CONSTRAINT OF WHEAT PRODUCTION IN ALAMDANGA UPAZILA UNDER CHUADANGA DISTRICT

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CONSTRAINT OF WHEAT PRODUCTION IN ALAMDANGA UPAZILA UNDER CHUADANGA DISTRICT

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CERTIFICATE

This is to certify that the thesis entitled, "CONSTRAINT OF WHEAT PRODUCTION IN ALAMDANGA UPAZILA UNDER CHUADANGA DISTRICT" submitted to the Faculty of Agricultural Extension & Information system, Sher-e-Bangla Agricultural University, Dhaka, in partial fulfillment of the requirements for the degree of MASTER OF SCIENCE (MS) in Agricultural Extension, embodies the results of a piece of bona-fide research work carried out by Munshi Abdul Nashir Nahid, Registration No. 12-04890 under my supervision and guidance. No part of the thesis has been submitted for any other degree ordiploma.

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

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Place: Dhaka, Bangladesh

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Dedicated to My Beloved Parents

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CONSTRAINT OF WHEAT PRODUCTION IN ALAMDANGA UPAZILA UNDER CHUADANGA DISTRICT

ABSTRACT

A survey study was carried out with the objective to determine the constraints of wheat production and explore the relationships between the selected characteristics of the wheat growers and the constraints faced in wheat cultivation. The study was conducted in 100 wheat growers of five villages of Alamdanga Upazila under Chuadanga district. Data were collected from a proportionately random sample of 100 wheat farmers by using an interview schedule during the period from 1 to 30 September, 2019. The majority (62%) of the respondents (farmers) faced high problem while 38% faced medium problems and no respondent was under low category. Pearson's Product Moment Co-efficient of Correlation analysis indicated that among 12 selected characteristics of the farmers, only eight namely, education, farm size, annual family income, training exposure, knowledge on wheat cultivation, extension media contact, innovativeness and cosmopoliteness had significant negative relationship and one character namely credit received had significant positive relationship with their constraints faced in wheat cultivation. On the basis of constraints faced index (CFI), it was observed that "High price of laborer" ranked first followed by "Low market price of wheat", "High price of HYV seeds", "Shortage of quality seeds", "Shortage of capital" were the major five problems in wheat cultivation. Total respondents (100%) 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 increase wheat production in their fields. 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 constraints regarding production (cultivation), harvesting, processing, storing and selling.

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ABBREVIATIONS AND ACRONYMS

AEZ	=	Agro-Ecological Zone
BBS	=	Bangladesh Bureau of Statistics
BCSRI	=	Bangladesh Council of Scientific Research Institute
cm	=	Centimeter
CV %	=	Percent Coefficient of Variation
DAS	=	Days After Sowing
DMRT	=	Duncan's Multiple Range Test
et al.,	=	And others
e.g.	=	exempli gratia (L), for example
etc.	=	Etcetera
FAO	=	Food and Agricultural Organization
g	=	Gram (s)
i.e.	=	id est (L), that is
Kg	=	Kilogram (s)
LSD	=	Least Significant Difference
m^2	=	Meter squares
ml	=	MiliLitre
M.S.	=	Master of Science
No.	=	Number
SAU	=	Sher-e-Bangla Agricultural University
var.	=	Variety
^{o}C	=	Degree Celceous
%	=	Percentage
NaOH	=	Sodium hydroxide
GM	=	Geometric mean
mg	=	Miligram
P	=	Phosphorus
K	=	Potassium
Ca	=	Calcium
L	=	Litre
µg	=	Microgram
USA	=	United States of America
WHO	=	World Health Organization

CHAPTER I

INTRODUCTION

1.1 Background of the Study

Wheat is one of the main cereal crops is the world as well as in Bangladesh. It is considered to very important crop in several ways. It is important cereal crops with respect to both acreage and production and currently it ranked second among the cereals in Bangladesh (BBS, 2018). It contributes more calories and protein than any other food crop. Presently, it constitutes about 15 percent of the staple cereal food of Bangladesh and it is the staple food for about one million people in as many as 43 countries, providing 20 percent of the total food calories (Taslim, 1999). The annual production of wheat in Bangladesh is about 1099 thousand tons which is cultivated in 351 thousand hectares of land with an average yield of 3.13 t/ha (BBS, 2018). This yield is very low compared to the yield obtained by the popular varieties in the research stations as well as the farmers' field demonstrations

The factors of production are not used properly at farmers' level. Variation in different items of production package is mainly responsible for such kind of yield gap. Amount and quality of different inputs used and other management vary form one farmer to another. Thus, the potential yield level at farmers' field is not achieved in many cases. Sometimes farmers are found to be interested to cultivate crops with traditional management practices. Farmers cultivating HYVs of different crops also do not follow the recommended practices.

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 (Islam**,** 2016).

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. 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). 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% World wheat production is now under threat due to the wheat blast outbreak in Bangladesh in early March 2016 (BBS, 2017).

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 (DAE, 2017).

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.

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 constraints regarding seed, production, processing, marketing, storage etc. Hence it is necessary to conduct a research study on the constraints faced by the farmers in wheat cultivation.

1.2 Statement of the Problem

Wheat is a main cereal crop in Bangladesh and its production is decreasing day by day (Wheat Research Centre, BBS, 2014). Wheat blast is considered a major disease affecting wheat production. Some other problems like high labor cost, lack of quality seeds, low selling price etc. are also responsible for higher production of wheat.

In order to have an understanding of the farmer constraints in wheat cultivation, the researcher undertook the investigation entitled "Constraint of wheat production in Alamdanga upazila under Chuadanga district". In spite of greater potentially of wheat cultivation, the farmers of Bangladesh are not free from constraints 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 constraints 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 constraints faced by the farmers in wheat cultivation?

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

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

1.3 Justification of the Study

Wheat is the most valuable cereal crop in Bangladesh. Research on constraints of wheat cultivation is very necessary 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 constraints act adversely in the cultivation of wheat. It is therefore, urgently needed to devise ways and means to increase wheat cultivation through identifying the constraints and by minimization. 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 approach.

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 constraints faced in wheat cultivation. The selected characteristics are:
    i. Age
    ii. Level of education
    iii. Family size
    iv. Farm size
    v. Annual family income
    vi. Training exposure on wheat cultivation
    vii. Extension media contact
    viii. Innovativeness
    ix. Cosmopoliteness
    x. Wheat cultivation area
    xi. Knowledge on wheat cultivation
    xii. Credit received;

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

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

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

1.5 Scope of the study

The present study was designed to have an understanding constraints faced by the farmers in wheat production and to explore the contribution of the farmers' selected characteristics to their constraints in wheat production. The findings of the study will be applicable in the study area of Alamdanga upazila under Chuadanga district. The findings may also be applicable to other locale of Bangladesh where socio-cultural, psychological and economic circumstance do not differ much than those of the study areas.

The findings of the study may also be subsidiary to the field worker of extension service to enhance their action strategies on constraints faced by the farmers in wheat production. The findings of the study will be conducive to accelerate the improvement in agriculture, farmers" logistic supports, information needs. The outcomes might also be helpful to the planners, policy makers, extension workers, beneficiaries of the agriculture.

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 constraints 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 restricted to Alamdanga upazila under Chuadanga district.
2. The study was limited to the wheat farmers and they constituted the population of this study.
3. Population for the study was kept limited within the heads of the farm families because they were the decision makers in their respective families and also to those who were directly associated with the wheat cultivation.
4. There were various dimensions in wheat cultivation and many sorts of constraints were connected with this issue. It was not possible for the researcher to include all dimensions of wheat cultivation constraints in a single study.
1. In this study the researcher considered only seventeen constraints faced by the wheat growers in wheat cultivation.
5. Collection of all relevant data was limited to the farmers growing wheat in the study area.
6. Relationship of the constraints in wheat cultivation could be studied with the various characteristics of the farmers but only seven characteristics of the fanners were selected for investigation in this study.

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 for this study were capable enough to provide proper replies to the queries included in the interview schedule.

2. The researcher who acted as interviewer was adjusted to social 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. Views and opinions furnished by the wheat growers included in the sample were the representative views and opinions of the whole population of the study area.

5. The selected characteristics and constrains faced by the farmers in wheat production of the study were normally and independently allotted with respective means and standard deviation.

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.

1.8.1 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.

1.8.2 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.

1.8.3 Age

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

1.8.4 Education

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

1.8.5 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.

1.8.6 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.

1.8.7 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.

1.8.8 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.

1.8.9 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.

1.8.10 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.

1.8.11 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.

1.8.12 Innovativeness

Innovativeness is the degree to which an individual adopts an innovation relatively earlier than other members in a social system (Rogers,1995). This has been defined as the quickness of accepting innovation by the respondent in relation to others and also was measured on the basis of time dimension.

1.8.13 Cosmopoliteness

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

1.8.14 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.

1.8.15 Constraints faced

Constraints 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.

1.8.16 Wheat farmers

Wheat farmers referred to those farmers who have cultivated wheat during the Rabi season of 2018-2019.

CHAPTER II

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 Constraints faced by the farmers during cultivation

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.

Islam *et al.* (2016) found that wheat severe disease symptoms appeared in wheat field in Chuadanga and Meherpur districts and rapidly spread to adjacent four districts within two weeks and it was the main constraints for successful production. 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)* is a common constraint which 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 blast of wheat is a sever constraint which can be spread to Asia and

Africa from disease existing countries because of similar climatic conditions in these regions.

Index Mundi (2016) carried out 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.

Bodruzzaman *et al.* (2004) observed that a major cause of lower production of wheat in the country is lower quality of seeds which resulted 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.

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

Anisur (2000) pointed out 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) showed 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) carried out a 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.

Alam *et al*. (2000) conducted a survey on jute crops in seven districts of Bangladesh to find out the state of art in jute cultivation and found that scarcity of quality seeds, high labour wage and low market price of fiber were the major constraints of jute production.

Faroque (1997) found that female rural youth in Bhaluka (Mymensingh) lacked cash for buying seeds, seedlings and fisheries and deprived of necessary knowledge in improved vegetable cultivation. He further added that the majority of female rural youth faced very high (54%) constraints in crop cultivation.

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 nonavailability of seed, insecticide and fertilizer.

Uddin (2004) identified five aspects of constraints in commercial cultivation of vegetables in his study *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) 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) identified constraints in potato cultivation in their study. 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.

Ramachandran and Sripal (1990) identified different constraint in adoption of dry land technology for rain fed cotton in Kamaraj district, Tamilnado, India. They found that constraints faced by the farmers which were insufficient rainfall, susceptibility of inputs in time, lack of knowledge, insufficient livestock, risk due to failure of monsoon, high cost etc.

Ismail (2001) conducted a study on problems faced by the farm youths of hoar area of Mohangonj upazila. Study revealed six top problems in rank order and these were (i) no arrangement of loan for the farm youth for fishery cultivation, (ii) lack of government programmes in agriculture for the farm youth, (iii) absence of loan giving agencies for establishing farm in locality, (iv) general people face problem for fishery due to government leashing of Jalmohal, (v) lack of government programmes for establishing poultry farm, and (vi) lack of agricultural loan for the farm youth.

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.

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.

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.

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.

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 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.

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.

2.2.7 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.

2.2.8 Innovativeness and problem faced

Uddin (1995) reported that there was a highly significant relationship between Innovativeness of the farmers and their reception of information on planting method.

Islam (1987) found that Innovativeness of the farmers had positive and highly significant relation with the use of communication media.

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

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 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.

2.2.11 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.

2.2.12 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 socioeconomic 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.

Conceptual Framework of the Study

Independent variables	Focus of the study

- Age
- Education
- Family size
- Farm size
- Annual income
- Training exposure
- Extension contact
- Innovativeness
- Cosmopoliteness
- Wheat cultivation area
- Knowledge on wheat cultivation
- Credit received

Constraints faced in wheat cultivation by the farmers
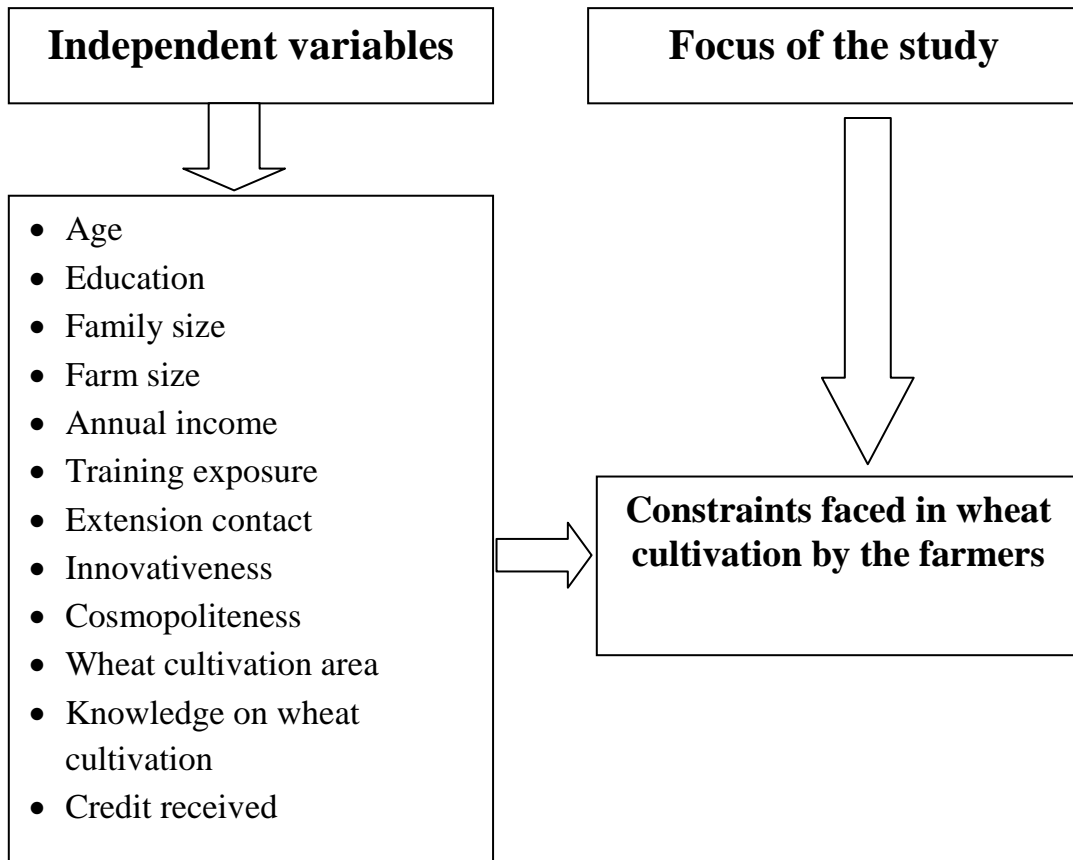
Fig. 2.1 Conceptual Framework of the study

CHAPTER III

MATERIALS AND METHODS

Methodology plays a vital role in a scientific research. This Chapter deals with research methodology and procedures used to collect and analyze the data for answering the research questions and attaining the purposes. A chronological description of the methodology followed in conducting this research work has been presented in the subsequent sections and subsections:

2.1 The locale of the study

The study was conducted among the wheat growers of five villages of Alamdanga Union of Alamdanga Upazilla under Chuadanga District. Out of fifteen unions of this Upazila, Alamdanga Union was purposively selected. Among 19 villages of Alamdanga Union; five villages (Bondobill, Hazratola, Karimpara, Eidgahpara and Getpara) were selected purposively. The map of Bangladesh showing Chuadanga district appear in the Figure 3.1 and a map of Alamdanga Upazila showing the study area have been shown in Fig 3.2.

Figure 3.1 A Map of Chuadanga district showing Alamdanga Upazila
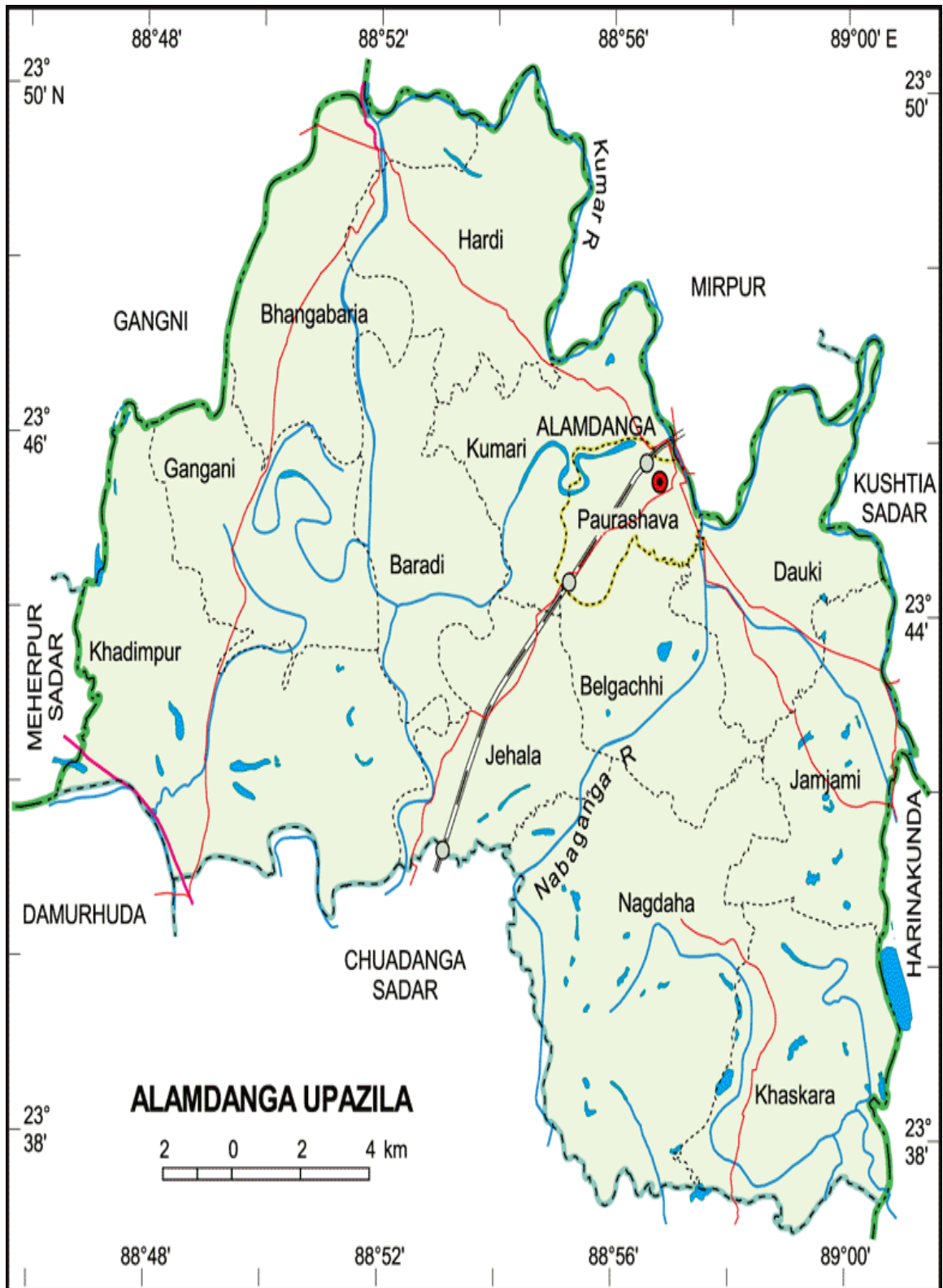
Figure 3.2. A map of Alamdanga upazila showing the study area

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 Alamdanga Upazila Agriculture Office. The list comprised a total of 506 wheat growers in the study area. These farmers constituted the population of this study. To make a representative sample 20 percent of the population was selected using random sampling technique. Because limited wheat growers were present of the study area. Thus 100 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 of wheat grower	Sample Size (20%)	Reserve list (2%) Total
Bondobill	127	25	3
Hazratola	102	20	2
Karimpara	73	15	1
Eidgahpara	81	15	1
Getpara	123	25	3
Total	506	100	10

2.2 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 10 respondents of the study area. Those 10 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-I.

2.3 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 (SAAO) 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 30 days from 2nd January to 31st January, 2018.

2.4 Selection of focus and independent variables

Constraints 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 independent 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, education level, family size, farm size, annual family income, training exposure, extension contact, innovativeness, cosmopoliteness wheat cultivation area, knowledge on wheat cultivation and credit received were selected as the explanatory variables.

2.5 Measurement of dependent variables

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

2.5.1 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 I).

2.5.2 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 I). 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.

2.5.3 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-I).

2.5.4 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. Question regarding this variable appears in the item no. 3 in the interview schedule (Appendix-I). The land possession was measured for each respondent in terms of hectare by using the following formula:

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

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

2.5.5 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.

2.5.6 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.

2.5.7 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 and 3 for the

responses of not at all, rarely, occasionally and frequently, respectively. Thus, extension media contact of the respondents could range from 0 to 54, where 0 indicating no extension media contact and 54 indicating very high extension media contact.

2.5.8 Innovativeness

Innovativeness of a respondent was measured by computing a innovativeness score based on his/her logical frequency of applying eight (8) different techniques for higher production of wheat. Each respondent was asked to indicate the number of innovations used to each of the eight different techniques. Scores were assigned to his/her response in the following ways: The scores were added together to obtain the innovativeness score of a respondent. This score could range from 0 to 24, zero indicating no innovativeness at all and 24 including highest level of innovativeness of a respondent.

2.5.9 Cosmopoliteness

Cosmopoliteness of a respondent was measured by computing a cosmopoliteness score based on his/her logical frequency of visit to selected seven (7) 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:

The score for visit to all the places were added together to obtain the cosmopoliteness score of a respondent. This score could range from 0 to 21, zero indicating no cosmopoliteness at all and 21 including highest level of cosmopoliteness of a respondent.

2.5.10 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.

2.5.11 Knowledge on wheat cultivation

Knowledge on wheat cultivation score of a respondent was measured by asking him/her 18 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 36, where 0 indicating poor knowledge and 36 indicating high knowledge on wheat cultivation.

2.5.12 Credit received

Credit received was measured in thousand taka. For example score 15 as assigned for receiving as credit of 15000 Tk. from Bank or micro credit organization or personally from any person.

2.6 Measurement of Focus Variable

Constraints faced by the farmers in wheat cultivation were the main focus of the study. It was measured on the basis of the constraints faced by the farmers in wheat cultivation. A scale was used for measuring constraints faced by the farmers in wheat cultivation. The scale contained 17 constraints, the farmers face in respect of wheat cultivation. When interview schedule was pre-tested, there are many constraints created for wheat cultivation. Among them 17 major constraints were selected. Each respondent was asked to indicate the extent of difficulty faced by each of the constraints by checking any one of the six alternative responses as very high constraint, high constraints, moderate, low, very low, not at all constraint. Scores were assigned to these responses as 5, 4, 3, 2, 1 and 0 respectively. Scores for responses against all the 17 constraint-items of a respondent were added together to obtain his constraints faced score. Therefore,

the constraints faced score of the farmers could range from 0 to 85, where 0 indicated facing no constraint and 85 indicated facing of very high constraint.

To compare the severity among the constraints, Constraints Faced Index (CFI) was computed for each constraint-item with help of the following formula:

$$CFI = Cvh \times 5 + Ch \times 4 + Cm \times 3 + Cl \times 2 + Cvl \times 1 + Cno \times 0$$

Where,

CFI = Constraints Faced Index

Cvh = Number of farmers facing very high constraint

Ch = Number of farmers facing high constraint

Cm = Number of farmers facing moderate constraint

Cl = Number of farmers facing low constraint

Cvl = Number of farmers facing very low constraint

Cno = Number of farmers facing no constraint

Thus, the CFI of a constraint could range from 0-500, where 0 indicated facing of no constraint and 500 indicated facing of serious constraints. Rank order also made with the descending order of the CFI of the constraint-items.

2.7 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."

2.8 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 constraints faced in wheat cultivation".

2.9 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 constraints faced in wheat cultivation".

2.10 Data Processing

2.10.1 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.

2.10.2 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.

2.10.3 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.

2.11 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 constraints 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.

CHAPTER IV

RESULTS AND DISCUSSION

This chapter divided into four sections; first section deals with the selected characteristics of the respondents (farmers), while the second section deals with the constraints faced by the respondents in wheat cultivation. Relationship between the selected characteristics of the farmers and their constraints faced in wheat cultivation has been discussed in the third section. The fourth section deals with the comparative severity of constraints faced by the growers in wheat cultivation.

4.1 Selected characteristics of wheat growers (farmers)

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

Table 4.1 Summary on demographic characteristics of wheat growers

SL. No.	Characteristics (with measuring unit)	Range		Mean	Standard deviation
		Possible	Observed		
1	Age (years)	--	24-75	42.19	12.53
2	Education (schooling years)	--	0.50-14	6.50	2.82
3	Family size (number of family members)	--	3.00-9.00	5.27	1.12
4	Farm size (hectare)	--	0.25-5.60	1.86	1.19
5	Annual family income (Tk. '000')	--	30.00-425.00	189.60	104.98
6	Training exposure on wheat cultivation (number of days)	--	0-30.00	3.72	3.25

7	Extension media contact (score)	0-57	16.00-34.00	25.55	3.57
8	Innovativeness	0-24	4.00-20.00	14.61	3.28
9	Cosmopoliteness (score)	0-21	2.00-18.00	4.42	1.61
10	Wheat cultivation area (ha)	--	0.01-1.70	0.62	0.37
11	Knowledge on wheat cultivation (score)	0-36	22.00-32.00	29.73	1.86
12	Credit received	--	0-200	32.60	11.50
13	Constraints	0-85	49.00-63.00	57.00	2.73

4.1.1 Age

Age of the selected respondents (wheat growers) ranged from 24 to 75 years with a mean of 42.19 years and standard deviation of 12.53. 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 respondents (wheat growers) according to their age

Categories	Basis of categorization (year)	Respondents		Mean	Standard deviation
		Number	Percent		
Young	up to 35	40	40.00	42.19	12.53
Middle-aged	36-50	40	40.00		
Old	Above 50	20	20.00		
Total		100	100.00		

Data presented in Table 4.2 indicate that (40%) of the respondents were middle aged and also 40% respondents were young aged as compared to 20 percent being old. Findings again revealed that above three fourth (80%) 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 0.50 to 14 years of schooling having an average of 6.50 years with a standard deviation of 2.82. On the basis of their education, the respondents were classified into four categories as shown in Table 4.3.

Table 4.3 Distribution of the respondents (wheat growers) according to their levels of education

Categories	Respondents		Mean	Standard deviation
	Number	Percent		
Illiterate or can sign only (0-0.5)	8	8.00		
Primary education (1-5)	46	46.00		
Secondary education (6-10)	40	40.00	6.50	2.82
Above secondary education	6	6.00		
Total	100	100.00		

Data contained in Table 4.2 indicates that 8 percent of the respondents were illiterate and 92 percent were literate. It was found that 40 percent had secondary level of education, 46 percent had primary level of education, and 6 percent had above secondary level of education whereas literacy rate in Bangladesh is 62.7 percent. It was also revealed that higher level of education of an individual is likely to be more receptive to the modem facts and ideas. They have much mental strength in deciding on a matter related to problem solving. Education helps the farmers to gain knowledge on different aspects of cultivation practices by reading books, leaflets, bulletins and other printed materials. Thus, farmers in the study area may be well considered as a suitable ground against constraints of wheat cultivation.

4.1.3 Family size

Family size scores of the farmer ranged from 3 to 9 with an average of 5.27 and standard deviation of 1.12. According to family size, the respondents were

classified into three categories as shown in Table 4.4.

Table 4.4 Distribution of the respondents (wheat growers) according to their family size

Categories	Respondents		Mean	Standard deviation
	Number	Percent		
Small family (up to 4)	25	25.00		
Medium family (5-7)	71	71.00	5.27	1.12
Large family (above 7)	4	4.00		
Total	100	100.00		

Data contained in Table 4.3 indicates that majority (71%) of the farmers had medium family while 4 percent of them had large family and 25 percent of them had small family. Thus, about (96%) of the farmers had small to medium family. Therefore, it could be said that maximum size of medium family were involved in wheat farming practices in the study area.

4.1.4 Farm size

Farm size of the respondents ranged from 0.25 to 5.60 hectares with the mean of 1.86 and standard deviation of 1.19. 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 respondents according to their farm size

Categories (ha)	Basis of categorization (ha)	Respondents		Mean	Standard deviation
		Number	Percent		
Marginal farm	Up to 0.20	0	0		
Small farm	0.21 - 1	23	23.00	1.86	1.19
Medium farm	1.1 - 3	62	62.00		
Large farm	Above 3	15	15.00		
Total		100	100.00		

Data presented in the Table 4.5 demonstrate that no respondent was under marginal farm category in the study area. But majority (62%) of the respondents

had medium farm compared to 23% having small farm and 15% having large farm. 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. The average farm size of the farmers of the study area (1.86 ha) was higher than that of national average (0.60 ha) of Bangladesh (BBS, 2014).

4.1.5 Annual family income

Annual family income of the respondents ranged from 30 to 425 thousand taka. The mean was 189.60 thousand taka and standard deviation was 104.98. 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 respondents (wheat growers) regarding their annual family income

Categories (per year)	Respondents		Mean	Standard deviation
	Number	Percent		
Low (up to Tk. 150 thousand)	50	50.00	189.60	104.98
Medium (Tk. 151-300 thousand)	36	36.00		
High (above Tk. 300 thousand)	14	14.00		
Total	100	100.00		

From the Table 4.6 it was observed that the half of the total respondents (50%) had small annual family income compared to 36 percent having medium and 14 percent had high annual family income. In the study area, major portion of the farmers were in low income and 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 Training exposure on wheat cultivation

The score of training exposure on wheat cultivation of the farmers ranged from 0-30 days. The mean was 3.72 days and standard deviation was 3.25. On the basis of

training exposure on wheat cultivation, the respondents were categorized into four groups as shown in Table 4.8.

Table 4.7 Distribution of the respondents (wheat growers) according to their training exposure on wheat cultivation

Categories	Basis of categorization (Days)	Respondents		Mean	Standard deviation
		Number	Percent		
No training	0	20	20.00		
Low training	1-10	25	25.00		
Medium training	11-20	40	40.00	3.72	3.25
High training	21-30	15	15.00		
Total		100	100.00		

Data presented in the Table 4. 7 showed that majority (67%) of the farmers had no training exposure; while 22 percent of the farmers had low training exposure and only 7 percent had medium exposure. It means that an overwhelming majority (89%) 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. Trained wheat growers (farmers) can face any kind of challenges about the adverse situation in their wheat cultivation.

4.1.7 Extension media contact

The scores of the farmers regarding extension media contact ranged from 16-34 with a mean of 25.55 and standard deviation of 3.57. On the basis of their extension contact scores, the farmers were classified into three categories (Table 4.8).

Table 4.8 Distribution of the respondents (wheat growers) according to their extension media contact

Categories	Basis of categorization (score)	Respondents		Mean	Standard deviation
		Number	Percent		
Low contact	up to 18	4	4.00		
Medium contact	19-36	94	94.00	25.55	3.57
High contact	Above >36	0	0.00		
Total		100	100.00		

Data presented in the table 4.8 indicated that majority (94.00%) of the farmers had medium extension media contact as compared to 4.00 percent (only) having low extension media contact and no respondents had high extension contact. Thus, an overwhelming all the respondents (100%) 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.

4.1.8 Innovativeness

The observed innovativeness scores of the farmers ranged from 4-20 against the possible range of 0 to 24. The average innovativeness scores of the farmers were 14.61 with a standard deviation of 3.28. On the basis of the innovativeness scores, the farmers were classified into three categories (Table 4.9).

Table 4.9 Distribution of the respondents (wheat growers) according to their innovativeness

Categories	Basis of categorization (score)	Respondents		Mean	Standard deviation
		Number	Percent		
Low	up to 8	3	3.00		
Medium	9-16	59	59.00	14.61	3.28
High	Above 16	38	38.00		
Total		100	100.00		

Data presented in the Table 4.9 shows that the highest proportion (59.00%) of the farmers had medium innovativeness as compared to 3.00 percent having low innovativeness and 38.00 percent having high innovativeness. Thus, most (97.00%) of the farmers had medium to high innovativeness. In the study area it is noticed that farmers had medium to high innovativeness which means that they are well awarded with innovation of wheat cultivation.

4.1.9 Cosmopoliteness

The observed cosmopoliteness scores of the farmers ranged from 2-18 against the possible range of 0 to 21. The average cosmopoliteness scores of the farmers were 4.42 with a standard deviation of 1.61. On the basis of the cosmopoliteness scores, the farmers were classified into three categories (Table 4.10).

Table 4.10 Distribution of the respondents (wheat growers) according to their cosmopoliteness

Categories	Basis of categorization (score)	Respondents		Mean	Standard deviation
		Number	Percent		
Low	up to 7	73	73.00		
Medium	8-14	15	15.00	4.42	1.61
High	Above 14	12	12.00		
Total		100	100.00		

Data presented in the Table 4.10 show that the highest proportion (73.00%) of the farmers had low cosmopoliteness as compared to 15.00 percent having medium cosmopoliteness and 12.00 percent having high cosmopoliteness. Thus, most (88.00%) of the farmers had low to medium cosmopoliteness. The findings suggest that cosmopoliteness might be an important factor for the respondents to modify their attitude on wheat cultivation. Here, maximum respondents were under low cosmopoliteness, so, upgrade is needed to develop cosmopoliteness under the study area.

4.1.10 Wheat cultivation area

Wheat cultivation area of the respondents varied from 0.01 to 1.70 hectare, the average being 0.62 ha with the standard deviation of 0.37. The respondents were classified into three categories on the basis of their wheat cultivation area as shown in Table 4.11.

Table 4.11 Distribution of the respondents (wheat growers) according to their wheat cultivation area

Categories	Basis of categorization (ha)	Farmers		Mean	Standard deviation
		Number	Percent		
Very small	Less than 0.20	25	25.00		
Small	Up to 0.20	18	18.00		
Medium	0.21 – 0.50	37	37.00		
Large	0.5-1.00	13	13.00	0.62	0.37
Very large	Above 1	7	7.00		
Total		100	100.00		

Data contained in Table 4.11 indicates that the largest proportion (77.00%) of farmers had small wheat cultivation area compared to 9.00 percent having marginal and 14.00 percent had large wheat cultivation area. It was again found that most (86.00%) 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 (BBS, 2014).

4.1.11 Knowledge on wheat cultivation

Knowledge on wheat cultivation score of the respondents ranged from 22 to 32 against the possible range of 0 - 44 having an average of 29.73 and standard deviation of 1.86. 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 4.12.

Table 4.12 Distribution of the respondents (wheat growers) according to their knowledge on wheat cultivation

Categories	Basis of categorization (score)	Respondents		Mean	Standard deviation
		Number	Percent		
Low	Up to 12	23	23.00		
Medium	13-24	35	35.00	29.73	1.86
High	Above 24	42	42.00		
Total		100	100.00		

Data of Table 4.12 represented that near about all the respondents (97%) felt in high knowledge category followed by 3.00 percent in medium knowledge category and no respondents was in low knowledge category. Knowledge is to be considered as vision of an explanation in any aspect of the situation regarding wheat cultivation.

4.1.12 Credit Received

The observed credit received scores of the farmers ranged from 0 to 200 thousand taka, the mean being 32.60 and standard deviation of 11.50. Based on the credit received scores, the farmers were classified into four categories as shown in Table 4.13.

Data contained in Table 4.13 indicates that 33.00 percent of the farmers had low credit availability, while 53.00 percent of the farmers had no credit availability and 7.00 percent had medium and 7.00 percent high credit availability. It meant that overwhelming majority (86%) of the respondents had no to low credit availability. Therefore, it could be said that a considerable portion of the respondents (47%) was under credit function to continue wheat cultivation under the study area. So, credit facilities should be increased by GO or NGOs programs to increase wheat production under the study area.

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Table 4.13 Distribution of the respondents (wheat growers) according to their credit received

Categories	Basis of categorization (Tk. '000')	Respondents		Mean	Standard deviation
		Number	Percent		
No credit received	0	53	53.00		
Low credit	1-65	33	33.00	32.60	11.50
Medium credit	66-130	7	7.00		
High credit	Above 130	7	7.00		
Total		100	100		

4.2 Constraints faced by the farmers in wheat cultivation

Constraints mean some difficulties that create barriers to achieve specific goal. In this study, constraints faced by the farmers in wheat cultivation were the dependent variable. For going through wheat cultivation, farmers face a lot of significant challenging situations. To overcome these situations, insightful thinking is very essential. Constraints faced, therefore, indicates the extent to which individual faced difficult situations about which something needs to be done. In this study, computed constraints faced by the farmers in wheat cultivation scores ranged from 49 to 63 against the possible range 0 to 85, the mean score was 57.00 and the standard deviation was 2.73. Based on the constraints faced scores, the farmers were classified in to three categories as shown in table 4.14.

Table. 4.14 Constraints of wheat cultivation faced by the respondents (wheat growers)

Categories	Basis of categorization (score)	Respondents		Mean	Standard deviation
		Number	Percent		
Low	Up to 28	15	15.00		
Medium	29-56	38	38.00	57.00	2.73
High	Above 56	47	47.00		
Total		100	100		

Data presented in the table 4.14 shows that the majority (62.00%) of the farmers faced high constraints while 38.00% percent of the farmers faced medium constraints where no respondent (0%) was under low constrain faced category in wheat cultivation. It is quite logical that farmers facing lower constrain could minimize their losses in wheat cultivation. Constrain 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 constrains 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 constraint in wheat cultivation it will encourage him/her to go for more wheat production.

4.3 Relationship between the selected characteristics of the respondents and their constraints faced in wheat cultivation

Coefficient of correlation was computed in order to find out the relationship between the selected characteristics of the respondents and their constraints faced in wheat cultivation.

The function of this section is to observe the relationship of 12 selected characteristics of the farmers with their constraints faced in wheat cultivation. The 12 characteristics of the farmers included: age, education, family size, farm size, annual family income, training exposure on wheat cultivation, extension media contact, innovativeness, cosmopoliteness, wheat cultivation area, knowledge on wheat cultivation and credit received.

Each of the characteristics constituted the explanatory variables, while constraints faced in wheat cultivation was the focus variable. To explore the relationships between the selected individual characteristics of the farmers and their constraints 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 98 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 4.15 and Appendix II showing the relationship between 12 characteristics of the respondents and their constraints faced in wheat cultivation.

Table 4.15 Co-efficient of correlation showing relationship between selected Characteristics of the wheat growers and their constraints faced in wheat cultivation (n= 100 with df 98)

Focus variables	Dependent variables	Computed value of "r"	Tabulated value of "r" at 98 df	
			at 0.05 level	at 0.01 level
Constraints faced in wheat cultivation	Age	-0.082^{NS}	0.195	0.254
	Education	-0.374(**)		
	Family size	-0.076^{NS}		
	Farm size	-0.238(*)		
	Annual income	-0.208(*)		
	Training exposure	-0.382(**)		
	Extension contact	-0.318(**)		
	Innovativeness	-0.242(*)		
	Cosmopoliteness	-0.207(*)		
	Wheat Cultivation Area	-0.023^{NS}		
	Knowledge on wheat cultivation	-0.726(**)		
	Credit received	0.211(*)		

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

4.3.1 Relationship between age of the respondents and their constraints faced in wheat cultivation

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

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.082 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.

a) The computed value of 'r' (r= -0.082) was found to be smaller than the tabulated value (r= 0.195) with 98 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.

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

Based on the above findings, the researcher concluded that age of the farmers had negative and non significant relationship with their constraints faced in wheat cultivation. This meant that age of the farmers was not an important factor in constraints faced in wheat cultivation. But it can be concluded that higher aged farmer can be contributed to minimize constraints in wheat cultivation.

4.3.2 Relationship between level of education of the respondents and their constraints faced in wheat cultivation

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

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.374 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.

a) The computed value of 'r' (r= -0.374) was found to be larger than the tabulated value (r= 0.254) with 98 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 constraints faced in wheat cultivation. This indicated that education of the wheat farmers in adoption of wheat cultivation technologies was an important factor for their constraints faced in wheat cultivation.

4.3.3 Relationship between family size of the respondents and their constraints faced in wheat cultivation

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

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.076 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.

a) The computed value of 'r' (r= -0.076) was found to be smaller than the tabulated value (r= 0.195) with 98 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.

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

Based on the above findings, the researcher concluded that family size of the farmers had negative and non significant relationship with their constraints faced in wheat cultivation. This indicated that family size of the farmers was not an important factor for their constraints faced in wheat cultivation.

4.3.4 Relationship between farm size of the respondents and their constraints faced in wheat cultivation

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

The calculated value of the co-efficient of correlation between the concerned variable was found to be -0.238 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.

a) The computed value of 'r' (r= -0.238) was found to be larger than the tabulated value (r= 0.195) with 98 degrees of freedom at 0.05 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 farm size of the respondents had negative and significant relationship with their constraints faced in wheat cultivation. This indicated that farm size of the farmers was an important factor for their constraints faced in wheat cultivation.

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

Relationship between annual family income of the farmers and their constraints faced in wheat cultivation was determined by testing the following null hypothesis: "There is no relationship between annual family income of the respondents and their constraints faced in wheat cultivation". The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.208 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.

a) The computed value of 'r' (r= -0.208) was found to be larger than the tabulated value (r= 0.195) with 98 degrees of freedom at 0.05 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 respondents had negative and significant relationship with their constraints faced in wheat cultivation. This indicated that annual family income of the respondents was an important factor for their constraints faced in wheat cultivation.

4.3.6 Relationship between training exposure on wheat cultivation of the respondents and their constraints faced in wheat cultivation

Relationship between training exposure on wheat cultivation of the respondents and their constraints faced in wheat cultivation was determined by testing the following null hypothesis: "There is no relationship between training exposure on wheat cultivation of the respondents and their constraints faced in wheat cultivation". The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.382 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.

a) The computed value of 'r' (r= -0.382) was found to be larger than the tabulated value (r= 0.254) with 98 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 respondents had negative and significant relationship with their constraints faced in wheat cultivation. This implies that farmers with higher training exposure on wheat cultivation were likely to have lower level of constraints 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 constraints in wheat cultivation.

4.3.7 Relationship between extension contact of the farmers and their constraints faced in wheat cultivation

Relationship between extension media contact of the farmers and their constraints faced in wheat cultivation was determined by testing the following null hypothesis: "There is no relationship between extension media contact of the respondents and their constraints faced in wheat cultivation." The calculated value of the co-efficient of correlation between the concerned variables was found to be − 0.318 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.

a) The computed value of 'r' (r= -0.318) was found to be larger than the tabulated value (r= 0.254) with 98 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 respondents had negative and significant relationship with their constraints faced in wheat cultivation. This implies that farmers with higher extension media contact were likely to have lower level of constraints faced in wheat cultivation.

4.3.8 Relationship between innovativeness of the farmers and their constraints faced in wheat cultivation

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

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.242 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.

a) The computed value of 'r' (r= -0.242) was found to be larger than the tabulated value (r= 0.195) with 98 degrees of freedom at 0.05 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 innovativeness of the respondents had negative and significant relationship with their constraints faced in wheat cultivation. This implies that farmers with higher innovativeness were likely to have lower level of constraints faced in wheat cultivation.

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

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

The calculated value of the co-efficient of correlation between the concerned variables was found to be -0.207 as shown in Table 4.5. The following observations were made regarding the relationship between the two variables under consideration.

e) The computed value of 'r' (r= -0.207) was found to be larger than the tabulated value (r= 0.195) with 98 degrees of freedom at 0.05 level of probability.
f) The null hypothesis was rejected.
g) The relationship between the concerned variables was significant.
h) The relationship showed a negative trend between the concerned variables.

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

4.3.10 Relationship between wheat cultivation area of the respondents and their constraints faced in wheat cultivation

Relationship between wheat cultivation area of the respondents and their constraints faced in wheat cultivation was determined by testing the following null hypothesis: "There is no relationship between wheat cultivation area of the respondents and their constraints faced in wheat cultivation". The calculated value

of the co-efficient of correlation between the concerned variables was found to be -0.023 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.

a) The computed value of 'r' (r= -0.023) was found to be smaller than the tabulated value (r= 0.195) with 98 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 non-significant and negative relationship with their constraints faced in wheat cultivation. This indicated that wheat cultivation area of the respondents was not an important factor for their constraints faced in wheat cultivation.

4.3.11 Relationship between knowledge on wheat cultivation of the respondents and their constraints faced in wheat cultivation

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

The calculated value of the co-efficient of correlation between the concerned variables was found to be – 0.726 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.

a) The computed value of 'r ' (r= -0.726) was found to be larger than the tabulated value (r= 0.254) with 98 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 respondents had negative and significant relationship with their constraints faced in wheat cultivation. This indicates that farmers with higher knowledge on wheat cultivation were likely to have lower level of constraints faced in wheat cultivation.

4.3.12 Relationship between credit received of the respondents and their constraints faced in wheat cultivation

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

The calculated value of the co-efficient of correlation between the concerned variables was found to be 0.211 as shown in Table 4.15. The following observations were made regarding the relationship between the two variables under consideration.

a) The computed value of 'r' (0.211) was larger than the tabulated value 'r' (0.195) with 98 degrees of freedom at 0.05 levels of probability.

b) The null hypothesis could not be rejected.

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

d) The relationship showed a positive trend between the concerned variables

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

4.4 Comparison of the degree of severity among the constraints

The observed constraints faced index in wheat cultivation ranged from 215 to 420 against the possible range of 0 to 500. The formula for determining CFI has been shown in chapter 3.

Table 4.16 Rank order of constraints faced by the respondents in wheat cultivation

Constraints faced by the farmers	Extent of constraints faced by the respondents						CFI	Rank Order
	Very high	High	Moderate	Low	Very low	Not at all		
	5	4	3	2	1	0		
High price of laborer	74	6	2	2	16	0	420	1
Low market price of wheat	69	9	4	2	16	0	413	2
High price of HYV seeds	62	5	6	4	23	0	379	3
Shortage of quality seeds	58	5	4	20	13	0	375	4
Shortage of capital	55	10	8	7	20	0	373	5
High price of fertilizer/pesticide	50	10	8	10	22	0	356	6
Lack of marketing facilities	50	7	10	14	19	0	355	7
Difficulty in getting loan from Bank or other financial organization in time	47	10	9	18	16	0	354	8
High cost of irrigation	45	10	8	15	22	0	341	9
Lack of knowledge on using balanced fertilizers for wheat cultivation	40	8	7	20	25	0	318	10
Lack of storage facilities	40	10	9	13	28	0	321	11
Pest attack in wheat field	37	6	11	21	25	0	309	12
Lack of training on wheat cultivation	32	9	14	17	28	0	300	13
Shortage of irrigation facilities	29	10	13	22	26	0	294	14
Unavailability of pesticides in time	28	7	19	21	25	0	292	15
Lack of proper knowledge on seed storage at farmers level	25	10	14	27	24	0	285	16
Transport problem	21	10	6	19	14	30	215	17

CFI = Constraints Faced Index, N = 100

The selected 17 constraints faced by the respondents which were arranged in rank order according to their descending order of constraints faced index (CFI) as shown in Table 4.16.

On the basis of CFI, it was observed that "High price of laborer" ranked first followed by "Low market price of wheat", "High price of HYV seeds", Shortage of quality seeds", "Shortage of capital", "High price of fertilizer/pesticide", "Lack of marketing facilities", "Difficulty in getting loan from Bank or other financial organization in time", "High cost of irrigation", "Lack of knowledge on using balanced fertilizers for wheat cultivation", "Lack of storage facilities", "Pest attack in wheat field", "Lack of training on wheat cultivation", "Shortage of irrigation facilities", "Unavailability of pesticides in time", "Lack of proper knowledge on seed storage at farmers level" and least one is "Transport problem".

CHAPTER V

SUMMARY AND CONCLUSION

This chapter presents the summery of findings, conclusions and recommendations of the study. The study was conducted in Alamdanga upazila under Chuadanga district to find out the constraints faced by the farmers in wheat production. Total 500 wheat growers were listed as the population and 100 wheat cultivators constituted the sample of the study. A well-structured interview schedule was developed based on objectives of the study for collecting information. The independent variables were: age, education, family size, farm size, annual family income, training exposure on wheat cultivation, extension media contact, innovativeness, cosmopoliteness, wheat cultivation area, knowledge on wheat cultivation and credit received. Data collection was started in 1st September 2019 to 30th September 2019. Various statistical measures such as frequency counts, % distribution, average, and standard deviation were used in describing data. In order to estimate the contribution of the selected characteristics of wheat cultivators to their constraints faced by the respondents in wheat production, Pearson's correlation coefficient (r) was used.

Summary of findings

Selected characteristics of the farmers

Findings in respect of the 12 selected characteristics of the farmers are summarized below:

Age: Slightly above four fifth (80.00%) of the farmers was young to middle aged, while 20 percent were old aged.

Education: The highest proportion (92.00%) of the farmers was literate and 8.00 percent illiterate. Primary, secondary and above secondary level of literacy were found to be 46.00 percent, 40.00 percent and 6.00 percent respectively.

Family Size: About two third (71.00%) of the respondents had medium family size, while 25.00% and 4.00% belonged to the small family size and large family size respectively.

Farm size: About (62.00%) of the respondents had medium farm size, 15.00% had large farm and the rest 23.00% small belonged to the medium farm size whereas no respondents was under marginal farm.

Annual family income: The highest proportion (50.00%) of the respondent farmers had low annual family income compared to 36.00 percent having medium and 14.00% having high annual family income.

Training exposure: The highest proportion (67.00%) of the respondents had no training exposure compared to 22.00%, 7.00% and 4.00% having low, medium and high training respectively. It means, overwhelming majority (89.00%) of the wheat growers had no to low training on wheat cultivation.

Extension media contact: The highest proportion (94.00%) of the respondents had medium extension media contact as compared to 4.00% having low extension media contact and no respondent was in high extension contact. It means, overwhelming majority (100%) of the wheat growers had low to medium extension media contact.

Innovativeness: The highest proportion (59.00%) of the farmers had medium innovativeness as compared to 38% having hight innovativeness and only 3.00% having low innovativeness.

Cosmopoliteness: The highest proportion (73.00%) of the farmers had low cosmopoliteness as compared to 15% having medium cosmopoliteness and 12.00% having high cosmopoliteness.

Wheat cultivation area: The highest proportion (77.00%) of the respondents had small farm area, while 9.00% and 14% belonged to the marginal and medium farm area respectively.

Knowledge on wheat cultivation: Near about (97.00%) of the respondents fell in high knowledge category followed by only 3% in medium knowledge category and no respondent was under low knowledge category.

Credit received: Credit received scores of the wheat growers ranged from 0 to 200 with the mean being 32.60. The majority (53.00%) of the wheat growers had no credit received, 33% had low credit received and 7% had both medium and high credit received, respectively.

Constraints faced by the farmers in wheat cultivation

The observed overall constraints faced score of the farmers in wheat cultivation ranged from 49-63 against the possible range of 0 to 85. The mean score was 57.00 and the standard deviation was 2.73. Majority (62.00%) of the respondents faced high constraints in wheat production activities and 38.00% faced medium constraints and no respondent was under low constraints. Findings again reveal that all the respondents (100%) of the farmers faced medium to high constraints in wheat production.

Relationship between selected characteristics and constraints faced:

Education level, farm size, annual family income, training exposure, extension media contact, innovativeness, cosmopoliteness and knowledge on wheat cultivation had significant negative relationships with the constraints faced by the respondents in wheat cultivation whereas credit received had significant positive relationships with the constraints faced by the respondents in wheat cultivation. Age, family size and wheat cultivation area had no significant relationship with the constraints faced by the farmers in wheat cultivation.

Comparison among the constraints faced by the respondents in wheat cultivation

In order to compare the constraints faced by the farmers in 17 selected items of wheat production, a constraints faced index (CFI) was computed for each constraint. Farmers faced highest constraint in "High price of laborer" which ranked first followed by "low market price of wheat" whereas the "transport problem" ranks last.

Conclusions

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

1. A very great majority (100%) of the farmers faced medium to high constraints in wheat production. From this fact, almost all the respondents have been facing constraints. It may be concluded that until the wheat growers are not free from different constraints in wheat cultivation, they will not be encouraged higher wheat production.

2. About (46.00%) of the wheat growers were under secondary to above secondary education level while there existed a negative significant relationship between education of the wheat growers and their constraints faced. Therefore, it may be concluded that a major portion of the respondents should be upgraded to higher education level to face the constraints effectively.

3. A large proportion (86.00%) of the farmers had low to medium annual family income, again there existed a negatively significant relationship between farmers' annual family income and their constraints faced in wheat cultivation. It may, therefore, be concluded that efforts to raise annual family income of the respondents will lead to minimize their constraints faced in wheat cultivation.

4. Majority (85.00%) of the farmers had small to medium farm size, while there was a negatively significant relationship between farm size and their constraints faced. Thus, it may be concluded that small and medium farm size owners face more constraints than large farm owners.

5. An overwhelming majority (89.00%) 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 constraints faced. Therefore, it may be concluded that majority of the wheat growers more likely to face problems unless steps are taken to provide proper training on wheat cultivation.

6. An over-whelming a great majority (100%) of the respondents had low to medium extension media contact, while there was a negatively significant relationship between extension media contact of the farmers and their constraints faced. Therefore, it may be concluded that all the farmers will continue to face constraints, if suitable steps are not taken to strengthen extension activities among the respondents.

7. A majority (59.00%) of the farmers had medium innovativeness, while there existed a negative significant relationship between farmers' innovativeness and their constraints faced. The above facts lead to the conclusion that more innovativeness of the farmers will be highly helpful for minimizing their constraints in wheat cultivation.

8. A majority (88.00%) of the farmers had low to medium cosmopoliteness, while there existed a negative significant relationship between farmers' cosmopoliteness and their constraints faced. The above facts lead to the conclusion that more cosmopoliteness of the farmers will be helpful to minimizing their constraints in wheat cultivation.

9. Near about 100% of the respondents fell in high knowledge category, but there exists a very strong negative significant relationship between wheat cultivation knowledge of the farmers and their constraints faced. This might be due to cause of other negative factors which are responsible against wheat cultivation and only higher knowledge on wheat cultivation is able to solve all the constraints. Therefore, conclude that an effort to improve wheat cultivation knowledge of the farmers would be helpful for minimizing their constraints in wheat cultivation.

10. Farmers faced highest constraints in "high price of laborer" which ranked first followed by "low market price of wheat", "high price of HYV wheat seed" and "shortage of quality seeds". Therefore, it may be concluded that emphasis should be taken to minimize these constraints.

Recommendations

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

Recommendation for policy implication

1. Most of the respondents (62%) faced high constraints 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 constraints causing impediment to the wheat cultivation, harvesting, storage and marketing.

2. Majority (85%) of the farmers had small to medium farm size, while there was a negatively significant relationship between farm size and their constraints faced. Therefore, it may be recommended that attempts should be taken to provide technical support and subsidy, especially for the small and medium farm sized wheat growers.

3. DAE should increase training facilities to develop skills of the wheat farmers technologically to minimize their constraints because training exposure on wheat cultivation had a significant negative relationship with the constraints faced by the farmers.

4. DAE, NGOs and other organizations should pay concentrations to increase the contact with farmers personally and motivate them to be connected with different media which will reduce their constraints on wheat cultivation because significant negative relationship between the extension media contact and the constraints faced by the farmers were found in wheat cultivation.

5. Majority (88%) of the respondents had medium to low cosmopoliteness. So, extension workers should identify the cosmopolite farmers and utilize them in extension programs for encouraging adoption of improved wheat cultivation technologies. To motivate farmers for adopting new technologies, visiting of farmers in different research organization should be done.

6. The findings indicated that wheat cultivation knowledge had significant negative relationship with the constraints faced by the farmers in wheat cultivation. So, to minimize constraints.

7. Thus, it may be recommended that the extension provider 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 constraints.

8. It is necessary to increase awareness about any improved production technologies to reduce constrains. No development work will be effective if the farmers remain illiterate or low education. So, to reduce constraints education levels should be upgraded.

9. Investment on wheat cultivation should be increased to decreased constraints to ensure use quality seed, fertilizer and irrigation etc. in times. So, it may be recommended that DAE, GOs, NGOs should supply credit so that they can overcome the constraints.

10. By analyzing CFI, it was found that farmers faced higher constraints in "high price of laborer" which ranked first followed by "low market price of wheat", "high price of HYV seeds" and "shortage of quality seeds". Therefore, it may be recommended that necessary technical support should be provided for the wheat growers to minimize their constraints with special emphasis to these constraints.

Recommendations for further study

The present piece of research work was conducted on some selective constraints 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 Alamdanga upazila under Chuadanga 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 constraints faced by the farmers in wheat cultivation. Measurement of constraints of the farmers is not free from questions. More reliable measurement of the concerned variable is necessary for further study.

   iii.   To explore relationships of 12 selected characteristics of the respondents with their constraints faced in wheat cultivation, this study was carried out. 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 wheat cultivation.

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

v. To solve wheat cultivation constraints, research should be undertaken on the effectiveness of agricultural extension services and other related organizations.

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Appendix I. Questionnaire of the study: Constraint of wheat production in Alamdanga upazila under Chuadanga district

Department of Agricultural Extension & Information System

Sher-e-Bangla Agricultural University, Dhaka-1207

A questionnaire on

An interview schedule for a research study entitled

CONSTRAINT OF WHEAT PRODUCTION IN ALAMDANGA UPAZILA UNDER CHUADANGA DISRTRICT

Serial No. : ………………………………………….

Name of the respondent : …………………………………………..

Address : …………………………………………..

: …………………………………………..

: …………………………………………..

Please answer the following questions. Information given by you will be kept secret and only be used for research work

1. Age

What is your age? ------------------------- Years.

2. Education:

     a) Illiterate ……………….

     b) Can sign only …………….

     c) Studied up to primary education -----------

     d) Studied up to secondary education --------------

     e) Studied up to above secondary education --------------

3. Family size

Please mention the number of your family members in the following groups:

     Total member = ----------------------------------- person(s)

4. Farm Size

Please mention the area of your land possession:

Sl. No.	Types of land ownership	Land Area	
		Local unit	Hectare
1.	Homestead area (Including pond) (A_1)		
2.	Own land under own cultivation (A_2)		
3.	Land given to others as shared crop (A_3)		
4.	Land taken from others as shared crop (A_4)		
5.	Land given to others as lease (A_5)		
6.	Land taken from others as lease (A_6)		
7.	Fallow land (A_7)		
	Total		

Total farm size = $A_1 + A_2 + ½ (A_3 + A_4) + A_5 + A_6 + A_7$

5. Annual income (Tk.)

Please mention your annual family income from different sectors in the last year

  A. Agriculture

Sl. No.	Source of income	Amount of production	Price per unit (Tk.)	Total (Tk.)
1	Rice			
2	Jute			
3	Wheat			
4	Potato			
5	Pulse			
6	Oilseed			
7	Spices and condiments			
8	Vegetables			
9	Fruits			
10	Other crops			
11	Fish culture			
12	Poultry rearing			
13	Cattle rearing			

  B. Other sources

Sl. No.	Source of income	Amount of production	Price per unit (Tk.)	Total (Tk.)
1	Business			
2	Service			
3	Labour			
4	Others			

  Total annual income = A+B+C+D+E = ……………………………. Tk.

6. Training Exposure

Do you attend any training on agriculture during last 5 years?   **Yes** ☐   **No** ☐

If yes, Please mention the training courses you have attended so far

Sl. No.	Subject	Place	Duration (day)	Organization
1.				
2.				
3.				
4.				
5.				
6.				

7. Extension contact
Please mention the extension contact you have attended so far

Type of media	Name of information media	Extent of contact			
		Frequently	Occasionally	Rarely	Not at all
		3	2	1	0
Personal Contact	Friends/relatives				
	Extension agents (SAAO/FMO)				
	Extension officials (AEO/AAO/UAO)				
	BADC officials/UFPO				
	NGO personnel/AHI/UMO				
	Input dealers				
	Model farmer				
Group Contact	Demonstrations				
	Field days				
	Training days				
	Group meetings				
Mass Contact	Radio				
	Television				
	Newspaper				
	Leaf lets or booklet				
	Reading agricultural books				
	Agricultural fair				
	Audio-visual aids				

8. Innovativeness

Please mention extent of use of the following modern agricultural practices.

Sl. No.	Name of Innovation	Used			Do not use
		Below 1 year (1)	1-3 years (2)	Above 3 year (3)	(0)
1.	Use of organic manure instead of chemical fertilizers				
2.	Use of green manure in crop production				
3.	Use of modern Agricultural Machineries (Power tiller/ Pump/ Seed Driller)				
4.	Use of light trap/IPM technology				
5.	Use of HYV/Hybrid Seed				
6.	Reduction of chemical pesticides				
7.	Effective use of organic pesticides				
8.	Processing of agricultural products for storage and/or marketing using organics instead of synthetic chemicals				

9. Cosmopoliteness

Please indicate how frequently you visit the following places within a specific period.

Sl. No.	Places of visit	Degree of Visit			
		Regularly (3)	Occasionally (2)	Rarely (1)	Not at All (0)
1.	Visit to market/Relatives/friends Outside of your own village but Within your own union	7 or more times/month	3-6 times/ month	1-2 times/ month	No Visit
2.	Visit to Other union	6 or more Times/month	4-5 times/ month	1-3times/ month	No Visit
3.	Visit to own thana headquarter	6 or more Times/month	4-5 times/ month	1-3times/ month	No Visit
4.	Visit to other Thana headquarter	4 or more Times/year	3-4 times/ year	once/ year	No Visit
5.	Visit to own town/head quarter	4 or more Times/year	3-4 times/ year	once/ year	No Visit
6.	Visit to other District town/headquarter	4 or more Times/year	2-3times/ year	once/ year	No Visit
7.	Visit to Capital City or Other Metropolitan City	4 or more Times/year	2-3times/ year	once/ year	No Visit

9. Wheat cultivation area: Mention the area you have used for wheat cultivation?
…………………………. (hectares)

10. 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 seed rate kg/ha for modern wheat cultivation?	2	
5.	How many times irrigation is needed for wheat cultivation?	2	
6.	How can you increase soil fertility?	2	
7.	Mention the rate of fertilizer per ha is needed in wheat cultivation?	2	
8.	What is the importance of applying balance fertilizer in wheat?	2	
9.	How do you control insect & pest in wheat field?	2	
10.	After how many days of sowing the first irrigation is required?	2	
11.	Mention two chemicals for wheat blast treatment?	2	
12.	Mention two diseases of wheat?	2	
13.	Mention the name of a pesticide for wheat seed treatment?	2	
14.	Mention the symptom of blast diseases of wheat?	2	
15.	How do you control blast diseases in wheat field?	2	
16.	What is the suitable time of harvesting wheat?	2	
17.	What is the best method for seed storing?	2	
18.	Why wheat cultivation is decreasing day by day?	2	
	Total	36	

11. Credit received:

Did you receive any credit from any sources?   Yes ☐   or   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. Constraints: Constraints faced by the Farmers in wheat cultivation in Alamdanga Upazila under Chuadanga disrtrict.

Please mention the constraints faced in wheat cultivation

Sl. No.	Problems	Constraints score					
		Very high	High	Moderate	Low	Very low	Not at all
		5	4	3	2	1	0
1.	Shortage of capital						
2.	Shortage of quality seeds						
3.	High price of HYV seeds						
4.	High price of fertilizer/pesticide						
5.	Lack of training on wheat cultivation						
6.	Difficulty in getting loan from Bank or other financial organization in time						
7.	Lack of marketing facilities						
8.	Shortage of irrigation facilities						
9.	Unavailability of pesticides in time						

10.	Low market price of wheat							
11.	High cost of irrigation							
12.	Lack of storage facilities							
13.	Lack of knowledge on using balanced fertilizers for wheat cultivation							
14.	High price of laborer							
15.	Lack of proper knowledge on seed storage at farmers level							
16.	Transport problem							
17.	Pest attack in wheat field							

Thanks for your co-operation

Date

_____
Signature of the interviewer

Appendix II. Correlation matrix

Category	Age	Education	Family size	Farm size	Annual income	Training exposure	Extension contact	Innovativeness	Cosmopoliteness	Wheat Cultivation Area	Knowledge on wheat cultivation	Credit received	Constraints
Age	1	-.479(**)	.636(**)	0.019	-0.053	-0.109	-.387(**)	-.221(*)	-.510(**)	-0.025	-0.094	-0.072	-0.082
Education	-.479(**)	1	-.266(**)	.433(**)	.448(**)	.237(*)	.376(**)	.239(*)	.492(**)	.461(**)	.284(**)	0.006	-0.374(**)
Family size	.636(**)	-.266(**)	1	-0.034	0.012	-0.023	-0.139	-0.07	-.260(**)	-0.031	-0.037	0.008	-0.076
Farm size	0.019	.433(**)	-0.034	1	.854(**)	.199(*)	-0.028	.584(**)	.489(**)	.960(**)	.426(**)	0.151	-0.238(**)
Annual income	-0.053	.448(**)	0.012	.854(**)	1	.283(**)	0.069	.577(**)	.586(**)	.838(**)	.496(**)	0.08	-0.208(*)
Training exposure	-0.109	.237(*)	-0.023	.199(*)	.283(**)	1	0.131	0.111	0.187	.204(*)	0.187	-0.047	-0.382(**)
Extension contact	-.387(**)	.376(**)	-0.139	-0.028	0.069	0.131	1	-0.011	.401(**)	-0.001	.224(*)	0.118	-0.318(**)
Innovativeness	-.221(*)	.239(*)	-0.07	.584(**)	.577(**)	0.111	-0.011	1	.546(**)	.613(**)	.477(**)	.206(*)	-0.242(*)
Cosmopoliteness	-.510(**)	.492(**)	-.260(**)	.489(**)	.586(**)	0.187	.401(**)	.546(**)	1	.520(**)	.488(**)	.232(*)	-0.207(*)
Wheat Cultivation Area	-0.025	.461(**)	-0.031	.960(**)	.838(**)	.204(*)	-0.001	.613(**)	.520(**)	1	.458(**)	.204(*)	-0.023
Knowledge on wheat cultivation	-0.094	.284(**)	-0.037	.426(**)	.496(**)	0.187	.224(*)	.477(**)	.488(**)	.458(**)	1	0.087	-0.726(**)
Credit received	-0.072	0.006	0.008	0.151	0.08	-0.047	0.118	.206(*)	.232(*)	.204(*)	0.087	1	0.211(*)
Constraints	-0.082	-0.374(**)	-0.076	-0.238(**)	-0.208(*)	-0.382(**)	-0.318(**)	-0.242(*)	-0.207(*)	-0.023	-0.726(**)	0.211(*)	1

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