ADOPTION OF MODERN HIGH YIELDING VARIETIES (HYV) OF WHEAT BY THE FARMERS

MD. KAMAL HOSSAIN

DEPARTMENT OF

AGRICULTURAL EXTENSION AND INFORMATION SYSTEM

SHER-E-BANGLA AGRICULTURAL UNIVERSITY
DHAKA-1207

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ADOPTION OF MODERN HIGH YIELDING VARIETIES (HYV) OF WHEAT BY THE FARMERS

By

MD. KAMAL HOSSAIN
Reg. No. : 00478

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Approved by:

(Professor M. Zahidul Haque)
Supervisor

(Assoc. Prof. Md. Sekender Ali)
Co-Supervisor

(Professor M. Zahidul Haque)
Chairman
Examination committee

CERTIFICATE

This is to certify that the thesis entitled, "ADOPTION OF MODERN HIGH YIELDING VARIETIES (HYV) OF WHEAT 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 AGRICULTURAL EXTENSION, embodies the result of a piece of *bona fide* research work carried out by MD. KAMAL HOSSAIN, Registration No.00478 under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

I further certify that such help or source of information, as has been availed of during the course of this investigation has been duly acknowledged by him.

Dated:
Place: Dhaka, Bangladesh

(Professor M. Zahidul Haque)
Supervisor

Dedicated to

My Beloved Parents

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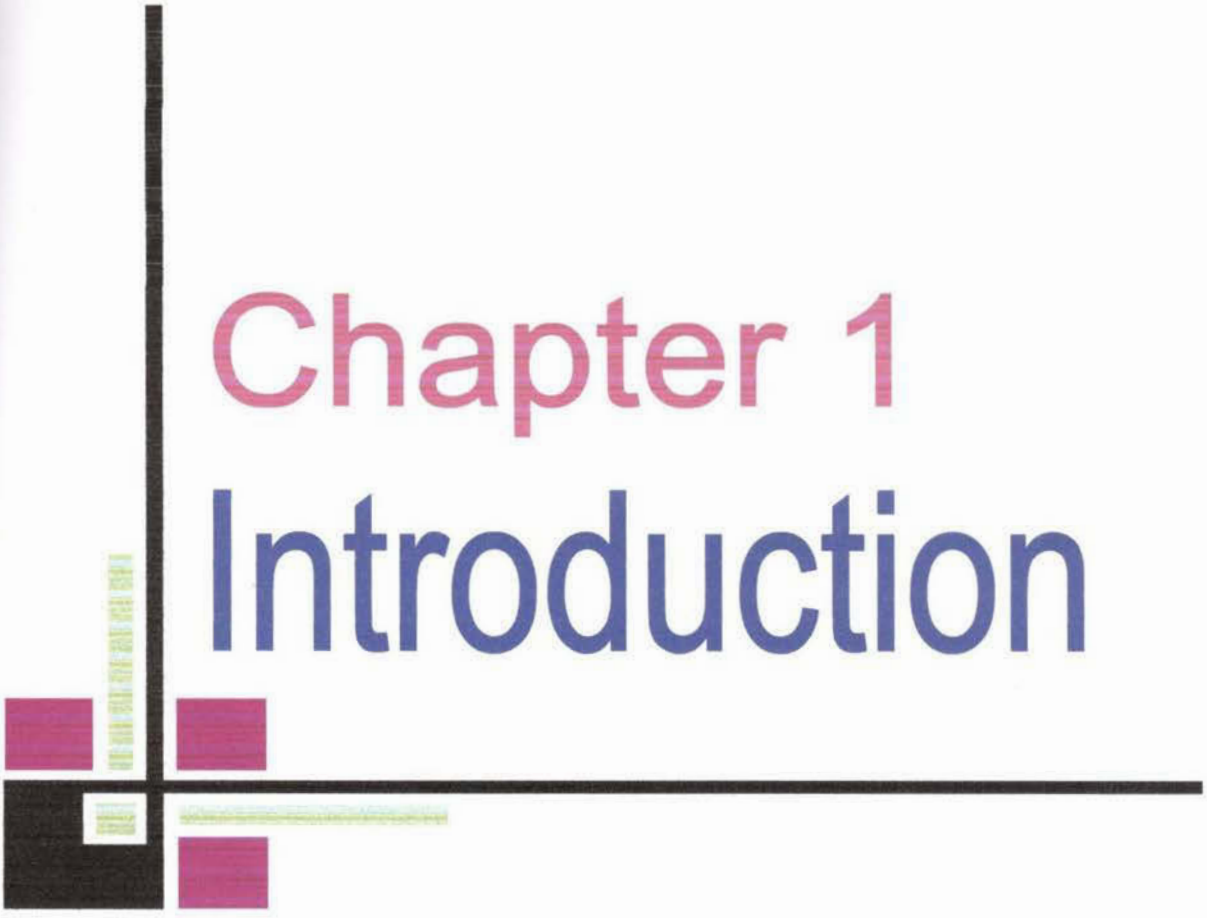
ADOPTION OF MODERN HIGH YIELDING VARIETIES (HYV) OF WHEAT BY THE FARMERS

ABSTRACT

The purpose of the study was to determine the extent of adoption of modern HYV wheat by the farmers and to explore the relationships between farmers' selected characteristics and their adoption of modern HYV wheat. Joydebpur Purashava and Basan union of Gazipur Sadar upazila and Kaoraid union of Sreepur upazila under Gazipur distrct were the locales of the study. Data were collected by using interview schedule from 110 farmers selected randomly during 20 October to 20 November, 2007. The finding revealed that a large proportion (44.5 percent) of the farmers/wheat growers had low adoption of modern HYV wheat as compared to 36.4 percent medium adoption and 19.1 percent high adoption respectively. Computed coefficient of correlation (r) values indicated that seven out of ten characteristics of the farmers namely, farm size, family income, agricultural training, attitude towards modern HYV wheat cultivation, innovativeness, contact with different media and knowledge on wheat cultivation had significant positive relationship with their adoption of modern HYV wheat. On the other hand, other three characteristics of the farmers namely, age, education and non-localite behaviour had no significant relationship with their adoption of modern HYV wheat. Ten problems of the farmers were identified which they confronted frequently during modern HYV wheat cultivation. Five major problems in descending order of Problem Confrontation Index (PCI) were: (i) high price of fertilizer, (ii) high price of seeds, (iii) lack of HYV wheat seeds in the market, (iv) scarcity of fertilizer supply in time and (v) requires high amount of fertilizer in HYV wheat crops.



Chapter 1
Introduction

CHAPTER I

INTRODUCTION

1.1 Background of the study

Bangladesh is an agriculture based country. The country's population is 147.1 million with high density of 953/sqkm (BBS, 2007). About 64.8 percent of their population lives in rural areas and 62 percent of the country's total labour force are engaged in agriculture (BBS, 2007). The total land area of Bangladesh is 14.84 million hectare of which 8.29 million hectare are cultivable land and total cropped area is 14.11 million hectare of which 8.02 million hectare are net cropped area (BBS, 2007). In 2005-06 fiscal year production of food crop was 27.27 million metric tons whereas Aus 1.83 million metric tons, Aman 11.52 million metric tons, Boro 12.83 metric tons, wheat 1.25 million metric tons and maize 2.41 lakh metric tons (BBS, 2007).

Wheat (*Triticum aestivum* L.) is the world's most widely cultivated cereal crop which ranks first followed by rice. It is preferable to rice for its higher seed protein content. Wheaten food supplies carbohydrate and considerable amount of protein and mineral (Walton, 1969). Wheat seed is rich in nutrients containing 69.60 percent carbohydrate, 12 percent fat and 27.20 percent mineral matter (BARI, 1997). Wheat has been taken as one of the principle food by two-thirds of the world population.

In Bangladesh wheat is the second important cereal crop next to rice and has achieved a remarkable progress in increasing wheat production and productivity over the last 30 years and the average yield of wheat is only 2.2 ton/hectare (BBS, 2001) and it can be increased up to 6.41 ton/hectare (RARS, 1993). So, there is an ample opportunity to increase production of wheat per unit area through adoption of modern HYV wheat and also through improved agronomic practices.

Food production in Bangladesh is not increasing by keeping space with the increase of population growth. Total land area under food production has been decreasing year after year to accommodate the ever-increasing population. On the other hand, yield of rice, the major food crop of this country has been declining for the last two decades due to decreasing of soil fertility and crop production (Roy, 1996) and as a result the country has been suffering from food shortage. So, in this situation efforts should be taken to increase the food production by cultivating promising crop like wheat other than rice.

In *Rabi* season, most of the lands, especially in north-western part of the country remain fallow due to lack of irrigation facilities which could easily be brought under wheat cultivation. The climate and soil of Bangladesh are quite favourable for the cultivation of wheat during this period.

Bangladesh is a rice growing country but its climatic conditions are suiTable for wheat production. In 1970 wheat cultivation area was only 0.1 million hectare. In 1985 the area increased at 0.7 million hectare and total production were 1.2 million metric ton. In 1999 wheat cultivation area of our country was 0.85 million hectare and the production were about 1.9 million metric ton (BBS, 2007).

Wheat can be a good supplement of rice and can play the most vital role to feed the teeming millions of the people. There is ample scope for wheat cultivation in Bangladesh as it is cultivated in Rabi season having minimum competition with rice for land. Wheat can be grown in winter season along with other crops like pulses, oil seeds, vegetable etc.

Wheat Research Institute of Bangladesh developed so many high yielding varieties. But a very few previous research works had tried to find out the extent of adoption of those varieties. Therefore, the researcher felt necessity to

conduct a research entitled "adoption of modern high yielding varieties (HYV) of wheat by the farmers".

1.2 Statement of the problem

Just after rise, wheat is the second cereal crop in Bangladesh. Bangladesh government is upgrading the extent of wheat cultivation and production of this crop through various projects. Wheat has much potentiality, as a high value crop (HVC), for widespread cultivation by the respondents. But before undertaking any massive programme for its increased cultivation in Bangladesh, it is first necessary to know the existing situation of the extent of cultivation of wheat in the most protection areas of Bangladesh. In our country Dinajpur region is very much well known for cultivating wheat. In Dinjpur, wheat is used as the people's second staple food. Most people take wheat as bread for their breakfast. Sometimes bread is used as their dinner. It is surely good and less expensive than taking rice in every meal. In Dinajpur, there is situated Bangladesh Wheat Research Center (WRC) at Nashipur. With the technological help of this research station, the farmers are being more benefited. The station introduces some innovations to increase the wheat production. Kanchan, Akber, Satabdi & Balaka are the improved varieties osf wheat which were adopted by the farmers of this area. It is needed to design appropriate programmes for its widespread cultivation; the knowledge on the present situation of wheat cultivation will be significantly contributory to expand the adoption of these varieties in other parts of the country. In these regards, the answers are very much important to extend of the following questions:

1. To what extent of wheat varieties have been adopted by the wheat growers?
2. What are the characteristics of the wheat growers?
3. Is there any relationship between the characteristics of the wheat growers and their extent of adoption of wheat varieties?
4. What problems the growers usually encounter in cultivating the wheat varieties?

These questions obviously indicate the need for conducting a research study entitled "Adoption of modern high yielding varieties (HYV) of wheat by the farmers".

1.3 Specific objectives of the study

The following objectives were formulated to give clear direction to the study:

1. To determine and describe the selected characteristics of the farmers. The selected characteristics are:
   (a) Age
   (b) Education
   (c) Farm size
   (d) Annual family income
   (e) Agricultural training
   (f) Non-localite behaviour
   (g) Attitude towards modern HYV wheat cultivation
   (h) Innovativeness
   (i) Contact with different media
   (j) Knowledge on wheat cultivation
2. To determine the extent of adoption of modern HYV wheat by the farmers.
3. To explore the relationships between selected characteristics of the farmers and their adoption of modern HYV wheat.
4. The problems confronted by the farmers in adoption of modern HYV wheat.

1.4 Justification of the study

By improving wheat cultivation practices by the farmers Production of wheat may be increased. It is to be disseminated about the concept and benefits of the wheat varieties to the farmers in a convincing and attractive manner, so that farmer's response quickly to adopt wheat varieties. Surely it is an educative process and is possible through Extension Education System, which is concerned mainly with increasing agricultural production and improving living standards of the farmers. In winter season we have about 2.4 to 2.8 million hectares of land remain uncultivated during winter season. We have an

opportunity to cultivate another crop after harvesting of wheat for its short duration and so we can obtain self sufficiency in food. Wheat can be played a great role along with rice. Transferring of modern technology, increasing wheat production and getting necessary information related to wheat production would be the key factor for the farmers in adoption of wheat cultivation (Islam, 1996). But the actual increase in production will depend on the activities of the wheat growers. The behavior of a farmer is influenced by his personal, economic, social and physiological characteristics (Hossain, 1991). Now considerable effort is being made through research and extension delivery system to increase wheat production in our country.

1.5 Scope of the study

The basic concern of the study is to determine adoption of the modern HYV wheat varieties. The findings of the study will be specifically applicable to Gazipur district. However, the findings will also have implications for other areas of the country having relevance to the socio-cultural context of the study area. The investigator believes that the findings of the study will reveal the phenomenon related to diffusion of innovation. These will be of special interest to the policy makers and planners in formulating and redesigning the extension programmes especially for modern HYV wheat varieties. It is expected that the findings are expected to be helpful to the field workers of different nation building departments and organizations to develop appropriate extension strategies which is effective work for villagers.

1.6 Assumptions of the study

The researcher had the following assumptions (Goode and Hatt, 1952) in mind while undertaking this study:

1) The respondents included in the sample were capable of providing proper answer to the question in the interview schedule.

2) The researcher who acted as interviewer was adjusted to social and environmental condition of the study area. Hence, the data collected by him and the respondents were free from bias.
3) The responses furnished by the respondents were reliable. They expressed the truth about their conviction and opinions.
4) Views and opinions furnished by farmers included in the sample were representative views and opinions of the whole population of the study.
5) The finding of the study will have general application to other parts of the country with similar socio-economic, cultural and agro-ecological conditions of the study area.
6) The respondents were more or less conscious about the use of wheat varieties.

1.7 Limitations of the study

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

1. The study was confined mainly to farmers' adoption of modern HYV wheat.
2. The study was confined in eight villages of Gazipur Sadar Upazila and Sreepur upazila under Gazipur district.
3. The characteristics of wheat growers are many and varied but only ten characteristics were selected for investigation in this study.
4. Population of the study includes only the heads of the farm families.
5. Facts and figures were collected by the investigator applied to the present situation in the selected area.
6. For information about the study, the researcher has to depend on the data furnished by the selected respondents during data collection.

1.8 Statement of hypothesis

The research hypothesis was converted into null form for the purpose of statistical testing. The major null hypothesis states that "there is no relationship between the farmers' adoption of modern HYV wheat varieties and their

selected characteristics". Ten null hypotheses were formulated dealing with each of the selected characteristics".

The following null hypothesis was formulated to explore the relationship between the dependent and independent variables. The major research hypothesis for the study is: "there is no relationship between farmers' adoption of modern HYV wheat and their selected characteristics including age, education, farm size, annual family income, agricultural training, non-localite behaviour, attitude towards modern HYV wheat cultivation, innovativeness, contact with different media and knowledge on wheat cultivation".

1.9 Definition of key terms

For clarity of understanding, a number of key concepts/terms frequently used throughout the study defined were interpreted as follows:

Adoption

It is the implementation of a decision to continue the use of an innovation. According to Rogers (1995), "Adoption is a decision to make full use of an innovation as the best course of action available." When an individual takes up a new idea as the best course of action and practices it the phenomenon is known as adoption (Ray, 1991). In this study, adoption was defined as the phenomenon of taking up a new idea (wheat varieties) and put it into practice by the wheat growers.

Age

It is a long period of time that is from a farmer's birth time to up to the time of present research investigation.

Assumption

An assumption is "The supposition that an apparent fact or principle is true in the light of the available evidence" (Goode and Hatt, 1952).

Attitude towards wheat cultivation

The term attitude towards wheat cultivation of an individual was used to refer to his feelings, belief and action tendencies towards the various aspects of wheat cultivation.

Contact with different media

It is referred to the respondents becoming accessible to the influence of different information media through different extension teaching methods.

Non-localite behaviour

Non-localite behaviour of a respondent is measured by computing a score. This score is assigned on the basis of his frequency of visit to different places outside his own social system.

Education

Human behavior can be changed by receiving different kinds of education, i.e. change in knowledge, skill and attitude of an individual through reading, writing and other related activities. It is measured in terms of years of schooling.

Farmers/Growers

Those persons who are engaged in farming activities are called farmers. The farmers are involved in different farm and community level activities like several farming activities, crops, livestock, fisheries etc.

Farm size

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

Annual family income

It means the total earning by the respondent himself and the members of his family from agriculture and other sources during a year. It is expressed in taka.

Hypothesis

Defined by Goode and Hatt (1952), a proposition this can be put to "a test to determine its validity". It may be true or false, it may seem contrary to or in accord with common sense. However, it leads to an empirical test.

Innovation

An innovation is an idea or practice perceived as new by the individual. It is the newness of the idea to the individual that determines his reaction to it.

Innovativeness

Innovativeness is the degree to which an individual is relatively earlier in adopting agricultural innovations, new ideas, practices and things than the other members of a social system (Rogers, 1995). This was comprehended by the quickness of accepting innovations by an individual in relation to others and was measured on the basis of time dimension.

Knowledge on wheat cultivation

It is the extent of basic understanding of the farmers in different aspects of high yielding varieties of wheat. It includes the basic understanding of the use of different wheat varieties.

Problem

Problem refers to a difficulty about which something to be done. Problem faced by the farmers in this study was defined as the extent of difficulties faced by wheat growers in the way of adoption of modern HYV wheat.

Null hypothesis

The hypothesis which we pick for statistical test is null hypothesis (Ho). In this study the null hypothesis is stated that there is no relationship between the concerned variables.

Research methodology

Research methodology is the description, explanation and justification of various methods of conducting research. It may be understood as a science of studying how research is done scientifically. In it we study the various steps that are generally adopted by a researcher in studying the research problem along with the logic behind them.

Respondents

People who answer questions asked by an interviewer for a social survey are called respondents. They are the people from whom a social research worker usually gets most data required for his research.

Statistical test

A body of rules which help to take decision regarding acceptation or rejection of the hypothesis is defined as test. In this study if a null hypothesis is rejected it is assumed that there is a relationship between the variables.

Agricultural training

It refers to the total number of days attended by the farmers in his/her life to the various agriculture related subject matter.

Variable

A general indication in statistical research of characteristic that occurs in a number of individuals, objects, groups etc. and that can take on various values, for example the age of an individual.

Chapter 2
Review of Literature

CHAPTER II

REVIEW OF LITERATURE

The purpose of this Chapter is to review of literature having relevance to the present study. The researcher made an elaborate search of available literature for the above purpose. But only a few studies dealing with the relationship of the characteristics of growers and their adoption of selected modern HYV wheat was found. Therefore, the finding of such studies related to the extent of adoption of selected modern HYV wheat by the wheat growers and other partially related studies have been discussed in this chapter.

This Chapter is divided into three sections; the **first** section deals with Past research findings relating to extent of adoption of innovation, the **second** section deals with past research findings relating to the relationships of farmers' adoption of innovations with their selected characteristics, the **third** section deals with the conceptual framework of the study.

2.1 Past research findings relating to extent of adoption of innovations

Squire (2000) studied on factors influencing traditional farmers to adopt improved food crop production technologies in BO district of Southern Sierra Leone. He found that agricultural technology communication media (other farmers (54%): characteristics of the arable crops (good to excellent eating quality of the improved crop varieties (53%); artificial fertilizers (55%); mechanical technology (65%); draught animal technology (59%); pest and disease control technologies (increase in crop yield (61%); and row planting technologies (easy to weed(53%).

Rahman (2001) conducted an investigation on knowledge, attitude and adoption of Aalok-6201 hybrid rice by the farmers of Sadar Upazila in Mymensingh district. The study revealed that the majority (75 percent) of the

farmers had medium adoption while 18 percent and 7 percent had high and low adoption in Aalok-6201 hybrid rice cultivation respectively.

Hussen (2001) conducted an investigation on adoption of modern sugarcane cultivation practices by the farmers of Dewanganj Upazila in Jamalpur district. The study revealed that about cent percent (91 percent) of the farmers had medium adoption compared to 7 percent having low adoption and only 2 percent having high adoption of modern sugarcane cultivation practices.

Islam (2002) conducted a study on adoption of modern agricultural technologies by the farmers of Sandwip. The study revealed that 69 percent of the farmers had medium adoption while 13 percent had low adoption and 18 percent had high adoption of modern agricultural technologies.

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

Aurangojeb (2002) studied on the extent of adoption of integrated farming technology by the rural women in RDRS. He observed that the highest percent of rural women (64%) used high level, (28%) of the women used medium level and only 8% used low level integrated homestead farming technologies.

Ahmed (2006) studied on the extent of adoption of selected wheat varieties by the farmers. The study revealed that the majority (55 percent) of the respondents had medium adoption of selected wheat varieties.

2.2 Past research findings relating to the relationships of farmers' adoption of selected innovations with their selected characteristics

This selection presents a review of previous studies relating the association of the selected characteristics of the farmers and their adoption of innovations. Eleven characteristics of the contract growers were selected as independent variables of this study. The researcher made utmost efforts to search out studies dealing with relationships of each of the selected characteristics with the adoption of wheat cultivation.

2.2.1 Age and adoption of innovation

Islam (1996) carried out a research study on growers' use of indigenous technical knowledge (ITK), in the context of sustainable agricultural development. He observed that age of the respondent growers had significant negative relationship with their extent of use of ITK (at 0.01 level of probability). Hossain (1991), Ali (1993), Haque (1993), Khan (1993), Pal (1995) and Hasan (1996) found similar relationships.

Sarkar (1997) observed that there was no significant relationship between age of the farmers and their adoption of improved potato cultivation practices. Similar findings were observed by Karim and Mahaboob (1986) and Kher (1992) in their respective studies.

Aurangozeb (2002) observed that there was significant negative relationship between age and use of integrated homestead farming technologies. The interpretation is that with increased age level of the respondents there was a corresponding decrease of the adoption of homestead farming technologies.

Haque (2003) conducted a study on farmer's adoption of modern maize cultivation technologies. He observed that age of the respondents had negatively significant relationship with their extent of farmer's adoption of modern maize cultivation technologies.

Islam (2005) conducted a study on adoption of pashu pusti in cattle rearing at farmers' level. He observed that age of the respondents had insignificant relationship with their extent of adoption of pashu pusti in cattle rearing at farmers' level.

Ahmed (2006) found in his study that age of the respondents had no significant relationship with their adoption of selected wheat varieties.

2.2.2 Education and adoption of innovation

Muttaleb (1995) studied the relationship of education with adoption of improved potato technologies. The study observed that education had a positive relationship with their adoption of potato technologies.

Hasan (1996) conducted a study on adoption of some selected agricultural technologies among the farmers as perceived by the frontline GO and NGO workers. He found that the education had no significant relationship with the perceived adoption of selected agricultural technologies.

Alam (1997) observed that the level of education of the farmer had a positive and significant relationship with the use of their improved farm practices.

Sarkar (1997) found that the level of education of the farmer had a positive significant relationship with their adoption of improved potato cultivation practices.

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

Rahman (2001) conducted a study on knowledge, attitude and adoption of the farmers regarding Aalok 6201 hybrid rice in Sadar upazila of Mymensingh district. He found that age of the farmers had no significant relationship with their adoption regarding Aalok 6201 hybrid rice.

Aurangozeb (2002) observed that there was positive relationship between education and adoption of integrated homestead farming technologies. The educated women were more interested in adoption of integrated homestead farming technologies than the illiterate women.

Islam (2002) conducted a study on adoption of modern agricultural technologies by the farmers of Sandwip. He found that education of the farmers had a positive significant relationship with their adoption of modern agricultural technologies.

Sardar (2002) conducted a study on adoption of IPM practices by the farmers under PETRRA projects of RDRS. He found that education of the farmers had a positive significant relationship with their adoption of IPM practices.

Hossain (2003) concluded that education of the farmers had a significant and positive relationship with their adoption and modern Boro rice cultivation practices.

Ahmed (2006) found in his study that education of the respondents had no significant relationship with their adoption of selected wheat varieties.

2.2.3 Farm size and adoption of innovation

Singh (1991) in a study found that income of the farmers was significantly associated with the level of adoption of plant protection measures.

Hossain (1991) conducted a study to determine the extent of adoption behaviour of contract wheat growers in Sadar upazila of Jamalpur district. He found negatively insignificant relationship between farm size of the farmers and their level of adoption of improved farm practices.

Hossain and Crouch (1992) studied the relationship of farm size with adoption of farm practices. They found positive relationship between the farm size and adoption of farm practices. Similar result was found by Kashem (1991).

Ali (1993) in his study found that farm size of the respondents had no significant relationship with STP adoption behaviour of sugarcane farmers.

Basher (1993) conducted a study on the adoption of intercropping of sugarcane. He observed that there was no relationship between farm size of the respondent farmers and their adoption of sugarcane intercropping.

Muttaleb (1995) observed that farm size of the growers had a positive relationship with the adoption of improved potato varieties.

Islam (1996) found that there was significant and negative relationship between the farm size of the farmers and their extent of use of indigenous technical knowledge.

Chowdhury (1997) observed that there was a positively significant relationship between farm size and adoption of selected BINA technologies. Similar results were found by Islam (1993), Pal (1995) and Sarkar (1997) in their respective studies.

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

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

Hussen (2001) found that the farm size had positive significant relation with their adoption of modern sugarcane cultivation practices.

Aurangozeb (2002) observed that there was no relationship between homestead area and adoption of integrated homestead farming technologies.

Islam (2002) conducted a study on adoption of modern agricultural technologies by the farmers of Sandwip. He found that farm size of the farmers had a positive significant relationship with their adoption of modern agricultural technologies.

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

Haque (2003) conducted a study on farmer's adoption of modern maize cultivation technologies. He observed that farm size of the respondents had insignificant relationship with their extent of farmer's adoption of modern maize cultivation technologies.

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

Ahmed (2006) found in his study that farm size of the respondents had no significant relationship with their adoption of selected HYV wheat varieties.

2.2.4 Annual family income and adoption of innovation

Chowdhury (1997) found that the annual income of the respondents had a positively significant relationship with their adoption of selected BINA technologies.

Hussen (2001) conducted a study on farmer's knowledge and adoption of modern sugarcane cultivation practices. He found that annual income of the

growers had a positive significant relationship with their adoption of modern sugarcane cultivation practices.

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

Aurangozeb (2002) in his study found a positive significant relationship between annual income and adoption of integrated homestead farming technologies.

Islam (2002) conducted a study on adoption of modern agricultural technologies by the farmers of Sandwip. He found that annual income of the farmers had a positive significant relationship with their adoption of modern agricultural technologies.

Sardar (2002) conducted a study on adoption of IPM practices by the farmers under PETRRA project of RDRS. He found that the annual income of the farmers had no significant relationship with their adoption of IPM practices.

Haque (2003) conducted a study on farmer's adoption of modern maize cultivation technologies. He observed that annual income of the respondents had insignificant relationship with their extent of farmer's adoption of modern maize cultivation technologies.

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

Ahmed (2006) found in his study that annual family income of the respondents had no significant relationship with their adoption of selected wheat varieties.

2.2.5 Agricultural training and adoption of innovation

Haque (2003) found that training received of the respondent had positive significant relationship with their practices in farmers' adoption of modern maize cultivation technologies.

Islam (2002) conducted a study on farmers' knowledge and adoption of ecological agricultural practices under the supervision of proshika. He found that agricultural training exposure of the farmers had no significant relationship with their adoption of ecological agricultural practices.

Verma *et al.* (1989) found there was significant change in attitude of rural women from before training to after training in improved home making tasks. They said that due to gain in knowledge the attitude became more favourable.

Hossain (1981) showed that proper training could raise the knowledge and skill level of participants significantly.

Ahmed (2006) found in his study that training received of the respondents had significant positive relationship with their adoption of selected wheat varieties.

2.2.6 Non-localite behaviour and adoption of innovation

Hossain (1999) found a positive significant relationship between cosmopoliteness of the farmers and their adoption of improved practices.

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

Hussen (2001) found that the cosmopoliteness had positive significant relationship with their adoption of modern sugarcane cultivation practices.

Aurangozeb (2002) conducted a study on adoption of integrated farming technologies by the rural women in RDRS. He found that there was a positive

relationship among cosmopoliteness and their adoption of integrated farming technologies.

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

Islam (2002) conducted a study on adoption of modern agricultural technologies by the farmers of Sandwip. He found that cosmopoliteness of the farmers had significant positive relationship with their adoption of modern agricultural technologies.

Haque (2003) conducted a study on farmer's adoption of modern maize cultivation technologies. He observed that cosmopoliteness of the respondents had insignificant relationship with their extent of farmer's adoption of modern maize cultivation technologies.

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

Ahmed (2006) found in his study that cosmopoliteness of the respondents had significant positive relationship with their adoption of selected wheat varieties.

2.2.7 Attitude towards wheat cultivation and adoption of innovations

Hossain (1981) conducted a study on relationships of selected characteristics of the Jute growers with their adoption of improved practices of Jute cultivation. He found that there is no relationship between attitude towards intensive Jute cultivations scheme of the Jute growers and their adoption of improved practices of jute cultivation.

Hasan (1996) conducted a study on adoption of some selected agricultural technologies among the farmers as perceived by the frontline GO and NGO workers. He found that there was strong positive relationship between attitude towards development and perceived adoption of selected technologies.

Islam (2002) revealed that the attitude towards technology of the farmers had a significant positive relationship with their adoption of modern agricultural technologies.

Ahmed (2006) found in his study that attitude towards wheat cultivation of the respondents had significant positive relationship with their adoption of selected wheat varieties.

2.2.8 Innovativeness and adoption of innovation

Kashem and Halim (1991) reported that innovativeness of the farmers had significant positive correlation with their adoption of modern rice technology use of communication media in livestock production.

Jamal (1996) found no relationship between innovativeness of dropout rural youth with their preference in selected agricultural and non-agricultural entrepreneurship.

Rahman (1995) found a significant negative relationship between the farmers' innovativeness and their problem confrontation in feeds and feeding cattle.

Hossain (1999) found a positive significant relationship between innovativeness of the farmers and their adoption of fertilizer and also observed no relationship with adoption of pesticides.

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

Rahman (2003) revealed that the highest proportion (63 percent) of the farmers had low innovativeness as compared to 22 percent medium innovativeness and 15 percent very low innovativeness.

Ahmed (2006) found in his study that innovativeness of the respondents had significant positive relationship with their adoption of selected wheat varieties.

2.2.9 Contact with different media and adoption of innovation

Ali (1993) conducted a study based on farmer's response to spaced transplanting technology of sugarcane. He found a significant positive relationship between extension contact and adoption. Similar results were obtained by Kher (1992), Haque (1993), Pal (1995), Bhatkar et al. (1998) and by many other researchers.

Alam (1997) studied use of improved farm practices of rice cultivation by the farmers of Anwara thana of Chittagong district. His study indicated no significant relationship of extension contact of farmers with their use of improved farm practices in rice cultivation.

Sarkar (1997) observed a positive and significant relationship between extension contacts and adoption of improved potato cultivation practices.

Hossain (1999) conducted a study to determine the farmers' perception of the effect of agro-chemicals on environment. He found that there was no relationship between the farmers' media exposure with the adoption of agro-chemicals. Ali *et al.* (1986) observed similar findings with respective studies.

Rahman (1999) found that extension contact of the Boro rice farmers had a significant positive relationship with their adoption of balanced fertilizers in Boro rice cultivation.

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

Rahman (2001) found that extension contact of the farmers had a significant and positive relationship with their adoption regarding Aalok 6201 hybrid rice.

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

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

Ahmed (2006) found in his study that communication behaviour of the respondents had significant positive relationship with their adoption of selected wheat varieties.

2.2.10 Knowledge on wheat cultivation and adoption of innovation

Most of the researchers found very high relationships between farmers' knowledge on a particular technology and its adoption.

Koch (1985) conducted a study in the North Western organize free state of South Africa concerning perception of agricultural innovations aspiration, knowledge and innovation adoption. He observed that there was a strong positive relationship between knowledge and practice adoption.

Reddy *et al.* (1987) found that the significant association between knowledge and use of improved package of practices in paddy production by participant and non-participant farmers.

Rahman (1995) in his study observed no significant relationship between farmers' adoption of improved practices and their knowledge on improved practices of potato cultivation.

Moullik *et al.* (1996) conducted a study on predictive values of some factors of adopting nitrogenous fertilizers by the north Indian farmers in India. He found

a significant positive relationship between agricultural knowledge and adoption of nitrogenous fertilizers among the cultivators.

Alam (1997) observed that agricultural knowledge of the rice growers had significant relationship with their use of farm practices in rice cultivation.

Sarkar (1997) found that potato production knowledge of potato growers had a positive and significant relationship with their adoption of improved potato cultivation practices.

Sardar (2002) studied adoption of IPM practices by the farmers under PETRRA Project of BDRS. He found that agricultural knowledge had positive significant relationship with their adoption of IPM practices.

Ahmed (2006) found in his study that knowledge on wheat cultivation of the respondents had significant positive relationship with their adoption of selected wheat varieties.

2.3 The conceptual framework of the study

In scientific research, selection and measurement of variables constitute on important task. The hypothesis of a research while constructed properly contains at least two important elements i.e. "a dependent variable" and "an independent variable". A dependent variable is that factor which appears, disappears or varies as the researcher introduces, removes or varies the independent variables. An independent variable is that factor which is manipulated by the researcher in his attempt to ascertain its relationship to an observed phenomenon. In view of prime findings of review of literature, the researcher constructed a conceptual frame work of the study which is self explanatory and is presented in Figure 2.1.

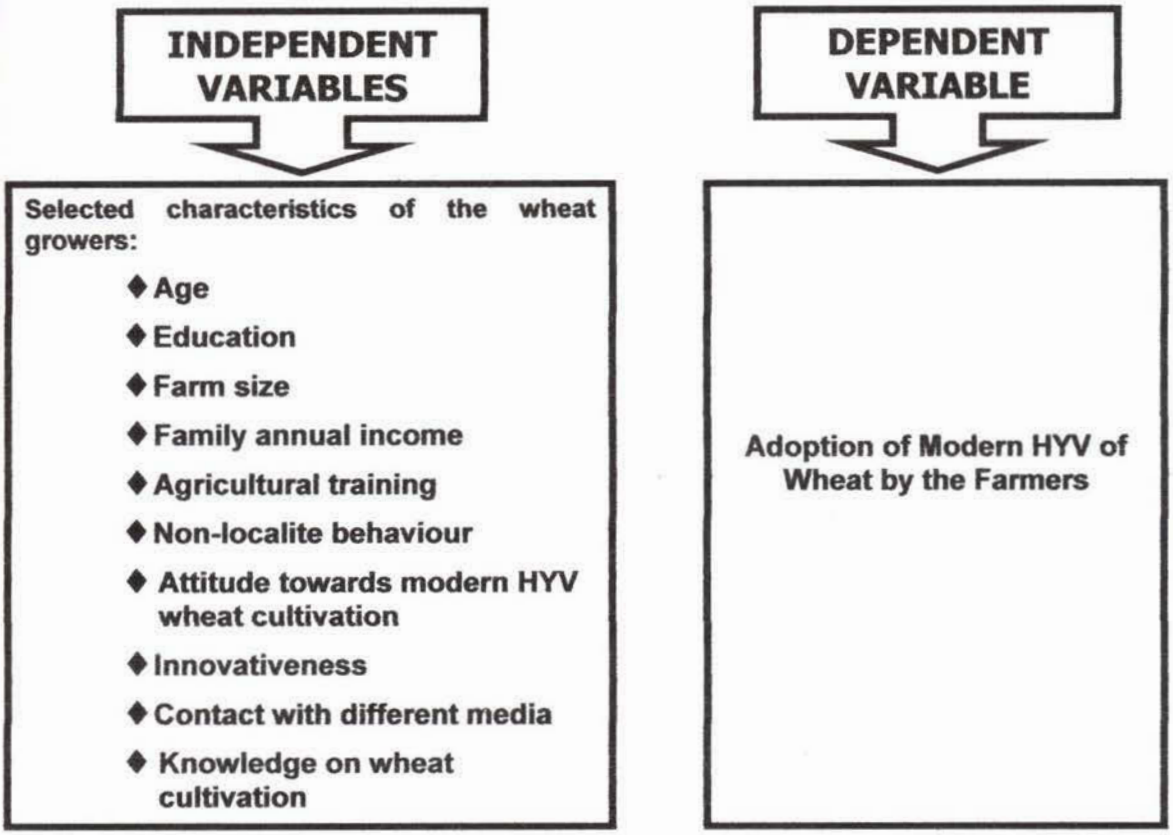


Figure 2.1 The conceptual framework of the study

Chapter 3
Methodology

CHAPTER III

METHODOLOGY

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

3.1 Locale of the Study

The study was conducted at Joydebpur Paurashava and Basan Union of Gazipur Sadar Upazila and Kaoraid Union of Sreepur Upazila under Gazipur district. Wheat is the second crop of the farmers of this area. Maps of Gazipur district, Gazipur Sadar Upazila and Sreepur Upazila showing the study area have been presented in Figs. 3.1 and 3.2 and 3.3 respectively.

3.2 Design of the study

The design of the study was a descriptive survey research. It was designed to describe some selected personal characteristics of the farmers and the relationship between selected characteristics of the farmers and their adoption of modern HYV wheat. Efforts were also made to assess the problems of the wheat growers in adopting modern HYV wheat.

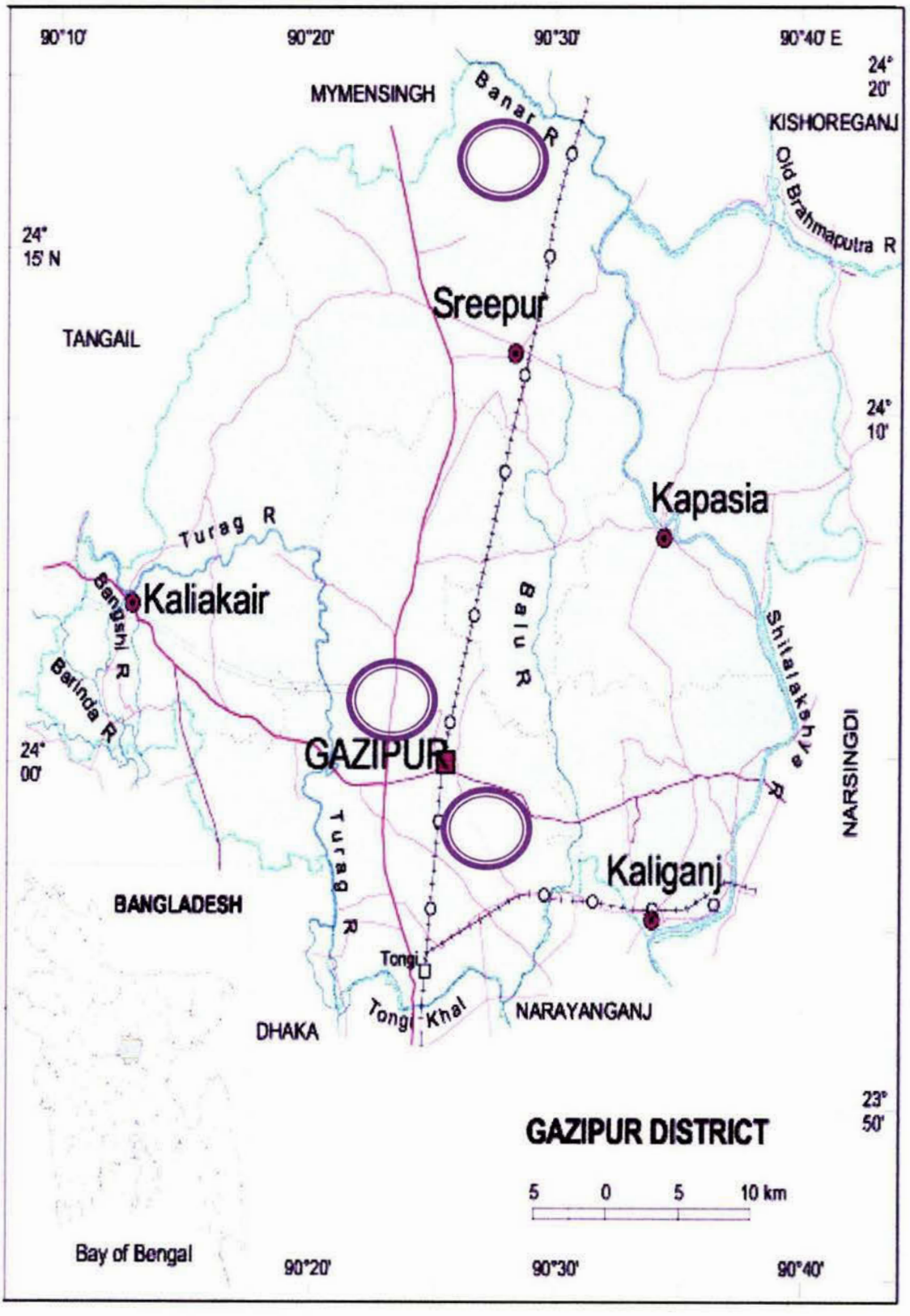


Fig: 3.1 A map of Gazipur district showing the study upazila

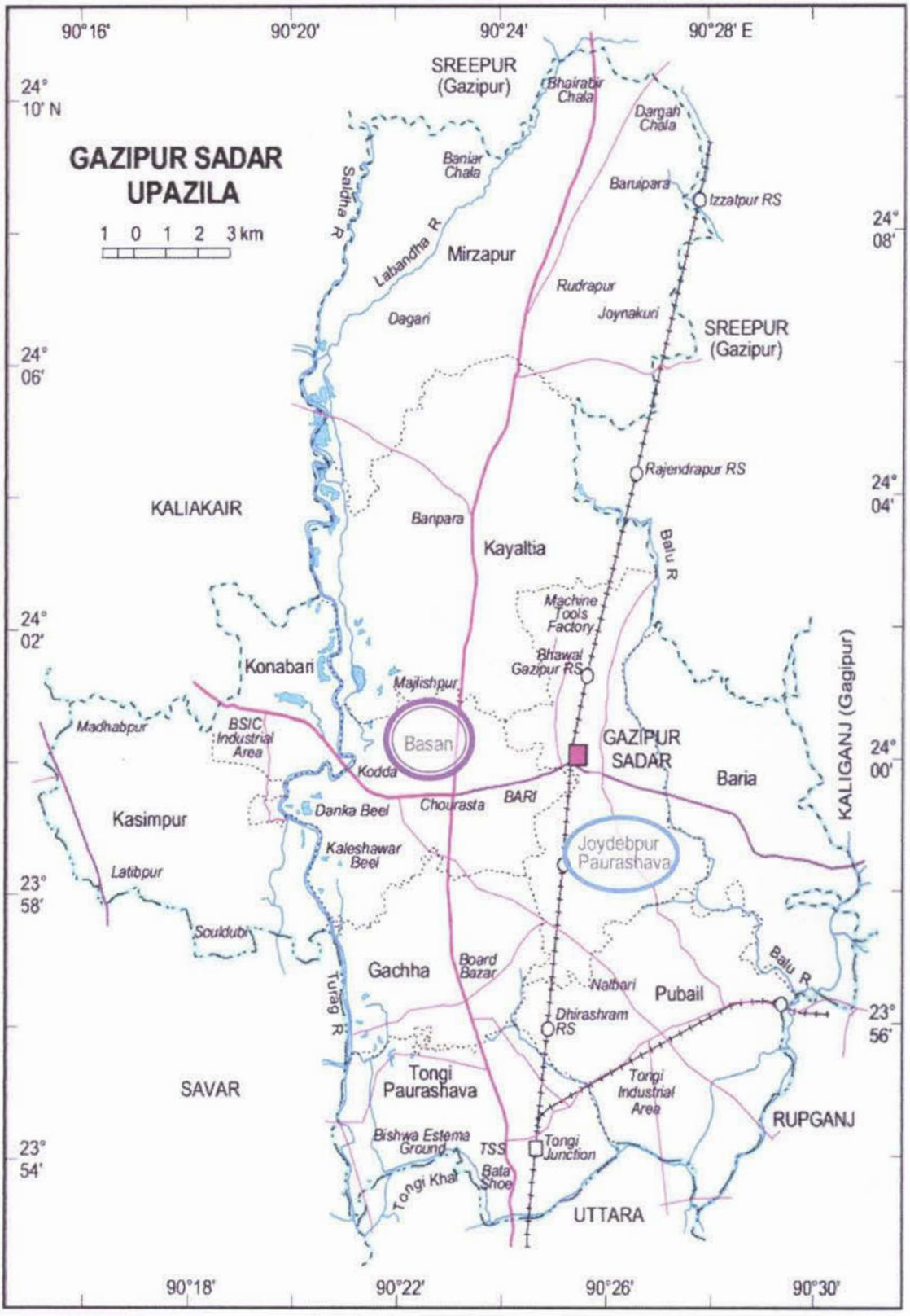


Fig: 3.2 A map of Sadar upazila of Gazipur district showing the locale

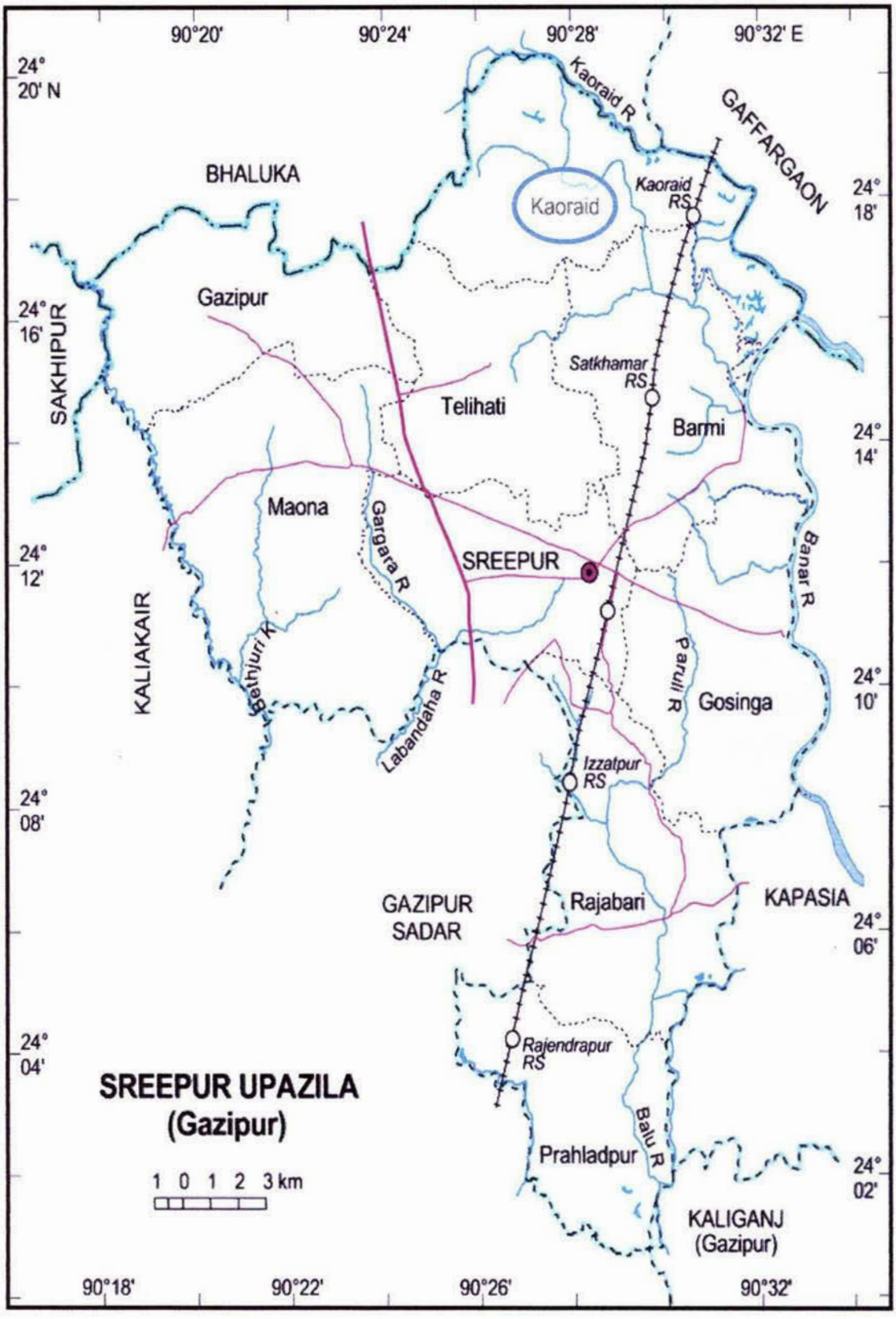


Fig: 3.3 A map of Sreepur upazila of Gazipur district showing the locale

3.3 Population and sampling design

Joydebpur Paurasava and Basan union of Gazipur Sadar upazila covering six villages namely, Adaboil, Jugitola, Chaitannapur, Shamantapur, Dhiraj and Choto Daoura, and Kaoraid union of Sreepur upazila covering two villages namely, Bapta and Nandia Sargon were selected purposively. Then a list of wheat growers of these villages was prepared with the help of the Sub Assistant Agriculture Officers (SAAOs) of those areas. The number of wheat growers of this village was 1116. Only heads of these 1116 wheat growers constituted the population of the study. Ten percent of the wheat growers were selected by using random sampling methods. As a result 110 wheat growers constituted the sample size.

In addition to that, 1 percent of the population was selected randomly and proportionately from the selected village. Thus, the additional sample, so drawn stood 11, which were included in the reserve list. In case, the individuals included in the original samples were not available or not found suiTable at the time of data collection, the wheat growers of the reserve list were used for the purpose. The distribution of the wheat growers included in the population, sample and those in the reserve list appears in Table 3.1.

Table 3.1: Distribution of Population, Sample Size and Reserve List

Upazila	Unions/ Paurasava	Villages	Population	Sample Size	Reserve List
Gazipur Sadar	Joydebpur	Adaboil	135	13	1
	Joydebpur	Jugitola	118	11	1
	Joydebpur	Chaitannapur	126	13	1
	Joydebpur	Shamantapur	145	15	2
	Joydebpur	Dhiraj	138	14	1
	Joydebpur	Choto Daoura	114	11	1
Sreepur	Kaoraid	Bapta	156	15	2
	Kaoraid	Nandia Sargon	184	18	2
Total =			1116	110	11

3.4 Selection of the variables of the study

Before setting the variable of the study, the researcher himself visited the study area and talked to the farmers and he was able to observe the selected characteristics of the farmers (in the study area) which might have influence on the adoption of selected wheat varieties. Based on this experience, review of literature, discussion with the relevant experts and academicians and also with the research supervisor, the researcher selected the dependent and independent variables. 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 researcher introduces, removes or varies the independent variables.

The dependent variable is often called 'criterion or predicted variable' whereas independent variable is called 'treatment, experimental or antecedent variable'.

3.4.1 Independent variables

The Research Advisory Committee and the researcher selected ten characteristics of the farmers as independent variables of the study. These were age, education, farm size, annual family income, training received, cosmopoliteness, attitude towards modern HYV wheat cultivation, innovativeness, communication behavior and knowledge on wheat cultivation.

3.4.2 Dependent variable

A dependent variable is that factor which appears, disappears or varies as the experimenter introduces, removes or varies the independent variables. "Adoption of modern HYV wheat by the farmers" was selected as dependent variable of the study.

3.5 Measurement of variables

In order to conduct the study in accordance with the objectives, it was necessary to measure the selected variables. This section contains procedures for measurement of both independent as well as dependent variables of the study. The procedures followed in measuring the variables are presented below:

3.5.1 Measurement of independent variables

The selected characteristics of the respondent growers constituted the independent variables of the study. To keep the research within the manageable sphere, ten independent variables were selected for the study. The procedures of measurement of the selected variables were as follows:

3.5.1.1 Age

The age of individual is one of the important factors pertaining to his personality make up (Smith and Zope, 1970) which can play an important role in his adoption behaviour. The age of respondent growers was measured by counting the actual years from his birth to the time of interview on the basis of his statement. It was measured in terms of actual years. No fraction of year was considered. A score of one (1) was assigned for each years of age. Age was placed in item no.1 of the interview schedule.

3.5.1.2 Education

Education was measured in terms of grades of formal education (school/college) completed by an individual. It was expressed in terms of years of schooling. A score of one (1) was assigned for each year of schooling completed. For example, if the respondent passed the S.S.C. examination, his education score was given as 10, if passes the final examination of class Seven (VII), his education scores was given as 7. If the respondent did not know how

to read and write, his education score was given as '0' (zero). A score of 0.5 (half) was given to that respondent who could sign his name only.

3.5.1.3 Farm size

Farm size of the respondent was measured as the size of his farm (including wheat and others crops) on which he continued his farm practices during the period of study. Each respondent was asked to mention the homestead area, the land under his own cultivation, own and given to others on borga (share cropping) system, land taken from others on borga system, land given to others on lease system, land taken from others on lease system, own pond, own garden and miscellaneous fallow land. The area was estimated in terms of full benefit to the growers or his family. The following formula was used in measuring the farm size:

Farm size = $A_1 + A_2 + \frac{1}{2}(A_3 + A_4) + A_5$

Where,

A_1 = Homestead area

A_2 = Own land under own cultivation

A_3 = Own land given to others on borga

A_4 = Land taken from others on borga

A_5 = Land taken from others on lease

The unit of measurement was hectare.

3.5.1.4 Annual family income

Annual family income refers to the total earnings in taka of the respondent and all family members of a farm family from agriculture, livestock, fisheries and other sources (service, business etc.) during the previous year. The methods of ascertaining income from different sources were involved three phases. In the first phase, the yield of all the crops in the previous year was noted. Then all the yields were converted into cash income according to the prevailing market price. In the second phase, the prices of other enterprises (livestock, poultry,

fisheries etc.) were also added to the price of crops. In the third phase, earning of each respondent himself or other members of his family from different sources (like service, business, and labors) were also included in calculating the income. Yearly earning from farming and other sources were added together to obtain total family annual income of a respondent. In case of business or service their monthly income was multiplied by twelve to determine annual family income. Annual family income of an individual was expressed in 1,000 Taka. A score of one was given for each Tk. 1000 to compute the annual income scores of the respondents. Data obtained in response to item no. 5 of the interview schedule were used to determine the annual family income of the respondents.

3.5.1.5 Agricultural training

Agricultural training of the respondents was calculated by the number of days that a respondent had received agricultural training in his entire life. It was indicated by the total number of days of receiving agricultural training by a respondent under different training programs.

3.5.1.6 Non-localite behaviour

Non-localite behaviour of a respondent was measured in terms of his nature of visits to the eight different places external to his own social system and as shown in item number 6 in the interview schedule. The respondents indicated whether they visited those places frequently, occasionally, rarely and never. Weights assigned to these visits were 3, 2, 1 and 0 respectively. A respondent's non-localite behaviour score was obtained by summing the weights for his visits to all the places listed in the instrument. The non-localite behaviour score of the respondents could range from 0 to 24, where 0 indicating no non-localite behaviour and 24 indicating high non-localite behaviour.

3.5.1.7 Attitude towards modern HYV wheat cultivation

An attitude may be defined as predisposition to act towards an object in a certain manner. Attitude of a grower towards wheat cultivation was used to refer to his belief, feelings and action towards the various aspects of wheat cultivation. It was measured by constituting 10 statements (five positive and five negative). A statement was considered positive if it possessed an idea favourable towards the modern HYV wheat cultivation. On the other hand, a statement was considered negative if it was unfavourable towards the modern HYV wheat cultivation. The respondents were asked to express their opinion in the form of 'strongly agree', 'agree', 'no opinion', 'disagree' and 'strongly disagree'. A score of 4 was given to 'strongly agree', 3 to 'agree', 2 to 'no opinion', 1 to 'disagree' and 0 to 'strongly disagree', if the statement was positive. A reverse scoring method was followed in case of statements considered negative. Attitude score of a respondent was determined by summing the scores obtained by him for all the items in the scale. The index scores of respondents could range from 0 to 48 where 0 indicating unfavorable and 48 for favourable attitude towards wheat cultivation.

3.5.1.8 Innovativeness

Innovativeness of a wheat grower was measured by computing an "innovativeness score" on the basis of his adoption of 7 selected wheat production technologies. Innovativeness is the degree to which an individual adopts an innovation relatively earlier than other members in a social system (Rogers, 1995). Scores were assigned on the basis of time required by an individual to adopt each of the technology in the following manner:

Period of Adoption	Assigned Score
Within one year after hearing	4
Within two years after hearing	3
Within three years after hearing	2
Within four years after hearing or above	1
Do not use	0

The scores for all the 7 selected wheat production technologies were added together to constitute the innovativeness score of a respondent. Innovativeness score of a respondent growers could range from 0 to 28, where, 0 indicating no innovativeness and 28 indicating very high innovativeness.

3.5.1.9 Contact with different media

It was measured as one's extent of contact with different media or information sources. It was assumed that the more contact an individual would have with different information sources, the more he becomes educated and knowledgeable. An extension contact score was computed for each respondent on his extent of contact with 13 selected media. Each respondent was asked to mention the frequency of his contact with each of the 13 selected media. Here the score measured as 0 for no contact, 1 for occasionally and 2 for frequently of the contact respectively. The communication behaviour score of the respondents could range from 0 to 26, where 0 indicating no communication behaviour and 26 indicating very high communication behaviors. Respondent's communication behaviour score was obtained by adding the weights for his responses to all the sources listed in the instrument.

3.5.1.10 Knowledge on wheat cultivation

To measure the knowledge on wheat cultivation of a respondent 20-items scale was constructed in the interview schedule. Each respondent was asked to answer all the 20 questions. Out of assigned scores against each question, the summation of obtained scores against 20 questions represented the agricultural knowledge of a respondent. Agricultural knowledge was measured by the total knowledge score about agriculture. The total assigned score was 40. But, the score of each question was not equal, it was determined according to the extent of difficulty. Full score was assigned for each correct answer and zero (0) for the wrong answer. However, for correct responses to all questions, a respondent could get a total score of 40 and for wrong responses to all questions he could get 0 (zero). Thus knowledge on wheat cultivation of the

respondents could range from 0-40, where 0 indicates very poor knowledge on wheat cultivation and 40 indicates very high knowledge on wheat cultivation.

3.5.2 Measurement of dependent variable

Adoption of modern HYV wheat varieties

Three modern HYV wheat namely, Satabdi, Sonali and Balaka were selected to measure the adoption behaviour of the respondents. The procedure followed in measuring the dependent variable is presented below:

The adoption of modern HYV wheat was measured by percentage of area coverage by the selected varieties in last year by using the following formula developed by M.A. Kashem (2004).

$$\text{Extent of Adoption} = \frac{\text{Cultivated Area (ha) of the selected varieties}}{\text{Potential Area (ha)}} \times 100$$

Thus, the possible range of adoption of modern HYV wheat was 0 to 100 where 0 indicates no adoption of HYV wheat and 100 indicates very high adoption of HYV wheat.

3.6 Measurement of problem confrontation index (PCI)

Growers in the study area might have faced various types of problems in the way of adopting selected wheat varieties. But the investigator gained an experience through personal contact regarding common problems faced by the respondents before collection of data. Besides, the researcher gained experience through consultation with experts pre-testing experience and reviewing previous research findings. Finally, he prepared a list of ten possible problems in this regard. A scale was prepared to indicate the extent to which each of the ten problems was applicable in the case of a respondent. The responses were obtained through a 4-point scale: 'high', 'medium', 'low' and

'not at all' problem and weights were assigned to these responses as, 3, 2, 1 and 0 respectively. Problem confronted score of respondents/wheat growers could range from 0 to 30, where 0 indicates no problem confrontation at all and 30 indicates very high problem confrontation.

In order to determine the comparative importance of the ten problems, a problem confronting index (PCI) was computed for each of the ten problems by summing up the scores obtained by all the respondents by using the following formula:

$$\mathbf{PCI = f_s X 3 + f_m X 2 + f_l X 1 + f_n X 0}$$

Where,

PCI = Problem Confrontation Index
f_s = No. of respondents confronted severe problem
f_m = No. of respondents confronted moderate problem
f_l = No. of respondents confronted low problem
f_n = No. of respondents confronted no problem at all

Thus Problem Confrontation Index of any problem could range from 0 to 330, where 0 indicated no problem at all and 330 indicated very high problem.

3.7 Instruments for data collection

Keeping the objectives of the study in mind an interview schedule was prepared to collect relevant data from the respondents. Both open and closed form questions were used in collecting data. Simple and direct questions were included in the schedule to ascertain dependent and independent variables. The interview schedule was pre-tested with 15 wheat growers of the study area. On the test experiences, necessary additions, corrections and modifications of the schedule were done. Valuable suggestions and comments were received from the research supervisor and co-supervisor. Appropriate scales were developed to measure some characteristics of the wheat growers. The interview schedule was prepared in Bengali language. A copy of the interview schedule in English version is presented in the Appendix-A.

3.8 Collection of data

Data were collected personally by the researcher himself through face to face interview from selected respondents. But for familiarizing the researcher with the study area and for getting local support and establishing rapport with the wheat growers at the time of interview, the interviews were usually conducted with the respondents in their homes. While starting interview with any respondent the researcher took all possible care to establish rapport with him so that he did not hesitate to furnish proper responses to the questions and statements in the schedule. However, if any respondent failed to understand any question the researcher took care to explain the issue. He received excellent co-operation from the respondents and others concerned during the time of interview. The entire process of collecting data took place during October 20 to November 20, 2007.

3.9 Data processing and analysis

After completion of field survey, all the data were processed according to the objectives of the study. Local units were converted into standard unit. All the individual responses to questions of the interview schedule were transferred to master sheet to facilitate tabulation, categorization and organization. In case of qualitative data, appropriate scoring technique was followed to convert the data into quantitative form. Data was transferred to coding sheet with numerical scores given to each question. Simple statistics like frequency, percentage, range, mean, standard deviation and rank order were used to perform the data analysis. Correlation coefficients were to determine the relationships between selected characteristics of the farmers and adoption of selected wheat varieties.

3.10 Statement of hypothesis

A hypothesis is a conjectural statement of the relation between two or more variables. Hypotheses are always in declarative sentence form and they relate either generally or specifically variables to sentence form and they relate either

generally or specifically variables to variables. Hypothesis may be broadly divided into two categories, namely, research hypothesis and null hypothesis.

Research hypothesis

The following research hypotheses were put forward to know the relationships between each of the ten selected characteristics of the wheat growers and their adoption of selected wheat varieties. "Each of the ten selected characteristics of the wheat growers will have significant relationships with their adoption of modern HYV wheat by the farmers".

Null hypothesis

A null hypothesis states that there is no relationship between the concerned variables. The following null hypothesis was undertaken for the present study: "there is no relationship between the selected characteristics of wheat growers and their adoption of selected wheat varieties". The selected characteristics are age, education, farm size, annual family income, agricultural training, non-localite behaviour, attitude towards wheat cultivation, innovativeness, contact with different media, and knowledge on wheat cultivation. If a null hypothesis is rejected on the basis of a statistical tests, it is assumed, that there is a relationship between the concerned variables.

3.11 Statistical treatment

Data collected were compiled, coded, tabulated and analyzed in accordance with the objectives of the study. Qualitative data were quantified by means of suitable scoring techniques. The statistical measures such as range, mean, standard deviation, percentage distribution and rank order were used to describe both the independent and dependent variables. Tables were also used in presenting data for clarity of understanding. In order to explore the relationships of the selected characteristics of the growers with their adoption of selected wheat varieties, the Pearson's Product Moment Correlation Co-efficient was computed. Correlation matrix were also computed to determine the inter relationships among the variables. Five percent (0.05) and one percent (0.01) level of significance was used as the basis of rejecting any null hypothesis. The Table value of 'r' was calculated at (110-2) = 108 degrees of

freedom. If the calculated value of co-efficient of correlation "r" was greater than tabulated value at designated level of significance for the relevant degrees of freedom, the null hypothesis was rejected and it was concluded that there was a significant relationship between the concerned variables. However, when the calculated value of co-efficient of correlation was found to be equal or smaller than the tabulated value at the designated level of significance for the relevant degrees of freedom, the null hypothesis was accepted and hence, it was concluded that there was no relationship between the concerned variables.

Chapter 4
Results and Discussion

CHAPTER IV

RESULTS AND DISCUSSION

In this chapter, the findings of the study and interpretation of the results have been presented. Data obtained from respondents by interview were measured, analyzed, tabulated and statistically treated according to the objectives of the study. These are presented in four sections according to the objectives of the study. The **first** section deals with selected characteristics of the wheat growers, the **second** section deals with the adoption of modern wheat varieties by the farmers, the **third** section, relationships between selected characteristics of the farmers and their adoption of modern high yielding varieties (HYV) of wheat have been discussed. The **fourth** section deals with the problem confronted by the wheat growers during wheat cultivation.

4.1 Selected characteristics of the farmers

This section deals with the classification of the farmers according to their various characteristics. Behaviour of an individual is largely determined by his characteristics. These characteristics of an individual contribute to a great extent in the matter of shaping of his behaviour. In this section the findings on the farmer's selected ten characteristics have been discussed. The selected characteristics are (i) age, (ii) education, (iii) farm size, (iv) annual family income, (v) agricultural training, (vi) non-localite behaviour, (vii) attitude towards modern HYV wheat cultivation, (viii) innovativeness, (ix) contact with different media, and (x) knowledge on wheat cultivation. Therefore, the major hypothesis of the study was that the adoption of selected wheat varieties would also be influenced by various characteristics of the farmers. Range, mean and standard deviations of these characteristics of the wheat growers are described in this section. A summary profile of the farmer's characteristics has been given in Table 4.1.

Table 4.1 A summary profile of the farmers'/wheat growers' characteristics

Sl. No.	Characteristics	Measuring unit	Possible range	Observed range	Mean	Standard deviation
1.	Age	Actual years	Unknown	25-60	44.16	8.88
2.	Education	Years of schooling	Unknown	0-14	5.95	4.87
3.	Farm size	Hectare	Unknown	0.28-2.55	1.08	0.64
4.	Family income	In Tk.1000	Unknown	41-832	173.26	129.54
5.	Agricultural training	Number of days	Unknown	0-30	2.25	4.77
6.	Non-localite behaviour	Score	0-26	2-23	9.46	4.68
7.	Attitude towards modern HYV wheat cultivation	Score	0-40	9-32	21.50	5.07
8.	Innovativeness	Score	0-28	4-26	16.91	4.42
9.	Contact with different media	Score	0-26	1-25	5.96	3.64
10.	Knowledge on wheat cultivation	Score	0-40	12-32	21.37	6.23

4.1.1 Age

Age scores of the farmers ranged from 25 to 60 having an average of 44.16 with a standard deviation 8.88. On the basis of the age scores of the farmers, they were classified into three categories: "young" (up to 35), "middle aged" (36-50) and "old" (above 50). The distribution of the wheat growers according to their age is shown in Table 4.2.

Table 4.2 Distribution of the farmers according to their age

Categories	Farmers		Mean	Standard Deviation
	Number	*Percent*		
Young (up to 35)	23	20.9	44.16	8.88
Middle aged (36-50)	61	55.5		
Old (above 50)	26	23.6		
Total =	110	100		

The finding indicates that a large proportion (55.5 percent) of the farmers were middle aged compared to 20.9 percent and 23.6 percent having young and old respectively. Now a day's middle aged farmer are proving to accept various agricultural innovations and according to rural social system in Bangladesh generally middle aged people of the family own land and cash and dominate family decisions. They might have a favourable attitude towards trying new ideas. The extension agents can make use of these views and opinion in designing their extension activities.

4.1.2 Education

The education scores of the farmers ranged from 0 to 14 having an average of 5.95 and the standard deviation was 4.87. On the basis of their education scores, the wheat growers were classified into five categories, namely "illiterate" (0), "can sign only" (0.5), "primary" (1-5), "secondary" (6-10) and "above secondary" (above 10). The distribution of the farmers according to their education is shown in Table 4.3.

Table 4.3 Distribution of the farmers according to their education

Categories	Farmers		Mean	Standard Deviation
	Number	*Percent*		
Illiterate/can sign only (0.5)	13	11.8	5.95	4.87
Can sign only (0.5)	26	23.7		
Primary (1-5)	19	17.2		
Secondary (6-10)	32	29.1		
Above secondary (above 10)	20	18.2		
Total =	110	100		

The finding shows that 29.1 percent of the wheat growers had secondary level of education compared to 17.2 and 18.2 percent having primary level and above secondary level of education respectively. On the other hand, 11.8 percent of the respondents were illiterate and 23.7 percent of the respondents could sign only. It was revealed that higher level of education of an individual is likely to be more receptive to the modern facts and ideas. They have much mental strength in deciding on a matter related to problem solving. Possession of some education by the wheat growers is a positive aspect in the context of the adoption of selected wheat varieties. Education helps the wheat growers to gain knowledge on the improved methods of cultivation by reading books, leaflets, bulletins and other printed materials. Thus, farming community in the study area may be well considered as a suitable ground for the adoption of selected wheat varieties.

4.1.3 Farm size

The farm size scores of the respondents varied from 0.28 to 2.55. The average farm size was 1.08 hectares with a standard deviation of 0.64. The respondents were classified into the following three categories based on their farm size: "marginal" (up to 0.5), "small" (0.51-1.00), and "medium" (above 1.00). The distribution of the farmers according to their farm size is shown in Table 4.4.

Table 4.4 Distribution of the farmers according to their farm size

Categories	Farmers		Mean	Standard Deviation
	Number	*Percent*		
Marginal (up to 0.5)	27	24.5	1.08	0.64
Small (0.51-1.00)	35	31.9		
Medium (above 1.00)	48	43.6		
Total =	110	100		

The finding indicates that majority (43.6 percent) of the farmers' possessed medium farms compared to 24.5 and 31.9 percent having marginal and small farms respectively. According to the data contained in the Table 4.4 there are moderately rich farmers in the study area. So, they can adopt new technologies and target oriented special extension services.

4.1.4 Annual family income

The observed annual family income of the respondents ranged from 41-832 having the average of 173.26 and standard deviation was 129.54. Based on their income scores, the farmers were classified into three categories: "low income" (up to 100), "medium income" (101-300) and "high income" (above 300). The distribution of the wheat growers according to their annual family income is shown in Table 4.5.

Table 4.5 Distribution of the farmers according to their annual family income

Categories	Farmers		Mean	Standard Deviation
	Number	*Percent*		
Low income (up to 100)	32	29.1	173.26	129.54
Medium income (100-300)	67	60.9		
High income (above 300)	11	10		
Total	110	100		

The finding shows that the highest portion (60.9 percent) of the respondents had medium income while 29.1 percent of the respondents had low income and only 10 percent of the respondents had high income. Most of farmers of the study area were medium group. The average income of the respondents was higher than national average income of the country. This might be due to the fact that the farmers of the study area were not engaged in agriculture only, they earned from other sources such as service, business etc.

4.1.5 Agricultural training

Agricultural training scores of the respondents ranged from 0-30 with an average of 2.25 and a standard deviation of 4.77. Based on their agricultural training received scores, the respondents are classified into four groups: "no training", "less training" (up to 10), "medium training" (11-20), and "high training" (above 20). The distribution of the farmers is shown according to their classified groups in Table 4.6.

Table 4.6 Distribution of the farmers according to their training received

Categories	Farmers		Mean	Standard Deviation
	Number	*Percent*		
No training (0)	64	58.2	2.25	4.77
Less training (up to 10)	41	37.3		
Medium training (11-20)	3	2.7		
High training (above 20)	2	1.8		
Total =	110	100		

The finding indicates that majority (58.2 percent) of the farmers received no training at all. On the other hand, 37.3 percent of them received less agricultural training while only 2.7 percent and 1.8 percent of them received medium agricultural training and high agricultural training respectively. The finding reveals that maximum respondents of the study area did not receive any training. As a result they are not interested to adopt innovations which ultimately decrease their productivity. It is proved that there is always a relationship between agricultural training and adoption of innovation. In order

to increase adoption of modern HYV wheat, they should be provided with various training facilities on wheat cultivation.

4.1.6 Non-localite behaviour

Non-localite behaviour of the respondents ranged from 2 to 23 with an average of 9.46 and a standard deviation of 4.68 against the possible range of 0 to 26. On the basis of their non-localite behaviour scores, the farmers were classified into three categories: "low non-localite behaviour" (upto10), "medium non-localite behaviour" (11-20) and "high non-localite behaviour" (above 20). The distribution of the wheat growers according to their cosmopoliteness is shown in Table 4.7.

Table 4.7 Distribution of the farmers according to their cosmopoliteness

Categories	Farmers		Mean	Standard Deviation
	Number	*Percent*		
Low non-localite behaviour (up to 9)	58	52.7	9.46	4.68
Medium non-localite behaviour (10-16)	41	37.3		
High non-localite behaviour (above 16)	11	10		
Total =	110	100		

The finding shows that majority (52.7 percent) of the farmers had low non-localite behaviour compared to 37.3 percent and 10 percent of them having medium non-localite behaviour and high non-localite behaviour respectively. The finding reveals that maximum respondents do not have outward exposure in terms of non-localite behaviour which has a positive relationship with adoption on innovation.

4.1.7 Attitude towards modern HYV wheat cultivation

The attitude towards wheat modern HYV wheat cultivation scores ranged from 9 to 32 against the possible range 0 to 40 with an average of 21.50 and a standard deviation of 5.07. Based on the observed attitude towards modern HYV wheat cultivation scores, the respondents were classified into three categories: "unfavourable attitude" (up to 16), "moderately favourable attitude" (17-24) and "highly favourable attitude" (above 24). The distribution of the respondents according to their attitude towards modern HYV wheat cultivation scores is shown in Table 4.8.

Table 4.8 Distribution of the farmers according to their attitude towards modern HYV wheat cultivation

Categories	Farmers		Mean	Standard Deviation
	Number	*Percent*		
Unfavourable attitude (up to 16)	13	11.8	21.5	5.07
Moderately favourable attitude (17-24)	64	58.2		
Highly favourable attitude (above 24)	33	30.0		
Total =	110	100		

The finding shows that the highest proportion (58.2 percent) of the wheat growers had unfavourable attitude towards modern HYV wheat cultivation as compared to 11.8 and 30.0 percent having unfavourable attitude and highly favourable attitude towards modern HYV wheat cultivation respectively.

4.1.8 Innovativeness

The observed innovativeness scores of the respondents ranged from 4 to 26 against the possible range of 0 to 28. However, the average was 16.91 and the standard deviation was 4.42. Based on their innovativeness scores, the respondents were classified into three categories: "low innovativeness" (up to

11), "medium innovativeness" (12-19) and "high innovativeness" (above 19). The distribution of the respondents according to their innovativeness is shown in Table 4.9.

Table 4.9 Distribution of the farmers according to their innovativeness

Categories	Farmers		Mean	Standard Deviation
	Number	*Percent*		
Low innovativeness (up to 11)	8	7.3	16.91	4.42
Medium innovativeness (12-19)	66	60.0		
High innovativeness (above 19)	36	32.7		
Total =	110	100.0		

The finding indicates that the highest proportion (60 percent) of the wheat growers had medium innovativeness as compared to 7.3 percent and 32.7 percent having low and high innovativeness respectively. The result would help the extension planners to chalk out future extension programmes for transfering technologies to the potential growers.

4.1.9 Contact with different media

The computed contact with different media scores of the respondents ranged from 1 to 25 with an average of 5.96 and a standard deviation of 3.64 against the possible range of 0 to 26. On the basis of their contact with different media scores, the farmers were classified into three categories: "low contact" (up to 8), "medium contact" (9-17) and "high contact" (above 17). The distribution of the wheat growers according to their contact with different media is shown in Table 4.10.

Table 4.10 Distribution of the farmers according to their contact with different media

Categories	Farmers		Mean	Standard Deviation
	Number	*Percent*		
Low contact (up to 8)	95	86.4	5.96	3.64
Medium contact (9-16)	11	10.0		
High contact (above 16)	4	3.6		
Total =	110	100.0		

The finding indicates that majority (86.4 percent) of the farmers had low contact with different media while 10 and 3.6 percent of them had medium contact and high contact with different media respectively. The finding reveals that the respondents of the study area had very poor contact with different media. It is proved that there is always a relationship between contact with different media and adoption of innovation. In order to increase adoption of modern HYV wheat, contact with different media of the farmers should be increased.

4.1.10 Knowledge on wheat cultivation

Knowledge on wheat cultivation scores of the respondents ranged from 12 to 32 against the possible range of 0 to 40. The average and standard deviation were 21.37 and 6.23 respectively. Based on the observed knowledge on wheat cultivation scores, the farmers were classified into the following three categories: "poor knowledge" (up to 18), "medium knowledge" (19 to 25) and "high" (above 25). The distribution of the wheat growers according to their knowledge on wheat cultivation is shown in Table 4.11.

Table 4.11 Distribution of the farmers according to their knowledge on wheat cultivation

Categories	Farmers		Mean	Standard Deviation
	Number	*Percent*		
Poor knowledge (up to 20)	56	50.9	21.37	6.23
Medium knowledge (21-30)	45	40.9		
High knowledge (above 30)	9	8.2		
Total =	110	100.0		

The finding shows that highest proportion (50.9 percent) of the farmers had poor knowledge on wheat cultivation compared to 40.9 percent of them having medium knowledge on wheat cultivation and 8.2 percent high knowledge on wheat cultivation. The knowledge on wheat cultivation of the farmers of the study area was not satisfactory at all. It is assumed that high knowledge on wheat cultivation is likely to be contributory to the adoption of modern HYV wheat. So, knowledge of the farmers on wheat cultivation should be increased by providing training.

4.2 Adoption of modern high yielding varieties (HYV) of wheat

The observed adoption of modern HYV wheat varieties of the farmers ranged from 14.50 to 75.75 against the possible range of 0 to 300. The average adoption was 39.96 with a standard deviation of 15.92. Based on the adoption score, the farmers were classified into three categories: "low adoption" (up to 36.00), medium adoption" (36.01-56.00) and "high adoption" (above 56.00). The distribution of the respondents according to their adoption of modern HYV wheat varieties is shown in Table 4.12.

Table 4.12 Distribution of the farmers according to their adoption of modern HYV wheat

Categories	Farmers		Mean	Standard Deviation
	Number	Percent		
Low adoption (up to 36.00)	49	44.54	39.96	15.92
Medium adoption (36.01-56.00)	40	36.36		
High adoption (above 56.00)	21	19.10		
Total =	110	100		

The finding indicates that the highest proportion (44.5 percent) of the wheat growers had low adoption of modern HYV wheat as compared to 36.4 percent medium adoption and 19.1 percent low adoption respectively. The percentage of different categories of adoption of modern HYV wheat by the farmers was shown in Figure 4.1.

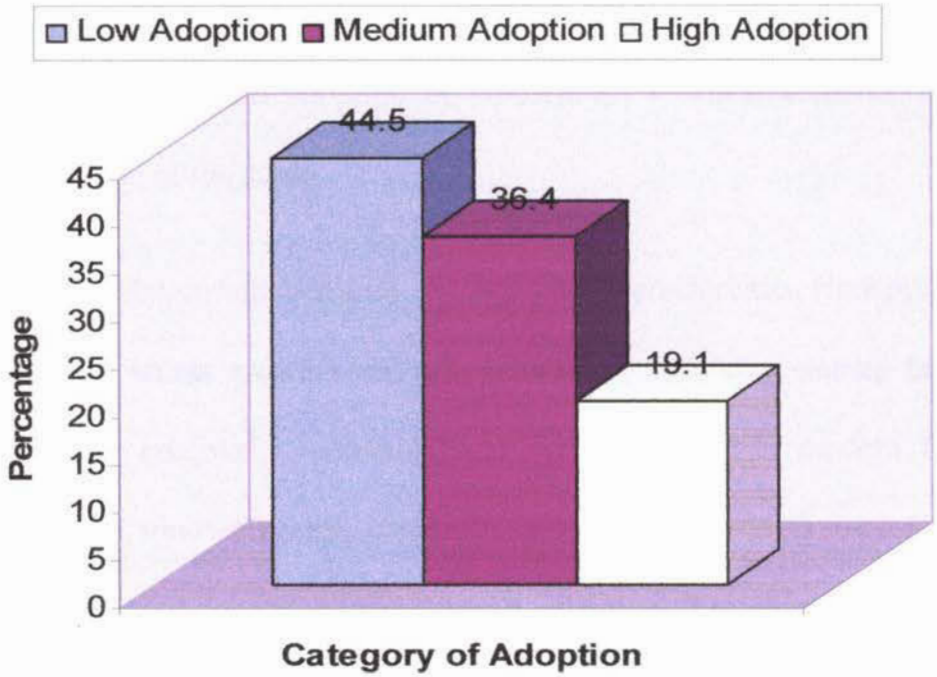


Figure 4.1 A bar graph showing different categories of adoption of modern HYV wheat

The finding shows that the majority (44.5 percent) of the respondents had low adoption of modern HYV wheat while 36.4 percent and 19.1 percent of the respondents had medium adoption and high adoption of modern HYV wheat respectively.

4.3 Relationships between the selected characteristics of the wheat growers and their adoption of modern HYV wheat

Coefficient of correlation was computed in order to explore the relationship between the selected characteristics of the wheat growers and their adoption of modern HYV wheat. The selected characteristics constituted independent variables of the study and adoption of modern HYV wheat constituted the dependent variable of the study.

In this section relationship between ten selected characteristics (independent variables) of the wheat growers viz. age, education, farm size, annual family income, training received, cosmopoliteness, attitude towards modern HYV wheat cultivation, innovativeness, communication behaviour and knowledge on wheat cultivation and dependent variables i.e. adoption of modern HYV wheat have been described.

Pierson's Product Moment Co-efficient of Correlation (r) has been used to test the hypothesis concerning the relationship between two variables. Five percent and one percent level of probability were used as the basis of acceptance or rejection of a hypothesis. The Table value of 'r' was calculated at (110-2) = 108 degrees of freedom. The summary of the results of the co-efficient of correlation indicating the relationships between the selected characteristics of the respondents and their adoption of modern HYV wheat varieties is shown in Table 4.13.

Table 4.13 Co-efficient of correlation between the selected characteristics of the farmers and their adoption of modern HYV wheat

Dependent variable	Independent variables	Computed value of 'r'	Table value of 'r' of 108 degrees of freedom	
			0.05%	0.01%
Adoption of modern HYV wheat	Age	0.062 NS	0.184	0.240
	Education	0.178 NS		
	Farm size	0.217 *		
	Annual family income	0.205 *		
	Agricultural training	0.290 **		
	Non-localite behaviour	0.148 NS		
	Attitude towards modern HYV wheat cultivation	0.235 *		
	Innovativeness	0.267 **		
	Contact with different media	0.207 *		
	Knowledge on wheat cultivation	0.268 **		

NS = Non significant

* = Significant at 0.05 level of probability

** = Significant at 0.01 level of probability

4.3.1 Relationship between age of the wheat growers and their adoption of modern HYV wheat

As shown in the Table 4.13 the co-efficient of correlation (r) between the concerned variables was computed and found to be 0.062 which led to the following observations:

- Firstly, the relationship showed a positive trend.
- The computed value of 'r' (0.062) was smaller than the Table value of r (0.184) with 108 degrees of freedom at 0.05 level of probability.
- Hence, the concerned null hypothesis was accepted.
- The correlation co-efficient between the two concerned variables was not significant.

The finding implies that the age of the wheat growers had no significant relationship with their adoption of modern HYV wheat. Islam (1993), Kher (1992) and Sarker (1997) observed the similar findings in their studies.

4.3.2 Relationship between education of the wheat growers and their adoption of modern HYV wheat

The co-efficient of correlation (r) between the concerned variables was found to be 0.178 as shown in Table 4.13. This led to the following observations regarding the relationship between the two variables under consideration:

- The relationship showed a tendency in the positive direction.
- The computed value of 'r' (0.178) was smaller than the Table value of r (0.184) with 108 degrees of freedom at 0.05 level of probability.
- The concerned null hypothesis was accepted.
- The correlation co-efficient between the two concerned variables was not significant.

The finding indicates that the education of the farmers had no significant relationship with their adoption of modern HYV wheat. Similar findings were also observed by Hossain (1981).

4.3.3 Relationship between farm size of the wheat growers and their adoption of modern HYV wheat

Computed value of the co-efficient of correlation (r) between farm size of the farmers and their adoption of modern HYV wheat was found to be 0.217 as shown in Table 4.13. The following observations were recorded regarding the relationship between the two variables on the basis of the co-efficient of correlation:

- The relationship showed a tendency in the positive direction.
- The computed value of 'r' (0.217) was found to be greater than the Table value of r (0.184) with 108 degrees of freedom at 0.05 level of probability.
- The concerned null hypothesis was rejected.
- The co-efficient of correlation between the concerned variable was not significant at 0.05 level of probability.

The finding implies that the farm size of the wheat growers had significant positive relationship with their adoption of modern HYV wheat. The finding is quite rational because adoption of selected wheat cultivation practice is relatively costly. Hence, large growers get more scope than the small growers as the can invest more money for adoption of wheat cultivation practices. Many researchers Haque (1993), Khan (1993), Pal (1995), Chowdhury (1997), Muttaleb (1995), Islam (2002) and Rahman (2002) observed the similar findings in their studies.

4.3.4 Relationship between annual family income of the wheat growers and their adoption of modern HYV wheat

Computed value of the co-efficient of correlation (r) between annual family income of the wheat growers and their adoption of modern HYV wheat was found to be 0.205 as shown in Table 4.13. The following observations were recorded regarding the relationship between the two variables on the basis of the co-efficient of correlation:

- The relationship showed a tendency in the positive direction.
- The computed value of 'r' (0.205) was found to be greater than the Table value of r (0.184) with 108 degrees of freedom at 0.05 level of probability.
- The concerned null hypothesis was rejected.
- The co-efficient of correlation between the concerned variable was not significant at 0.05 level of probability.

The finding reveals that annual family income of the wheat growers had significant positive relationship with their adoption of modern HYV wheat. The findings are quite logical because wheat cultivation was costly. It needs more improved seed, fertilizer, insecticides, irrigation and more adoption of various intercultural practices for a long duration. Khan (1993), Pal (1995), Chowdhury (1997) and Islam (2002) also found the similar findings.

4.3.5 Relationship between agricultural training of the wheat growers and their adoption of modern HYV wheat

Computed value of the co-efficient of correlation between agricultural training of the wheat growers and their adoption of modern HYV wheat was found to be 0.290 as shown in Table 4.13. The following observations were recorded regarding the relationship between the two variables on the basis of the co-efficient of correlation:

- The relationship showed a tendency in the positive direction.
- The computed value of 'r' (0.290) was found to be greater than the Table value of r (0.240) with 108 degrees of freedom at 0.01 level of probability.
- The concerned null hypothesis was rejected.
- The co-efficient of correlation between the concerned variable was significant at 0.01 level of probability.

The finding implies that the agricultural training of the wheat growers had significant positive relationship with their adoption of modern HYV wheat. It was found in the study area that people receiving high training had high

adoption of HYV wheat varieties. So the finding is quite logical. Verma et al. (1989) and Haque (2003) also found the similar findings.

4.3.6 Relationship between non-localite behaviour of the wheat growers and their adoption of modern HYV wheat

The co-efficient of correlation between the concerned variables was found to be 0.148 as shown in Table 4.13. This result led to the following observations regarding the relationship between the two variables under consideration:

- The relationship showed a positive trend.
- The computed value of 'r' (0.148) was smaller than the Table value of r (0.184) with 108 degrees of freedom at 0.05 level of probability.
- Hence, the concerned null hypothesis was accepted.
- The co-efficient of correlation between the concerned variable was not significant at 0.05 level of probability.

The finding implies that non-localite behaviour of the wheat growers had no significant relationship with their adoption of modern HYV wheat. It means that farmers with larger organization participation were more likely to high adoption. Hossain (1983), Kher (1992) and Sarkar (1997) also found the similar findings.

4.3.7 Relationship between attitude towards wheat cultivation of the wheat growers and their adoption of modern HYV wheat

Computed value of the co-efficient of correlation between attitude towards wheat cultivation of the wheat growers and their adoption of modern HYV wheat varieties was found to be 0.235 as shown in Table 4.13. The following observations were recorded regarding the relationship between the two variables on the basis of the co-efficient of correlation:

- The relationship showed a positive trend.
- The computed value of 'r' (0.235) was found to be greater than the Table value of r (0.184) with 108 degrees of freedom at 0.05 level of probability.
- Hence, the concerned null hypothesis was rejected.

- The co-efficient of correlation between the concerned variable was significant at 0.05 level of probability.

The finding reveals that the attitude towards wheat cultivation of the wheat growers had positive significant relationship with their adoption of modern HYV wheat. It could influence directly to adopt wheat varieties. Innovative farmers are more dynamic, conscious and have more eagerness towards innovation. Mostafa (1999) and Islam M.S. (2002) also found the similar significant and positive relation between these two varieties.

4.3.8 Relationship between the innovativeness of the wheat growers and their adoption of modern HYV wheat

The co-efficient of correlation between the concerned variables was found to be 0.267 as shown in Table 4.13. This result led to the following observations regarding the relationship between the two variables under consideration:

- The relationship showed a positive trend.
- The computed value of 'r' (0.267) was greater than the Table value of r (0.240) with 108 degrees of freedom at 0.01 level of probability.
- Hence, the concerned null hypothesis was rejected.
- The co-efficient of correlation between the concerned variable was significant at 0.01 level of probability.

The finding reveals that innovativeness of the wheat growers had significant positive relationship with their adoption of modern HYV wheat. Hossain (1999), Kashem and Halim (1991) also found the similar significant and positive relationship between these two variables.

4.3.9 Relationship between contact with different media of the wheat growers and their adoption of modern HYV wheat

The co-efficient of correlation between the concerned variables was found to be 0.207 as shown in Table 4.13. This result led to the following observations regarding the relationship between the two variables under consideration:

- The relationship showed a positive trend.

- The computed value of 'r' (0.207) was greater than the Table value of r (0.184) with 108 degrees of freedom at 0.05 level of probability.
- The concerned null hypothesis was rejected.
- The co-efficient of correlation between the concerned variable was significant at 0.05 level of probability.

The finding implies that contact with different media of the wheat growers had positive significant relationship with their adoption of modern HYV wheat. The communication behaviour strengthened the base of their knowledge. The knowledge definitely act as motivator towards adoption of new technologies. Pal (1995), Chowdhury (1997) and Sarker (1997) also found the similar findings.

4.3.10 Relationship between knowledge on wheat cultivation of wheat growers and their adoption of modern HYV wheat

Computed value of the co-efficient of correlation between knowledge on wheat cultivation of the wheat growers and their adoption of modern HYV wheat was found to be 0.268 as shown in Table 4.13. The following observations were recorded regarding the relationship between the two variables on the basis of the co-efficient of correlation:

- The relationship showed a positive trend.
- A high relationship was found to exist between the two variables.
- The computed value of 'r' (0.268) was found to be greater than the Table value of r (0.240) with 108 degrees of freedom at 0.01 level of probability.
- The concerned null hypothesis was rejected.
- The co-efficient of correlation between the concerned variable was significant at 0.01 level of probability.

The finding reveals that knowledge on wheat cultivation of the wheat growers had significant positive relationship with their adoption of modern HYV wheat. This finding indicates that adoption of selected wheat varieties increases with the increase of knowledge of the growers. It helps the framers to grow crops by using environmentally friendly cultivation practices. Moulik et al. (1996)

Bezbora (1980), Ali et al. (1986), Reddy et al. (1987), Ali (1993) and Sardar (2002) found the similar findings.

4.4 Problem Confrontation Index (PCI)

In order to measure the problems regarding modern HYV wheat cultivation a pre-tested questionnaire was used. The purpose of this section was to have an understanding on the problems faced by the wheat growers in adopting selected wheat varieties. Problem in each item has been presented with frequency distribution of the wheat growers in percent.

For clear understanding of problems of the wheat growers an index for each item along with rank order was computed by using the following formula:

Problem Confrontation Index (PCI) = $P_h \times 3 + P_m \times 2 + P_l \times 1 + P_n \times 0$

Where,

P_h = Percent of respondent with "high problem"
P_m = Percent of respondent with "medium problem"
P_l = Percent of respondent with "low problem"
P_n = Percent of respondent with "not at all problem"

The problem confrontation of the respondents towards adoption of modern HYV wheat was described through the Problem Confrontation Index (PCI) as shown in Table 4.14.

Table 4.14 Ranked order of problem confrontation index (PCI) of the wheat growers in adopting modern HYV wheat

Sl. No.	Problems	Nature of Opinion				Total Score	Rank Order
		Severe problem	Moderate problem	Little problem	Not at all problem		
1.	High price of fertilizers	85	15	0	0	285	1
2.	High price of seeds	80	7	8	5	262	2
3.	Lack of HYV wheat seeds in the market	57	29	7	7	236	3
4.	Scarcity of fertilizer supply in time	65	17	7	11	236	3
5.	Requires high amount of fertilizers in HYV wheat crops	23	50	22	5	191	4
6.	Lack of training in adoption of selected wheat varieties	42	18	10	30	172	5
7.	Non availability of printed materials about cultivation of wheat	30	22	12	36	146	6
8.	Lack of Agricultural machineries & tools for wheat cultivation	32	7	27	34	137	7
9.	Requires high amount of pesticides in HYV wheat crops	30	7	23	40	127	8
10.	Lack of IPM knowledge	18	13	47	22	127	8

Problem Confrontation Index (PCI) of the wheat growers for the 10 items in adopting selected wheat varieties ranged from 127 to 285 against a possible range of 0 to 300. According to the rank order the ten problems are described here:

Data contained in Table 4.14 indicated that "High price of fertilizers" ranked **1st** with PCI value of 285. The growers of the study area did not get fertilizer in normal price for the unfair handing of price rate by the dealers.

The **2nd** cited problem of the growers was "High price of seeds" with the PCI of 262. The seed production companies are not selling seeds in reasonable price.

The **3rd** cited problem of the growers was "Lack of wheat seeds in the market" with PCI value of 236. Most of the farmers of the study area did not get wheat seed timely for insufficient supply of wheat seeds.

The **3rd** cited problem of the growers was also "Scarcity of fertilizer supply in time" with the PCI of 236. The growers do not get fertilizers in time when they go for cultivation of wheat. Fertilizers were not available at the village market due to lack of transport facility.

The **4th** cited problem of the growers was "Requires of high amount of fertilizers in wheat crops" with the PCI of 191. Wheat cultivation cost is higher because more fertilizers are needed for wheat production than other crops.

The **5th** cited problem of the growers was "Lack of training in adoption of selected Wheat varieties" with the PCI at 172. The people of this area are deprived of modern technologies due to facilities of receiving training. So, it is a problem for growers hindering the adoption of wheat varieties

The **6th** cited problem of the growers was "Non availability of printed materials about cultivation of wheat" with the PCI of 146. The growers of the study area do not get printed materials to learn about wheat cultivation.

The 7th cited problem of the growers was "Lack of Agricultural machineries & tools for wheat cultivation" with the PCI of 137. It is the big problem of the growers. Agricultural machineries & tools for wheat cultivation are costly. Most of the farmers are unable to buy those tools.

The 8th cited problem of the growers was "Requires high amount of pesticides in HYV wheat crop" with the PCI of 127. They need adequate supply of pesticides during cropping season. For scarcity at pesticides, growers could not produce better yield.

The 8th cited problem of the growers was also "Lack of IPM knowledge" with PCI of 127. The performance of Sub Assistant Agriculture Officers in making awareness among the farmers about IPM practices is not satisfactory.

Chapter 5

Summary, Conclusion and Recommendation

CHAPTER V

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

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

5.1 Summary of Findings

The major findings of the study are summarized below:

5.1.1 Selected characteristics of the farmers

The findings of ten characteristics of the farmers are summarized below:

5.1.1.1Age

The age scores of the farmers ranged from 25 to 60 years. The average age score was 44.16 with a standard deviation of 8.88. The finding indicates that a large proportion (55.5 percent) of the farmers were middle aged compared to 20.9 percent and 23.6 percent having young and old respectively.

5.1.1.2 Education

Education scores of the farmers ranged from 0 to 14. The average score was 5.95 and the standard deviation was 4.87. The finding shows that 29.1 percent of the wheat growers had secondary level of education compared to 17.2 and 18.2 percent having primary level and above secondary level of education respectively. On the other hand, 11.8 percent of the respondents were illiterate and 23.7 percent of the respondents could sign only.

5.1.1.3 Farm size

Farm size scores of the farmers ranged from 0.28 to 2.55 hectares with an average of 1.08 and the standard deviation was 0.64. The finding indicates that majority (43.6 percent) of the farmers' possessed medium farms compared to 24.5 and 31.9 percent having marginal and small farms respectively.

5.1.1.4 Annual family income

Annual family income scores of the farmers ranged from 41-832 with an average of 173.26 and the standard deviation was 129.54. The finding shows that the highest portion (60.9 percent) of the respondents had medium income while 29.1 percent of the respondents had low income and only 10 percent of the respondents had high income.

5.1.1.5 Agricultural training

Agricultural training scores of the farmers ranged from 0 to 30 with an average of 2.25 and the standard deviation was 4.77. The finding indicates that majority (58.2 percent) of the farmers received no training at all. On the other hand, 37.3 percent of them received less training while only 2.7 percent and 1.8 percent of them received medium training and high training related to agriculture respectively.

5.1.1.6 Non-localite behaviour

Non-localite behaviour scores of the farmers ranged from 2 to 23 against the possible range of 0 to 26. The average non-localite behaviour score was 9.46 with a standard deviation of 4.68. The finding shows that majority (52.7 percent) of the farmers had low non-localite behaviour compared to 37.3 percent and 10 percent of them having medium non-localite behaviour and high non-localite behaviour respectively.

5.1.1.7 Attitude towards modern HYV wheat cultivation

The attitude towards modern HYV wheat cultivation scores of the farmers ranged from 9 to 32 against the possible scores 0 to 40. The average attitude towards modern HYV wheat cultivation score was 21.50 with a standard deviation of 5.07. The finding shows that the highest proportion (58.2 percent) of the wheat growers had unfavourable attitude towards modern HYV wheat cultivation as compared to 11.8 and 30.0 percent having unfavourable attitude and highly favourable attitude towards modern HYV wheat cultivation respectively.

5.1.1.8 Innovativeness

The innovativeness scores of the farmers ranged from 4 to 26 against the possible range of 0 to 28 with an average of 16.91 and a standard deviation of 4.42. The finding indicates that the highest proportion (60 percent) of the wheat growers had medium innovativeness as compared to 7.3 percent and 32.7 percent having low and high innovativeness respectively.

5.1.1.9 Contact with different media

The contact with different media scores of the farmers ranged from 1 to 25 against the possible range of 0 to 25. The finding indicates that majority (86.4 percent) of the farmers had low contact with different media while 10 and 3.6 percent of them had medium contact and high contact with different media respectively.

5.1.1.10 Knowledge on wheat cultivation

Knowledge on wheat cultivation scores of the farmers ranged from 12 to 32 against the possible range of 0 to 40 with an average of 21.37 and a standard deviation of 6.23. The finding shows that highest proportion (50.9 percent) of the farmers had poor knowledge on wheat cultivation compared to 40.9 percent of them having medium knowledge on wheat cultivation and 8.2 percent high knowledge on wheat cultivation.

5.1.1.11 Adoption of modern HYV wheat

Adoption of modern HYV wheat was the main focus of the study. It was quantified by computing scores. These scores of the respondent could range from 14.50 to 75.75 with an average of 39.96 and the standard deviation of 15.92. The finding indicates that the highest proportion (44.5 percent) of the wheat growers had low adoption of modern HYV wheat as compared to 36.4 percent medium adoption and 19.1 percent low adoption of modern HYV wheat respectively.

5.1.2 Relationship between the selected characteristics of the farmers with their adoption of modern HYV wheat

Ten null hypotheses were formulated to explore the relationship between the selected characteristics of the farmers and their adoption of modern HYV wheat. For testing each of the hypotheses the co-efficient of correlation (r) test was used.

Correlation analysis indicates that farm size, annual family income, agricultural training, attitude towards modern HYV wheat cultivation, innovativeness, contact with different media and knowledge on wheat cultivation of the farmers had significant positive relationship with their adoption of modern HYV wheat. Hence, the null hypotheses concerning these seven variables were rejected by the researcher. On the other hand, age, education and non-localite behaviour of the farmers had no significant relationship with their adoption of modern HYV wheat. Hence, the null hypotheses concerning these three variables were accepted by the researcher.

5.1.3 Problem confronted by the wheat growers in adopting modern HYV wheat

The farmers expressed some problems as which they faced during adoption of modern HYV wheat. An attempt was made to identify the problems faced by the farmers in adopting modern HYV wheat. As many as 10 problems were mentioned by the farmers and ranked based on Problem Confrontation Index (PCI). The problems were as follows according to rank order.

1. High price of fertilizers,
2. High price of seeds,
3. Lack of HYV wheat seeds in the market,
4. Scarcity of fertilizer supply in time,
5. Requires high amount of fertilizers in HYV wheat crops,
6. Lack of training in adoption of selected wheat varieties,
7. Non availability of printed materials about cultivation of wheat,
8. Lack of Agricultural machineries & tools for wheat cultivation,
9. Requires high amount of pesticides in HYV wheat crops and
10. Lack of IPM knowledge.

5.2 Conclusions

Findings of the study and the logical interpretations of their meaning in the light of other relevant facts prompted the researcher to draw the following conclusions:

I. Finding shows that 44.5 percent of the farmers had low adoption of modern HYV wheat. These might be due to the reason that most of the farmers (50.9 percent) of those areas do not have sufficient knowledge on wheat cultivation and also they are not aware of the benefits of modern HYV wheat production. Therefore it can be concluded that adoption of modern HYV wheat varieties is not at satisfactory level and needs further improvement.

II. Age of the farmers had no significant relationship with their adoption of modern HYV wheat. It may, therefore be concluded that for adoption of selected wheat varieties by the farmers, the extension workers should concentrate their works with all age categories of farmers.

III. Education of the farmers showed that there was no significant relationship with their adoption of modern HYV wheat varieties. Formal education system can hardly influence farmers to adopt modern HYV wheat. So, it may, therefore be concluded that formal education of the respondents had negligible contribution to increase adoption of modern HYV wheat varieties.

IV. Farm size of the farmers had significant positive relationship with their adoption of modern HYV wheat. The farmers having large farms and being economically solvent always try to adopt new innovations. Considering the above facts, it may be concluded that the adoption of modern HYV wheat varieties can be encouraged to the farmers having large farms.

V. Annual family income of the farmers showed significant positive relationship with their adoption of modern HYV wheat. Economic solvency is an important factor for the adoption of modern HYV wheat varieties for getting increased yield. Considering this fact, it may be concluded that the annual family income of the farmers of the study areas should be increased to enhance the rate of adoption of modern HYV wheat varieties.

VI. Agricultural training of the farmers had positive significant relationship with their adoption of modern HYV wheat. The farmers having high training gained more knowledge and as a result, they adopted new innovations swiftly. Considering the above fact, it may be concluded that the adoption of modern HYV wheat can be increased if more training is conducted.

VII. Non-localite behaviour increases the outlook of the farmers, which lead them to adopt improved farm practices. There was significant positive

relationship between farmers' non-localite behaviour and their adoption of modern HYV wheat. Hence, the higher the non-localite behaviour of the farmers, the higher will be their adoption of modern HYV wheat.

VIII. Attitude towards wheat cultivation of the farmers had significant positive relationship with their adoption of modern HYV wheat. So, it may be concluded that favourable attitude towards the adoption of modern HYV wheat can led the farmers to adopt modern HYV wheat.

IX. Innovativeness of the farmers had significant positive relationship with their adoption of modern HYV wheat. Considering this fact, it can be concluded that any attempt to increase the innovativeness of the farmers would be helpful to increase the adoption of modern HYV wheat.

X. Contact with different media of the farmers had positive significant relationship with their adoption of modern HYV wheat. It can be concluded that any attempt to increase the communication behaviour of the farmers would be helpful to increase the adoption of modern HYV wheat.

XI. Knowledge on wheat cultivation of the farmers had significant positive relationship with their adoption of modern HYV wheat. So, the farmers' knowledge on wheat cultivation should be developed by arranging various training courses to get higher adoption rate of modern HYV wheat.

5.3 Recommendations

5.3.1 Recommendations for policy implications

Based on the findings and conclusions of the study, the following recommendations are presented below:

I. It may be recommended that agricultural extension agencies especially the DAE and relevant NGOs should critically review their training programmes and make sound provisions so that the farmers understand the benefits of adoption of modern HYV wheat. The DAE and other non-governmental organizations should strengthen their extension

services to the growers and farmers to motivate them for adopting modern HYV wheat cultivation practices. The farmers should be encouraged to adopt modern HYV wheat.

II. Majority of the farmers had medium farms and they could give more attention to their farming operation as they generally work on the farm. Hence, extension workers should give emphasize to the farmers having medium farm size so that they can increase the adoption of modern HYV wheat on a high significant scale.

III. Extension services should provide adequate farm management advice to the growers for increasing their farm income. In this connection government should come forward to launch various income generating activities for the rural people and encourage them to involve with those activities in order to enhance their income.

IV. The concerned authorities should take necessary steps to find out how communication behaviour of the farmers can be increased. For this, the Sub Assistant Agriculture Officer (SAAO) should frequently visit the farmers and advice them to adopt modern HYV wheat. Other print, electronic and inter-personal information media should be used extensively to create awareness and encourage them for adopting modern HYV wheat.

V. Adoption of modern HYV wheat had significant positive correlation with the knowledge on wheat cultivation of the farmers. This indicates an urgent need for an effective training programme to increase the knowledge on wheat cultivation for developing favourable attitude of the farmers towards the adoption of modern HYV wheat. Hence, it may be recommended that arrangements should be made by the relevant authorities to increase the knowledge on wheat cultivation of the farmers through increased extension contact, training programme and so on.

VI. Necessary inputs such as seedling, chemical fertilizers, insecticides, quality seeds to be made available to the respondents at right time and at fair prices.

VII. To ensure proper prices for wheat products marketing support should be ensured.

VIII. Extension agencies should realize the existing problems of the wheat cultivation and take necessary steps to minimize these problems.

5.3.2 Recommendations for further study

A small piece of study as has been conducted which can not provide all information for the proper understanding of the adoption of modern HYV wheat varieties. Therefore, the following suggestions are made for further study:

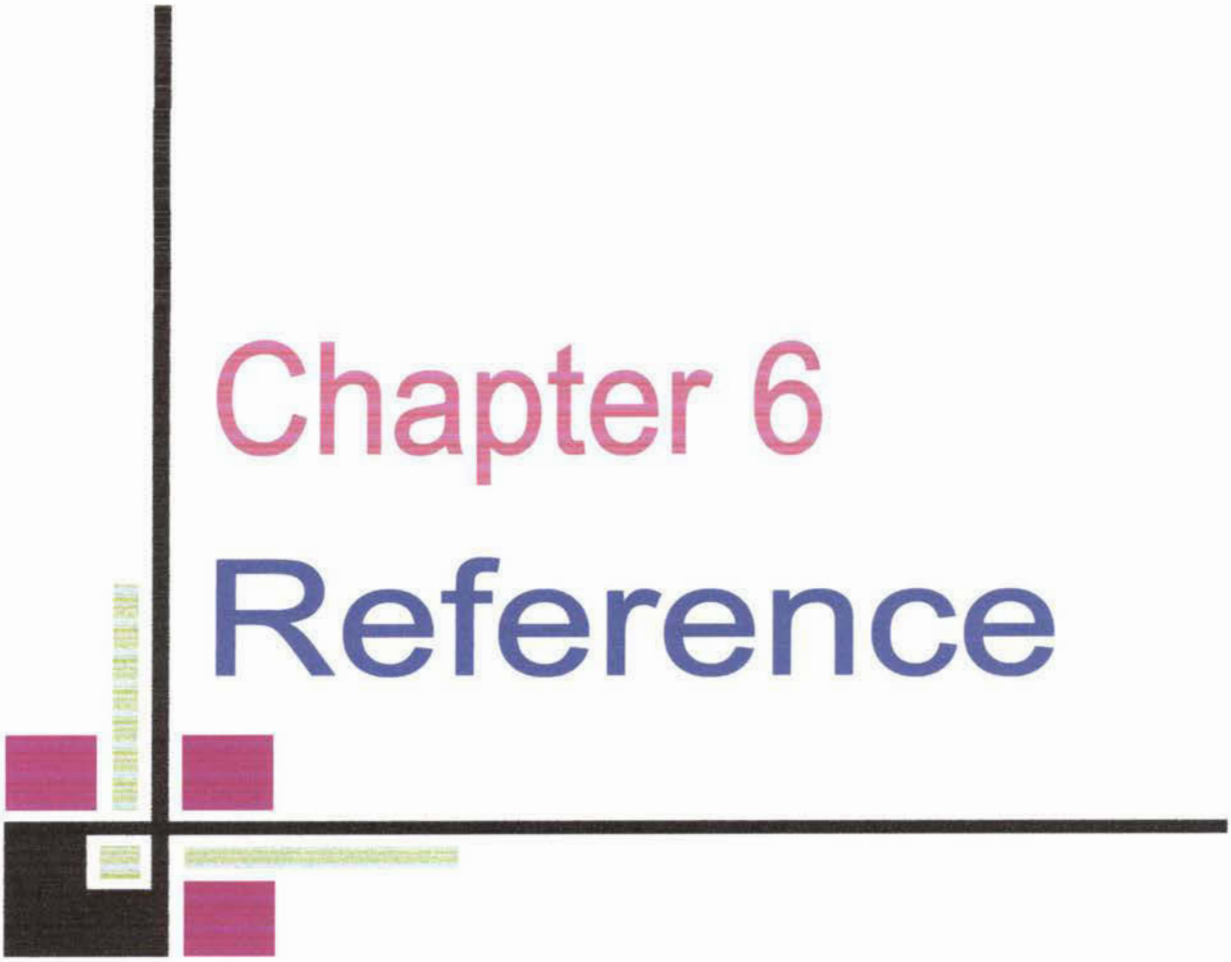
I. The present investigation explored the relationships of the ten characteristics of the wheat growers with their adoption of modern HYV wheat. Further research may be conducted by taking other characteristics to observe relationships with their adoption of modern HYV wheat.

II. The present study was conducted in eight villages of Gazipur Sadar Upazila and Shreepur Upazila under Gazipur district. So, similar studies may be undertaken in other parts of the country to verify the findings of the present study.

III. A positive trend of relationship was obtained between education of the growers and their adoption of modern HYV wheat, but the relationship was not statistically significant. Generally a positive significant relationship is expected to be observed between education of the farmers and their adoption of modern HYV wheat. Hence, further studies are necessary to verify the relationship between the concerned variables.

IV. The present study has been carried out among the male farmers only. So, a similar study may be conducted with the farm women to examine their views and opinions regarding the adoption of modern HYV wheat.

V. The present study was concerned only with the adoption of modern HYV wheat. It is therefore, suggested that future studies should include other important HYV crop varieties rather than wheat only.



Chapter 6

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APPENDIX-A

DEPARTMENT OF AGRICULTURAL EXTENSION AND INFORMATION SYSTEM SHER-E-BANGLA AGRICULTURAL UNIVERSITY DHAKA-1207

An interview schedule for collection of data on

"ADOPTION OF MODERN HIGH YIELDING VARIETIES (HYV) OF WHEAT BY THE FARMERS"

Serial No. : .....
Name of Respondent : .....
Village : .....
Union : .....
Thana/Upazila : .....
District : .....

(Please answer the following questions. All information will be kept confidentially.)

1. Age

How old are you?

..... years.

2. Educational Qualification

Please mention your educational qualification.

(i) Do not know how to read or write ( )
(ii) Do not know how to read or write but can sign only ( )
(iii) Read up to class ..... . ( )

3. Firm Size

Please indicate your firm size.

Sl. No.	Types of Land Ownership	Area of Land	
		Local unit (Decimal)	*Hectare*
1.	Home stead		
2.	Own land under own cultivation		
3.	Own land given to others on borga		
4.	Land taken from others on borga		
5.	Land taken from others on lease		
Total =			

4. Annual Family Income

Please furnish the annual income from different sources in the last year.

Sl. No.	Sources of income	Amount in Taka
1.	Field crop cultivation	
2.	Vegetable and fruit production	
3.	Animal rearing	
4.	Poultry rearing	
5.	Fish culture	
6.	Business	
7.	Service	
8.	Others	
Total =		

5. Agricultural Training

a) Did you participate in training program? Yes/ No. .....

b) If yes then please provide the following information:

Sl. No.	Topics of training	Sponsor	Duration (Days)
1.			
2.			
3.			
4.			
5.			
Total =			

6. Non-localite Behaviour

Please indicate the frequency of your visit to the following places:

Sl. No.	Place of visit	Frequency of visits				
		Never (0)	*Rarely (1)*	*Occasionally (2)*	*Often (3)*	*Regularly (4)*
1.	Other villages out side of your own	0 time/ month	1 time/ month	2-3 times/ month	4-5 times/ month	> 5 times/ month
2.	Local Hat/Bazar	0 time/ month ( )	1 time/ month ( )	2-3times/ month ( )	4-5 times/ month ( )	> 5 times/ month ( )

3.	Own upzilla H.Q.	0 time/ month ( )	1 time/ month ( )	2-3 times/ month ( )	4-5 times/ month ( )	> 5 times/ month ( )
4.	Other thana H.Q.	0 time/2 months ( )	1 time/ 2 months ( )	2-3 times/2 months ( )	4-5 times/ 2 months ( )	> 5 times/ month ( )
5.	Own district	0 time/ quarter ( )	1 time/ quarter ( )	2-3 times/ quarter ( )	4-5 times/ quarter ( )	> 5 times/ month ( )
6.	Other district	0 time/ year ( )	1 time/ year ( )	2-3 times/ year ( )	4-5 times/ year ( )	> 5 times/ month ( )
7.	Capital city	0 time/ year ( )	1 time/ year ( )	2-3 times/ year ( )	4-5 times/ year ( )	> 5 times/ month ( )
8.	Regional research station	0 time/ year ( )	1 time/ year ( )	2-3 times/ year ( )	4-5 times/ year ( )	> 5 times/ month ( )
Total =						

7. Attitude towards Modern HYV Wheat Cultivation

Please mention the extent of your agreement towards the following statements.

Sl. No.	Statements	Extent of agreement				
		Strongly agree	*Agree*	*No opinion*	*Disagree*	*Strongly disagree*
1.(-)	Wheat seeds are costly					
2.(+)	Less insect infestation					
3.(-)	No yield difference between HYV and LIV					
4.(+)	Production is higher in wheat cultivation					
5.(-)	Use of pesticide is must in HYV wheat					
6.(+)	HYV wheat is more disease resistant					
7.(-)	HYV wheat is more fertilizer consuming					
8.(+)	HYV wheat needs comparatively less production periods					
9. (-)	Modern HYV wheat cultivation is costly					
10.(+)	HYV wheat is more stress resistant					
Total =						

8. Innovativeness

Please answer the following questions:

Sl. No.	Name of Technologies	Duration of use				
		Within 1 years after hearing (4)	*Within 2 years after hearing (3)*	*Within 3 years after hearing (2)*	*Above 3 years after hearing (1)*	*Do not use (0)*
1.	Use of granular urea					
2.	Use of recommended dose of irrigation					
3.	Use of green manure					
4.	Use of power tiller					
5.	Use of IPM					
6.	Use of recommended varieties of seeds					
7.	Use of balanced fertilizers					
Total =						

9. Contact with Different Media

Please indicate your extent of your contact with the following media:

(a) Personal Contact

Sl. No.	Places of visit	Extent of Contact		
		Regularly (2)	**Occasionally (1)**	**Never (0)**
1.	Upazilla Agriculture Office (Additional/UAEO)	3 or more times/year	1-2 times/ year	0 time/ year
2.	SAAO	7 or more times/year	1-6 times/ year	0 time/ year
3.	Other Extension Officer (Livestock Officer, Fisheries Officer)	3 or more times/year	1-2 times/ year	0 time/ year
4.	Other organization's field worker (health worker)	3 or more times/year	1-2 times/ year	0 time/ year
5.	Field worker of NGO	5 or more times/month	1-4 times/ month	0 time/ year
6.	Dealer of agricultural commodities	5 or more times/month	1-4 times/ month	0 time/ year
Total Score =				

(b) Group Contact

Sl. No.	Places of Visit	Extent of Contact		
		Regularly (2)	Occasionally (1)	Never (0)
1.	Group discussion	5 or more times/ 6 months	1-4 times/ 6 month	0 time/ 6 month
2.	Field day	3 or more times/ year	1 time/ year	0 time/ year
3.	Result discussion	3 or more times/ year	1 time/ year	0 time/ year
4.	Participation in agricultural training course	5 or more times/ life	1-4 times/ life	0 time/ life
Total score =				

(c) Mass Contact

Sl. No.	Places of visit	Extent of Contact		
		Regularly (2)	Occasionally (1)	Never (0)
1.	Upazila agricultural fair	3 or more times/ month	1-2 times/ month	0 time/ month
2.	Radio program named "Desh Amar Mati Amar"	3 or more times/ month	1-2 times/ month	0 time/ month
3.	District agricultural fair	3 or more times/3 month	1-2 times/ 3 month	0 time/ 3 month
Total score =				

10. Knowledge on Wheat Cultivation

Please answer the following questions:

Sl. No.	Questions	Score	
		Weighted	*Obtained*
1.	What do you understand by HYV wheat?	2	
2.	Name two HYV wheat varieties.	2	
3	Mention two major function of Urea on wheat.	2	
4.	What is the required rate of Urea fertilizer per hectare in wheat cultivation?	2	
5.	What is the required rate of TSP fertilizer per hectare in wheat cultivation?	2	
6.	What is the required rate of MP fertilizer per hectare in wheat cultivation?	2	

7.	Mention the name of two organic manures.	2	
8.	Mention two important diseases of wheat.	2	
9.	Mention two major harmful insect of wheat.	2	
10.	What are the deficiency symptoms of Urea fertilizer?	2	
11.	What are the deficiency symptoms of TSP fertilizer?	2	
12.	What are the deficiency symptoms of MP fertilizer?	2	
13.	Name two green manuring crops.	2	
14.	Name two insecticides available in your local market for wheat cultivation.	2	
15.	What do you mean by balanced fertilizer?	2	
16.	What are the characteristics of quality wheat seed?	2	
17.	How would you improve of your soil fertility?	2	
18.	Mention the symptom of Loose Smut disease.	2	
19.	What is the recommended time of sowing wheat?	2	
20.	How will you identify accurate harvesting time of wheat?	2	
Total =		40	

10. Adoption of Modern High Yielding Varieties (HYV) of Wheat

a) Do you cultivate modern HYV wheat varieties? Yes/ No. .....

b) If yes then please mention from the following list which modern HYV wheat you are cultivating present year with their cultivated area and potential area.

Sl. No.	**Recommended Variety**	**2005-2006**		**2006-2007**		**2007-2008**	
		Potential area (ha)	*Cultivated area (ha)*	*Potential area (ha)*	*Cultivated area (ha)*	*Potential area (ha)*	*Cultivated area (ha)*
1.	Satabdi						
2.	Sonali						
3.	Balaka						

12. Problem Confrontation

Please provide appropriate responses to the following problems confronted by you at the time of modern HYV wheat cultivation:

Sl. No.	Problem	Extent of problem			
		Severe Problem (3)	*Moderate Problem (2)*	*Little Problem (1)*	*Not at all Problem (0)*
1.	High price of seeds				
2.	Lack of HYV wheat seeds in the market				
3.	Requires high amount of fertilizers in HYV wheat crops				
4.	High price of fertilizers				
5.	Scarcity of fertilizer supply in time				
6.	Lack of IPM knowledge				
7.	Lack of Agricultural machineries & tools for wheat cultivation				
8.	Lack of training in adoption of selected wheat varieties				
9.	Non availability of printed materials about cultivation of wheat				
10.	Requires high amount of pesticides in HYV wheat crops				
Total =					

Thank you for kind co-operation.

Name of the interviewer :

Signature of the interviewer :

Date :

APPENDIX–B

CORRELATION MATRIX AMONG THE VARIABLES OF THE STUDY (N=110)

VARIABLE	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Y
X1	1										
X2	-.216*	1									
X3	.013 NS	.308**	1								
X4	.247**	.161	.412**	1							
X5	-.076 NS	.233*	.263**	.162 NS	1						
X6	-.292**	.137 NS	.140 NS	.110 NS	.247**	1					
X7	-.120 NS	.181 NS	.091 NS	.084 NS	.197*	.187 NS	1				
X8	-.026 NS	.196*	.204*	.173 NS	.184 NS	.021 NS	.356**	1			
X9	-.222*	.321**	.133 NS	.207*	.328**	.328**	.112 NS	.052 NS	1		
X10	-.202*	.280**	.239*	.125 NS	.217*	.405**	.191*	.259**	.233*	1	
Y	.062 NS	.178 NS	.217*	.205*	.290**	.148 NS	.235*	.267**	.207*	.268**	1

NS = Correlation is not significant
* = Correlation is significant at the 0.05 level (2-tailed)
** = Correlation is significant at the 0.01 level (2-tailed)

X1 = AGE
X2 = EDUCATION
X3 = FARM SIZE
X4 = ANNUAL FAMILY INCOME
X5 = AGRICULTURAL TRAINING
X6 = NON-LOCALITE BEHAVIOUR
X7 = ATTITUDE TOWARDS MODERN HYV WHEAT CULTIVATION
X8 = INNOVATIVENESS
X9 = CONTACT WITH DIFFERENT MEDIA
X10 = KNOWLEDGE ON WHEAT CULTIVATION
Y = ADOPTION OF MODERN HIGH YIELDING VARIETIES (HYV) OF WHEAT