

**IMPACT OF PADMA BRIDGE ON AGRICULTURE AND LIVELIHOOD AS
PERCEIVED BY THE STAKEHOLDERS**

A THESIS

BY

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STUDENT ID: MS – 210830



**A Thesis Submitted to the Agrotechnology Discipline in Partial Fulfilment of the
requirements for the Degree of Master of Science in Agricultural Extension and Rural
Development**

AGROTECHNOLOGY DISCIPLINE

LIFE SCIENCE SCHOOL

KHULNA UNIVERSITY

KHULNA -9208

JUNE, 2023

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Approved as to style and contents

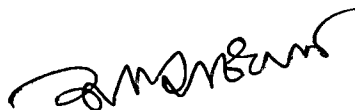
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**DEDICATED
TO
MY BELOVED PARENTS**

ABSTRACT

By the inauguration of Padma Bridge, many avenues have been opened. Especially it has impacted a lot for the improvement of Agriculture and Livelihood. The study was conducted with a view to identifying the impact of Padma Bridge on agriculture and livelihood as perceived by the stakeholders. Data were collected from the respondents with a pretested interview schedule through personal interview during January 1-15, 2023. All of the respondents perceived that Padma Bridge has high (22.5%) to very high (77.5%) impact on Agriculture and Livelihood. Most (98.5%) of the respondents agreed that time requirement to travel from Khulna to Dhaka has been decreased due to Padma Bridge followed by treatment of patients being easy now due to low time requirements to travel to hospitals (97.25%), time requirement for transportation of agricultural goods decreased (94.5%), availability and frequency of vehicles have been increased (94.5%), quality of agricultural commodities remained fresh (93.5%), price of agricultural goods has been increased in production zones (92.5%) etc. Only 64% of the respondents agreed that intensification of crop production has been increased and 64.75% of the respondents also agreed that per day income of farmer has increased. Among eleven selected characteristics, organizational participation ($P < 0.05$), cosmopolitanism ($P < 0.01$), agricultural training received ($P < 0.01$) and extension media contact ($P < 0.01$) of the respondents showed a significant positive relationship with their perceived impact. On the other hand, only family size ($P < 0.05$) showed a significant negative relationship with their perceived impact.

Keyword (s): Impact; Padma Bridge; Agriculture; Livelihood.



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June, 2023

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List of Acronyms and Abbreviation Used

BBS	Bangladesh Bureau of Statistics
BDT	Bangladeshi Taka
BRAC	Bangladesh Rural Advancement Committee
BSCIC	Bangladesh Small and Cottage Industries Corporation
<i>et al.</i>	And Others
GDP	Gross Domestic Product
Ha	Hectare
HIES	Household Income and Expenditure System
HPPIIS	Highest Possible Perceived Impact Index Score
Min.	Minimum
Max.	Maximum
MPA	Mongla Port Authority
No.	Number
NS	Non-significant
OPIIS	Observed Perceived Impact index Score
PII	Perceived Impact Index
PB	Padma Bridge
PMB	Padma Multipurpose Bridge
PMBP	Padma Multipurpose Bridge Project
PPCC	Pearson's Product Moment Coefficient of Correlation
SAAO	Sub Assistant Agriculture Officer
Sl	Serial
SPSS	Statistical Package for Social Science
UAO	Upazila Agriculture Officer



CHAPTER 1

INTRODUCTION

1.1 General Background

Bangladesh is a riverine country and the river is the main means of transport in the country's business and plays a vital role in public life. There are 213 rivers in Bangladesh, of which 20 important bridges have been constructed (Islam et al., 2020). Padma is a large river in Bangladesh, which separates the southwestern region from the capital city (Jalil et al., 2021).

The Padma Multipurpose Bridge was a dream project for the millions of people in the southwestern region of Bangladesh (Ahmed, 2022). It is the longest bridge in the country, serving as both a road and rail bridge. The Padma Bridge is situated on one side in Mawa, Munsigonj and on the other side in Zajira, Shariatpur district. The Bridge connects 21 districts in the southern region of the country (Rahman, 2023).

Struggle in ferry worsen every year with an increasing number of vehicles. The waiting time at ferry points is more than two hours for buses and light vehicles and almost 10 hours for trucks was a regular picture (Khan et al., 2021)

Padma Bridge ends all the sufferings as people of southwestern region now can drive straight to Dhaka by road. The long nightmarish wait for the ferry boat is over. They are now crossing the river in just six minutes the Padma Bridge (Manzur, 2022). The construction of Padma Bridge open an avenue for a reliable and safe fixed river crossing.

With the operation of Padma Bridge struggle of passengers for ferry and drastic weather conditions which disrupted travelling of the people by river became easier than ever. It is roughly calculated that the Bridge has reduced travel time to Dhaka from the Southwestern districts by 25 percent. This Bridge has saved much of vehicles operating cost accumulated during normal traffic on ferry. Notably, the Padma Bridge has directly connected 21 districts of the Southern part with Dhaka and its adjoining industrial towns like Narayanganj, Narsigndi and Gazipur (Mahmood, 2022).

The people, who suffered limitless miseries and sufferings for ages just for lack of a bridge, are now becoming self-confident with the imagination that this Padma Bridge will change their fate. Besides, people from various classes and professions including peasants and businessmen involved in agriculture are very much optimistic that the bridge will create positive impacts on the agri-based district (BSS, 2022).

The Bridge will assist in maximizing farm and non-farm growth possibilities, diversified agriculture and saline affected parts, and availing inter country trade between Bangladesh and India. By the same token, it will maximize dairy and fish processing, shrimp business, jute and

textile. By adopting strong supply chains, stakeholders will be benefited from being able to maintain the quality of their perishable commodities as well as lower production cost due to transportation and storage facilities (Khan et al., 2021).

With the rise of a myriad of possibilities from the Padma Multipurpose Bridge (PMB), there will be a sharp rise in entrepreneurial minds. Employments will fill up in droves. Better healthcare facilities coupled with lesser commute time will add to better living.

The total production of the transport, trade and local industrialization focused around the Padma Bridge, as well as GDP growth, will have an effect on the country's entire economy. A BRAC study anticipates a 5% contribution to GDP in 31 years based on the present base year. The Padma Bridge is no longer simply a steel structure; it has become the focal point of the Bangladesh's ability, economic prosperity and the emotions of the Bangladeshi people (Basu, 2022).

And that is why the Ananda Bazar, BBC News, China Daily and the News Page also call it a pride and opportunity for the people of Bangladesh because the opening of Padma Bridge is a symbol of pride and it has also created opportunity for the people of Bangladesh (Global Times, 2022; Kun and Zhou, 2022).

1.2 Statement of the problem

This bridge is a testament on how a country with limited resources can achieve its goal if there is determination. Under the leadership of Bangladesh's Prime Minister Sheikh Hasina, the Padma Bridge is the outcome of dedicated work of the Bangladeshi people including government officials, engineers, planners, workers and many other concerned persons. Infrastructure generates economic benefit to the extent they create services for people. In other words, benefits from infrastructure are not automatic and it cannot work in isolation. The return from investments depends on enabling policy framework and supporting measures. One of the preconditions is the development of all regions including the rural areas and creating opportunities for people everywhere. Decentralization of services and opportunities is critical for reaping benefits from such infrastructure.

Earlier, the Jamuna Bridge which linked the north-western districts with the rest of the country had also created a lot of hope. However, much of that hope remained unfulfilled. With much dismay we observe how stakeholders of Sirajganj and other districts have to throw milk on the road as they do not get fair prices. Potato and other vegetable producers in the villages have to do the same due to lack of better prices for their produce.

On the other hand, students from the rural areas have to come to Dhaka for higher studies. Critical patients have to be brought to big cities for treatment despite having clinics at district and sub-district levels. Professionals and doctors do not want to live outside Dhaka. In many districts there are medical colleges and universities. Still those places are not the desired destinations due to lack of other essential amenities. Because, Dhaka is the center of all economic, administrative, social and cultural activities, people cannot do without living in and around this mega city. This is deterring the development of the rural areas (Khatun, 2020).

Analyzing the problems associated with the impact of Padma Bridge from the Stakeholders' perspective, the researcher undertook the study entitled "Impact of Padma Bridge on Agriculture and Livelihood as Perceived by the Stakeholders".

In order to make the study manageable, the following research questions were taken into consideration:

- I. What are the perceived impacts of Padma Bridge on agriculture and livelihood?
- II. Is there any relationship between the selected characteristics of the stakeholders and their perceived impact of Padma Bridge?

1.3 Research Gap

The Padma Multipurpose Bridge is a dream bridge which has not only established long awaited direct road and rail communications between the capital and south western part of Bangladesh but also contribute to greater connectivity and trade among Asian countries (Ali et al., 2022). This bridge will bring great dynamism to the agro-based economy of Bangladesh as agriculture in 21 districts in the south-west of the country will undergo major changes. Agriculture and industry will benefit from new business opportunities brought about by improved transportation. New industrial units will be established, creating a large number of job possibilities.

The Padma Bridge is a dream project for the millions of people in the south western region of Bangladesh. It provides a broad range of economic opportunities. So, an appropriate set of policies needs to be targeted with a higher priority.

Different types of writers have reported many reports in different current news like Prothom Alo, The Daily Star, Business Post etc. and very few research has been conducted on Padma Bridge already. The researchers and reporters focused on many issues of Padma Bridge, "who inaugurated the Padma bridge, how much changes have been appeared already after inauguration of Padma Bridge, which sectors have been benefitted from Padma Bridge, who are the main beneficiaries, what are the possibilities that can be taken by the stakeholders, what

are the advantages and disadvantage of the Padma Bridges”. The researcher was attempt to fulfil the mentioned gaps with this piece of study entitled “The impact of Padma Bridge on Agriculture and Livelihood as perceived by the Stakeholders”.



1.4 Specific Objectives

The following objectives will be pursued in the current study:

- I. To determine the impact of Padma Bridge on agricultural and livelihood as perceived by the stakeholders.
- II. To analyze the selected characteristics of the stakeholders.
- III. To explore the relationship between the selected characteristics of the stakeholders and their perceived impact of Padma Bridge.

1.5 Scope of the Study

The present study provides valuable information about the Padma Bridge and its positive and potential role in improving agriculture and livelihood. This study also analyzed the changing scenery of activities related to agriculture in southwest part of Bangladesh. This study results will help them encourage to take full advantages of Padma Bridge for the betterment of agriculture and livelihood in the southwest region of Bangladesh.

1.6 Limitations of the study

Due to time and resource limitation, there are some limitations of the study.....

- I. The study was confined to selected areas rather whole connected region by the Padma Bridge like the capital and whole southern part of Bangladesh.
- II. The respondent's characteristics in the study area were many but only 12 characteristics were selected for interview in this study as stated in the methodology.
- III. In some cases, the researcher faced unexpected situation from the over interested side talkers while collecting data from the target populations. However, the researcher tried to overcome this situation as soon as possible with sufficient tact and skill.
- IV. Sometimes, the researcher was insulted by the respondents (who are old and illiterate).

1.7 Assumptions

An assumption is a supposition that an apparent fact in principle is actual in the light of available evidence (Goode et al., 1945). The following assumptions were in the mind of the researchers while conducting the study:

- I. The selected respondents were a reliable source of information that would make the study successful.
- II. The respondents were honest in answering the questions included in the interview schedule.
- III. The researcher who acted as the interviewer was able to deeply explain the purpose of the study to its respondents.
- IV. The interviewer was well adjusted to the social environment of the study area. Hence, the data collected by researcher was free from bias.

All the data concerning the study variables were normally and independently distributed.

1.8 Definition of Related Terms

The terms which have been frequently used throughout the research are defined and interpreted below

Stakeholders: Stakeholders are those who are directly or indirectly benefitted or affected by the establishment of Padma Multipurpose Bridge. But, in this study the farmers, teachers, businessmen, fishermen and milk producers etc were considered as stakeholders. (Adopted from Ahmed, 2011; p66)

Respondent: A person who gives a response or answer to a question that is asked especially as a part of a survey.

Age: The age of the respondent is defined as the duration of his life that are operationally measured by the number of years from the date of birth to the time of interview.

Education: Education refers to the process of facilitating the acquisition of new knowledge, skills, moral values, beliefs, habits, learning and personal development through reading, writing and other related activities. It is measured in terms of the schooling of the individual respondent.

Family Size: The size of a family of a household was defined as the number of individuals in the family, including himself, his wife, children, and other dependent members who live and eat together.

Farm: A farm of a rural farmer refers to a household or unit of holding organized to produce one or more enterprises like crops, livestock, fish, trees, etc. to satisfy the rural stakeholders' goal. A farm may or may not be of commercial venture.

Farm Size: It refers to the area of land owned by a farmer on which farming activities are carried out. A respondent was considered to have full benefit from the cultivated area either owned by him/her or obtained on the sharecropping system. The areas are estimated in terms of full benefit to the stakeholders. The right of stakeholders on the land taken on lease or mortgage from others was regarded as ownership in estimating the farm size.

Farming Experience: It means the involvement of stakeholders' from the starting point to the present time in various fields of agricultural activities.

Extension Media Contact: Extension media contact refers to individual access to or contacts the communication media and sources or any extension teaching methods used to disseminate new technologies among stakeholders.

Agricultural Training Received: It refers to the total number of days farming his/her life attended to the various farming related training courses.

Annual Income: Annual income is defined as the total earning of the respondents and their family members from agriculture and other sources (services, business, labor, etc.) during a year.

Impact: Impact implies changes in people's lives. This might include changes in knowledge, skill, behavior, health or living conditions for children, adults, families or communities. Such changes are positive or negative long term effects on identifiable population groups produced by a development intervention, directly or indirectly, intended or unintended.

Perceived Impact: The changes that are positive or negative long term effects on the population of the study area produced by the establishment of Padma Bridge directly or indirectly are perceived by the stakeholders considered as perceived impact.

CHAPTER 2

REVIEW OF LITERATURE

The researcher dealt with a thorough search for relevant secondary sources like news, web site, reports, opinions of specialists and very few researches on this topic. This search was well-organized and focused on the study's main goals. This chapter is divided into six sections. Such as...

1. Concept and Location of Padma Bridge
2. Time Series Analysis
3. The Effect of Padma Bridge on Agriculture
4. The Effect of Padma Bridge on Livelihood
5. The Negative Effect of Padma Bridge
6. Contribution of Padma Bridge
7. Conceptual Framework of the study

2.1 Concept and Location of Padma Bridge

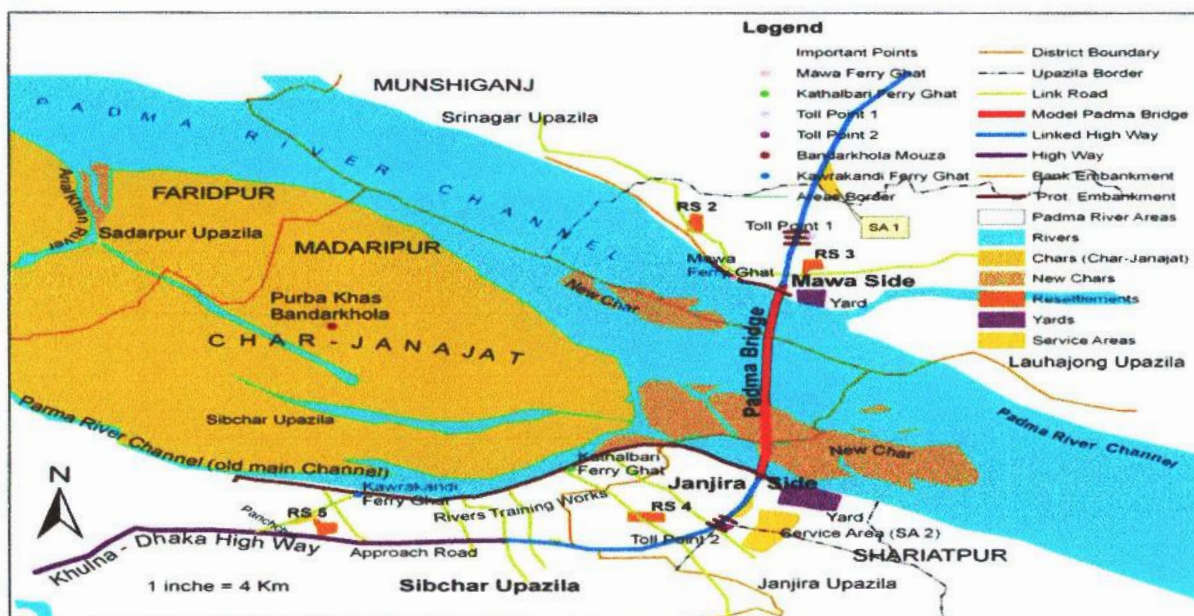


Source: The Finance Today, 2022

Our Honorable Prime Minister Sheikh Hasina inaugurated the much awaited Padma Bridge on 25 June, 2022. A huge amount of people of southwest part of Bangladesh were decentralized from the capital city of Dhaka. Transport system between the capital and southwest part of Bangladesh was very difficult. But a combined transport system is established after inaugurating the Padma Bridge.

Through the inauguration of Padma Bridge, it has been proved our ability and steadiness of development of our country to the World Arena.

The main Bridge is located over the Padma River in the north south direction starting at Mawa on the Dhaka side under Lauhajong Upazilla and ending at Janjira on the other side of the river under Shariatpur district. The Padma Bridge is 6.15 km long and it stands as the 25th longest road bridge in the World.



Source: (Islam, 2011)

2.2 Time Series Analysis

From a report of Cost Benefit Analysis: Padma Bridge Projects by Ashikur Rahman, Senior Economist, Policy Research Institute (PRI) of Bangladesh and Bazlul Hauque Khandakar, Professor, Department of Economics, Dhaka University analyzed Traffic and Revenue volume Forecasts Prepared by AECOM. They perceived that the number of vehicle will be increased year after year after launching Padma Multipurpose Bridge. As a result the revenue volume from the increased traffic will be increased. This will be a great opportunity for the government to raise their revenue from the vehicles for the port related and road related transport facilities.

2.2.1 Traffic Volume Forecast

Table 2.1 Traffic Volume Forecast

Year	Truck (No.)	Bus (No.)	Car (No.)	Motor cycle (No.)
2014	3477	5693	2658	228
2015	4233	6091	3097	265
2016	5154	6518	3607	308
2017	6274	6974	4203	356
2018	7638	7463	4896	415
2019	9299	7985	5707	482
2020	11320	8544	6645	559
2024	14378	9460	11058	972
2034	22449	11348	27641	2617
2044	25882	12190	34312	3271

Source: AECOM, 2010

Data of Table 2.1 demonstrate that the distinguished differences of the number of vehicles from southern districts to Dhaka before inauguration of Padma Bridge and after the inauguration of Padma Bridge and what would be the expected number of vehicles for the next couple of decades. The following column chart can help to understand the differences clearly (Figure 2.1).

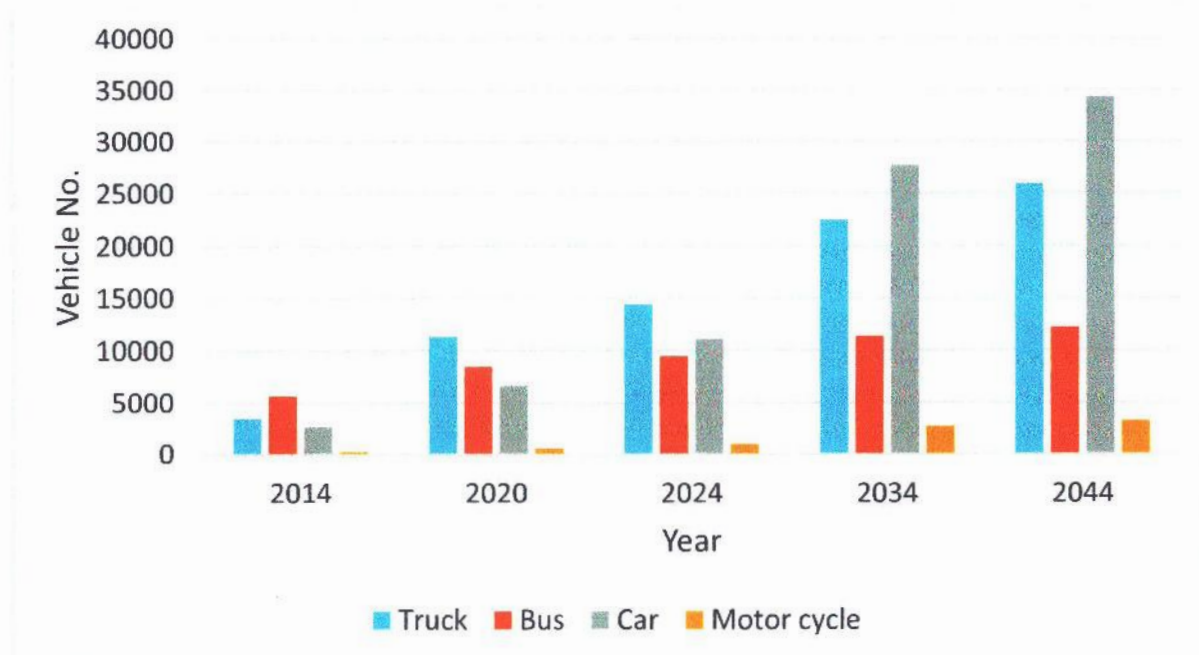


Figure 2.1 Traffic forecast

2.2.2 The Revenue (BDT million) Forecast

Table 2.2 The Revenue (BDT million) Forecast

Year	Truck (BDT million)	Bus (BDT million)	Car (BDT million)	Motor cycle (BDT million)	Total (BDT million)
2014	1187	1652	388	3	3229
2015	1445	1768	452	3	3667
2016	1759	1891	527	3	4180
2017	2141	2024	614	4	4782
2018	2607	2165	715	5	5491
2019	3173	2317	833	5	6328
2020	3863	2479	970	6	7319
2024	4907	2745	1615	11	9277
2034	7661	3292	4036	29	15018
2044	8833	3537	5010	36	17416

Source: AECOM, 2010

Data of Table 2.2 demonstrate that the distinguished differences of the amount of revenue for vehicles from southern districts to Dhaka before inauguration of Padma Bridge and after the inauguration of Padma Bridge and what would be the expected amount of revenue for the next couple of decades. The following line chart can help to understand the differences clearly (Figure 2.2)

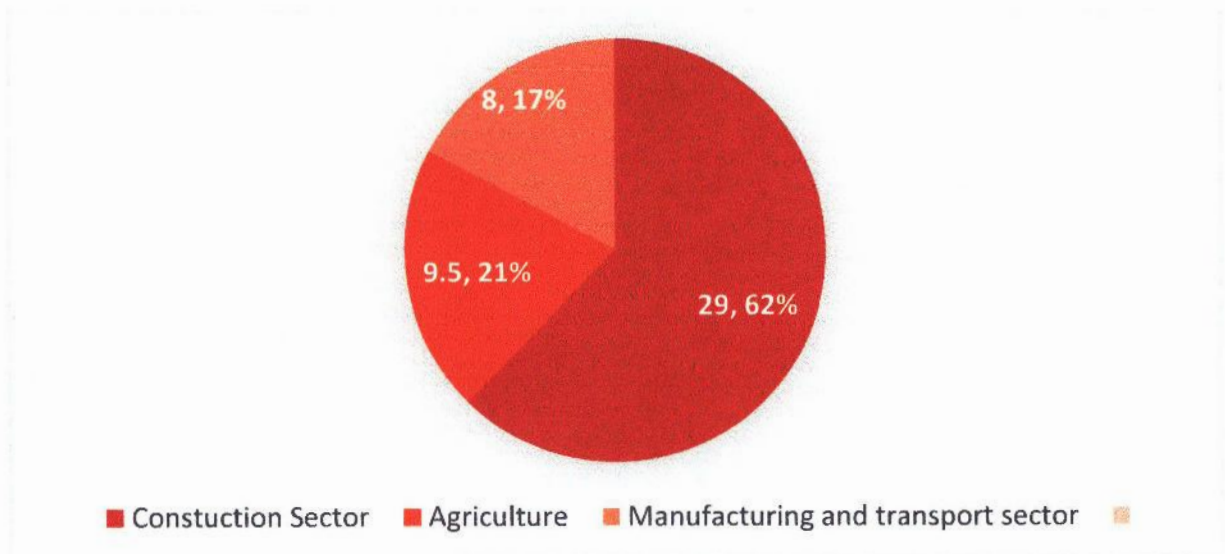


Figure 2.3 Sector wise contribution (%) of Padma Bridge

2.6 The Negative Effect of Padma Bridge

- I. The process of overall construction of Padma Bridge generates about 50 million cubic meter dredge material from the river.
- II. Loss of fish breeding area about 767 hectare and 12 hectare fishing ponds will be filled up, etc.
- III. About 295,072 trees loss (excluding 485,074 bamboo and banana trees).
- IV. About 24,684 tons of crops losses.
- V. Traffic congestion, safety hazards, noise pollution, sanitation. Health and hygiene, waste generation etc. are increasing.

Source: Bangladesh Bridge Authority, 2015

2.7 Conceptual Framework of the Study

In scientific research, the conceptual framework is selecting and measuring variables. A properly constructed research hypothesis contains a “dependent variable” and “independent variable.” This study is concerned with the impact of Padma Bridge on Agriculture and Livelihood as perceived by the Stakeholders of Dumuria Upazila under Khulna District. So the perceived impact of Padma Bridge were the study’s dependent variables. Although it is impossible to deal with all the variables in a single study. And about 11 selected characteristics of the stakeholders’ which might contribute to the perceived impact of Padma Bridge. The conceptual framework of this study has been formulated as shown below:

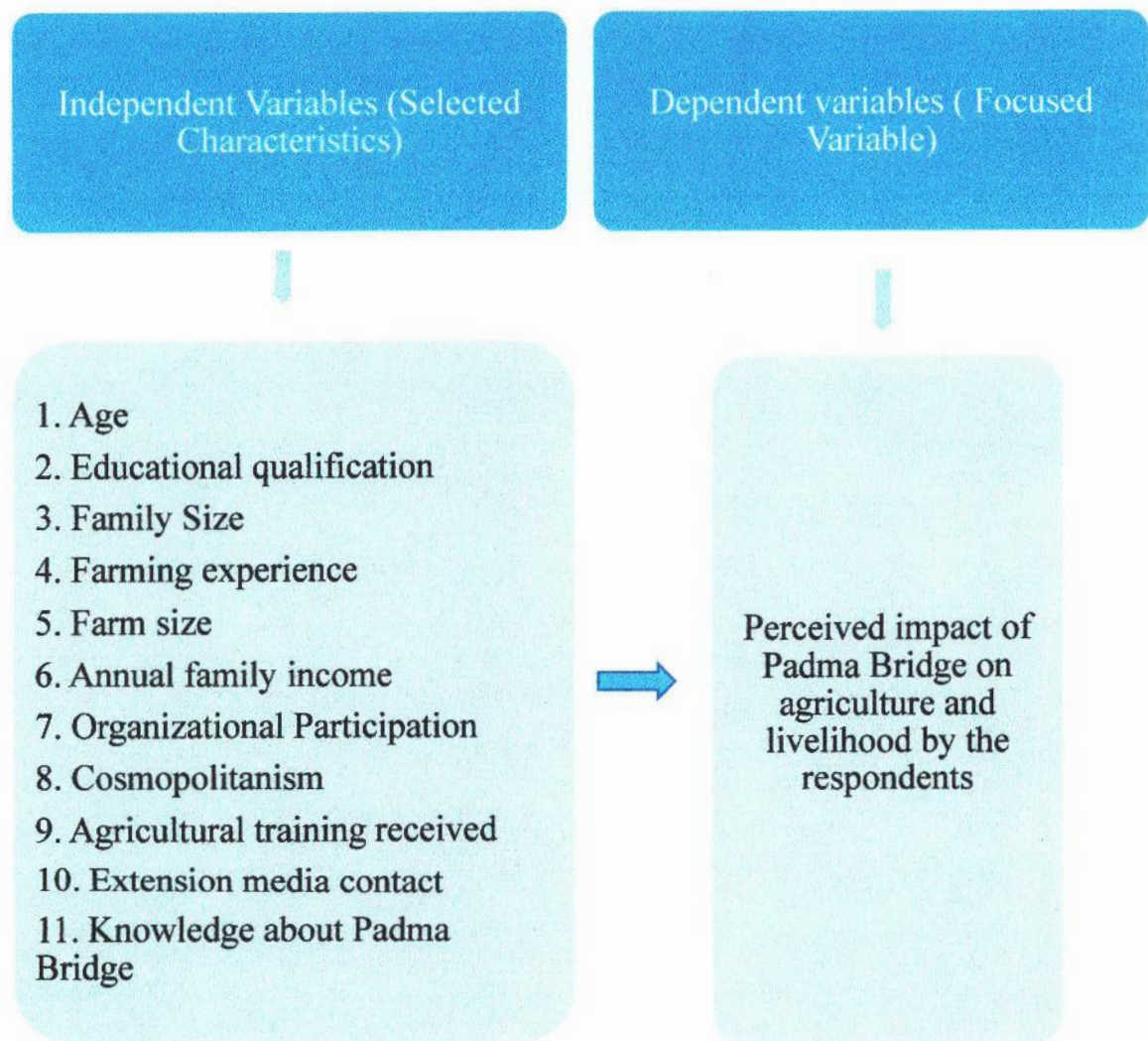


Figure 2.4 Conceptual model showing the relationship between the selected characteristics of the respondents (Independent Variable) and their perceived impact of Padma Bridge on agriculture and livelihood (Dependent Variable).

CHAPTER 3

METHODOLOGY

Methodology is the philosophical framework within which the research is conducted or the foundation upon which the research is based (Brown, 2006). It should enable the researcher to collect the valid information and analyze the same data properly to arrive correct decision. The methods and procedures followed in conducting this research are being described below:

3.1 Design of the Study

The research was conducted following the Diagnostic and Descriptive design. It was designed to determine the impact of Padma Bridge on Agriculture and Livelihood as Perceived by the stakeholders. The data related to perception of the stakeholders the regarding impact of Padma Bridge were collected through personal interview with the stakeholders.

3.2 Locale of the Study

The study was conducted to Dumuria Upazila in Khulna district as it is agriculturally rich Upazila. Dumuria Sadar Union was purposively selected out of 14 union. The study was conducted mainly in Golna, Khalshi, Mirzapur, Dakkhin Dumuria and Araj Sajiara villages under Dumuria Sadar Union. The selected areas for the study are actually best on time and resource availability. Dumuria Upazila area is 454.23 sq km and is located in between 22° 39' and 22° 56' north latitudes and in between 89° 15' and 89° 32' east longitudes. There are two main rivers: Shibsra and Singrail. A map of Dumuria Upazila under Khulna district is shown in Figure 3.1.

3.3 Population and Sampling

The stakeholders who are related to Padma Multipurpose Bridge were benefited as population in this study who lived in the study area. However, a number of 80 stakeholders were purposively selected as the sample of the study, followed by an accidental random sampling method (Kothari, 2004).



Figure 3.1 Map of Dumuria upazila under Khulna district showing the study area

(Source: https://en.banglapedia.org/index.php/Dumuria_Upazila; 1.08 pm; 18 June, 2021)

3.4 Data Collection

3.4.1 Preparation of Interview Schedule

In order to collect the perceived impact of Padma Bridge from the stakeholders, an interview schedule was carefully designed. Simple and direct questions were included in the interview schedule. The questions were systematically arranged to help the respondents to understand the consequences easily. Scales were developed for collecting information required for measuring the selected characteristics. The interview schedule was pretested by six stakeholders. Based on their reaction, the interview schedule was corrected and modified. The interview schedule was then printed in its final form and then finally multiplied. A copy of the interview schedule in the English version is placed in Appendix A.

3.4.2 Method and Time of Data Collection

Data were collected from the sampled stakeholders using a pretested interview schedule through face to face interview by the researcher herself. The researcher had to make several visits to collect valid and reliable information from the stakeholders during January 1-15, 2023. Before starting data collection, the researcher met the respective Upazila Agriculture Officer (UAO) and the concerned Sub Assistant Agriculture Officer (SAAO). With the help of concerned authorities, the researcher collected the address and information about the stakeholders of the respective Union. The researcher met with the respondents and interviewed them at their convenient time. The researcher discussed the objectives of the present study with the respondents so that they did not feel any hesitation to share their personal information at the time of interview. However, if any respondent failed to understand any question, the researcher explained and clarified the question and statement as much as possible without any biasness so that the respondents could easily understand and answer the questions correctly. After completing the interview, it was checked and editing was done if needed. The researcher did not face any major problem during data collection. The respondent and other concerned persons extended excellent cooperation and coordination during data collection.

3.5 Data Tabulation

After completing the field survey, all the interview schedule were prepared for data tabulation. Collected data were summarized and inspected thoroughly following the instruction of the Supervisor. A master sheet was prepared to tabulate the data by transferring all the individual variables to meet the study's objectives.

3.6 Data processing

During data processing, an appropriate scoring technique was followed to convert the data into a quantitative form in case of qualitative data. Local units were converted into standard units. Indices and scales were considered efficient instrument for data reduction and analysis. All personal characteristics were categorized and arranged in simple tables for interpretation and discussion. Number, frequency, percentage, range, mean, standard deviation and rank order were used for statistical description.

3.7 Measurement of Variables

3.7.1 Measurement of Selected Characteristics of the Respondents

Eleven (11) characteristics of the respondents were selected for the study. The procedure followed in measuring the independent variable are discussed below:

3.7.1.1 Age

The respondent's age was measured in terms of actual years from his/her birth to the time of interview based on their response to the term no.1 of interview schedule (Appendix A). It was expressed in terms of whole years. It is the first item in the interview schedule. Based on age, the respondents were classified into different categories, as shown in Table 3.1

Table 3.1 Categories of the respondents according to their age

Categories	Age limits (Years)
Young aged	≤ 35
Middle aged	36 to 50
Old aged	>50

3.7.1.2 Educational Qualification

The educational qualification of a respondent was measured by the number of years of schooling. A score of one was assigned for each year of schooling completed. For example, if a respondent completed a study of class five, his/her education score was assigned as 5. Based on the educational qualification, the respondents were classified into different categories, as shown in Table 3.2

Table 3.2 Categories of the respondents according to their educational qualification

Categories	Score (Year of schooling)
Illiterate	0
Primary	1-5
Secondary	6-10
Higher Secondary	11-12
Above Higher Secondary	≥ 13

3.7.1.3 Family Size

The family size of a respondents was measured by the total number of his/her family members including themselves, spouse, children and other dependents who were eating and staying together. Based on family size, the respondents were classified into different categories, as shown in Table 3.3.

Table 3.3 Categories of the respondents according to their family size

Categories	No. of Family Members
Small Sized Family	≤ 4
Medium Sized Family	5-6
Large Sized Family	>6

**3.7.1.4 Farming Experience**

The farming experience of a respondent was measured based on his/her involvement in farming. It had been expressed in terms of year. For example, if a respondent was involved in farming for one year, his/her experience score was 1. Based on the farming experience score, the respondents were classified into different categories, as shown in Table 3.4.

Table 3.4 Categories of the respondents according to their farming experience

Categories	Score (Year of experience)
Low Experience	≤ 15
Medium Experience	16-30
High Experience	>30

3.7.1.5 Farm Size

Farm size was measured as the size of the respondents' farm on which stakeholders continued his/her farming operations during the study period. It included the area of homestead, land under his/her family cultivation, land given to others on lease etc. The area was measured in terms of a hectare.

The farm size of a respondent was measured by using the following formula:

$$\text{Farm Size} = a + b + \frac{1}{2}(c + d) + e + f$$

$$\text{Or, } a + b + \frac{1}{3}(c + d) + e + f$$

- Where,
- a- Homestead Area
 - b- Own land under own cultivation
 - c- Land taken from others on barga
 - d- Land given to others on barga
 - e- Land taken on lease
 - f- Others

The actual size of the farm was considered as the score of the farm size. For example, if a respondent had 0.05 ha of land, then his/her score was 0.05. The data were first recorded in a local unit and then converted to hectare. Based on farm size, the respondents were classified into different categories, as shown in Table 3.5.

Table 3.5 Categories of the respondents according to their farm size

Categories	Score (Hectare, ha)
Landless	<0.02
Marginal Farmer	0.02-0.20
Small Farmer	0.21-1.0
Medium Farmer	1.01-3.0
Large Farmer	>3

3.7.1.6 Annual Family Income

Annual family income is operationally defined as the total income of the respondents from farming and other sources including the incomes of other family members for one year. The response was obtained by asking the respondent about the income s/he earned during the last

year. A score of one was arranged for 1000 BDT. Based on annual family income, the respondents were classified into different categories, as shown in Table 3.6.

Table 3.6 Categories of the respondents according to their annual family income

Categories	Income ("000" BDT)
Low Income	≤150
Medium Income	151-300
High Income	>300

3.7.1.7 Organizational Participation

Organizational participation of the respondent was measured on the basis of number of organizations s/he involved along with nature of participation (Item no.8 of the interview schedule, Appendix A). For considering his/her nature of participation accordingly as no involvement (0), general member (1), executive member (2), Executive officer (3). Based on organizational participation, the respondents were classified into different categories, as shown in Table 3.7.

Table 3.7 Categories of the respondents according to their organizational participation

Categories	Score (No. of organization)
No Participation	0
Low Participation	1-6
Medium Participation	7-12
High Participation	13-18

3.7.1.8 Cosmopolitanism

The cosmopolitanism of a respondent was measured by the frequency of visits to outside his/her union (Item no.9 of the interview schedule, Appendix A). Based on the cosmopolitanism, the respondents were classified into different categories, as shown in Table 3.8.

Table 3.8 Categories of the respondents according to their cosmopolitanism

Categories	Score (Frequency of visits)
Low Cosmopolitanism	1-7
Medium Cosmopolitanism	8-14
High Cosmopolitanism	15-21

3.7.1.9 Agricultural Training

Agricultural training experience was measured by the total number of training received by the days of a respondent in his/her entire life under different agricultural programs. Based on agricultural training received, the respondents were classified into different categories, as shown in Table 3.9.

Table 3.9 Categories of the respondents according to their agricultural training received

Categories	Score (No. of Training received)
No Training	0
Low Training	1-10
Medium Training	11-20
High Training	>20

3.7.1.10 Extension Media Contact

It refers to the extent of exposure by the respondents to the different extension methods during the last year. The respondents were asked to indicate their exposure as regularly, sometimes, rarely and not at all and the scores assigned as 3, 2, 1 and 0 as shown in the scales respectively (Item no.11 of the interview schedule, Appendix A). The maximum and minimum scores could be 36 and 0, respectively. The extension contact score was determined by adding all the scores obtained by a respondent against extension media. Based on the extension media, the respondents were classified into different categories, as shown in Table 3.10.

Table 3.10 Categories of the respondents according to their extension media contact

Categories	Score
Low Extension Media Contact	≤12
Medium Extension Media Contact	13-24
High Extension Media Contact	25-36

3.7.1.11 Knowledge about Padma Bridge

The knowledge of the respondents about Padma Bridge was measured by asking 10 selected questions and a score of 2 was assigned to each of the questions. Full marks were given to appropriate answer and partial score was given for partially correct answer whereas zero was given to wrong or no answer. Knowledge score could range from 0 to 20 where 0 indicated no knowledge and 20 indicated highest knowledge. Based on knowledge score, the respondents were classified into different categories, as shown in Table 3.11.

Table 3.11 Categories of the respondents according to their knowledge about Padma Bridge

Categories	Score
Poor Knowledge	≤6
Moderate Knowledge	7-12
High Knowledge	>13

3.7.2 Measurement of the Perceived Impact of Padma Bridge

A 20 item statements which were incorporated in item no.13 of the interview schedule (Appendix A) were used to determine the stakeholders' perception regarding the impact of Padma Bridge. A five points rating scale such as strongly agree, agree, undecided, disagree and strongly disagree were employed against each of the statements. And a score of 5, 4, 3, 2 and 1 were assigned against the rating scales respectively. (Adopted from Ahmed, 2011; p52)

The perceived impact score of a respondent was calculated by adding all the scores obtained by the respondent against the 20 statements. The perceived impact score could range from 20-100 where 100 indicated high impact and 20 indicated less impact of Padma Bridge on agriculture and livelihood. Based on perceived impact score, the respondents were grouped into different categories as shown in the Table 3.12.

Table 3.12 Categories of the respondents according to their perceived impact

Categories	Score
Very Low Impact	1-20
Low Impact	21-40
Medium Impact	41-60
High Impact	61-80

Very High Impact	81-100
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Besides the impact of Padma Bridge also determined by item analysis. For this purpose a perceived impact index (PII) was calculated by using following formula:

$$\%PII = \frac{OPIIS}{HPPIIS} \times 100$$

Where,

PII = Perceived impact index

OPIIS = Observed perceived impact index score.

HPPIIS = Highest possible perceived impact index score

Further, OPIIS was determined by the following formula:

$$OPIIS = N_{sa} \times 5 + N_{ag} \times 4 + N_{ud} \times 3 + N_{da} \times 2 + N_{sd} \times 1$$

Where,

N_{sa} = No. of respondents who were strongly agreed about impact of Padma Bridge on particular parameter/statement

N_{ag} = No. of respondents who were agreed about impact of Padma Bridge on particular parameter/statement

N_{ud} = No. of respondents who were undecided to express the impact of Padma Bridge on particular parameter/statement

N_{da} = No. of respondents who were disagreed about impact of Padma Bridge on particular parameter/statement

N_{sd} = No. of respondents who were strongly disagreed about impact of Padma Bridge on particular parameter/statement

The PII score may range from 80-400 where '80' indicate strong disagreement and 400 indicates strong agreement with impact of Padma Bridge.

3.8 Compilation of Data

After completing the field survey, all the data of the interview schedule were compiled. First, local units were converted into standard units. Then, appropriate coding and scoring techniques were followed to convert the qualitative data into quantitative forms. Finally, the responses of the individual respondent contained in the interview schedules were transferred to a master sheet for entering the data in the computer. As soon as the data was entered into the computer, it was then analyzed in accordance with the objectives of the study.

3.9 Statistical Analysis

Collected data was analyzed in accordance with the objectives of the study. Various statistical measures such as number, percentage, mean, standard deviation, minimum, maximum, and rank order were used to describe the study's independent and dependent variables. For exploring the relationship between the selected characteristics of the respondents and their perceived impact on agriculture and livelihood, Pearson's Product Coefficient of Correlation (r) was computed. Data were analyzed by using the concerned software named Statistical Package for Social Science (SPSS), version 15.0.

CHAPTER 4

RESULTS AND DISCUSSION

The study's findings and logical interpretations of the results have been discussed in this chapter. The first section dealt with the impact of Padma Bridge on agriculture and livelihood followed by findings on selected characteristics. The relationships between the selected characteristics of the respondents and their perceived impacts of Padma Bridge have been presented in last section of this chapter.

4.1 Perceived Impact of Padma Bridge on Agriculture and Livelihood

The respondents' perception scores related to impact of Padma Bridge ranged from 62 to 100 with a mean 86.88 and standard deviation of 8.57. The distribution of the respondents according to their perception score related to the impact of Padma Bridge on agriculture and livelihood is shown in the Table 4.1.

Table 4.1 Distribution of the respondents based on their perceived impact of Padma Bridge on agriculture and livelihood

Categories	Score	Respondents (N= 80)		Range (Min.- Max.)	Mean $\pm$ Standard deviation
		Number	Percentage		
Very low Impact	1-20	0	0	62-100	86.88 $\pm$ 8.57
Low Impact	21-40	0	0		
Medium Impact	41-60	0	0		
High Impact	61-80	18	22.5		
Very high Impact	81-100	62	77.5		
Total		80	100		

Data presented in Table 4.1 indicate that an overwhelming majority (77.5%) of the respondents perceived that the Padma Bridge has very high impact on agriculture and livelihood followed by high impact (22.5%). But none of the respondents perceived very low, low and medium impact of Padma Bridge on agriculture and livelihood.

For clear understanding of the extent of the perceived impact of Padma Bridge on agriculture and livelihood a Perceived Impact Index (PII) was calculated which has been presented in Table 4.2.

Table 4.2 Extent of perceived impact of Padma Bridge on agriculture and livelihood by the respondents.

Sl. No.	Impact related Statement	PII		Rank Order
		Score	Percentage	
	Impact of Padma Bridge on agriculture			
1.	Time Requirement for transportation of agricultural goods has decreased	378	94.5	3 th =
2.	Price of agricultural goods has been increased in production zones	370	92.5	5 th
3.	Quality of agricultural commodities has remained fresh	374	93.5	4 th
4.	The possibility of damage of agricultural goods has decreased	361	91.75	6 th =
5.	Marketing facilities has increased	363	90.75	7 th
6.	Agricultural labor migration is being high due to easy communication system	349	87.25	11 th
7.	Conversion of agricultural land to industrialization is increasing day by day	352	88	10 th
8.	Land price has been increased	367	91.75	6 th =
9.	Diversification of crop production has been increased	292	73	16 th
10.	Intensification of crop production has been increased	256	64	18 th
	Impact of Padma bridge on livelihood			
11.	The time requirement to travel from Khulna to Dhaka has been decreased	394	98.5	1 st
12.	Treatment of patients is easy now due to low time requirements to travel to hospitals	389	97.25	2 nd

13.	Shopping is easy due to low time requirements to travel to the capital	357	89.25	9 th
14.	Establishment of small and medium enterprises has been increased	359	89.75	8 th
15.	Tourism industries has been improved	344	86	12 th
16.	Availability and frequency of Vehicles has been increased	378	94.5	3 th =
17.	Avenue for establishment of resort has been increased	339	84.75	13 th
18.	Establishment of recreation site has been increased	342	85.5	12 th
19.	Employment Opportunities has been increased	331	82.5	15 th
20.	Per day income of farmer increased	259	64.75	17 th

Data presented in Table 4.2 indicate that most (98.5%) of the respondents agreed that the time requirement to travel from Khulna to Dhaka has been decreased due to Padma Bridge followed by treatment of patients being easy now due to low time requirements to travel to hospitals (97.25%), time requirement for transportation of agricultural goods decreased (94.5%), availability and frequency of vehicles been increased (94.5%), quality of agricultural commodities remained fresh (93.5%), price of agricultural goods has been increased in production zones (92.5%) etc. While only 64% of the respondents agreed that intensification of crop production been increased and also 64.75% of the respondents agreed that per day income of farmer increased.

4.2 Selected Characteristics of the Respondents

The facts on the selected eleven characteristics of the stakeholders have been discussed in this section.

4.2.1 Age

The age of the respondents ranged from 25 to 70 years, with a mean of 43.2 years and standard deviation of 10.42. The distribution of the respondents according to their age is shown in Table 4.3.

Table 4.3 Distribution of the respondents based on their age

Categories	Score (Years)	Respondents (N=80)		Range (Min.-Max.)	Mean $\pm$ Standard deviation
		Number	Percentage		
Young	Upto 35	19	23.75	25-70	43.2 $\pm$ 10.42
Middle aged	36 - 50	44	55		
Old aged	>50	17	21.25		
Total		80	100		

Data presented in Table 4.1 indicate that the highest percentage (55%) of the respondent falls in the middle aged category compared to young aged (23.75%) and old aged (21.25%). Most (78.75%) of the respondent belonged young and middle aged categories. The findings of the study have similarity with findings of Ahmed et al. (2021). They found that most (77.5%) of the respondents were young to middle aged.

4.2.2 Educational Qualification

The educational qualification score of the respondents ranged from 0 to 17 with a mean of 8.28 and standard deviation of 4.82. The distribution of the respondents according to their educational qualification is shown in Table 4.4.

Table 4.4 Distribution of the respondents based on their educational qualification

Categories	Score (Year of schooling)	Respondents (N=80)		Range (Min.-Max.)	Mean $\pm$ Standard deviation
		Number	Percentage		
Illiterate	0	2	2.5	0-17	8.28 $\pm$ 4.82
Primary	1-5	27	33.75		
Secondary	6-10	32	40		
Higher Secondary	11-12	5	6.25		
Above Higher Secondary	≥ 13	14	17.5		
Total		80	100		

Data presented in Table 4.4 indicates that the highest percentage or two-fifth (40%) of the respondents falls in the secondary education category compared to primary (33.75%), higher secondary (6.25%), above higher secondary (17.5%) and illiterate (2.5%). The findings also indicate that almost all (97.5%) of the respondents possessed different level of education and only a few (2.5%) were illiterate. Similar results were also reported by Miah et al. (2007) where he stated that the highest number of the respondents were in the secondary level of education.

4.2.3 Family size

The family sizes of the respondents ranged from 2 to 11 with a mean of 4.46 and standard deviation of 2.14. The distribution of the respondents according to their family is shown in Table 4.5.

Table 4.5 Distribution of the respondents based on their family size

Categories	Score (Number)	Respondents (N=80)		Range (Min.-Max.)	Mean± Standard deviation
		Number	Percentage		
Small Family	Upto 4	55	68.75	2-11	4.46 ± 2.14
Medium Family	5-6	17	21.25		
Large Family	>6	8	10		
Total		80	100		

Data presented in Table 4.3 indicate that the majority (68.75%) of the respondents belonged to small family compared to medium family (21.25%) and large family (10%). Similar results were also reported by Manabika et al. (2019) where they stated that majority (55%) of the respondents were in small family. The respondents' average family size (4.46) is higher than the national average (4.26; HIES, 2022).

4.2.4 Farming Experience

The farming experience score of the respondents ranged from 1 to 60 with a mean of 18.26 and standard deviation of 15.78. The distribution of the respondents according to their farming experience is shown in Table 4.6.

Table 4.6 Distribution of the respondents based on their farming experience

Categories	Score (Years)	Respondents (N=80)		Range (Min.- Max.)	Mean± Standard deviation
		Number	Percentage		
Low Experience	Upto 15	43	53.75	1-60	18.26 ± 15.78
Medium Experience	16-30	19	23.75		
High Experience	>30	18	22.5		
Total		80	100		

Data presented in the Table 4.4 reveal that majority (53.75%) of the respondents were low experienced compared to medium experienced (23.75%) and high experienced (22.5%). The findings related farming experience have harmony with the findings of the age (Table 4.5). Most (77.5%) of the respondents had low to medium experienced in farming.

4.2.5 Farm Size

The farm size scores of the respondents ranged from 0 to 2.19 with a mean of 0.40 and standard deviation of 0.36. The distribution of the respondents according to their farm size is shown in Table 4.7.

Table 4.7 Distribution of the respondents based on their farm size

Categories	Score (Hectare)	Respondents (N=80)		Range (Min.- Max.)	Mean± Standard deviation
		Number	Percentage		
Landless	< 0.02	2	2.5	0-2.19	0.40 ± 0.36
Marginal Farmer	0.02 - 0.20	25	31.25		
Small Farmer	0.21 - 1.00	50	62.5		
Medium Farmer	1.01 - 3.00	3	3.75		

Large farmer	>3.00	0	0		
Total		80	100		

The findings reveal that majority (62.5%) of the respondents were small stakeholders compared to marginal farmer (31.25%), Medium farmer (3.75%) and landless (2.5). Rest there were no respondents found to belong large farmer category. The average farm size (0.40) of the study area is higher than the national average (0.54 ha; Kamruzzaman et al., 2020).

4.2.6 Annual Family Income

The annual family income of the respondents ranged from 118-1510 thousand BDT with a mean of 276.860 thousand BDT and standard deviation of 173.82. The distribution of the respondents according to their annual family income is shown in Table 4.8.

Table 4.8 Distribution of the respondents based on their annual family income

Categories	Score (‘000’ BDT)	Respondents (N=80)		Range (Min.-Max.)	Mean Standard deviation ±
		Number	Percentage		
Low Income	Upto 150	10	12.5	118-1510	276.86 173.82 ±
Medium Income	151 – 300	50	62.5		
High Income	>300	20	25		
Total		80	100		

Data presented in the Table 4.8 reveal that majority or above three fifth (62.5%) of the respondents had medium income compare to high Income (25%) and low income (12.5%). The average per capita income of the respondents of the study area (276.860 thousand BDT) is higher than the national per capita income (270.414 thousand BDT; The financial express, 2023).

4.2.7 Organizational Participation

The scores on organizational participation of the respondents ranged from 0 to 5 with a mean of 1.51 and standard deviation of 1.03. The distribution of the respondents according to their organizational participation is shown in Table 4.9.

Table 4.9 Distribution of the respondents based on their organizational participation

Categories	Score	Respondents (N=80)		Range (Min.- Max.)	Mean $\pm$ Standard deviation
		Number	Percentage		
No Participation	0	7	8.75	0-5	1.51 $\pm$ 1.03
Low Participation	1 - 6	73	91.25		
Medium Participation	7 - 12	0	0		
High Participation	13 -18	0	0		
Total		80	100		

Data presented in Table 4.9 indicate the most of the respondents (91.25%) belonged to low organizational participation category while a few (8.75%) of them had no participation in any organization. However, none of the respondents had medium or high participation. This might be done due to the majority of the respondents are confined in their farming activities. Being busy with their farming activities it obviously that they do not have enough time to participate different organization.

4.2.8 Cosmopolitanism

The scores of cosmopolitanism of the respondents ranged from 2 to 14 with a mean of 6.68 and standard deviation of 2.81. The distribution of the respondents according to their cosmopolitanism is shown in Table 4.10.

Table No. 4.8 Distribution of the respondents based on their cosmopolitanism

Categories	Score	Respondents (N=80)		Range (Min.- Max.)	Mean $\pm$ Standard deviation
		Number	Percentage		
Low Cosmopolitanism	1 - 7	51	63.75	2-14	6.68 $\pm$ 2.81
Medium Cosmopolitanism	8 -14	29	36.25		
High Cosmopolitanism	15 -21	0	0		

Total		80	100		
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Data presented in Table 4.10 reveal that majority (63.75%) of the respondents belonged to low cosmopolitanism category. On the other hand, 36.25% of them belonged to medium cosmopolitanism category whereas there were no respondents found in high cosmopolitanism category.

4.2.9 Agricultural Training Received

The number of training received by the respondents ranged from 0 to 30 with a mean of 3.025 and standard deviation of 6.19. The distribution of the respondents according to their agricultural training received is shown in Table 4.11.

Table 4.11 Distribution of the respondents based on their agricultural training received

Categories	Score (Number)	Respondents (N=80)		Range (Min.- Max.)	Mean $\pm$ Standard deviation
		Number	Percentage		
No Training	0	29	36.25	0-30	3.025 $\pm$ 6.19
Low Training	1 – 10	45	56.25		
Medium Training	11 – 20	3	3.75		
High Training	>20	3	3.75		
Total		80	100		

Data presented in Table 4.11 indicate that the majority (56.25%) of the respondents belonged to the low training category. On the other hand, a few (3.75%) of them re had both medium and high training category. However, 36.25% of the respondents had no training experience.

4.2.10 Extension Media Contact

The extension media contact scores of the respondents ranged from 0 to 36 with a mean of 10.54 and standard deviation of 8.55. The distribution of the respondents according to their extension media contact is shown in Table 4.12.

Table 4.12 Distribution of the respondents based on their extension media contact

Categories	Score	Respondents (N=80)		Range (Min.- Max.)	Mean $\pm$ Standard deviation
		Number	Percentage		
No Contact	0	3	3.75	0-36	10.54 $\pm$ 8.55
Low Contact	1 -15	57	71.25		
Medium Contact	16 - 30	17	21.25		
High Contact	31 - 45	3	3.75		
Total		80	100		

Data presented in Table 4.12 indicate that majority (71.25%) of the respondents belonged to low extension media contact category compared to medium extension media contact (21.25%) and high contact (3.75%). Whereas there are also a few (3.75%) of the respondents found in no extension media contact category.

4.2.11 Knowledge about Padma Bridge

The knowledge scores about Padma Bridge of the respondents ranged from 5 to 18 with a mean of 11.01 and standard deviation of 2.66. The distribution of the respondents according to their knowledge about Padma Bridge is shown in Table 4.13.

Table 4.13 Distribution of the respondents based on their knowledge about Padma Bridge

Categories	Score	Respondents (N= 80)		Range (Min.- Max.)	Mean $\pm$ Standard deviation
		Number	Percentage		
Low Knowledge	Upto 6	2	2.5	5-18	11.01 $\pm$ 2.66
Medium Knowledge	7-12	58	72.5		
High Knowledge	>13	20	25		
Total		80	100		

Data presented in Table 4.13 indicate that majority (72.5%) of the respondents had medium knowledge about Padma Bridge compared to high knowledge (25%) and low knowledge (2.5%).

4.3 Relationship between Perceived Impact and Selected Characteristics of the respondents

The coefficient of correlation was computed to explore the relationship between stakeholders' perceived impact of Padma Bridge on agriculture and livelihood and the selected characteristics of them. The selected characteristics of stakeholders constituted independent variables and their perceived impact of Padma Bridge on agriculture and livelihood constituted the dependent variable of the study. In this section, relationship between the respondents' eleven characteristics (independent variables) and the dependent variable (the respondents' perceived impact of Padma Bridge on agriculture and livelihood) have been described. Pearson's Product Moment Co-efficient of Correlation (r) was used. Five percent and one percent levels of probability were used. The results of the coefficient of correlation indicating the relationship between the selected characteristics of the respondents and their perceived impact of Padma Bridge on agriculture and livelihood are shown in Table 4.14.

Table 4.14 Relationship between perceived impact and selected characteristics of the respondents

Dependent variable	Characteristics (Independent variable)	Correlation Coefficient
Impact of Padma Bridge on Agriculture and Livelihood	1. Age	.146
	2. Educational Qualification	-.147
	3. Family Size	-.239*
	4. Farming Experience	.147
	5. Farm Size	.200
	6. Annual Family Income	.026
	7. Organizational Participation	.254*
	8. Cosmopolitanism	.291**

	9. Agricultural Training Received	.289**
	10. Extension Media Contact	.360**
	11. Knowledge about Padma Bridge	.117

*NS- Non-Significant, **Correlation is significant at the 0.01 level (2-tailed), *Correlation is significant at the 0.05 level (2-tailed), PPCC = Pearson's Product Moment Co-efficient of Correlation (r).*

Among eleven selected characteristics, family size ($P < 0.05$) showed a significant negative relationship with their perceived impact. It means that the higher is family size- the lower is the perceived impact. On the other hand, organizational participation ($P < 0.05$), cosmopolitanism ($P < 0.01$), agricultural training received ($P < 0.01$) and extension media contact ($P < 0.01$) of respondents showed a significant positive relationship with their perceived impact. It means that the higher are the organizational participation, cosmopolitanism, agricultural training received and extension media contact, the higher are the stakeholders' ability to identify the impact of the Padma Bridge on agriculture and livelihood. But age, educational qualification, farming experience, farm size, annual family income of the respondents did not show any significant relationship with their perceived impact of Padma Bridge on agriculture and livelihood.

Khan et al (2017) found a similar type of result regarding extension media contact. They found that farmers' extension media contact had significant ($P < 0.01$) and positive relationship with their perception. Khan et al (2017) also found a similar type of result regarding organizational participation. They found that farmers' organizational participation had significant ($P < 0.05$) and positive relationship with their perception. And Ahmed (2011) founds a similar type of results in case of organizational participation, cosmopolitanism and agricultural training received with farmers' perception regarding the impact of shrimp farming on socioeconomic, agriculture and environmental conditions in the south western region of Bangladesh.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

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

5.1 Summary of Findings

The study was conducted with a view to determine the perceived impact of Padma Bridge on agriculture and livelihood by the stakeholders. Data were collected from 80 respondents of Dumuria upazila of Khulna district, using an interview schedule through face to face interview. The findings of the study are summarized below.

5.1.1 Perceived impact of Padma Bridge on Agriculture and livelihood

The most (77.5%) of the respondents perceived that Padma Bridge has very high impact on Agriculture and Livelihood while the rest (22.5%) of them perceived that it has high impact on Agriculture and Livelihood. It also indicated that all respondents (100%) belong to high impact to very high impact categories.

5.1.2 Selected Characteristics of the Respondents

Majority (55%) of the respondents falls in the middle aged category compared to young aged (23.75%) and old aged (21.25%). Two fifth (40%) of the respondents possessed secondary level of education compared to primary (33.75%), Higher secondary (6.25%), above higher secondary (17.5%) and illiterate (2.5%). The majority (68.75%) of the respondents belong to small family compared to medium family (21.25%) and large family (10%). Majority (53.75%) of the respondents were low experienced compared to medium experienced (23.75%) and high experienced (22.5%) in farming. Majority (62.5%) of the respondents were small stakeholders compared to landless (2.5%), marginal stakeholders (31.25%), medium stakeholders (3.75%) and there were no respondents found to belong large farmer category. Majority or above three fifth (62.5%) of the respondents had medium income compared to High Income (25%) and low income (12.5%). The most (91.25%) of the respondents belonged to low organizational participation category while the rest (8.75%) of the respondents did not participate in any organization. It indicates that the majority of the respondents are confined in their farming activities. Majority (63.75%) of the respondents belonged to low cosmopolitanism category while the rest (36.25%) of the respondents belonged to medium cosmopolitanism category. The majority (56.25%) of the respondents belonged to the low training category. Both medium and high training categories composed of 3.75% of the respondents. However, 36.25% of the

respondents had no training experience. Majority (71.25%) of the respondents belonged to low contact category compared to medium (21.25%) and high (3.75%) contact categories. Whereas there are also 3.75% of the respondents found in no contact category. Majority (72.5%) of the respondents had medium knowledge about Padma Bridge compared to high knowledge (25%) and low knowledge (2.5%).

5.1.3 Relationship between the selected characteristics of the respondents and their Perceived Impact of Padma Bridge on Agriculture and Livelihood.

Among eleven selected characteristics, family size ($P < 0.05$) showed a significant negative relationship with their perceived impact. On the other hand, organizational participation ($P < 0.05$), cosmopolitanism ($P < 0.01$), agricultural training received ($P < 0.01$) and extension media contact ($P < 0.01$) showed a significant positive relationship with their perceived impact.

5.2 Conclusion

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

Due to Padma Multipurpose Bridge mostly time requirement to travel from Khulna to Dhaka has been decreased, treatment of patients being easy now due to low time requirements to travel to hospitals, time requirement for transportation of agricultural goods decreased, availability and frequency of vehicles been increased, quality of agricultural commodities remained fresh, price of agricultural goods has been increased in production zones etc.

Among eleven selected characteristics, organizational participation, cosmopolitanism, agricultural training received and extension media contact showed a significant positive relationship with their perceived impact. On the other hand, only family size showed a significant negative relationship with their perceived impact.



5.3 Recommendations

5.3.1 Recommendations for Policy Implication

- I. The findings on perceived impact of Padma Multipurpose Bridge will help the policy maker to formulate policy for the establishment of industry in the south western region of Bangladesh.
- II. Skilled workforce and land availability will be two major issues in this region. Hence, the government should prioritize skill training for its workforce and land acquisition through clearly defined channels.
- III. Implementation of different action plan to minimize adverse impact of Padma Bridge like waste management, drainage management, erosion and sediment control, soil quality management, tree plantation and greenbelt development plan must be ensured.

5.3.2 Recommendations for Further Research

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

- I. The study was limited to the selected areas of Khulna district. Therefore, the study does not represent the whole picture of Bangladesh, so it is recommended to conduct similar studies in other parts of Bangladesh.
- II. Contributions of eleven characteristics of stakeholders with their perceived impact of Padma Bridge on agriculture and livelihood have been investigated in this study. However, further research should be conducted to find out the contribution of other personal characteristics of the stakeholders with their perceived impact.
- III. Further studies can be conducted using an exploratory research design.

CHAPTER 6

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APPENDIX – A
Interview Schedule
Agrotechnology Discipline
Khulna University



Impact of Padma Bridge on Agriculture and Livelihood as Perceived by the Stakeholders

Sample no.

Date:

Name of the Respondent:			
Father/ Husband name:			
Village:	Union:	Upazila:	District:
Contact No:			

1. Age (years):

2. Educational Qualification: Please put tick mark (✓) against the correct response

- a) Can't read and write.....
- b) Can sign only.....
- c) Passed.....Class/PEC/JSC/SSC/HSC/Bachelor (Hons. / Pass)/ Master degree

3. Family Size (number of member):

4. Farming Experience (years):

5. Farm size (hectare):

Type/ Ownership of Land	Area		Remark
	Local Unit	Hectare	
a) Homestead Area			
b) Own land under own cultivation			
c) Land taken from others on borga			
d) Land given to others on borga			
e) Land taken on lease			
f)Others			
Total = $a + b + \frac{1}{2}(c + d) + e + f$ or $a + b + \frac{1}{3}(c + d) + e + f$			

6. Occupation:

a) Major occupation.....

b) Subsidiary.....

7. Annual family income ('000' BDT): Please mention the annual family income from different sources

A. Income from agricultural sectors: How much money did you receive income sources from the following agricultural sectors in the preceding:

Sl. No.	Income Sources	Sources	Total production (local unit)	Price/Unit (Taka)	Total price (Taka)
1.	Agriculture	Crops			
		Vegetables			
		Fruits			
2.	Livestock rearing	Cattle			
		Goat			
		Poultry			
3.	Fisheries				
4.	Social forestry				
5.	Homestead gardening				
6.	Others (Specify)				
7.	Total				

B. Income from non- agricultural sectors: How much money did you receive from the following non- agricultural sectors in the preceding year?

Sl. No.	Income Sources	Total value (taka)
1.	Service	
2.	Business	
3.	Day laborer	
Total		

Total income: A+B (BDT) = ...Taka

8. Organizational participation:

a) Are you involved in any organization?

Yes / No

b) If yes, then answer the following question:

Sl. No.	Name of the organization (Non- Political)	Extent of involvement				Duration (Year)
		(0)	(1)	(2)	(3)	
1.	Youth Organization					
2.	Committee (Mosque, Temple, Church, Madrasa)					
3.	NGO Maintained Association					
4.	GO Maintained Association					
5.	Farmer's Club					
6.	Other(Specify)					

❖ Executive Officer means President, General Secretary.

❖ 0- No Involvement; 1- General Member; 2- Executive Member; 3- Executive Officer.

9. Cosmopolitanism

Please state your frequency of visits outside your union

Sl. No.	Place of Visit	Frequency of Visit			
		Regularly(3)	Often(2)	Occasionally(1)	Not at all
1.	Other Villages				
2.	Other Unions				
3.	Own Upazila				
4.	Other Upazila Sadar				
5.	Own District Sadar				
6.	Other District Sadar				
7.	Other Cities (Dhaka, Barishal, Sylhet)				

10. Agricultural Training Received(Number)

Are you trained? "Yes" or "No"

If your answer is "yes", please giving me the following information

Sl. No.	Title of Training(s)	Duration (Days)	Venue of Training	Organized by	Sponsored by
1.					
2.					
3.					
4.					
5.					

11. Extension Media Contact (score)

Please state where you get the information about agricultural technology

A. Personal Media Contact



Sl. No.	Extension Media	Frequency of Contact			
		Regularly (3)	Sometimes (2)	Rarely (1)	Not at all
1.	Sub Assistant Agriculture Officer(SAAO)				
2.	Agriculture Extension Officer(AEO)				
3.	Additional Agricultural Officer(AAO)				
3.	Upazila Agriculture Officer(UAO)				
4.	Other Extension Officer (Livestock, Fisheries)				
5.	NGO Workers				

B. Group Media Contact

Sl. No.	Extension Media	Frequency of Contact			
		Regularly (3)	Sometimes (2)	Rarely (1)	Not at all
1.	Village Meeting				
2.	Result Demonstration				
3.	Stakeholders Field Day				
4.	Method Demonstration				

C. Mass Media contact

C.1. Electronic Media

Sl. No.	Extension Media	Frequency of Contact			
		Regularly (3)	Sometimes (2)	Rarely (1)	Not at all
1.	Television				
2.	Radio				
3.	Internet/Web Media				

C.2. Print Media Contact

Sl. No.	Extension Media	Frequency of Contact			
		Regularly (3)	Sometimes (2)	Rarely (1)	Not at all
1.	Leaflet related with rice, jute, wheat, vegetables, fruits, seed, fertilizer and pest control information				
2	Bulletin related with rice, jute, wheat, vegetables, fruits, seed, fertilizer and pest control information				

12. Knowledge about Padma Bridge

Sl. No.	Types of Question	Correct (2)	Partially Correct(1)	Wrong
1.	What is the length of Padma Bridge?			
2.	Which districts are connected by Padma Bridge?			
3.	Who inaugurated Padma Bridge?			
4.	When the Padma Bridge was inaugurated?			
5.	Which country is engaged in the establishment of Padma Bridge?			
6.	What is the name of company involved in the Padma Bridge Project?			
7.	What is the total amount of Padma Bridge construction?			
8.	What are the benefits of Padma Bridge in terms of communication?			
9.	What are the benefits of Padma Bridge in terms of agricultural products' transport?			
10.	Tell me two impacts of Padma Bridge on your livelihood status.			

13. Please answer the following questions from your perception.

(5- Strongly agree, 4- Agree, 3- Undecided, 2- Disagree, 1- Strongly disagree)

Sl. No.	Statements about the impact of Padma Bridge	Level of Suitability				
		5	4	3	2	1
A.	Impact of Padma Bridge on Agriculture					
1.	Time Requirement for transportation of agricultural goods has decreased					
2.	Price of agricultural goods has been increased in production zones					
3.	Quality of agricultural commodities has remained fresh					

4.	The possibility of damage of agricultural goods has decreased					
5.	Marketing facilities has increased					
6.	Agricultural labor migration is being high due to easy communication system					
7.	Conversion of agricultural land to industrialization is increasing day by day					
8.	Land price has been increased					
9.	Diversification of crop production has been increased					
10.	Intensification of crop production has been increased					
B.	Impact of Padma Bridge on Livelihood					
11.	The time requirement to travel from Khulna to Dhaka has been decreased					
12.	Treatment of patients is easy now due to low time requirements to travel to hospitals					
13.	Shopping is easy due to low time requirements to travel to the capital					
14.	Establishment of small and medium enterprises has been increased					
15.	Tourism industries has been improved					
16.	Availability and frequency of Vehicles has been increased					
17.	Avenue for establishment of resort has been increased					
18.	Establishment of recreation site has been increased					
19.	Employment Opportunities has been increased					
20.	Per day income of farmer increased					

Thanks for your cooperation

Signature of Interviewer

Date: