ADOPTION OF SELECTED INDIGENOUS TECHNOLOGIES BY THE FARMERS

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CERTIFICATE

This is to certify that the thesis entitled ***"ADOPTIONON OF SELECTED INDIGENOUS TECHNOLOGIES BY THE FARMERS"*** submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of *MASTER OF SCIENCE IN AGRICUTURAL EXTENSION AND INFORMATION SYSTEM*, embodies the result of a piece of bona fide research work carried out by ***Utpal Chowdhury, Registration No. 01005,*** under my supervision and guidance. No part of this thesis has been submitted for any other degree or diploma.

I further certify that any help or sources of information as has been availed of during the course of this inquire have been duly acknowledged and the contents & style of the thesis have been approved and recommended for submission.

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DEDICATED
TO
MY BELOVED PARENTS,
SISTER & BROTHER

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The Author

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ABSTRACT

The main purpose of the study was to examine the extent of adoption of indigenous technologies by the farmers and to found out the relationship between the selected characteristics of the farmers and there adoption of indigenous technologies.. The study was conducted two villages namely Khagbari and Ramshil of Kotalipara Upazilla under Gopalgonj District. Among the total farmers of Khagbari and Ramshil villages, 100 were selected as the sample of the study. A well structured protested interview schedule was developed based on objectives of the study for collecting information. The independent variables were: age, education, family size, annual family income, farm size, farming experience, extension media contact, agricultural knowledge, and fatalism of farmers. The dependent variable of this study was adoption of selected indigenous technologies by the farmers. Data collection was started on 15 January, 2008 and completed on 20 February, 2008. From the study it was found that the highest proportion (65.0 percent) of the farmers belongs to the group of medium adoption followed by 19.0 percent in low adoption group and 16.0 percent in high adoption group. Among the respondents, overwhelming majority (88 percent) were young to middle aged, 88 percent had either primary to secondary level of the education, 81percent had medium to small family size, 96 percent had low to medium family income, 96 percent had small to medium farm size, 73 percent had medium to high farming experience, 85 percent had low to medium media contact, cent percent had moderate to sound agricultural knowledge and 89 percent had low to medium fatalism. Age, family size, annual family income, , farming experience and agricultural knowledge had significant positive relation and farm size had significant negative relationship with adoption of indigenous technologies by the farmers whereas education, extension media contact and fatalism had non significant relationship with adoption of indigenous technologies.

CHAPTER I

INTRODUCTION

1.1 General Background

Bangladesh is predominantly an over populated agricultural based country with inhabiting about 141.8 millions of people in 147,570 sq. km of area (BBS, 2006). Again the addition of population per year is 1.8 million with an annual growth rate of 1.41 percent (UNICEF, 2006). About 80% of the total our populations are farmers. They have little or no access to people who occupy positions of influences, for the most part. They are illiterate, they also eat least (Lovell, 1991).

"Modern" agriculture in Bangladesh with high levels of external inputs like agrochemical, hybrid seed, fuel-based mechanization together with enhanced research and extension activities have contributed to an overall increase in the country's food production but have created observable dissonance in the agro ecosystem. Overexploitations of the limited natural resources have brought changes in the natural ecosystem, which threaten to undermine future progress.

Recently, considerable attention is being paid to the farmer's wisdom or indigenous or local knowledge systems in different parts of the world. For some, this knowledge provides a basis for identifying ecologically sustainable options of resource adoption. For others, these are cheaper sources of identifying ideas which have considerable scope for commercial exploitation in agriculture after value addition (Talawar and Singh, 1992). Moreover, through a proper understanding of the technological, sociological and other relevant aspects of

information technologies, the degree and direction of planned change for the client system could be properly assessed through formal research (Verma and Singh, 1969).

Bangladesh possesses a rich heritage of Indigenous technologies, though much of which is lost during modernization of agriculture. Still this country and people are proud to nurture many myths, believes and traditions (Chowdhury *et al.*, 1996). According to Warren (1991) "Indigenous knowledge is local knowledge that is unique to a given culture or society. This knowledge is the information base for a society; it facilitates communication and decision making. Indigenous knowledge is dynamic which changes through indigenous creativity and innovativeness as well as through contact with other knowledge system." This emphasizes the urgency of growing interest in documenting these local technologies and drawing the attention of researchers, development workers and funding agencies to the merits of preserving and improving them in order to achieve development of agriculture.

1.2 Statement of the problem

The economic survey which was done in our country the role of farmers cannot be overlooked. Farmers are the unprivileged category of the society. Farmers can play vital role in our economy. Active participation of farmers is important for the implementation of any development program.

The innovativeness of farmers has been well documented by Johnsan (1972), Reij *et al.* (1986), Lightfoot (1987), Millington (1987), and McCorkle *et al.* (1988). In current literature, the innovative farmers are now accepted as the norm, not the

exception and, in recent years, there has been a growing scientific interest in locally developed farming systems and technologies.

Being a new country in an ancient land, Bangladesh possesses a rich heritage of Indigenous technologies, though much of which is lost during modernization of agriculture. Still this country and people are proud to nurture many myths, believes and traditions (Chowdhury *et al.*, 1996). The historical, anthropological and socio religious traditions of Bangladesh particularly the Mauryan epigraphy, the puthi calendars of Bengal, the sayings of 'Khana' the Quran and Hadith, the value system of Hindus- all exhibit a strong indigenous awareness of the environment and natural resource conservation. Agriculture still is the main occupation of the majority people in Bangladesh, as it has been so far thousand years. Agriculture alone served the dwellers of this area in the challenging days when the other means of social survival had been forced out of the economy by colonial interest.

Farmers are prehistorically experienced with the indigenous farming technologies for minimizing risk with in their own domain using the existing facilities. The conventional technologies are most useful for the small and marginal farmers need special attention by the scientists and extension workers. Considering the above reasons and time available, the present study, therefore, aims to provide information regarding the following matters:

1. To what extent are these indigenous technologies were adopt by the farmers?
2. What are the selected characteristics of farmers?
3. What are the relationships exist between the characteristics of the farmers and their adoption of the indigenous technologies?

1.3 Objectives of the study

Objectives help researchers to get into the right truck. Meaningful, clear-cut and achievable objective are the key to success in all kinds of research. The research work was conducted with the following objectives:

1. To determine some selected characteristics of the farmers. The selected characteristics contain:
    - Age
    - Education
    - Family size
    - Annual family income
    - Farm size
    - Farming experience
    - Extension media contact
    - Agricultural knowledge
    - Fatalism
2. To examine the extent of adoption of indigenous technologies by the farmers in their farming,
3. To explore the relationship between selected characteristics of the farmers and their extent of adoption of ITs in agricultural farming

1.4 Justification and scope of the Study

Agriculture and environment has an in-built relationship. We need increased agricultural production keeping the environment healthy and friendly. Indigenous technical knowledge (ITs) is an appropriate package of technology in crop cultivation which is most economical and less hazardous to the environment. As most of the farmers of Bangladesh are poor, they could hardly adopt-modern technology for crop cultivation. According to FAO, the environmental problems of developing countries are largely due to overexploitation of lands, extension of cropping and deforestation. Some large irrigated areas are seriously affected by

salinity. Increased use of pesticides and artificial fertilizers are also causing environmental problems, particularly the degradation of soil texture including soil fertility. Referring to the no desert areas, 43% of Africa, 32% of Asia, and 19% of Latin America is at the risk of desertification (FAO, 1984). According to more recent global data given by the World Watch Institute (Brown, 1988) in several populous countries, agricultural production stagnated whereas population continued to grow.

Indigenous technologies are highly effective and applicable to many instances. ITs indicates the ways of improving soil structure, water holding capacity and nutrient and water availability without the use of artificial inputs. It keeps the farming systems sophisticated forms of ecological agriculture fine-tuned to the specific environmental conditions. The major strength of indigenous farming systems lie in their functional integration of different resources and farming techniques. By integrating various land-use functions (e.g., producing food, wood, etc. conserving soil and water; protecting crops; maintaining soil fertility) and the use of different biological components (trees, herbs, green manure etc), the stability and productivity of the farming system as a whole can be increased and the natural resource base can be conserved.

In Bangladesh, the role of farmers is strongly affected by social and religious norms, such as the selection of farmers, the veiling of farmers in public and the segregation of male and female. The restrictions constrain farmers' involvement

in farming activities. However, the farmers; productive involvement is high, especially in rural areas, which is not clearly reflected on official statistics.

Although the findings of this study will, be applicable to 2 villages under Kotalipara upazila of Gopalgonj district, it is expected that the findings may also have applicable to other areas of Bangladesh were the physical, socio-economic, and other cultural conditions do not differ much from those of the study

The findings of the study are expected to be useful to the students, researchers, extension personnel, policy makers to improve strategic of action for conserving friendly farm environment with the rural people.

1.5 Assumptions of the Study

An assumption in the supposition that an apparent fact or principle is true in the light of available evidence (Goode, 1945).

Following assumptions were in the mind of the researcher during conducting the study:

- The respondents selected for this study were competent to furnish proper responses to the queries included in the interview schedule.
- The responses furnished by the respondents were reliable. They expressed the truth about their convictions or opinions.
- Views and opinions furnished by the farmers included in the sample were the representative views and opinions of all the farmers of the study area.
- The researcher who acted as an interviewer was well aware of the social and cultural environment of the study area. Hence, the data collected by the researcher were free from bias and the respondents furnished their opinions without hesitations.

1.6 Limitations of the Study

In order to conduct the research in a meaningful and manageable way, it became necessary to impose some limitations in certain aspects of the study. Considering the time, money, labor and other necessary resources available to the researcher, the following limitations have been observed throughout the study:

1. The study was confined to purposively selected two villages of Kotalipara Upazila under Gopalgonj district.
2. There were many farmers in the study area, but only the selected who were involved in crop cultivation were considered for this study.
3. Personal and socio-economic characteristics of the respondents could be many but only nine were selected for investigation in this study.
4. There were many indigenous technologies practiced by the farmers in farming, but only eighteen indigenous technologies were selected for measuring the extent of their adoption.
5. The researcher relied on the data furnished by the farmers from their memory during interview.

1.7 Definition of Terms

Certain "terms" have been used in this study report that needs to be defined properly, so the findings of the study report become well-clarified to its users

Technology

Technology is a design for instrumental action that reduces the uncertainty in the cause-effect relationship involved in achieving a desired outcome (Rogers, 1983). In the other words, technology refers to the combination of knowledge, inputs, and management practices are used together with productive resources to gain a desired output (ILEIA, 1991:3).

Indigenous Technology (IT)

The terms "Indigenous Technology (IT)", "Indigenous Farming Technology (IFT)", "Indigenous Technical Knowledge (ITK)", "Traditional Knowledge", "Indigenous Techniques", "Farmers Knowledge System", "Local Knowledge" etc. have been interchangeably used in various literatures.

However, IT in the present study referred to the sum total of knowledge and practices which are based on people's accumulated experiences in dealing with situations and problems in various aspects of life, and such knowledge and practices are special to a particular culture (Wang, 1988).

Indigenous technology on crop production

This included the various indigenous techniques used by the farmers to manage different aspects of crop production like seed selection, seed treatment, intercultural operations, multiple cropping, relay cropping, fertility management, pest control, rising of seedlings, harvesting, processing and storing of farm products and the like.

Age

The age of a respondent was measured in terms of actual years from his birth to the time of interview on the basis of his statement.

Education

Empirically it was defined as the number of years spent by the respondent in receiving formal education.

Family size

Family size referred to the total number of members including the respondent himself, his wife, children and other permanent dependents who live and eat together in a family unit.

Annual family income

Annual family income of a respondent referred to the total earning in thousand taka by his and other members of his family from various agricultural (crop, livestock, vegetables, fruits and timbers, fish and other) and non-agricultural (service, business, other) sources in a year. Not only savings but also annual income of the respondent included the cost of maintaining his family.

Farm size

Farm size referred to the hectare of land area devoted to the maintenance of farming enterprise(s) by a farmer. It included the homestead, own land under own cultivation, land taken from or given to others on borga, land taken from or given to others on lease and miscellaneous land holdings which the farmer has got ownership upon and have the prospect of engaging in farming as and when she wishes.

Farming experience

Farming experience means duration of involvement with farming activities by the individual farmers. It is expressed in years.

Extension media contact

Refers to an individual's exposure to contact with different communication media and source and personalities being used for dissemination of new technologies among the farmers.

Agricultural Knowledge

It refers to the basic understanding of the farmers on different agricultural management practices namely, cultivation procedure, and use of judicious level of fertilizer and pesticides, high yielding variety, intercultural operation.

CHAPTER II

REVIEW OF LITERATURE

In this chapter, reviews of the literatures related to the major focus of the study are presented. This study is mainly related with the farmers to adoption of indigenous technologies in their agricultural farming. The first part deals with the concepts, significance and adoption/use of indigenous technologies by the farmers in agriculture farming. The second part, deals with the relationship of certain variables with adoption behavior of the client system. The third part, conceptual framework of the study has been formulated based on which the present study was conducted. However it should be mentioned that the terms "adoption" and "use" are logically same.

2.1. Concept, Significance and adoption of indigenous farming technology

2.1.1 Concept of indigenous farming technology

The terms "Indigenous Farming Technology (IFT)", "Indigenous Technology (IT)", "Traditional Technology", "Indigenous Techniques", "Local Technology" etc. have been interchangeably used in various literatures. However some reviews relating to the concept of indigenous farming technology are presented below:

Reijntjes *et al.* (1992) expressed that indigenous knowledge is not static. New techniques developed by a member of the community or introduced from outside, if locally beneficial, spread by word of mouth, imitation or informal education in

village meetings, initiation rites etc. and become part of IT. As new experiences are gained, other loses their relevance because of changing circumstances and needs. The capacity of farmers to manage change is also part of there IT system. Thus, IT can be seen as a dynamic and ever-changing accumulation of the collective experience of generations

Chowdhury *et al.* (1996) asserted of indigenous technology as" indigenous people and farmers develop their location specific knowledge and practices of agriculture, natural resource management, human and animal health care and many other subjects for centuries. This complex of knowledge, traditional beliefs and practices are generally known as indigenous or traditional knowledge."

2.1.2 Significance of indigenous farming technology

Scientists, development workers as well as policy planners round the globe are now in a consensus that emphasizing and evaluating local technologies would pave the way for a sustainable agricultural development. Some reviews of significance of indigenous farming technologies are given below:

Verma and Singh (1969) states that indigenous knowledge has undergone evolutionary process and is built from and based on thousands of years of experience. Traditional wisdom is time tested and understanding the dimension of technology of clienteles helps ascertaining the degree and direction of change through formal research.

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Gupta (1990) holds that the knowledge produced by peasants, pastoralists, artisans and woman in the household laboratory, the kitchen-is an important source of generation of technologies for sustainable development. Existing the frontiers of science is possible by building upon some of functional, intuitive, composite recipes of peasant culture.

Many indigenous technologies and decision making systems are useful for sustainable development (Warren, 1991), which include:

- The utility of indigenous mixed cropping systems and forest gardens has been realized.
- Ethno veterinary medicine includes folk beliefs, knowledge, skills, methods and practices pertaining to the health care of animals.
- There are several indigenous crop pest management techniques, which are important tools for gaining sustainability in agriculture.

These studies illustrate the need for understanding and working with indigenous knowledge system.

Talawar and Singh (1992) argued that abstracting the science underlying indigenous knowledge system would help us understand the concepts and practices depicting the elements of sustainability to integrate with the modern information system for efficient resource management.

Reijntjes *et al.* (1992) reported that in recent years, there has been a growing scientific interest in locally developed farming systems and technologies. These are seen as a source of sound ideas, locally adapted cultivars *and* practices which

could lead to sustainable use of resources. Indigenous technical knowledge is an important' source of information about the local farming system, experiences, institutions, culture etc. Above all, farmers' knowledge and skills in adapting new ideas to their local conditions and needs form the basis for change within the farming community.

Indigenous technologies used by one society to solve problems can also be used to solve problems faced by another society in a similar agro-ecosystem in another part of the world. This knowledge is a valuable natural resource by its internal creativity and experimentation as well as by contact with external systems. It helps assure that the end users of agriculture development projects are involved in developing technologies appropriate to their needs. It is cost effective as it builds on local development efforts enhancing sustainability and capacity building (Anonymous, 1994).

Shah (1994) stated that indigenous systems may not work in every situation, but the integration of local and external technologies can result in appropriate solutions.

Chowdhuiy *et al.* (1996) suggested that indigenous knowledge should be valued, as it comprises a storehouse of accumulated experience about natural resource management essential for sustainable agricultural development.

Sheheli (2003) pointed out that no training is necessary for using them as the IFTs are brung used since long in their own families.

2.1.3 Adoption of indigenous technologies

In this section literature reviews relating to the adoption of indigenous farming technologies in various aspects of crop, fishery and livestock production. ITs is an important source of information about the local farming system, experiences, institutions, culture etc. Above all, producers' knowledge and needs from the basis for change within the farming community (Reijaties *et al.* 1992).

Budathoki *et al.* (1989) reported that farmer uses cattle urine in vegetable crops as manure. It was reported that damp sand application in the crop field reduces soil pH (Anonymous, 1994). De Schlippe (1956) reported that the sites of termite mounds are particularly good for growing sorghum and cowpea.

Sheheli (2003) mentioned that IFTs are more readily available, cheap environmentally friendly and requires less technical knowledge for using.

Wilken (1987) found that, use of ant refuse in Zachilla and Mexico to fertilize high-value crops such as tomatoes, chill and onions. In India, ash applied in seedbed and in onion fields before sowing and planting helps in development and improvement of quality of bulbs. Farmers believe that this helps in soil reclamation (Anon., 1994).

Kashem *et al.* (1996) observed that the farmers in Bangladesh use muddy soil collected from the bottom of the pond to enrich the fertility of surface soil.

Altieri (1987) and Thurston (1990) opined that traditional crop selection, planting times and cultivation practices often reflect efforts to minimize insect damage.

The following indigenous pest control techniques are very effective (Anon., 1994):

- Mint leaves emit a pungent smell, which repels insects.
- Chilies and other hot peppers can be used on vegetables against the caterpillars, aphids, flies, ants and other pests.
- Pyrethrum acts as a botanical insecticide against caterpillars, aphids, flies, ant and other pests.
- Wood ash sprinkled on seedlings, helps repel cutworms.

The use of diluted cattle urine as pesticide has been reported by many. Lohar (1952) advocated that diluted urine was very effective in controlling powdery mildew on broad leaf mustard.

Koradia (1996) reported that uses of empty shells of cotton ball control a noxious weed *Cyperus rotundus.*

Hossain and Alam (1993) reported that the farmers in Kazirshimla of Mymensingh district, Bangladesh use the following indigenous techniques of pest control in crops:

- Haphazard planting of crops to reduce the infestation of certain weeds.
- Criss-cross hanging of banana leaf thread above brinjal plot to prevent bird attack.
- Digging deep ring around cabbage, cauliflower and tomato seedling to inhibit cutworm attack.
- Spreading sawdust over banana beetle.

- Using powdered seeds of peetraj *(Amoora rohutika)* as insecticide.
- Using ash as repellent.

Halim (1992) noticed that the farmers of Gazipur district cut deep ring in the oil around the cabbage, brinjal and cauliflower plants to prevent the attack of cutworm.

Chowdhury *et al.* (1996) reported that in Sunamganj, women farmers mix ash with kerosene and spread over leaves to control aphid infestation in vegetables.

To destroy aphids and sucking flies of cucurbits and country beans the vines are fumigated by igniting dry cow dung under the platform. Farmers of Lalmonirhat (Chowdhury *et al.*, 1996) do this practice.

Chowdhury *et al* (1996) found that seedlings of different fruit trees were protected from grazing animals by applying liquid cow dung on the stem.

Chowdhury *et al.* (1996) observed that neem cake powder was applied by the farmers in the field to control termite infestation.

Sing (2001) made a survey on the storage structures used by the farming community in North Bihar, India. He reported that they owned at least 13 different types of storage structures for storing of their agricultural products. Among all, gunny bags were in maximum (25.78%).

Prakash (1996) reported that dried leaves of neem and dried pepper stalk (after extracting pepper) are mixed with rice and other stored grains to repel pests in India.

In Lalmonirhat, farmers are collected mature leaves of 'Bishkatali', sun dried, powdered and applied in upper layers of storage grain to prevent insect attack in pulses (Chowdhury *et al.* 1996).

In Monohordi, Bangladesh tubers of local potato variety are kept in medium sized earthen container for better storage. The containers are placed one upon another (Chowdhury *et al.*, 1996).

Large sized ripe tomato fruits from first flash are collected. By cutting longitudinally into equal halves the juice with the seeds are gathered in an earthen bowl. When one kg of juice is collected powdered clay soil (about 2 kg) is mixed thoroughly with it. Small size balls or blocks are made with the moist clay, each of them is pierced by inserting a sharp stick. These clay balls/blocks are sun dried for several days, and hanged in a comer of the kitchen by making a garland with a rope. In the next season when the seedbed is ready for sowing, the soil blocks are powdered and spread in the bed. Preservation in this way helps maintain good germination capacity and is practiced by the farmers of Ranipukilr, Rangpur, Bangladesh (Chowdhury *et at.*, 1996).

In Gazipur, Chowdhury *et al.* (1996) found that the fanners preserve bottle gourd seeds by keeping them inside the fruit. Selected bottle gourds are kept in the vine. After the season is over, they are exposed to strong sunlight for through drying. The inner pulp dries up completely and dry seeds make sound when the shell is shaken. These are stored in dry corner of the house. A small cut is made in the upper portion of the fruit. Germination capacity is fully retained in this way.

The study of Chowdhury *et al.* (1996) revealed that farmers of different regions in Bangladesh practiced various techniques of multiple cropping which arc unique to the local agro-ecological and socio-cultural settings. Some of the techniques documented by them were:

- Relaying potato and pointed gourd,
- Relaying potato and sweet gourd,
- Relaying potato and pepper,
- Intercropping potato and wheat,
- Intercropping potato and bitter gourd,
- Intercropping gourd, cucumber, potato and leafy vegetables like 'napa shak' and lal shak',
- Intercropping ash gourd, sweet and ginger with pineapple, and
- Intercropping vegetables like cauliflower, cabbage, tomato, red amaranth etc. with sugarcane.

Hossain and Alam (1993) observed that the farmers of kazirshimla, Mymensing plant bitter gourds need the rhizome of banana plants in the belief that the water supply by the banana plant enhances the growth of bitter gourd and intercropping gram and lentil.

2.2 Studies concerning the relationship of certain variables of the client systems and their adoption/use of IT

2.2.1 Age and adoption/use

Iqbal (1963) reported that elderly farmers were more to adopt modern agricultural practices as compared to other age groups.

Naher (2000) in her study found that there was no relationship between ages of rural women and their participation in homestead vegetable cultivation, post harvest practices, poultry raising and goat rearing, while the activities in vegetable, cultivation are mostly participated by the younger housewives.

Ogunfiditimi (1981) concluded that age of the farmers in relation to adoption was a positive but not significantly correlated. He suggested that age of a farmer did not contribute to the use of recommended farm practices.

Nidagundi (1985) in his study found that there was no significant relationship between the age of the farmers and their adoption behaviour.

Gogoi and Gogoi (1989) in a study found that age had a significant negative effect on the adoption of recommended plant protection practices.

Khan (1993) in his study found that age of the fanners was significantly related with their adoption of insecticides. He also stated that with the increase of age of the fanners the adoption of insecticides reduces i.e. age was negatively related with adoption.

Islam (1996) found that age of the farmers had significantly negative relationship with their extent of use of ITK.

Sheheli (2003) found non significant negative relation between age and use of indigenous farming technologies by rural women in Mymensingh district.

2.2.2 Education and adoption/use

Singh (2001) found that family education of the farmers was positively significantly related to adoption of agricultural technology.

Kaur (1988) observed that education influenced the opinion of the women about the project activity and adoption of vegetables gardening, animal husbandry etc.

Kashem and Mikuni (1998) did not find any relationship between education of the farmers and their perception about benefits of using ITK.

Carlier (1987) found that education of fanners had a significant relationship with their adoption behavior.

Chamrakala et.el. (2001) observed no significant relationship between education of the farmers and their adoption of dry land farming practices.

Khan (1993) studied on the adoption of insecticides and related issues in the village of Pachar union, Madaripur district. He observed that education had a significant positive relationship with the adoption of insecticides. The similar findings also been

reported by Rahim (1961), Bose and Saxena (1965), Chowdhury *et al,* (1968), Hossain (1971), Rao (1976), Halim (1982), Ali and Chowdhury (1983) and Bashar (1993) in their respective studies.

Sheheli (2003) found non significant negative relation between level of education and use of indigenous farming technologies by rural women in Mymensingh district.

2.2.3 Family size and adoption/use

Halim and McCarthy (1985) reported that women performed different types of economic activities like post harvest, vegetable gardening, livestock care etc. and their rate of involvement depended on family structure.

Roa (1976) reported that rural women's participation in agriculture was negatively correlated with the size of their family.

Hossain (1991) in his study in Sadar Upazila of Jamalpur district observed that family size of the farmers had no significant effort on their adoption of improved farm practices.

Sheheli (2003) found significant positive relation between family size and use of indigenous farming technologies by rural women in Mymensingh district.

2.2.4 Annual family income and adoption/use

Kaur (1988) observed that income level of rural women was highly associated with the use of improved agricultural technologies (HYV seeds, fertilizers and chemicals).

Hoque (1984) in his study found a positive relationship between income of the farmers and their adoption of improved farm practices.

Islam (1996) found a negative and significant relationship between annual income of the farmers and their extent of use of ITK.

Sheheli (2003) found significant positive relation between annual family income and use of indigenous farming technologies by rural women in Mymensingh district.

2.2.5 Farm size and adoption/use

Kashem and Mikuni (1998) did not find any significant relationship between farm size and perception about benefits of using ITK among Bangladeshi and Japanese farmers.

Karim (1973) indicated in his study that farm size of the transplanted aman growers had a substantial positive relationship with their use of fertilizers.

Hossain (1981) in his study on the adoption of four improved farm practices revealed a consistent and positive relationship between size of farm and use of all the four practices by the farmers.

Ogunfiditimi (1981) found that farm size had a negative correlation to use of the new farm practices.

Islam (1996) found that the farm size of the farmers had a significant negative relationship with their extent of use of indigenous technical knowledge (ITK).

Sheheli (2003) found significant positive relation between farm size and use of indigenous farming technologies by rural women in Mymensingh district.

2.2.6 Farming experience and adoption/use

Chowdhury (1996) conducted a study in Nawabgonj, Dhaka on the factors affecting adoption behaviour of Boro rice growers. He reported that farming experience significantly influenced farmers in accepting production technologies.

Islam (2006) found the farming experience of the farmers had positively significant relationship with their adoption of brinjal production technologies.

Khalil (1998) mentioned in his study that farming experience of the farmers had low association with their use of different information sources.

2.2.7 Extension media contact and adoption/use

Halim (1982), Ali *et al.* (1986) and Bashar (1993) found no relationship between contact with extension workers and farmers' adoption behaviour regarding improved crop production practices.

Significant positive relationship between extension contact and adoption of improved farm practices were observed by Fligel (1956), Hardee (1965), Moulik *et al.* (1966), Rao (1976), Grewal (1980), Bezbora (1980), Mohammad and Mahboob (1981), Hossain (1981), Osunlogun *et al.* (1986), Mustafi *et al.* (1987), Igodan *et al.* (1988), Ali (1993) and many other researchers.

Islam (1996) observed in his study that a significant and positive relationship between the media exposure of the farmers and their extent of *use of* indigenous technical knowledge.

Sheheli (2003) found non significant positive relation between extension media contact and use of indigenous farming technologies by rural women in Mymensingh district.

2.2.8 Agricultural knowledge and adoption/use

Chandrakala and Eswarappa (2001) revealed that majority of the farm women labors had high level of knowledge and medium level of adoption.

Akter (2000) in his study found that agricultural knowledge of the women significant positive relationship with their participation in decision making role the family with regard to development activities.

Akanda (2000) in his study found that agricultural of the rural women had positive relationship with their participation in the cultivation of fruit trees.

2.2.9 Fatalism and adoption/use

No literature was found on the relationship between fatalism and adoption of innovation.

2.3 The Conceptual Framework

The prime objective of the present study was to deal with the adoption of ITs by farmers in the contest of sustainable agriculture development. In Bangladesh most of the land is being used for agricultural activities to meet the need of growing population years after years. This practices results in a number of adverse effects on environment. Reports of many research findings recognized soil quality deterioration, health hazards due to environmental pollution, deterioration of socio-economic condition of rural people. The change agent should try to motivate the client to change their behavior and thoughts. So, before taking any extension programmed everybody should know their economical, social status, beliefs, feelings and actions in this respect.

It is important to know and understand what the concept of IFTs is and what beneficial role ITs can play in farming and what is farmers' reaction about the issue. This study, thus attempts to address the matter that what does the farmers' get benefit from using ITs in farming. It is evident from the past studies that the every occurrence or phenomenon is the outcome of a number of variables which may or may not be interdependent or interrelated with each other. In the other words, no single variable can contribute wholly to a phenomenon.

The conceptual framework was kept in mind in farming the structure arrangement for the dependent and independent variables. It also included the other factors that may play probable role in this case. The extent of adoption of indigenous technologies was considered as dependent variables and their nine characteristics were selected as independent variable for investigation in the present study. In the light of the foregoing discussions, a conceptual framework has been developed for this study, which is diagrammatically shown in Figure 2.1.

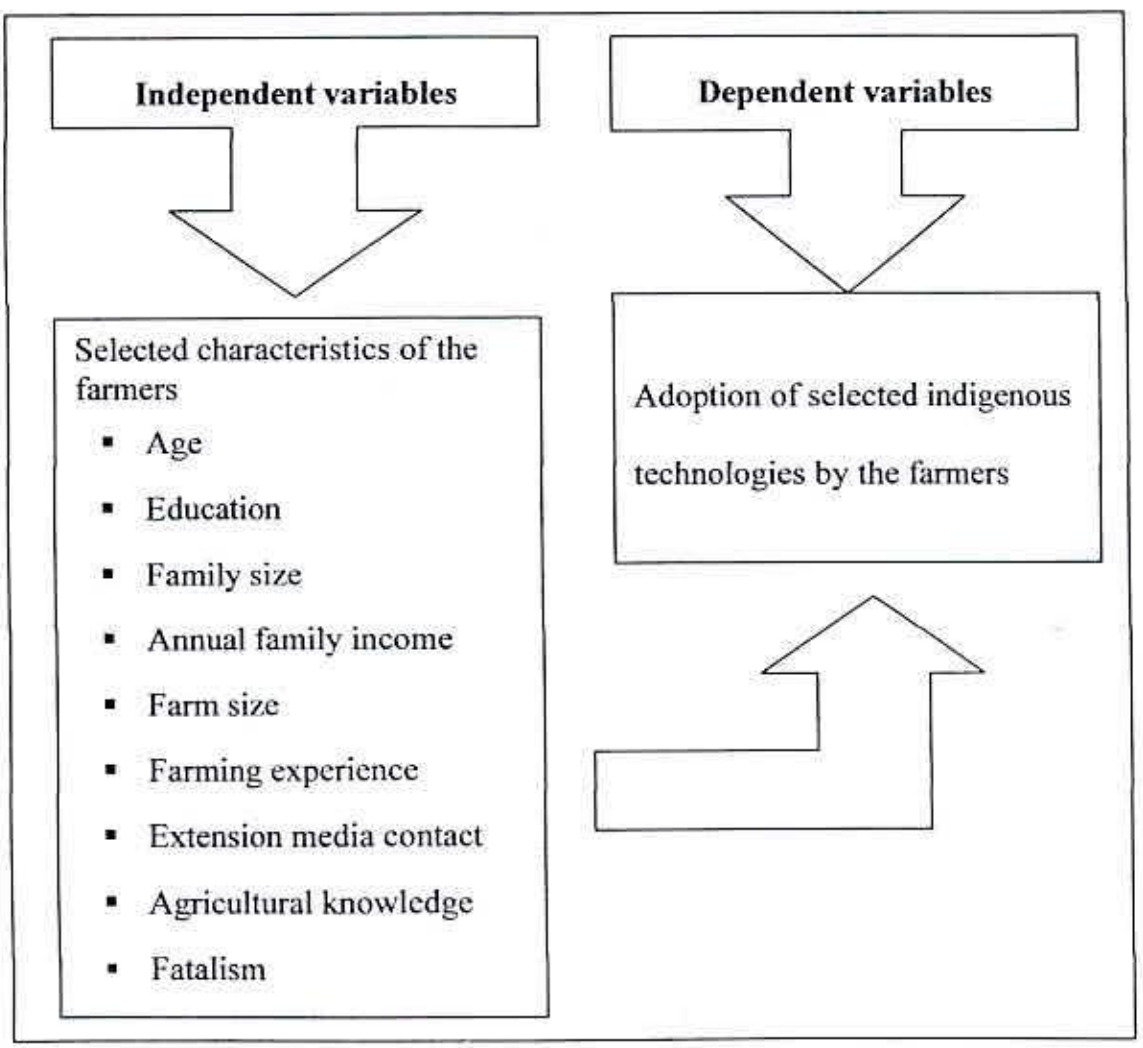

Figure 2.1 The conceptual framework of the study

CHAPTER III

METHODOLOGY

To perform a research work systematically, careful consideration is a must. Methodology plays an important role for systemically data collection, analysis and suitable direction of analysis in a systematic manner. It also enables the researcher to collect valid and reliable information to arrive at correct decisions. The methods and procedures followed in conducting this study have been described in this chapter.

3.1 Locale of the study

Two villages namely Khagbari and Ramshil of Kotalipara Upazila under Gopalgonj District were selected purposefully as the locale of the study. These two villages are 12 km far from Kotalipara head quarter with developed communication facilities and educational opportunities. Both GO and NGOs were working on crop technologies and development in these two villages. For this reason these two villages were selected as the locale of the study. A map of Gopalgonj District showing Kotalipara and an other map of Kotalipara Upazila showing Ramshil the study area are presented in Figure 3.1 and 3.2, respectively.

3.2 Population of the study

All of the farmers of those two selected villages were conducted to be the population of the study. There were 1250 farmers in two villages (Table 3.1).

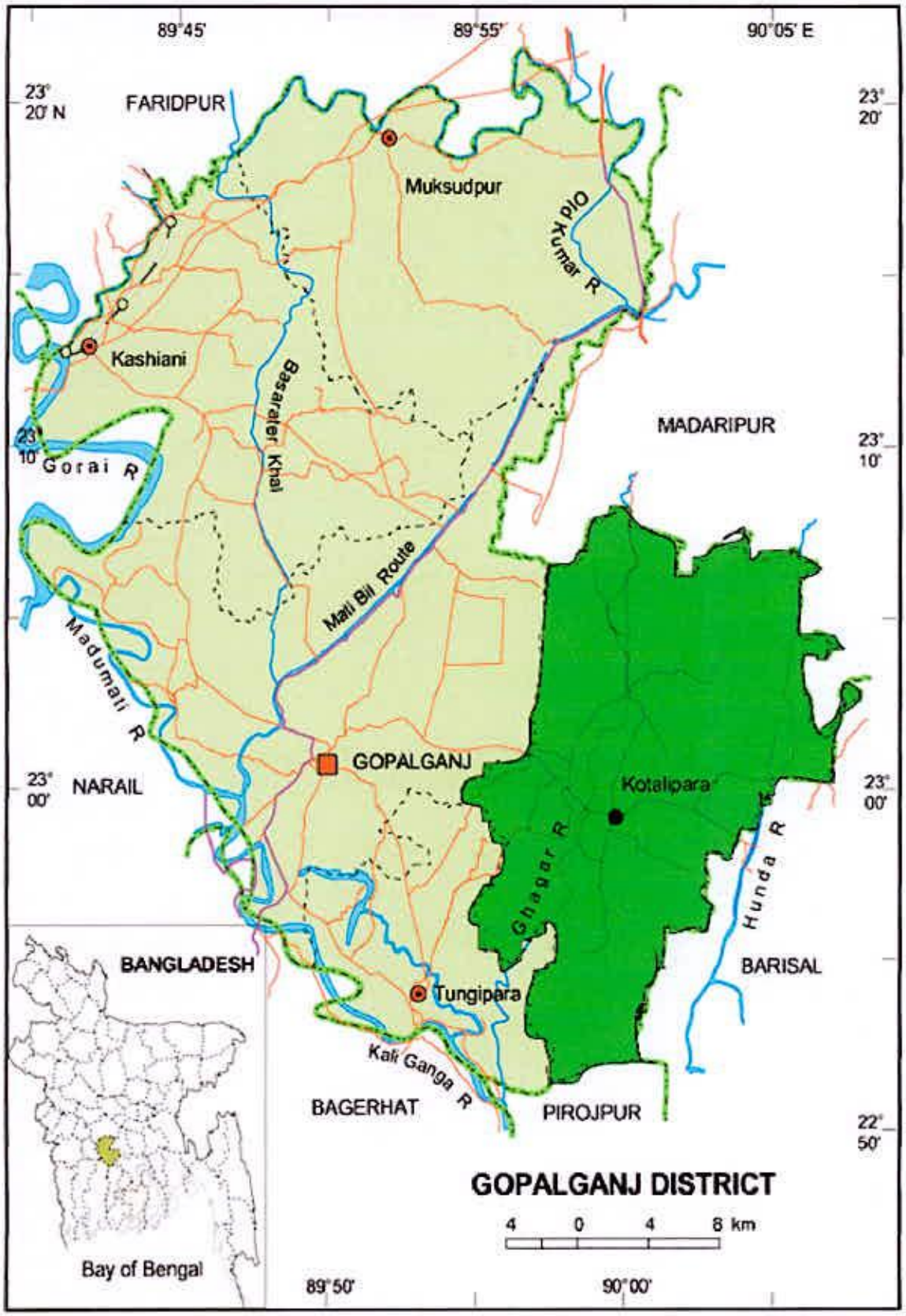

Figure 3.1 A Map of Gopalgonj District showing Kotalipara Upazila

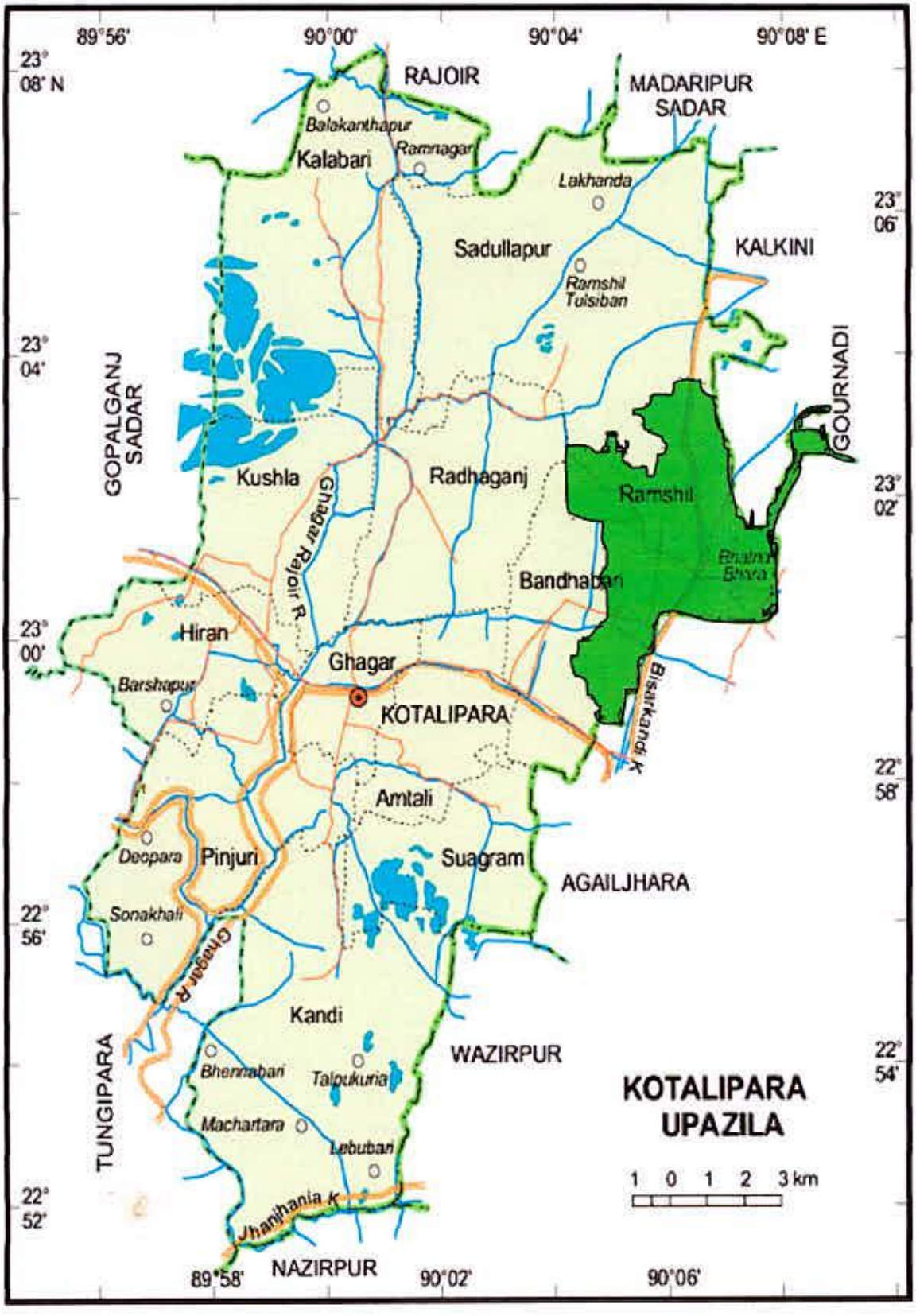

Figure 3.2 A Map of Kotalipara Upazila showing the study Union

An up to date list of farmers was collected with the help of concerned Union Parishad.

3.3 Sample of the study

The numbers of farmers of Khagbari and Ramshil Villages were 525 and 725 respectively. An eight percent (8%) of the farmers were selected randomly and proportionally from each of the selected two villages. Thus, the sample size so drawn stood at 100. In addition to this, 10% of the sample was selected randomly and proportionately from the population of each of the selected two villages which constitute the reserve list. In case of any respondent included in the original sample was not available or found unsuitable at the time of data collection, he was replaced from this reserve list of 10 farmers. The distribution of the population, sample and reserve list is shown in Table 3.1.

Table 3.1 Distribution of population, sample and reserve list

Name of the villages	Name of Union	Total number of farmers	Sample size	Farmers included in reserve list
Khagbari	Ramshil	525	42	4
Ramshil	Ramshil	725	58	6
Total		1250	100	10

3.4 Variables of the study and their selection

An independent variable is that factor which is manipulated by the researcher in his attempt to ascertain its relationship to an observed phenomenon. A dependent variable is that factor which appears, disappears or varies as the research introduces, removes or varies the independent variables (Townsend, 1953). The

dependent variable is often called criterion or predicted variable, whereas independent variables is called the treatment, experimental or antecedent variable (Dalen, 1977).

For selection of dependent or independent variable, the researcher went through the past related literature and discussed with experienced researchers, teachers, local leaders and experts, in relevant fields of agricultural extension. Before setting the variables of the study, the researcher himself visited the study area and talked to the farmers. After discussions with the supervisor and co-supervisor and considering time, money and other sources available for the study, one dependent and nine characteristics of the farmers as independent variables were selected for the study. The dependent variable was: adoption of selected indigenous technologies and the independent variables were: i) age, ii) education, iii) family size, iv) annual family income, v) farm size, vi) farming experience, vii) extension media contact, viii) agricultural knowledge and ix) fatalism.

3.4.1 Measurement of independent variables

Nine selected characteristics of the respondent farmer constituted the independent variables of this study. The procedure of measurement of the selected variables is presented below:

3.4.1.1 Age

The age of a respondent was measured in terms of actual years from his birth to the time of interview on the basis of his statement. A score of one (1) was assigned for each year of his age.

3.4.1.2 Education

The education of farmer was measured by the complete years of schooling as indicated by his in response to item no. 2 of the interview schedule (Appendix A). If a respondent did not know how to read and write, his education score was taken as zero (o) but if he could sign his name only, he got a score of 0.5. Besides, the respondents got actual score for the number of year of schooling i.e., 1 for class one, 2 for class two and so on.

3.4.1.3 Family size

The family size of a farmer was measured by computing actual number of members in his family including himself, his wife, children, brothers, sisters, parents and other person who jointly live and ate together during interviewing.

3.4.1.4 Annual family income

Annual family income of a respondent was measured by computing an "Annual family income score" on the basis of total yearly earnings in taka from agriculture and other sources by himself and other members of his family as provided in response to item no. 4 of the interview schedule (Appendix A). He was asked to indicate the total earnings of his family from crop production, livestock rearing, poultry rising, fish culture, services, business, labor and other sources. The earnings from these sources were added together for computation of annual family income score. A score of (1) was assigned for each one thousand taka.

3.4.1.5 Farm size

The farm size of the respondents was computed in hectares using the following formula:

$$FS = A_1+A_2+0.5(A_3+A_4)+A_5+A6$$

Where

Fs = Farm size
A_1 = Homestead area
A_2 = Own land under own cultivation
A_3 = Land given to others on borga
A_4 = Land taken from others on borga
A_5 = Land taken from others on lease
A_6 = Own pond

3.4.1.6 Farming experience

Farming experience of the respondents farmers were measured by the year since his involvement in farming activities.

3.4.1.7 Extension media contact

In this study, the extension media contact score was computed for each respondent on the basis of the extent of his contact with 12 selected media as ascertained from his responses to item No. 7 in the interview schedule.

A four-point rating scale ranging from "not at all, rarely, occasionally and frequently" was developed for this purpose. The scoring technique used for computing the media exposure score of respondent is given below:

Nature of extension contact	Scores assigned
Not at all	0
Rarely	1
Occasionally	2
Frequently	3

Extension media contact score was determined by summing the scores of all the 12 selected extension media. Thus, extension media contact score of the farmers could range from 0 to 36, where zero (0) indicated no extension media contact and 36 indicated highest extension media contact.

3.4.1.8 Agricultural knowledge

Agricultural knowledge referred to the knowledge gained by the farmers. Twenty questions on different aspect of agriculture related to crop varieties, soil, fertilizer, insect, pest, disease and cultural practices were asked to the farmers to ascertain their agricultural knowledge score. The score was assigned as 2 for correct answer and zero (0) for incorrect or no answer for each question. Partial score was assigned for partial answers. Thus agricultural knowledge scores of the respondents could range from 0 to 40. Where zero (0) indicated very low agricultural knowledge and 40 indicated very high agricultural knowledge.

3.4.1.9 Fatalism

It was measured on the basis of inferences drawn from the oral actions and verbal statements of believes and feelings of the respondents. A 12-item fatalism related statement developed by Ali (1995) was used for measuring fatalism score of the

respondents. These items consist of 7 positive and 5 negative items and were arranged randomly in the scale. The respondents indicated for each statement of the scale whether they strongly agreed, agreed, have no opinion, disagreed and strongly disagreed. Weights were assigned to the above responses were 4, 3, 2, 1 and 0, respectively for positive statements and the weighting system was reversed for the negative statements. Fatalism score of a respondent was obtained by adding the weights for his responses against all the statements of the scale. Fatalism scores of the respondents could range from 0 to 48, where 0 indicating no fatalism and 48 indicating vary high fatalism.

3.4.2 Measurement of dependent variable

The present study includes only one dependent variable – adoption of indigenous technologies by the farmers. It was measured by computing adoption of indigenous technologies score. Twenty five indigenous technologies were identified on the basis of field survey and consultation with the farmers of the study area. These 25 indigenous technologies with the 9-point continuum against each of the technologies were given to 30 Judges selected from different related disciplines. Letter to Judges from the Thesis Supervisor of this research appears in Appendix-C with the list of Judges. Judges were requested to mention there opinion in 9-point suitability continuum against each of the indigenous technologies. Therefore, the responses of all Judges retained for selection of indigenous technologies for the study. Suitable Index (SI) of each technology was determined by the following formula:

$$SI = 9\times f_9+8\times f_8+7\times f_7+6\times f_6+5\times f_5+4\times f_4+3\times f_3+2\times f_2+1\times f_1$$

Where,

f_9 = No. of Judges mentioning their opinion as the respective indigenous technology was most suitable, i.e. no. of Judges mentioning their opinion in the 9^{th} column of 9-point suitability continuum against the respective technology

f_8 = No. of Judges mentioning their opinion as the respective indigenous technology was next to most suitable

f_7 = No. of Judges mentioning their opinion in the 7^{th} column of 9-point suitability continuum against the respective indigenous technology

f_6 = No. of Judges mentioning their opinion in the 6^{th} column of 9-point suitability continuum against the respective indigenous technology

f_5 = No. of Judges mentioning their opinion as the respective indigenous technology was moderately suitable, i.e. no. of Judges mentioning their opinion in the 5^{th} column of 9-point suitability continuum against the respective technology

f_4 = No. of Judges mentioning their opinion in the 4^{th} column of 9-point suitability continuum against the respective indigenous technology

f_3 = No. of Judges mentioning their opinion in the 3^{th} column of 9-point suitability continuum against the respective indigenous technology

f_2 = No. of Judges mentioning their opinion in the 2^{th} column of 9-point suitability continuum against the respective indigenous technology

f_1 = No. of Judges mentioning their opinion as the respective indigenous technology was least suitable, i.e. no. of Judges mentioning their opinion in the 1^{th} column of 9-point suitability continuum against the respective technology

Eighteen indigenous technologies were finally selected from twenty five indigenous technologies by Judgment Ratting to measure the extent of adoption of indigenous technologies by the farmers. The respondents were asked to indicate their extent of adoption to each of the 18 indigenous technologies along a four-point rating scale: "frequently", "occasionally", "rarely" and "not at all". Scores were assigned to these responses in the descending order of 3, 2, 1 and 0 respectively. The four–point scale used in this measurement need to be explained

to enable one to make sense of the implicit ideas that each of the point holds. The explanations go as follows:

- **Frequently**- this point indicates characteristics of the adoption of a particular indigenous technologies by a respondent exclusive of other means (modern techniques) when the necessity and scope of using that indigenous technologies arises. The term "frequently" referred to almost regular use of particular indigenous technologies to achieve a particular outcome without using other means which could be used as the substitute of those indigenous technologies.
- **Occasionally**- it referred to the irregular use of indigenous technologies. The term was used when it was found that the farmers sometimes used indigenous technologies while in successive cases utilized other modern techniques also to achieve same outcome.
- **Rarely**- this point is self-explanatory. It referred to the rare adoption of indigenous technologies by a respondent.
- **Not at all**- this point is also self-explanatory. It was employed in case the farmers never utilized particular indigenous technologies. Moreover, farmers having knowledge on particular indigenous technologies did not ever apply that in his circumstances was also placed under this category.

Employing the above rating scale, score on the "extent of adoption of indigenous technologies" for an individual respondent was calculated by summing up the scores for all the 18 enlisted indigenous technologies as appears in interview schedule item no. 10 (Appendix-A). The "extent of

adoption of indigenous technologies" score for an individual respondent could range from 0 to 54 where 0 indicates no adoption of indigenous technologies and 54 indicates maximum adoption of IT.

3.5 Statement of Hypothesis

The following hypothesis was formulated to explore the relationships between the dependent and independent variables. The research hypothesis for this study was: "There is a relationship between each of the selected personal characteristics such as age, education, family size, annual family income, farm size, farming experience, extension media contact, agricultural knowledge and fatalism of the farmers and their adoption of indigenous technologies".

For testing this hypothesis statistically, they were transformed into null form as follows:

"There is no relationship between each of age, education, family size, annual family income, farm size, farming experience, extension media contact, agricultural knowledge and fatalism of the farmers and their adoption of indigenous technologies".

3.6 Research Instrument for Data Collection

For the purpose of data assembling, well prepared, up-to-date personal interview schedule was prepared carefully keeping the objectives of the study in mind. The questions and statements content in the schedule were simple, direct and easily understandable by the farmers without giving rise to any doubt and

misunderstanding in their mind. The schedule was prepared in Bengali for clear understanding of the respondents.

The interview schedule was pre-tested with fifteen farmers in actual field situation before finalizing the same for collection of final data. Some minor corrections, additions, alterations, rearrangements and adjustments were made in the schedule based on pre-test experiences. The schedule was then cyclostyled in its final form for the collection of data. An English and a Bengali version of the interview schedules are enclosed at Appendix-A and Appendix-B, respectively.

3.7 Collection of Data

Data were collected by the researcher himself through interview of sampled farmers using the interview schedule. The researcher sought help from local leaders and Sub Assistant Agriculture Officer (SAAO) to familiarize him with the study area for getting local support and establishing rapport during interview of farmers. Before going to the respondents for interview, they were informed verbally to ensure their availability at the proper places as per scheduled date and time. If any respondent failed to understand any question, the researcher took top care to explain the issue. When originally listed respondents were repeatedly unavailable for data collection, the reserve-listed respondents were interviewed. Excellent co-operation and co-ordination were obtained from all respondents who were concerned in the field during data collection. Data for this study were collected through personal interview by the researcher himself during January 15, 2008 to February 20, 2008.

3.8 Compilation of Data

After completion of field survey, all the responses in the interview schedules were given numerical coded values. Local units were converted into standard units. The responses to the questions in the interview schedules were transferred to a master sheet to facilitate tabulation.

3.9 Statistical Analysis

Data collected for this study were complied, categorized, tabulated and analyzed in accordance with the objectives of the study. Statistical measures such as number and percentage distribution, range, mean, and standard deviation were used in describing the adoption of indigenous technologies by the farmers in farming and the selected characteristics of the respondents. For clarity of understanding, tables were also used in presenting the data. For exploring the relationships between selected characteristics of the farmers with their extent of adoption of ITs, Pearson's product-moment correlation coefficient (r) was used. Five-percent (0.05) level of probability was used as the basis for rejecting any null hypothesis.

CHAPTER IV

RESULTS AND DISCUSSION

This chapter deals with the findings that were recorded in accordance with the objective of the study that was collected with the help of an interview schedule. It contains findings and possible interpretation of the recorded information. The chapter has three (3) sections. The first section deals with the characteristics of the respondents farmers. The second section deals with the adoption of selected indigenous technology by the farmers. The third section deals with the relationship between individual characteristics of the farmers and their adoption of selected indigenous technologies.

4.1 Characteristics of the respondents

An individual possesses various interrelated characteristics. It was therefore, hypothesized that the characteristics of the farmers would have an effect on adoption of selected indigenous technology. However, the salient features of nine selected characteristics of the respondent farmers such as age, education, family size, annual family income, farm size, farming experience, extension media contact, agricultural knowledge and fatalism by the farmers are presented below:

4.1.1 Age

The age of the farmers ranged from 21 years to 57 years with the mean and standard deviation of 37.72 and 9.742, respectively. Considering the observed age of the respondent farmers was classified into three categories namely 'young

aged, 'middle aged' and 'old aged'. The distribution of the respondent farmers on the basis of age is presented in Table 4.1.

Table 4.1 indicates that the young farmers constitute the highest proportion (45 percent) followed by middle aged (43 percent) and the lowest proportion was made by the old category (12 percent). Data also indicates that the young and middle aged farmers constitute an overwhelming majority (88 percent) of the respondents. The middle and old farmers generally tend to involve in indigenous agricultural technologies than the younger.

Table 4.1 Distribution of the farmers according to their age

Categories (Years)	Respondents'		Mean	Standard deviation
	Number	Percent		
Young (below 35)	45	45.0	37.72	9.742
Middle (36-50)	43	43.0		
Old (above 50)	12	12.0		
Total	100	100		

4.1.2 Education

The education of the respondent farmers ranged from 0 to 16 with the mean and standard deviation of 5.48 and 3.351 respectively. Based on their education, the farmers were classified into five categories 'illiterate' (0), 'can sign name only' (0.5), 'primary education' (1 to 5), 'secondary education' (6 to 10), higher secondary and above higher secondary (above 10). The distribution of the farmers according to their education has been presented in Table 4.2.

Table 4.2 Distribution of the farmers according to their education

Categories (Schooling years)	Respondents'		Mean	Standard deviation
	Number	Percent		
Illiterate (0)	4	4.0	5.48	3.351
Can sign only (0.05)	6	6.0		
Primary education (1-5)	41	41.0		
Secondary education (6-10)	45	45.0		
Above secondary (above 10)	4	4.0		
Total	100	100		

Table 4.2 shows that more than half (51%) of the farmers were either illiterate or could sign their name only or had primary level of education compared to 45 percent secondary and 4 percent above secondary level. Education broadens the horizon of outlook of farmers and expands their capability to analyze any situation related to production.

4.1.3 Family Size

Family size of the respondents' farmers ranged from 4 to 12 with the mean and standard deviation of 6.82 and 2.12 respectively. According to family size, the respondent farmers were classified into three categories viz. 'small family', 'medium family' and 'large family'. The distribution of the farmers according to family size has been presented in Table 4.3. Data in Table 4.3 indicate that the medium family constitute the highest proportion (46.0 percent) followed by small family (35 percent) and the lowest proportion (19 percent) belong to large family. Such finding is quite normal as per the situation of Bangladesh. Table 4.3 also showed that average family size of the respondent farmers was higher than that of

Table 4.3 Distribution of the farmers according to their family member

Categories (No. of members)	Respondents'		Mean	Standard deviation
	Number	Number		
Small family (below 5)	35	35.0	6.82	2.12
Medium family (5-7)	46	46.0		
Large family (above 7)	19	19.0		
Total	100	100		

national average of 5.4 (BBS, 2005).

4.1.4 Annual Family Income

Annual family income of the respondent farmers ranged from 35.8 to 470 thousand taka with the mean and standard deviation of 122.25 and 77.26 respectively. On the basis of their annual family income, the farmers were classified into three categories as low, medium and high family income. The distribution of the farmers according to the annual family income has been presented in Table 4.4.

Table 4.4 Distribution of the farmers according to their family income

Categories ('000 Taka)	Respondents'		Mean	Standard deviation
	Number	Number		
Low income (below 100)	49	49.0	122.25	77.26
Medium Income (100-300)	47	47.0		
High Income (above 300)	4	4.0		
Total	100	100.0		

Data in Table 4.4 revealed that the farmers having very low annual family income constituted the highest proportion (49.0 percent) followed by the farmers having medium annual family income (47.0 percent) and high annual family income (4.0

percent) constitute the lowest proportion. Income of an individual allows him to invest more in investment as well as taking risks involved in adoption of technologies.

4.1.5 Farm size

The farm size of the respondent farmers ranged from 0.12 hectare to 5.68 hectare with the mean and standard deviation of 1.108 and 0.833 respectively. Based on their farm size, the respondents were classified into three categories followed by DAE (1999) as small farmers (up to 1.0 ha.), medium farmers (1.01 to 3.0 ha) and large farmers (above 3.0 ha). The distribution of the farmers according to their farm size has been presented in Table 4.5.

Table 4.5 indicates that the farmers holding farm size below 1.0 hectare, i.e., small farm holder constitute the more than half (53.0 percent) of the respondents, compared to 43.0 percent medium farmers and 4.0 percent large farmers. The average farm size of the farmers of the study area (1.108 hectares) was higher than that of national average of Bangladesh (0.81 hectares), (BBS, 2005).

Table 4.5 Distribution of the farmers according to their farm size

Category (ha.)	Respondents'		Mean	Standard deviation
	Number	Percent		
Small (below 1.0)	53	53.0	1.108	0.833
Medium (1.01 to 3.0)	43	43.0		
Large (above 3.0)	4	4.0		
Total	107	100.0		

Usually the farmers of Kotalipara have enough land for performing their agricultural activities.

4.1.6 Farming experience

Farming experience score of the farmers ranged from 3 to 37 with the mean and standard deviation of 17.79 and 9.377 respectively. According to farming experience the respondent farmers were classified into three categories viz. 'low experience, 'medium experience and 'high experience' on the basis of their observed scores. The distribution of the farmers according to their farming experience has been presented in Table 4.6.

Table 4.6 Distribution of the farmers according to their farming experience

Categories (Years)	Respondents'		Mean	Standard deviation
	Number	Percent		
Low experience (below 10)	27	27.0	17.79	9.377
Medium experience (11-20)	34	34.0		
High experience (above 20)	39	39.0		
Total	100	100		

Data in Table 4.6 indicate that the high farming experience constitutes the highest proportion (39.0 percent) followed by medium experience (34.0 percent) and the low experience (27.0 percent). The farmers with more farming experience could be able compare between Its and modern technologies regarding this benefits.

4.1.7 Extension media contact

The score related to extension media contact of the respondents ranged from 9 to 30 against the possible range of 0 to 36, with an average of 19.15, and standard

deviation of 5.366. Based on the possible scores of extension media contact, the respondents were classified into the three categories i.e., low contact, medium contact and high contact. The distribution has been shown in the Table 4.7.

Table 4.7 Distribution of the farmers according to their extension media contact

Categories (Score)	Respondents'		Mean	Standard deviation
	Number	Percent		
Low media contact (below 12)	13	13.0	19.15	5.366
Medium media contact (13-24)	72	72.0		
High media contact (above 24)	15	15.0		
Total	100	100		

About three-fourths (72 percent) of the respondents had medium extension media contact while 15 percent had high media contact and 13.0 percent had low extension media contact. It means that an overwhelming majority (85 percent) of the farmers had low to medium extension media contact. The findings also indicate that the respondents of the study area do not get sufficient information about the technological aspects.

4.1.8 Agricultural knowledge

Agricultural knowledge of the score of respondent farmers ranged from 15 to 37 against the possible range of 0-40. The mean and standard deviation of agricultural knowledge was 25.33 and 5.172 respectively. On the basis of knowledge scores, the respondents were classified into two categories namely, 'moderate knowledge' and 'sound knowledge'. The distribution of the respondents according to their agricultural knowledge is given in Table 4.8.

Table 4.8 Distribution of the farmers according to their agricultural knowledge

Categories (score)	Respondents'		Mean	Standard deviation
	Number	Percent		
Moderate knowledge (15-26)	56	56.0	25.33	5.172
Sound knowledge (Above 26)	44	44.0		
Total	100	100.0		

Data of Table 4.8 reveal that majority (56.0 percent) of the respondents feel in moderate knowledge category followed by 44.0 percent in sound knowledge category. Knowledge is to be considered as vision of an explanation in any aspect of the situation. It is act or state of understanding; clear perception of fact or truth, that helps an individual to foresee the consequence he may have to face in future. It makes individuals to become rational and conscious about related field. To perform optimum production, farmers should have adequate knowledge on different aspects of it. The findings of the present study reveal that 56.0 percent of the farmers in the study area had moderate knowledge on agriculture. Hence, the concerned authority may give appropriate emphasis to increase the knowledge level of agriculture of the farmers in different area of production.

4.1.9 Fatalism

Fatalism score of the respondent farmers ranged from 2 to 36 against possible range of 0-48, with the mean and standard deviation of 22.14 and 7.644 respectively. On the basis of their fatalism score the farmers were classified into three categories, such as low, medium and high fatalism. The distribution of the farmers according of to their fatalism has been presented in Table 4.9.

Table 4.9 Distribution of the farmers according to their fatalism

Categories (Score)	Respondents'		Mean	Standard deviation
	Number	Percent		
Low (below 16)	21	21.0	22.14	7.644
Medium (16-32)	68	68.0		
High (above 32)	11	11.0		
Total	100	100		

Data in Table 4.9 revealed that the farmers having medium fatalism constitute the highest proportion (68 percent) followed by the farmers having low fatalism (21.0 percent) and high fatalism (11.0 percent).

4.2 Adoption of selected indigenous technologies

The observed score of adoption of selected indigenous technologies of the respondents ranged from 17-37 against the possible range of 0-54 with the average of 26.54 and standard deviation of 5.118. The respondents were classified into three categories as low, medium and high adoption on the basis of their adoption of indigenous technologies scores and the distribution is shown in Table 4.10. About two third (65.0 percent) of the farmers belonged to medium adoption ctegory compared to 19.0 percent low and 16.0 percent high adoption. It means that an overwhelming majority (84 percent) of the respondent farmers had low to medium adoption in selected indigenous technologies.

Table 4.10 Distribution of the farmers according to their adoption of selected indigenous technologies

Categories (Score)	Respondents'		Mean	Standard deviation
	Number	Percent		
Low adoption (below 21)	19	19.0	26.54	5.118
Medium adoption (22-31)	65	65.0		
High adoption (above 31)	16	16.0		
Total	100	100		

4.3 Relationship of the selected characteristics of farmers with their adoption of selected indigenous technology

Pearson product moment correlation co-efficient was computed in order to find variables (Table 4.11). To reject or accept the null hypothesis, 0.05 level of significance was used.

Table 4.11 Results of Pearson's product moment correlation showing the relationship between their (adoption of selected indigenous technologies) and their selected characteristics

Dependent variable	Independent variable	Value of co-efficient of correlation	Tabulated value	
			0.05 level	0.01 level
Adoption of selected indigenous technologies by the farmers	Age	0.508**	0.196	0.256
	Education	0.188^{NS}		
	Family size	0.576**		
	Annual family income	0.289**		
	Farm size	-0.271**		
	Farming experience	0.489**		
	Extension media contact	0.061^{NS}		
	Agricultural knowledge	0.242*		
	Fatalism	-0.112^{NS}		

NS: Not significant

* Correlation is significant at the 0.05 level

** Correlation is significant at the 0.01 level

4.3.1 Relationship between age of the farmers and their adoption of selected indigenous technologies

The correlation coefficient between age of the farmers and their adoption of selected indigenous technologies was to be 0.508. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables.

- *The calculated value of "r" (0.508) was found to be greater than the tabulated value (r = 0.256) with 98 degrees of freedom at 0.01 level of probability.*
- *The null hypothesis was rejected.*
- *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*
- *The relationship showed a positive trend between the concerned variables.*

Based on the above findings, it was concluded that age had significant positive relationships with adoption of selected indigenous technologies by the farmers. This characterize that age of the farmers was an important factor in adoption of selected indigenous technologies and with the increases of age of the respondent's adoption also increases. Age of the farmers influence adoption of selected indigenous technologies. Actually aged farmers are experienced in using indigenous technologies in their farms.

4.3.2 Relationship between education of the farmers and their adoption of selected indigenous technologies

The correlation coefficient between education of the farmers and their adoption of selected indigenous technologies was found to be 0.188. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables.

- *The calculated value of "r" (0.188) was found to be smaller than the tabulated value (r = 0.196) with 98 degrees of freedom at 0.05 level of probability.*
- *The null hypothesis was accepted.*
- *The relationship between the concerned variables were statistically non significant at 0.05 level of probability.*
- *The relationship showed a positive trend between the concerned variables.*

Based on the above findings, it was concluded that education had non significant positive relationships with adoption of selected indigenous technologies by the farmers. This characterize that education of the farmers was not an important factor in adoption of selected indigenous technologies.

4.3.3 Relationship between family size of the farmers and their adoption of selected indigenous technologies

The correlation coefficient between family size of the farmers and their adoption of selected indigenous technologies was found to be 0.576. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables.

- *The calculated value of "r" (0.576) was found to be greater than the tabulated value (r = 0.256) with 98 degrees of freedom at 0.01 level of probability.*
- *The null hypothesis was rejected.*
- *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*
- *The relationship showed a positive trend between the concerned variables.*

Based on the above findings, it was concluded that family size had significant positive relationships with adoption of selected indigenous technologies by the farmers. This characterize that family size of the farmers was an important factor in adoption of selected indigenous technologies and with the increases of family

size of the respondent adoption also increases. Family size of the farmer influences adoption of selected indigenous technologies.

4.3.4 Relationship between annual family income of the farmers and their adoption of selected indigenous technologies

The correlation coefficient between annual family income of the farmers and their adoption was found to be 0.289. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables.

- *The calculated value of "r" (0.289) was found to be greater than the tabulated value (r = 0.256) with 98 degrees of freedom at 0.01 level of probability.*
- *The null hypothesis was rejected.*
- *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*
- *The relationship showed a positive trend between the concerned variables.*

Based on the above findings, it was concluded that annual family income had significant positive relationships with adoption of selected indigenous technologies by the farmers. This characterize that annual family income of the farmers was an important factor in adoption of selected indigenous technologies and with the increases of annual family income of the respondent's adoption also increases. Annual family income of the farmers influences adoption of selected indigenous technologies.

4.3.5 Relationship between farm size of the farmers and their adoption of selected indigenous technologies

The correlation coefficient between farm size of the farmers and their adoption of selected indigenous technologies was found to be -0.271. The following

observations were made on the basis of the value of correlation coefficient between the two concerned variables.

- *The calculated value of "r" (-0.271) was found to be greater than the tabulated value (r = 0.256) with 98 degrees of freedom at 0.01 level of probability.*
- *The null hypothesis was rejected.*
- *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*
- *The relationship showed a negative trend between the concerned variables.*

Based on the above findings, it was concluded that farm size had significant negative relationships with adoption of selected indigenous technologies by the farmers. This characterize that farm size of the farmers was an important factor in adoption of selected indigenous technologies and with the increases of farm size of the respondent's adoption also decreases. Farm size of the farmers influence adoption of selected indigenous technologies.

4.3.6 Relationship between farming experience of the farmers and their adoption of selected indigenous technologies

The correlation coefficient between farming experience of the farmers and their adoption of selected indigenous technologies was found to be 0.489. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables.

- *The calculated value of "r" (0.489) was found to be greater than the tabulated value (r = 0.256) with 98 degrees of freedom at 0.01 level of probability.*
- *The null hypothesis was rejected.*
- *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*
- *The relationship showed a positive trend between the concerned variables.*

Based on the above findings, it was concluded that farming experience had significant positive relationships with adoption of selected indigenous technologies by the farmers. This characterize that farming experience of the farmers was an important factor in adoption of selected indigenous technologies and with the increases of farming experience of the respondent's adoption also increases. Farming experience of the farmers influence adoption of selected indigenous technologies.

4.3.7 Relationship between extension media contact of the farmers and their adoption of selected indigenous technologies

The correlation coefficient between extension media contact of the farmers and their adoption of selected indigenous technologies was found to be 0.061. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables.

- *The calculated value of "r" (0.061) was found to be smaller than the tabulated value (r = 0.196) with 98 degrees of freedom at 0.05 level of probability.*
- *The null hypothesis was accepted.*
- *The relationship between the concerned variables was statistically non significant at 0.01 level of probability.*
- *The relationship showed a positive trend between the concerned variables.*

Based on the above findings, it was concluded that extension media contact had non significant positive relationships with adoption of selected indigenous technologies by the farmers. This characterize that extension media contact of the farmers was not an important factor in adoption of selected indigenous technologies and with the increase of extension media contact of the respondent's

adoption also increases. Extension media contact of the farmers influence adoption of selected indigenous technologies.

4.3.8 Relationship between agricultural knowledge of the farmers and their adoption of selected indigenous technologies

The correlation coefficient between agricultural knowledge of the farmers and their adoption of selected indigenous technologies was found to be 0.242. The following observations were made on the basis of the value of correlation coefficient between the two concerned variables.

- *The calculated value of "r" (0.242) was found to be greater than the tabulated value (r = 0.196) with 98 degrees of freedom at 0.05 level of probability.*
- *The null hypothesis was rejected.*
- *The relationship between the concerned variables was statistically significant at 0.01 level of probability.*
- *The relationship showed a positive trend between the concerned variables.*

Based on the above findings, it was concluded that agricultural knowledge had significant positive relationships with adoption of selected indigenous technologies by the farmers. This characterize that agricultural knowledge of the farmers was an important factor in adoption of selected indigenous technologies and with the increases of agricultural knowledge of the respondent's adoption also increases. Agricultural knowledge of the farmers influences adoption of selected indigenous technologies.

4.3.9 Relationship between fatalism of the farmers and their adoption of selected indigenous technologies

The correlation coefficient between fatalism of the farmers and their adoption of selected indigenous technologies was found to be -0.112. The following

observations were made on the basis of the value of correlation coefficient between the two concerned variables.

- *The calculated value of "r" (-0.112) was found to be greater than the tabulated value (r = 0.195) with 98 degrees of freedom at 0.05 level of probability.*
- *The null hypothesis was accepted.*
- *The relationship between the concerned variables was statistically non significant at 0.05 level of probability.*
- *The relationship showed a negative trend between the concerned variables.*

Based on the above findings, it was concluded that fatalism had non significant negative relationships with adoption of selected indigenous technologies by the farmers. This characterize that fatalism of the farmers was an important factor in adoption of selected indigenous technologies and with the increases of fatalism of the respondent's adoption also decreases. Fatalism of the farmers influences adoption of selected indigenous technologies.

CHAPTER V

SUMMARY OF THE FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the Findings

The study was conducted two villages namely Khagbari and Ramshil of Kotalipara Upazila under Gopalgonj District. Among the total farmers (1250) of Khagbari (525) and Ramshil (725) villages, 100 (8% of the whole farmers) were selected at random for conducting interview. A well structured interview schedule was developed based on objectives of the study for collecting information. The researcher himself collected data from the sampled respondents through personal interview. The independent variables were: age, education, family size, annual family income, farm size, farming experience, extension media contact, agricultural knowledge, and fatalism of farmers. The dependent variable of this study was adoption of selected indigenous technologies by the farmers. Data collection was started on 15 January, 2008 and completed on 20 February, 2008. Data collected from the respondents were complied, coded, tabulated and analyzed in accordance with the objectives of the study. Various statistical measures such as frequency counts, percentage distribution, average, and standard deviation were used in describing data. Co-efficient of correlation test was used to explore relationship between the concerned variables. The major findings of the study are summarized below:

5.1.1 Characteristics of the farmers

Age

The young farmers constitute the highest proportion (45 percent) followed by middle aged (43 percent) and the lowest proportion were made by the old aged (12 percent)

Education

Farmers under 'can sign only' and above secondary category constitute the lowest proportion (4.0 percent) compared to 6.0 percent 'can sign only' category. On the other hand the highest 45.0 percent under the group of secondary education followed by 41 percent primary level education.

Family Size

The medium family category constitutes the highest proportion (46.0 percent) followed by small family category (35 percent) and the lowest family category are the large family category (19 percent).

Annual Family Income

The farmers family having very low income constitute the highest proportion (49.0 percent) followed by the farmers family having medium annual family income (47.0 percent) and high annual family income (4.0 percent) constitute the lowest proportion.

Farm size

The farmers holding farm size below 1.0 hectare, i.e., small farm holder constitute the highest proportion (53.0 percent) compared to 43.0 percent medium farm holder and 4.0 percent large farm holder.

Farming experience

The high levels farming experience constitutes the highest proportion (39.0 percent) followed by medium level participation (34.0 percent) and the lowest proportion was the low experience (27.0 percent).

Extension media contact

The medium media contact constitutes the highest proportion (72.0 percent) while 15 percent had high media contact and 13.0 percent had low media contact.

Agricultural knowledge

The majority (56.0 percent) of the respondents fell in moderate knowledge category followed by 44.0 percent in sound knowledge category.

Fatalism

The farmers family having medium fatalism constitute the highest proportion (68 percent) followed by the farmers family having low fatalism (21.0 percent) and high fatalism (11.0 percent).

5.1.2 Adoption of selected indigenous technologies by the farmers

About two-thirds (65%) of the respondents farmers belongs to medium adoption group compared to 19% low adoption and 16% high adoption group.

5.1.3 Relationship

Age, family size, annual family income, farming experience and agricultural knowledge of the farmers had significant positive relationships with their adoption of selected indigenous technologies. Farm size had significant negative relationships

with adoption of selected indigenous technologies. Rest three variables, namely education, Extension media and fatalism contact had non significant relationships with adoption of selected indigenous technologies.

5.2 Conclusions

1. The findings indicated that overwhelming majority (84%) of the respondents had low to medium adoption of indigenous technology. This fact leads to the conclusion that it is necessary to increase the adoption level of the farmers in adopting of selected indigenous technologies.

2. Age of the respondent farmers had positive significant relationship with their adoption of selected indigenous technologies. But, overwhelming majority (88%) of the respondent farmer were young aged to medium aged. This fact lead to the conclusion that old aged of the farmers increase their adoption of selected indigenous technologies.

3. Family size of the respondent farmers had positive significant relationship with their adoption of selected indigenous technologies. But, overwhelming majority (81%) of the respondent farmers had small to medium family. These facts lead to the conclusion that large family of the farmer increases their adoption of selected indigenous technologies.

4. Annual family income of the respondent farmers had positive significant relationship with their adoption of selected indigenous technologies. But, majority (96 percent) of the respondent farmers had low to medium annual family income.

The above facts lead to the conclusion that higher annual family income of the farmer increases their adoption of selected indigenous technologies.

5. Farm size of the farmers had negative relationship with adoption of selected indigenous technologies. Again, an overwhelming majority (96 percent) of the respondents were small to medium farmers. Indigenous technology might not be applied easily to the large farm size. Therefore, it may be concluded that attempt might be taken to make easily application of the indigenous technologies.

5.3 Recommendations

5.3.1 Recommendations for policy implications

Recommendations formulated on the basis of experience, observation and conclusions drawn from the findings of the study and have been prescribed to the concerned authorities, planners and executioners are given below:

1. Reasons behind the low to medium adoption of selected indigenous technologies by the farmers need to identify and necessary attempt should be made to identify the possible reason for this situation.

2. Age of the farmer had positive significant relationship with their adoption of selected indigenous technologies. Therefore, it might be recommended that it is motivate old aged farmers to use indigenous technologies.

3. Annual family income of the respondents could increase their adoption of selected indigenous technologies. Therefore, it may be recommended that concerned authorities could take various types of income generating programs for the farmers.

4. Necessary attempts should be taken by the concerned authorities so that the large farmers could use the indigenous technologies in there large size farms.

5. Farming experience of the farmers had positive relationship with their adoption of selected indigenous technologies. Therefore, it may be recommended that it is necessary to motivate lower experience farmers to use indigenous technologies.

6. Agricultural knowledge of the farmer's had positive significant relationship with their adoption of selected indigenous technologies. Therefore, it is necessary to increase the farmer's knowledge on agriculture.

5.3.2 Recommendations for further study

On the basis of scope and limitations of the present study and observation made by the researcher, the following recommendations are made for future study.

1. The present study investigated about nine selected characteristics of the farmers in the study area. But there are many other characteristics of these farmers, which may influence them to use indigenous technologies in farming. So it is recommended that further study should be conducted involving more characteristics

2. This study was conducted in Kotalipara Upazila under Gopalgonj District. Similar studies are required to be conducted in other sites of the country where similar socio-economic and physical conditions exist to compare the findings.

3. The present study was conducted on the use of indigenous technologies by the farmers in one major dimension of farming namely crop cultivation. But in other dimension like fishery, forestry and livestock production should be included in further.

4. To achieve agricultural sustainability, farmers' awareness is a must. But it is known whether the farmers of Bangladesh are aware of the growing sustainability issues. Hence, it is suggested to include this factor in farther studies.

5. The present study has been carried out at farmers' level to determine their adoption of indigenous technologies in farming. A similar study could be conducted with the field level extension staff of DAE as well as other extension related agencies.

6. DAE and related agencies might be taken such necessary step like training, seminar, symposium, field day etc. for the farmers to adopt the indigenous technologies upto a logical extent.

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Appendices

Appendix- A

Department of Agricultural Extension and Information System

Sher-e-Bangla Agricultural University

Adoption of Selected Indigenous Technologies by the Farmers

(Research related Interview Schedule)

(Please answer the following questions)

Name: ---------- Sample no: ---------

Father's Name\ Husband's Name: ----------

Village: ---------- -- Union: ---------- Dist: ----------

1. Age:

How old are you? ---------- Years.

2. Level of education

Please mention your educational status

a. Can't read and write ( )

b. Can sign only ( )

c. Attended class up to ( )

3. Family size:

Please mention the number of your family members (including yourself)

Type of Members	Total Number
a) Adult (more than 18 years)	
b) Pre-adult (5 to 18 years)	
c) Infant (less than 5 years)	
Total	

4. Annual family income:

Please furnish your and your family members' annual income from different sources

Sl. No	Source of income	Amount of taka
1.	Agriculture(crops)	
2.	Livestock	
3.	Poultry	
4.	Fish culture	
5.	Business	
6.	Service	
7.	Labor	
8.	Others(if any)	
Total		

5. Farm size:

Please mention the area of your land according to tenure status

Sl. No	Type of land use	Area of land	
		Local unit	Hectare
1.	Homestead		
2.	Own land under own cultivation		
3.	Land given to others on borga		
4.	Land taken from others on borga		
5.	Land taken from others on lease		
6.	Pond		
Total			

6. Farming experience:

How old are your farming experience? ..... Years.

7. Extension media contact:

Please mention the extent your level of communication with the following media

Sl. no.	Communication media	Frequently	Occasionally	Rarely	Not at all
A. Personal contact					
01	Ideal farmer/Neighbor	>5 or more times/month( )	3-4 times/month ( )	1-2 times/month ( )	0 time/month ( )
02	Friends and relatives	>5 or more times/month( )	3-4 times/month ( )	1-2 times/month ( )	0 time/month ( )
03	Fertilizer, seed or pesticides dealer	>5 or more times/month( )	3-4 times/month ( )	1-2 times/month ( )	0 time/month ( )
04	NGO worker	>12 or more times/month( )	6-11 times/year ( )	1-5 times/month ( )	0 time/month ( )
05	Sub Assistant Agricultural Officer (SAAO)	>12 or more times/month( )	6-11 times/year ( )	1-5 times/month ( )	0 time/month ( )
06	Agricultural Extension Officer(AEO)	>7 or more times/month ( )	4-6 times/year ( )	1-3 times/month ( )	0 time/month ( )
B. Group communication					
07	Method demonstration	>5 or more times/month ( )	3-4 times/month ( )	1-2 times/month ( )	0 time/month ( )
08	Result demonstration	>5 or more times/month ( )	3-4 times/month ( )	1-2 times/month ( )	0 time/month ( )
09	Agricultural meeting/field day	>5 or more times/month ( )	3-4 times/month ( )	1-2 times/month ( )	0 time/month ( )
C. Mass communication					
10	Radio	>20 or more times/month ( )	10-19 times/month( )	1-9 times/month ( )	0 time/month ( )
11	Newspaper	>20 or more times/month ( )	10-19 times/month( )	1-9 times/month ( )	0 time/month ( )
12	Television	>10 or more times/month ( )	5-9 times/month ( )	1-4 times/month ( )	0 time/month ( )

8. Agricultural knowledge:

Please mention your opinion regarding the following items

Sl. No.	Items	Full marks	Marks obtained
1.	Please mention two high yielding varieties of rice	2	
2.	Please mention two ways of increasing soil fertility	2	
3.	Please mention two year round vegetable	2	
4.	Please mention two pesticides of rice	2	
5.	Please mention two crops that use for green manuring	2	
6.	Please mention the main components of urea and TSP fertilizer	2	
7.	Please mention two functions of zinc fertilizer	2	
8.	Please mention two diseases of rice	2	
9.	Please mention two beneficial insects	2	
10.	Please mention two vegetables that cultivated in Ail	2	
11.	Please mention two problems for mango cultivation	2	
12.	Please mention two fruits that cultivated commercially	2	
13.	Please mention two plant that give fruits and timber	2	
14.	Please mention two usefulness of early cultivation of vegetables	2	
15.	Please mention two medicinal plants	2	
16.	Please mention the reason of earthen up of soil in potato field	2	
17.	Please mention two usefulness of ground nut cultivation in line	2	
18.	Please mention two diseases and pests of coconut	2	
19.	Please mention the age of Boro seedlings (25-30days/31-35days/36-40 days	2	
20.	Please mention two methods of pest control	2	

9. Fatalism:

Please expresse your opinion on the following issues

Sl. No.	Topics	Degree of opinion				
		Strongly agree	Agree	Undecided	Disagree	Strongly disagree
- 01.	Sometimes water deficiency occurs towards the end of cultivation in aman rice. For this, it is necessary to irrigate by power pump or other means					
+ 02.	There is no need to use balanced fertilizer in the field, if fate is favorable, production will be high without fertilizer					
+ 03.	There is no need to take any measure to control insect pests. If fate is favorable, insects will not attack in the field					
- 04.	Fate is nothing if one work hard success is sure to come					
+ 05.	There is no need to vaccinate cattle, goat and poultry for prevention from diseases. Because if fate is not favorable those will be diseased even if they are vaccinate					
- 06.	Family planning is a must to make small family. It is not wise to depend fully on fate					
- 07.	Many men think that prosperity in life depends on fate, but this is wrong. If a man works honestly and intelligently, he can prosper in life from lower level					
+ 08.	It is meaningless to vaccinate for pox because one may be attacked with this even after vaccination if the luck is bad.					
+ 09.	If fate is not favorable, the children can not prosper in life through they are educated.					
+ 10.	It is learnt that by eating fish, meat and vegetables the health becomes good. But I do not believe it. If fate is favorable the health becomes good even without these					
+ 11.	If fate is bad, the production will not be good by using balanced fertilizers. So I do not advise my friends to use balanced fertilizers.					
- 12.	The importance of knowledge, skills and abilities of men is much more important than fate					

10. Extent of the use of Indigenous Farming Technologies:

Please indicate the extent to which you use and why you use the following (ITs) in your farm-

Sl. no	Indigenous Technologies	Extent of use			
		Frequently	Occasionally	Rarely	Not at all
1.	It is necessary to select mature and healthy seeds for better growth and maximum yield of crop				
2.	Seeds are soaked in water for sometime before sowing in the bed for rapid germination				
3.	It is necessary to apply compost in field that was made by cowdung and domestic refuses				
4	Setting up bamboo sticks, branches of trees etc. in vegetable field to let the birds sit and eat away insects				
5.	Mulching potato fields with straw/water-hyacinth				
6.	Dried chilli should be stored for long time in polybag				
7.	Spreading ash in mustard and bean to control aphid insect				
8.	Storing seeds by mixing with the dust of dried neem /mango leaves to repeal stored grain pest				
9.	Applying of poultry manure for better growth of plant				
10.	Cereals, pulses and oil seed are put in pitcher, earthen pot, duhli, motka in order to control insect infestation				
11.	In order to reduce and attack in the ripen paddy field, 'Scarecrow' (Kaktarua) is used				
12.	Applying diluated cattle urine to control insects.				
13.	Residues of crop are burned in the field				
14.	Applying fish and vegetables cleaning water at the bases of plant				
15.	Bitter gourd seeds are kept in mud ball and dried for preservation				
16.	Applying muddy soil collected from the bottom of the pond to improve the fertility of surface soil				
17.	In order to control rodents in the crop field, banana cover-sheath painted with coaltar are kept scatteredly on the path of rodents.				
18.	Turmeric are being cultivated over pile of water hyacinth on the water				

Thank you for your co-operation

Signature of the
Interviewer with date

Appendix- B

কৃষি সম্প্রসারণ ও ইনফরমেশন সিষ্টেম বিভাগ

শেরে বাংলা কৃষি বিশ্ববিদ্যালয়

"ADOPTION OF SELECTED INDIGENOUS TECHNOLOGIES BY THE FARMERS"

গবেষণা সম্পর্কিত সাক্ষাৎকার অনুসূচী

(অনুগ্রহ পূর্বক নিচের প্রশ্নগুলির উত্তর দিন)

ক্রমিক নং ---------

উত্তরদাতার নাম ঃ ----------

পিতা/ স্বামীর নাম ঃ----------

গ্রাম ঃ ---------- ইউনিয়ন ঃ ---------- জেলা ঃ ----------

১। বয়স (Age) ঃ

আপনার বর্তমান বয়স কত? ---------- বৎসর।

২। শিক্ষাগত যোগ্যতা (Level of Education) ঃ

আপনার শিক্ষাগত যোগ্যতা সম্পর্কে বলুন।

ক) লিখতে ও পড়তে পারি না। ( )

খ) কেবল মাত্র স্বাক্ষর করতে পারি । ( )

গ) আমি ---------- শ্রেনী পর্যন্ত পড়ালেখা করেছি।

৩। পরিবারের আকার (Family Size) ঃ

অনুগ্রহ পূর্বক আপনার পরিবারের সদস্য সংখ্যা উল্লেখ করুণ (আপনাকে সহ)

পরিবারের সদস্যের ধরণ	সদস্য সংখ্যা
ক) ১৮ বছরের উপরে বয়ঃপ্রাপ্ত	
খ) ৫-১৮ বছরের মধ্যে অপ্রাপ্ত বয়স্ক	
গ) ৫ বছরের মধ্যে	
মোট	

৪) পরিবারের আর্থিক আয় (Annual Family Income) ঃ

অনুগ্রহ পূর্বক বিভিন্ন উৎস হতে প্রাপ্ত আপনার ও আপনার পরিবারের বাৎসরিক আয়ের বিবরণ দিন।

ক্রমিক নং	আয়ের উৎস	মোট টাকা
১)	কৃষি খাত (ফসল হতে)	
২)	গবাদি পশু হতে	
৩)	হাঁস মুরগী পালন হতে	
৪)	মাছ চাষ হতে	
৫)	ব্যবসায় হতে	
৬)	চাকুরী হতে	
৭)	শ্রম ও মজুরি হতে	
৮)	অন্যান্য উৎস হতে	
সর্বমোট		

৫। খামারের আকার (Farm Size) ঃ

অনুগ্রহ পূর্বক ব্যবহার অনুযায়ী আপনার জমির বিবরণ দিন।

ক্রমিক নং	জমির বিবরণ	জমির পরিমান	
		স্থানীয় একক	হেক্টর
১)	বসত বাড়ির জমি		
২)	নিজ জমি নিজ চাষে		
৩)	নিজ জমি অন্যকে বর্গা দেয়া		
৪)	অন্যের নিকট থেকে বর্গা নেয়া জমি		
৫)	অন্যের নিকট থেকে বন্ধক নেয়া জমি		
৬)	পুকুর		
মোট জমির পরিমান			

৬। কৃষি কাজের অভিজ্ঞতা (Farming Experience)

আপনার কৃষি কাজের অভিজ্ঞতা কত বছর? ---------- বৎসর।

৭। সম্প্রসারণ মাধ্যমের সাথে যোগাযোগের মাত্রা (Extension Media Contact) ঃ

নিম্নলিখিত যোগাযোগ মাধ্যম গুলি থেকে আপনি কিরূপ পরিমাণ কৃষি বিষয়ক তথ্য নিয়ে থাকেন তা উল্লেখ করুন।

ক্রমিক নং	যোগাযোগের মাধ্যম	নিয়মিত	মাঝে মাঝে	কদাচিৎ	মোটেই না
ক) ব্যক্তিগত যোগাযোগ					
১.	আদর্শ কৃষক/ প্রতিবেশী	প্রতি মাসে ৫ বার বা তার বেশি ( )	প্রতি মাসে ৩-৪ বার বা তার বেশি ( )	প্রতি মাসে ১-২ বার বা তার বেশি ( )	প্রতি মাসে ১ বার ও নয় ( )
২.	বন্ধুবান্ধব বা আত্মীয়	প্রতি মাসে ৫ বার বা তার বেশি ( )	প্রতি মাসে ৩-৪ বার বা তার বেশি ( )	প্রতি মাসে ১-২ বার বা তার বেশি ( )	প্রতি মাসে ১ বার ও নয় ( )
৩.	সার, বীজ বা কীটনাশক বিক্রেতা	প্রতি মাসে ৫ বার বা তার বেশি ( )	প্রতি মাসে ৩-৪ বার বা তার বেশি ( )	প্রতি মাসে ১-২ বার বা তার বেশি ( )	প্রতি মাসে ১ বার ও নয় ( )
৪.	এন, জি, ও কর্মী	প্রতি বছরে ১২ বার বা তার বেশি ( )	প্রতি বছরে ৬-১১ বার বা তার বেশি ( )	প্রতি বছরে ১-৫ বার বা তার বেশি ( )	প্রতি বছরে ১ বার ও নয় ( )
৫.	উপসহকারী কৃষি সম্প্রসারণ কর্মকর্তা	প্রতি বছরে ১২ বার বা তার বেশি ( )	প্রতি বছরে ৬-১১ বার বা তার বেশি ( )	প্রতি বছরে ১-৫ বার বা তার বেশি ( )	প্রতি বছরে ১ বার ও নয় ( )
৬.	কৃষি সম্প্রসারণ কর্মকর্তা	প্রতি বছরে ৭ বার বা তার বেশি ( )	প্রতি বছরে ৪-৬ বার বা তার বেশি ( )	প্রতি বছরে ১-৩ বার বা তার বেশি ( )	প্রতি বছরে ১ বার ও নয় ( )
খ) দলীয় যোগাযোগ					
৭.	দলীয় আলোচনা	প্রতি মাসে ৫ বার বা তার বেশি ( )	প্রতি মাসে ৩-৪ বার বা তার বেশি ( )	প্রতি মাসে ১-২ বার বা তার বেশি ( )	প্রতি মাসে ১ বার ও নয় ( )
৮.	ফলাফল/ পদ্ধতি প্রদর্শন	প্রতি বছরে ৫ বার বা তার বেশি ( )	প্রতি বছরে ৩-৪ বার বা তার বেশি ( )	প্রতি বছরে ১-২ বার বা তার বেশি ( )	প্রতি বছরে ১ বার ও নয় ( )
৯.	কৃষি বিষয়ক সভা/ মাঠ দিবস	প্রতি বছরে ৫ বার বা তার বেশি ( )	প্রতি বছরে ৩-৪ বার বা তার বেশি ( )	প্রতি বছরে ১-২ বার বা তার বেশি ( )	প্রতি বছরে ১ বার ও নয় ( )
গ) গণ যোগাযোগ					
১০.	রেডিও	প্রতি মাসে ২০ বার বা তার বেশি ( )	প্রতি মাসে ১০-১৯ বার বা তার বেশি ( )	প্রতি মাসে ১-৯ বার বা তার বেশি ( )	প্রতি মাসে ১ বার ও নয় ( )
১১.	খবরের কাগজ	প্রতি মাসে ২০ বার বা তার বেশি ( )	প্রতি মাসে ১০-১৯ বার বা তার বেশি ( )	প্রতি মাসে ১-৯ বার বা তার বেশি ( )	প্রতি মাসে ১ বার ও নয় ( )
১২.	টেলিভিশন	প্রতি মাসে ১০ বার বা তার বেশি ( )	প্রতি মাসে ৫-৯ বার বা তার বেশি ( )	প্রতি মাসে ১-৪ বার বা তার বেশি ( )	প্রতি মাসে ১ বার ও নয় ( )

৮। কৃষি বিষয়ক জ্ঞান (Agricultural Knowledge) ঃ

অনুগ্রহ পূর্বক নিচের প্রশ্নগুলির উত্তর দিন।

ক্রমিক নং	প্রশ্ন	পূর্ণ নম্বর	প্রাপ্ত নম্বর
১)	ধানের দুটি উচ্চফলনশীল জাতের নাম বলুন।	২	
২)	মাটির উর্বরতা বৃদ্ধির জন্য দুটি পদ্ধতির নাম উলে□খ কর□ণ।	২	
৩)	দুটি বারমাস সব্জির নাম বলুন।	২	
৪)	ধানের দুটি কীটনাশকের নাম বলুন।	২	
৫)	সবুজ সার তৈরীর জন্য দুটি ফসলের নাম বলুন।	২	
৬)	ইউরিয়া ও টি এস পি সারের প্রধান উপাদানের নাম বলুন।	২	
৭)	জিংক সারের দুটি কাজ বলুন।	২	
৮)	ধানের দুটি রোগের নাম বলুন।	২	
৯)	দুটি উপকারী পোকার নাম বলুন।	২	
১০)	জমির আইলে চাষ করা যায় এমন দুটি সব্জির নাম বলুন।	২	
১১)	আপনার এলাকায় আম চাষে দুটি সমস্যা বলুন।	২	
১২)	বানিজ্যিকভাবে চাষ করা যায় এমন দুটি ফলের নাম বলুন	২	
১৩)	ফল ও কাঠ দানকারী দুটি গাছের নাম বলুন।	২	
১৪)	শাকসব্জির আগাম চাষের দুটি উপকারীতা বলুন।	২	
১৫)	দুটি ঔষধি বৃক্ষের নাম বলুন।	২	
১৬)	আলু গাছের গোড়ায় মাটি তুলে দেয়া হয় কেন?	২	
১৭)	সারিতে চীনাবাদাম চাষের দুটি উপকারীতা বলুন।	২	
১৮)	নারিকেল গাছের একটি রোগ ও একটি পোকার নাম বলুন।	২	
১৯)	কতদিন বয়সের বোরো ধানের চারা রোপন করা হয়? ২৫-৩০ দিন/ ৩১-৩৫ দিন/ ৩৬-৪০ দিন।	২	
২০)	পোকা দমনের দুটি যান্ত্রিক পদ্ধতির নাম বলুন।	২	

৯। অদৃষ্টবাদ (Fatalism) ঃ

অনুগ্রহপূর্বক নিম্নলিখিত উক্তিগুলির প্রতি আপনার মতামত প্রকাশ করুন।

ক্রমিক নং	উক্তিসমূহ	মতামতের ধরণ				
		সম্পূর্ণ একমত	একমত	মতামত নেই	একমত নই	মোটেই একমত নই
- ১)	আমন চাষের শেষের দিকে পানি স্বল্পতা দেখা দিলে বৃষ্টির জন্য অপেক্ষায় না থেকে পাওয়ার পাম্প বা অন্য উপায়ে সেচ দেওয়া উচিৎ।					
+ ২)	ভাগ্য যদি সুপ্রন্ন হয় তাহলে সার ছাড়াই ভাল ফলন হবে এজন্য মাঠে সুষম সার প্রয়োগের কোন প্রয়োজন নাই।					
+ ৩)	পোকা মাকড় নিয়ন্ত্রনের জন্য কোন পদ্ধতি গ্রহণ করার দরকার হয় না। যদি ভাগ্য ভাল থাকে তাহলে এমনিতেই আক্রমন হবে না।					
- ৪)	ভাগ্য বলতে কিছুই নাই। কঠোর পরিশ্রম করলে অবশ্যই সফলতা আসবে।					
+ ৫)	গবাদি পশু ও পোল্ট্রির রোগ প্রতিরোধের জন্য কোন টীকা দেয়ার দরকার হয় না। কপাল মন্দ হলে টীকা দেয়া সত্ত্বেও এদের রোগ হবে।					
- ৬)	ছোট পরিবারের জন্য পরিবার পরিকল্পনা অবশ্যই দরকার। ভাগ্যের উপর পুরোপুরি ছেড়ে দেয়া জ্ঞানের পরিচয় বহন করে না।					
- ৭)	অনেকের ধারণা জীবনের উন্নতি ভাগ্যের উপর নির্ভর করে কিন্তু এটা ঠিক নয়।					
+ ৮)	পক্সের প্রতিরোধের জন্য টীকা নেয়া অর্থহীন কারণ ভাগ্য খারাপ হলে টীকা নেয়া সত্ত্বেও পক্সে আক্রান্ড় হয়।					
+ ৯)	ভাগ্যে না থাকলে কেউ শিক্ষিত হয়েও জীবনে উন্নতি লাভ করতে পারে না।					
+১০)	মাছ, মাংস, শাকসব্জি খেলে ভাল স্বাস্থ্য হয়। কিন্তু আমি বিশ্বাস করি না কারণ ভাগ্যে থাকলে এগুলি ছাড়াই স্বস্থ্য হবে।					
+ ১১)	ভাগ্য মন্দ হলে সুষম সার ব্যবহার করলেও ভাল উৎপাদন হবেনা। তাই আমি আমার বন্ধুদেরও সুষম সার ব্যবহারের পরামর্শ দেই না।					
- ১২)	মানুষের ভাগ্যেও চেয়ে তার জ্ঞান, দক্ষতা এবং সামর্থ্য অধিক গুরুত্বপূর্ণ।					

১০। সনাতন/ দেশীয় প্রযুক্তি ব্যবহারের মাত্রা (Extent of use of Indigenous Farming Technology) ঃ

ক্রমিক নং	সনাতন/ দেশীয় প্রযুক্তি	ব্যবহারের মাত্রা			
		প্রায়ই	মাঝে মাঝে	কদাচিৎ	মোটেই না
১)	ফসলের ভাল বৃদ্ধি এবং অধিক উৎপাদন পাওয়ার জন্য বীজ বপনের সময় পরিপক্ক এবং সুস্থ বীজ নির্বাচন করা হয় ।				
২)	দ্রুত অংকুরোদগমের জন্য বীজতলায় বীজ বপনের কিছু সময় পূর্বে কতিপয় বীজ পানিতে ভিজিয়ে রাখা হয়।				
৩)	গোবর , বাড়ির আবর্জনা এবং ফসলের অবশিষ্টাংশ দ্বারা কম্পোষ্ট সার তৈরি করে ফসলের মাঠে ব্যবহার করা হয়।				
৪)	পাখির বসা ও পোকামাকড় ভক্ষনের জন্য ফসলের ক্ষেতে বাঁশের কঞ্চি, গাছের ডাল ইত্যাদি পুঁতে রাখা হয়।				
৫)	আলুর ক্ষেতে খড়/ কচুরিপানা দিয়ে জাবরা প্রয়োগ করা হয়।				
৬)	শুকনো মরিচ দীর্ঘ সময় সংরক্ষনের জন্য পলিথিনের ব্যাগে রাখা হয়।				
৭)	সরিষা ও সীম জাতীয় গাছে জাব পোকা দমনের জন্য ছাই প্রয়োগ করা।				
৮)	গুদামজাত শস্যের বালাইয়ের আক্রমন কমানোর জন্য শুকনা নিম/ আম পাতার গুড়া মিশ্রিত করে বীজ সংরক্ষন করা।				
৯)	উদ্ভিদের ভাল বৃদ্ধির জন্য গাছের গোড়ায় পোল্ট্রি এর বর্জ্য ব্যবহার করা হয়।				
১০)	কীটপতঙ্গের আক্রমন কমানোর জন্য দানাদার শস্য, ডাল ও তৈলবীজ কলসী, মাটির পাত্র, ডুলি, মটকা এবং অন্যান্য সনাতন সংগ্রাহকে সংরক্ষন করা হয় ।				
১১)	পাকা ধানের জমিতে পাখির আক্রমন কমানোর জন্য কাকতাড়ুয়া বানিয়ে জমিতে পুতে রাখা হয়।				
১২)	কীটপতঙ্গ নিয়ন্ত্রনের জন্য গরুর লঘু মূত্র ব্যবহার করা।				
১৩)	জমিতে ফসলের অবশিষ্টাংশ আগুনে পোড়ানো হয়।				
১৪)	মাছ ও শাক সব্জি ধোয়া পানি এবং এর অবশিষ্টাংশ গাছের গোড়ায় দেয়া হয়।				
১৫)	করলার বীজ সংরক্ষনের জন্য কাদামাটির মধ্যে রেখে বল তৈরি করে রোদে শুকিয়ে সংরক্ষন করা হয়।				
১৬)	মাটির উর্বরতা বৃদ্ধির জন্য পুকুরের তলদেশের কাঁদামাটি প্রয়োগ করা।				
১৭)	ফসলের ক্ষেতে ইদুর নিয়ন্ত্রনের জন্য কলার খোলে আলকাতরা লাগিয়ে চলার পথে রেখে দেয়া হয়।				
১৮)	পানির উপর কচুরিপানা খাদা করে বাঁশ তৈরি করে হলুদ এর চাষ করা হয়।				

সহযোগীতার জন্য আপনাকে ধন্যবাদ।

সাক্ষাৎকার গ্রহণকারীর স্বাক্ষর ও তারিখ

Appendix- C

Letter to judges from the Thesis Supervisor of this research for Judgment of 25 statements of Attitude Scale together with the 9-point continuum against each of the statements

From

Date: 02.01.2008

Dr. Md. Sekender Ali
Associate Professor
Dept. of Agrl. Extn. & Information System
Sher-e-Bangla Agricultural University, Dhaka

To

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.....

.....

Sub: **Selection of item for indigenous technologies**

Dear Sir,

This is connection with the study of my MS student **Utpal Chowdhury** who has undertaken a research study on **"Adoption of Selected Indigenous Technologies by the Farmers"**. You are selected as a judge for selection of items in connection with indigenous technologies. You are requested to rank the suitability of the items regarding indigenous agricultural technologies. This will be helpful to a design and prepare research instrument for the study.

Please return this material back at your earliest convenience after completing your task.

With personal regards

Sincerely yours,

Dr. Md. Sekender Ali
Supervisor &
Associate Professor
Dept. of Agril. Extension. & Information System and
Sher-e-Bangla Agricultural University

Judge/Expert no.....

Instruction for rating

Please rate the extent of the suitability of the following statements regarding Indigenous Agricultural Technologies by putting tick (√) mark against each column.

Sl. No	Statement (Item)	Least suitable								Most suitable
		1	2	3	4	5	6	7	8	9
1	Applying muddy soil collected from the bottom of the pond to improve the fertility of surface soil									
2	Spreading ash in mustard and bean to control aphid insect									
3	Seeds are soaked in water for sometime before sowing in the bed for rapid germination									
4	It is necessary to apply compost in field that was made by cow dung and domestic refuses									
5	Potato preserve in sand layers for long time storing									
6	It is necessary to select mature and healthy seeds for better growth and maximum yield of crop									
7	Dried chilli should be stored for long time in polybag									
8	Cereals, pulses and oil seed are put in pitcher, earthen pot, duhli, motka in order to control insect infestation									
9	Storing seeds by mixing with the dust of dried neem/ mango leaves to repeal stored grain pest									
10	Applying of poultry manure for better growth of plant									
12	Visiting the potato field early in the morning to detect and to kill potato cut worm									
13	In order to reduce and attack in the ripen paddy field, 'Scarecrow' (*Kaktarua*) is used									
14	Applying diluated cattle urine to control insects.									
15	Spraying *Bishkatali* solution to control vegetables									
16	Setting up bamboo sticks, branches of trees etc. in vegetable field to let the birds sit and eat away insects									
17	Using the skeleton of dried bottle gourd to store different types of seeds									
18	Applying fish and vegetables cleaning water at the bases of plant									
19	Bitter gourd seeds are kept in mud ball and dried for preservation									
20	Chilies and brinjal seeds are soaked in water and hanged in cotton bags for better germination									
21	Spreading tobacco dusts over the field to control insects									
22	Turmeric are being cultivated over pile of water hyacinth on the water									
23	Intercropping garlic and potato to minimize pest attack									
24	Residues of crop are burned in the field									
25	Mulching potato fields with straw/water-hyacinth									

Signature of Judge & date

Appendix- D

Suitability Index (SI) of each Indigenous Technology

Sl. No	Statement (Item)	Obtained Score	Ranking
1	It is necessary to select mature and healthy seeds for better growth and maximum yield of crop.	252*	1
2	Seeds are soaked in water for sometime before sowing in the bed for rapid germination.	247*	2
3	Spreading ash in mustard and bean to control aphid insect	199*	7
4	It is necessary to apply compost in field that was made by cow dung and domestic refuses.	235*	3
5	Applying of poultry manure for better growth of plant.	187*	9
6	Applying muddy soil collected from the bottom of the pond to improve the fertility of surface soil.	141*	16
7	Dried chilli should be stored for long time in polybag.	203*	6
8	Cereals, pulses and oil seed are put in pitcher, earthen pot, duhli, motka in order to control insect infestation.	183*	10
9	Storing seeds by mixing with the dust of dried neem/ mango leaves to repeal stored grain pest.	191*	8
10	Potato preserve in sand layers for long time storing.	095	22
11	Applying the mixture of Kerosene and urea in rice fields to control stem borers and leaf cutters.	052	25
12	Mulching potato fields with straw/ water-hyacinth.	216*	5
13	Applying diluated cattle urine to control insects.	176*	12
14	Spraying *Bishkatali* solution to control vegetables.	082	23
15	Setting up bamboo sticks, branches of trees etc. in vegetable field to let the birds sit and eat away insects.	222*	4
16	Using the skeleton of dried bottle gourd to store different types of seeds.	116	21
17	Applying fish and vegetables cleaning water at the bases of plant.	158*	14
18	Bitter gourd seeds are kept in mud ball and dried for preservation.	152*	15
19	Chilies and brinjal seeds are soaked in water and hanged in cotton bags for better germination.	121	20
20	In order to control rodents in the crop field, banana cover-sheath painted with coaltar are kept scatteredly on the path of rodents.	138	17
21	Turmeric is being cultivated over pile of water hyacinth on the water.	135*	18
22	Intercropping garlic and potato to minimize pest attack.	075	24
23	Residues of crop are burned in the field.	172*	13
24	In order to reduce and attack in the ripen paddy field, 'Scarecrow' (*Kaktarua*) is used.	180*	11
25	Visiting the potato field early in the morning to detect and to kill potato cut worm.	134	19

Appendix- E

Correlation matrix among the Variables of the study

Characters	Age	Level of education	Family Size	Annual Income	Farm Size	Farming experience	Extension Media contact	Agricultural knowledge	Fatalism	Extent of the use of Indigenous Farming Technologies
Age	1									
Level of education	-.094	1								
Family Size	.429(**)	.076	1							
Annual Income	.366(**)	.092	.395(**)	1						
Farm Size	-.065	-.161	-.129	.413(**)	1					
Farming experience	.983(**)	-.088	.408(**)	.368(**)	-.081	1				
Extension Media contact	-.004	.398(**)	-.021	-.057	-.147	-.008	1			
Agricultural knowledge	.032	.490(**)	.010	.221(*)	.092	.014	.503(**)	1		
Fatalism	-.042	-.438(**)	-.093	-.141	.094	-.024	-.415(**)	-.474(**)		
Extent of the use of Indigenous Farming Technologies	.508(**)	.188(NS)	.576(**)	.289(**)	-.271(**)	.489(**)	.061(NS)	.242(*)	-.112(NS)	1

NS: Not significant

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed)