BENEFITS OF BANGABANDHU BRIDGE FOR AGRICULTURAL PRODUCTION AND MARKETING AS PERCEIVED BY THE FARMERS

A Thesis

By

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CERTIFICATE

This is to certify that the thesis entitled,**" Benefits of Bangabandhu Bridge for Agricultural Production and Marketing as Perceived by the Farmers"** submitted to the Faculty of Agriculture, Sher-e-Bangla Agricultural University, Dhaka in partial fulfilment of the requirements for the degree of **Master of Science (MS) in Agricultural Extension and Information Science**, embodies the result of a piece of bona-fide research work conducted by **SAZEDUL ISLAM, Registration no. 18-09185** under my supervision and guidance. No part of this thesis has been submitted for any other degree or diploma.

I also affirm that any assistance or source of information obtained during the course of this study was dully acknowledged by him.

Dated: December, 2020

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DEDICATED
TO
MY DEPARTED FATHER
AND
BELOVED MOTHER

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The Author

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Benefits of Bangabandhu Bridge for Agricultural Production and Marketing as Perceived by The Farmers

Abstract

The present study was mainly designed to assess the benefits of Bangabandhu Bridge for agricultural production and marketing and to explore the relationships of each of the selected characteristics of the farmers with their perceived benefits of Bangabandhu Bridge for Agricultural production and Marketing. The study was conducted in randomly selected three villages of three unions of Ullapara Upazila under Sirajganj district of Bangladesh. Survey revealed that all the farmers of the study area perceived medium to high benefits of Bangabandhu Bridge for agricultural production and marketing. Finding of the study showed that age, farm size, farming experience, annual agricultural income and extension media contact of the farmers had significant relationship with their perceived benefits of Bangabandhu Bridge for agricultural production and marketing. Based on the findings of the study, it is recommended that agricultural advisory service providing organizations should provide necessary support to the younger farmers having lower farm size, lower farming experience, lower annual agricultural income and lower extension media contact to increase their perception on the benefits of Bangabandhu bridge for agricultural production and marketing.

CHAPTER 1
INTRODUCTION

1.1 General Background

The river 'Jamuna' is running from the north to the south which divides Bangladesh into two halves: the east and the west. The capital city of Dhaka and the main port city of Chittagong lie in the east, both providing economic development opportunities and poverty reduction for the eastern region. The western part – especially the north western – embraces Rajshahi and Rangpur Divisions, widely known as pervasively poverty stricken and less integrated with the eastern markets due to communication problems.(Bayes,2007).

Until the Bangabandhu Multi-Purpose Bridge Project on Jamuna river started functioning, ferries accounted for all cross-river traffic between the east and the west, and were the only means of crossing the river. Intermittent influence of the weather made things even worse deterring the mobility of goods and services to and from Rajshahi and Rangpur Divisions. The hindrances pushed up transport costs and spoilage, and thus, hampered smooth trade flows. Reportedly, a one-way trip took more than two hours; the water level and the width of the river changed significantly between the dry and rainy seasons to render it difficult to expand and improve the existing ferry facilities.

Bangabandhu bridge formed a formidable bottleneck in east-west traffic, hindering the transport of agricultural products grown in the granaries in the west to the consumption centers in the east. In addition, regions in the west were deprived of infrastructural development, including gas, electricity and communications that were, hitherto, concentrated mostly in the east. To overcome these problems, construction of the bridge began in October 1994 and finished in June of 1998. The Bridge was built with a view to providing the first road and rail link between the relatively less-developed Northwest region of the country and the more developed eastern part including the capital of Dhaka and the port of Chittagong. Out of 64 districts of Bangladesh, 16 districts belongs to

Rajshahi Division. The names of the districts are: Bogra, Dinajpur, Gaibandha, Joypurhat, Kurigram, Lalmonirhat, Noagaon, Natore, Nwabgonj, Nilphamari, Pabna, Panchagarh, Rajshahi, Rangpur, Sirajgong and Thakurgaon. The districts together account for 23% of total area, 48% of population and 22% of GDP of Bangladesh.

Louis Berger group Inc. (2003) reported that the Bangabandhu Bridge imported positive impacts on the economy of Northwest Bangladesh, especially marketing mergins of commodities was decreased, price integration was increased, the share of traded output was increased as a result of decreased transportation cost

Bangabandhu bridge increased the communication facilities of the people of western side of Bangladesh with the people of eastern side. As a results farmer of western side are getting more benefits to transport their agricultural products to eastern side for higher price. On the other hand, agricultural inputs are easily reached to the western people. Therefore, the farmers are getting benefits for their agricultural production and marketing. On these considerations, the researcher of the present study felt necessity to conduct this place of research on “Benefits of Bangabandhu bridge for Agricultural Production and Marketing as perceived by the Farmers”.

Figure 1.1: Bangabandhu Multi-Purpose Bridge

1.2 Justification for the study

It is assumed that Bangabandhu bridge is beneficial to the farmers of the western part of Bangladesh for increasing farm employment, income, and improving their livelihoods. Bangabandhu bridge infrastructure in agricultural areas may have several multiplier effects which have not yet been fully examined. Through this research, how Bangabandhu bridge influences farmers to commercialize their produce would be known and it would serve as one of the documents concerning Bangabandhu bridge infrastructure as a determinant of livelihood strategies and farming system dynamics. The findings would facilitate further research in the agriculture and serve as one of the bases to encourage the development of transport corridors in agricultural Product of the farmers

of western Bangladesh. This research would show the extent to which Bangabandhu bridge infrastructure could transform agriculture to benefit farm households and the economy of the farmers of the north-west part of Bangladesh.(BBS 2003/04)

1.3 Research questions

This research is based on the hypothesis that farmers having access to improve Bangabandhu bridge are able to market their farm produce, access farm inputs, and intensify farming. On these considerations, the present research has been conducted to find out the following research questions:

1. What are the benefits of Bangabandhu bridge for agricultural production and marketing?
2. What are the selected characteristics of the research?
3. What relationship exists between the selected characteristics of the farmers to their perceived benefits of Bangabandhu bridge on agricultural production and Marketing?

1.4 Objectives of Research

The overall objective of the study is to assess the socioeconomic benefits of Bangabandhu Bridge on agricultural production and marketing. The specific objectives were as follows:

- To assess the benefits of Bangabandhu Bridge for agricultural production and Marketing as perceived by the farmers
- To investigate the selected characteristics of the farmers of Sirajganj District
- To explore the relationship of the selected characteristics of the farmers with their perceived benefits of Bangabandhu Bridge on agricultural production and marketing

1.5 Assumptions of the Study

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

1. The findings would give a clear indication of the benefits of Bangabandhu Bridge for agricultural production and marketing.

2. The respondents were capable of furnishing proper responses to the question contained in the interview schedule.

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

4. Information furnished by the farmers included in the sample was the representative of the whole population of the study area.

5. The data collected from the respondents were free from interviewer bias.

6. The selected characteristics of the respondent farmers and their benefits of Bangabandhu bridge for agricultural production and marketing were normally And independently distributed with their respective means and standard Deviation.

1.6 Limitations of the Study

Considering time, money and other resources available to the researcher and to make the research meaningful and manageable from the practical point of view, it has certain limitations that are listed below:

- It was very difficult to get accurate information because the respondents do not keep any written records with respect their activities, production or income. Therefore, the researcher had to depend on data furnished by the respondents.
- Characteristics of the farmers were many and varied. However, only six Characteristics were selected for this study.
- The study was confined to only one Upazila, namely Ullapara Upazila under Sirajganj District.

1.7 Definitions of Important Terms

The terms used frequently throughout the thesis are defined and interpreted with particular meaning in order to eliminate the incurious confusions of meaning.

Bridge: A bridge is a structure built to span a physical obstacle, such as a body of water, valley, or road, without closing the way underneath. It is constructed for the purpose of providing passage over the obstacle, usually something that is otherwise difficult or impossible to cross.

Agricultural production and Marketing: Agricultural marketing indicates moving an agricultural product from the farm to the consumer. These services involve the planning, organizing, directing and handling of agricultural produce in such a way as to satisfy farmers, intermediaries and consumers. Agricultural production indicates the production of any growing grass, crops, or trees attached to the surface of the land or farm animals or fish culture with commercial value.

Age: A farmer's age refers to the amount of time (years) he spends from birth to the interview period.

Education: Education refers to the development of an individual's beneficial improvement in knowledge, skills, attitude and capacity through reading, writing, working, observing and other related activities. This implies the degree to which a farmer is formally educated at some kind of formal educational institution.

Farm size: the size of the farm referred to the area in which it carried out its farming activities belonging to or obtained from other farmers on a leasing basis.

Farming experience: It is described as how many years a farmer has basically been in touch with his agricultural system and observed it.

Annual income: Annual income earned by farmers from agricultural activities is described in Taka.

Extension media contact: Refers to farmers' exposure to different sources of knowledge, such as extension workers, mass media, community events, etc.

CHAPTER 2
REVIEW OF LITERATURE

Literature analysis provides the researcher with guidance to carry out the research program. The present study is concerned with the benefits of Bangabandhu bridge for agricultural production marketing as perceived by the farmers and its relationship with their selected characteristics. An attempt was made to understand the results of previous studies. Just a few studies that were indirectly connected to the current study were identified by the researchers. The internet, blogs, available books, journals and printed materials from various sources were intensively searched by the researchers.

2.1 Benefits of bridge and related matters

The analysis in this paper is related to a large and growing literature on the effects of market integration and transport infrastructure on a variety of economic outcomes, and on the spatial organization of economic activities in both developed and developing countries.

Fan et. al (1998) deliberates on the role of various types of infrastructure on poverty reduction in rural India. They argue that government spending on productivity enhancing investments like agricultural R&D and irrigation, rural infrastructure (including roads and electricity) and rural development, targeted directly on rural poor, all have contributed to the reductions in poverty, and most have also contributed to growth in agricultural productivity.

Ruttan's (1984) "frontier model" pointing to the agricultural prosperity of North and South America and Australia also places at the center the role-played by transportation and communication. The author's "diffusion model"- explaining the process of technological spread in agriculture as a source of dramatic growth in 14 agricultural production, assumes a central role by physical and institutional infrastructure .

Mellor (1976) argues that the future of India's economic development critically rests on the infrastructural development in that country. He points out as to how development of infrastructure results in larger multiplier effects arising from agricultural growth and the expenditure of the agricultural income on consumption.

Donaldson (2018) uses archival data from colonial India to show that India's railroad network reduced trade costs and interregional price gaps, increased interregional and international trade, and real income levels.

Banerjee et al. (2012) analyze the effects of access to transport infrastructure on economic growth in China.

Emran and Hou (2013) provide evidence that better access to domestic and international markets increase household consumption in rural China, and that there is complementarity between domestic and international market access.

Emran and Shilpi (2012) provide a positive relation of transports infrastructure on the extent of the market and stages of Agricultural specialization.

Faber (2014) reported that transport network connection had adverse effects on industrial growth in peripheral counties in China.

Bird and Straub (2014) study the effects of rapid road network expansion between 1960 and 2000 in Brazil using a historical natural experiment and show that proximity to the newly constructed radial road network increases population, GDP and GDP per capita.
Using nightlights data as an indicator of economic activity, Storeygard (2016) provides an estimate of the elasticity of city economic activity to transport costs of 0.25 for 15 sub-Saharan African countries.

Gollin,Douglas and Rogerson (2014) analyze the implications of exogeneous productivity change for the effects of transport cost reduction on subsistence agriculture in the context of Uganda.

Thompsett (2013) analyzes the effects of bridges over the Ohio and Mississippi rivers on population density and value of agricultural land. The evidence suggests positive effects on both population density and value of agricultural land.

In the context of Bangladesh, Mahmud and Sawada (2014) provide preliminary evidence on labor market effects of Bangabandhu bridge. The data used in their analysis cover only two districts adjacent to the Bangabandhu bridge (Tangail and Sirajganj), and thus likely to miss much of effects of the bridge construction on labor reallocation.

Physical infrastructure is seen as an essential precondition for industrialization and economic development (Murphy et al. 1989). Studies show that the development of physical infrastructure improves an economy's long-term production and income levels of an economy in both the macroeconomic endogenous growth literature.

Hulten et al (2006) found that in India, from 1972 to 1992, highways and electricity accounted for almost half of the growth of the Solow residuals of manufacturing industries.

Louis Berger Group, Inc. (2003) examined the benefits of Bangabandhu Bridge on the economy of Northwest Bangladesh. Based on a "before and after" simulation exercise, the report submits that the Bridge imparted positive benefits in that area. Especially, marketing margins of commodities decreased, price integration has increased and more so, the share of traded output increased as a result of decreased transportation costs and increase productivity of Agricultural production.

Infrastructural facilities operating through the markets and institutions as discussed above are likely to lead to poverty reduction. In a research report released by IFPRI, Fan et.al.

(2002) showed how infrastructural development in rural China helped reduce poverty, Agricultural production and regional inequality.

Research gap

A research gap is defined as a topic or area for which missing or insufficient information limits the ability to reach a conclusion of a question**.**

In these researches, there has limited literature. So, I was trying to find out such a relationship between the selected characteristics of the farmers with their perceived benefits of Bangabandhu bridge on agricultural production and marketing.

2.4 Conceptual framework of the study

The conceptual framework is the researcher understands of how the particular variables in study connect with each other. Thus, it identifies the variables required in the research investigation. It is the researcher's "map" in pursuing the investigation. From the past studies and literature, it is observed that various personal characteristics affected respondents on use of various technologies but it is quite impossible to deal with all the characteristics. No literature was found directly related with benefits of Bangabandhu bridge for agricultural production and marketing as perceived by the farmers and relationships between the selected characteristics of the farmers with their perceived benefits of Bangabandhu bridge on agricultural production and marketing. Based on these considerations a conceptual framework has been developed for this study where the researcher mainly attempted to highlight two concepts, namely selected characteristics of the farmers (age, education, farm size, annual agricultural income farming experience and extension media contact) as and the focus issue (benefits of Bangabandhu bridge for agricultural production and marketing as perceived by the farmers). The conceptual framework has been given below:

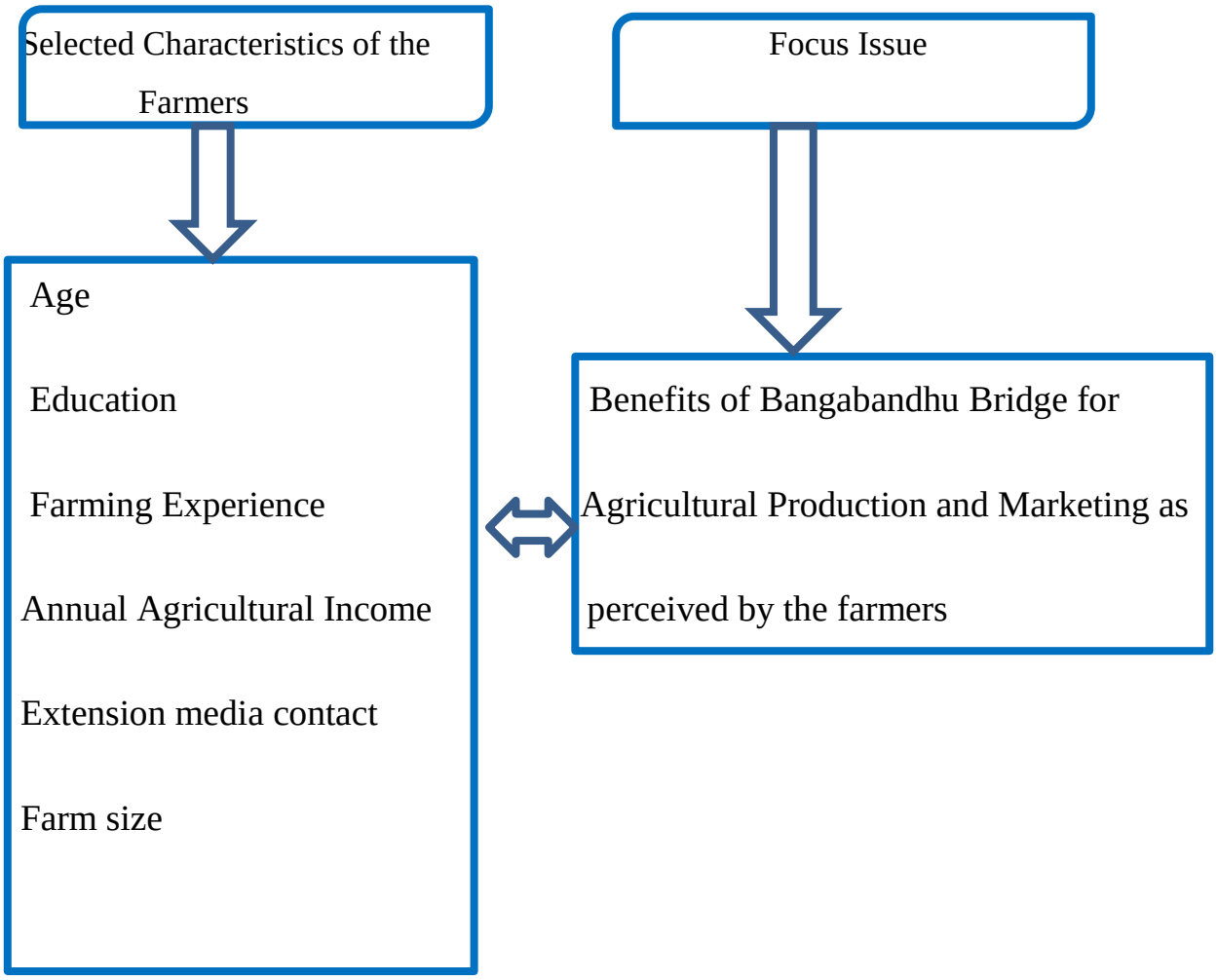

Figure 2.1 A conceptual framework of the study

CHAPTER 3
MATERIALS AND METHODS

It is one of the most essential components of any scientific study for data collection and analysis. Before undertaking a report, it must be considered carefully. In gathering relevant and accurate data and evaluating and interpreting those to arrive at the right summery and meaningful conclusion, the researcher has the duty to clearly explain what kinds of research design, methods and procedures will be followed. The chapters also mention the operational format and comparative reflection of some variables, statistical methods used in the study.

3.1 locale of the study

Ullapara Upazila under Sirajganj was purposively selected on the locate of the study Three (3) villages of three (3) unions of Ullapara upazila Unions, namely, Betkandi under Panchakrushi Union, Puthia under Purnimaganti, Kuthipara under Salanga Union were selected purposively. The main reasons for selecting this study area were:

I. Most of the villagers depend on Bangabandhu Bridge.

ii. The researcher's felt comfortable to conduct the research in the study area.

3.2 Population

The researcher collected an updated list of all the farmers of the selected villages of respective unions. The total numbers of Agricultural farmer in these areas were 955 which constituted the population of the study. A map of Sirajganj district and a map of Ullapara Upazila showing study areas have been shown in figure 3.1 and 3.2 respectively.

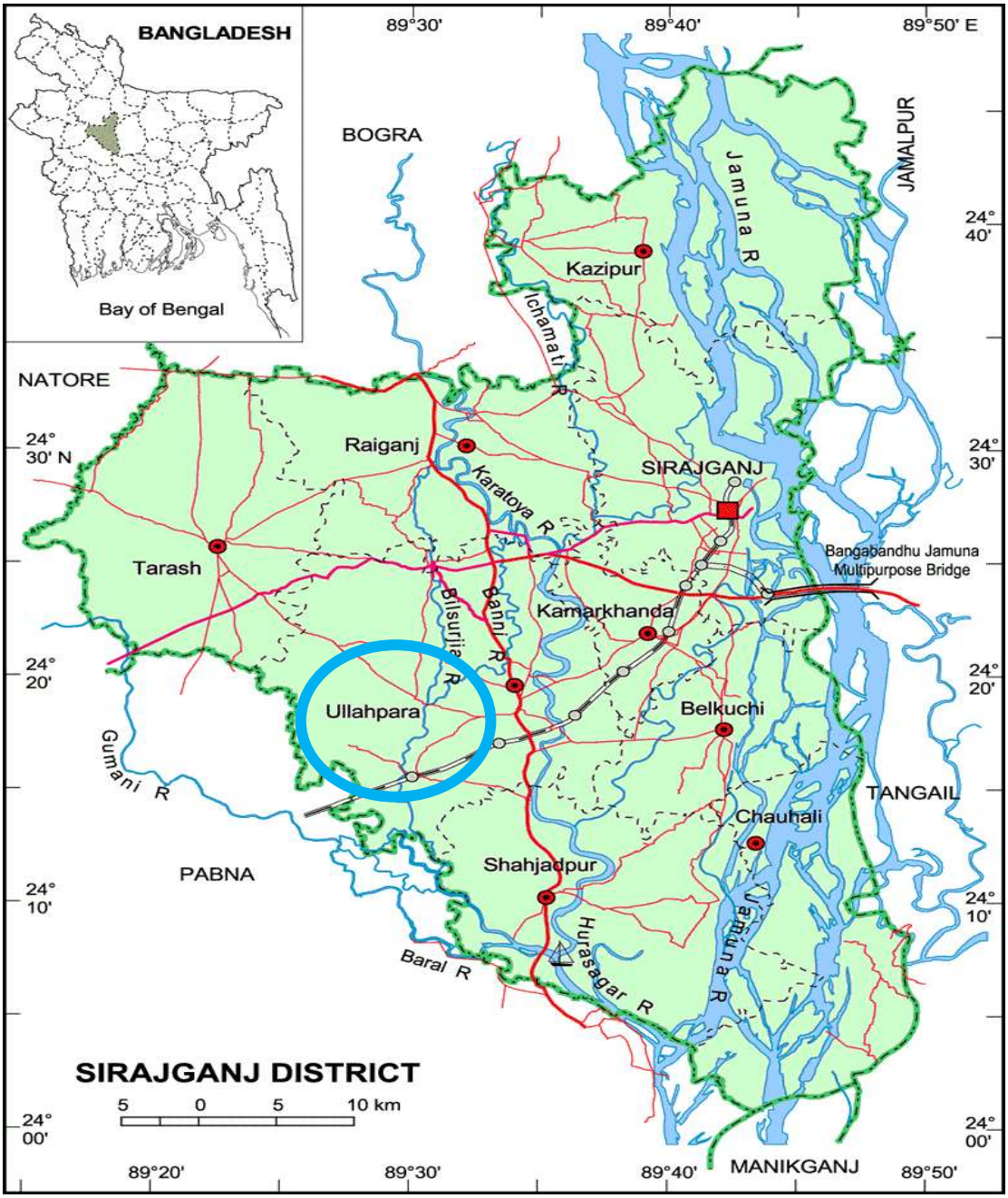

Figure 3.1: Map of Sirajganj showing Ullapara Upazila

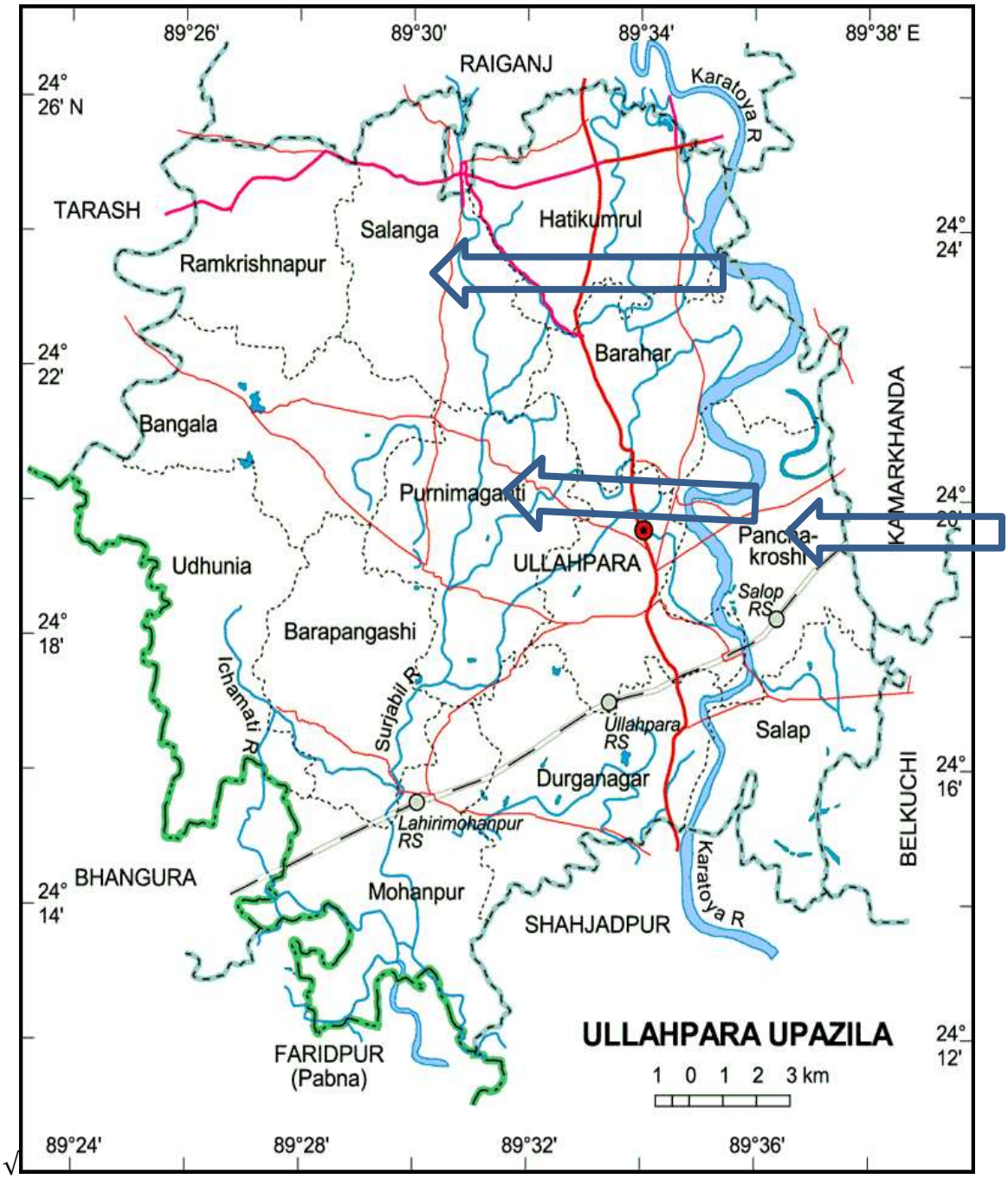

Figure 3.2: Map of Ullapara Upazila showing study areas

3.3 Sample of the study

Ninety-six (96) farmers were taken as the sample of the study by taking of the total population (955 farmers) by using proportionate random. (Table 3.1) (10%)

Table 3.1 Village distribution of the population and sample wise

Name of Village	Population	Sample
Puthia	357	36
Betkandi	297	30
Kuthipara	301	30
Total =	955	96

3.4 Research instruments and data collection

Data were collected personally by the researcher himself through face to face interview from the selected farmers with the help of an interview schedule by keeping in mind the pretested objectives of the study. The researcher took every possible care at the time of the interview with farmers to build a relationship with them so that their cooperation and response to the questions and statements in the schedule was better. The entire process of collecting data was completed in December, 2020.

3.5 Variables and their measurement techniques

A variable is any measurable characteristic which can assume varying or different values in successive individual cases (Ezekiel and Fox, 1959). A well-organized research usually contains at least two important elements. In any scientific research, the selection and measurement of variables is very important. The researcher reviewed the literature to widen his understanding about the nature and scope of the variables relevant to this research. The selected individual characteristics of the farmers were the experimental

variables (namely, age, education, farm size, farming experience, annual income, and extension media contact). Benefits of Bangabandhu bridge on their agricultural production and marketing were the main focus of the study which was considered as the predicted variable.

3.6 Measurement of the selected characteristics of the farmers

Farmers' socio-economic characteristics and farming expertise could have an effect on crop production, fish farming and livestock farming and marketing. Measurement of these characteristics and their knowledge are discussed in the following sub-sections:

3.6.1 Age

The age of a farmers was measured in terms of actual years from his/her birth to the time of interview on the basis of the farmer's statement. Age define the significance of biological maturity of an individual. The contribution of age on use of various technologies has not been well established but it is used in social research to understand the demographic character of a population. A score of 1 (one) was assigned for each year of his age. Question of this characteristic appears in item no. 1 in the interview schedule (Appendix-A).

3.6.2 Education

Education was measured as the farmer’s ability to read and write and the level of formal education received from educational institution. A score one (1) was assigned to each year of successful schooling. If a farmer did not know how to read and write his educational score was zero (0). A score was score (.5) assigned to those who can sign their name only. This variable appears in item no.2 in the interview schedule (Appendix-A).

3.6.3 Farm size

The farm size of a farmer applied to the total farm area either owned by a farmer or leased from others during the time of research. The total farm size in hectare was considered as farm size score of the farmers. This characteristic included in item no.3 in the interview schedule (Appendix-A).

3.6.4 Farming experience

A farming experience has been determined by the cumulative number of years since a farmer has been engaged in the cultivation of his crops, fish and livestock. The real experience generated by the farmers was assessed as a ranking. For each year since the beginning of their farming, a score of 1 (one) has been assigned. This characteristic appears in item no.4 in the interview schedule (Appendix-A).

3.6.5 Annual Agricultural income

Annual agricultural income of a farmer referred to the gross annual income obtained from crop, fish, and livestock sources. It was measured on the basis of his family's yearly earning from farming activities. The Annual farming income was expressed in taka. In measuring the variable total earning in taka of a farmers was converted into score. A score of 1 was assigned for each '1000' taka of the annual income to compute. It is included in item no. 5 in the interview schedule (Appendix-A).

3.6.6 Extension media contact

This variable was measured by computing an extension contact score on the basis of a farmer's extent of contact with seven (7) selected media. Selected media with five alternative responses as regularly, frequently, sometimes, rarely, and not at all, were assigned as 4, 3, 2, 1 and 0 respectively. Logical frequencies were assigned for each alternative response for each of the 7 selected items. The extension contact score of a farmer was determined by summing up his score against all the 7 items. Thus, the extension contact score of the respondent could vary from zero 0 to 28, where '0'

indicated no extension contact and '28' indicated the highest level of extension contact. This characteristic appears in item no. 6 in the interview schedule (Appendix -A).

3.7 Measurement of the benefits of Bangabandhu Bridge for Agricultural Production and Marketing

Twenty seven (27) items of benefits of Bangabandhu bridge for agricultural production and marketing was collected after thorough consultation of the relevant experts and search literatures The farmers were asked to indicate the benefits of Bangabandhu bridge for agricultural production and marketing with four alternative responses as high benefits, medium benefits, low benefits and no benefits with the assigned score as 3, 2, 1 and 0 respectively. Bangabandhu Bridge for agricultural production and marketing was measured by summing up all the scores obtained against all the 27 items. The possible range of benefit score was 0-81, while 0 indicated no benefit and 81 indicated highest. This characteristic appears in item no. 7 in the interview schedule (Appendix -A).

3.8 Statement of Hypothesis

A hypothesis is a conjectural statement of the relation between two or more variables which can be put to a test to determine its validity. Hypothesis are always in declarative sentence form and they are related, either generally or specifically from variables to variables (Kerlinger, 1973). In broad sense hypotheses are divided into two categories: (a) Research hypothesis and (b) Null hypothesis.

3.8.1 Research hypothesis

Research hypothesis indicates a possible relationship between the variables being studied or a difference between experimental treatments that the researcher expects to emerge. The research hypothesis was formulated: “there were significant relationships between each of the selected characteristics of farmers and benefit of Bangabandhu bridge for agricultural production and marketing”.

3.8.2 Null hypothesis

A null hypothesis states that there is no relationship between the concerned variables. The null hypothesis was formulated: “there was no significant relationships between each of the selected characteristics of farmers and their benefits of Bangabandhu bridge for agricultural production and marketing”.

3.9 Categorization of data

The farmers were grouped into many groups. These categories were established by taking into account the essence of data distribution, the general understanding existing in the social system and the system of potential scores. The procedure for categorization of data in respect of different variables is elaborately discussed while describing those variables in Chapter 4.

3.10 Data Processing

After the field survey, all data was coded and tabulated in accordance with the study objectives. Local units have been converted into standard units. Proper scoring methods were used to translate the data into quantitative form in the case of qualitative data. All the individual responses to all questions of the interview schedule were transferred into a master sheet to simplify tabulation, categorization and organization.

3.11 Statistical Procedures or Analysis

The data were analyzed according to the objectives of the study. Qualitative data were converted into quantitative data by means of suitable scoring technique. The analysis was performed using SPSS (Statistical Package for Social Sciences) computer package and the statistical measures such as range, means, standard deviation, number and percentage distribution were used to describe the variables.

Pearson's Product Moment co-efficient of correlation (r) was used to describe the relationships between the concerned variables. At one percent (0.05) level of probability was used for the rejecting of any null hypothesis.

CHAPTER 4
RESULTS AND DISCUSSIONS

In this Chapter, the findings of the study and their interpretation have been presented according to the objectives of the study. This Chapter has been divided into three sections. The first section deals with the selected individual characteristics of the farmers while the second section deals with the benefits of Bangabandhu bridge for agricultural production and marketing. The third section deals with the relationships between each of the selected characteristics of the farmers and their perceived benefits of Bangabandhu bridge for agricultural production and marketing.

4.1 Selected characteristics of the farmers

Benefits of Bangabandhu bridge plays a vital role on the agricultural production and marketing. Farmers use Bangabandhu bridge for their product marketing. Farmer's individual characteristics play a vital role in their production. The individual characteristics of the farmers might have relationship with their perceived benefits of Bangabandhu bridge for their Agricultural Production and Marketing. This section deals with the categorization of the farmers based on their various characteristics.

The characteristics of the farmers were age, education, farm size, annual agricultural income, farming experience and extension media contact. These characteristics of the farmers are described in this section.

Table 4.1 reveals the salient features of the characteristics of the farmers and separate tables are provided while presenting categorizations, discussing and /or interpreting results concerning each of the characteristics of the farmers.

Table 4.1: Salient features of the selected characteristics of the farmers (n=96)

SL NO.	Individuals Characteristics	Range		Mean	Standard Deviation
		Minimum	Maximum		
1	Age	26	82	48.24	11.95
2	Education	0	16	5.20	3.42
3	Farm Size	.2	4.46	1.16	.71
4	Experience	5	60	23.82	11.14
5	Annual income	60	650	190.31	92.70
6	Extension Media Contact	3	20	11.92	2.83

4.1.1 Age

The observed score of age of the farmers ranged from 26 to 82 with the average of 48.24 and the standard deviation of 11.95. Based on the age scores, the farmers were classified into three categories following legislative standard such as young (up to 30), middle aged (31-50) and old (above 50) as shown in Table 4.1.1

Table 4.1.1 Distribution of the farmers according to their age

Categories	Farmers (n=96)	
	Number	Percent
Young (Unto 35)	19	19.8
Middle-aged (36-50)	33	34.4
Old (Above 50)	44	45.8
Total	96	100

Data showed that the highest proportion (45.84 percent) of the farmers were middle aged compared to 19.8 percent being young and 45.84 percent old. That means that most (80.2%) of the farmers of the study area were middle aged or old.

4.1.2 Education

The farmer's educational status was classified into 3 categories namely can't read and write (0), can sign only (.5), a score one (1) was assigned to each year of successful schooling. The distribution of the farmers according to their education is shown in Table 4.1.2

Table 4.1.2 Distribution of the farmers according to their Education

Categories	Farmers (n=96)	
	Range	Percentage
Can't read and write	13	13.54
Only write	9	9.38
Primary level	41	42.71
Secondary level	30	31.25
Above Secondary	3	3.12
Total =	96	100

Data indicated that the highest proportion (42.71 percent) of the farmers who performed their primary level, 31.25 percent were secondary level, 13.54 percent of farmers couldn't read and write or illiterate farmers, 9.38 percent of the farmers could sign only and 3.12 percent were above secondary level. Here educated farmers have better mental strength in decision making and problem-solving activities. Education helps the farmers to gain knowledge by reading books, leaflets, bulletins and other printed materials about various technologies.

4.1.3 Farm size

The observed score of farm size of the farmers ranged from 0.2 to 4.46 with the average of 1.16 and the standard deviation of 0.71. Based on farm size score, the farms were classified into 4 sub-groups. Farmers holding land less than .5 hectares was considered as

marginal farms, holding land between .5 up to 1 hectare were considered as small farms, holding land between 1.00 to 2.5 hectare were considered as medium farms, those holding land above 2.5 hectares were considered as large farms.

The distribution of the farmers according to their farm size is shown in Table 4.1.4

Table 4.1.3 Distribution of the farmers according to their farm size

Categories	Farmers (96)	
	Number	Percentage
Marginal(>.5)	13	13.54
Small(.5-1)	32	33.33
Medium(1-2.5)	47	48.96
Large<2.5	4	4.17
Total =	96	100

Data presented that the majority (48.96 percent) of the farmers had medium farm size, small farm size had 33.33 percent, while only 4.17 percent had large farm size and marginal farmers had 6.25 percent. It might be indicated that small farmers and medium farmers have gotten more benefits of their production and marketing level.

4.1.4 Farming experience

The observed score of farming experience of the farmers ranged from 5 to 60 with the average of 23.82 and the standard deviation of 11.14. Based on farming experience score, the farmers were classified into three categories as low (up to 10), medium (11-30), and high (above 30) as shown in Table 4.1.4

Table 4.1.4 Distribution of the farmers according to their Farming experience

Categories	Farmers (n=96)	
	number	Percentage
Low (up to 10)	18	18.75
Medium (11-30)	62	64.58
High (above 31)	16	16.67
Total	96	100

Data revealed that about 18.75 percent of farmers had low farming experience, while 64.58 percent had medium 16.67 percent high farming experience respectively.

4.1.5 Annual agricultural income

The observed score of annual agricultural income (taka in thousands) of the farmers ranged from 60 to 650 with the average of 190.31 and the standard deviation of 92.7. Based on the annual family income score, the farmers were classified into three categories as low income (up to 100), medium income (100-250) and high income (above 250) as shown in Table 4.1.5

Table 4.1.5 Distribution of the farmers according to their annual agricultural farming income

Categories	Farmers (n=96)	
	Number	Percentage
Low income (up to 100)	11	11.46
Medium income (100-250)	68	70.83
High income (above 250)	17	17.71
Total	96	100

Data revealed that about 70.83 percent of farmers had medium annual agricultural income, while 17.71 percent of farmers had high annual agricultural income and 11.46 percent of farmers had low annual agricultural income.

4.1.6 Extension media contact

The observed score of extension media contact of the farmers ranged from 3 to 20 with the average of 11.92 and the standard deviation of 2.83. Based On possible score, the farmers were classified into three categories such as low (up to 8), medium (9-14) and high (above 14) as shown in Table 4.1.6

Table 4.1.6 Distribution of the farmers according to their extension media contact

Categories	Farmers (n=96)	
	Number	Percentage
Low (up to 8)	13	13.54
Medium (9-14)	70	72.92
High (above 14)	13	13.54
Total	96	100

Data showed that the majority (72.92 percent) of the farmers had medium extension media contact, while 13.54% had and 13.54% had high extension media contact when low and high had same percentage (13.54). It is logical that there may be a relationship between extension media contact of the farmers with their perceived benefits of Bangabandhu bridge for agricultural production and marketing.

4.2 Benefits of Bangabandhu bridge for agricultural production and marketing

The observed score of benefits of Bangabandhu bridge by the farmers ranged from 42 to 77 against the possible range of 0-81 with an average of 60.27 and standard deviation of 6.85. Based on score, the farmers were classified into three categories namely low benefits of Bangabandhu bridge (0-27), medium benefits of Bangabandhu bridge (28-54) and high benefits of Bangabandhu bridge (above 54). The distribution of the farmers according to their perceived benefits of Bangabandhu bridge is given in Table 4.2

Table 4.2 Distribution of the farmers according to their benefits of Bangabandhu bridge for agricultural production and marketing

Categories	Farmers (n=96)		Mean	SD
	Number	Percentage		
Medium benefits (28-54)	20	20.83	60.27	6.85
High benefits (above 55)	76	79.17		
Total	96	100		

Data stated that largest portion (79.17 percent) of the farmers perceived high benefits of Bangabandhu bridge, while 20.83 percent perceived medium and nobody perceived low benefits of Bangabandhu bridge. So, it can be said that all the farmers perceived medium to high benefits of Bangabandhu bridge for agricultural production and marketing.

4.3 Relationship of the selected characteristics of the farmers with their perceived benefits of Bangabandhu Bridge for agricultural production and marketing

The goal of these parts was deal to deals with the relationships of the selected characteristics of the farmers with their perceived benefits of Bangabandhu Bridge for agricultural production and Marketing. The characteristics include age, education, farm size, farming experience, annual agricultural income and extension media contact.

Pearson's Product Moment co-efficient of correlation (r) was used to test null hypotheses concerning the relation between each of the selected characteristics of the farmers with their perceived benefits of Bangabandhu bridge for agricultural production and marketing. Five (0.05) percent level of significance was used as the basis for acceptance or rejection of null hypothesis. Results of co-efficient of correlation between each of the selected characteristics of the farmers with their perceived benefits of Bangabandhu bridge for agricultural production and marketing have shown in Table 4.3. In addition, a correlation matrix has been presented in Appendix-B

Table 4.3 Correlation results showing the relationships of each of the selected Characteristics of the farmers with their perceived benefits of Bangabandhu Bridge for agricultural production and Marketing

Focus Issue	Selected Characteristics	Correlation coefficient (r)
Benefits of Bangabandhu bridge for Agricultural production and marketing	Age	0.282**
	Education	0.053^{NS}
	Farm size	0.603**
	Farming experience	0.322**
	Annual agricultural income	0.626**
	Extension media contact	0.376**

^{NS} not significant

* Significant at .05 level

** Significant at the 0.01 level

4.3.1 Age and benefits of Bangabandhu bridge for Agricultural production and marketing

The calculated 'r' (0.282) value was greater than the tabulated value (r =0.262) with 94 degree of freedom at 0.01 level of probability as shown in Table 4.3. Hence, the concerned null hypothesis could be rejected. Therefore, Age of farmers had significant positive relationship with benefits of Bangabandhu bridge.

4.3.2 Education and benefits of Bangabandhu bridge for Agricultural production and marketing

The calculated 'r' (0.053) value was smaller than the tabulated value (r = 0.262) with 94 degree of freedom at 0.01 level of probability as shown in Table 4.3. Hence, Hence, the concerned null hypothesis could not be rejected. Therefore, Relationship between education of farmers and benefits of Bangabandhu bridge for Agricultural production and marketing was not significant but it has positive relationship.

4.3.3 Farm size and benefits of Bangabandhu bridge for Agricultural production and marketing

The calculated ‘r’ (0.603) value was greater than that of the tabulated value (r = 0.262 2) with 94 degree of freedom at 0.01 level of probability as shown in Table 4.3. Hence, the concerned null hypothesis could be rejected. Farm size of the farmers had significant positive relationship with their perceived benefits of Bangabandhu bridge for Agricultural production and marketing.

4.3.4 Farming experience and benefits of Bangabandhu bridge for Agricultural production and marketing

The computed ‘r’ (0.322) value was higher than the tabulated value (r = 0.262) with 94 degree of freedom at 0.01 level of probability as shown in Table 4.3. Hence, the concerned null hypothesis could be rejected. Therefore, Relationship between farming experience of the farmers and their perceived benefits of Bangabandhu bridge for Agricultural production and marketing was significant and positive.

4.3.5 Annual agricultural income and benefits of Bangabandhu bridge for Agricultural production and marketing

The computed value of ‘r’ (0.626) was higher than the tabulated value (r = 0.262) with 94 degree of freedom at 0.01 level of probability as shown in Table 4.3. Hence, the concerned null hypothesis could be rejected. Therefore, there was a significant and positive relationship between annual agricultural income of the farmers and benefits of Bangabandhu bridge for Agricultural production and marketing.

4.3.6 Extension media contact and benefits of Bangabandhu bridge for Agricultural production and marketing

The calculated ‘r' (0.376) value was larger than the tabulated value (r = 0.262) with 94 degree of freedom at 0.01 level of probability as shown in Table 4.3. Hence, the concerned null hypothesis could be rejected. Therefore, Extension media contact of the

farmers had significant relationship with their perceived benefits of Bangabandhu bridge for Agricultural production and marketing.

CHAPTER 5

SUMMARY OF FINDINGS CONCLUSIONS AND RECOMMENDATIONS

5.1 Selected characteristics of the farmers

Age: The 46.87 percent farmers had middle and only 7.29 percent of the farmers was young aged categories, while the old aged category had 45.84 percent. we saw a result about middle to old aged people have gotten more benefits.

Education: Education Data revealed that 31.25 percent were secondary level, 13.54 percent of farmers could not read and write or illiterate farmers, 9.38 percent of farmers could only sign and 3.12 percent were above secondary level, the highest percentage (42.71 percent) of farmers who completed their primary level.

Farm size: Data presented that the majority (48.96 percent) of the farmers had medium farm size, small farm size had 33.33 percent, while only 4.17 percent had large farm size and marginal farmers had 6.25 percent. It might be indicated that small farmers and medium farmers have gotten more benefits of their production and marketing level.

Farm Experience: Data revealed that about 18.75 farmers had low farming experience, while 64.58 percent and 16.67 percent had medium and high farming experience respectively. Here, we showed that experience farmers have gotten more benefits of their Agricultural production and marketing level

Annual Agricultural income: Data showed that large portion (70.83 percent) of the farmers had medium income where 11.46 percent farmers had low and 17.71 percent farmers had high income. Thus, majority (88.54) of the farmers had medium to high income. So, research showed that medium and high had more benefits.

Extension media contact: Data showed that the majority (72.92 percent) of the farmers had medium extension media contact, when low and high had same percentage (13.54). It is logical that there may be a relationship between contact with different media and benefits of Bangabandhu bridge. In order to benefits of Bangabandhu bridge for Agricultural production and marketing, contact with different media of the farmers should be increased.

5.2 Benefits of Bangabandhu bridge for agricultural production and marketing

Majority proportion (79.17) of the farmers perceived high benefits while (20.83) percent perceived medium benefits of Bangabandhu bridge for Agricultural production and marketing

5.3 Relationships between the selected characteristics of the farmers and their perceived benefits of Bangabandhu bridge for agricultural production and marketing

Correlation co-efficient analysis indicated that age, farm size, farming experience, annual agricultural income, extension media contact of the farmers had significant positive relationships with their perceived benefits of Bangabandhu bridge for agricultural production and marketing. On the contrary, education did not show significant relationships with the benefits of Bangabandhu bridge.

5.4 Conclusion:

Based on findings of the study and their logical interpretations in the light of relevant facts the researcher has been drawn the following conclusions.

1. All the farmers perceived medium to high benefits of Bangabandhu bridge for agricultural production and marketing. Therefore ,it may be concluded that there is scope to increase the benefits of Bangabandhu bridge to whom who perceived medium benefits.

2. Age of the farmers had significant and positive relationships with their perceived benefits of Bangabandhu bridge for agricultural production and marketing. Therefore, it

can be concluded that older farmers perceived more benefits of Bangabandhu bridge for agricultural production and marketing

3. Farm size of the farmers had significant and positive relationships with their perceived benefits of Bangabandhu bridge for agricultural production and marketing. Therefore, it can be concluded that farmers having larger farm size perceived more benefits of Bangabandhu bridge for agricultural production and marketing.

4. Farming experience of the farmers had significant and positive relationships with their perceived benefits of Bangabandhu bridge for agricultural production and marketing. Therefore, it can be concluded that farmers having larger farming experience perceived more benefits of Bangabandhu bridge for agricultural production and marketing.

5. Annual agricultural income of the farmers had significant and positive relationships with their perceived benefits of Bangabandhu bridge for agricultural production and marketing. Therefore, it can be concluded that farmers having more annual agricultural income perceived benefits of Bangabandhu bridge for agricultural production and marketing.

6. Extension media contact of the farmers had significant and positive relationships with their perceived benefits of Bangabandhu bridge for agricultural production and marketing. Therefore, it can be concluded that farmers having more extension media contact perceived more benefits of Bangabandhu bridge for agricultural production and marketing.

5.5 Recommendations

5.5.1 Recommendations for policy implication

Based on the findings and conclusions of the study, the following recommendations were made:

1) All the farmers perceived medium to high benefits of Bangabandhu bridge for agricultural production and marketing. So, it is recommended that agricultural advisory service providers can provide necessary information to the farmers regarding agricultural

input and product transportations through Bangabandhu bridge to increase the benefits for agricultural production and marketing.

2. Age of the farmers had significant positive relationships with their perceived benefits of Bangabandhu bridge for agricultural production and marketing. Therefore, it may be recommended that motivational campaigning to be done for the young farmers to increase their perception on the benefits of Bangabandhu bridge for agricultural production and marketing.

3. Farming experience of the farmers had significant positive relationships with their perceived benefits of Bangabandhu bridge for agricultural production and marketing. Therefore, it may be recommended that motivational campaigning to be done for the farmers having lower farming experience to increase their perception on the benefits of Bangabandhu bridge for agricultural production and marketing.

4. Farm size of the farmers had significant positive relationships with their perceived benefits of Bangabandhu bridge for agricultural production and marketing. Therefore, it may be recommended that necessary technical support may be provided for the farmers having lower farm size to increase their perception on the benefits of Bangabandhu bridge for agricultural production and marketing.

5. Annual agricultural income of the farmers had significant positive relationships with their perceived benefits of Bangabandhu bridge for agricultural production and marketing. Therefore, it may be recommended that necessary technical support may be provided for the farmers having lower agricultural income to increase their perception on the benefits of Bangabandhu bridge for agricultural production and marketing

6. Extension media contact of the farmers had significant positive relationships with their perceived benefits of Bangabandhu bridge for agricultural production and marketing. Therefore, it may be recommended that extension media contact should be increased for the farmers to increase their perception on the benefits of Bangabandhu bridge for agricultural production and marketing.

5.5.2 Recommendations for further study

The following recommendations could be made for further research work:

1) The present study was conducted among the farmers of selected area under Ullapara Upazila of Sirajganj district. Similar studies may be conducted in other areas of the country.

2) The present study was undertaken to explore the relationships of six selected characteristics of the farmers with their perceived benefits of Bangabandhu bridge for production and marketing. Therefore, it could be recommended that further studies should be conducted with other characteristics of the farmers.

3) This study showed that Education of the farmers had no significant relationships with their perceived benefits of Bangabandhu bridge. Hence, further studies are necessary to find out the relationships between these variables again.

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APPENDIX -A

Department of the Agricultural Extension and Information System

Sher-e-Bangla Agricultural University

An interview schedule of the research study entitled

Benefits of Bangabandhu Bridge for Agricultural Production and Marketing as Perceived by the Farmers

Serial No: ……

Name of the respondent: ……

Union: …….

Village: …….……..

Please provide the following information. Your information will be kept confidential and will be used for research purpose only.

1. Age

How old are you? _____ Years.

3. Level of education

Please mention your level of education.

I can't read and write

I can sign only

I have passed…….class.

4. Farm size

Please mention the area of your agricultural farms on the following items

Sl. No	Items	Area of land	
		Local unit	Hectare
1.	Crop farms		
2.	Livestock farms		
3.	Fisheries farm		
	Total		

5. Farming experience

Please mention you experience in farming…… years.

6. Annual agricultural income

Please mention your annual agricultural income from below items:

SL	Items	Annual income (000, BDT)
1	Crops farm	
2	Livestock farm	
3	Fisheries Farm	
	Total =	

6. Extension media contact

Sl.NO	Name of Information sources	Extent to contact				
		Regularly (4)	Frequently (3)	Sometimes (2)	Rarely (1)	Not at all (0)
1	Upazila Agriculture Officer	>6 times/ years	5-6 times/years	3-4 times/years	1-2 times/years	0 times/years
2	Sub Assistant Agriculture Officer	>6 times/ years	5-6 times/years	3-4 times/years	1-2 times/years	0 times/years
3	Upazila Fisheries Officer	>6 times/ years	5-6 times/years	3-4 times/years	1-2 times/years	0 times/years
4	Upazila Livestock Officer	>6 times/ years	5-6 times/years	3-4 times/years	1-2 times/years	0 times/years
5	Group Discussion	>6 times/ years	5-6 times/years	3-4 times/years	1-2 times/years	0 times/years
6	Watching Agricultural related program TV and Radio	Daily	Weekly	Fortnightly	Once/month	0 times/month
7	Reading Agricultural related leaflets	Daily	Weekly	Fortnightly	Once/month	0 times/month
	Total =					

7. Benefits of Bangabandhu Bridge for agricultural production and marketing

Sl. No	Item	Extent of Benefits			
		HI (3)	MI (2)	LI (1)	NI (0)
1	Increasing crop production				
2	Increasing livestock production				
3	Increasing fisheries production				
4	Increasing profitability of crop production				
5	Increasing profitability of livestock production				
6	Increasing profitability of fisheries production				
7	Increasing availability of inputs for crop production				
8	Increasing availability of inputs for livestock production				
9	Increasing availability of inputs for fisheries production				
10	Increasing marketing facilities of crop products				
11	Increasing marketing facilities of livestock products				
12	Increasing marketing facilities of fisheries products				
13	Increasing transporting facilities of				

	crop products				
14	Increasing transporting facilities of livestock products				
15	Increasing transporting facilities of Fisheries products				
16	Decreasing post-harvest losses of crops products due to quick transportation facilities				
17	Decreasing post-harvest losses of livestock products due to quick transportation facilities				
18	Decreasing post-harvest losses of Fisheries products due to quick transportation facilities				
19	Increasing bargaining capacity with the traders to buy crop production inputs				
20	Increasing bargaining capacity with the traders to buy livestock production inputs				
21	Increasing bargaining capacity with the traders to buy fisheries production inputs				
22	Increasing bargaining capacity with the traders to sell crop products				
23	Increasing bargaining capacity with the traders to sell livestock products				
24	Increasing bargaining capacity with				

	the traders to sell fisheries products				
25	Increasing food availability due to increase crop, fisheries, livestock				
26	Increasing purchasing capability due to increase profitability in crop, livestock and fisheries production				
27	Increasing social status, due to increase crop, fisheries, livestock production				
	Total =				
HI= High Benefits. MI= Medium Benefits, LI= Low Benefits, NI= No Benefits,					

Thank you for your participation

……

Date…… Signature of interviewer

Appendix B: Correlation matrix

Variables	X1	X2	X3	X4	X5	X6	Y
X1	-						
X2	-0.294**	-					
X3	-0.090	0.305**	-				
X4	0.894**	-0.289**	-0.153	-			
X5	-0.049	0.297**	0.949**	-0.125	-		
X6	-0.181	0.541**	0.502**	-0.139	0.376**	-	
Y	0.282**	0.053	0.603**	0.332**	0.626**	0.376**	-

* Correlation is significant at .05 level of probability

**Correlation is significant at .01 level of probability

X1= Age

X2= Education

X3=Farm size

X4= Farming Experience

X5= Annual agricultural income

X6= Extension Media Contact

Y= Benefits of Bangabandhu Bridge for agricultural production and marketing.