

ATTITUDE OF THE MAIZE FARMERS TOWARDS VALUE CHAIN

A Thesis

By

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**MASTER OF SCIENCE
IN
AGRICULTURAL EXTENSION**

**Department of Agricultural Extension
Hajee Mohammad Danesh Science and Technology University
Dinajpur**

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Student No. 1605084

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The Author

ATTITUDE OF THE MAIZE FARMERS TOWARDS VALUE CHAIN

ABSTRACT

The main purpose of the study was to determine the attitude of maize farmers towards value chain. Data were collected from 94 randomly selected farmers out of 750 maize farmers of Joldhaka upazila under Nilphamari district during 13 March, 2017 to 25 April, 2017, through personal interview. Simple and direct questions with different scales were used to obtain information. Co-efficient of correlation (r) was computed in order to explore the relationships between the maize farmers' attitude towards value chain project and their eight selected characteristics. Slightly more than four-fifths percent (81.9 percent) of the total sampled farmers had moderately favorable attitude towards access to backward linkage. Overall more than four-fifths (83.0 percent) of the total respondents had moderately favorable attitude towards access to forward linkage. Overall more than three-fifths (62.8 percent) of the total respondents had moderately favorable attitude towards maize value chain project while 19.1 percent having slightly favorable attitude and 18.1 percent fell in the highly favorable attitude category. Correlation analyses indicated that among eight selected characteristics education, family income, organizational participation and training received had positive significant relationships with their attitude towards value chain project while family size had significant negative relationship. However, age, farm size and savings of the farmers had no significant relationships with their attitude towards value chain project. 'Training is not enough on production technologies and marketing which is provided by private company' (91.49 percent) emerged as the most important problem opined by the farmers. 'Distance buyers are not coming due to fewer amounts of products' was the least problems as opined by the farmers (69.15 percent). The foremost (85.11 percent) suggestion cited by the farmers was 'Private company should provide training as per farmers demand'. 'Should organize the farmers to aggregate the products as per buyers demand' is the last ranked suggestion given by the farmers (61.11 percent).

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CHAPTER 1

INTRODUCTION

1.1 General Background

Bangladesh is the country with distinct agricultural setting and has a primarily agrarian economy. Agriculture is main occupation of the working population with 45.0 percent being engaged in these activities. Contribution of agriculture in GDP is more than 15.0 percent in 2015-16. Its diverse sub-sectors comprising of crops, livestock, fisheries and forests account for 55.0 percent, 14.0 percent, 22.0 percent and 9.0 percent respectively in its agriculture economy (BBS, 2017).

Agriculture is the principal means of livelihoods in Bangladesh. Maize is the third most important cereal crop in Bangladesh, after rice and wheat. It is a major cash crop and mostly used and traded as a leading feed crop but is also an important food staple. In addition to food and feed, maize has wide range of industrial applications as well; from food processing to manufacturing of ethanol and is one of the major sources of employment of char dwellers, especially for smallholders and women. In the char areas, amongst its use in numerous other areas, maize is most commonly used in the poultry and fish feeds industries, for baking and other foods for human consumption. The nutritional value of maize, its economic importance and its incredibly diverse uses is significant of the immense and transferrable virtues of the crop, important not only in Bangladesh, but across every region of the world. The fertile soils and subtropical monsoon climate make Bangladesh much suitable for maize cultivation, although maize is a new crop. Before independence in 1971, maize was rarely cultivated across Bangladesh except in a few tribal areas of the southeastern Chittagong Hill Tracts (BBS, 2010). At presents the area, production, and yield of maize have increased by 17 percent, 33 percent, and 16 percent, respectively, which reflect the effect of adopting improved technology (Mohiuddin, 2003). The cultivation of maize is increasing day by day in Bangladesh. In 2009-10 cropping season, it was planted on about 147996.59 ha of land with national average yields of around 5.7 ton/ha producing well over a million tons of maize grain annually (BBS, 2010) and in 2013-14 it was planted on 37144.29 ha of land national yield was 6913.53 mt/ha and total production was 21,23,572 mt, similarly in the production session of 2014-15 it was planted on 3,25,453.036 ha, average yield was 6,980.22 mt/ha as well as total production was 22,71,998 (BBS, 2016). The data also demonstrates a notable trend of increasing annual domestic production in maize.

Bangladesh is the 7th most populous country in the world with a total population of 153.6 million, population growth rate is 1.37 (BES, 2013) and its density of population is 1015 persons per Km² (BES, 2013). More than 70.0 percent of the country's population as well as 48.40 percent of its labour force are directly and indirectly being dependent on agriculture and contributing 19.95 percent to the GDP (BBS, 2010). In Bangladesh, the total cultivated area is decreasing year to year. Rice is the major cereal crop and is the staple food occupying 70.0 percent of the total cropped land (BER, 2010). The government policy is predominantly based upon a high yielding variety (HYV) rice and wheat (BBS, 2010). The country puts emphasis on replacing its traditional agricultural practices by applying modern inputs such as HYV seeds, fertilizer, irrigation, pesticides, power tiller, etc. (BARI, 2008). Bangladesh has a huge potentiality for increasing maize production. It has 14.09 million hectares of cultivated land and it is estimated that nearly 2.8 million hectares are suitable for maize cultivation but it covers only 1.5 million hectares (BBS, 2010). Local demand for maize stands at an estimated 12 million tons annually, and this demand is mostly from the poultry and fish sector. Maize is grown both in winter and summer seasons in Bangladesh. It is always more profitable than many other crops and the enthusiastic farmers are getting a high yielding variety of maize seeds and latest scientific methods of cultivation for further success. Although maize is one of the major grain crop of Bangladesh, but its production technologies has not been standardized from the scientific and economic point of view.

iDE (International Development Enterprises) has been putting business to work for the poor for more than three decades, using market based solutions to change the living conditions and livelihoods of millions of people around the globe. Profitable Opportunities for Food security (PROOFS) is a value chain project implemented by iDE. To achieve the project objectives it has three components: Agriculture, Water, Sanitation and Hygiene (WASH) and nutrition. The project was employed a market-development approach in acting as a facilitator to deliver results by working through and strengthening private sector actors (PSAs) rather than acting as a direct service provider. The result was achieved through a "solutions as a business" and "business as a solution" approach.

Since the maize market in Bangladesh is mostly dependent on the poultry industry, it is important to diversify the maize market and reduce risk. There is also room for maize-based food products which can be a good source of nutrition and can contribute to the health and food security of Bangladesh. The project is looking for innovative solutions to mitigate the risk.

Value chains have become a key concept in international discussions on development, in particular in relation to the effects of globalization on employment and poverty reduction. The value chain as a concept describes the full range of activities that firms, farms and workers do to bring a product from its conception to its end use and beyond. This includes activities such as design, production, marketing, distribution and support to the final consumer. The activities that comprise a value chain can be contained within a single firm or divided among different firms. Value chain activities can produce goods or services, and can be contained within a single geographical location or spread over wider areas.

The maize value chain would benefit from better regional trade integration throughout the country. Increased intra-regional trade in maize would have several multiplier effects on maize value chain. Besides more remunerative prices for the producers and improved standards, greater intra-regional maize trade would stimulate public and private investments in research, marketing, agricultural services and infrastructures (Kaminski *et al.*, 2013). Bangladesh has a great opportunity to sustain such kind of flow in maize, if maize cultivation, processing and marketing are postulated in a scientific manner. But no in-depth study was conducted on productivity, efficiency, profitability in Bangladesh. A few efficiency studies regarding rice, wheat, potato, tomato, cauliflower, poultry and fish farming were observed in Bangladesh. That's why to increase and make profitable for farmers as well as market actors the GOs, NGOs and policy makers conduct a successful maize revolution in Bangladesh.

1.2 Importance of the Study

Bangladesh is an agricultural country. The most of her inhabitants directly or indirectly are involved in agricultural activities for their livelihood. Bangladesh by birth possesses very fertile land in which diversified crops grow very easily. Various types of crops are produced in this country. Maize is one of the most important food grains in the world as well as developing countries like Bangladesh. It is one of the cash crops in Bangladesh which has the potential to pull farmers out of poverty. Poverty cannot be reduced to a desired level except increasing productivity of agriculture sector and at the same time it is to be assured that farmers get fair price of the crops. A value chain is a set of activities that a firm operating in a specific industry performs in order to deliver a valuable product or service for the market. The maize value chain would benefit from better regional trade integration throughout the country. Increased intra-regional trade in maize would have several multiplier effects on maize value chain. In order to justify the farmers' attitude towards maize value chain this research work has been undertaken.

1.3 Statement of the Problem

Agriculture is considered as a critical sector in the world economy. It contributes 24.0 percent of global GDP and provides employment to 22.0 percent of world's population (FAO, 2010). Maize is one of the cash crops in Bangladesh which has the potential to pull farmers out of poverty. It is a versatile crop due to its multifarious uses as feeds, food and industrial raw material. Every part of the maize plant is useful.

Bangladesh government is remarkably concerned about this agriculture sector. Notable portion of annual budget has consistently been allocated for the last couple of years for the development of the sector. Government has also been launching many programmes one after another in order to boost up the agriculture production. Production of crops, cost of production of crops and market price of crops are directly interrelated. Government has to give proper attention on these three factors as stated so that the farmer get fair price of the crop produced during the harvest time.

Now a day's most of the NGOs working in Bangladesh have been incorporating rural poor into their multiphase development activities. There are a good number of research studies reporting positive impact of value chain on socio-economic uplift of the lowest segment of people in Bangladesh. Hence, it is very necessary to undertake a research study on attitude towards value chain. In view of the foregoing discussion the researcher undertook a research study entitled "attitude of the maize farmers towards value chain". Therefore, the present study undertakes to endeavor with the followings research questions.

1. In what extent the maize farmers' attitude towards value chain?
2. What are the relationships among the farmers selected characteristics with their attitude towards value chain?
3. What are the problems faced by the maize farmers in implementing value chain process and what are the probable suggestions to overcome these problems?

1.4 Objectives of the Study

In view of the problems stated above, the following objectives put forward for giving proper direction to the study:

- a) To determine and describe the socio-demographic characteristics of the maize farmers in value chain. The selected characteristics are:

- i. Age
- ii. Education
- iii. Family size
- iv. Family income
- v. Farm size
- vi. Savings
- vii. Organizational participation
- viii. Training received

b) To determine the attitude of maize farmers towards value chain in the following two dimensions:

- i) Attitude of maize farmers towards access to backward linkage as well as inputs availabilities regarding maize production.
- ii) Attitude of maize farmers towards access to foreword linkage as well as product sale through the relevant market actors.

c. To determine the relationship between the selected characteristics of maize farmers with their attitude towards value chain activities.

d) To determine the problems faced by the maize farmers in implementing value chain process and their probable suggestions to overcome the problems.

1.5 Assumptions of the Study

The researcher made the following assumptions while undertaking the study.

1. The researcher who has acted as interviewer was well adjusted to the social and cultural environment of the study area. Hence, the data collected by the researcher from the respondents furnished their correct opinions.
2. The respondents were capable of furnishing proper responses to the questions included in the interview schedule.
3. Views and opinions given by the respondents included in the sample of the study were the representative views and opinions of the whole population of the study area.
4. The responses furnished by the respondents were reliable and valid. They expressed the truth about their convictions and awareness.
5. The information sought reveals the real situation to satisfy the objectives of the study.
6. The items, questions and scales included in the questionnaire were relevant and appropriate.
7. Data were normally and independently distributed.

8. The sampling procedures followed for this study, the analysis of data and interpretations etc. were free from all biases.
9. The findings of the study will have general application to other part of the country with similar environment, ecology, socio-economic and cultural characteristics of the study area.

1.6 Limitations of the Study

In order to make the study meaningful and manageable from the point of view of the researcher, it was necessary to impose some limitations as stated below:

1. Since the findings of the study were based on the opinion expression capability and ability to recall of the respondents, the study was confined to both their ability to recall and also their sincerity and honesty in providing the needed information.
2. There are many characteristics of the farmers but only eight of them were selected for this study.
3. For investigation of this study, the researcher depended on the data as furnished by the selected farmers during the time of data collection.
4. The attitude of the farmers was measured on the basis of their responses to the selected statements.

1.7 Definition of Important Terms

For the purpose of clarity, certain terms frequently used throughout the entire study are defined and explained as follows:

Age

Age of a respondent defined as the span of his/her life and is measured by the number of years from his/her birth to the time of interviewing.

Education

Education referred to the development of desirable knowledge, skill and attitude in an individual through the experience of reading, writing, observation and relative activities.

Family size

Family size referred to actual number of permanent members in a subject's family who live in a fixed dwelling unit and eat from the same cooking arrangement.

Farm size

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

Family income

Family income referred to the total earnings of all the family members of a respondent from agriculture, livestock and fisheries and other accessible resources.

Training received

Training received refers to the total number of days that a respondent had received training in her/his entire life from any organizations under different training programs.

Farmer

Farmer means the principal decision maker involved in the management of a farm, not always be the head of the farm-household.

Attitude

Attitude is a mental state of readiness, which has dynamic influence upon the individuals' response to any social objects or situation. It is an enduring psychological system considering of three interacting components centering on a single object. These three components may be classified as cognitive components, feeling components and action tendency components.

Value chain

A value chain is a high-level model developed by Michael Porter used to describe the process by which businesses receive raw materials, add value to the raw materials through various processes to create a finished product, and then sell that end product to customers (Porter, 1985).

Problems

Problems refer to the influences/aspects/features/issues that act as obstruction or barrier in farmer's cultivation of pariza rice. Generally, a problem is created in the context of either a theoretical or practical situation.

Solution

Solution is the means of solving a problem or dealing with a difficult situation.

CHAPTER 2

REVIEW OF LITERATURE

In this chapter, review of literatures relevant to the objectives is presented. This is mainly concerned with farmers' attitude towards maize value chain. Reviewed materials included books, M.S. Thesis, websites, publications, journals, reports, magazines etc. The researcher therefore, made exhaustive effort to review the previous research works directly or indirectly related to the present study by different research in home and abroad. This chapter has been presented in three sections. First section deals with concept of attitude, second section details with concept of value chain, and the third section deals with the review of past studies concerning relationship of the selected characteristics of the farmers with their attitudes. The conceptual framework of the study is presented in the fourth section.

2.1 Concept of Attitude

Attitude is a predisposition or a tendency to respond positively or negatively towards a certain idea, object, person, or situation. Attitude influences an individual's choice of action, and responses to challenges, incentives, and rewards (Business Dictionary, 2012).

The classic, tripartite view is that an attitude contains cognitive, affective, and behavioral components. Empirical research, however, fails to support clear distinctions between thoughts, emotions, and behavioral intentions associated with a particular attitude (Rosenberg and Hovland, 1960).

A criticism of the tripartite view of attitudes is that it requires cognitive, affective, and behavioral associations of an attitude to be consistent, but this may be implausible. Thus some views of attitude structure see the cognitive and behavioral components as derivative of affect or affect and behavior as derivative of underlying beliefs (Whitley, 2010).

The readiness to respond to a certain object in a favorable or unfavorable fashion; every attitude has both an intrinsic belief and a behavioral disposition. Attitudes are a permanent system of evaluations, emotions, and direct behavioral tendencies for or against an object. Individuals develop their attitudes through a continuous process of adaptation to the social environment. Attitudes are organized ways of thinking and acting in relation to facts and people in our environment, and they help influence our overall way of life (Encyclopedia of Britannica, 1960).

Attitudes can also be explicit and implicit. Explicit attitudes are those that we are consciously aware of and that clearly influence our behaviors and beliefs. Implicit attitudes are unconscious, but still have an effect on our beliefs and behaviors (Cherry, 2012).

Attitude is the learned orientations towards object, or predisposition to behave in certain ways towards a given objects or a class of objects. An attitude has always on object, person, thing or concept and it may be general or specific (McGrath, 1966).

Attitude, in social psychology, is a predisposition to classify objects and events and to react to them with some degree of evaluative consistency. The concept of attitude arises from attempt to account for observed regularities in the behavior of individual persons. The quality of one's attitude is judged from the observable, evaluative responses he tends to make (Encyclopedia of Britannica, 1960).

An attitude as the degree of positive or negative affect associated with some psychological object like symbol, phrase, slogan, person, institution, ideal or ideas towards which people can differ in varying degrees (Thurstone, 1946).

Attitude as a state of mental and emotional readiness to react to situations, person or things, in harmony with a habitual pattern of response previously conditioned to or associated with these stimuli. Attitude is the by-product of an individual's experience and has their bases in inner uses, acquired habits and environmental influences by which he is surrounded (Goode, 1945).

2.1.1 Components of attitude

Triandis (1971) explained that, "An attitude is an idea charged with emotion, which predisposes a class or actions to a particular class or social situation." This definition suggests that attitude has three components, those components are cognition, affective and behavioral, are:

- a) The cognitive component of attitude consists of the belief of the individual about the object. This may also be said as understanding, knowledge and conception.
- b) The feeling or affective component of an attitude refers to the emotions connected with the object. The object is felt to be pleasing or displeasing; it is liked or it is disliked.
- c) The action or behavioral component of an attitude includes all die behavioral readiness associated with the attitude.

Krech *et al.* (1962) explains attitude as a system of the interrelated components that the authors express as “In defining attitude as systems, we are emphasizing the interrelatedness of the three attitude components. When incorporated in a system, these components become manually interdependent about an object are influenced by his feelings and action tendencies toward that object. And a change in his cognition about the object will tend to produce changes in his feelings and action tendencies toward it.”

2.1.2 Formation of attitude

Attitudes form directly as a result of experience. They may emerge due to direct personal experience, or they may result from observation. Social roles and social norms can have a strong influence on attitudes. Social roles relate to how people are expected to behave in a particular role or context. Social norms involve society's rules for what behaviors are considered appropriate.

Attitudes can be learned in a variety of ways. Consider how advertisers use classical conditioning to influence your attitude toward a particular product. In a television commercial, one see young, beautiful people having fun in on a tropical beach while enjoying a sport drink. This attractive and appealing imagery causes you to develop a positive association with this particular beverage. Operant conditioning can also be used to influence how attitudes develop. Imagine a young man who has just started smoking.

Whenever he lights up a cigarette, people complain, chastise him and ask him to leave their vicinity. This negative feedback from those around him eventually causes him to develop an unfavorable opinion of smoking and he decides to give up the habit. Finally, people also learn attitudes by observing the people around them. When someone you admire greatly espouses a particular attitude, you are more likely to develop the same beliefs. For example, children spend a great deal of time observing the attitudes of their parents and usually begin to demonstrate similar outlooks (Cherry, 2012).

2.1.3 Changes of attitude

While attitudes can have a powerful effect on behavior, they are not set in stone. The same influences that lead to attitude formation can also create attitude change. The theories of attitude that can influence people's attitude are:

Learning theory of attitude change: Classical conditioning, operant conditioning and observational learning can be used to bring about attitude change. Classical conditioning can be used to create positive emotional reactions to an object, person or event by associating

positive feelings with the target object. Operant conditioning can be used to strengthen desirable attitudes and weaken undesirable ones. People can also change their attitudes after observing the behavior of others.

Elaboration likelihood theory of attitude change: This theory of persuasion suggests that people can alter their attitudes in two ways. First, they can be motivated to listen and think about the message, thus leading to an attitude shift, or they might be influenced by characteristics of the speaker, leading to a temporary or surface shift in attitude. Messages that are thought-provoking and that appeal to logic are more likely to lead to permanent changes in attitudes.

Dissonance theory of attitude change: As mentioned earlier, people can also change their attitudes when they have conflicting beliefs about a topic. In order to reduce the tension created by these incompatible beliefs, people often shift their attitudes (Cherry, 2012).

2.1.4 Review of literature on different aspects of attitude

Rahman (2015) found that about 77.78 percent of the respondents had high favorable attitude towards the rice cultivation and 22.22 percent of the respondents had low favourable attitude towards the rice cultivation.

Rashid (2014) found that highest proportion (58.7percent) of farmers' had moderately favorable attitude, while 22.1 percent and 19.2 percent had highly favorable attitude and slightly favorable attitude towards the use of *dolochun* for crop production. It is found that the majority of the respondent showed moderately favorable attitude.

Husna (2014) found that two-thirds (66.2 percent) of the respondents had less favorable attitude followed by 21.3 percent had medium favorable and only 12.5 percent had high favorable attitude towards pesticide risk reduction.

Ahmed (2013) reported that maximum (60.0 percent) of the farmers had highly favorable attitude towards thai koi farming.

Khan (2012) found that the majority (64.0 percent) of the farmers had moderately favorable attitude, compared to 29.0 percent having favorable and only one percent had unfavorable attitude towards modern jujube cultivation.

Shahin (2012) found that, highest proportion (38.0 percent) of farmers had 'moderately favorable' while 32.0 percent and 30.0 percent had 'highly favorable' and 'slightly favorable' attitude towards the use of Cattle Health Card (CHC) under SDVC project of

CARE respectively. Correlation analyses showed that the characteristics of the farmers' namely educational qualification, annual family income and agricultural knowledge had significant positive relationships with their attitude towards the use of cattle health card under SDVC project of CARE.

Samad (2010) found that the majority (69.84 percent) of the farmers had favorable attitude, while one percent had unfavorable attitude and 29.16 percent had neutral attitude for the project farmers. The attitude score of non-project farmers showed that the majority (58.33. percent) possessed neutral attitude, 2.08 percent had favorable attitude and 39.59 percent had favorable attitude towards aerobic rice cultivation.

Dzomeku *et al.* (2009) revealed that smallholders contribute significantly to the agricultural gross domestic product of most developing countries. The majority (84 percent) of the farmers indicated that the hybrids were superior to the landraces in terms of plant establishment, plant growth, vigor and fruit yield.

Ahmed (2006) found that majority (87.0 percent) of the shrimp farmers had favorable attitude towards shrimp farming compared to 7.0 percent having neutral and only 6.0 percent had unfavorable attitude.

Uddin *et al.* (2006) observed equal proportion of farmers (39.0 percent) having moderately favorable and highly favorable attitude towards sustainable agriculture. On the other hand, 4.0 percent and, 18.0 percent farmers had highly unfavorable and moderately unfavorable attitude towards sustainable agriculture respectively. Farmers level of education, farm size, annual family income, training exposure, knowledge of environment friendly farming, experience of environment friendly farming practice and innovativeness had positive and significant relationship with their attitude towards sustainable agriculture. The major problems confronted by the farmers in practicing sustainable agriculture were: lack of insects/diseases resistance varieties of crops, lack of training facilities related to sustainable agriculture, lack of knowledge about environment friendly production technology of crops, and lack of knowledge about IPM attitude.

Khan (2004) attempted to determine the attitude of farmers towards groundnut cultivation and to explore relationships between twelve selected characteristics of the farmers and their attitude. The author purpose of the study was to determine the adoption of improve practices by the farmers in cultivating groundnut and to identify the problems faced by the farmers in groundnut cultivation. The overwhelming majority (93.14 percent) of the groundnut farmers

had favorable attitude towards groundnut cultivation compared to 4.90 percent having neutral and only 1.96 percent had unfavorable attitude. Correlation analysis indicated that education, farm size, agricultural knowledge, agricultural training experience and innovativeness of the farmers had significant positive relationships with their attitude towards groundnut cultivation.

Sarkar (2004) revealed that 28.75 percent of the imams had favorable attitude towards crop cultivation, while 51.25 percent had moderately favorable attitude and the rest 20.0 percent had less favorable attitude towards crop cultivation. For livestock development, 22.5 percent of the imams had favorable attitude, while 67.5 percent had moderate and the rest 10.0 percent had less favorable attitude towards livestock development. For fish culture, 28.75 percent had favorable, 66.25 percent had moderate and rest 5.0 percent had less favorable attitude towards fish culture. Again, 16.25 percent of the imams had favorable attitude towards overall improved agricultural technologies, while 70.0 percent had moderate and rest 13.75 percent had less favorable attitude towards overall improved agricultural technologies.

Farhad and Kashem (2004) conducted a study to determine attitude of rural women in using IPM in vegetable cultivation and to explore the relationship between the selected characteristics of the women and their attitude of IPM in vegetable cultivation. The majority (68.0 percent) of the respondents had medium attitude while 17.0 percent low attitude and 15 percent high attitude in using IPM in vegetable cultivation. Out of 10 selected characteristics of the respondents, education, cosmopolitaness and contact with extension media had positive significant relationship.

Chowdhury (2003) observed that majority of the farmers in progressive village held moderately favorable attitude (52.0 percent) compared to farmers of traditional village of whom 43 percent held moderately favorable and 29.0 percent held moderately unfavorable attitude towards crop diversification. Farmers of progressive village having favorable attitude towards crop diversification were more than the farmers of traditional village. Overall 61.0 percent farmers of the study area had moderately favorable to highly favorable attitude towards crop diversification. Out of twelve selected characteristics of the farmers seven, namely, level of education, family annual income, and cosmopolitaness, knowledge on crop diversification, risk orientation, and awareness on adverse effect of rice monoculture were positively correlated with their attitude towards crop diversification.

Haque (2002) carried out a study to assess the extent of attitude of rural women in selected homestead agriculture activities viz. homestead vegetable cultivation, poultry raising, goat

rearing, fish cultivation and tree plantation. The highest percentage of the rural women had moderate favorable attitude in each of the five selected activities. These were 85.0 percent in poultry rising, 83.0 percent in goat rearing, 78.0 percent in fish cultivation, 72.0 percent in tree plantation, and 70.0 percent in vegetable cultivation. The correlation analysis showed that education, farm size and family income of the rural women had positive relationship with their attitude to all of the activities and in most cases the relationship was significant.

Sarkar (2002) revealed that the majority of rice growers (62.37 per cent) had moderately unfavorable attitude towards the use of DAP while 26.73 per cent and 5.95 per cent had moderately favorable and highly favorable attitude respectively towards the use of DAP. Only 4.95 per cent fell in highly unfavorable attitude.

2.2 Concept of Value Chain

The value chain concept was developed and popularized in 1985 by Michael Porter,

Porter, (1985) defined value chain is a chain of activities. Products pass through all activities of the chain in order and at each activity the product gains some value.

The value chain categorizes the generic value adding activities of an organization. The “primary activities” include inbound logistics, operation (production), outbound logistics, sales and marketing, and service (maintenance). The “support activities” include administrative infrastructure management, human resource management, research and development, and procurement. The costs and value drivers are identified for each value activity. The value chain framework quickly makes its way to the forefront of management as a powerful analysis tool for strategic planning. Its ultimate goal is to maximize value creation while minimizing cost.

The primary value chain activities (Porter, 1985) of a company include the following:

- Inbound logistics: The receiving and warehousing of raw materials, and their distribution to manufacturing as they are required. For example, seeds and pesticides from input supplies stockiest.
- Operations: The processes of transforming inputs into finished products and services. For example, the operation in case of maize industry includes farm preparation (ridging, planting, weeding, harvesting, handling, processing etc.
- Outbound logistics: The warehousing and distribution of finished goods. For example, in case of a maize industry activity would entail the ways product is sold to customer, customer care costs and handling.
- Marketing and sales: The identification of customer needs and creating awareness among the target audience of the company about the firm’s products and services. Maize companies should make use of marketing communications tools like

advertising, sales promotions to attract customers towards their products and Service. There is often a need to provide services like pre-system or after-sales service before or after the sale of the product or service.

Rahko (2012) analyzed value chain of potato and factors that prevent the industry's development in Tanzania. The study evaluated agricultural policies affecting potato value chain and illustrated the present state of potato production and marketing chain in contrast to other crops. The results indicated that the government did not affect much to the operation nor the development of the potato value chain and potato was not prioritized to Tanzania government. There were no straight policy measures or institutional barriers that were hindering the conditions of smallholders or other actors in the chain. Bad seed quality, difficulties to get loans and the lack of investments and farmers' groups and poor road network in the countryside were main obstacles hindering production. It was suggested to establish a national potato board and marketing centers in the villages by the government.

Akhter and Hafiz (2015) conducted a value chain analysis on Marketing of Maize Products in Bangladesh. They found that three sectors are involved in maize production and these are as follow:

- Primary sector: Input suppliers, producers and silo owners play the key role in here. Silo owners facilitate safe storage of maize and ensure round-the-year supply to the buyers.
- Secondary sector: Millers and animal feed manufacturers are the actors in this stage. Millers transform raw grains to maize meals for human consumption. The animal feed manufacturers use the yellow maize for producing broiler and layer feed rations. They also convert the white-maize to hominy chop to use in feedlots.
- Tertiary sector: Traders, retailers and transporters are the key people at this stage. Traders help shift the produce to either local or export market. Traders can further be split into three subcategories, as in the hedgers, arbitrageurs and speculators. While hedgers take the help of financial tools such as futures and options for defend existing portfolio against any unfavorable market volatilities; arbitrageurs look for making money from the price differentials of maize in various markets; and the speculators checks on ways to make profits by taking the advantage of short-term price fluctuations. The retailers facilitate distribution of maize products from millers to final consumers by providing necessary infrastructure and services. The transporters ensure movements of maize from farmers to silo owners then to millers and also from the agents to final consumers.

Competitive advantage can emerge from judicious designing, production, marketing, delivering and supporting of a product or service. Companies have been using his outline to explore the value creation by the activities performed by business units, scrutinize the modus operandi of value creation due to the linkages between the external buyers and suppliers, and allocate resources to align with strategies towards strategic direction, strengthen the most critical activities towards effective strategy, and pass up less critical tasks (Akther and Hafiz, 2015).

Oxfam GB (2013) conducted a value chain analysis on Maize in northern Char in Bangladesh and they found the following actors are involved in maize value chain activities in the northern chars in Bangladesh.

Input Sellers: the main and essential inputs for maize cultivation refers to seeds, fertilizers cum nutrients, pesticides are supplying among the farmers through the existing chain like the inputs companies manufactures or import the various inputs and disseminated by them to their respective distributors, who are considered the actors at the second stage in maize value chain. The distributors in turn sell their products to different local-level retailers and at times directly to the maize producers/farmers. Local-level input retailers are the third (and most likely the ultimate) type of input sellers who are directly linked with farmers. In most cases, such retailers handle inputs of all kinds like seeds, pesticides, micro-nutrients and fertilizers. Local-level input sellers generally hold a permanent business outlet or shop in local market places on the mainland; these are also a few travelling vendors who set up mobile stalls and conduct their business only on hat days.

Farmers: Farmers are engaged in cultivating maize and only income generating activity they are engaged in. These farmers are mostly smallholders, either landless or owners of small areas of land.

Middle men (Forias): Forias are traditional small-scale floating traders who act as profiteering middlemen between the small farmers and the trade markets. They buy directly from the growers and sell to other traders or to local markets. They collect various crop and farm products directly from the farmers by approaching them door-to-door in their communities. They buy the farmers' for the lowest negotiated prices possible, and smaller farmers with limited market networks comply having no other viable buyers for their products.

Small traders: Small traders are, to some extent, similar to forias, except that the former does not accrue their purchases via door-to-door processes. These traders station themselves

at local market places (with or without permanent business outlets established) and buy different products including maize from forias or even directly from farmers who come to the markets to sell their produce.

iDE Bangladesh (2013) conducted a subsector study on vegetable, potato and local poultry in Rangpur, Kurigram, Gaibandha and Nilphamari district, they found as below-

Availability of quality seeds in locality: There are wide numbers of seed dealers, working with Lal Teer, ACI, Syngenta, Mollika, Ispahani, GETCO, Supreme and other reputed private companies and supplying their vegetable seeds to the producers. Due to the proven germination rate and other seed qualities, majority of the vegetable growers were seen using packed seeds of these companies. Due to the convenient pack size (5gm), even the smallholders can effort these seeds. There are some BADC seed dealers supplying BADC vegetable seeds, though the number is insignificant in comparison with the private seed dealers, and also the quality of these vegetable seeds are spurious. Usage of these seeds was seen confined within homestead growers only. Even some mobile seed vendors were also found, especially in the chars and remote areas of these districts, who purchase seeds from dealers and sell those to the vegetable farmers.

Prevalence of hybrid seed usage for bitter gourd and cauliflower: Because of the high germination rate, vegetable producers in northern districts predominantly use hybrid varieties of seeds for vegetables. All the seeds used to produce Cauliflower are hybrid seeds and the major portion used for bitter gourd is also hybrid. These seeds are supplied by the private seed companies through the seed dealers and retailers.

Usage of retained seed for eggplant: The farmers in the locality informed that the local indigenous variety of eggplant has a better productivity. As a result, the demand for hybrid variety of eggplant is almost nil in these districts. The seeds used are mostly retained by the farmers themselves or by other farmers in the district. Seed dealers collect these open pollinated seeds and distribute among other eggplant farmers. Because of the low demand, input suppliers were seen uninterested in selling hybrid variety of eggplant seeds.

Cropping intensity

The number of crops cultivated on a land annually gauges cropping intensity. Lands are usually cultivated in 3 periods a year: 1. July-October, 2. October to March, and 3. March to July. For survey purposes, cropping intensity was calculated based on how many periods they have used the same land for cultivation. The maximum is 3 (cultivated in all three periods) and the minimum is 0 (didn't cultivate in any of the periods). The value from the PROOFS

baseline is 1.5. Respondents whose cropping intensity score exceeds this value are considered to have intensified their land usage. In the 2nd HH survey, 61.8 percent of respondents had cropping intensities that exceeded the baseline value of 150 percent. However, in the 3rd HH survey, 65 percent of farmers in the treatment group had intensified land usage, an increase of 3.2%. The control group value was 55%.

Maize production within the treatment group was 1,970 Kg/HH and for control group was 632 Kg/HH (Northern region). The sales figure for the treatment group was significantly higher than that of the control group. This can be reasoned due to the treatment group's cultivated land size being more than that of the control groups. Also, because the treatment group was able to produce more due to using the service promoted feasible technologies, they were able to sell more. This can be supported by referring to the yield per decimal statistics in Exhibit 19, which shows that the yield for the treatment group was more than the per decimal yield for the control group. The project worked with mung bean farmers in the south. The data shows that per HH sales of the treatment group was 307 Kg, which was more than that of the control group 280 Kg.

2.2.1 Attitude towards maize value chain

Akther and Hafiz (2015) found that maize value chain would benefit from better regional trade integration throughout the country. Increased intra-regional trade in maize would have several multiplier effects on maize value chain. Besides more remunerative prices for the producers and improved standards, greater intra-regional maize trade would stimulate public and private investments in research, marketing, agricultural services and infrastructures. Therefore, addressing the existing barriers to intraregional trade is a priority concern for maize value chain development. The possibilities that came out from the focus group discussion are: a. New maize varieties for the poor: New improved maize varieties are seen as a critical vehicle to enhance the lives of the poorest producers and consumers across the target geographies of maize. New improved maize varieties include high-yielding, nutritionally enhanced and stress-tolerant hybrids and open-pollinated varieties (OPVs). Currently, many smallholder farmers across the country use low-yielding, nutritionally poor varieties/landraces, which are susceptible to major abiotic (heat and drought) and biotic (fungal, bacterial and viral) stresses and insect pest (stem borers, etc.).

b. New tools and methods for national institutions, entrepreneurs and farmers: Novel tools to give small- and medium-scale public and private seed enterprises in developing countries the

same tools as multinational enterprises, so that they can meet unfulfilled demand niches, especially for smallholders.

c. Quality maize supply to industrial buyers: While there have been noteworthy gains made in maize production over the past decade, there is a significant opportunity to further increase quality productivity. Quality maize is one of the most important cereals in terms of production and supply to industrial buyer. Estimates indicate that the current maize yield could be doubled if farmers adopt higher quality inputs and proven agronomy best practices.

d. Collaboration with corn-based food processing industry: Collaboration with different food processing manufactures for establishment of corn-based food processing industry in the northern zone of country is another endeavour of the project. Various products for both human and animal consumption are produced from corn dry milling. For example, human-grade corn can be processed into meal, flour, oil, and hominy.

Khatun (2004) in his study found that attitude towards NGO had significant positive relationship with extent of contact with information system on sustainable livelihood.

Asaduzzaman (2003) found insignificant relationship between attitude towards NGOs of the women beneficiaries and their decision-making ability.

iDE Bangladesh (2016) in their third household survey for PROOFS project found that attitude towards that value chain projects as below-

Input Purchase:

3rd households (HHs) survey data showed that, 67.0% treatment HHs have purchased inputs either directly from FBA/DBG EC or through their assistance which was higher than 1st and 2nd HHs survey respectively.

Further, on average each FBA have been providing input services to around 150 PG members and 90 non-PG members.

Output Sales:

FBA and FBG-ECs also provide support to producers for selling their outputs. This makes it easier for these producers to sell their products and has enabled them to enhance their profitability.

On average, each FBA has been providing output services to around 123 PG members and 106 non-PG members.

2.3 Review of literature related to selected characteristics of the farmers with their attitude on different aspects

Several characteristics of the respondents were selected as independent variables of this study. The researcher tried to review various literatures to know the relationships of the selected characteristics with the attitude of the farmers. However, a brief review of literature on the relationships of remaining independent variables is presented below.

2.3.1 Age and attitude

Rahman (2015) found that age of the farmers had significant positive relationship with attitude towards salt tolerant variety of rice.

Husna (2014) found that age of the mango growers had negative relationship with their attitude towards pesticide risk reduction.

Rashid (2014) found that age of the farmers showed negative significant relationship with their attitude towards *dolochun* using in land.

Ahmed (2013) observed that age of the respondents had positively significant relationship with their attitude towards thai koi farming.

Khan (2012) found that age of the jujube farmers had no significant relationship with their attitude towards modern jujube cultivation.

Shahin (2012) observed that age of the respondents had no significant relationship with their attitude towards SDVC project of CARE.

Parvez (2007) concluded that there was no relationship between age of the farmers and their attitude towards IPM for HYVs production.

Rahman *et al.* (2007) found that there was negatively significant relationship between age of the farmers and their attitude towards organic farming.

Chowdhury *et al.* (2006) reported in his study that age of the farmers had no significant relationship with their attitude towards sustainable agriculture.

Parveen (2004) found that age of the modern village women influenced their attitude towards homestead agricultural production. But in case of the women of the traditional village, age was not associated with their attitude towards homestead agricultural production.

2.3.2 Education and attitude

Rahman (2015) found that level of education of the farmers had significant positive relationship with attitude towards salt tolerant variety of rice.

Husna (2014) found that educational qualification of the mango growers had significant relationship with their attitude towards pesticide risk reduction.

Rashid (2014) found that educational qualification of the farmers showed significant relationship with their attitude towards using *dolochun* in land.

Ahmed (2013) observed that educational qualification of the respondents had positively significant relationship with their attitude towards thai koi farming.

Khan (2012) found that educational qualification of the jujube farmers had no significant relationship with their attitude towards modern jujube cultivation.

Shahin (2012) observed that educational qualification of the respondents had no significant relationship with their attitude towards SDVC project of CARE.

Parvez (2007) concluded that there was positive significant relationship between education of the farmers and their attitude towards IPM for HYVs production.

Rahman *et al.* (2007) found that there was positively significant relationship between academic qualification of the farmers and their attitude towards organic farming.

Chowdhury *et al.* (2006) reported in his study that academic qualification of the farmers had positive significant relationship with their attitude towards sustainable agriculture.

2.3.3 Family size and attitude

Rahman (2015) found that family size of the farmers had no significant relationship with attitude towards salt tolerant variety of rice.

Rashid (2014) family found that family size of the farmers showed negative significant relationship with their attitude towards using *dolochun* in land.

Shahin (2012) found that there was no significant relationship between family size of the farmers and their attitude towards SDVC project of CARE.

Parvez (2007) concluded in his study that there was no significant relationship between family size of the farmers and their attitude towards IPM for HYVs production.

Rahman *et al.* (2007) found that there was no relationship between family size of the farmers and their attitude towards organic farming.

Chowdhury *et al.* (2006) reported in his study that family size of the farmers had no significant relationship with their attitude towards sustainable agriculture.

2.3.4 Farm size and attitude

Rahman (2015) found that farm size of the farmers had no significant relationship with their attitude towards salt tolerant variety of rice.

Rashid (2014) found that farm size of the farmers showed non-significant relationship with their attitude towards using *dolochun* in land.

Husna (2014) found that farm size of the mango growers had non-significant relationship with their attitude towards pesticide risk reduction.

Ahmed (2013) observed that farm size of the respondents had no significant relationship with their attitude towards thai koi farming.

Khan (2012) found that farm size of the jujube farmers had significant positive relationship with their attitude towards modern jujube cultivation.

Shahin (2012) observed that farm size of the respondents had no significant relationship with their attitude towards SDVC project of CARE.

Rahman *et al.* (2007) found that there was no significant relationship between farm size of the farmers and their attitude towards organic farming.

Parvez (2007) concluded in his study that there was no significant relationship between farm size of the farmers and their attitude towards IPM for HYV's production.

Chowdhury *et al.* (2006) reported in their study that farm size of the farmers had positive significant relationship with their attitude towards sustainable agriculture.

2.3.5 Family income and attitude

Rashid (2014) found that annual family income of the farmers showed non-significant relationship with their attitude towards using *dolochun* in land.

Husna (2014) found that annual income of the mango growers had non-significant relationship with their attitude towards pesticide risk reduction.

Ahmed (2013) observed that annual family income of the respondents had no significant relationship with their attitude towards thai koi farming.

Shahin (2012) observed that annual family income of the respondents had significant relationship with their attitude towards SDVC project of CARE.

Parvez (2007) concluded in his study that there was no significant relationship between annual income of the farmers and their attitude towards IPM for HYVs production.

Rahman *et al.* (2007) found that there was no significant relationship between annual family income of the farmers and their attitude towards organic farming.

Chowdhury *et al.* (2006) reported in his study that annual family income of the farmers had no significant relationship with their attitude towards sustainable agriculture.

2.3.6 Savings and attitude

There is no review of literature on the relationship between savings and attitude was found although taking different initiatives in searching various thesis, journals, proceedings, books and web.

2.3.7 Organizational participation and attitude

Samad (2010) found in his study that organizational participation of farmers had significant positive relationship with attitude.

Nurjjaman (2000) observed similar findings in their respective studies.

Hossain (2006) in his study observed a significant relationship between organizational participation and farmers attitude towards plantation of timber yielding plants.

Azad (2007) found a significant relationship between organizational participation and farmers attitude towards medicinal plants.

Sarker (2001) conducted a study that revealed organizational participation of farmers had negative relationship with attitude towards organic homestead gardening program.

Habib (2000) conducted a study on attitude towards the use of agrochemicals that revealed organizational participation had no relationship with attitude towards the use of agrochemicals.

2.3.8 Training received and attitude

Rashid (2014) found that training exposure of the farmers showed significant relationship with their attitude towards using *dolochun* in land.

Ahmed (2013) observed that training exposure of the respondents had positively significant relationship with their attitude towards *thai koi* farming

Habib (2000) found that training experience of BBS had significant relationship with their attitude towards the use of agrochemicals.

Paul (2000) Observed that there was a positive significant relationship between training experience of the farmers and their attitude towards the use of urea super granule.

2.4 The Conceptual Framework of the Study

Conceptual frameworks are a type of intermediate theory that attempt to connect to all aspects of inquiry (e.g. problem definition, purpose, literature review, methodology, data collection and analysis). Conceptual frameworks can act like maps that give coherence to empirical inquiry. Because conceptual frameworks are potentially so close to empirical inquiry, they take different forms depending upon the research question or problem. It is evident from the past studies that every occurrence or phenomenon is the outcome of a number of variables, which maybe or may not be interdependent or interrelated with each other. In the other words, no single variable can contribute wholly to a phenomenon. Variables together are the cause and the phenomenon is effect and thus, there is effect relationship everywhere in the universe. The conceptual framework of Rosenberg and Hovland (1960) was kept in mind framing the structure arrangement for the dependent variables.

In order to develop the conceptual framework for the selected characteristics and focus issue of this study, attitude is conceptualized having three components as: i) cognitive domain come from head ii) affective domain come from heart and iii) behavior components come from different visible parts of the body such as hand, skin, ear, eye, etc. From the past studies and literature it is observed that various factors influenced and affected farmers in acquiring their attitude towards value chain activities. In this study, the researcher attempted to highlight two concepts, namely farmers' selected characteristics and farmers' attitude towards value chain project. An individual's attitude may be influenced by his/her personal characteristics and through other interacting forces in his/her surroundings. As it is quite impossible to deal with all the forces and characteristics in a single study, it is, therefore, needed to be confined with some selected characteristics.

Farmer's characteristics may also influence on problem confrontation and vice-versa which is also investigated in this research work. On the basis of above discussion and review of

literature, the conceptual framework of this study has been structured as shown in figure 2.1.

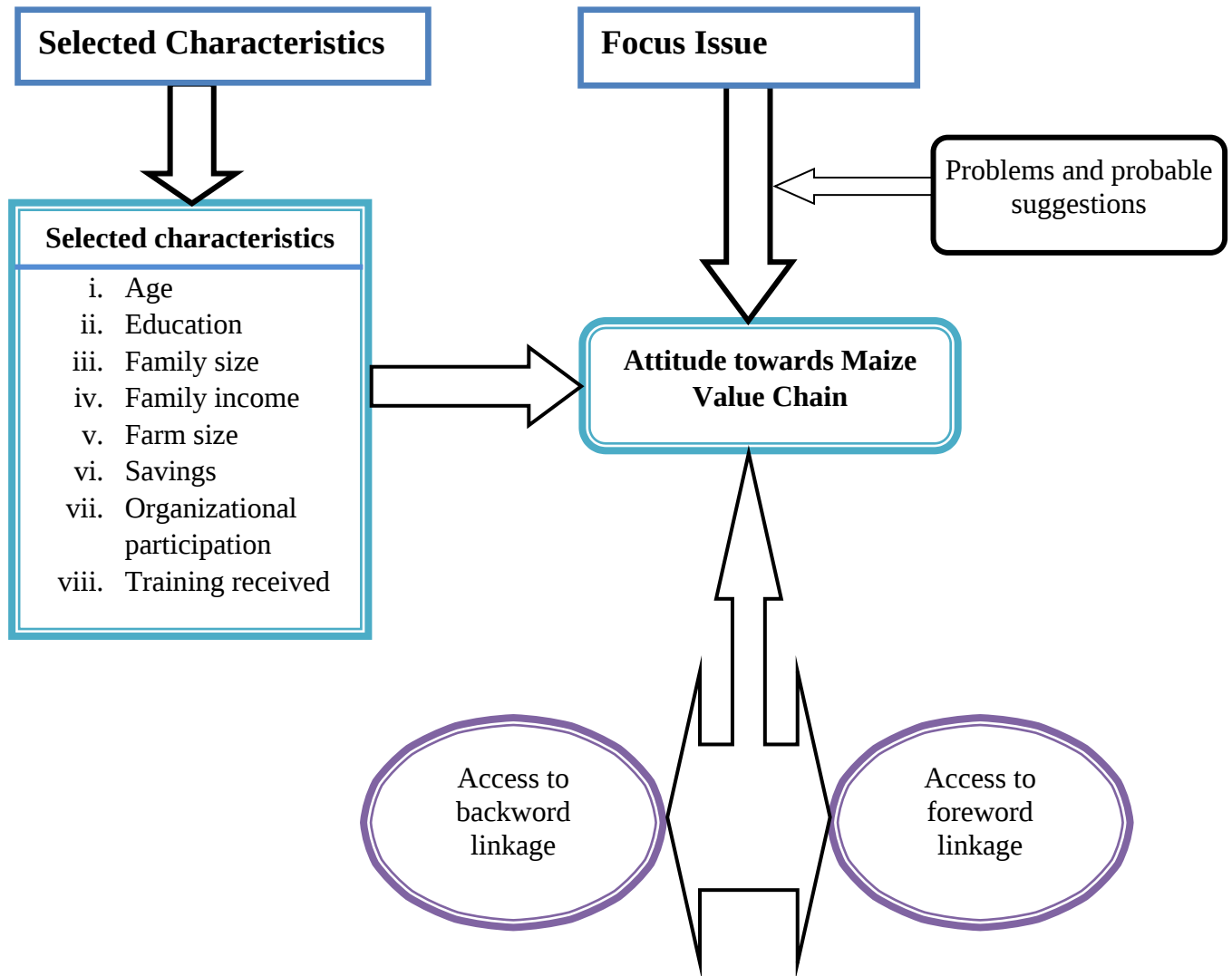


Figure 2.1 Conceptual framework of the study

CHAPTER 3

METHODOLOGY

This chapter presents a detail methodology adopted in this study which includes with the methods and procedures for collection and analysis of data. That is why, methodology is always very important to conduct scientific investigation. It deserves very careful consideration on the part of the researcher. Appropriate methodology helps the researcher to collect valid and reliable information and to analyze the same (information) to arrive at correct decisions. It is deals with the selection of study area, selection of sample, preparation of survey schedule, data collection method, period of survey, editing and tabulation of data and analytical techniques to be used. A chronological description of the methodology followed in conducting this research work has been presented in this chapter.

3.1 Methodological Approach and Research Design of the Study

Research design means the plan, structure and strategy of investigation conceived so as to obtain answer to research question and control variance (Kerlinger, 1996). Designing the research for the present study was taken in a scientific manner. Firstly, different research themes are collected and analyzed followed by research problem formulation. Reviews were studied to select appropriate variables and preparation of questionnaire. Pretesting of the interview schedule was done before final data collection. At last data were collected, analyzed and report was prepared. An explanatory and cross sectional research design was used in this research (Figure 3.1).

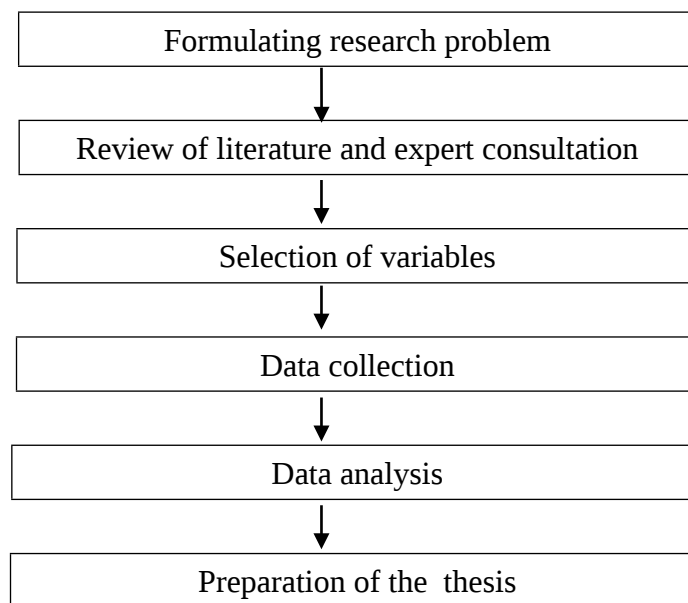


Figure 3.1 Research design of the study

3.2 Locale of the Study

Joldhaka upazila under Nilphamari district was selected as the study area for this research. This research was aimed at the population of all the beneficiaries of International Development Enterprises (iDE) Bangladesh under this upazila. Joldhaka upazila consists of thirteen unions, namely Jaldhaka Sadar, Balagram, Mirganj, Golmunda, Golna, Shoulmari, Dhormopal, Shimulbari, Dawabari, Kathalbari, Koimari. Out of these unions Balagram, Mirganj and Golmonda were selected purposively for conducting the study. There are ten producer groups of each union and out of them two producer groups were selected from each union for conducting the study. The area mostly covered by maize cultivation. A map of Nilphamari district including its upazilas as well as Bangladesh (inset) and a map of Joldhaka upazila are presented in Figure 3.1 and Figure 3.2 respectively.

3.3 Population and Sample

The people who were the members of iDE Bangladesh organization of Joldhaka upazila under Nilphamari district were the population of the study. Joldhaka upazila and Nilphamari district was purposively selected due to:

- i. Nilphamari is one of the widely maize producing districts of the country,
- ii. One of NGO operated value chain project was working there,
- iii. The researcher was familiar with the local farming, local culture, belief and other characteristics of the area.
- iv. The maize value chain actors were available mainly in these three upazilas selected and also produce about approximately 40 percent-45 percent of maize of total production in Nilphamari district because these three upazilas cover about 75% of the land area of the district.
- v. No such study was conducted earlier in this area. So “Attitude of the Maize Farmers towards Value Chain Project” was a new study conducted in the research areas.

An updated list of 750 (250 for each union) beneficiaries of the study area was collected from NGO named iDE Bangladesh. Out of 750 beneficiaries a sample of 94 (around 12 percent) were selected by simple random sampling procedure. Simultaneously, a reserve list of twelve respondents (around 10 percent of sample) was prepared out of this list to use in case of non-availability of sampled respondents. Distribution of respondents constituting the population, sample and reserve list in selected two producer groups under each union is presented in Table 3.1. The detailed plan of selection and distribution of population and sample are shown in Figure 3.3.

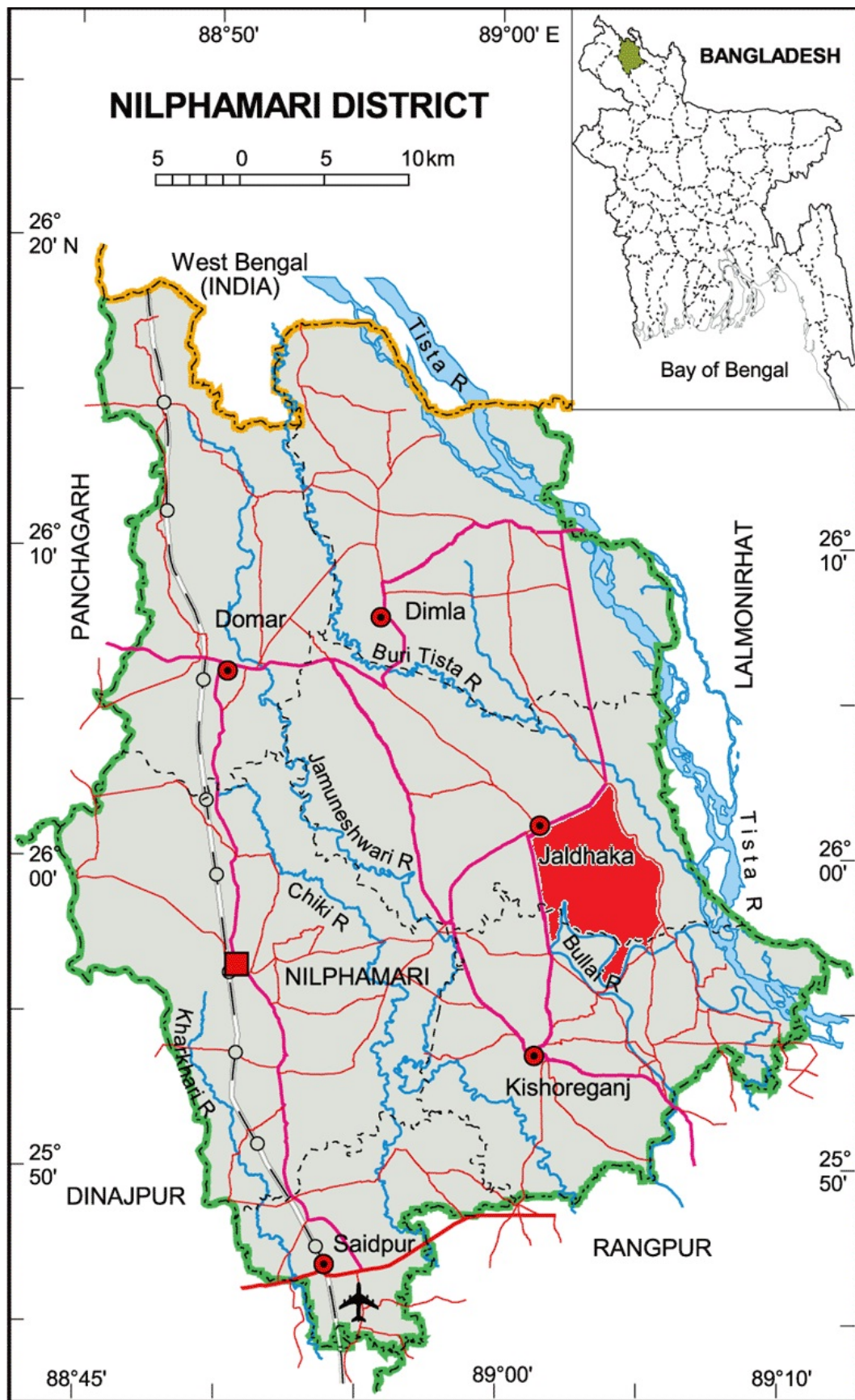


Figure 3.2 Map of Nilphamari district showing the study area (Bangladesh inset)

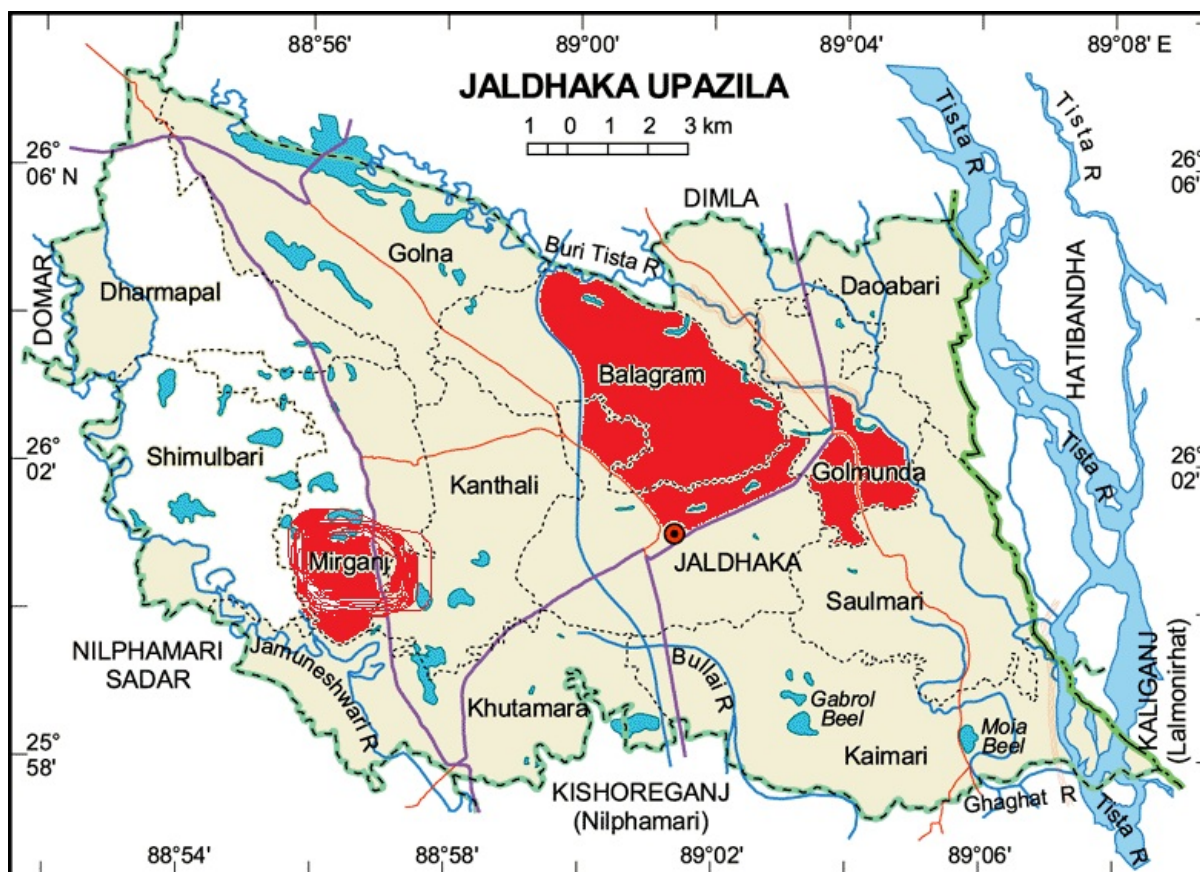


Figure 3.3 Map of Jaldhaka upazila under Niphamari district indicating the study area

Table 3.1 Distribution of the respondents according to population and sample

District	Upazilla	Unions	Population	Sample	Reserve list
Nilphamari	Joldhaka	Balagram	250	34	4
		Golmunda	250	30	3
		Mirganj	250	30	3
		Total=	750	94	10

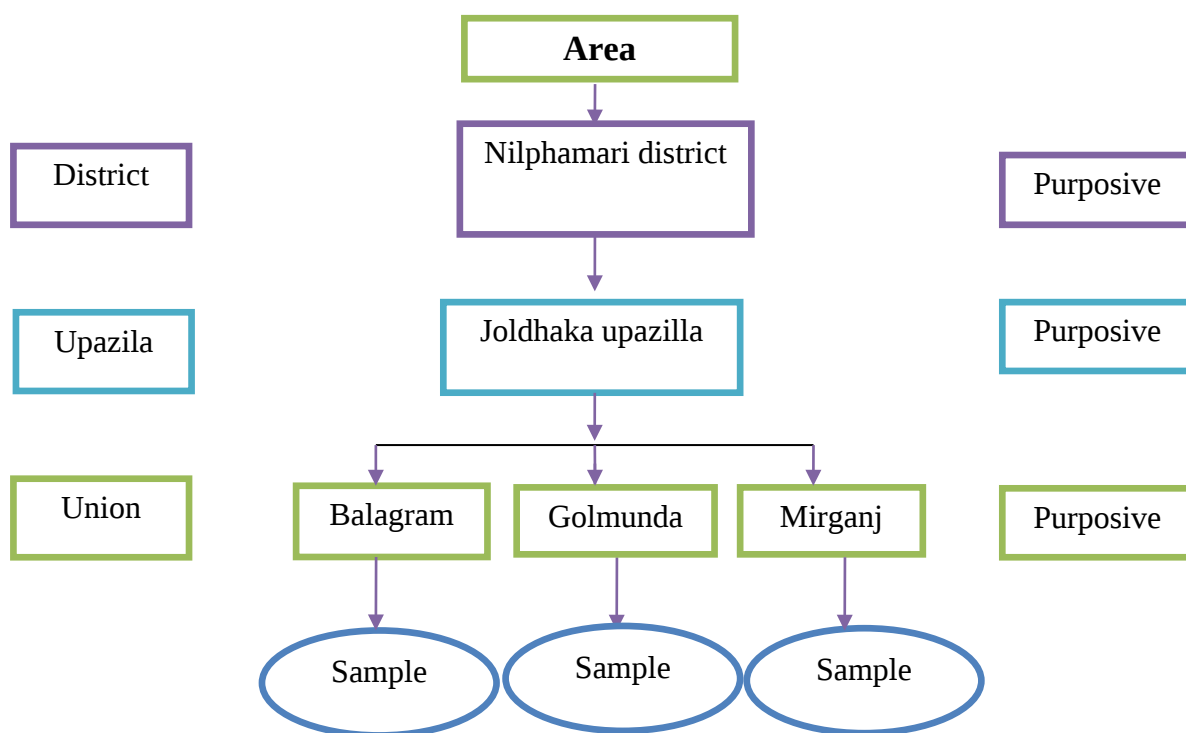


Figure 3.4 Layout of the sampling procedure of the study area

3.4 Instrument for Data Collection

A structured interview schedule was used for collection of relevant data. Both closed and open form questions were included in the schedule. The questions included were simple and direct to ascertain the opinion of the respondents. To determine the attitude on value chain activities scales was developed. A draft interview schedule was prepared in accordance with the objectives of the study. The interview schedule was pre-tested with 20 respondents of the study area before finalizing for data collection. Based on the pre-test result necessary correction, addition and modification was made in the interview schedule. The modified, corrected and adjusted interview schedule was printed in the final form in English (Appendix A) which was transferred to Bengali version for clear understanding of the respondents and

enumerator. Finally, data were collected from the study area during 13 March, 2017 to 25 April, 2017.

3.5 Data Collection Procedure

Personal interviewing was followed by the researcher himself for data collection. Prior to data collection, the researcher met with the Field Team Leader (FTL), Innovation and Quality Manager (iQM) and Officer Business Management (OBM) of iDE Bangladesh. Researcher requested them to provide necessary help and co-operation for information collection. Respective OBMs of the study area introduced Farmers organization's leaders and other respective market actors with the researcher who were also very helpful for the researcher in collecting information. The researcher made all possible efforts to establish rapport with the respondents so that they could feel free to respond to the questions contained in the schedule. All possible efforts were made to explain the purpose of the study to the respondents and their answers were recorded sincerely. Whenever, any respondent felt difficulty in understanding any question, care was taken to help them getting understand of the same. The researcher in collecting data faced no serious problem. Though the researcher made every effort to arrive all the respondents' house and field, it was not possible to collect data from two respondents under the samples, as they were not available during interviewing. Therefore, the researcher compelled to replace the unavailable respondents by two respondents from the reserve list.

3.6 Selection of Variables

The researcher employed adequate sincerity and care in selecting the variables of the study. Considering time and resource availability to research, reviewing relevant literature as far as available, discussed with the teachers and experts in the relevant fields, the variables were selected for the study. Attitude towards value chain was the focus issue of this study. The selected eight characteristics i.e. age, education, family size, family income, farm size, savings, organizational participation and training received were the causal factors.

3.7 Measurement of Variables

3.7.1 Measurement of selected characteristics

The eight selected characteristics of the respondents constitute the independent variables of this study. The procedure followed for measuring these selected characteristics are presented below:

3.7.1.1 Age

Age of the respondents was measured in terms of years from his/her birth to the time of interview was taken. A score of one was assigned for each year of age. It was measured in a complete years on the basis of responses of the respondents.

3.7.1.2 Education

Years of schooling was used to measure educational qualification completed by an individual in educational institutes. If a respondent cannot read and write his/her score was taken as zero (0). A score of 0.5 was assigned to that respondent who could sign his name only. Besides this, a respondent was given actual score of one for passing of each class i.e. 1 for class I, 2 for class II and so on.

3.7.1.3 Family size

The family size of the respondent was measured on the basis of the number of family members including himself/herself, his wife/her husband, children and other dependents living in a nuclear family. For example, if a respondent had five members in his family the score of the family size was taken as 5.

3.7.1.4 Family income

The family income of a respondent was measured in taka and was taken 1 (One) for every 1,000/- of family income on the basis of total yearly earning of the respondents and member of his/her family. For determining the family income of a respondent from agriculture, it was first necessary to identify his annual production from different farm outputs like crops, vegetables, fruits, poultry, fish culture, domestic animals. The price of each unit was determined on the basis of market price at the time of interviewing. Income from other sources like service, business, day labor and others of each respondent and other members of family was also determined. Finally, the family income of the respondent was obtained from the summation of their income from various sources.

3.7.1.5 Farm size

Farm size of a respondent included the areas of own land, homestead, land taken from others on *borga*, land given to others on *borga*, land taken from others on lease system, pond area, fallow land and others which could give full benefit to the family and it was expresses in terms of hectares by using the following formula:

$$FS = [A+B+ (C+D)/2 + E+F+G]$$

Where,

FS= Farm Size

A= Homestead (including garden and fallow land)

B= Own land under own cultivation

C= Land given to others on *borga*

- D= Land taken from others on *borga*
 E= Land taken from others on lease
 F= Pond area
 G= Others (if any)

The data were collected in local unit at the time of data collection and then converted to hectare.

3.7.1.6 Savings

It was measured by taking the total savings of the respondents and member of the respondent's family from any source in last year. A score of one was assigned for each thousand taka.

3.7.1.7 Organizational participation

The term organizational participation was used to refer to the orientation of an individual external to his/her own social system. The organizational participation score was computed for each respondent to determine the degree of his/her organizational participation on the basis of his/her visits to six different places. The weights assigned for visits to each of the following five different places are as follows:

Place of visit	Frequency of visit	Weight assigned
1. Visit to relatives or friends house located outside of his/her own village/month	Not even once a month	0
	1-2 times a month	1
	3-4 times a month	2
	5 or more times a month	3
2. Visit to union parishad	Not even once a month	0
	1-2 times a month	1
	3-4 times a month	2
	5 or more times a month	3
3. Visit Own upazila sadar	Not even once a month	0
	1-2 times a season	1
	3-4 times a season	2
	5 or more times a season	3
4. Visit own district sadar	Not even once a season	0
	1-2 times a season	1
	3-4 times a season	2
	5 or more times a season	3
5. Visit other district sadar	Not even once per year	0
	1-2 times a year	1
	3-4 times a year	2
	5 or more times per year	3

6. Visit Capital city	Not even once per year	0
	1-2 times a year	1
	3-4 times a year	2
	5 or more times per year	3

The organizational participation score of a respondent was calculated by adding together the weights obtained for his visits to all the six types of places.

3.7.1.8 Training received

Training received was determined by total number of days a respondent received training in his/her entire life from different organizations. For example, if a respondent received three (3) days training then the score was given 3 and so on.

3.7.2 Measurement of focus issue

Attitude towards maize value chain project was the dependent variable of this study and the dependent variable was divided into two dimensions: 1) attitude of the maize farmers towards access to backward linkage and 2) attitude of the maize farmers towards access to forward linkage. This variable was measured by 5-point rating scale, a scale mentioned by Likert (1932).

3.7.2.1 Measurement of attitude of the maize farmers towards access to backward linkage

Likert scale was used to determine the access to backward linkages. The scale contained 10 statements of access to backward linkages. Each respondent was asked to express his/her opinion in the form of one of the 5 responses such as strongly agree, agree, undecided, disagree, strongly disagree and the scores assigned as 5, 4, 3, 2 and 1 respectively in the responses for an item. The scores were reverse for negative statements. The overall access to backward linkages was computed by adding together all the individual scores obtained from the access to backward linkages. Therefore, the possible overall access to backward linkages of a respondent could range from 10 to 50 where, 10 indicated strongly disagree or unfavorable attitude and 50 indicated strongly agree or highly favorable attitude towards access to backward linkages.

Attitude towards access to Backward Linkages Index (ABLI) was calculated for each 10 selected access to backward linkages was computed using the following formula which is similar as Attitude Index (AI) formulae used by Islam (2007):

$$\text{ABLI for positive statements} = (N_{sa} \times 5) + (N_a \times 4) + (N_{ud} \times 3) + (N_{da} \times 2) + (N_{sd} \times 1)$$

Where,

ABLI = Attitude towards to Backward Linkages Index

N_{sa} = Number of respondents indicating the access to backward linkages as ‘strongly agree’

N_a = Number of respondents indicating the access to backward linkages as ‘agree’

N_{ud} = Number of respondents indicating the access to backward linkages as ‘undecided’

N_{da} = Number of respondents indicating the access to backward linkages as ‘disagree’

N_{sd} = Number of respondents indicating the access to backward linkages as ‘strongly disagree’

Similarly, ABLI for negative statements= $(N_{sa} \times 1) + (N_a \times 2) + (N_{ud} \times 3) + (N_{da} \times 4) + (N_{sd} \times 5)$

3.7.2.2 Measurement of attitude of the maize farmers towards access to forward linkage

Similarly attitude towards access to forward linkage was measured by five point rating scale. The scale contained 10 statements of access to forward linkages. Each respondent was asked to express his/her opinion in the form of one of the 5 responses such as strongly agree, agree, undecided, disagree, strongly disagree and the scores assigned as 5, 4, 3, 2 and 1 respectively. The scores were reverse for negative statements. The overall access to forward linkages was computed by adding together all the individual scores obtained from the access to forward linkages. Therefore, the possible overall access to forward linkages of a respondent could range from 10 to 50 where, 10 indicated strongly disagree or unfavorable attitude and 50 indicated strongly agree or highly favorable attitude towards access to forward linkages.

Attitude towards access to Forward Linkages Index (AFLI) was calculated for each 10 selected access to forward linkages was computed using the following formula which is similar as Attitude Index (AI) formulae used by Islam (2007):

AFLI for positive statements= $(N_{sa} \times 5) + (N_a \times 4) + (N_{ud} \times 3) + (N_{da} \times 2) + (N_{sd} \times 1)$

Where,

FLI = Attitude towards access to Forward Linkages Index

N_{sa} = Number of respondents indicating the access to forward linkages as ‘strongly agree’

N_a = Number of respondents indicating the access to forward linkages as ‘agree’

N_{ud} = Number of respondents indicating the access to forward linkages as ‘undecided’

N_{da} = Number of respondents indicating the access to forward linkages as ‘disagree’

N_{sd} = Number of respondents indicating the access to forward linkages as ‘strongly disagree’

Similarly, AFLI for negative statements= $(N_{sa} \times 1) + (N_a \times 2) + (N_{ud} \times 3) + (N_{da} \times 4) + (N_{sd} \times 5)$

3.8 Measurements of Problems and Suggestions to Overcome the Problems

The respondents were requested to mention the problems that hinder the smooth implementation of value chain process and were also requested to mention the probable suggestions to solve these problems. In this case an open ended question was used. Then the mentioned problems and suggestions were ranked on the basis of number of citations on the respective areas.

3.9 Hypothesis

A hypothesis is a proposition, which can be put to a test to determine its validity (Goode and Hatt, 1981). According to Kerlinger (1973) a hypothesis is a conjectural statement of the relation between one or more variables. It may prove to be correct or incorrect. In any event, it leads to an empirical test. Hypothesis may be broadly classified into two types, namely research hypothesis (H_a) and null hypothesis (H_0).

Research hypothesis (H_a) states anticipated relationships between concerned variables. Based on review literature and development of conceptual framework, the research hypothesis was: ‘there are relationships between the selected characteristics namely age, education, family size, family income, farm size, savings, organizational participation, training received and attitude towards maize value chain project (access to backward linkages and access to forward linkages)’.

Null hypothesis (H_0) states that there is no significant relationship between the concerned variables. Therefore, the null hypothesis of this study was ‘there are no significant relationship between the selected characteristics namely age, education, family size, family income, farm size, savings , organizational participation, training received and attitude towards maize value chain project (access to backward linkages and access to forward linkages)’.

3.10 Data Processing and Analysis

3.9.1 Compilation of data

After completion of field survey, data from all the interview schedules was coded, compiled, tabulated and analyzed in accordance with the objectives of the study. In this process, all the responses in the interview schedule were given numerical code value. Local units were converted into standard units and qualitative data was converted into quantitative ones by means of suitable scoring whenever necessary. The responses to the questions in the interview schedules were transferred to a master sheet to facilitate tabulation.

3.9.2 Categorization of data

For describing the different characteristics and their attitude towards value chain project, the respondents were classified into several categories. These categories were developed by considering the nature of distribution of data, general understanding prevailing in the social system and possible scores system. The procedure for categorization of data in respect of different variables was elaborately discussed while describing those variables in chapter 4.

3.9.3 Statistical Analysis

The analysis was performed using Statistical Packages for Social Science (SPSS) 20.0 version computer package. Descriptive analysis such as range, number, percentage, mean, standard deviation and rank order were used whenever necessary. For clarity of understanding tables were also used for presenting the data. Pearson's Product Moment Correlation Co-efficient (r) was used to examine the relationships of independent variables of the respondents with the attitude towards value chain project.

CHAPTER 4

RESULTS AND DISCUSSION

The results of the study are presented in this chapter with the help of proper statistical analysis along with their logical interpretations. This study has been conveniently presented in four sections according to the objectives. The first section deals with socio-demographic characteristics of the maize farmers. The second section deals with determine the attitude of maize farmers towards value chain. The third section deals with the relationship between socio-demographic characteristics of the maize farmers with attitude towards value chain and in the fourth section problems faced by the maize farmers in implementing value chain process and their probable suggestions to overcome the problems is presented.

4.1 Socio-demographic Characteristics of the Maize Farmers

4.1.1 Age

The age of the respondents varied from 27 to 66 years with a mean and standard deviation were 42.72 and 6.70 respectively. The respondents were classified into three categories on the basis of their age: 'young' (≤ 35 years); 'middle' (36-50 years) and 'old' (> 50 years). On the basis of the age, the respondents were distributed into three categories as presented in Table 4.1.

Table 4.1 Distribution of the respondents according to their age

Range	Categories	Respondents		Mean	SD
		Frequency	Percent		
27-66	Young (≤ 35)	19	20.3	42.72	6.70
	Middle (36-50)	65	69.1		
	Old (> 50)	10	10.6		
	Total=	94	100.0		

Data contained in table 4.1 revealed that more than four-fifths (69.1 percent) of respondents were in the middle aged category followed by 20.3 percent young and 10.6 percent under old aged category. This lead to understanding that overwhelming portion (89.4 percent) of the respondents belonged to young to middle age group i.e active age group.

4.1.2 Education

The education scores of the respondents ranged from 0.5 to 10, the mean being 7.58 and standard deviation 1.80. Based on the education scores, the respondents were classified as 'can sign only' (0.5); 'primary' (1-5); and 'secondary' (6-10). The distribution of the respondents on the basis of their education score has been presented in Table 4.2.

Table 4.2 Distribution of the respondents according to their education

Range	Categories	Respondents	Mean	SD
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		Frequency	Percent		
0.50-10	Can sign only (0.5)	1	1.1	7.58	1.80
	Primary (1-5)	19	20.2		
	Secondary (6-10)	74	78.7		
	Total=	94	100.0		

Data presented in the above table indicate that more than three-fourths (78.7 percent) of the respondents had secondary education, 20.2 percent had primary education and only 1.1 percent of the respondent were under can sign only.

4.1.3 Family size

The minimum and maximum family size scores were 4 and 11 respectively. The average family size was 7.51 with a standard deviation 1.49. According to family size score, the respondents were classified into three categories like ‘small’ (≤ 5); ‘medium’ (6-8); ‘large’ (> 8) are presented in Table 4.3.

Table 4.3 Distribution of the respondents according to their family size

Range	Categories	Respondents (N=90)		Mean	SD
		Frequency	Percent		
4-11	Small (≤ 5)	15	16.0	7.51	1.49
	Medium (6-8)	55	58.5		
	Large (> 8)	24	25.5		
	Total=	94	100.0		

The data furnished in the above table revealed that more than half (58.5 percent) of the respondents had medium family size, 25.5 percent had large family size and only 16.0 percent had large family. Thus, near about three-fourths (74.5 percent) of the respondents had small to medium family size. This may be due to the intervention of the family planning programme of the GOs and NGOs in the study area.

4.1.4 Family income

The family income of the respondents ranged from 80.50 to 253.0 with a mean of 160.28 and standard deviation 31.37. According to the family income, the maize farmers were classified in to three categories such as ‘low’ (≤ 129.0); ‘Medium’ (129.01-192.0) and ‘High’ (> 192.0) as shown in Table 4.4.

Table 4.4 Distribution of the respondents according to their family income

Range	Categories	Respondents		Mean	SD
		Frequency	Percent		
80.50-253.0	Low (≤ 129.0)	13	13.8	160.28	31.37
	Medium (129.01-192.0)	70	74.5		
	High (> 192.0)	11	11.7		
	Total=	94	100.0		

Near about three-fourths (74.5 percent) of the respondents belong to the medium income category while 13.8 percent of the respondents had low income and rest 11.7 percent were fell in the high income category. Majority of the maize farmers i.e. 86.2 percent were in the medium to high income category. This might be due to the effect of cultivation of various crops like maize and especially for maize value chain.

4.1.5 Farm size

The farm size range of the respondent was 0.18-0.84. The mean value of farm size was 0.459 with a standard deviation of 0.120. According to farm size score, the respondents were categorized into four categories like ‘landless’ (< 0.02 ha); ‘marginal’ (0.02-0.2 ha); and ‘small (0.21-1.0 ha) are presented in Table 4.5.

Table 4.5 Distribution of the respondents according to their farm size

Range	Categories	Respondents		Mean	SD
		Frequency	Percent		
0.18-0.84	Landless (< 0.02 ha)	2	2.1	0.459	0.120
	Marginal (0.02-0.2 ha)	3	3.2		
	Small (0.21-1 ha)	89	94.7		
	Total=	94	100.0		

Data presented in table 4.5 shown that overwhelming majority (94.7 percent) of the maize farmers had small farm size, 3.2 percent had marginal farm size and only 2.1 percent are in the landless category. Therefore, near about all the farmers (97.9 percent) were under marginal to small farm category.

4.1.6 Savings

The savings of all the respondents ranged from 0.0 to 87.0 with a mean and standard deviation of 21.03 and 11.19 respectively. The maize farmers were categorized into four categories as ‘no’ (0); ‘low’ (≤ 10); ‘medium’ (10.01-32.0) and ‘high’ (≥ 32.01) on the basis of savings score (Table 4.6).

Table 4.6 Distribution of the respondents according to their savings

Range	Categories	Respondents		Mean	SD
		Frequency	Percent		
0.00-87.0	No (0)	3	3.1	21.03	11.19
	Low (≤ 10)	14	14.9		
	Medium (10.01-32.0)	73	77.7		
	High (≥ 32.01)	4	4.3		
	Total=	94	100.0		

Slightly more than three-fourths (77.7 percent) of respondents had medium savings where as 14.9 percent of the total respondents had low savings, 4.3 percent of the respondents had high savings and remaining only 3.1 percent had no savings. Thus, overwhelming majority (92.6 percent) of the respondents had low to medium savings.

4.1.7 Organizational participation

Organizational participation scores of the respondents ranged from 3 to 9 against the possible range of 0 to 18 with a mean of 4.41 and standard deviation of 0.897. On the basis of overall scores of organizational participation, the respondents were categorized into three categories such as low (≤ 6), medium (7-12) and high (> 12) as shown in Table 4.7.

Table 4.7 Distribution of the respondents according to their organizational participation

Range		Categories	Respondents		Mean	SD
			Frequency	Percent		
Possible	Observed					
0-18	3-9	Low (≤ 6)	9	9.6	4.41	0.897
		Medium (7-12)	79	84.0		
		High (> 12)	6	6.4		
		Total=	94	100.0		

It is observed from the Table 4.7 that more than four-fifths (84.0 percent) of the respondents had medium organizational participation while 9.6 percent having low and only 6.4 percent having high organizational participation. The finding indicates that overwhelming majority of the maize farmers (90.4 percent) had medium to high organizational participation.

4.1.8 Training received

The training received score of the respondents ranged from 2 to 8, the average being 3.89 and standard deviation of 1.27. Based on training received score, the respondents were classified into three categories: short (≤ 3), medium (4-5) and long (> 5) as shown in Table 4.8.

Table 4.8 Distribution of the respondents according to their training received

Range	Categories	Respondents	Mean	SD
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		Frequency	Percent		
2-8	Short (≤ 3)	35	37.2	3.89	1.27
	Medium (4-5)	52	55.3		
	Long (> 5)	7	7.5		
	Total=	94	100.0		

Data contained in Table 4.8 shows that more than half of the respondent (55.3 percent) had medium training, 37.2 percent had short duration training and only 7.5 percent had long duration training. The finding indicates that overwhelming majority of the maize farmers (92.5 percent) of the respondents had short to medium duration training.

4.2 Attitude of the Farmers towards Maize Value Chain

4.2.1 Attitude of the maize farmers towards access to backward linkage

Attitude towards access to backward linkage scores of the farmers ranged from 36 to 47 where as the expected ranged was 10 to 50. The mean was 40.54 with the standard deviation of 2.73. Based on the observed attitude scores, the farmers were classified into three categories as ‘slightly favorable (≤ 38)’, ‘moderately favorable (39-43)’ and ‘highly favorable (> 43)’. The distribution of the farmers according to their attitude towards access to backward linkage is shown in Table 4.9.

Table 4.9 Distribution of the respondents according to their attitude of the maize farmers towards access to backward linkage

Range		Categories	Respondents		Mean	SD
Possible	Observed		Frequency	Percent		
10-50	17-47	Slightly favorable (≤ 38)	11	11.7	40.54	2.73
		Moderately favorable (39-43)	77	81.9		
		Highly favorable (> 43)	6	6.4		
		Total=	94	100.0		

Data presented in Table 4.9 indicated that slightly more than four-fifths percent (81.9percent) of the total sampled farmers had moderately favorable attitude towards access to backward linkage while 11.7 percent having slightly favorable attitude and only 6.4 percent fell in the highly favorable attitude category. It is found that the majority about 88.3 percent of the farmers showed moderate to high favorable attitude towards access to backward linkage. Rank order and attitude indices of farmers towards access to backward linkage are presented in Table 4.10.

Table 4.10 Rank order and attitude indices of the maize farmers towards access to backward linkage

Sl.	Statements	Extent of opinion	ABLI	RO
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No.		(frequency)						
		SA	A	U	D	SD		
1.(+)	The value chain make a functional linkage with maize input suppliers	0	0	0	79	15	391	1 st
2.(-)	Some farmers are left value chain project due to non-quality inputs and proper information	0	0	21	53	20	375	8 th
3.(+)	It make easy to collect quality inputs from reputed inputs sellers	0	0	1	87	6	381	4.5 th
4.(-)	Some existing farmers has been left from the system due to complex activities of the project	0	0	40	30	24	360	10 th
5.(+)	It make sure to get market information (like input price and technology)	0	0	1	90	3	378	7 th
6 (-)	These linkages are not profitable for maize cultivation	0	0	10	64	20	386	2 nd
7.(+)	The quality inputs and information make sure to increase production	0	0	1	87	6	381	4.5 th
8.(-)	Collecting inputs is difficult for me	0	0	4	83	7	379	6 th
9.(+)	Some new farmers are involving in the system due to get quality inputs easily	0	0	22	57	15	369	9 th
10.(-)	The market information are not focusing the production	0	0	14	60	20	382	3 rd

SA= Strongly agree, A=Agree, U= Undecided, D=Disagree and SD=Strongly Disagree

The weights assigned for the responses were same for all the statements. The observed score ranged from 391-360 against the possible ranged from 470 to 10 for positive responses and for negative responses vice-versa. Data contained in Table 4.10 revealed that the statements “The value chain make a functional linkage with maize input suppliers” ranked first (1). The project firstly introduces the farmers with the quality maize input suppliers. Quality inputs are the prior condition of better production in agriculture. So, it is the first ranked statement as opined by the maize farmers and having Attitude toward access to Backward Linkage Index (ABLI) value of 391. With the time farmers become familiar with the various linkages. But sometimes some linkages do not run properly like do not supply quality input to the farmers or do not able to give proper market information. As a result simply farmers fell in some trouble and this linkage become non-profitable to him. That is why the “These linkages are not profitable for maize cultivation” become the second ranked statement in the rank table with AI value of 386 as perceived by the farmers.

As per the data contained in Table 4.10 it is revealed that the statement “Some existing farmers has been left from the system due to complex activities of the project” had lowest Attitude toward access to Backward Linkage Index value (ABLI=360) and ranked 9th. Farmers are used to in the traditional cultivation system i.e they purchase the agricultural

inputs by thyself and after production sell them in the market. They do not easily adopt innovation. Though value is a profitable system but sometimes complexity might arise due to unavoidable circumstances. In that case some farmers left the system and that is why they perceived it as the last ranked statement in the rank table. “Some new farmers are involving in the system due to get quality inputs easily” is the second last ranked statement in the rank table with ABLI value of 369.

4.2.2 Attitude of the maize farmers towards access to forward linkage

Attitude towards access to forward linkage scores of the farmers ranged from 36 to 46 where as the expected ranged was 10 to 50. The mean was 39.83 with the standard deviation of 2.08. Based on the observed attitude scores, the farmers were classified into three categories as ‘slightly favorable (≤ 38)’, ‘moderately favorable (39-42)’ and ‘highly favorable (>42)’. The distribution of the farmers according to their attitude towards access to forward linkage is shown in Table 4.11.

Table 4.11 Distribution of the respondents according to their attitude of the maize farmers towards access to forward linkage

Range		Categories	Respondents		Mean	SD
Possible	Observed		Frequency	Percent		
10-50	36-46	Slightly favorable (≤ 38)	7	7.4	39.83	2.08
		Moderately favorable (39-42)	78	83.0		
		Highly favorable (>42)	9	9.6		
		Total=	94	100.0		

Data presented in Table 4.11 indicated that more than four-fifths (83.0 percent) of the total respondents had moderately favorable attitude towards access to forward linkage while 9.6 percent having highly favorable attitude and only 7.4 percent fell in the slightly favorable attitude category. Therefore, it is found that the majority about 92.6 percent of the farmers showed moderate to high favorable attitude towards access to forward linkage.

Rank order and attitude indices of farmers towards access to forward linkage are presented in Table 4.12.

Table 4.12 Rank order and attitude indices of the maize farmers towards access to forward linkage

Sl. No.	Statements	Extent of opinion (frequency)					AF LI	RO
		SA	A	U	D	SD		
1.(+)	The project make a functional linkage with distance buyers for maize	0	0	1	86	7	382	1 st
2.(-)	It is difficult for me to produce as per market demand and attributes	0	0	5	85	4	375	5 th

3.(+)	It make easy to collect market demand and attributes from the buyers	0	0	12	79	3	367	7 th
4.(-)	Some existing farmers has been left from the system due to less profit	0	0	44	26	24	356	9 th
5.(+)	It make sure to sale the maize with premium price	0	0	1	91	2	377	4 rd
6.(-)	The attributes of distance buyers are not profitable for maize cultivation	0	0	17	73	4	363	7 th
7.(+)	By getting the market demand and attributes it make sure to get better price	0	0	6	86	2	372	6 th
8.(-)	Collecting market demand and attributes are difficult for me	0	0	3	86	5	378	2.5 nd
9.(+)	Some new farmers are involving in the system for easy selling with better price	0	0	34	47	13	355	10 th
10.(-)	The maize sale with premium price is difficult for me	0	0	1	90	3	378	2.5 nd

SA= Strongly agree, A=Agree, U= Undecided, D=Disagree and SD=Strongly Disagree

The weights assigned for the responses were same for all the statements. The observed score ranged from 355-382 against the possible ranged from 470 to 10 for positive responses and for negative responses vice-versa. The result revealed in Table 4.12 that the statements “The project makes a functional linkage with distance buyers for maize” ranked first with Attitude towards access to Forward Linkage Index (AFLI) value of 382. The maize value chain project introduces the distance buyers with the farmers and makes a linkage with them. As a result, the farmers get fair price from their product. So, it is perceived as the first ranked statement in the rank table. “Collecting market demand and attributes are difficult for me” and “The maize sale with premium price is difficult for me” with AFLI value of 378 and 378 respectively become jointly second ranked statements in the rank table as opined by the maize farmers.

As per the result presented in Table 4.12 it is revealed that the statement “Some new farmers are involving in the system for easy selling with better price” had lowest Attitude Index value (AFLI =355) and ranked in last position in the rank table. They are new in the system so, simply they have very low perception about the project activity. They only involve in the system for better price of their product. So, it is the last ranked statement opined by the farmers in the rank table. “Some existing farmers have been left from the system due to less profit” with AFLI value of 356 is the second last statement in the rank table as opined by the farmers. Profit is the main focus in every sector by everyone. In the maize value chain some of the farmers do not get more profit. That is why, simply they exit the system. So, it is the second last statement as perceived by the maize farmers.

4.2.3 Overall Attitude of the Farmers towards Maize Value Chain

Overall attitude towards maize value chain scores of the farmers ranged from 70 to 90 where as the expected ranged was 20 to 100. The mean was 81.63 with the standard deviation of 5.22. Based on the observed attitude scores, the farmers were classified into three categories as ‘slightly favorable (≤ 76)’, ‘moderately favorable (77-87)’ and ‘highly favorable (>87)’. The distribution of the farmers according to their attitude towards maize value chain is shown in Table 4.13.

Table 4.13 Distribution of the respondents according to their overall attitude of farmers towards maize value chain

Range		Categories	Respondents		Mean	SD
Possible	Observed		Frequency	Percent		
20-100	70-90	Slightly favorable (≤ 76)	18	19.1	81.63	5.22
		Moderately favorable (77-87)	59	62.8		
		Highly favorable (>87)	17	18.1		
		Total=	94	100.0		

Data presented in Table 4.13 indicated that more than three-fifths (62.8 percent) of the total respondents had moderately favorable attitude towards maize value chain while 19.1 percent having slightly favorable attitude and 18.1 percent fell in the highly favorable attitude category. It is found that the overwhelming majority (80.9) of the maize farmers showed moderate to high favorable attitude towards maize value chain. This might be due to that during the peak period of maize the price remain very low. But maize value chain ensures the fair price of the maize as the project linkages the buyers with the producers.

4.3 Relationship between the Selected Characteristics of the Farmers with their Attitude towards Maize Value Chain

The purpose of this section is to explore the relationships between each of the selected characteristics of the farmers and their attitude toward maize value chain. The selected characteristics constituted causal factors and the focus issue was considered farmers attitude towards maize value chain. Pearson’s Product Moment Correlation Co-efficient ‘r’ was used to test the null hypothesis concerning the relationship between any two variables. The summary results of test of correlation coefficient are shown in Table 4.14. However, a correlation matrix for independent and dependent variables were presented in Appendix B.

Table 4.14: Correlation between selected characteristics and focus issue

Focus Issue	Selected Characteristics	Computed r-value with 92 d.f.	Tabulated value of 'r'	
			0.05 level	0.01 level
Attitude towards Maize Value Chain	Age	-0.102 ^{NS}	± 0.208	±0.271
	Education	0.374**		
	Family size	-0.208*		
	Family income	0.250*		
	Farm size	0.159 ^{NS}		
	Savings	0.168 ^{NS}		
	Organizational participation	0.233*		
	Training received	0.293**		

* Correlation is significant at the 0.05 level.

** Correlation is significant at the 0.01 level.

NS= Not significant

4.4.1 Age and attitude towards maize value chain

The co-efficient of correlation between age of the respondents with their attitude towards maize value chain was -0.102, which was not significant at 0.05 level of probability with 92 degrees of freedom. On the basis of the above findings the null hypothesis could not be rejected. So, there was no significant relationship between the age of the respondents with their attitude towards maize value chain. So, one can say that age had no effect with their attitude towards maize value chain.

4.4.2 Education and attitude towards maize value chain

The co-efficient of correlation between educations of the respondents with their attitude towards maize value chain was 0.374, which was significant at 0.01 level of probability with 92 degrees of freedom. On the basis of the above findings the null hypothesis could be rejected. So, there was significant positive relationship between the education of the respondents with their attitude towards maize value chain. So, it can say that education had significant effect with their attitude towards maize value chain. This indicates that higher the education of the farmers, the higher was their attitude towards maize value chain.

4.4.3 Family size and attitude towards maize value chain

The co-efficient of correlation between family size of the respondents with their attitude towards maize value chain was -0.208, which was significant at 0.05 level of probability with 92 degrees of freedom. On the basis of the above findings the null hypothesis could be rejected. So, there was significant negative relationship between family size of the respondents with their attitude towards maize value chain. So, it can say that family size had significant effect with their attitude towards maize value chain. This indicates that higher the

family size of the farmers, the lower was their attitude towards maize value chain and vice-versa.

4.4.4 Family income and attitude towards maize value chain

The co-efficient of correlation between family income of the respondents with their attitude towards maize value chain was 0.250, which was significant at 0.05 level of probability with 92 degrees of freedom. On the basis of the above findings the null hypothesis could be rejected. So, there was significant positive relationship between family income of the respondents with their attitude towards maize value chain. So, it can say that family income had significant effect with their attitude towards maize value chain. This indicates that higher the family income of the farmers, the higher was their attitude towards maize value chain and vice-versa.

4.4.5 Farm size and attitude towards maize value chain

The co-efficient of correlation between farm size of the respondents with their attitude towards maize value chain was 0.159, which was not significant at 0.05 level of probability with 92 degrees of freedom. On the basis of the above findings the null hypothesis could not be rejected. So, there was no significant relationship between the farm size of the respondents with their attitude towards maize value chain. So, it might say that farm size had no effect with their attitude towards maize value chain.

4.4.6 Savings and attitude towards maize value chain

The co-efficient of correlation between savings of the respondents with their attitude towards maize value chain was 0.168, which was not significant at 0.05 level of probability with 92 degrees of freedom. On the basis of the above findings the null hypothesis could not be rejected. So, there was no significant relationship between savings of the respondents with their attitude towards maize value chain. So, it can say that savings had no effect with their attitude towards maize value chain.

4.4.7 Organizational participation and attitude towards maize value chain

The co-efficient of correlation between organizational participation of the respondents with their attitude towards maize value chain was 0.233, which was significant at 0.05 level of probability with 92 degrees of freedom. On the basis of the above findings the null hypothesis could be rejected. So, there was significant positive relationship between organizational participation of the respondents with their attitude towards maize value chain. So, it can say

that organizational participation had significant effect with their attitude towards maize value chain. This indicates that higher the organizational participation of the farmers, the higher was their attitude towards maize value chain and vice-versa.

4.4.8 Training received and attitude towards maize value chain

The co-efficient of correlation between training received of the respondents with their attitude towards maize value chain was 0.293, which was significant at 0.01 level of probability with 92 degrees of freedom. On the basis of the above findings the null hypothesis could be rejected. So, there was significant positive relationship between training received of the respondents with their attitude towards maize value chain. So, it can say that training received had significant effect with their attitude towards maize value chain. This indicates that higher the training received of the farmers; the higher was their attitude towards maize value chain and vice-versa.

4.4 Problems and Suggestions

Maize farmers may face several problems. For easy understanding of the problems faced by the farmers and the suggestions to overcome the problems given by them are listed in this sub-section with their number of citation, percent and rank order.

4.4.1 Problems faced by the maize farmers in implementing value chain process

The researcher made an attempt to identify the various problems in implementing value chain process. These are given in Table 4.15.

Table 4.15 Rank order of the problems faced by the farmers in implementing value chain process

Problems	No. of citation	Percent	Rank
Training is not enough on production technologies and marketing which is provided by privet company	86	91.49	1 st
Financial institutes are not providing to farmers production friendly loan.	81	86.17	2 nd
Privet company are not providing enough technical support in field level during production of maize	70	74.47	3 rd
Distance buyers are not coming due to fewer amount of products	65	69.15	4 th

It is evident from the data contained in the Table 4.15 that ‘Training is not enough on production technologies and marketing which is provided by privet company’ (91.49 percent)

emerged as the most important problem opined by the farmers. The result might be due to that the farmers under maize value chain project are not well known about the production technologies of maize and the training received is not enough.

‘Distance buyers are not coming due to fewer amounts of products’ was the least problems as opined by the farmers (69.15 percent). Generally buyers are not agreed to purchase fewer amount of product as they come from distant places. So, small farmers face such type of problems.

4.4.2 Probable suggestions to overcome the problems in implementing value chain process

Many suggestions were suggested by the respondents to overcome the problems. These are given in Table 4.16.

Table 4.16 Rank order of the probable suggestions to overcome the problems in implementing value chain process

Sl. No.	Problems	No. of citation	Percent	Rank
1.	Private company should provide training as per farmers demand	80	85.11	1 st
2.	Project should make a linkage with financial institute	71	75.53	2 nd
3.	Private company should provide technical support as per farmers requirement	60	66.67	3 rd
4.	Should organize the farmers to aggregate the products as per buyers demand	55	61.11	4 th

It is noted from the data in Table 4.16 that the foremost (85.11 percent) suggestion cited by the farmers was ‘Private company should provide training as per farmers demand’. Training is very much important to increase the skill on certain aspects. So, farmers opined it as the topmost suggestion to solve the problem.

‘Should organize the farmers to aggregate the products as per buyers demand’ is the last ranked suggestion given by the farmers (61.11 percent). Especially small farmers face the problems of lack of buyers as the buyers did not buy fewer amount of product. So, farmers opined this as the last suggestion to overcome the problems.

CHAPTER 5

SUMMARY OF THE FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the Findings

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

5.1.1 Socio-demographic characteristics of the maize farmers

Age: More than four-fifths (69.1 percent) of respondents were in the middle aged category followed by 20.3 percent young and 10.6 percent under old aged category.

Education: More than three-fourths (78.7 percent) of the respondents had secondary education, 20.2 percent had primary education and only 1.1 percent of the respondent were under can sign only.

Family size: More than half (58.5 percent) of the respondents had medium family size, 25.5 percent had large family size and only 16.0 percent had large family.

Family income: Near about three-fourths (74.5 percent) of the respondents belong to the medium income category while 13.8 percent of the respondents had low income and rest 11.7 percent were fell in the high income category.

Farm size: Overwhelming majority (94.7 percent) of the maize farmers had small farm size, 3.2 percent had marginal farm size and only 2.1 percent are in the landless category.

Savings: Slightly more than three-fourths (77.7 percent) of respondents had medium savings where as 14.9 percent of the total respondents had low savings, 4.3 percent of the respondents had high savings and remaining only 3.2 percent had no savings.

Organizational participation: More than four-fifths of the respondents (84.0 percent) had medium organizational participation while 9.6 percent having low and only 6.4 percent having high organizational participation.

Training received: More than half of the respondent (55.3 percent) had medium training, 37.2 percent had short duration training and only 7.4 percent had long duration training.

5.1.2 Attitude of the Farmers towards Maize Value Chain

5.1.2.1 Attitude of the maize farmers towards access to backward linkage

Slightly more than four-fifths percent (81.9 percent) of the total sampled farmers had moderately favorable attitude towards access to backward linkage while 11.7 percent having slightly favorable attitude and only 6.4 percent fell in the highly favorable attitude category. The statements “The value chain make a functional linkage with maize input suppliers” ranked first (1) having Attitude toward access to Backward Linkage Index (ABLI) value of 391. The statement “Some existing farmers has been left from the system due to complex activities of the project” had lowest Attitude toward access to Backward Linkage Index value (ABLI=360) and ranked 9th.

5.1.2.2 Attitude of the maize farmers towards access to forward linkage

More than four-fifths (83.0 percent) of the total respondents had moderately favorable attitude towards access to forward linkage while 9.6 percent having highly favorable attitude and only 7.4 percent fell in the slightly favorable attitude category.

The statements “The value chain makes a functional linkage with distance buyers for maize” ranked first with Attitude towards access to Forward Linkage Index (AFLI) value of 382. The statement “Some new farmers are involving in the system for easy selling with better price” had lowest Attitude Index value (AFLI =355) and ranked in last position.

5.1.3 Overall Attitude of the Farmers towards Maize Value Chain Project

More than three-fifths (62.8 percent) of the total respondents had moderately favorable attitude towards maize value chain project while 19.1 percent having slightly favorable attitude and 18.1 percent fell in the highly favorable attitude category.

5.1.4 Relationship between the Selected Characteristics of the Farmers with their Attitude towards Maize Value Chain Project

The coefficient of correlation (r) was computed in order to explore the relationships between the selected characteristics of the farmers and their attitude towards value chain project. Correlation analyses indicated that among eight selected characteristics education, family income, organizational participation and training received had positive significant relationships with their attitude towards value chain while family size had significant negative relationship. However, age, farm size and savings of the farmers had no significant relationships with their attitude towards value chain.

5.1.5 Problems and Suggestions

5.1.5.1 Problems faced by the maize farmers in implementing value chain process

‘Training is not enough on production technologies and marketing which is provided by privet company’ (91.49 percent) emerged as the most important problem opined by the

farmers. ‘Distance buyers are not coming due to fewer amounts of products’ was the least problems as opined by the farmers (69.15 percent).

5.1.5.2 Probable suggestions to overcome the problems in implementing value chain process

The foremost (85.11 percent) suggestion cited by the farmers was ‘Private company should provide training as per farmers demand’. ‘Should organize the farmers to aggregate the products as per buyers demand’ is the last ranked suggestion given by the farmers (61.11 percent).

5.2 Conclusions

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

- i) The overwhelming majority (80.9) of the maize farmers showed moderate to high favorable attitude towards maize value chain. So, it may be concluded that maize value chain ensures the fair price of the maize as the project linkages the buyers with the producers.
- ii) Education of the maize farmers had significant positive relationship with their attitude towards value chain. So, it is concluded that educated farmers had favorable attitude toward value chain while uneducated farmers had negative effect towards value chain.
- iii) Family income of the maize farmers had significant positive relationship with their attitude towards value chain. So, it might be concluded that farmers attitude toward value chain is dependent on family income.
- iv) Organizational participation of the maize farmers had significant positive relationship with their attitude towards value chain. Therefore, it may be concluded that more attention may need to be paid towards farmers’ organizational participation, so that they become more aware about the benefits of maize value chain.
- v) Training received of the farmers’ had significant and positive relationship with their attitude towards value chain. It was thus proved that farmers’ attitude towards value chain project is dependent with their training received on maize value chain.
- vi) Based on the findings of farmers regarding problems in implementing value chain and probable suggestion to solve them, it can be concluded that maize farmers are facing considerable extent of problems whether it may be low or high. There is a lot of provision to solve these problems.

5.3 Recommendations

5.3.1 Recommendations for policy implication

i) It is found that overwhelming majority of the maize farmers (92.5 percent) of the respondents had short to medium duration training on value chain. So, it is recommended that adequate technical support and training facilities should be provided by the concerned NGOs and GOs like DAE.

ii) It is observed that more than three-fifths (62.8 percent) of the total respondents had moderately favorable attitude towards maize value chain project. So, there is great scope to work here by the GOs and NGOs to improve the attitude towards value chain. Therefore it can be recommended that concerned GOs like DAE and NGOs should take necessary steps to increase the positive attitude towards value chain project.

iii) Farmers faced considerable amount of problems in implementing maize value chain project. It is therefore, recommended that concerned authorities (GOs and NGOs) should give due attention to the solution of the problems as soon as possible.

5.3.2 Recommendations for further study

The following suggestions were put for further study in connection with this study:

- i) The study was conducted among the farmers of selected area of Joldhaka upzila at Nilphamari district. Findings of this study need verification by similar research in other parts of the country.
- ii) Attitude towards value chain project was investigated. But such study may be conducted by taking into consideration of other factors.
- iii) Relationships of eight selected characteristics of the farmers with their attitude were investigated in this study. Further research should be conducted to explore relationships of other characteristics of the farmers with their attitude towards value chain project.
- iv) This study was conducted at the farmers' level and similar studies may be conducted at the different stakeholders' levels (Government and NGO sectors top level official).

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Appendix A

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**Interview schedule of the research study entitled
Attitude of the Maize Farmers towards Value Chain**

Date..... Sl.No.

(Please answer the following questions and put check mark wherever applicable)

Name of the respondents:.....Father's/Husband's name:.....

Village:.....Union:.....Mobile:.....

1. **Age:** What is your present age?
Years.

2. **Education:** Please mention
yours educational qualification.

i) Cannot read and write

ii) Can sign only

iii) Read up to class

iv) Passed..... class

3. **Family size:** Please mention yours' total number of family members.

a) Male.....b) Female.....Total=.....

4. **Family income:** Give particulars about your family income of last year from different sources.

Sl. No.	Source of income	Production	Market price	Total (TK.)
1.	Crops			
2.	Vegetables			
3.	Fruits			
4.	Poultry			
5	Fish culture			
6	Domestic Animals			
7	Service			
8	Business			
9	Day labor			
10	Others (if any)			
Total (Tk.)				

5. **Farm Size:** Please mention
your total cultivable land size.

Sl. No.	Nature of holding	Area		
		Local Unit		Hectare
		Bigha	Decimal	
A.	Homestead (including garden and fallow land)			
B.	Own land under own cultivation			
C.	Land given to others on barga			
D.	Land taken from others on barga			
E.	Land taken from others on lease			
F.	Pond area			
G.	Others (if any)			
Total [A+B+ (C+D)/2 + E+F+G]=				

6. **Savings:** Please mention your last year savings from the following sources

Sl. No.	Type of savings	Amount of savings(Taka)
1.	Pot at home	
2.	NGO group	
3.	Bank	
4.	Others	

7. **Organizational Participation:**
Please indicate the number of items you visit the following places within the specified period

Sl. No.	Place of visit	Nature of visit			
		Not at all	Rarely	Occasionally	Frequently
1.	Visit to relatives or friends		1-2times/month	3-4times/month	≥5time/month
2.	Visit to union parishad		Do	Do	Do
3.	Own upazilasadar		1-2 times/season	3-4times/season	≥5times/season
4.	Own district sadar		Do	Do	Do
5.	Other district sadar		1-2times/year	3-4times/year	≥5times/year
6.	Capital city		Do	Do	Do

8. **Training received:** Have you received any training from Value chain project or other organization (s)?
Yes..... No.....
If, yes please indicate the following information

Sl. No.	Subject matter	Duration of training	Name of the organization
---------	----------------	----------------------	--------------------------

1.			
2.			
3.			
4.			
5.			

9. **Attitude towards Value Chain project:** Please express your attitude towards Value chain project in the following aspects

9.1 Access to backward linkage:

Sl. No.	Statement	Extent of opinion				
		SA	A	UD	DA	SD
1.(+)	The value chain make a functional linkage with maize input suppliers					
2.(-)	Some farmers are left value chain project due to non-quality inputs and proper information					
3.(+)	It make easy to collect quality inputs from reputed inputs sellers					
4.(-)	Some existing farmers has been left from the system due to complex activities of the project					
5.(+)	It make sure to get market information (like input price and technology)					
6 (-)	These linkages are not profitable for my maize cultivation					
7.(+)	The quality inputs and information make sure to increase production					
8.(-)	Collecting inputs is difficult for me					
9.(+)	Some new farmers are involving in the system due to get quality inputs easily					
10.(-)	The market information are not focusing the production					

SA=Strongly agree, A=Agree, UD=Undecided, DA=Disagree, SD=Strongly disagree

9.2 Access to forward linkage:

Sl. No.	Statement	Extent of opinion				
		SA	A	UD	DA	SD

1.(+)	The project make a functional linkage with distance buyers for maize					
2.(-)	It is difficult for me to produce as per market demand and attributes					
3.(+)	It make easy to collect market demand and attributes from the buyers					
4.(-)	Some existing farmers has been left from the system due to less profit					
5.(+)	It make sure to sale the maize with premium price					
6.(-)	The attributes of distance buyers are not profitable for maize cultivation					
7.(+)	By getting the market demand and attributes it make sure to get better price					
8.(-)	Collecting market demand and attributes are difficult for me					
9.(+)	Some new farmers are involving in the system for easy selling with better price					
10.(-)	The maize sale with premium price is difficult for me					

SA=Strongly agree, A=Agree, UD=Undecided, DA=Disagree, SD=Strongly disagree

10. Problems: Please mention your problems in implementing value chain project.

- 1.
- 2.
- 3.
- 4.

11. Suggestions: Please give your suggestions to overcome the problems.

- 1.
- 2.
- 3.
- 4.

Thanks for your kind cooperation.

.....
Signature of interviewer

Appendix B

Correlation Matrix between Focus Issue and Selected Characteristics

Selected Characteristics	Age	Education	Family size	Family income	Farm size	Savings	Organizational participation	Training received	Attitude towards value chain
Age	1								
Education	-.358**	1							
Family size	.261*	-.173	1						
Family income	-.075	.179	.007	1					
Farm size	-.160	.347**	.023	.551**	1				
Savings	-.005	.066	.252*	.357**	.317**	1			
Organizational participation	.087	.092	-.093	.434**	.274**	.212*	1		
Training received	.043	.151	.032	.270**	.174	.097	.171	1	
Attitude towards value chain	-.102	.374**	-.208*	.250*	.159	.168	.233*	.293*	1

** Correlation is significant at the 0.01 level; * Correlation is significant at the 0.05 level.