PROBLEMS FACED BY THE FARMERS IN WHEAT CULTIVATION IN BOCHAGANJ UPAZILA UNDER DINAJPUR DISTRICT

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This is to certify that the thesis entitled **"PROBLEMS FACED BY THE FARMERS IN WHEAT CULTIVATION IN BOCHAGANJ UPAZILA UNDER DINAJPUR DISTRICT"** *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 and information system**, *embodies the result of a piece of bona fide research work carried out by* **MD. FEROJ KAMAL**, *Registration No.* **10-04066** *under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.*

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

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ACRONYMS AND ABBREVIATIONS

BARI   Bangladesh Agricultural Research Institute

BAU   Bangladesh Agricultural University

BBS   Bangladesh Bureau of Statistics

DAE   Department of Agricultural Extension

SPSS   Statistical Package for Social Science

SO   Scientific Officer

SAU   Sher-e-Bangla Agricultural University

SAAO   Sub-Assistant Agriculture Officer

FAO   Food and Agriculture Organization

HYV   High Yielding Variety

PFI   Problem Faced Index

IPM   Integrated Pest Management

GDP   Gross Domestic Product

CIS   Commonwealth of Independent States

MoT   *Magnaporthe oryzae Triticum pathotype*

BADC   Bangladesh Agricultural Development Corporation

CIMMYT   International Maize and Wheat Improvement Center

WRC   Wheat Research Centre

PROBLEMS FACED BY THE FARMERS IN WHEAT CULTIVATION IN BOCHAGANJ UPAZILA UNDER DINAJPUR DISTRICT

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ABSTRACT

Wheat production is decreasing in Bangladesh day by day. Therefore the objective of the study was to determine the problems faced by the farmers in wheat cultivation and explore the relationships between the selected characteristics of the wheat growers and the problems faced in wheat cultivation. The study was conducted in 105 wheat growers of twelve villages of Atgaon Union of Bochaganj Upazila under Dinajpur district. Data were collected from a proportionately random sample of 105 wheat farmers by using an interview schedule during the period from 1 February, 2018 to 28 February, 2018. The majority (72.38%) of the farmers faced medium problem while 11.43 percent faced low problem and 16.19 percent faced high problem in wheat cultivation. Pearson's Product Moment Co-efficient of Correlation analysis indicated that among 11 selected characteristics of the farmers, only seven namely, education, farm size, annual family income, training exposure, knowledge, extension media contact, cosmopoliteness had significant negative relationship with their problem faced in wheat cultivation. On the basis of Problem Faced Index, it was observed that "Low market price of wheat" ranked first followed by "Difficulty in getting loan from Bank", "High Price of wheat seed", "Shortage of quality seeds", "High price of fertilizer or Pesticide" were the major five problems in wheat cultivation. A very great majority (88.57%) of the farmers faced medium to high problems in wheat cultivation. From this fact, it may be concluded that until the wheat farmers are not free from different problems in wheat cultivation, they will not be able to produce more wheat in their field. In view of the urgent need for increasing wheat production, it is recommended that steps should be taken on a priority basis to remove the various problems causing hindrance to the wheat cultivation, harvesting, storage and marketing.

Chapter 1

INTRODUCTION

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INTRODUCTION

1.1 Background of the Study

Wheat (*Triticum aestivum* L.) is a grass widely cultivated for its seed, a cereal grain which is a worldwide staple food. There are many species of wheat which together make up the genus *Triticum*; the most widely grown is common wheat (*T. aestivum*). Wheat (species of *Triticum*) is a cereal grain that people can eat. It is a kind of grass whose fruit is a "head of wheat" with edible seeds. It was first grown in the Levant, a region of the Near East. Now it is cultivated worldwide. World trade in wheat is greater than for all other crops combined. Globally, wheat is the leading source of vegetable protein in human food. It has a higher protein content than other major cereals such as maize (corn) or rice. In terms of total production, it is second to rice as the main human food crop and ahead of maize. It was one of the first crops that could be easily cultivated on a large scale, and its seeds could be stored for long periods in a dry climate. Wheat helped the growth of city-states in the Fertile Crescent, including the Babylonian and Assyrian empires. Wheat grain is a staple food used to make flour for leavened, flat and steamed breads, biscuits, cookies, cakes, breakfast cereal, pasta, noodles. It can also be fermented to make ethanol, for alcoholic drinks, or biofuel.

Wheat is one of the most important winter crops. In this review, we provide an up-to-date and detailed account of wheat research of Bangladesh and the impact that global warming may have on agriculture, especially wheat production. Although flooding is not of major importance or consequence to the wheat crop at present, some perspectives are provided on this stress since wheat is flood sensitive and the incidence of flooding is likely to increase. Wheat is grown under a wide range of climatic and soil conditions. It however, grows well in clayey loam soils. In Bangladesh it is a crop of Rabi season, requires dry weather and bright sunlight. Well distributed rainfall between 40 and 110 cm is congenial for its growth. Wheat normally needs between 110 and 130 days between sowing and harvest, depending upon climate, seed type, and soil conditions (winter wheat lies dormant during a winter freeze). Optimal crop management requires that the farmer have a detailed understanding of each stage of development in the growing plants. In particular, spring fertilizers, herbicides, fungicides, and growth regulators are typically applied only at specific stages of plant development. For

example, it is currently recommended that the second application of nitrogen is best done when the ear (not visible at this stage) is about 1 cm in size. Knowledge of stages is also important to identify periods of higher risk from the climate. Farmers also benefit from knowing when the 'flag leaf' (last leaf) appears, as this leaf represents about 75% of photosynthesis reactions during the grain filling period, and so should be preserved from disease or insect attacks to ensure a good yield.

Wheat ear

Wheat, any of several species of cereal grasses of the genus *Triticum* (family *Poaceae*) and their edible grains. Wheat is one of the oldest and most important of the cereal crops. Of the thousands of varieties known, the most important are common wheat (*Triticum aestivum*), used to make bread; durum wheat (*T. durum*), used in making pasta and club wheat (*T. compactum*), a softer type, used for cake, crackers, cookies, pastries, and flours. The wheat plant has long slender leaves and stems that are hollow in most varieties. The inflorescences are composed of varying numbers of minute flowers, ranging from 20 to 100. The flowers are borne in groups of two to six in structures known as spikelet's, which later serve to house the subsequent two or three grains produced by the flowers. Though grown under a wide range of climates and soils, wheat is best adapted to temperate regions with rainfall between 30 and 90 cm (12 and 36 inches). Winter and spring wheat are the two major types of the crop, with the severity of the winter determining whether a winter or spring type is cultivated. Winter wheat is always sown in the fall; spring wheat is generally sown in the spring but can be sown in the fall where winters are mild.

Estimate of wheat (2016-2017), the cultivation of wheat in Bangladesh has been decreased this year in relation to previous year. DAE discourage to cultivate wheat the farmers of south-

west districts due to **blast disease** at last year. This discouraging program of government agency is to consider as main reasons of decreased area of wheat.

In a subjective manner, farmers were interviewed on some points relating to management and distribution system of seed and fertilizer. Observing the field reports it revealed that good management and distribution system of seed and fertilizer brings significantly increased yield rate (4.19%) of this crop.

Area: The total area under wheat crop has been estimated 10,26,343 acres (4,15,339 hectares) compared to 10,99,158 acres (4,44,805 hectares) of the last year. Decrease area 6.624%.

Yield: The weather condition was favorable during sowing period in the survey year 2016-2017. Average yield rate of wheat has been estimated 34.23 maunds per acre (3.158 metric tons per hectare) which is 4.19% higher than that of last year, (3.031 metric tons).

Production: Total production of wheat has been estimated 13,11,473 metric tons compared to 13,48,186 metric tons of the last year, which is reduced 2.72%.
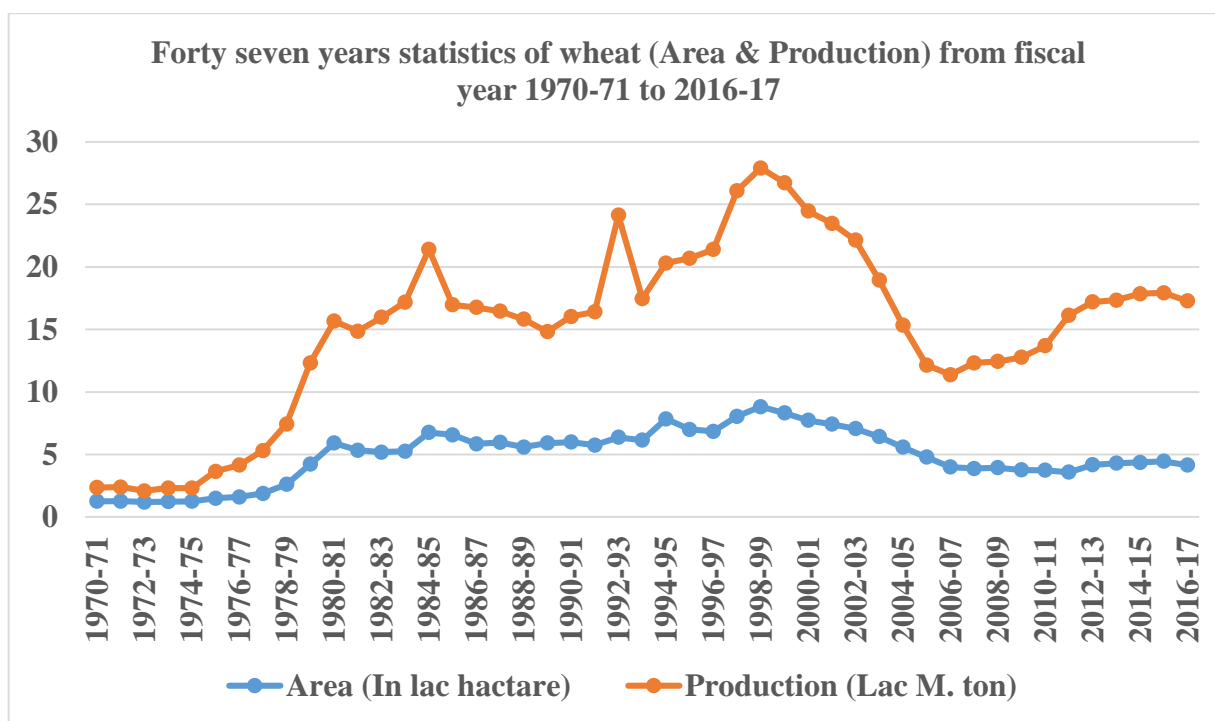
Figure 1.1. Line graph shows forty seven years statistics of wheat (area & Production) from fiscal year 1970-71 to 2016-17. (Source: BBS 2017)

Yield (Metric tons per hectare)
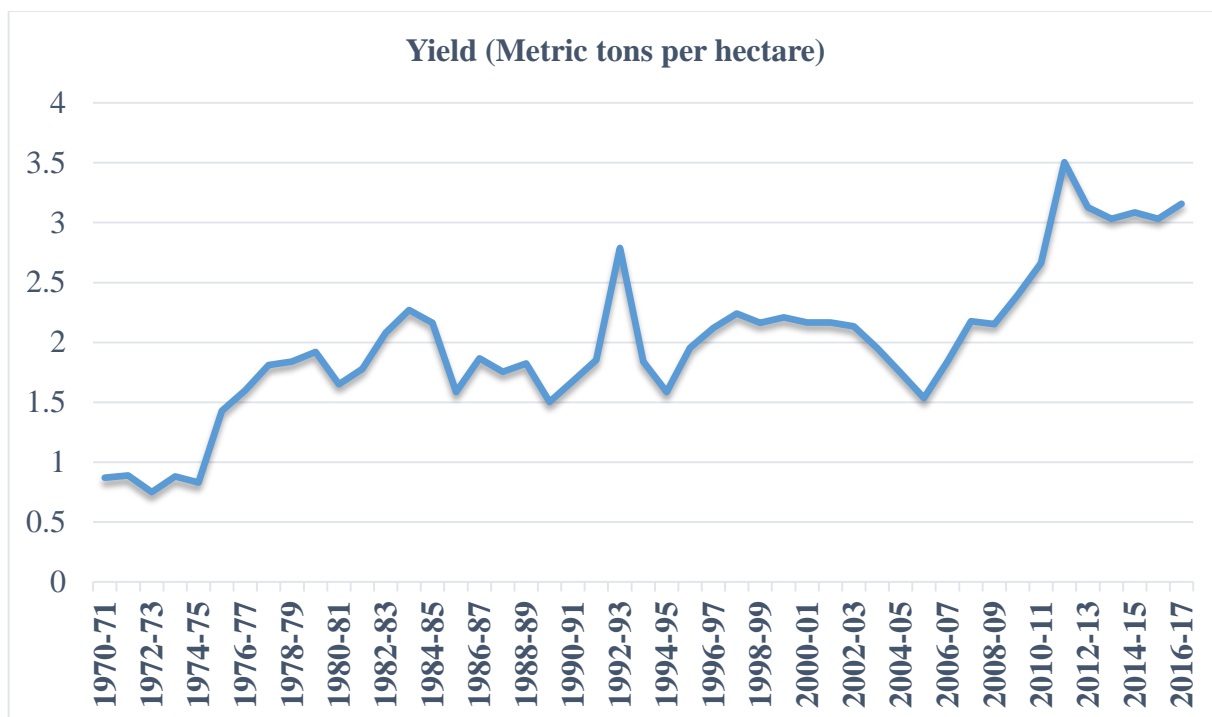
Figure 1.2. Line graph shows the 47 years average yield rate of wheat from fiscal year 1970-71 to 2016-17. (Source: BBS 2017)

World wheat production is now under threat due to the wheat blast outbreak in Bangladesh in early March 2016. This is a new disease in this area, indicating the higher possibility of this pathogen spreading throughout the Asia, the world's largest wheat producing area. However, as a long-term perspective, much greater losses will occur once this disease spreads to other major wheat producing areas of Bangladesh, India, and Pakistan due to the existing favorable condition for the blast pathogen. The wheat blast pathogen belongs to the *Magnaporthe oryzae* species complex causing blast disease on multiple hosts in the *Poaceae* family. Phylogenetic analysis revealed that the Bangladesh outbreak strains and the Brazil outbreak strains were the same phylogenetic lineage, suggesting that they might be migrated from Brazil to Bangladesh during the seed import. To protect wheat production of Bangladesh and its neighbors, several measures including rigorous testing of seed health, use of chemicals, crop rotation, reinforcement of quarantine procedures, and increased field monitoring should be implemented. Development of blast resistant wheat varieties should be a long-term solution and combination of different methods with partial resistant lines may suppress this disease for some time.

Wheat blast is caused by the fungus Magnaporthe oryzae Triticum pathotype (MoT). The potential for wheat blast to cause widespread losses demands immediate action to understand and manage this explosive disease. The recent appearance of wheat blast in Bangladesh demonstrates the threat of global spread, which could occur via the movement of infected seed or grain. MoT mainly infects wheat heads, with symptoms closely resembling *Fusarium* head blight. To date, wheat blast is considered an intractable and dangerous disease and fungicides have shown limited efficacy. Disease management requires identification of new resistance sources and a complete understanding of MoT ecology and wheat blast epidemiology.

In February 2016, a new fungal disease was spotted in wheat fields across eight districts in Bangladesh. The epidemic spread to an estimated 15,000 hectares, about 16 % of the cultivated wheat area in Bangladesh, with yield losses reaching up to 100 %. Within weeks of the onset of the epidemic, we performed transcription sequencing of symptomatic leaf samples collected directly from Bangladeshi fields. Wheat forms the base of global food security, providing 20% of protein and calories of majority of the population in developing countries. Wheat is cultivated in the world over a large area and under varied climatic conditions ranging from sub-tropical to temperate. Wheat blast symptoms appeared first in the middle of February of 2016 in Chuadanga and Meherpur districts and rapidly spread to adjacent four districts within two weeks. Wheat seed from blast infected areas should not be used for sowing.

The agro-climatic conditions of Bangladesh are favorable for wheat cultivation. Wheat can and will play an important role along with other cereals in meeting future need of growing population. Sufian (2005) Consumption of wheat is also increasing @ 3% per year whereas production of wheat is reducing day by day. Besides, wheat has other additional benefits as follows:

> ➢ High farm return,
> ➢ Increase employment opportunity in rural areas,
> ➢ Supply poultry feed and industrial raw materials,
> ➢ Scope for strengthening flour and biscuit industry,
> ➢ Low production cost especially for less irrigation/rain fed condition,
> ➢ Production for increased population.

The importance of wheat cultivation in the economy of Bangladesh can hardly be over emphasized, but the production of wheat has not been able to keep place with the increased demand due to some problems regarding seed, production, processing, marketing, storage etc. Hence it is necessary to conduct a research study on the problems faced by the farmers in wheat cultivation. Therefore, the purpose of the study was to have an understanding of the problems faced by the wheat growers of selected area. It was anticipated that such study would discover the causes of the constraints related to cultivation, marketing, processing and storing of wheat as well as help in cultivating an effective measure for wheat cultivation all over the country.

1.2 Statement of the Problem

Wheat production is decreasing in Bangladesh day by day (Wheat Research Centre, BBS). A dynamic change (examples: Blast disease, low market price) in wheat production has already been observed in Bangladesh. Wheat blast is considered a major disease affecting wheat production. In order to have an understanding of the farmer problems in wheat cultivation, the researcher undertook the investigation entitled "Problems faced by the farmers in wheat cultivation". In spite of greater potentially of wheat cultivation the farmers of Bangladesh are not free from problems in the field of cultivating wheat. They faced several problems in production and marketing. Most of the farmers in Bangladesh fail to overcome their problems. The farmers are compelled to sell major part of their produce immediately after harvesting at a very low price, mainly because of not even temporary storage accommodation being available to them. Therefore, research information is required which could be helpful to the policy makers, concerned bodies with the supply of inputs, technologies and knowledge.

Problems in cultivation of wheat are influenced by their personal, economic, social characteristics. The researcher needs to an essential understanding of the wheat cultivation problems faced by the farmers and its relationship with their various characteristics for policy formulation regarding effective planning and execution of increasing wheat cultivation in Bangladesh. In this connection, the following research questions were raised to have clear understanding about the nature of problem faced by the wheat farmers for solution:

    a. What are the selected characteristics of wheat farmers?
    b. What is the extent of problems faced by the farmers in wheat cultivation?

c. What relationship exists between the problems faced by the wheat farmers and their selected characteristics?

d. What are the problems faced by the farmers in wheat cultivation?

1.3 Justification of the Study

It is stated that wheat is the valuable cereal crop of Bangladesh. Needless to say that, research is necessary to determine the pattern of problems faced in wheat production in order to formulate long-term strategy on wheat production. Although some studies were conducted by WRC, DAE, BARI and BAU but these were limited in scope and coverage. On a broader perspective, the investigator believes that the findings of the present study will reveal the phenomenon related to problems in wheat production. This will be of special interest to the policy makers and planners in formulating and redesigning the extension services especially for wheat cultivation. But different problems act adversely in the cultivation of wheat. It is therefore, urgently necessary to devise ways and means to increase wheat cultivation through identifying the problems and by minimizing the problems. The findings of the study are expected to be useful to the planners, research personnel and extension workers in planning and execution of wheat extension programs in a better way.

1.4 Specific Objectives

The following specific objectives were formed to give proper direction to the study:

1. To describe the selected characteristics of the farmers that might represent their problems faced in wheat cultivation. The selected characteristics are:
   - ❖ Age
   - ❖ Level of education
   - ❖ Family size
   - ❖ Farm size
   - ❖ Annual family income
   - ❖ Wheat cultivation area
   - ❖ Training exposure on wheat cultivation
   - ❖ Knowledge on wheat cultivation
   - ❖ Extension media contact
   - ❖ Cosmopoliteness and
   - ❖ Credit received;

2. To assess the extent of problems faced by the farmers in wheat cultivation

3. To explore the relationship between each of the selected characteristics of the farmers and their problems faced in wheat cultivation; and

4. To compare among the severity of problems faced by the farmers in wheat cultivation

1.5 Scope of the study

The findings of the study will be particularly applicable to the study area. However, the findings may also have generally implications for other areas of Bangladesh, where socio-economic, physical, cultural and geographical conditions are mostly similar to the study area. Thus, the findings are expected to be useful to students, researchers, extension workers and particularly for planners in formulating future plans related to nation building activities. The findings may be a piece of contribution to the body of knowledge in the field of agricultural extension services.

1.6 Limitations of the Study

The study was undertaken with a view to having an understanding of the problems faced by the farmers in wheat cultivation. However, from the research point of view, it was necessary to impose certain limitations as follows:

1. The study was confined to Bochaganj upazila under Dinajpur district.

2. Farmers have many varied characteristics but only 11 were selected to complete this study as stated in the objectives.

3. The researcher dependent on the data as furnished by the selected farmers during interview.

4. Facts and figures collected by the researcher applied to the situation prevailing during the year 2018.

1.7 Assumptions of the Study

The researcher had the following assumptions in mind while undertaking this study:

1. The respondents included in the sample were capable of furnishing proper responses to the questions included in the interview schedule.

2. The researcher who acted as interviewer was adjusted to social, cultural and environmental conditions of the study area. Hence, the data collected by him from the respondents were free from bias.

3. The responses furnished by the respondents were valid and reliable.

4. Data were normally and independently distributed with their means and standard deviation.

5. The findings of the study will have general applications to other parts of the country with similar personal, socio-economic and cultural conditions.

1.8 Definition of Terms

In this study, the certain terms have been frequently used. These are defined and interpreted below for clarity of understanding.

Respondents

Randomly selected people considered to be representable of the population are known as respondents. They were the people from whom a social research worker usually got most data required for his research. In this study the respondents were the village level wheat farmers.

Farmers

The persons who were involved in farming activities were called farmers. They participated in different farm and community level activities like crops, livestock, fisheries, other farming activities etc. In this study, wheat growers were treated as farmers.

Age

Age of the respondent refers to the period of the time from his birth to the time of interview in years.

Education

Education was considered as the formal education of the respondent by the number of years spent to obtain formal education through successful schooling.

Family size

It was considered as the actual number of permanent members in a respondent's family including himself, his wife, children and others that live and eat together in a family unit.

Farm size

Farm size meant the total area of land on which a farmer's family carried on farming operations in terms of full benefit to the family.

Wheat cultivation area

Wheat cultivation area referred to the area of land under his/her management only for wheat cultivation. The area was estimated in terms of full benefit to a farmer or his/her family.

Annual family income

It was considered as the total annual earnings by the all earning family members of the respondent from wheat, other crops, poultry, livestock, fisheries, business, service, daily labor and other accessible sources during last one year.

Training exposure

This has been determined as the number of days attended by the respondent in his whole life to the training courses on various agriculture related subject maters including wheat cultivation.

Knowledge

Knowledge is operationally defined for the purpose of this investigation as those behaviors and test situations, which emphasized the remembering either by recognition or recall of ideas, material or phenomenon. It referred to the amount of understood information possessed by the farmers on various aspects of wheat cultivation.

Extension media contact

Extension media contact refers to the respondents' participation directly or indirectly for collecting information from different sources that are used for technology dissemination among the farmers.

Cosmopoliteness

The term cosmopoliteness referred to the rural farmer mobility from their own village to another village, upazila, district and other places.

Credit received

Credit availability of a respondent refers to the demand of cash money treated as loan for wheat cultivation received from institutional or non-institutional sources by the respondent during the sowing season.

Problem faced

Problem faced referred to the degree of difficulties faced by concerned people in accomplishment of particular activities. In this study problem faced meant extent of problem wheat growers faced in wheat cultivation.

Wheat farmers

Wheat farmers referred to those farmers who have cultivated wheat during the Rabi season of 2017-2018.

Chapter 2

REVIEW OF LITERATURE

CHAPTER 2

REVIEW OF LITERATURE

The aim of this Chapter is to describe the review of past researches conducted in line of the major focus of this study. Literature having relevance to the present study has been reviewed in three sections. The first section deals with the literature on problems faced by the farmers in producing various crops, the second section deals with review of studies dealing with the relationship of selected characteristics with problem faced. Finally last section of this chapter deals with the conceptual framework of the study.

2.1 Literature on Problems Faced by the Farmers in Cultivating Various Crops

Bodruzzaman *et al.* (2004) observed that a major cause of lower production of wheat in the country is lower yield at farmer's field.

Bodruzzaman *et al.* (2005) also found that lower yield of wheat was also reported as a major problem due to late planting even with optimum fertilizer doses and other management practice.

Islam *et al.* (2016) found that blast pathogen attacks at the base or upper part of the rachis affecting the spike formation that makes the spike partial or complete dead resulting shriveled seeds or no grain, respectively.

Islam *et al.* (2016) also found that wheat blast symptoms appeared first in the middle of February of 2016 in Chuadanga and Meherpur districts and rapidly spread to adjacent four districts within two weeks. The recent report also indicated the high risk of wheat production throughout the Bangladesh and in neighbor countries, because blast disease also found in other region which is quite far from the first spotted place (Barisal and Bhola districts).

Callaway (2016) found that terrifying blast disease of wheat (*Triticum aestivum*) was spotted in Bangladesh and this was the first occurrence in the Asia.

CIMMYT (2016) conducted a study and found that recent outbreak proved the predictions of International Maize and Wheat Improvement Center (CIMMYT) experts that wheat blast can be spread to Asia and Africa from disease existing countries because of similar climatic conditions in these regions.

Index Mundi (2016) conducted a study and found that plant pathologists from Wheat Research Center (WRC) of Bangladesh also warned that this disease has the chance to spread to India,

Pakistan, and China which ranks third, seventh, second in the world wheat production, respectively.

BADC (2015) Farmers get wheat seeds for cultivation only from the government agencies (Bangladesh Agricultural Development Corporation) BADC and DAE. Although, the seed requirement for wheat cultivation has increased constantly.

Akter and Jiam (2002) reported that the government agencies fulfilled only 40-50% of the total seed requirement of the country.

Anisur (2000) reported that there a number of storage insect of wheat. The red flour beetle (*T. casteneum*) is the serious pest of stored wheat and can penetrate deeply into the storage commodity.

Gumisiriza *et al.* (1994) showed several constraints of wheat production in Uganda. Those were: traditional farming practices, unavailability or lack of improved cultivars, information and technology transfer, rust and foliar diseases and ineffective communication between research stations.

Muttaleb et al. (1998) revealed that among different constraints, high fertilizer cost, high seed cost, lack of quality seed, lack of awareness, lack of technological knowledge and low price of potato at harvest period were perceived as barriers for the adoption of potato technologies.

Meisner (1992) found that inadequate use of fertilizers and inappropriate timing of fertilizers and irrigations also resulted in the yield reduction of wheat.

Pramanik (2001) made an extensive study on 24 problems of farm youth in Mymensingh district relating to different problem in crop cultivation .Out of 24 problems the top 4 problems in rank order were: (1) local NGOs take high rate of interest against a loan, (2) lack of agricultural machinery and tools, (3) lack of cash and (4) financial inability to arrange improved seeds, fertilizer and irrigation.

Raha et al. (1986) identified some common problem of cotton cultivation as perceived by the farmers in Bangladesh. Those were lack of suitable land, lack of irrigation facility, shortage of labor, shortage of cash money, lack of technical knowledge, lower price of cotton and non-availability of seed, insecticide and fertilizer.

Uddin (2004) in his study identified five aspects of constraints in commercial cultivation of vegetables viz. seed constraints, disease and insect infestation constraints, field management constraints, marketing of vegetable constraints and extension work constraints. Among these

aspects of constraints he revealed disease and pest infestation constraints severely faced by the farmers.

Salam (2003) in his study identified constraints in adopting environmentally friendly farming practices. Top six identified constraints according to their rank order were: (i) low production due to limited use of fertilizer, (ii) lack of organic matter in soil, (iii) lack of Govt. support for environmentally friendly farming practices, (iv) lack of capital and natural resources for integrated farming practices, (v) lack of knowledge on integrated farm management and (vi) unavailability of pest resistant varieties of crops.

Chander *et al.* (1990) in their study identified constraints in potato cultivation. Main constraints were ignorance about improved cultivars and cultivation practice, ignorance about time and number of irrigations, ignorance about scientific method of sowing, lack of guidance of marketing of potato, high cost of improved cultivars, high cost of fertilizers, pesticide and irrigation, lack of enough space for storing potatoes scientifically and so on.

Hassan *et al.* (1998) observed that almost two-thirds (64.15%) of the respondents had medium problem confrontation compared to 18.82 percent high and 1.98 percent low problem confrontation in crop production.

2.2 Studies on Relationship of Selected Characteristics of the Respondents with their Problem faced

2.2.1 Age and problem faced

Mansur (1989) found that age of the farmers had no significant relationship with the feeds and feeding problem confrontation.

Nahid (2005) conducted a study and found that there was no relationship between age of the cotton growers and their problem confrontation in cotton production.

Akanda (1993) found that there was no relationship between age of farmers and their problem faced in using quality rice seed.

Hasan (1995) found that there was no relationship between age of the block supervisors and their problem faced.

Bhuyan (2002) in his study found a positive and significant relationship between age of the farmers and their constraint in banana cultivation. Similar findings were obtained by.

Rahman (1995) conducted a study and found negative relationship between age of the cotton farmers and their problem faced.

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Karim (1996) conducted a study and found that age had no significant relationship with problem faced.

2.2.2 Education and problem faced

Kashem (1977) in his study found a significant negative relationship between education of the landless labours and their problem confrontation.

Nahid (2005) conducted a study and found that there was very high significant negative relationship between education of the cotton growers and their problem confrontation in cotton production.

Hague (2001) found a significant negative relationship between education and problem faced of the FFS farmers in practicing IPM.

Karim (1996) in his study found that education of the farmers had significant negative relationship with their problem faced.

Basher (2006) found that education of the farmers had significant negative relationship with their problem confrontation in mushroom cultivation.

Huque (2006) found that education of the farmers had highly significant negative relationship with their problem faced in using integrated plant nutrient management.

Aziz (2006) in his study revealed that there was no significant relationship between education and constraints faced by the farmers in potato cultivation.

2.2.3 Family size and problem faced

Rahman (1995) found that there was no significant relationship between family size of the pineapple growers and their problem confrontation. He also found negative tendency between the concerned variables.

Basher (2006) found that family size of the farmers had no significant relationship with their problem confrontation in mushroom cultivation.

Hossain (1985) found in his study that there was no relationship between family size of the landless labours and their problem confrontation.

Salam (2003) in his study found a positive significant relationship between family size and their problem confrontation in adopting environmentally friendly farming practices.

Nahid (2005) conducted a study and found that there was no significant relationship between family size of the cotton growers and their problem confrontation in cotton production.

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Haque (2006) found that family size of the farmers had no significant relationship with their problem faced in using integrated plant nutrient management.

2.2.4 Farm size and problem faced

Rahman (1996) found that farm size of the respondents had a negative significant relationship with their problem confrontation in potato cultivation.

Roy (2007) in his study found no significant relationship between farm size under maize cultivation and constraints faced by farmers in maize cultivation.

Nahid (2005) conducted a study and found that there was a high significant negative relationship between total farm size of the cotton growers and their problem confrontation in cotton production.

Kashem (1977) found a significant negative relationship between borga farm size of the landless labourers and their problem confrontation.

Basher (2006) found that farm size of the farmers had significant negative relationship with their problem confrontation in mushroom cultivation.

Hague (2001) revealed that significant positive relationship existed between farm size and problem confrontation of the FFS farmers in practicing IPM.

Karim (1996) conducted a study and found that farm size of the fanners had no significant relationship with their problem confrontation.

Aziz (2006) revealed that there was no significant relationship between farm size and constraints faced by the farmers in maize cultivation.

Rashid (2003) found that farm size of the rural youth had no relationship with problem confrontation in selected agricultural production activities.

2.2.5 Annual family income and problem faced

Nahid (2005) conducted a study and found that there was a very high significant negative relationship between annual income of the cotton growers and their problem confrontation in cotton production.

Hossain (1985) found a significant relationship between income and problem confrontation of the land less laborers.

Karim (1996) found that the annual income of the farmers had significant negative relationship with their problem confrontation.

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Islam (1987) reported that the relationship between income and artificial insemination problem confrontation was negatively significant.

Bashar (2006) found that annual family income high significant negative relationship with problem confrontation in mushroom cultivation.

Rahman (1995) found in his study that annual family income of the farmers had a significant negative effect on their problem confrontation in pineapple cultivation.

Karim (1996) found in his study that annual family income of the farmers had a significant negative effect on their problem confrontation in kakroal cultivation.

2.2.6 Wheat cultivation area and problem faced

No study was found on the study of relation between problems faced in wheat cultivation and wheat cultivation area. However, there is other study relevant to problem faced by wheat farmers have been stated below:

Rahman (1995) found a significant and negative relationship between area under cotton cultivation of the farmers and their faced constraint.

Halim (2003) in his study constraints faced by the farmers in adopting crop diversification found that there was positive and significant relationship between area under rice cultivation of the farmers and their problem confrontation.

Nahid (2005) conducted a study and found that there was a significant negative relationship between cotton farm size of the cotton growers and their problem confrontation in cotton production.

Bhuiyan (2002) in his study found no significant relationship between area under banana cultivation of the farmers and their constraints in banana cultivation.

2.2.7 Training exposure in wheat cultivation and problem faced

No study was found on the study of relation between problems faced in wheat cultivation and training exposure on wheat cultivation. However, there is other study relevant to problem faced by wheat farmers have been stated below:

Ahmed (2002) showed that training experience of the farmers had a significant negative relationship with their problem confrontation in jute seed production.

Ali (1999) found that training experience of the rural youth had no relationship with the problem confrontation in self-employment by undertaking selected agricultural income generating activities.

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Anwar (1994) found that rural youth faced various problems in training and the top three problems in rank order were: a) No arrangement of training on rural and agricultural development of the upazila. b) No scope to have training on improved agricultural practices. c) No arrangement for vocational training in the upazila.

Basher (2006) found that training exposure of the farmers had high significant negative relationship with their problem confrontation in mashroom cultivation.

2.2.8 Extension media contact and problem faced

No literature was found on the study of relation between problem faced in wheat cultivation and extension media contact. However, there is other study relevant to problem faced by wheat farmers have been stated below:

Rahman (1995) in his study concluded that extension contact of the farmers had significant negative relationship with their faced problem in cotton cultivation. Similar findings were obtained by Faroque (1997), Pramanik (2001), Hossain (2002), Bhuiyan (2002) and Salam (2003) in their respective studies.

Akanda (2005) reported that there was significant positive relationship between communication exposure and technological gap in cultivating transplanted modern aman rice.

Nahid (2005) conducted a study and found that there was a very high significant negative relationship between extension media contact of the cotton growers and their problem confrontation in cotton production.

Huque (2006) found that extension media contact of the farmers had high significant negative relationship with their problem faced in using integrated plant nutrient management.

Basher (2006) found that extension media contact of the farmers had significant negative relationship with their problem confrontation in mushroom cultivation.

2.2.9 Cosmopoliteness and problem faced

No literature was found on the study of relation between problems faced in wheat cultivation and cosmopoliteness. However, there is other study relevant to problem faced by wheat farmers have been stated below:

Rashid (1975) found that there was a negative relationship between cosmopoliteness of the farmers and their agricultural problem confrontation.

Pramanik (2001) found that Cosmopoliteness of the farm youth had significant negative relationship with their crop cultivation problems.

Bashar (2006) found that cosmopoliteness of the farmers had significant negative relationship with their problem confrontation in mushroom cultivation.

Hoque (1995) in his study revealed a strong positive relationship between cosmopoliteness of the cane growers and their constraint in sugarcane cultivation. Similar findings were obtained by Islam (1993), Khan (1993) and Parveen (1993) in their respective studies.

Kashem (1977) found that there was a negative relationship between cosmopoliteness of the landless labours and their constraints faced. There was however, a negative trend between the two variables.

2.2.10 Knowledge on wheat cultivation and problem faced

No study was found on the study of relation between problems faced in wheat cultivation and knowledge on wheat cultivation. However, there is other study relevant to problem faced by wheat farmers have been stated below:

Mansur (1989) found in his study that there was a substantial significant negative relationship between knowledge in feeds and feeding cattle of the farmer and their problem confrontation in feeds and feeding. Similar findings were obtained by Sarker (1983), Rahman (1996), Basher (2006), Aziz (2006), karim (1996), Hossain (2002) and Ahmed (2002) in their respective studies.

Saha (1983) studied on poultry problem confrontation and reported that the relationship between poultry knowledge and poultry problem confrontation was negative.

Huque (2006) found that knowledge of the farmers had significant negative relationship with their problem faced in using integrated plant nutrient management.

Ali (1999) found that knowledge of the rural youth had significant positive relationship with their anticipated problem confrontation in self-employment by undertaking selected income generating activities.

Aziz (2006) found that knowledge of the farmers had very high significant negative relationship with their constraints faced in potato cultivation in Jhikargacha upazilla under Jessore district.

2.2.11 Credit Received and problem faced

No literature was found related to relationship between credit received and problems faced in wheat cultivation. However, there is other study relevant to problem faced by wheat farmers have been stated below:

Ali (2001) stated that ninety-one percent of the respondents were small to medium credit recipient. Credit received of the respondents showed a positively significant relationship with their change in income and housing environment. Credit received had a great influence for socio-economic development of the beneficiaries but it was not helpful in case of food consumption. As there was an existence of small to medium credit received by higher proportion of the respondents, there was a scope to increase impact of micro-credit towards poverty alleviation by increasing credit recipient.

Basak (1997) in his study observed that the credit received of the respondents under BRAC had no significant relationship in BRAC rural development activities, though a positive trend was observed between the concerned variables.

Khan (2006) in his study indicates that credit received has a great influence for socio-economic development of the beneficiaries. As there was an existence of small to medium credit received was the higher proportion of the respondents there is a scope to increase income.

Sarker (2002) stated that women with more credit had more income than those with less credit. Credits received by some of the members were high because two or more persons joined the group from the same family in order to receive more credit. They invested more credit in their self-employment opportunities and got more return from those. So, their income has changed significantly.

Rahman (1996) found that credit availability had a positive role in the participation of women in income earning activities.

2.3 Conceptual Framework of the Study

In scientific research, selection and measurement of variables constitute an important task. The hypothesis of a research while constructed properly contains at least two important elements i.e. a focus variables and an explanatory variables. A focus variables is that factor which appears, disappears or varies the researcher introduces, removes or varies as the explanatory variables. An explanatory variables is that factor which is manipulated by the

researcher in this attempt to ascertain its relationship to an observed phenomenon. A simple conceptual framework for the study is shown in figure 2.1.

Explanatory variables	**Focus variables**
❖ Age	
❖ Level of education	
❖ Family size	
❖ Farm size	
❖ Annual family income	Problem faced in wheat cultivation
❖ Wheat cultivation area	
❖ Training exposure on wheat cultivation	
❖ Knowledge on wheat cultivation	
❖ Extension media contact	
❖ Cosmopoliteness	
❖ Credit received	
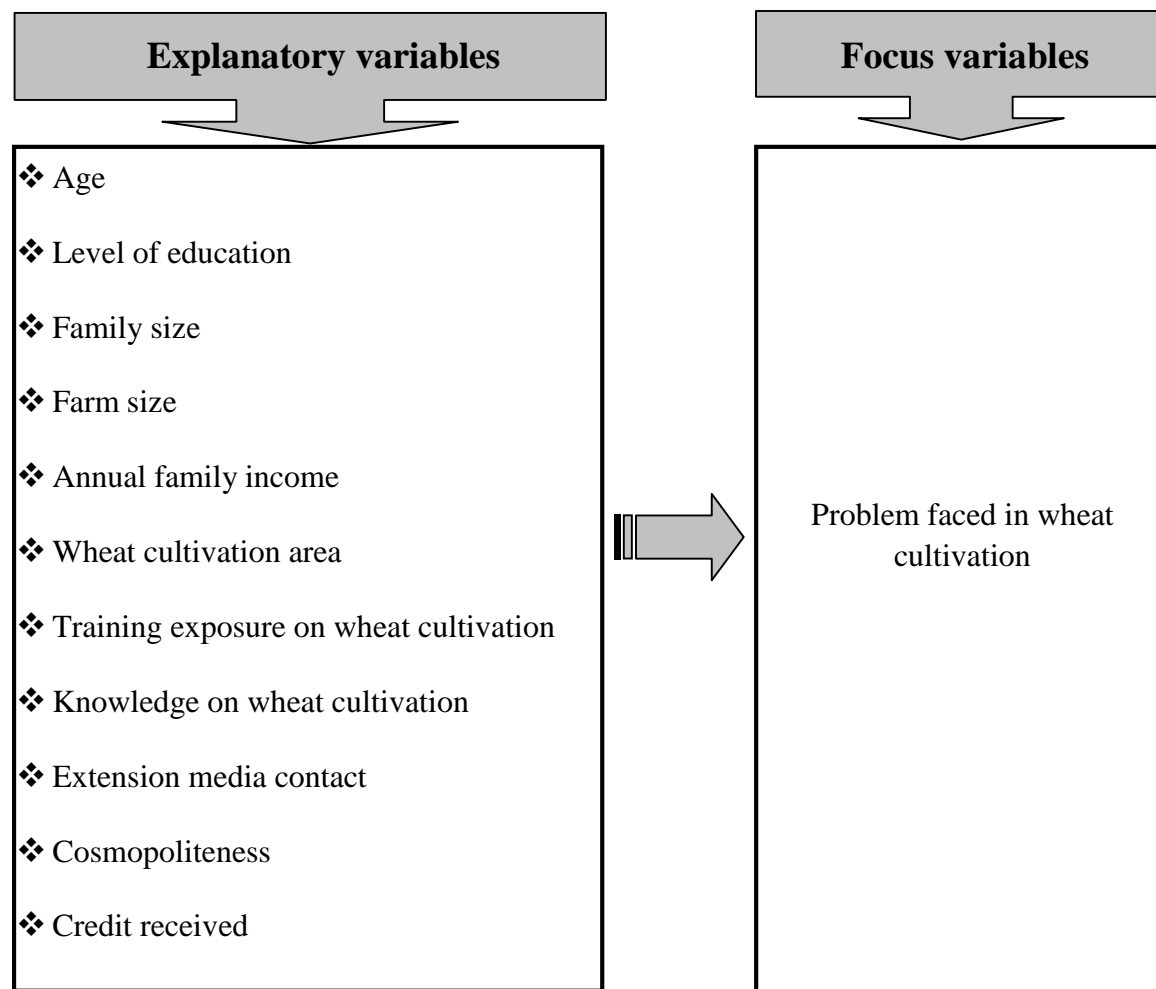
Table 2.1. A Conceptual Framework of the Study

Chapter 3

METHODOLOGY

CHAPTER 3

METHODOLOGY

The methods used in conducting research need very careful consideration. Methodology should be such that it enables the research to collect the valid information and to analyze the same properly to arrive at correct decisions. The methods and procedures followed in conducting this study have been described in this Chapter.

3.1 The Locale of the Study

The study was conducted among the wheat growers of twelve villages of Atgaon Union of Bochaganj Upazilla under Dinajpur District. Out of six unions of this Upazila, Atgaon Union was purposively selected because farmers are known to me in this union. From these Union twelve villages (Atgaon, Sripur, Jalali, Sottomandangi, Bondhugaon, Borgaon, Pulhut, Horipur, Mollapara, Doula, Dokkhingram, Silet) were selected randomly from 29 villages of this Union. The map of Bangladesh showing Dinajpur district appear in the Figure 3.1 and a map of Bochaganj Upazila showing the study area have been shown in Fig 3.2.

Figure 3.1 A Map of Dinajpur District showing Bochaganj Upazila
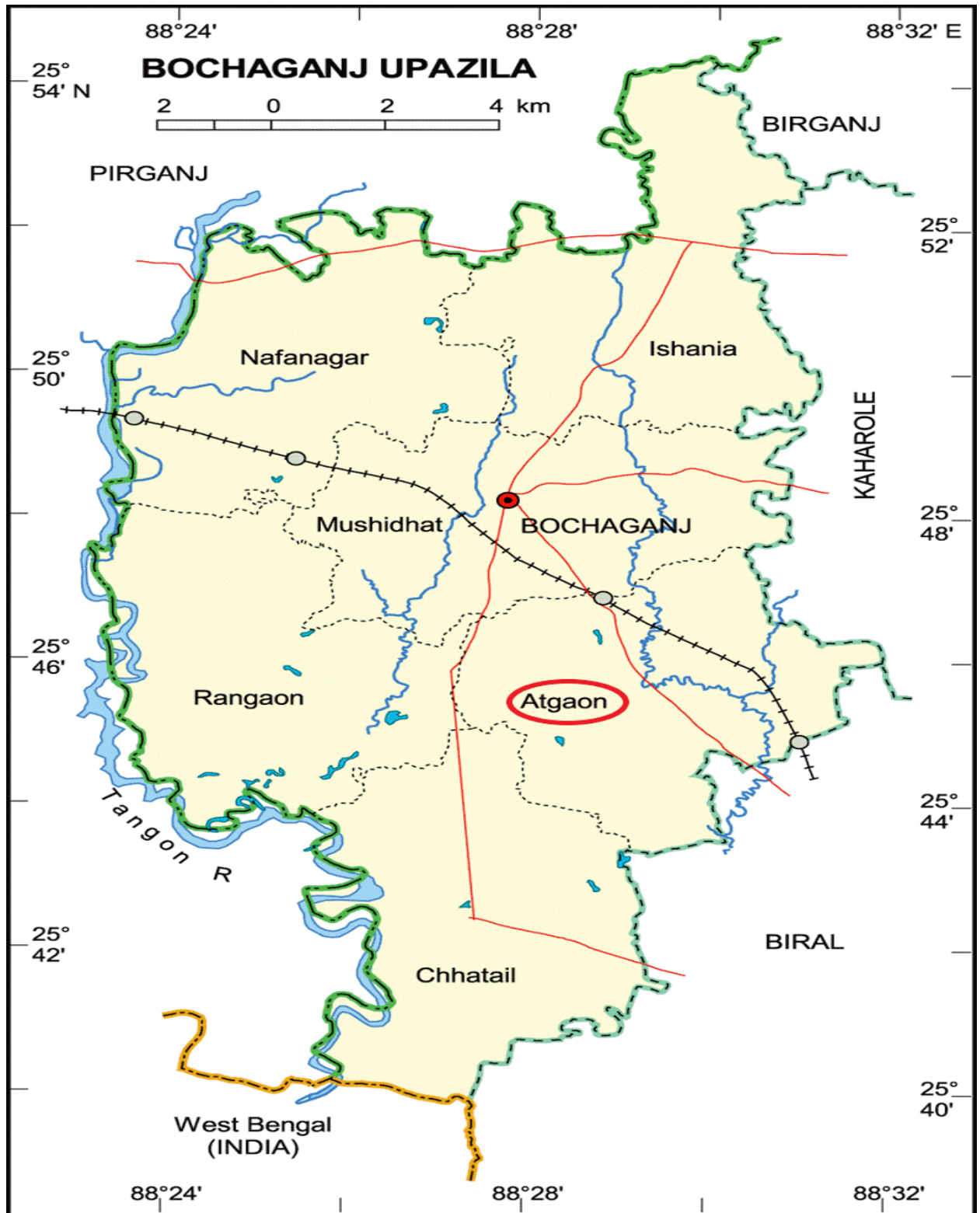
Figure 3.2. A map of Bochaganj Upazila showing the study area (Atgaon Union)

3.2 Population and Sample of the Study

A list of wheat growers of the study area was prepared by the researcher himself with the help of the Sub Assistant Agriculture Officer (SAAO) of Bochaganj Upazila Agriculture Office. The list comprised a total of 220 wheat growers in the study area. These farmers constituted the population of this study. To make a representative sample 48 percent of the population was selected using random sampling technique. Because limited wheat growers were present of the study area. Thus 105 wheat growers were selected as the sample of the study. The village-wise distribution of the population and sample are shown in Table 3.1. Besides this, 10 percent of the samples were selected randomly as reserves who were supposed to be used when a respondent in the original sample was unavailable during data collection.

Table 3.1 Distribution of the population and sample of the study including reserve list

Villages	Population (Wheat	Sample Size (48%)	Reserve list (10%) Total
Atgaon	41	20	
Jalali	45	22	
Sripur	13	6	
Sottomandangi	13	6	
Bondhugaon	10	5	
Borgaon	6	3	
Pulhut	22	10	11
Mollapara	13	6	
Silet	13	6	
Horipur	35	17	
Doula	5	2	
Dokkhingram	4	2	
Total	**220**	**105**	**11**

3.3 Data Collecting Instrument

In a social research, preparation of an interview schedule for collection of information with very careful consideration is necessary. Keeping this fact in mind the researcher prepared an interview schedule carefully for collecting data from the respondents. Objectives of the study were kept in view while preparing the interview schedule.

The initially prepared interview schedule was pre-tested among 30 respondents of the study area. Those 30 respondents were excluded while selecting sample. The pretest was helpful to find out gaps and to locate faulty questions and statements. Alterations and adjustments were made in the schedule on the basis of experience of the pretest. English version of the interview schedule is shown in appendix-A.

3.4 Collection of Data

The researcher collected data from the sample farmers with the help of a pretested interview schedule. The local leaders and Sub Assistant Agriculture Officer of the area were also approached to render essential help. The interviews were held individually in the house or farms of the respective respondent. Collection of data took 28 days from 1th February to 28th February, 2018.

3.5 Selection of Focus and Explanatory Variables

Problem faced by the farmers in wheat cultivation were the main focus of this study and it was considered as the focus variables.

For selection of explanatory variables the researcher went through the past related literature as far as available. He helped the experts in the relevant fields and research fellows in agricultural and related disciplines. He also carefully noticed the various characteristics of the farmers of the study. Characteristics of the farmers like age, level of education, family size, farm size, annual family income, wheat cultivation area, training exposure on wheat cultivation, credit received, extension contact, cosmopoliteness and knowledge on wheat cultivation were selected as the explanatory variables.

3.6 Measurement of Explanatory Variables

As mentioned earlier, eleven selected characteristics of the farmers constituted the explanatory variables of this study. Procedures followed for measuring these variables are described below.

3.6.1 Age

Age of a respondent was measured in complete years as reported by the respondent in response to question item no. 1 of the interview schedule (Appendix A).

3.6.2 Level of education

The education of a respondent was measured on the basis of his years of schooling (completed in educational institute), which was determined by his response to item no. 2 of the interview

schedule (Appendix A). A score of one was given for each year of schooling. For example, if a respondent passed class V or equivalent, his education score was taken as 5. If a respondent passed the final examination of class IX, his score was taken as 9. A score of 0.5 was given to that respondent who could sign his name only. A score of zero (0) was assigned to the illiterate respondents and can't sign.

3.6.3 Family size

The family size was measured by the total number of members in the family of a respondent. The family members included family head and other dependent members like husband/wife, children, etc. who lived and ate together. A unit score 1 was assigned for each member of the family. If a respondent had five members in his/her family, his/her family size score was given as 5 (Khan, 2004). Question regarding this variable appears in the item no. 3 in the interview schedule (Appendix-A).

3.6.4 Farm size

The total farm size of a respondent referred to the total area of land, on which his family carried out farming operations, the area being estimated in terms of full benefit to the farmers. A farm was considered to have full benefit from the cultivated area either owned by him or obtained on lease from others and half benefit from the area which was either cultivated by him on borga or given others for cultivation on borga basis. The land possession was measured for each respondent in terms of hectare by using the following formula:

Farm size = $A_1 + A_2 + A_3 + 1/2(A_4 + A_5)$

Where,

A_1 = Homestead area including pond

A_2 = Own land under own cultivation

A_3 = Land taken from others on lease

A_4 = Land given to others on borga

A_5 = Land taken from others on borga

3.6.5 Annual family income

Annual family income of a respondent was measured in thousand taka on the basis of total yearly earning from agricultural and non-agricultural sources by the respondent himself and other family members.

3.6.6 Wheat cultivation area

Wheat cultivation area was measured by the area of land under his/her management only for wheat cultivation. The unit of measurement was in hectare and was considered as the wheat cultivation area of a respondent.

3.6.7 Training exposure on wheat cultivation

Training was measured by the total number of days a respondent received training in his/her total life on wheat cultivation. A score of 1 (one) was given to a respondent for each day of training. A zero (0) score was assigned for no training exposure.

3.6.8 Extension media contact

The term extension media contact referred to one's becoming accessible to the influence of extension education through different extension media. It was measured with nine selected extension media. A scale was developed on the basis of logical frequency of contract and weights were assigned as 0, 1, 2, 3 and 4 for the responses of not at all, rarely, occasionally, frequently and regularly respectively. Thus, extension media contact of the respondents could range from 0 to 36, where 0 indicating no extension media contact and 36 indicating very high extension media contact.

3.6.9 Cosmopoliteness

Cosmopoliteness of a respondent was measured by computing a cosmopoliteness score based on his/her logical frequency of visit to selected eight (8) different places outside his/her own social environment. Each respondent was asked to indicate the number of times he/she visited to each of the eight different places. Scores were assigned to his/her response in the following ways:

Place of visit	Nature of visit	Weight
Other village	Not even once a month	**0**
	1-3 times a month	**1**
	4-5 times a month	**2**
	6-7 times a month	**3**
	8 or more times/month	**4**
Local market	Not even once a month	0
	1-3 times a month	1
	4-5 times a month	2
	6-7 times a month	3
	8 or more times/month	4
Own union parishad	Not even once a month	**0**
	1-2 times a month	**1**
	3-4 times a month	**2**
	5-7 times a month	**3**
	8 or more times/month	**4**
Own upazila headquarter	Not even once a month	0
	1-2 times a month	1
	3-4 times a month	2
	5-7 times a month	3
	8 or more times/month	4
Other upazila	Not even per three months	**0**
	1-2 times per three months	**1**
	2-3 times per three months	**2**
	4-7 times per three months	**3**
	8 or more per times three month	**4**
Own District town	Not even per six months	0
	1-2 times per six months	1
	3-4 times per six months	2
	5-7 times per six months	3
	8 or more times/ six month	4
Other District Sadar (per year)	Not even once a year	**0**
	Once a year	**1**
	2-3 times per year	**2**
	4-7 times per year	**3**
	8 or more times/ year	**4**
Capital city (per year)	Not even once a year	0
	Once a year	1
	Twice a year	2
	3-5 times a year	3
	6 or more times per year	4

The weights for visit to all the places were added together to obtain the cosmopoliteness score of a respondent. This score could range from 0 to 32, zero indicating no cosmopoliteness at all and 32 including highest level of cosmopoliteness of a respondent.

3.6.10 Knowledge on wheat cultivation

Knowledge on wheat cultivation score of a respondent was measured by asking him/her 22 questions on different aspect of wheat cultivation. A score 2 was assigned to each correct question so an individual could get 2 for correct answer and 0 for no or wrong answer to each question. Partial score were assigned for partial correct answer. Thus, the wheat cultivation knowledge of the respondents could range from 0 to 44, where 0 indicating poor knowledge and 44 indicating high knowledge on wheat cultivation.

3.6.11 Credit received

Credit received was measured in thousand taka. For example score 15 as assigned for receiving as credit.

3.7 Measurement of Focus Variable

Problems faced by the farmers in wheat cultivation were the main focus of the study. It was measured on the basis of the problems faced by the farmers in wheat cultivation. A scale was used for measuring problems faced by the farmers in wheat cultivation. The scale contained 20 problems, which the farmers face in respect of wheat cultivation. When interview schedule was pre-tested, there are many problems created for wheat cultivation. Among them I select 20 major problems. Each respondent was asked to indicate the extent of difficulty faced by each of the problems by checking any one of the six alternative responses as very high problem, high problem, moderate, low, very low, not at all problems. Weights were assigned to these responses as 5, 4, 3, 2, 1 and 0 respectively. Weights for responses against all the 20 problem-items of a respondent were added together to obtain his problem faced score. Therefore, the problems faced score of the farmers could range from 0 to 100, where 0 indicated facing no problem and 100 indicated facing of very high problem.

To compare the severity among the problems, Problem Faced Index (PFI) was computed for each problem-item with help of the following formula:

$$PFI = P_{vh} \times 5 + P_h \times 4 + P_m \times 3 + P_l \times 2 + P_{vl} \times 1 + P_{no} \times 0$$

Where,

PFI = Problem Faced Index

P_{vh} = Number of farmers facing very high problem

P_h = Number of farmers facing high problem

P_m = Number of farmers facing moderate problem

P_l = Number of farmers facing low problem

P_{vl} = Number of farmers facing very low problem

P_{no} = Number of farmers facing no problem

Thus, the PFI of a problem could range from 0-525, where 0 indicated facing of no problem and 525 indicated facing of serious problem. Rank order also made with the descending order of the PFI of the problem-items.

3.8 Statement of the Hypotheses

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

3.8.1 Research hypotheses

In the light of the objectives of the study and variables selected, the following research hypotheses were formulated to test them. The research hypotheses were stated in positive form, the hypotheses were as follows:

"Each of the selected characteristics of the farmers had relationship to their problem faced in wheat cultivation".

3.8.2 Null hypotheses

In order to conduct statistical tests, the research hypotheses were converted to null form. Hence, the null hypotheses were as follows:

"Each of the selected characteristics of the farmers had no relationship to their problem faced in wheat cultivation".

3.9 Data Processing

3.9.1 Editing

The collected raw data were examined thoroughly to detect errors and omissions. As a matter of fact the researcher made a careful scrutiny of the completed interview schedule to make

sure that necessary data were entered as complete as possible and well arranged to facilitate coding and tabulation. Very minor mistakes were detected by doing this, which were corrected promptly.

3.9.2 Coding and tabulation

Having consulted with the research supervisor and co-supervisor, the investigator prepared a detailed coding plan. In case of qualitative data, suitable scoring techniques were followed by putting proper weight against each of the traits to transform the data into quantitative forms. These were then tabulated in accordance with the objective of the study.

3.9.3 Categorization of data

Following coding operation, the collected raw data as well as the respondents were classified into various categories to facilitate the description of the explanatory and focus variables. These categories were developed for each of the variables by considering the nature of distribution of the data and extensive literature review. The procedures for categorization have been discussed while describing the variables under consideration in chapter 4.

3.10 Statistical Analysis

Data collected were coded, compiled, tabulated and analyzed in accordance with the objectives of the study. The statistical measures such as range, mean, standard deviation, percentage etc. were used for describing both the explanatory and focus variables. Tables were also used in presenting data for clarity of understanding. To find out the relationship between each of the selected characteristics of the wheat growers with their problems faced in wheat cultivation, Pearson's Product Moment Co-efficient of Correlation was used. Five percent (0.05) level of probability was used as the basis for rejection of a null hypothesis throughout the study. Co-efficient values significant at 0.05 level is indicated by one asterisk (*), and that at 0.01 level by two asterisks (**).

Chapter 4

FINDINGS AND DISCUSSION

CHAPTER 4

FINDINGS AND DISCUSSION

The purpose of this Chapter is to describe the findings of the present study. The first section deals with the selected characteristics of the farmers, while the second section deals with the problems faced by the farmers in wheat cultivation. Relationship between the selected characteristics of the farmers and their problem faced in wheat cultivation has been discussed in the third section. The fourth section deals with the comparative severity among the problems faced by the farmers in wheat cultivation.

4.1 Selected Characteristics of the Wheat Farmers

Eleven characteristics of the farmers were selected for this research. The selected characteristics of the farmers were; age, level of education, family size, farm size, annual family income, wheat cultivation area, training exposure on wheat cultivation, extension media contact, cosmopoliteness, credit received and knowledge on wheat cultivation. Measuring unit, range, mean and standard deviations of those characteristics of wheat growers were described in this section. Table 4.1 provides a summary profile of wheat grower characteristics.

Table 4.1 A summary profile of wheat growers characteristics

SL. No.	Characteristics (with measuring unit)	Range		Mean	Standard Deviation
		Possible	Observed		
01	Age (years)	Unknown	22 - 65	43.70	9.45
02	Level of education (schooling years)	Unknown	0 - 15	7.01	5.52
03	Family size (number of members)	Unknown	3-15	5.66	1.46
04	Farm size (hectare)	Unknown	0.15-4.68	1.02	0.91
05	Annual family income (per 1000 Taka)	Unknown	85-620	206.44	111.67
06	Wheat cultivation area (hectare)	Unknown	0.05-1.33	0.34	0.28
07	Training exposure on wheat cultivation (number	Unknown	0 - 7	2.06	1.96
08	Extension media contact (score)	0 - 36	11 - 26	19.15	3.73

09	Cosmopoliteness (score)	0 - 32	18 - 32	24.34	3.38
10	Knowledge on wheat cultivation (score)	0 - 44	23-36	29.93	3.91
11	Credit received	Unknown	0 - 60	14.76	14.41

4.1.1 Age

The observed age of the farmers ranged from 22 to 65 years with a mean of 43.70 years and standard deviation of 9.45. The respondents were classified into three age categories namely, young (up to 35 years), middle aged (36-50 years) and old (above 50 years) as shown in Table 4.2

Table 4.2 Distribution of the farmers according to their age

Categories	Basis of categorization (year)	Farmers		Mean	Standard deviation
		Number	Percent		
Young	up to 35	23	22	43.70	9.45
Middle-aged	36-50	62	59		
Old	Above 50	20	19		
Total		105	100		

Data presented in Table 4.2 indicate that (59%) of the respondents were middle aged as compared to 22 percent being young and 19 percent old. Findings again revealed that slightly above three fourth (81%) of the respondents were young to middle aged. Therefore, it could be said that decision regarding the farming practices in the study area were expected to be considerably influenced by the young and middle aged farmers.

4.1.2 Education

Education of the farmers ranged from 0 to above 15 years of schooling having an average of 7.01 years with a standard deviation of 5.52. On the basis of their education, the respondents were classified into five categories as shown in Table 4.3.

Table 4.3 Distribution of the farmers according to their education

Categories	Respondent farmers		Mean	Standard Deviation
	Number	Percent		
Illiterate (0-0.5)	38	36.2	7.01	5.52
Primary education (1-5)	7	6.7		
Secondary education (6-10)	27	25.7		
Above secondary education (>10)	33	31.4		
Total	105	100		

Data contained in Table 4.2 indicates that 36.2 percent of the farmers were illiterate and 63.8 percent literate. It was found that 25.7 percent had secondary level of education, 6.7 percent had primary level of education, and 31.4 percent had above secondary level of education whereas literacy rate in Bangladesh is 62.7 percent.

4.1.3 Family size

Family size scores of the farmer ranged from 3 to 15 with an average of 5.66 and standard deviation of 1.46. According to family size, the respondents were classified into three categories as shown in Table 4.4.

Table 4.4 Distribution of the farmers according to their family size

Categories	Respondent farmers		Mean	Standard Deviation
	Number	Percent		
Small family (up to 4)	11	10.5	5.66	1.46
Medium family (5-7)	85	80.9		
Large family (above 7)	9	8.6		
Total	105	100		

Data contained in Table 4.3 indicates that majority (80.9%) of the farmers had medium family while 8.6 percent of them had large family and 10.5 percent of them had small family. Thus, about (89.5%) of the farmers had medium to large family.

4.1.4 Farm size

Farm size of the respondents ranged from 0.15 to 4.68 hectares with the mean of 1.02 and standard deviation of 0.91. On the basis of their farm size, the farmers were classified into three categories followed by DAE (1999) as shown in Table 4.5.

Table 4.5 Distribution of the wheat farmers according to their farm size

Categories (hectare)	Basis of categorization (ha)	Farmers		Mean	Standard deviation
		Number	**Percent**		
Marginal farm	Up to 0.20	4	3.81	1.02	0.91
Small farm	0.21 - 1	69	65.71		
Medium farm	1.1 - 3	28	26.67		
Large farm	Above 3	4	3.81		
Total		105	100		

Data presented in the Table 4.5 demonstrate that majority (65.71%) of the farmers had small farm compared to 26.67% having medium farm. Equal percentage of the farmer had large farm and marginal farm which of 3.81%. In Bangladesh most of the farmers (12.1%) live on below a subsistence level. Most of the farmers in Bangladesh are small and medium-scale farmers 98.45 percent who have less than 7.5 acres or 3 ha of land, with few large-scale farmers 1.55 percent.

4.1.5 Annual family income

Annual family income of the respondents ranged from 85 to 620 thousand taka. The mean was 206.44 thousand taka and standard deviation was 111.67. On the basis of annual family income, the respondents were categorized into three groups as shown in Table 4.6.

Table 4.6 Distribution of the wheat farmers regarding their annual family income

Categories (per year)	Wheat Farmers		Mean	Standard Deviation
	Number	Percent		
Low (up to 95 Thousand BDT)	5	4.76	206.44	111.67
Medium (96-300 Thousand BDT)	85	80.95		
High (above 300 Thousand BDT)	15	14.29		
Total	105	100		

From the Table 4.6 it was observed that the highest portion (80.95%) of the farmers had medium annual family income compared to 4.76 percent having low and 14.29 percent had high annual family income. Farmers with low income generally invest less in their farms. It is therefore, likely that a considerable portion of farmers may face difficulty in wheat cultivation.

4.1.6 Wheat cultivation area

Wheat cultivation area of the respondents varied from 0.05 to 1.33 hectare, the average being 0.34 ha with the standard deviation of 0.28. The respondents were classified into three categories on the basis of their wheat cultivation area as shown in Table 4.7.

Table 4.7 Distribution of the wheat farmers according to their wheat cultivation area

Categories	Basis of categorization (ha)	Farmers		Mean	Standard deviation
		Number	**Percent**		
Marginal wheat farm	Up to 0.2	51	48.57	0.34	0.28
Small wheat farm	0.21 – 1	50	47.62		
Medium wheat farm	1.1-3	4	3.81		
Total		105	100		

Data contained in Table 4.5 indicates that the largest proportion (48.57%) of farmers had marginal wheat cultivation area compared to 47.62 percent having small and 3.81 percent had medium wheat cultivation area. It was again found that most (96.19%) of the farmers had marginal to small wheat cultivation area. Most of the farmers in Bangladesh are small and medium-scale farmers 98.45 percent who have less than 7.5 acres or 3 ha of land, with few large-scale farmers 1.55 percent.

4.1.7 Training exposure on wheat cultivation

The score of training exposure on wheat cultivation of the farmers ranged from 0-7 days. The mean was 2.06 days and standard deviation was 1.96. On the basis of training exposure on wheat cultivation, the respondents were categorized into four groups as shown in Table 4.8.

Table 4.8 Distribution of the wheat farmers according to their training exposure on Wheat cultivation

Categories	Basis of categorization (Days)	Farmers		Mean	Standard deviation
		Number	**Percent**		
No training	0	42	40.00	2.06	1.96
Low training	1-4	50	47.62		
Medium training	5-8	13	12.38		
Total		105	100		

Data presented in the Table 4. 8 showed that majority (47.62 %) of the farmers had low training exposure; while 40.00 percent of the farmers had no training exposure and 12.38 percent had medium exposure. It means that an overwhelming majority (87.62 %) of the farmers had no or low training exposure. Training received develops the farmer's knowledge, skill, and attitude in positive manner. The findings suggest that training experience might be the most important factor for the respondents to change their knowledge and skill level on wheat cultivation.

4.1.8 Extension media contact

The scores of the farmers regarding extension media contact ranged from 0-36 with a mean of 19.15 and standard deviation of 3.73. On the basis of their extension contact scores, the farmers were classified into three categories (Table 4.9).

Table 4.9 Distribution of the wheat farmers according to their extension media contact

Categories	Basis of categorization (score)	Farmers		Mean	Standard deviation
		Number	**Percent**		
Low contact	up to 14	10	9.52		
Medium contact	15-24	85	80.95	19.15	3.73
High contact	Above >24	10	9.52		
Total		105	100		

Data presented in the table 4.9 indicated that majority (80.95 %) of the farmers had medium extension media contact as compared to 9.52 percent having low extension media contact and 9.52 percent had high extension contact. Thus, an overwhelming majority (90.47 %) of the farmers had low to medium extension contact. In the study area it is noticed that farmers had low to medium extension media contact. That means they are not well acquainted with wheat cultivation information.

4.1.9 Cosmopoliteness

The observed cosmopoliteness scores of the farmers ranged from 18-32 against the possible range of 0 to 32. The average cosmopoliteness scores of the farmers were 24.34 with a standard deviation of 3.38. On the basis of the cosmopoliteness scores, the farmers were classified into three categories (Table 4.10).

Table 4.10 Distribution of the wheat farmers according to their Cosmopoliteness

Categories	Basis of categorization (score)	Farmers		Mean	Standard deviation
		Number	**Percent**		
Low	up to 20	15	14.28	24.34	3.38
Medium	21-27	74	70.48		
High	Above 27	16	15.24		
Total		105	100		

Data presented in the Table 4.10 show that the highest proportion (70.48 %) of the farmers had medium cosmopoliteness as compared to 14.28 percent having low cosmopoliteness and 15.24 percent having high cosmopoliteness. Thus, most (84.76 %) of the farmers had low to medium cosmopoliteness.

4.1.10 Knowledge on wheat cultivation

Knowledge on wheat cultivation score of the respondents ranged from 23 to 36 against the possible range of 0 - 44 having an average of 29.93 and standard deviation of 3.91. On the basis of knowledge scores, the respondents were classified into three categories namely low knowledge, medium knowledge and high knowledge. The distribution of the respondents according to their knowledge on wheat cultivation is given in Table 4.11.

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

Categories	Basis of categorization (score)	Farmers		Mean	Standard deviation
		Number	**Percent**		
Low	< 25	14	13.4	29.93	3.91
Medium	25-33	70	66.67		
High	> 33	21	20.00		
Total		105	100		

Data of Table 4.11 show that more than two third of the respondents (66.67%) of the respondents felt in medium knowledge category followed by 20.00 percent in high knowledge category and 13.4 percent in low knowledge category. Knowledge is to be considered as vision of an explanation in any aspect of the situation regarding wheat cultivation.

4.1.11 Credit Received

The observed credit received scores of the farmers ranged from 0 to 60 thousand taka, the mean being 14.76 and standard deviation of 14.41. Based on the credit received scores, the farmers were classified into three categories as shown in Table 4.12.

Table 4.12 Distribution of the farmers according to their credit received

Categories	Wheat farmers		Mean	Standard deviation
	Number	Percent		
No Credit Received (0)	43	40.95	14.76	14.41
Low Credit (1-30)	53	50.48		
Medium Credit (31-60)	9	8.57		
Total	105	100		

Data contained in Table 4.12 indicates that 8.57 percent of the farmers had medium credit availability, while 40.95 percent of the farmers had no credit availability and 50.48 percent had low credit availability. It meant that overwhelming majority (91.43 %) of the respondents had no to low credit availability.

4.2 Problem Faced in Wheat Cultivation

Problem means some difficulties that create obstacles to achieve specific yield. In this study, problems faced by the farmers in wheat cultivation were the dependent variable. For going through wheat cultivation, farmers face a lot of significant challenging circumstances. To overcome these situations, reflective thinking is very essential. Problem faced, therefore, indicates the extent to which individual faced difficult situations about which something needs to be done. In this study, computed problems faced by the farmers in wheat cultivation scores ranged from 59 to 81 against the possible range 0 to 100, the mean score was 69.93 and the standard deviation was 4.46. Based on the problems faced scores, the farmers were classified in to three categories as shown in table 4.13.

Table 4.13 Distribution of the wheat farmers according to their problem faced in wheat Cultivation

Categories	Basis of categorization (score)	Farmers		Mean	Standard deviation
		Number	**Percent**		
Low	< 65	12	11.43	69.93	4.46
Medium	65-74	76	72.38		
High	> 74	17	16.19		
Total		105	100		

Data presented in the table shows that the majority (72.38 %) of the farmers faced medium problem while 11.43 % percent of the farmers faced low problem. (16.19 %) farmers faced high problem in wheat cultivation. It is quite logical that farmers facing lower problems could minimize their losses in wheat cultivation. Problem is a situation, matter, or person that presents perplexity or difficulty. It is negative situation that a farmer faces in his farming. It results negativity on farming. Farmers facing no or low problem in farming, help to go for more cultivation and for that reason it helps to gain more knowledge. That means if a farmer faces no or low problem in wheat cultivation it will encourage him/her to go for more wheat production.

4.3 Relationship between the Selected Characteristics of the Farmers and Their Problem Faced in Wheat Cultivation

The purpose of this section is to examine the relationship of 11 selected characteristics of the farmers with their problem faced in wheat cultivation. The 11 characteristics of the farmers included: age, level of education, family size, farm size, Wheat cultivation area, annual family income, training exposure on wheat cultivation, cosmopoliteness, extension media contact, Credit received and knowledge on wheat cultivation. Each of the characteristics constituted the explanatory variables, while problem faced in wheat cultivation was the focus variable.

To explore the relationships between the selected individual characteristics of the farmers and their problem faced in wheat cultivation, Pearson's product moment co-efficient of correlation (r) has been used. Five percent level of probability was used as the basis for rejection of a null hypothesis. The computed values of 'r' were compared with relevant tabulated values for 103

degrees of freedom at the designated level of probability in order to determine whether the relationships between the concerned variables were significant or not.

The summary of the results of the correlation analysis has been presented in Table 4.14 showing the relationship between 11 characteristics of the farmers and their problem faced in wheat cultivation. For clarity of understanding Appendix-B may be seen.

Table 4.14 Co-efficient of correlation showing relationship between selected Characteristics of the wheat farmers and their problem faced in wheat Cultivation (n= 105 with df 103)

Focus variables	Explanatory variables	Computed value of "r"	Tabulated value of "r"	
			at 0.05 level	at 0.01 level
Problem faced in wheat cultivation	➢ Age	0.160 ^{NS}	0.195	0.254
	➢ Level of education	-0.855**		
	➢ Family size	-0.183 ^{NS}		
	➢ Farm size	-0.279**		
	➢ Annual family income	-0.399**		
	➢ Wheat cultivation area	-0.177 ^{NS}		
	➢ Training exposure on wheat cultivation	-0.661**		
	➢ Extension media contact	-0.802**		
	➢ Cosmopoliteness	-0.700**		
	➢ Knowledge on wheat cultivation	-0.796**		
	➢ Credit received	0.181 ^{NS}		

NS = Not significant

* Significant at 0.05 level of probability

** Significant at 0.01 level of probability

4.3.1 Relationship between age of the farmers and their problem faced in wheat cultivation

Relationship between age of the farmers and their problem faced in wheat cultivation was determined by testing the following null hypothesis: "There is no relationship between age of the farmers and their problem faced in wheat cultivation".

The calculated value of the co-efficient of correlation between the concerned variables was found to be 0.160 as shown in Table 4.14. The following observations were made regarding the relationship between the two variables under consideration.

a) *The computed value of 'r' (r= 0.160) was found to be smaller than the tabulated value (r= 0.195) with 103 degrees of freedom at 0.05 level of probability.*

b) *The null hypothesis could not be rejected.*

c) *The relationship between the concerned variables was not significant.*

Based on the above findings, the researcher concluded that age of the farmers had no significant relationship with their problem faced in wheat cultivation. This meant that age of the farmers was not an important factor in problem faced in wheat cultivation.

4.3.2 Relationship between level of education of the farmers and their problem faced in wheat cultivation

Relationship between education of the farmers and their problem faced in wheat cultivation was determined by testing the following null hypothesis: "There is no relationship between level of education of the farmers and their problem faced in wheat cultivation".

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.855 as shown in Table 4.14. The following observations were made regarding the relationship between the two variables under consideration.

a) *The computed value of 'r' (r= -0.855) was found to be larger than the tabulated value (r= 0.254) with 103 degrees of freedom at 0.01 level of probability.*

b) *The null hypothesis was rejected.*

c) *The relationship between the concerned variables was significant.*

d. *The relationship showed a negative trend between the concerned variables.*

Based on the above findings, the researcher concluded that level of education of the farmers had negative and significant relationship with their problem faced in wheat cultivation. This

indicated that education of the wheat farmers in adoption of wheat cultivation technologies was an important factor for their problem faced in wheat cultivation.

4.3.3 Relationship between family size of the farmers and their problem faced in wheat cultivation

Relationship between family size of the farmers and their problem faced in wheat cultivation was determined by testing the following null hypothesis: "There is no relationship between family size of the farmers and their problem faced in wheat cultivation".

The calculated value of the co-efficient of correlation between the concerned variables was found to be - 0.183 as shown in Table 4.14. The following observations were made regarding the relationship between the two variables under consideration.

a) *The computed value of 'r' (r= - 0.183) was found to be smaller than the tabulated value (r= 0.195) with 103 degrees of freedom at 0.05 level of probability.*

b) *The null hypothesis could not be rejected.*

c) *The relationship between the concerned variables was not significant.*

Based on the above findings, the researcher concluded that family size of the farmers had no significant relationship with their problem faced in wheat cultivation. This indicated that family size of the farmers was not an important factor for their problem faced in wheat cultivation.

4.3.4 Relationship between farm size of the farmers and their problem faced in wheat cultivation

Relationship between farm size of the farmers and their problem faced in wheat cultivation was determined by testing the following null hypothesis: "There is no relationship between farm size of the farmers and their problem faced in wheat cultivation".

The calculated value of the co-efficient of correlation between the concerned variable was found to be -0.279 as shown in Table 4.14. The following observations were made regarding the relationship between the two variables under consideration.

a) *The computed value of 'r' (r= -0.279) was found to be larger than the tabulated value (r= 0.254) with 103 degrees of freedom at 0.01 level of probability.*

b) *The null hypothesis was rejected.*

c) *The relationship between the concerned variables was significant.*

d. *The relationship showed a negative trend between the concerned variables.*

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Based on the above findings, the researcher concluded that farm size of the farmers had negative and significant relationship with their problem faced in wheat cultivation. This indicated that farm size of the farmers was an important factor for their problem faced in wheat cultivation.

4.3.5 Relationship between annual family income of the farmers and their problem faced in wheat cultivation

Relationship between annual family income of the farmers and their problem faced in wheat cultivation was determined by testing the following null hypothesis: "There is no relationship between annual family income of the farmer and their problem faced in wheat cultivation". The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.399 as shown in Table 4.14. The following observations were made regarding the relationship between the two variables under consideration.

a. *The computed value of 'r' (r= -0.399) was found to be larger than the tabulated value (r= 0.254) with 103 degrees of freedom at 0.01 level of probability.*

b. *The null hypothesis was rejected.*

c. *The relationship between the concerned variables was significant.*

d) *The relationship showed a negative trend between the concerned variables.*

Based on the above findings, the researcher concluded that annual family income of the farmers had negative and significant relationship with their problem faced in wheat cultivation. This indicated that annual family income of the farmers was an important factor for their problem faced in wheat cultivation.

4.3.6 Relationship between wheat cultivation area of the farmers and their problem faced in wheat cultivation

Relationship between wheat cultivation area of the farmers and their problem faced in wheat cultivation was determined by testing the following null hypothesis: "There is no relationship between wheat cultivation area of the farmer and their problem faced in wheat cultivation". The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.177 as shown in Table 4.14. The following observations were made regarding the relationship between the two variables under consideration.

a) *The computed value of 'r' (r= -0.177) was found to be smaller than the tabulated value (r= 0.195) with 103 degrees of freedom at 0.05 level of probability.*

b) The null hypothesis could not be rejected.

c) The relationship between the concerned variables was not significant.

Based on the above findings, the researcher concluded that wheat cultivation area of the farmers had no significant relationship with their problem faced in wheat cultivation. This indicated that wheat cultivation area of the farmers was not an important factor for their problem faced in wheat cultivation.

4.3.7 Relationship between training exposure on wheat cultivation of the farmers and their problem faced in wheat cultivation

Relationship between training exposure on wheat cultivation of the farmers and their problem faced in wheat cultivation was determined by testing the following null hypothesis: "There is no relationship between training exposure on wheat cultivation of the farmer and their problem faced in wheat cultivation".

The calculated value of the co-efficient of correlation between the concerned variables was found to be - 0.661 as shown in Table 4.14. The following observations were made regarding the relationship between the two variables under consideration.

a) The computed value of 'r' (r= -0.661) was found to be larger than the tabulated value (r= 0.254) with 103 degrees of freedom at 0.01 level of probability.

b) The null hypothesis was rejected.

c) The relationship between the concerned variables was significant.

d) The relationship showed a negative trend between the concerned variables.

Based on the above findings, the researcher concluded that training exposure on wheat cultivation of the farmers had negative and significant relationship with their problem faced in wheat cultivation. This implies that farmers with higher training exposure on wheat cultivation were likely to have lower level of problem faced in wheat cultivation. Training provides the structures, techniques and awareness to manage time and work load efficiently, which increases productivity and motivates farmer more to achieve more. Training received develops the farmer's knowledge, skill, and attitude in positive manner. The farmer who has no training cannot gain enough knowledge, skill and practical experience. Such consideration indicates the need for improving knowledge and skill level of the farmers by supplying enough training on wheat cultivation in order to reduce problem in wheat cultivation.

4.3.8 Relationship between extension media contact of the farmers and their problem faced in wheat cultivation

Relationship between extension media contact of the farmers and their problem faced in wheat cultivation was determined by testing the following null hypothesis: "There is no relationship between extension media contact of the farmer and their problem faced in wheat cultivation." The calculated value of the co-efficient of correlation between the concerned variables was found to be - 0.802 as shown in Table 4.14. The following observations were made regarding the relationship between the two variables under consideration.

a. *The computed value of 'r' (r= -0.802) was found to be larger than the tabulated value (r= 0.254) with 103 degrees of freedom at 0.01 level of probability.*

b. *The null hypothesis was rejected.*

c. *The relationship between the concerned variables was significant.*

d. *The relationship showed a negative trend between the concerned variables.*

Based on the above findings, the researcher concluded that extension media contact of the farmers had negative and significant relationship with their problem faced in wheat cultivation. This implies that farmers with higher extension media contact were likely to have lower level of problem faced in wheat cultivation.

4.3.9 Relationship between cosmopoliteness of the farmers and their problem faced in wheat cultivation

Relationship between cosmopoliteness of the farmers and their problem faced in wheat cultivation was determined by testing the following null hypothesis: "There is no relationship between cosmopoliteness of the farmer and their problem faced in wheat cultivation".

The calculated value of the co-efficient of correlation between the concerned variables was found to be - 0.700 as shown in Table 4.14. The following observations were made regarding the relationship between the two variables under consideration.

a. *The computed value of 'r' (r= - 0.700) was found to be larger than the tabulated value (r= 0.254) with 103 degrees of freedom at 0.01 level of probability.*

b. *The null hypothesis was rejected.*

c. *The relationship between the concerned variables was significant.*

d. *The relationship showed a negative trend between the concerned variables.*

Based on the above findings, the researcher concluded that cosmopoliteness of the farmers had negative and significant relationship with their problem faced in wheat cultivation. This implies that farmers with higher extension media contact were likely to have lower level of problem faced in wheat cultivation. This implies that farmers having higher cosmopoliteness were likely to have lower level of problem faced in wheat cultivation.

4.3.10 Relationship between knowledge on wheat cultivation of the farmers and their problem faced in wheat cultivation

Relationship between knowledge on wheat cultivation of the farmers and their problem faced in wheat cultivation was determined by testing the following null hypothesis: "There is no relationship between knowledge on wheat cultivation of the farmer and their problem faced in wheat cultivation".

The calculated value of the co-efficient of correlation between the concerned variables was found to be - 0.796 as shown in Table 4.14. The following observations were made regarding the relationship between the two variables under consideration.

a. *The computed value of 'r' (r= -0.796) was found to be larger than the tabulated value (r= 0.254) with 103 degrees of freedom at 0.01 level of probability.*

b. *The null hypothesis was rejected.*

c. *The relationship between the concerned variables was significant.*

d. *The relationship showed a negative trend between the concerned variables.*

Based on the above findings, the researcher concluded that knowledge on wheat cultivation of the farmers had negative and significant relationship with their problem faced in wheat cultivation. This implies that farmers with higher knowledge on wheat cultivation were likely to have lower level of problem faced in wheat cultivation. This implies that farmers having higher knowledge on wheat cultivation were likely to have lower level of problem faced in wheat cultivation.

4.3.11 Relationship between credit received of the farmers and their problems faced in wheat cultivation

Relationship between credit received of the farmers and their problems faced in wheat cultivation was determined by testing the null hypothesis: "There is no relationship between credit availability of the farmers and their problems faced in wheat cultivation".

The calculated value of the co-efficient of correlation between the concerned variables was found to be 0.181 as shown in Table 4.14. The following observations were made regarding the relationship between the two variables under consideration.

a) *The computed value of 'r' (0.181) was smaller than the tabulated value 'r' (0.195) with 103 degrees of freedom at 0.05 level of probability.*

b) *The null hypothesis could not be rejected.*

c) *The relationship between the concerned variables was not significant.*

Thus, it was concluded that credit received of the farmers had no significant relationship with their problems faced in wheat cultivation. Therefore, credit received of the farmers was not an important factor for their problems faced in wheat cultivation.

4.4 Comparative severity among the problems faced by the farmers in wheat cultivation

The observed problem faced index in wheat cultivation ranged from 220 to 521 against the possible range of 0 to 525. The formula for determining PFI has been shown in chapter 3. The selected 20 problems faced by the respondents which were arranged in rank order according to their descending order of problem faced index (PFI) as shown in Table 4.15.

On the basis of PFI, it was observed that "Low market price of wheat" ranked first followed by "Difficulty in getting loan from Bank", "Shortage of quality seeds", "High Price of local seed", "High price of fertilizer or Pesticide", "High price of high yielding variety", "High cost of irrigation", "High price of laborer", "Unavailability of credit in time", "Shortage of irrigation facilities", "Lack of training on wheat cultivation", "Pest attack in wheat field", "Lack of storage facilities", "Unavailability of pesticides in time", "Lack of marketing facilities", "Lack of knowledge on using balanced fertilizers for wheat cultivation", "Shortage of capital", and least three are "Lack of proper knowledge on seed storage at farmers level", "Lack of advice in proper time" and "Transport problem".

Table 4.15 Rank Order of problems faced by the farmers in wheat cultivation

Problems	Extent of Problem faced						PFI	Rank Order
	Very high (5)	High (4)	Moderate (3)	low (2)	Very low (1)	Not at all (0)		
Low market price of wheat	101	4	0	0	0	0	521	1
Difficulty in getting loan from Bank	94	10	1	0	0	0	513	2
High Price of local seed	37	66	2	0	0	0	455	3
Shortage of quality seeds	25	74	6	0	0	0	439	4
High price of fertilizer or Pesticide	18	85	2	0	0	0	436	5
High price of high yielding variety	3	101	1	0	0	0	422	6
High cost of irrigation	3	94	7	1	0	0	414	7
High price of laborer	1	78	24	2	0	0	393	8
Shortage of irrigation facilities	3	60	35	7	0	0	374	9
Unavailability of credit in time	1	56	48	0	0	0	373	10
Pest attack in wheat field	0	50	27	28	0	0	337	11
Lack of training on wheat cultivation	3	21	73	8	0	0	334	12
Lack of storage facilities	1	8	82	14	0	0	319	13
Unavailability of pesticides in time	0	18	63	24	0	0	309	14
Lack of marketing facilities	0	11	74	20	0	0	306	15
Lack of knowledge on using balanced fertilizers for wheat cultivation	0	12	71	22	0	0	305	16
Lack of proper knowledge on seed storage at farmers level	0	11	73	19	2	0	303	17
Shortage of capital	0	9	75	19	2	0	301	18
Lack of advice in proper time	0	2	58	42	3	0	269	19
Transport problem	0	2	26	63	8	6	220	20

PFI = Problem Faced Index

N = 105

Chapter 5

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

CHAPTER 5

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

This chapter presents the summery of findings, conclusions 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

Findings in respect of the 11 selected characteristics of the farmers are summarized below:

Age: Slightly above four fifth (81%) of the farmers was young to middle aged, while 19 percent were old aged.

Level of Education: The highest proportion (36.2%) of the farmers were illiterate and 63.8 percent literate. Primary, secondary and above secondary level of literacy were found to be 6.7 percent, 25.7 percent and 31.4 percent respectively.

Family Size: About four fifth (80.9%) of the farmers had medium family size, while 10.5% and 8.6% belonged to the small family size and large family size respectively.

Farm size: About (65.71%) of the farmers had small farm size, 3.81% large farm and 3.81% marginal and the rest 26.67 percent belonged to the medium farm size.

Annual family income: The highest proportion (80.95%) of the respondent farmers had medium annual family income compared to 14.29 percent having high income and 4.76 percent having low annual family income.

Wheat cultivation area: The highest proportion (48.57%) of the respondents had marginal farm area, while 47.62 percent and 3.81 percent belonged to the small and medium farm area respectively.

Training exposure on wheat cultivation: The highest proportion (47.62%) of the respondents had low training exposure compared to 40.00 percent, 12.38 percent having no training and medium training respectively. It means, overwhelming majority (87.62%) of the wheat growers had no to low training on wheat cultivation.

Extension media contact: The highest proportion (80.95%) of the farmers had medium extension media contact as compared to 9.52 percent having low extension media contact and 9.52 percent having high extension contact. It means, overwhelming majority (90.47%) of the wheat growers had low to medium extension media contact.

Cosmopoliteness: The highest proportion (70.48%) of the farmers had medium cosmopoliteness as compared to 14.28 percent having low cosmopoliteness and 15.24 percent having high cosmopoliteness.

Knowledge on wheat cultivation: More than two third (66.67%) of the respondents fell in medium knowledge category followed by 13.4 percent in low knowledge category and only 20.00 percent in high knowledge category.

Credit received: Credit received scores of the wheat farmers ranged from 0 to 60 with the mean being 14.76. The majority (50.48%) of the wheat farmers had low credit received, 40.95 percent had no credit received, 8.57 percent had medium credit received.

5.1.2 Problem faced by the farmers in wheat cultivation

The observed overall problem faced score of the farmers in wheat cultivation ranged from 59 to 81 against the possible range of 0 to 100. The mean score was 69.93 and the standard deviation was 4.46. Majority (72.38%) of the respondents faced medium problem in wheat production activities and 16.19 percent faced high problems and 11.43 percent faced low problems. Findings again reveal that a very large proportions (88.57%) of the farmers faced medium to high problems in wheat production.

5.1.3 Relationship between selected characteristics and problem faced:

Level of education, Farm size, Annual family income, training exposure on wheat cultivation, extension media contact, cosmopoliteness and knowledge on wheat cultivation had significant negative relationships with the problem faced by the farmers in wheat cultivation. Age, family size, wheat cultivation area and credit received had had no significant relationship with the problems faced by the farmers in wheat cultivation.

5.1.4 Comparison among problems faced by the farmers in wheat cultivation

In order to compare the problem faced by the farmers in 20 selected items of wheat production, a Problem Faced Index (PFI) was computed for each problem. Farmers faced highest problems in "Low market price of wheat" which ranked first followed by "Difficulty in getting loan from Bank", "High Price of wheat seed", "Shortage of quality seeds", "High price of fertilizer or Pesticide". Therefore, it may be concluded that according to the severity of the problems, the first would be solved with the first priority and then the next.

5.2 Conclusions

Conclusions were drawn on the basis of findings, logical interpretation and other relevant facts of the study:

1. A very great majority (88.57 %) of the farmers faced medium to high problems in wheat production. From this fact, almost all the farmers have been facing problems. It may be concluded that until the wheat farmers are not free from different problems in wheat cultivation, they will not be able to produce more wheat in their field.

2. About (63.8%) of the wheat farmers were literate while there existed a negative significant relationship between education of the wheat farmers and their problem faced. Therefore, it may be concluded that an appreciable proportion of the wheat farmers will not continue to face problems in wheat cultivation, if suitable steps are taken to remove illiteracy from the wheat farmers.

3. A large proportion (85.71%) of the farmers had low to medium annual family income, again there existed a negatively significant relationship between farmers' annual family income and their problem faced in wheat cultivation. It may, therefore, be concluded that efforts to raise annual family income of the farmers will lead to minimize their problem faced in wheat cultivation.

4. Majority (92.38 %) of the farmers had small to medium farm size, while there was a negatively significant relationship between farm size and their problem faced. Thus, it may be concluded that small and medium farm size owners face more problem than large farm owners.

5. An over-whelming majority (87.62 %) of the farmers had no or low training exposure on wheat cultivation, while there was a negative significant relationship between training exposure on wheat cultivation and their problem faced. Therefore, it may be concluded that majority of the wheat farmers more likely to face problems unless steps are taken to provide proper training on wheat cultivation.

6. An over-whelming majority (90.47%) of the farmers had low to medium extension media contact, while there was a negatively significant relationship between extension media contact of the farmers and their problem faced. Therefore, it may be concluded that a very large majority of the farmers will continue to face problems, if suitable steps are not taken to strengthen extension activities among the farmers.

7. A great majority (84.76 %) of the farmers had low to medium cosmopoliteness, while there existed a negative significant relationship between farmers' cosmopoliteness and their problem faced. The above facts lead to the conclusion that more cosmopoliteness of the farmers will be highly helpful for minimizing their problem in wheat cultivation.

8. More than two third (66.67 %) of the respondents fell in medium knowledge category, while there exists a very strong negative significant relationship between wheat cultivation knowledge of the farmers and their problem faced. Therefore, conclude that an effort to improve wheat cultivation knowledge of the farmers would be helpful for minimizing their problem in wheat cultivation.

9. Farmers faced highest problems in "Low market price of wheat" which ranked first followed by "Difficulty in getting loan from Bank", "High Price of wheat seed" and "Shortage of quality seeds". Therefore, it may be concluded that emphasis should be taken to minimize these problems.

5.3 Recommendations

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

5.3.1 Recommendation for policy implication

1. Near about all (88.57%) of the farmers faced medium to high problems in wheat production. In view of the urgent need for increasing wheat production, it is recommended that steps should be taken on a priority basis to remove the various problems causing hindrance to the wheat cultivation, harvesting, storage and marketing.

2. Majority (96.19%) of the farmers had marginal to medium farm size, while there was a negatively significant relationship between farm size and their problem faced. Therefore, it may be recommended that attempts should be taken to provide technical support and subsidy, especially for the marginal, small and medium farm sized wheat farmers.

3. The findings revealed that the training exposure on wheat cultivation had a significant negative relationship with the problems faced by the farmers in wheat cultivation. So, it may be recommended that the concerned authority, DAE should increase training facilities to develop skills of the wheat farmers technologically so that they can minimize their problems.

4. The findings had a significant negative relationship between the extension media contact and the problems faced by the farmers in wheat cultivation. So, it may be recommended that the extension workers of the concerned authority should increase the contact with farmers personally and motivate them to be connected with electronic and printed media that can help them to exchange related information which will reduce their problems.

5. A great majority (84.76%) of the farmers had medium to low cosmopoliteness, while there existed a negative significant relationship between farmers' cosmopoliteness and their problem faced. The importance of cosmopoliteness on the part of the farmers leads to the following recommendations:

   a. Extension workers should identify the cosmopolite farmers and utilize them in extension programs for encouraging adoption of improved wheat cultivation technologies.

   b. There should be arrangement for tour of the farmers for visiting agricultural research stations, agricultural farms, agricultural universities and other agriculture related organizations. It will help them acquire knowledge, skill and attitude to cope more effectively with their problem in wheat cultivation.

6. The findings indicated that wheat cultivation knowledge had significant negative relationship with the problems faced by the farmers in wheat cultivation. Thus, it may be recommended that the extension provider of concerned authority should take the necessary steps to increase their wheat cultivation knowledge through motivation, group discussion, group meeting, day training program, demonstration, etc. to decrease their cultivation problems.

7. The education of the farmers is essential for any development programme. It is necessary for creating awareness about any improved production technologies. No development work will be effective if the farmers remain illiterate. So, we have to overcome illiteracy problem as soon as possible.

8. To increase the annual family income of the farmers, they need to invest money to use quality seed, fertilizer and irrigation etc. in times. So, it may be recommended that GOs, NGOs and Concern authority should supply credit so that they can overcome the problems.

9. By analyzing PFI, it was found that farmers faced higher problems in "Low market price of wheat" which ranked first followed by "Difficulty in getting loan from Bank", "High Price of wheat seed" and "Shortage of quality seeds". Therefore, it may be recommended that necessary technical support should be provided for the wheat growers to minimize their problems with special emphasis to these problems.

5.3.2 Recommendations for further study

The present study covers some selective problems faced by the farmers in wheat cultivation. The following recommendations are made for undertaking studies covering more dimensions in related matters.

i.   The study was conducted in Bochaganj Upazila under Dinajpur District. Similar studies should be conducted in other parts of the country to get a clear picture of the whole country which will be helpful for effective policy formulation.

ii. It is difficult to explore all the problems faced by the farmers in wheat cultivation. Measurement of problems of the farmers is not free from questions. More reliable measurement of the concerned variable is necessary for further study.

iii. The present study was undertaken to explore relationships of eleven selected characteristics of the farmers with their problem faced in wheat cultivation. Therefore, it could be recommended that further studies should be designed considering other agricultural and non- agricultural activities and other characteristics of the farmers that might affect problem faced in wheat cultivation.

iv. In the present study age, family size, wheat cultivation area and credit received had no significant relationship with their problem faced in wheat cultivation. In this connection, further verification is necessary.

v.   Research should be undertaken on the effectiveness of agricultural extension services and other related organizations in helping people to solve their wheat cultivation problems.

Chapter 6

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DEPARTMENT OF AGRICULTURAL EXTENSION AND INFORMATION SYSTEM

SHER-E-BANGLA AGRICULTURAL UNIVERSITY
DHAKA-1207

An interview schedule for a research work entitled-

"Problem Faced by the Farmers in Wheat Cultivation in Bochaganj upazila under Dinajpur district"

Serial No…………….

Respondent Name:

Village:

Union:

Upazila:

District:

Please provide information on the following aspects:

1. **Age:**

   What is your present age? .... Years
2. **Education:**

   What is the level of your education?
   a. Illiterate……….
   b. Can sign only …………
   c. I studied up to class ………
   d. I passed ………….. examination
3. **Please mention the number of your family member:**

   …………………………members (including yourself)
4. **Farm size (Please mention your farm size):**

SL. NO.	Types of land	Land area	
		Local Unit	Hectares
1.	Homestead area (including pond)		
2.	Own land under own cultivation		
3.	Land taken as borga from others		
4.	Land taken as lease from others		
5.	Land given as borga to others		
Total			

5. Annual Family income : Please state the income of your family during last one year :

1. Income from agricultural source	SL. No.	Source of income	Total price (taka)
i. Income from crops	1.	Field crops	
		a) Rice	
		b) Jute	
		c) Maize	
		d) Wheat	
		e) Pulse	
		f) Others	
	2.	Vegetables	
	3.	Fruits	
ii. Income from livestock and fisheries	1.	Livestock	
	2.	Poultry	
	3.	Fisheries	
2. Income from non-agricultural sources	1.	Service	
	2.	Business	
	3.	Others	
Total: (1+2)			

6. Wheat cultivation area: Mention the area you have used for wheat cultivation?

…………….acre/ bigha/ pakhi   …………………hectares

7. Training Exposure: Have you participated any training program on wheat cultivation?

Yes…………….../ No……………If yes, furnishes the following information:

SL. No.	Name of Training Course	Organization	Duration (days)	Organizer	Training year
1					
2					
3					

8. Knowledge on wheat Cultivation: Please answer the following questions:

SL. NO.	Questions	Full Marks	Obtained Marks
1.	Which type of land is suitable for wheat cultivation?	2	
2.	Mention two modern wheat varieties?	2	
3.	What is the proper sowing time of wheat seed?	2	
4.	What is the proper sowing method of modern wheat varieties?	2	
5.	What is the seed rate kg/ha for modern wheat cultivation?	2	
6.	How many times irrigation is needed for wheat cultivation?	2	
7.	How can you increase soil fertility?	2	
8.	After how many days of sowing you should complete gap filling or thinning out?	2	
9.	Mention the rate of fertilizer per ha is needed in wheat cultivation?	2	
10.	What is the importance of applying balance fertilizer in wheat?	2	
11.	How do you control insect & pest in wheat field?	2	
12.	After how many days of sowing the first irrigation is required?	2	
13.	Mention two chemicals for wheat blast treatment?	2	
14.	Mention two diseases of wheat?	2	
15.	Mention the name of a pesticide for wheat seed treatment?	2	
16.	Mention the symptom of blast diseases of wheat?	2	
17.	How do you control blast diseases in wheat field?	2	
18.	Mention two important crops that can be used in intercropping with wheat?	2	
19.	What is the suitable time of harvesting wheat?	2	
20.	What is the best method for seed storing?	2	
21.	How can you test optimum moister content for wheat seed storage?	2	
22.	Why wheat cultivation is decreasing day by day?	2	
	Total	44	

9. Extension media contact: Please indicate the extent of contact with the following communication media:

SL. NO.	Name of information sources	Extent of contact				
		Regularly (4)	Frequently (3)	Occasionally (2)	Rarely (1)	Not at all (0)
1.	Model farmers	6 or more times/month	4 or more times/month	2-3 times/month	At least once a month	

2.	Input dealers	6 or more times/month	3 or more times/month	1-2 times/month	At least once a month	
3.	NGO workers	6 or more times/month	3 or more times/month	1-2 times/month	At least once a month	
4.	Sub Assistant Agricultural Officer(SAAO)	6 or more times/month	4 or more times/month	2-3 times/month	One time per month	
5.	Scientific officer of BARI	6 or more times/year	4 or more times/year	2-3 times/year	One time per year	
6.	Participation in group meeting	6 or more times/month	3 or more times/month	1-2 times/month	At least once a month	
7.	Listening agricultural program on radio	Daily	4-7 days/week	1-3 days/week	1-3 days/month	
8.	Watching agricultural program on TV	Daily	4-7 days/week	1-3 days/week	1-3 days/month	
9.	Reading printed materials like leaflet, bulletin	6 or more times/month	4-5 times/month	3 times/month	1-2 times/month	

10. Cosmopoliteness : Please mention the extent of visit in specific place for a specific period

SL. NO.	Place of visit	Extent of contact				
		Regularly (4)	Frequently (3)	Occasionally (2)	Rarely (1)	Not at all (0)
1.	Other village	8 or more times/month	6-7 times/month	4-5 time/month	1-3 times/month	
2.	Local Market	8 or more times/month	6-7 times/month	4-5 time/month	1-3 times/month	
3.	Own Union Parishad	8 or more times/month	4-7 times/month	2-3 times/month	1-2 times/month	

4.	Own Upazilla Headquarter	8 or more times/month	5-7 times/month	3-4 times/month	1-2 times/month	
5.	Other Upazilla	8 or more times per three month	5-7 times per three month	3-4 times per three month	1-2 times per three month	
6.	Own district town	8 or more times per six month	5-7 or more times per six month	3-4 times per six month	1-2 times per six month	
7.	Other district	8 or more times per year	4-7 times per year	2-3 times per year	one time per year	
8.	Capital (per year)	6 or more times per year	3-5 times in a year	2 times in a year	Once a year	

11. Credit Received :

Did you receive any credit from any sources? -------------------Yes / No

If yes, please mention the sources of receiving credit and the amount of credit received

SL. NO.	Sources of credit	**Amount of credit (Tk.)**
1	NGOs	
2	Banks	
3	Money lenders	
4	Friends	
5	Neighbors	
6	Relatives	
7	Others	

12. Problems: Problem Faced by the Farmers in Wheat Cultivation in Bochaganj upazilla under Dinajpur district. Please mention the extent of problem you faced in wheat cultivation:

Sl. No.	Problems	Extent of Problem					
		Very High (5)	High (4)	Moderate (3)	Low (2)	Very low (1)	Not at all (0)
1.	Shortage of quality seeds						
2.	High Price of local seed						
3.	High price of fertilizer / Pesticide						
4.	Unavailability of credit in time						
5.	Lack of training on wheat cultivation						
6.	Difficulty in getting loan from Bank						
7.	Lack of marketing facilities						
8.	Shortage of irrigation facilities						
9.	Lack of advice in proper time						
10.	Unavailability of pesticides in time						
11.	Low market price of wheat						
12.	High cost of irrigation						
13.	Lack of storage facilities						
14.	Lack of knowledge on using balanced fertilizers for wheat cultivation						
15.	High price of laborer						
16.	Lack of proper knowledge on seed storage at farmers level						
17.	Transport problem						
18.	Pest attack in wheat field						
19.	High price of high yielding variety						
20.	Shortage of capital						

Thanks for your co-operation

Date…………………………....

....
Signature of the interviewer

Correlation Matrix

Characters	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	Y
X_1	-											
X_2	-0.170	-										
X_3	0.006	0.190	-									
X_4	0.030	0.380**	0.753**	-								
X_5	0.048	0.468**	0.659**	0.899**	-							
X_6	-0.059	0.265**	0.662**	0.877**	0.774**	-						
X_7	-0.097	0.805**	0.245*	0.379**	0.530**	0.284**	-					
X_8	-0.143	0.937**	0.218*	0.378**	0.488**	0.284**	0.767**	-				
X_9	-0.114	0.943**	0.192	0.369**	0.474**	0.254**	0.799**	0.897**	-			
X_{10}	-0.079	0.794**	0.375**	0.595**	0.688**	0.461**	0.693**	0.780**	0.814**	-		
X_{11}	-0.273**	-0.274**	-0.303**	-0.525**	-0.477**	-0.388**	-0.272**	-0.257**	-0.280**	-0.388**	-	
Y	0.160	-0.855**	-0.183	-0.279**	-0.399**	-0.177	-0.661**	-0.796**	-0.802**	-0.700**	0.181	-

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

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

X_1 : Age	X_2 : Level of Education	X_3 : Family Size
X_4 : Farm Size	X_5 : Annual family income	X_6 : Wheat Cultivation Area
X_7 : Training on wheat cultivation	X_8 : Knowledge on wheat cultivation	X_9 : Extension media contact
X_{10} : Cosmopoliteness	X_{11} : Credit Received	Y : Problems faced on wheat cultivation