative data were converted into quantitative by means of suitable scoring techniques for the purpose of analysis.

3.9 Categorization of Data

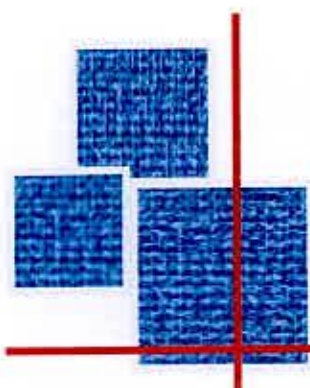
For describing the independent and the dependent variables, the respondents were classified into several categories in respect of each of the variable. These categories were developed by considering the nature of distribution of the data and the general conditions prevailing in the social system.

3.10 Data Processing and Statistical Analysis

The computer software SPSS (Statistical Package for Social Sciences, version 11.5) was used to analyze the data. Data were presented mostly in the tabular form. Various statistical measures like number, percentage distribution, range, mean, standard deviation, correlation coefficient etc. were used to describe and interpret the data.

In order to explore the relationships between adoption of improved farm practices and the selected characteristics of the rice farmers, the Pearson Product Moment Correlation was used. Correlation matrix was also computed to determine the interrelationships among the variables. Five percent (0.05) level of significance was used as the basis of rejecting any null hypothesis. If the computed value of co-efficient of correlation 'r' was equal to or greater than table value at designed (0.05) level of significance for the relevant degrees of freedom, the null hypothesis was rejected and it was concluded that there was significant

relationship between the concerned variables. However, when the computed value of coefficient of correlation was found to be smaller than the tabulated value at the designated level of significant for the relevant degrees of freedom, it was concluded that the null hypothesis could not be rejected and hence there was no relationship between the concerned variables.



Chapter 4

Results and Discussion

CHAPTER 4

RESULTS AND DISCUSSION

In this Chapter, the findings are presented in three sections in accordance with the objectives of the study. The first section deals with the selected characteristics of the farmers. The second section has dealt with their adoption of improved farm practices. And the last section has dealt with relationships between the selected characteristics of the farmers and their adoption of improved farm practices.

4.1 Characteristics of the Rice Farmers

The findings relating to the selected characteristics of the farmers namely; age, education, family size, farm size, annual income, training exposure, organization participation, extension media contact and cosmopolitaness are presented Table 4.1 and discussed afterwards:

Table 4.1 Salient features of the respondents with their characteristics

Characteristics	Measuring unit	Range		Categories	Farmers		Mean	SD
		Possible	Observed		Number (N=116)	Percent (%)		
Age	Actual Years	Unknown	24-70	Young aged (< 35)	54	46.55	37.81	10.14
				Middle aged (35-50)	52	44.83		
				Old (> 50)	10	8.62		
Education	Year of schooling	Unknown	0-15	Illiterate (0)	27	23.28	3.86	3.69
				Can sign only (0.5)	20	17.24		
				Primary education (1-5)	36	31.03		
				Secondary education (6-10)	27	23.28		
				Above secondary education (>10)	6	5.17		
Family size	Number of members	Unknown	2-9	Small (≤ 4)	81	69.83	3.97	1.90
				Medium (5-7)	26	22.43		
				Large (> 7)	9	7.76		
Farm size	Actual (in ha)	Unknown	0.07-2.11	Small (< 1 ha)	91	78.45	0.73	0.43
				Medium (1-2.99)	25	21.55		
				Large (≥ 3.00)	0	0		
Annual income	Taka ('000)	Unknown	68-373	Low (≤ 120)	13	11.20	204.66	75.07
				Medium (121-240)	66	56.90		
				High (> 240)	37	31.90		
Training exposure	Days obtained	Unknown	0-12	Low (≤ 4)	93	80.17	2.25	2.54
				Medium (5-8)	20	17.24		
				High (> 8)	3	2.59		
Organizational participation	Scores	0-30	0-24	Low (≤ 8)	99	85.34	4.53	4.92
				Medium (9-16)	12	10.34		
				High (> 16)	5	4.32		
Extension media contact	Scores	0-40	3-25	Low (≤ 8)	35	30.17	11.41	4.86
				Medium (9-16)	61	52.59		
				High (> 16)	20	17.24		
Cosmopolitaness	Scores	0-28	6-21	Low (≤ 9)	35	30.17	12.56	4.38
				Medium (10-18)	70	60.34		
				High (> 18)	11	9.49		

4.1.1 Age

Age of the respondents was ranged from 24 to 70 years, the average being 44.39 years and the standard deviation was 11.91. On the basis of age, the farmers were classified into three categories: "young aged" (< 35), "middle aged" (35-50) and "old aged" (> 50). Table 4.1 contains the distribution of the respondents according to their age.

Data presented in Table 4.1 indicated that the highest proportion (46.55 percent) of the respondents fell in the young aged category compared to 44.83 percent middle and 8.62 percent old aged category. It may also be revealed that 91.38 percent of the respondents under study area comprised young to middle-aged categories.

The findings indicate that a large proportion of 46.55 percent of the farmers were young aged. Young people generally show more favourable attitude towards trying new ideas. However, the older farmers because of their longer farm experience might have valuable opinions in regard to adoption of improve farm practices in rice cultivation. The extension agents can make using of these views and opinions in designing their extension activities.

4.1.2 Education

Education of a respondent was measured by the level of his formal education i.e. maximum class passed by him. The education score of the respondents ranged from 0 to 15, the average being 3.86 and the standard deviation was 3.69. Based on their education, the respondents were grouped into five categories: "illiterate" (0), "can sign only" (0.5), "primary education" (1-5), "secondary education" (6-10), and "above secondary education" (>10).

Data presented in Table 4.1 indicate that a large proportion (31.03 percent) of the respondents fell under category of "primary education" compared to 23.28 percent "illiterate" and "secondary education", 17.24 percent "can sign only" and 8.62 percent

having “above secondary education”. As education enlightens a person, it may contribute to the adoption of improve farm practices.

The findings indicate that education of an individual is likely to be more receptive to the modern facts and ideas; they have much mental strength in deciding on a matter related to problem solving or adoption of technologies in their daily life. Thus, farming community in the study area may be well considered as a suitable ground for the adoption of technologies, or execution of change programme whatever needed.

4.1.3 Family size

The family size of the respondents ranged from 2 to 9 with a mean of 3.97 and standard deviation of 1.90. Based on their family size, the respondents were classified into three categories viz., small family (≤ 4), medium family (5-7) and large family (> 7). The distribution of the farmers according to their family size has been presented in Table 4.1.

Data contained in the Table 4.1 indicated that the small family constituted the highest proportion (69.83 percent) of the farmers, while 22.43 percent had medium family and the remaining 7.76 percent had large family. The findings of the study revealed that overwhelming majority (92.78 percent) of the farmers have small to medium family size. The people of the study area were very much alert to keep their family size small. Small size family can educate their children properly and can enjoy other social amenities.

4.1.4 Farm size

The study found that, farm size was varied from 0.07 to 2.11 hectares. The average farm size was 0.73 hectares with a standard deviation of 0.43. The respondents were classified into three categories based on their farm size as followed by DAE (DAE, 1995): “small farm” (< 1 ha), “medium farm” (1-2.99 ha) and “large farm” (≥ 3.00 ha). The distribution of the respondents according to their farm size is shown in Table 4.1.



Data presented in the Table 4.1 show that the highest proportion (78.45 percent) of the farmers had small farm compared to 22.43 percent had medium farm and none of them had large farm.

4.1.5 Annual income

Annual income of the respondents ranged from Tk. 68 to 373 thousand with a mean of Tk. 204.66 thousand and standard deviation 75.07 thousand. Based on their annual income, the respondents were classified into three categories: “low income” ($\leq 120,000$), “medium income” (120,001-240,000), “high income” ($> 240,000$). The distribution of the respondents according to their family income is shown in Table 4.1.

Data shown in Table 4.1 revealed that highest proportion (56.90 percent) of the respondents had medium annual income compared to 31.90 percent fell in high income group and 11.20 percent in low income group. Thus, the majority (88.20 percent) of the respondents had medium to high family income indicating that improved farm practices were usually practiced by the farmers having comparatively higher economic standard.

The average income of the farmers of the study area is much higher. This might be due to the fact that the farmers of the study area were not only engaged in agriculture. They also earn from other sources such as service, business etc. farmers with the low income generally hesitate to adopt innovations in their own farms because of their lower risk bearing ability and their inability to make necessary financial investment.

4.1.6 Training exposure

Training exposure score of the respondent farmers ranged from 0 to 12 with a mean and standard deviation of 2.25 and 2.54 respectively. Based on their length of training score, the respondents were classified into three categories. These categories were low (≤ 4),

medium (5-8) and high (> 8) training exposure. The distribution of the respondents according to their training exposure has been presented in Table 4.1.

Data in Table 4.1 indicated that highest 80.17 percent of the respondents were in low training group while, 17.24 percent of them had medium training and only 2.59 percent had high training exposure. Training helps the farmers to acquire deep knowledge and improve skills about the respected aspects. Trained farmers can cope with and handle smoothly the adverse situation in their cultivation. So, they show favourable attitude toward adoption of innovation.

4.1.7 Organizational participation

The maximum organizational participation score of the respondents was 24 and the minimum score was zero '0'. However, the average was 4.53 and the standard deviation was 4.92. Based on the organizational participation scores, the respondents were classified into three categories: low organizational participation, medium organizational participation and high organizational participation. The distribution of the respondents according to their organizational participation has been shown in Table 4.1.

Data contained in Table 4.1 indicate that the highest proportion (85.34 percent) of the rice farmers had low organizational participation while 10.34 percent had medium organizational participation and the rest 4.32 percent had high organizational participation. The findings revealed that, an overwhelming portion (95.66 percent) of the farmers had in low to medium organizational participation in the study area. The extent of organizational participation in the study area was not satisfactory. The same result was found in respect of cosmopolitaness and extension contact. The DAE extension personnel should be more alert about their clients' communication behaviour. They must have

motivation strategy to make their client more cosmopolite, active to extension partner and active organizational participatory.

4.1.8 Extension media contact

The computed extension media contact scores of the respondents ranged from 3 to 25 with an average 11.41 and standard deviation of 4.86 against the possible range of 0 to 40. On the basis of extension media contact scores, the respondents were classified into three categories: “low media contact” (≤ 8), “medium media contact” (9-16) and “high media contact” (> 16). The distribution of the respondents according to their extension media contact has shown in Table 4.1.

Data presented in Table 4.1 indicate that the highest proportion (52.59 percent) of the farmers had medium media contact, while 30.17 percent had low media contact and 17.24 percent of the respondents had high media contact. The findings of the study indicate that majority of the respondents (82.76 percent) had low and medium extension contact with various information sources for getting necessary agricultural information. Bashar (1993), Pal (1995) and Hussen (2001) observed almost similar findings regarding media contact for getting agricultural information.

4.1.9 Cosmopoliteness

Cosmopoliteness scores of the respondents ranged from 6 to 21 against the possible range of 0 to 28 with an average of 12.56 and the standard deviation of 4.38. On the basis of cosmopoliteness scores, the respondents were classified into three categories: “low cosmopolite” (≤ 9), “medium cosmopolite” (10-18) and “high cosmopolite” (> 18). The distribution of the respondents according to their cosmopoliteness is shown in Table 4.1.

Data contained in Table 4.1 indicate that the majority (60.34 percent) of the respondents were “medium cosmopolite” compared to 30.17 percent of them were “low cosmopolite”

and the remaining 9.49 percent were “high cosmopolite”. Data also revealed that overwhelming majorities (90.51 percent) of the respondents had low to medium cosmopoliteness.

4.2 Adoption of Improved Farm Practices

Adoption score of improved farm practices was ranged from 9 to 48. The average score was 25.45 with a standard deviation of 8.89. Based on the scores of adoption of improved farm practices, the rice farmers were classified into three categories as ‘low adoption’ (≤ 17), ‘medium adoption’ (18-34) and ‘high adoption’ (≥ 35). The distribution of the respondents according to their adoption of improved farm practices has been presented in Table 4.2.

Table 4.2 Distribution of the farmers according to their adoption of improved farm practices

Categories (Scores)	Respondents		Mean	Standard deviation
	Number	Percent		
Low adoption (≤ 17)	24	20.69	25.45	8.89
Medium adoption (18-34)	73	62.93		
High adoption (≥ 35)	19	16.38		
Total	116	100		

Findings in the Table 4.2 reveal that the highest proportion (62.93 percent) of the respondents had medium adoption of improved farm practices, while 20.69 percent had low adoption and the rest 16.38 percent had high adoption of improved farm practices in their rice cultivation. Table 4.2 showed that a majority (79.31 percent) of the farmers had medium to high adoption of improved farm practices. Conclusion can be drawn that adoption rate in the study area was encouraging. Farmers were trying to adopt improved farm practices though they had to face various socio-economic difficulties and had

limited resources. DAE and other extension organizations, especially the NGOs should provide more technological supports to the farmers. In such cases, it is expected that the farmers will be able to adopt improved farm practices with better performance.

4.3 Relationship between Adoption of Improved Farm Practices and Selected Characteristics of the Rice Farmers

Pearson's Product Moment Correlation Co-efficient (r) was computed in order to find out the extent of relationship between adoption of improved farm practices of the rice farmers and their selected characteristics. To reject or accept the null hypothesis, 0.05 level of probability was used. Results of correlation have been shown in Table 4.3. Correlation co-efficient among all the variables might be seen in the correlation matrix in appendix-B.

Table 4.3 Pearson's product moment co-efficient of correlation showing relationship between adoption of improved farm practices and the selected characteristics of the farmers

Dependent variable	Independent variables	Computed value of co-efficient of correlation 'r'	Tabulated value at 114 df	
			0.05 level	0.01 level
Adoption of improved farm practices	Age	-0.071 ^{NS}	0.184	0.241
	Education	0.577**		
	Family size	0.123 ^{NS}		
	Farm size	0.179 ^{NS}		
	Annual income	0.125 ^{NS}		
	Training exposure	0.324**		
	Organizational participation	0.586**		
	Extension media contact	0.384**		
	Cosmopolitaness	0.236*		

** Significant at the 0.01 level

* Significant at the 0.05 level

^{NS} Not significant

4.3.1 Relationship between adoption of improved farm practices and age

Relationship between age and adoption of improved farm practices was determined by Pearson's product moment correlation coefficient. The coefficient of correlation between age and adoption of improved farm practices was presented in Table 4.4. The coefficient of correlation (r) between the concerned variables was found -0.071. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under consideration.

- a. The relationship showed a negative trend between the concerned variables.*
- b. The observed value of "r" (-0.071) between the concerned variables was found to be smaller than the tabulated value ($r = 0.184$) with 114 degrees of freedom at 0.05 level of probability.*
- c. The null hypothesis could not be rejected.*
- d. The relationship between the concerned variables was not statistically significant at 0.05 level of probability.*

Based on the above finding, it was concluded that age of the farmers had no significant relationship with the adoption of improved farm practices. That is, farmers of all age categories can adopt improved farm practices.

4.3.2 Relationship between adoption of improved farm practices and education

Relationship between education and adoption of improved farm practices was determined by Pearson's product moment correlation coefficient. The coefficient of correlation between education and adoption of improved farm practices was presented in Table 4.4. The coefficient (r) of correlation between the concerned variables was found 0.577. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under consideration.

- a. *The relationship showed a positive trend between the concerned variables.*
- b. *The observed value of "r" (0.577) between the concerned variables was found to be greater than the tabulated value ($r = 0.241$) with 114 degrees of freedom at 0.01 level of probability.*
- c. *The null hypothesis was rejected.*
- d. *The relationship between the concerned variables was statistically highly significant at 0.01 level of probability.*

Based on the above finding, it was concluded that education of the farmers had significant positive relationship with the adoption of improved farm practices. That is, higher the education higher the adoption. Education really a powerful variable that influence farmers to adopt improved farm practices.

4.3.3 Relationship between adoption of improved farm practices and family size

Relationship between family size and adoption of improved farm practices was determined by Pearson's product moment correlation coefficient. The coefficient of correlation between family size and adoption of improved farm practices was presented in Table 4.4. The coefficient (r) of correlation between the concerned variables was found 0.123. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under consideration.

- a. *The relationship showed a positive trend between the concerned variables.*
- b. *The observed value of "r" (0.123) between the concerned variables was found to be smaller than the tabulated value ($r = 0.184$) with 114 degrees of freedom at 0.05 level of probability.*
- c. *The null hypothesis could not be rejected.*

- d. *The relationship between the concerned variables was not statistically significant at 0.05 level of probability.*

Based on the above finding, it was concluded that family size of the farmers had no significant relationship with the adoption of improved farm practices.

4.3.4 Relationship between adoption of improved farm practices and farm size

Relationship between farm size and adoption of improved farm practices was determined by Pearson's product moment correlation coefficient. The coefficient of correlation between improved farm practices knowledge and adoption of improved farm practices was presented in Table 4.4. The coefficient (r) of correlation between the concerned variables was found 0.179. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under consideration.

- a. *The relationship showed a positive trend between the concerned variables.*
- b. *The observed value of "r" (0.179) between the concerned variables was found to be smaller than the tabulated value ($r = 0.184$) with 114 degrees of freedom at 0.05 level of probability.*
- c. *The null hypothesis could not be rejected.*
- d. *The relationship between the concerned variables was not statistically significant at 0.05 level of probability.*

Based on the above finding, it was concluded that farm size of the farmers had no significant relationship with the adoption of improved farm practices.

4.3.5 Relationship between adoption of improved farm practices and annual income

Relationship between adoption of improved farm practices and annual income was determined by Pearson's product moment correlation coefficient. The coefficient of

correlation between belief about rice and adoption of improved farm practices was presented in Table 4.4. The coefficient (r) of correlation between the concerned variables was found 0.125. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under consideration.

- a. *The relationship showed a positive trend between the concerned variables.*
- b. *The observed value of "r" (0.125) between the concerned variables was found to be smaller than the tabulated value ($r = 0.184$) with 114 degrees of freedom at 0.05 level of probability.*
- c. *The null hypothesis could not be rejected.*
- d. *The relationship between the concerned variables was not statistically significant at 0.05 level of probability.*

Based on the above finding, it was concluded that annual income of the farmers had no significant relationship with the adoption of improved farm practices.

4.3.6 Relationship between adoption of improved farm practices and training exposure

Relationship between training exposure and adoption of improved farm practices was determined by Pearson's product moment correlation coefficient. The coefficient of correlation between training exposure and adoption of improved farm practices was presented in Table 4.4. The coefficient (r) of correlation between the concerned variables was found 0.324. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under consideration.

- a. *The relationship showed a positive trend between the concerned variables.*

- b. The observed value of "r" (0.324) between the concerned variables was found to be greater than the tabulated value ($r = 0.241$) with 114 degrees of freedom at 0.01 level of probability.*
- c. The null hypothesis was rejected.*
- d. The relationship between the concerned variables was statistically significant at 0.01 level of probability.*

Based on the above finding, it was concluded that training exposure had highly significant positive relationship with the adoption of improved farm practices. Training increases courage and enable the farmers to do new or complicated farming activities. As the first use of any improved farm practices may be complicated to the farmers' community, the finding of the study revealed the truth that training exposure is a significant attribute for adoption of improved farm practices.

4.3.7 Relationship between adoption of improved farm practices and organizational participation

Relationship between organizational participation and adoption of improved farm practices was determined by Pearson's product moment correlation coefficient. The coefficient of correlation between organizational participation and adoption of improved farm practices was presented in Table 4.4. The coefficient (r) of correlation between the concerned variables was found 0.586. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under consideration.

- a. The relationship showed a positive trend between the concerned variables.*
- b. The observed value of "r" (0.586) between the concerned variables was found to be greater than the tabulated value ($r = 0.241$) with 114 degrees of freedom at 0.01 level of probability.*

- c. The null hypothesis was rejected.*
- d. The relationship between the concerned variables was statistically highly significant at 0.01 level of probability.*

Based on the above finding, it was concluded that organizational participation of the farmers had significant relationship with the adoption of improved farm practices. Organizational participation helps the farmers to acquire more knowledge and lead them to become more localite that direct the farmers to be more innovative and adoptive.

4.3.8 Relationship between adoption of improved farm practices and extension media contact

Relationship between extension media contact and adoption of improved farm practices was determined by Pearson's product moment correlation coefficient. The coefficient of correlation between extension media contact and adoption of improved farm practices was presented in Table 4.4. The coefficient (r) of correlation between the concerned variables was found 0.384. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under consideration.

- a. The relationship showed a positive trend between the concerned variables.*
- b. The observed value of "r" (0.384) between the concerned variables was found to be greater than the tabulated value ($r = 0.241$) with 114 degrees of freedom at 0.01 level of probability.*
- c. The null hypothesis was rejected.*
- d. The relationship between the concerned variables was statistically significant at 0.01 level of probability.*

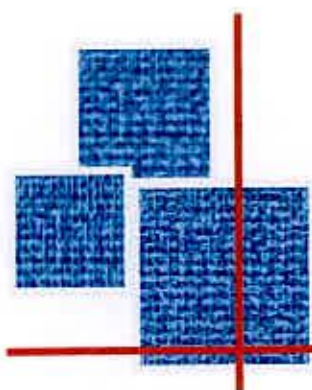
Based on the above finding, it was concluded that extension media contact of the farmers had significant positive relationship with the adoption of improved farm practices. The extension media contact strengthened the base of farmers' knowledge. The knowledge definitely acts as motivator towards adoption of new technologies. It means that higher the extension media contacts of the farmer lead to higher the adoption of improved farm practices.

4.3.9 Relationship between adoption of improved farm practices and cosmopolitanism

Relationship between cosmopolitanism and adoption of improved farm practices was determined by Pearson's product moment correlation coefficient. The coefficient of correlation between cosmopolitanism and adoption of improved farm practices was presented in Table 4.4. The coefficient (r) of correlation between the concerned variables was found 0.236. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables of the study under consideration.

- a. The relationship showed a positive trend between the concerned variables.*
- a. The observed value of "r" (0.236) between the concerned variables was found to be greater than the tabulated value ($r = 0.184$) with 114 degrees of freedom at 0.05 level of probability.*
- b. The null hypothesis was rejected.*
- b. The relationship between the concerned variables was statistically significant at 0.05 level of probability.*

Based on the above finding, it was concluded that cosmopolitanism of the farmers had significant relationship with the adoption of improved farm practices. Cosmopolitan farmers become adoptive by visiting and learning new things of agriculture.



Chapter 5

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

CHAPTER 5
SUMMARY OF FINDINGS, CONCLUSIONS AND
RECOMMENDATIONS

This chapter presents the summary of findings, conclusions and recommendations of this study.

5.1 Summary of Findings

5.1.1 Characteristics of the farmers

Age

The young aged rice farmers comprised the highest proportion (46.55 percent) followed by middle aged category (44.83 percent) and the lowest proportion were made by the old aged category (8.62 percent).

Education

The highest proportion (31.03 percent) of the respondents fell under category of “primary education” compared to 23.28 percent “illiterate” and “secondary education”, 17.24 percent “can sign only” and the rest 8.62 percent had “above secondary education”.

Family size

The small family size constituted the highest proportion (69.83 percent) of the farmers, while 22.43 percent had medium family size and the remaining 7.76 percent had large family size.

Farm size

The highest proportion (78.45 percent) of the farmers had small farm compared to 22.43 percent had medium farm and none of them had large farm.

Annual income

The highest proportion (56.90 percent) of the respondents had medium annual income compared to 31.90 percent fell in high income group and 11.20 percent in low income group.

Training exposure

The highest proportion (80.17 percent) of the respondents was in low training exposure group while, 17.24 percent of them had medium training exposure and only 2.59 percent had high training exposure.

Organizational participation

Among the farmers, the highest proportion (85.34 percent) of the rice farmers had low organizational participation while 10.34 percent had medium organizational participation and remaining 4.32 percent had high organizational participation.

Extension media contact

The highest proportion (52.59 percent) of the farmers had medium media contact, while 30.17 percent had low media contact and 17.24 percent of the respondents had high media contact.

Cosmopolitaness

The majority (60.34 percent) of the respondents were “medium cosmopolite” compared to 30.17 percent of them were “low cosmopolite” and the rest 9.49 percent were “high cosmopolite”.



5.1.2 Adoption of improved farm practices

The highest proportion (62.93 percent) of the respondents had medium adoption of improved farm practices, while 20.69 percent had low adoption and the rest 16.38 percent had high adoption of improved farm practices in their rice cultivation of the study area.

5.1.3 Relationship between adoption of improved farm practices and the selected characteristics of the farmers

Education, training exposure, organizational participation, extension media contact and cosmopolitaness had significant positive relationship with the adoption of improved farm practices. Family size, farm size and annual income had non-significant positive relationship with the adoption of improved farm practices. On the other hand, age had non-significant negative relationship with the adoption of improved farm practices.

5.2 Conclusions

Conclusions drawn on the basis of the findings of this study and their logical interpretation in the light of the other relevant factors are furnished below:

1. The adoption score of the farmers on improved farm practices was ranged from 9 to 48. Thus, all the sample farmers had been using more or less the improved farm practices in their rice cultivation. So, conclusion can be drawn that farmers of the study area were adopters in a several of degrees.
2. The major portion (79.31 percent) of the farmers had medium to high adoption of improved farm practices in the study area. Therefore, it may be concluded that the adoption extent by the farmers were moderate in the study area. However, to meet the ever-going demand of food, there is a need to further enhance the rate and extent of adoption of improved farm practices in rice cultivation by the farmers. Particularly, both the Government Organization (GO) and Non-Government Organization (NGO)

workers should provide appropriate technical and management related information to the farmers through continued extension and other support services.

3. Education had positively significant relationship with the adoption of improved farm practices. Therefore, it may be concluded that, high literacy and educational level among the farmers might have influenced high adoption of improved farm practices. Thus, mass literacy programme should be strengthened for the less educated farmers by the concerned authority.
4. A great majority (97.41 percent) of the farmers had low to medium training exposure, while there had a strong positive significant relationship between training exposure and the adoption of improved farm practices. Therefore, it may be concluded that, low trained farmers adopted less improved farm practices and with the increase of length of training of the farmers tends to increase their extent of adoption.
5. There had a positive significant relationship between organizational participation of the farmers and their adoption of improved farm practices. Therefore, it may be concluded that, involvement in different organizational activities might have encouraged the farmers to adopt the improved farm practices.
6. Extension media contact of the farmers had positive significant relationship with their adoption of improved farm practices. Therefore, it may be concluded that, any attempt to increase the extension media contact of the farmers would be helpful to increase the level of adoption of improved farm practices.
7. An overwhelming majority (90.51percent) of the farmers had low to medium cosmopolitanness, and there was a positive significant relationship between farmers' cosmopolitanness and their adoption of improved farm practices. Therefore, it may be concluded that, with the increase in cosmopolitanness of the farmers tends to increase their extent of adoption.

5.3 Recommendations for Policy Implications

Recommendations based on the findings and conclusions of the study are presented below:

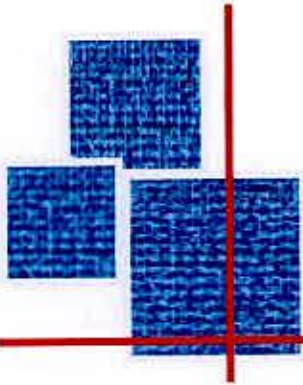
1. An increased rate and extent of adoption of improved farm practices are vitally important for increasing the rice production. But, a considerable proportion (83.62 percent) of the farmers had either medium or low adoption of improved farm practices. It is, therefore, recommended that, the DAE and different NGOs should be taken effective steps for strengthening extension services in order to change adoption behaviour of the rice cultivators.
2. Education of the farmers had significant positive relationship with their adoption of improved farm practices. Therefore, it may be recommended that, adult education should be provided to the farmers through training wing of DAE so that they could increase their educational level which might be helpful to increase their adoption of improved farm practices.
3. Length of training had significant positive relationship with their adoption of improved farm practices. Therefore, it may be recommended that, DAE and different NGOs should conduct more training programs that would make the farmers more skilled to adopt various new convenient technologies on improved farm practices.
4. Extension media contact had significant positive relationship with their adoption of improved farm practices. Therefore, it may be recommended that, extension service providers as well as other parties should increase their contact with the farmers so that the belief and attitude of farmers could increase. Because these are pre-conditions for adoption of improved farm practices. So, government should take necessary steps to improve the above characteristics of the farmers.
5. It may be recommended that massive demonstration programmes, training programmes, field trips etc. should be executed to make desirable changes in the

farmers' attitude and supply necessary inputs such as improved seed, fertilizer, IPM (Integrated Pest Management) tools, insecticides, irrigation facilities to be made available to the farmers at the right time and at a fair price.

5.3.1 Recommendation for further study

This study investigated adoption of improved farm practices by the farmers of Palashbari Upazila under Gaibandha District and mainly highlights some aspects of particular dimension (adoption of improved farm practices in rice cultivation) of agricultural development. As a small and limited research has been conducted in the present study cannot provide much information related to this aspect. Further studies should be undertaken to cover more information in the relevant matters. So the following suggestions were put forward for further research:

1. The present study was conducted only in three villages of Palashbari Upazila under Gaibandha District. Findings of the study need further verification through similar research in other parts of the country.
2. It is difficult to determine the extent of adoption by the farmers on improved farm practices. Measurement of adoption of the farmers is not free from questions. More reliable measurement of concerned variables is necessary for further study.
3. The study investigated the relationship of nine characteristics of the farmers with their adoption of improved farm practices. So it is recommended that further study would be conducted with other dependent and independent variables.
4. An exhaustive study on problems faced by the farmers in the adoption of improved farm practices in rice cultivation can also be undertaken.
5. Research should be undertaken on the effectiveness of agricultural extension services and other related organizations in helping farmers for adoption of innovations.



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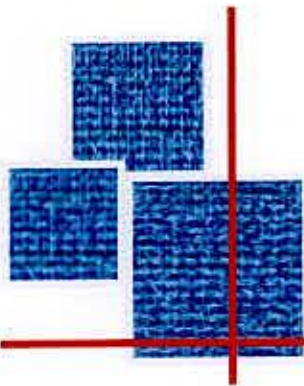
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Appendices

APPENDIX-A

ENGLISH VERSION OF THE INTERVIEW SCHEDULE
DEPARTMENT OF AGRICULTURAL EXTENSION AND INFORMATION SYSTEM
SHER-E- BANGLA AGRICULTURAL UNIVERSITY
SHER-E- BANGLA NAGAR, DHAKA-1207.

INTERVIEW SCHEDULE FOR A RESEARCH STUDY ENTITLED

“ADOPTION OF IMPROVED FARM PRACTICES IN RICE CULTIVATION BY THE FARMER”

Serial No:

Respondent Name:

Village: Union: Upazila: District:

(Please provide following information. Your information will be kept confidential and be used for research purpose only)

1. Age

What is your age? Years

2. Education

What is level of education?

a) Illiterate []

b) Can sign only []

c) Have passed class []

d) Did you read in school/madrasah but can read and write level of education is equivalent to class.....



3. Family Size

State the number of your family members Nos.

4. Farm Size

Please mention the area of your land from the following table

Sl. No.	Type of land used	Area of land	
		Local Unit	Hector
1.	Homestead land		
2.	Land under own cultivation		
3.	Land given to others on share cropping(borga)		
4.	Land taken from others on share cropping(borga)		
5.	Land given to others on lease		
6.	Land taken from others on lease		
7.	Pond		
8.	Garden		
Total farm size			

5. Annual income

Please mention the amount of annual income from the following sources

Sl No.	Sources of income	Taka
1.	Income from crops cultivation (field crops/vegetables /fruits)	
2.	Income from veterinary, poultry & fish	
3.	Service or other profession	
4.	Income from business	
5.	Others	

6. Training Exposure

Did you receive any kind of agricultural training in the last five years?

Yes...../ No..... (If yes, please furnished following information)

Sl. No.	Title of training course	Duration	Training Offering Organization
1.			
2.			
3.			
4.			
5.			

7. Organizational participation

Please mention the nature of your organizational participation with the following organizations(Tick the right place)

SL No.	Organization	No participation	Ordinary member	Executive member	Executive officer
1.	NGO organized group				
2.	Salish UnnyanKendro				
3.	Ansar/VDP				
4.	School Committee				
5.	Madrasah/Temple Committee				
6.	Farmer co-operative society				
7.	Mosque/Puja Committee				
8.	Hat/Bazaar Committee				
9.	Youth Club				
10	Union porishad				

8. Extension Media Contact

Do you communicate with the extension worker/organization?

Sl. No.	Media of communication	Regularly	Frequently	Occasionally	Rarely	Not at all
1	Model farmer					
2	SAAOs					
3	Agricultural Extension Officer					
4	Upazilla Agricultural Officer					
5	Group Discussion					
6	Field Day					
7	Method/ Result demonstration					
8	Television					
9	Radio					
10	Newspaper					

9. Cosmopolitaness

How frequently do you visit in the following selected places? Give (✓) tick mark against appropriate place

Place of visit	Nature of visit				
	Not at all	Rarely	Occasionally	Intermittently	Regularly
Other villages outside own village					
Nearby markets outside own village					
Own upazillasadar					
Other upazillasadar					
Own district town					
Other district town					
Capital city					

10. Adoption of improved farm practices

Have you adopted the following new technologies?

If answer is yes & continued it till now, when adopted please mention in the following questions

- a. Use of modern mechanical cultivation from.....years
- b. Use of High Yielding Variety(HYV) seed from.....years
- c. Straight-row and/or proper spacing of seedlings from..... years
- d. Use Urea Super Granular (USG) instead of urea from.....years
- e. Following controlledirrigation method.....years
- f. Use of Integrated Pest Management (IPM) from..... years
- g. Use of leaf color chart from.....years
- h. Use of organic fertilizer and/green manure from.....years

(Thank you for your nice cooperation)

Dated

Signature of the interviewer

Appendix-B. Correlation Matrix

Characters	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	Y
X ₁	1									
X ₂	-0.035	1								
X ₃	-0.152	0.021	1							
X ₄	0.029	0.085	0.124	1						
X ₅	-0.103	0.023	-0.035	-0.013	1					
X ₆	0.127	0.296**	0.042	0.003	0.262**	1				
X ₇	-0.018	0.353**	0.051	0.032	-0.009	0.183*	1			
X ₈	-0.091	0.257**	0.051	0.264**	0.074	0.201*	0.173	1		
X ₉	0.025	0.253**	0.066	0.074	0.064	0.056	0.269**	0.293**	1	
Y	-0.017	0.577**	0.123	0.179	0.125	0.324**	0.586**	0.384**	0.236*	1

X₁: Age

X₂: Education

X₃: Family size

X₄: Farm size

X₅: Annual income

X₆: Training exposure

X₇: Organizational participation

X₈: Extension media contact

X₉: Cosmopolitaness

Y: Adoption of improved farm practices

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