

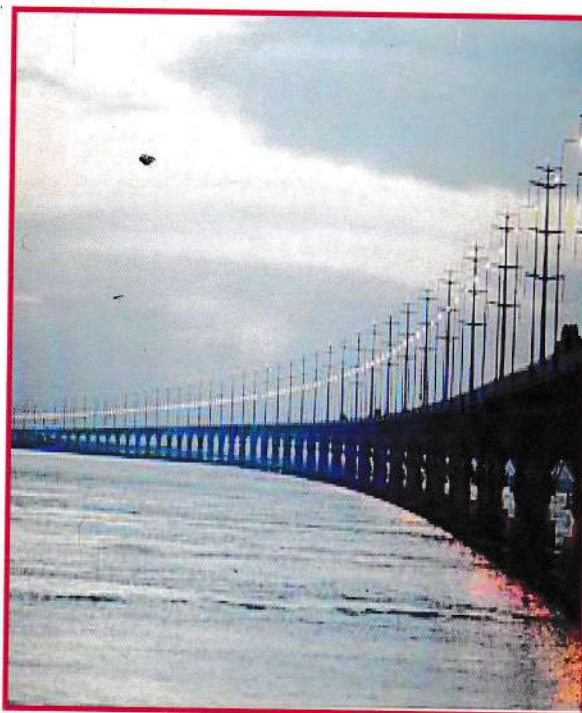
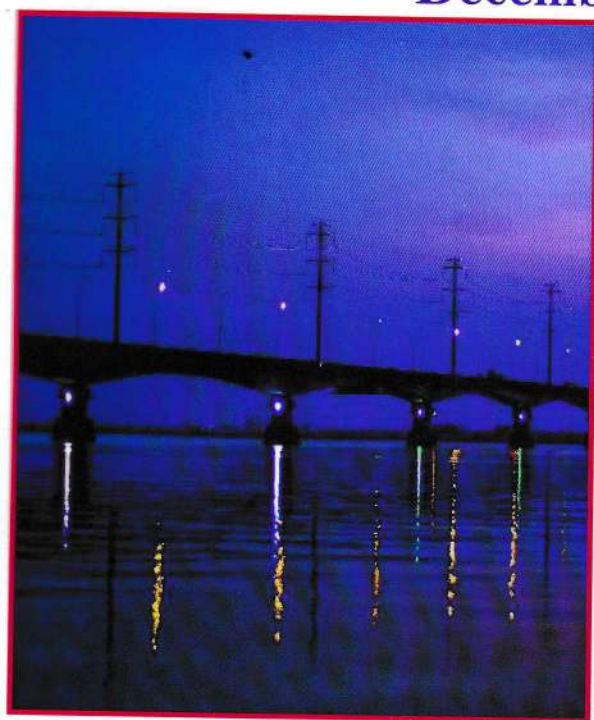
Government of People's Republic of Bangladesh
Ministry of Road Transport and Bridges
Bridges Division
Bangladesh Bridge Authority (BBA)



Socio-Economic Impact Evaluation Study of Bangabandhu Bridge

Final Research Report

December 2021



Research Conducted by
Institute of Social Welfare and Research
University of Dhaka

Final Research Report

SOCIO-ECONOMIC IMPACT EVALUATION STUDY OF BANGABANDHU BRIDGE

Report Submitted to

Government of the People's Republic of Bangladesh

Ministry of Road Transport & Bridges

Bridge Division

Bangladesh Bridge Authority (BBA)

Setu Bhaban, Banani, Dhaka

Tel: +880-2-55040333

Fax: +880-2-5040888

Email: info@bba.gov.bd

Web: <http://www.bba.gov.bd/>

Report Submitted by

Institute of Social Welfare and Research

University of Dhaka

Dhaka, Bangladesh

Phone/mobile : 58616662, 9670412, 01711239128, 01763983451

E-mail : iswrdu.ad@gmail.com

Web: https://www.du.ac.bd/academic/departement_item/ISW

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Tel: +880-2-55040333 E-mail: info@bba.gov.bd

FOREWORD

The Bangabandhu Jamuna Multipurpose Bridge also called the Bangabandhu Bridge (Bengali: Jamuna Bohu Mukhi Setu), is a bridge constructed over the Jamuna River in 1998. It connects Bhuapur on the Eastern part of Jamuna River and Sirajgonj on the Western part of the river Jamuna. To complete the construction work of the Bangabandhu Jamuna Bridge, It took 5 years (1994–1998) and the total expenditure was US \$ 839 million. This is one of the largest bridges in Bangladesh that was a long-cherished dream of the people of Bangladesh. After the construction of the Padma Bridge, the Bangabandhu Bridge takes the place of the second largest bridge of Bangladesh. The Bangabandhu Bridge project is one of the important and masterpieces of infrastructure in the history of Bangladesh. This a unique bridge that has the provisions for rail, gas, electricity line, fiber optic cables, internet line for the benefit of the people living in the northwestern part of the country.

I am so much delighted that the Institute of Social Welfare and Research (ISWR), University of Dhaka, Bangladesh has successfully completed the study entitled '**Socio-Economic Impact Evaluation Study of Bangabandhu Bridge**'. To conduct this research project was a great opportunity for ISWR as being an effective part of this gigantic national infrastructure development project in Bangladesh and the project was fully financed by the Bangladesh Bridge Authority, Bridges Division. The general objective of the study was to assess the overall socio-economic and ecological impact of Bangabandhu Bridge. The study was designed to explore the economy in general, and the people, in particular, have benefited because of the construction of the bridge. Specific objectives were to assess the social impacts, economic impacts, to explore the lives and the livelihoods of the people, the contribution of the bridge in poverty reduction in the adjacent districts; to assess the contribution of the Bangabandhu Bridge in industrialization and employment generation; and to assess the impact on ecology and environment in the adjacent districts.

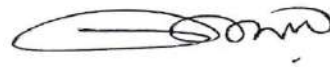
I believe that the findings of the study have turned to be a valuable resource for policy implications in many cross-cutting issues for the overall development of the country, especially the east-western part of the region. The study team has made (short, medium, and long term) some recommendations such as holistic and integrated management-based model, employment facilities for the occupational displacement people, tourism and hospitality management system, community-based post-rehabilitation and recovery interventions, etc. that can be considered to be essential to bring about multidimensional positive changes in the lives and livelihood of the people living in the adjacent areas of Bangabandhu Bridge. I have a very strong opinion that the research findings and

recommendations will be valuable guidelines to policymakers, development practitioners, community workers, local governments, and researchers in the relevant fields. In fact, this research report as a valuable document will certainly contribute to inspiring more to undertake further mega infrastructure development projects in Bangladesh.

I am also highly thankful to all the officials of the Bangladesh Bridge Authority (BBA), Bangladesh Bridges Division, and faculty and staff members of ISWR, University of Dhaka. In addition, my special thanks go to my all chief investigators, recruited research assistants, research supervisors, and field-level assistants for their sincere cooperation to complete this study with great success. My earnest acknowledgments are to all of the stakeholders and participants of the study who wholeheartedly provided their substantial supports and required information for undertaking and completing this research project.

December 2021

On Behalf of Study Team



Professor Tahmina Akhtar
Team Leader of the Study &
Director, Institute of Social Welfare and
Research
University of Dhaka

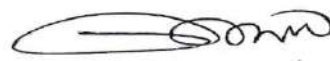
ACKNOWLEDGEMENTS

The ‘Socio-Economic Impact Evaluation Study of Bangabandhu Bridge’ is one of the significant evaluation research projects in the field of infrastructure development in Bangladesh. This research has been conducted by the Institute of Social Welfare and Research, University of Dhaka, and completed with the technical and financial supports of the Bangladesh Bridge Authority, Bridges Division, Ministry of Road Transport and Bridges, People’s Republic of Bangladesh. This research project would not have been possible without the supports of several individuals and organizations closely concerned with the study. From the original conceptualizing and initiation, this research team gives an acknowledgment to **Mr. Md. Abu Bakar Siddique**, Executive Director, Bangladesh Bridge Authority, Bridge Division, Ministry of Road Transport and Bridges, People’s Republic of Bangladesh. This is our high gratitude to the Honorable Vice-Chancellor; the University of Dhaka who gave his sincere permission to conduct this study with the Bangladesh Bridge Authority .

The research team expresses profound acknowledgments to eminent and conversant leaders of the Bangladesh Bridge Authority. They are **Dr. Moniruzzaman, Director (P&D); Mr. Altaf Hossain Shekh**, Additional Director (P&D); and **Mr. Md. Liaquat Ali**, Superintending Engineer and all concerned authorities of Bangladesh Bridge Authority, Bridges Division. We would appreciate their overall advice, guidance, and expository inputs. We are honor-bound to the Deputy Commissioners (DCs) and all officials of Natore, Sirajganj, Pabna, Kurigram, Tangail, and Manikganj Districts; Upazila Nirbahi Officers (UNOs) and all the concerned officials of the Departments of adjacent five districts and Manikganj district; Chairmen and members of Union Parishads of all unions of the study areas; all recruited Research Assistants, Research Supervisors, and field-level assistants engaged in this study. Our special thanks and greetings are to the NGO bodies and all of the participants in the study areas, whose voices are highlighted throughout the study findings. Finally, we would admit the immense contributions of all faculty and staff members of the Institute of Social Welfare and Research, the University of Dhaka particularly to the Chief Investigators- **Prof. ASM Atiqur Rahman, Prof. Md. Nurul Islam, Prof. Golam Azam, Prof. Tania Rahman, Prof. Mahbuba Sultana, Prof. Golam Rabbani, and Prof. M. Rezaul Islam**. We thank all of the authors, editors, and consultants whose studies, research findings and relevant works have been used in the literature review and discussion of the study.

December 2021

On behalf of Study Team



Professor Tahmina Akhtar
Team Leader of the Study &
Director, Institute of Social Welfare and
Research
University of Dhaka

ABBREVIATION

ADB	Asian Development Bank
BBA	Bangladesh Bridge Authority
BBS	Bangladesh Bureau of Statistics
BDT	Bangladesh BDT
CNG	Compressed Natural Gas
ECNEC	Executive Committee of the National Economic Council
EPZ	Export Processing Zone
FGDs	Focus Group Discussions
GDP	Gross Domestic Product
GNP	Gross National Product
GO	Government Organization
HEIS	Household Expenditure and Income Survey
HH	Household Head
IDCI	In- Depth Case Interview
IGC	International Growth Centre
JICA	Japan International Cooperation Agency
JBIC	Japan Bank for International Cooperation
JMB	Jamuna Multipurpose Bridge
KIIs	Key Informant's Interview
LFS	Labor Force Survey
MICS	Multiple Indicator Cluster Survey
NGO	Non- Government Organization
RADOL	Rehabilitation and Development Organization
SDG	Sustainable Development Goal
SEZ	Special Economic Zone
SME	Small and Medium Enterprise
SVRS	Sample Vital Registration System

UNO	Upazila Nirbahi Officer
UP	Union Parishad
VGD	Vulnerable Group Development
VGF	Vulnerable Group Feeding
WB	World Bank

TABLE OF CONTENTS

Foreword.....	2
Acknowledgements	4
Abbreviation.....	5
Table of Contents	7
List of Tables.....	13
List of Figures	19
Executive Summary	21
Chapter 1: Introduction	30
1.1 Statement of the Study Problem	30
1.2 Objectives of the Study	31
1.2.1 General Objectives of the Study	31
1.2.2. Specific Objectives of the Study	32
1.3 Scope of the Study.....	32
Chapter 2: Review of Literature Related to the Study	34
Introduction	34
2.1 Background History of Jamuna River and Bangabandhu Bridge (Jamuna Multipurpose Bridge).....	34
2.1.1. The River Jamuna	35
2.1.2. Reasons Behind the Construction of Jamuna Bridge	36
2.1.3 Brief History of Bangabandhu Bridge.....	37
2.1.4 Bangabandhu Bridge (BB)/ Jamuna Multipurpose Bridge (JMB)	39
2.1.5 The Bridge and its Major Components.....	39
2.1.6 Project Objectives of Jamuna Bridge (Bangabandhu Bridge).....	40
2.1.7. Scope of the Project	41
2.2 Physical, Social, Economic, & Cultural Aspects and Impacts of Bangabandhu Bridge (Jamuna Multipurpose Bridge)	42
2.2.1. Project Impacts.....	42

2.2.2. Economic Benefits	42
2.2.3. Benefits on Society, Economic Activities and Agriculture	43
2.2.4. Economic Aspects of Jamuna Bridge.....	44
2.2.5. Effects of Market Integration and Transport Infrastructure on Economic Outcomes, Economic Activities	45
2.2.6. Benefits in Multiple Viewpoints.....	47
2.2.7. Quality of Living Environment	47
2.2.8. Cultural Impact.....	48
2.2.9. Area Level Trends	49
2.2.10. Impacts of Bangabandhu Bridge.....	50
2.2.11. Short- Run Effects of Bangabandhu Bridge (Jamuna Bridge).....	51
Long - Run Effects of Bangabandhu Bridge (Jamuna Bridge)	52
2.3 Key Literature Survey Related to the Present Study.....	53
2.3.1. Review of Article-1 (Effects on Employment).....	54
2.3.2. Review of Article-2 (Impact on Agriculture)	54
2.3.3. Review of Article -3 (Social Impact).....	55
2.3.4. Review Article -4 (Impact on Poverty Level).....	56
2.3.5. Review Article-5 (Income Generation)	58
2.3.6. Review Article-6 (Market Integration, Reallocation and Productivity Effects) ...	59
2.3.7. Review Article-7 (Poverty Reduction)	60
2.3.8. Review Article-8 (Travel Time and Transport)	61
2.3.9. Review Article- 9 (Effect on Environment)	61
Chapter 3: Methodology of the Study.....	63
3.1 Research Philosophy and Research Design	63
3.2 Selection of the Study Area	63
3.3 Analytical Framework and Evaluation Design	63
Methods and Data.....	65
Source of Data	65
3.4 Population and Unit of The Study.....	66
3.5 Sampling Procedure and Sample Description	66

Sample Procedure	66
3.6 Respondents and Sampling: Distribution of Sample Size.....	66
3.7 Use of mixed method for the study: Methods and data collection.....	71
3.8 Plan of Data Processing and Analysis	71
Data Processing.....	71
Data Analysis.....	71
Data Presentation:.....	72
Data Reliability and Validity: Triangulation.....	72
3.9 Baseline Data and Comparison Group	73
Undertaking Primary Surveys	73
3.10 Study Management, Quality Control and Analysis Plan	75
Quality Control	75
Field Editing of Questionnaire.....	75
Quality Control in Data Management	75
Data Processing and Analysis	76
3.11. Ethical Considerations in Research.....	76
3.11. Limitations of the Study.....	77
Chapter 4: Major Findings of the Study.....	79
Introduction of the Respondents	79
Section- 4.1	80
Quantitative Data Analysis Based on Social Survey	80
4.1.1 Socio-Demographic Information of the Respondents.....	82
Changes in Selling and Marketing Produced Product after Construction of the Bangabandhu Bridge.....	108
4.1.2. Infrastructure and Social Condition in The Study Area.....	119
4.1.3. Sources of Water and Sanitation in Living Places.....	126
4.1.4. Education and Health Condition.....	130
4.1.5. Social Indicators in Daily Life	138
4.1.6. Poverty Eradication Related Information.....	139
4.1.7. Effect of Bridge in Mitigating Poverty	143

4.1.8. Effects of Bangabandhu Bridge in Mitigating Poverty (UNDP Model)	147
4.1.9. Quality of Life in Society	150
4.1.10. Migration and Social Mobility	151
4.1.11. Training and Skill	157
4.1.12. Positive Impact of Bangabandhu Bridge in Social Sector	163
Natural disasters and climate change at households' level	184
Section-4.2	190
Findings of the Qualitative Investigation in Selected Areas: FGDs, KIIs and In-depth case Interviews (ICIs).....	190
4.2.1. Focus Group Discussions (FGDs).....	190
4.2.2. In-Depth Case Interviews.....	215
4.2.3. Key Informants Interview (KII)	237
Section 4.3.....	251
Information Related to Market.....	251
Findings of the Section- 4.3	253
Findings of FGDs and ICIs	278
In-depth Case Interviews (ICIs).....	281
Section- 4.4	284
Information Related to the Industry.....	284
Chapter 5: Discussion: A Comparative Overview on the Findings of The Studies.....	310
5.1. Introduction	310
5.2 Baseline Information related to the Bangabandhu Bridge	310
5.3. SOCIO-DEMOGRAPHIC INFORMATION OF THE RESPONDENTS	312
5.4. SOCIO-ECONOMIC IMPACT OF BANGABANDHU BRIDGE	316
5.4. Infrastructure and Social Condition in the Study Area	326
5.5. Education and Health Related issues	327
5.6. People Benefited from the Bangabandhu Bridge Project.....	328
5.8. Quality of Life.....	329
5.6. Environmental and Ecological Impacts of Bangabandhu Bridge	331
5.7. Natural Disasters and Climate Change at Households' Level	332

5.8. Comparison of Effects	333
5.9. Effects of Bangabandhu Bridge on Industry Sector	337
5.9. Effects of Bangabandhu Bridge on Market Sector	339
Chapter 6: Recommendations and Conclusions.....	343
Recommendations	343
Recommendations for Short Term (2022-2030).....	343
Recommendations for Long Term (2030-2050).....	344
Conclusions.....	349
References	353
Appendices	358
1. Structured Interview Schedule	358
1.1. Structured Interview Schedule	358
2. In-Depth Case Study Guide	390
2.1. Case Study Guideline -1 (Rich, Middle Class, Poor and Ultra-poor)	390
2.2 Case Study Guideline -2 (Entrepreneurs- Export Processing Zone (EPZ) & Special Economic Zone).....	394
2.3 Case Study Guideline -3 (Entrepreneurs- Industry and Employment).....	396
2.4 Case Study Guide -4 (Market).....	398
3. Focus Group Discussion Guide	400
3.1 Guideline for Focus Group Discussion- 1 (EPZ/SEZ/Industrial Set up/Business).400	
3.2 Focus Group Discussion Guide- 2 (Civil Society)	413
3.3 Focus Group Discussion Guide- 3 (Settlement Area).....	419
3.4 Focus Group Discussion Guide- 4 (Owners of Small, Medium and Large Shops)).426	
4. Key Informant's Interview Guide	430
4.1 Key Informant's Interviews (KIIs) Guide for Secretary, Union Parishad Chairman	430
4.2. Key Informants Interviews Guide (KIIs) for UNO Office.....	432
4.3. Key Informant's Interviews (KIIs) Guide for EPZ/SEZ/Industry: Secretary: District Chamber of Commerce & Industry	435
4.4. Guideline of Key Informant's Interviews (KIIS) FOR Market: Business Association (Secretary)	436

5. Pictures of Market Places Under Study Area (Source: BBA, 2021)	439
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LIST OF TABLES

Table Number	Title of the Table	Page Number
2.1	Summary of the Estimated Quantified Poverty Impacts of the Jamuna Bridge	57
3.1	The Analytical Framework	64
3.2	Distribution of Sampled Respondents against Research Methods against Research Methods, Data Collection Instruments and Types of Sampled Respondents	67
3.3	Distribution of Selected Respondents for Quantitative Interviews against Study Areas	68
3.4	Distribution of the Selected Respondents for Qualitative Data Collection against Study Areas	69
3.5	Distribution of the Types and Number Respondents against Study Areas	70
3.6	Sets of Data Collection Instruments	74
4.1.1	Distance of the Area from the Bridge	80
4.1.2	Economic Status of the Respondents (Five Districts)	80
4.1.3	Economic Status of the Respondents (Manikganj)	81
4.1.4	Demographic Variables (Five Districts)	82
4.1.5	Major Occupation of the Respondents (Five Districts)	84
4.1.6	Major Occupation of the Respondents (Manikganj)	85
4.1.7	Occupation of the Respondent's Family Members (Five Districts)	87
4.1.8	Income of the Household Head	88
4.1.9	Number of Income Earning Persons in the Family (Five Districts)	89
4.1.10	Income Earning Members in the Family (Manikganj)	90
4.1.11	Distribution of Number of Dependents in Different Age Groups (Five Districts)	90
4.1.12	Income of the Respondents (Five Districts)	91
4.1.13	Income of the Respondents (Manikganj)	94
4.1.14	Expenditure of the Family (Five Districts)	95
4.1.15	Expenditure of the Family (Manikganj)	96
4.1.16	Nature of Wealth of the Respondents (Five Districts)	97
4.1.17	Changes in Financial Institutions / Enterprises and Transaction (Five Districts)	98

4.1.18	Sources of Family Debt (Five Districts)	99
4.1.19	Household's Savings and Investments (Five Districts)	100
4.1.20	Respondents Land Ownership and Volume of Land	102
4.1.21	Changes of Price of the Land beside Road (Highway) (Five Districts)	104
4.1.22	Changes of Price of the Land Far from Road (Highway) (Five Districts)	104
4.1.23	Changes in Price of Agricultural Products and Related Materials (Five Districts)	105
4.1.24	Ingredients/ Materials Available Before Bridge Construction (Five Districts)	107
4.1.25	Ingredients/ Materials Available After Bridge Construction	107
4.1.26	Buying Produced Goods Before * Buying Produced Goods Present (Cross-Tabulation)	108
4.1.27	Marketing Produced Goods Before * Marketing Produced Goods Present (Cross-Tabulation)	110
4.1.28	Income Generating Activities (Five Districts)	111
4.1.29	Previous and Present Income Level of the Respondents (Five Districts)	112
4.1.30	Financial Development of the Respondents of the Study Area (Five Districts)	113
4.1.31	Level of Mobility in Work (Five Districts)	115
4.1.32	Changes in the Communication System after Bangabandhu Bridge Construction (Five Districts)	117
4.1.33	Economic Inequalities Resulted from Bangabandhu Bridge Construction	118
4.1.34	Previous Condition of Roads in the Local Community	119
4.1.35	Present Condition of Roads in the Local Community	120
4.1.36	Previous Means of Local Transportation	121
4.1.37	Present Means of Local Transportation	122
4.1.38	Previous Medium of Information Communication	123
4.1.39	Present Medium of Information Communication	123
4.1.40	The Use of Electricity Facilities	124
4.1.41	Previous Facilities of Natural Fuel Use in Community	124
4.1.42	Present Facilities of Natural Fuel Use in Community	125
4.1.43	Cross Tabulation of Type of Ownership	126
4.1.44	Cross-Tabulation of Type of Habitat	127
4.1.45	Cross- Tabulation of the Condition of Habitat	128
4.1.46	Cross Table of Type of Toilet Use	129

4.1.47	Ownership of the Sources of Water	130
4.1.48	Pattern of Educational Institutions in the Locality	130
4.1.49	Children Going to Study in Education Institution	132
4.1.50	Type of Educational Institution Where Children Study in (Five Districts)	133
4.1.51	Opinion about Education System (Five Districts)	133
4.1.52	Family Members Suffer from Diseases	135
4.1.53	Institutions / Places the Respondents Take Medical Treatment	136
4.1.54	Health Service Centers in the Community	137
4.1.55	Social Indicators Related Opinions	138
4.1.56	Number of Daily Food Intake	139
4.1.57	Food Intake in the Morning	140
4.1.58	Food Intake at Noon	141
4.1.59	Food Intake in the Afternoon	142
4.1.60	Food Intake at Night	142
4.1.61	Daily Food Intake Twice a Day	143
4.1.62	Healthy Sanitation and Fresh Drinking Water	144
4.1.63	Vegetable and Fruit Farm in Household	145
4.1.64	Nature of Housing	146
4.1.65	Status of Education	147
4.1.66	School Going Children are Absent	148
4.1.67	At Least One Malnutrition Case in a Family	148
4.1.68	Mortality of Child in the Family	149
4.1.69	Electricity in the Family	150
4.1.70	Cleanliness of the Household Yards	150
4.1.71	Duration of Living in the Study Area	151
4.1.72	Migration Due to the Bangabandhu Bridge Project	152
4.1.73	Changes of Occupation due to Bangabandhu Bridge Project	153
4.1.74	Due to Migration, Changes of Occupation in Previous Years	154
4.1.75	Due to Migration, Changes of Occupation in Current Years (Five Districts)	155
4.1.76	Level of satisfaction Due to the Change of Occupation (Five Districts)	156
4.1.77	Respondents or their Family Members Received Training	157
4.1.78	Types of Training Received by the Respondent/ Respondent's Family	158
4.1.79	Level of Benefits after Receiving Training	161
4.1.80	Types of Training Centers in the Area	162
4.1.81	Much Advancement in Education Sector (Five Districts)	163
4.1.82	Health Facilities Reached the Doorstep	164

4.1.83	Increase of Roads and Communication	166
4.1.84	Increase of Income in New/ Changed Occupation	168
4.1.85	Increased the Scope of Modern Living Facilities	169
4.1.86	Increased Social Mobility	171
4.1.87	Increased Scope of Planned Housing	172
4.1.88	Increased the Flow of Loan from GO and NGOs	173
4.1.89	Early Marriage Increased	175
4.1.90	Environmental and Ecological Impacts of Bangabandhu Bridge Project (Five Districts)	177
4.1.91	Estimated loss regarding the disasters happened in previous 5 years (five districts)	180
4.1.92	Medium of Getting Forecast of Disasters	181
4.1.93	Impacts of Climate Change in the Study Area (Five Districts)	182
4.1.94	Occurrence of natural disasters at households' level	184
4.1.95	Number of the flood, its intensity, types of action taken, and service organizations	185
4.1.96	Number of river erosion, its intensity, types of action taken, and service organizations	186
4.1.97	Number of droughts, their intensity, types of action taken, and service organizations	187
4.1.98	Types of steps/initiatives taken to recover negative disaster impacts	188
4.2.1	Statistical Information Gathered	237
4.2.2	Bangabandhu Bridge, Toll Operations	246
4.3.1	Name of the Market Studied	251
4.3.2	Types of the market in six districts	254
4.3.3	Nature of the respondents	254
4.3.4	Income of the respondents	255
4.3.5	Respondent's Investments in the Market	256
4.3.6	Information about the market	257
4.3.7	Facilities in the market (Five districts)	258
4.3.8	Facilities in the market (Manikganj)	259
4.3.9	Market Environment (Five districts)	261
4.3.10	Market Environment (Manikganj)	262
4.3.11	Government and nongovernment Facilities (Five Districts)	264
4.3.12	Government and non-government facilities (Manikganj)	267
4.3.13	Days of market, number of buyers and sellers (Five districts)	267
4.3.14	Days of market, number of buyers and sellers (Manikganj)	270
4.3.15	Numbers of Products in the Market (Five districts)	271

4.3.16	Vehicles used for coming to the market (Multiple response)	272
4.3.17	<i>Market Management Information</i>	273
4.3.18	Vehicles used for commuting to the market (Multiple response)	273
4.3.19	Number of Vehicles used	274
4.3.20	New Business Organization/ Enterprise (Five Districts)	274
4.3.21	New business organization/ enterprise related information (Manikganj)	275
4.3.22	Work opportunities related information in the market (Five Districts)	276
4.3.23	Work opportunities related information in the market (Manikganj)	277
4.4.1	Distribution of Industry by Types, Ownership & Number of Employees	284
4.4.2	Industries by Types and Ownerships (Five Districts)	285
4.4.3	Industries by Types and Ownerships (Manikganj District)	286
4.4.4	Investment and Loan for Industries	287
4.4.5	Sources of Investment	287
4.4.6	Sources of loan before the Establishment of Bangabandhu Bridge	288
4.4.7	Sources of Current Loan	288
4.4.8	Income and Expenditure of Industries	289
4.4.9	Ownership of Land, Level of Price	289
4.4.10	Sources Raw Materials	290
4.4.11	Distribution of Intensity, Time and Cost Savings, Sufficiency of Transport, Medium of Transporting Produced Goods	291
4.4.12	Medium of Transporting Goods before	293
4.4.13	Medium of Transporting Goods Present	293
4.4.14	Selling Places of Produced Goods	294
4.4.15	Utility Services (Five districts)	295
4.4.16	Development of industry among the five districts	296
4.4.17	Living standard of industrial workers (Five districts)	298
4.4.18	Social Service for the Industry Worker	300
4.4.19	Types of service is provided by the Industry (Five districts)	300
4.4.20	Source of Delivered Services (Five districts)	301
4.4.21	Benefits from the Bangabandhu Bridge	301
4.4.22	Effects of the establishment of Bangabandhu Bridge (Five districts)	302
4.4.23	Contribution of industry on national and local stage (Five districts)	302
4.4.24	Challenges faced in directing the industry (Five districts)	305
4.4.25	Challenges faced in directing industry (Manikganj)	306
4.4.26	Opinion of the respondents for addressing industrial challenges (Five Districts)	306

4.4.27	Opinion of the respondents for on addressing industrial challenges (Manikganj)	308
5.1	Baseline Literature Related to the Bangabandhu Bridge (BB)	311
5.2	Toll Collection of Bangabandhu Bridge	325
5.3	Short- Run (2001), Long- Run (2011) and Current (2021) Effects	333
5.4	Influence of Change Process on Economic Impacts	334
5.5	Influence of Change Process on Health and Well-being	336
5.6	Influence of change process on cultural impacts	337
5.7	Contribution of Bangabandhu Bridge (Five Districts vs Manikganj District)	342

LIST OF FIGURES

Figure Number	Title of the Figure	Page Number
1.1	The Jamuna River & the Rivers of Bangladesh	35
2.1	Location of Bangabandhu Bridge (Jamuna Bridge)	40
2.2	Influence of Change Processes on Economic Impacts of Jamuna Bridge	43
2.3	Influence of Change Process on Health and Well-Being Impacts of Jamuna Bridge	48
2.4	Influence of Change Process on Cultural Impacts of Jamuna Bridge	49
2.5	Main Focuses of Literature Review per Study Objectives and Scope	53
3.1	Analytical Framework/Model for the Study	63
3.2	Phases of the Study	65
3.3	Sources of Data	65
3.4	Triangulation of Study	72
4.1	Economic Status of the Respondents (Five Districts)	81
4.2	Respondent's Economic Status (Manikganj)	82
4.3	Income of the Household Head	88
4.4	Number of Income Earning Person	89
4.5	Age Group of the Respondents (Five Districts)	91
4.6	Sources of Family Debt	99
4.7	Land Ownership and Volume of Land	103
4.8	Changes in Price of Agricultural Products and Related Materials	106
4.9	Expenses of Production in BDT	106
4.10	Income Level of the Respondents	112
4.11	Factors Attracting Mobility of Labor	116
4.12	Nature of Roads	120
4.13	Comparative Level of Electricity Use	124
4.14	Educational Institution in the Locality	131
4.15	Children Going to Study in Education Institution	132
4.16	Opinion about Education System	134
4.17	Number of Daily Food Intake	140
4.18	Daily Food Intake Twice a Day	144
4.19	Healthy Sanitation and Drinking Water	145

4.20	Nature of Housing	146
4.21	Status of Education	147
4.22	Malnutrition in the Family	149
4.23	Duration of Living	151
4.24	Migration Due to the Bangabandhu Bridge Project	152
4.25	Changes of Occupation due to Bangabandhu Bridge Project	153
4.26	Changes of Occupation in Current Years	156
4.27	Level of Satisfaction Due to Change of Occupation	157
4.28	Training Received	158
4.29	Types of Training Received by the Respondents	160
4.30	Level of Benefits	161
4.31	Types of Training Center in the Study Area	162
4.32	Advancement in Education Sector	163
4.33	Health Facilities Reached the Doorstep	165
4.34	Increase of Roads and Communication	166
4.35	Increase in Income in New/ Changed Occupation	168
4.36	The Increased the Scope of Modern Living Facilities	170
4.37	Increased Social Mobility	171
4.38	Increased the Scope of Planned Housing	173
4.39	Increased the Flow of Loan from GO and NGOs	174
4.40	Positive Impacts on Social Sector (Five Districts)	176
4.41	Impacts on Social Sector (Manikganj)	177
4.42	Environmental and Ecological Impacts of Bangabandhu Bridge Project (Five Districts)	178
4.43	Environmental and Ecological Impacts of Bangabandhu Bridge Project (Manikganj)	179
4.44	Estimated Loss in Disasters	180
4.45	Medium of Getting Forecast of Disasters	182
4.46	Impacts of Climate Change in the Study Area	183
4.47	Impacts of Climate Change in Manikganj	184
4.48	Market Picture of Natore Sadar	253
5.1	Baseline Literature Related to the Bangabandhu Bridge (BB)	310
6.1	Recommendations for Short Term	343
6.2	Recommendations for Long Term	344

EXECUTIVE SUMMARY

The Bangabandhu Jamuna Multi-purpose Bridge, also called as the Bangabandhu Bridge (Bengali: Jamuna Bohu Mukhi Setu), is a bridge constructed over the Jamuna River in 1998. It connects Bhuapur on the Eastern part of Jamuna River and Sirajgonj on the Western part of the river Jamuna. It took 5 years (1994–1998) to complete the construction work of the Bangabandhu Jamuna Bridge and the total expenditure was the US \$ 839 million for it. It was the largest bridge in Bangladesh and this bridge was a long-cherished dream of the people of Bangladesh. After the construction of the Padma Bridge, it placed the second largest bridge of Bangladesh. The Bangabandhu Bridge project is one of the important and masterpieces of infrastructure in the history of Bangladesh. This a unique bridge that has the provisions for rail, gas, electricity line, fiber optic cables, internet line for the benefit of the people of the northwestern part of the country.

Study Objectives

The general objective of the study was to assess the overall socio-economic and ecological impact of Bangabandhu Bridge. The study was tried to explore the economy in general, and the people, in particular, have benefited due to the construction of the bridge. Specific objectives were to assess the social impact, and in particular, to explore the lives and the livelihoods of the people have been improved; to assess the contribution of the bridge in poverty reduction in the adjacent districts; to assess the facilitated economic activities; to assess the contribution of the Bangabandhu Bridge in industrialization and employment generation, and to assess the impact on ecology and environment in the adjacent districts.

Research Methodology

The present study is based on pragmatism that includes both quantitative and qualitative approach that explored a good number of qualitative and quantitative variables. The quantitative survey as well as qualitative methods were used in the study. Data were collected from the respondents of six districts of Bangladesh by using a face-to-face interview schedule, focus group discussions (FGDs), key informant's interviews (KIIs), in-depth case interviews (ICIs), reviews of project documents, national policies, and documents. In the study the number of household surveys was 509 enterprises survey was 60, markets surveys were 94. Besides, 12 FGDs, 26 ICIs, and 21 KIIs were also undertaken concurrently. Quantitative data were processed and analyzed by using SSPS.

On the contrary, qualitative data (non-numerical) was analyzed by applying the thematic analysis approach and interpretive approach as well.

Key Findings

1. Socio- Demographic Information of the Respondents

- The 80 % respondents were far from the bridge, 12% were living near the bridge.
- The 45% respondents were from middle class and 39% from lower class of people.
- The 79% respondents were male and 21% were female. The male female ratio among the family members is 53:47.
- The 99% respondents' religion was Islam and 1% from Hinduism.
- Among the total respondents 92% were married and 5 % were widowed.
- Among the family members of the respondents, 77% were literate and literacy rate of the respondents was 61%.
- Among the 509 respondents 23% were farmer, 18% were housewife, and 11% were day laborer in agricultural and non-agricultural fields. Among the family members of the respondents 30% were housewife and 27 % were students.

2. Economic Condition of the Respondents

- Average monthly income of a household head was 22467.96 BDT.
- The 64% families had only one income earning members in the family and 25% families had only two members. Among the total number of dependents 69% dependents' age were from Under 10 to 30 years. 10% of dependents crossed the age of 50 years.
- Present income from the production of agricultural products is 4056.44.07 BDT per year and previously it was 214987.18 BDT. From fish farming it is currently 199724.14 BDT and previously 145739.10 BDT. Present income of cattle rearing is 78440.83 BDT and previously 48488.18 BDT. Previous income of daily labor from non agricultural work was 112804.55 BDT and currently it is raised to 151562.5BDT. Previous income from lithe business was 91829.55BDT and currently it is 151844.44 BDT. The average total income from all sources was previously 250813.60 BDT and currently it is 411526.13 BDT.
- The annual mean expenditure of a respondent is 328577.16 BDT and the three main sources of expenditure are buying agricultural and non-agricultural elements, food, housing and repairing, and vehicles.
- The mean value of wealth of the respondents was 2613952.59 BDT and larger share of that wealth was from the value of land (2970184.57 BDT).

- Bank and Insurance increased 63%, NGOs increased 83% and financial transaction increased 58%.
- Respondent's family had average 498405.41 BDT of Debt to the Banks and 158666.67 BDT TO Relatives.
- Overall household savings was 236399.28 BDT in previous years and currently 391645.83 BDT.
- Previously homestead land was 14.40 decimal and currently 13.58 decimals. Previously cultivable land was 116.25 decimals and currently it is increased to 120.84 decimals. Decrease of own land is 50%. Volume of pond has reduced 30%. Overall, previously respondents had 86.24 decimals of land and currently it is 83.97 decimals.
- Price of agricultural land beside roads has increased 95 % far from road 83 % and homestead land 94 %, commercial land 96 %.
- Increase of cost of agricultural production is 66%, amount of production and price of product are increased 69%.
- Previously expenditure against production was 31642.33 BDT and currently 48174.02 BDT.
- After the construction of bridge fertilizers are found 91% cases previously it was 78% and agricultural worker are found 74% cases and previously it was only 63%.
- The 30% respondents are self-employed and 27% are employed in Agro based industries. Another 11% are employed in business.
- Previously average income of the respondents was 156212.86 BDT and currently 206092.91 BDT.
- Financial development of the respondents was significant. Income increased 99%, scope of employment increased 89%, mobility of labor increased 99%, industries developed 57%, agricultural product marketing increased 89%.
- Mobility of work increased 99% and migration of labor increased 89%.
- Income inequality increased 61% and decreased 29%, employment inequality increased 57% and decreased 33%.
- Cooperation between two regions increased 71% and price of local products has increased 89%.

3. Infrastructure and Social Condition

- Previously muddy road was 48 percent and concrete road was 44 percent but currently muddy roads reduced to 43% and concrete roads increased to 52%.
- Previously 56% respondents used paddled rickshaw, 37% paddled van and 44% used electric van for local communication but 62% respondents are using auto rickshaw and 58% easy bike.

- Previously 72% respondents used post office and 69% mobile phones for communication but currently 99% of them are using mobile phone, 54% are using internet and 51 % post office for information communication.
- Previously 81% households used electricity and currently 95% are using electricity in daily life.
- Ninety two percent respondent's family previously used straw, wood, bamboo, tree leaves, dried branches of trees etc. for their fuel need and 14% respondent's families used liquid gas in cylinder. Currently 64% families are using straw/wood/bamboo/ dried branches of trees and 62% are using liquid gas in cylinder.
- Respondents are using tube wells water in 99% cases for drinking and cooking and 98% cases for bathing. The respondents owned 88% tube wells.

4. Education and Health

- Among the educational institutions 94% were primary schools, 88% were high schools, 51% were colleges and 68% were Madrasahs. 68% children are going to school and 32% are seen absent.
- Among the schools 54% were government primary schools, 49% were high schools.
- About 97% respondents have shown positive attitude to the quality of education system.
- Seasonal cold and flu affected people are 74% and Fever affected people are 66 %. Headache was seen among 61% of respondent's family. Back pain was also 27%.
- For treatment 74% cases people go to government Upazila or district hospitals and 47% cases go to the nearby pharmacy. 89% communities have community clinics and 50% communities have union health centers.

5. Social Indicators

- Freedom of movement of the people in the locality has increased 99% and freedom of expression of opinion has increased 99%. Social security system in the community was found excellent and teen age girls can move freely in the community.
- Social security of women, women's opinion sharing in the family, role of law enforcement agencies have been increased, but entertainment facilities have not increased much. Role of local government is not up to the mark.
- Among the study people 71% families take three times of meal and 28% are taking four times of meal.

- Among the respondents 96% respondents were habituated to eat rice and 87.2% respondents informed that they prefer vegetables in the morning. About 98% prefer rice and 88% prefer fish in their lunch.
- Besides, 97 % respondents eat rice and 79% eat fish at night but pulse (dal) is common in each meal.
- About 91% respondents have the proper sanitation and fresh drinking water for daily use.
- Forty six percent families have vegetable and fruit farms and 54% do not have vegetable garden or fruit farms.
- About 37% houses are brick built, 52% are Tin-shed house.

6. Bangabandhu Bridge Mitigating Poverty

- On an average 66% respondents are educated and 34% are illiterate in the study area. About 43% school going children were found absent in school.
- Twenty percent families have at least one malnutrition case in the family.
- Mortality of child in the study area was found 13%.

7. Quality of Life in the Society

- About 97% families use the basic facilities of electricity.
- Among the respondents 32% household yards were found clean and 68 percent yards were not found clean.
- About 81% respondents were found to live in study area from fathers' generation.
- Ninety two percent of respondents did not migrate due to the construction of the Bangabandhu Bridge, support roads, highways and railway facilities.
- Occupation changed for 19% respondents and 81% remained unchanged due to the construction of Bangabandhu Bridge. Among the migrants of bridge construction, 61% were in agriculture previously and currently 17 % are changed to non-agriculture labor and 30 % changed to unemployed.
- About 15% respondents were found unsatisfied and 46% found moderately satisfied due to the change of occupation.

8. Training and Skills

- Among the family members 85% did not receive any training and 15% received training of animal husbandry, computer training, fish farming, brick layering, seed production etc. Among them mostly 34% received computer training, 25% animal husbandry.
- Forty one percent training receiver moderately benefitted, and 34% more benefitted.

- In the study area/ community 86% centers were computer training institution and 52% were technical training institution. Besides, 46 % were animal husbandry training centers.

9. Positive Impacts of Bangabandhu Bridge in Social Sector

- About 64% respondents were agreed, 32% were highly agreed that much advancement was happen due to the construction of Bangabandhu Bridge in education sector.
- About 48% respondents were agreed, 29% were highly agreed that much advancement was happen due to the construction of Bangabandhu Bridge in health facilities to doorsteps.
- Roads and communication system were highly increased and 57% people gave positive remarks.
- In new or changed occupation income has increased highly according to 30% of respondents and income has increased according to 43% respondents.
- Forty five percent respondents were agreed and 37% were highly agreed that scope of modern living facilities have increased.
- Forty one percent respondents were agreed and 38% were highly agreed that social mobility has increased.
- About 29 % were highly agreed and 29% did not comment in the issue of increased scope of planned housing.
- Thirty seven percent respondents were highly agreed and 39% were agreed that flow of loan has increased.
- About 90 % of respondents' opinion on positive impacts on fish resources and 79% on aquatic lands and rivers, 79% positive impacts on forestry and tress. Besides, it has 72% of positive impacts on ecology, birds, and animals. The impact on agriculture was 79%. But opinions regarding impacts on the environment are both positive and negative.
- The estimated loss of wealth of various sectors in last five years was a total of 9521166.397 BDT and the average value of loss was 57000 BDT over the sectors.
- In 81% cases respondents know the forecasts of disasters in television, 83% cases by mobile phone, and 51 % cases by their neighbors.
- Due to climate change water level reduced 29%, path of river changed 17%, frequency of droughts increased 45%, agricultural production reduced 25% and crops were damaged 48%.
- Various types of pollution increased to 37%.

10. Information Related to Market:

- Number of studied Market in five districts was 72 and in Manikganj it was 22.
- Forty-five percent respondents were male and 45% respondents were female in five districts. In Manikganj, approximately 55% respondents were female and 45% respondents were male.
- In five districts the marital status of the respondents was 62% but in Manikganj it was 67%.
- In five districts among the respondents from the market 14% were illiterate and in Manikganj 3% were illiterate. But in 25% respondents from five districts were found to complete higher degrees.

11. Income and Investment (From/ in Market):

- In Five districts the average incomes from small, medium and large markets were 29375 BDT, 72857BDT and 135952 BDT monthly.
- In Manikganj, the average incomes from small, medium and large markets were 32500BDT, 73461 BDT and 129000 BDT.
- In five districts, the average investment in the small, medium and large markets was 129166 BDT, 733333BDT and 1894444 BDT.
- In Manikganj the amount of average investment in small, medium and large markets was 141666BDT, 657142BDT and 1990000BDT.

12. Facilities in the Market:

- In five districts, there were 61 male toilets, 30 female toilets, 70 roads inside the market, 49 drains, 68 tube-wells, 17 terminals, and 33 stations.
- In Manikganj, there were 9 male toilets, 4 female toilets, 15 roads inside the markets, 6 tube wells, 8 terminals and 9 stations.

13. Market Environment:

- In five Districts 62% markets faced water logging problems.
- In Manikganj, 67% markets faced water logging problems.
- In five districts, 57% market's waste management and drainage system was not good.
- In Manikganj, 63% market's waste management and drainage system was very bad or bad.
- In five districts, 83% markets have good quality of pure drinking water facilities.
- In Manikganj, 81% markets have the facilities of pure drinking water.
- 67% respondents agreed that markets of the five districts were clean and 75% markets of Manikganj were found clean.
- In five districts 3% markets were not connected with developed road system and in Manikganj 22% markets were not connected with road system.

14. Information Related to Industry:

- Studied number of small, medium and large industries in five districts was 68
- 72% industries have 1-50 employees in five districts but in Manikganj 100% industries have 1-50 employees.
- 60.9% industries provided social service and 39% did not provide social services.

15. Ownership of the Industry:

- In five districts, the number of single ownership of industries in small, medium and large industries was 79%, 82%, and 54%.
- In Manikganj, the number of single ownership of industries in small, medium industries was 100% and 80%.

16. Sources of Investments in Industry:

- In five districts, 56% industries are financed by own fund and 44% uses loan from various sources.
- In Manikganj, 64% industries are financed by own fund and 42% by loan from various sources.

17. Sources of loan in Industry:

- In five districts, industries took loan from government banks in 74% cases, from nongovernment banks 89% cases and from NGOs 17% cases.
- In Manikganj, Industries took loan from Non- Government banks in 14 % cases and from NGOs 86% cases.

18. Income and expenditure of Industries

- In five districts mean monthly income was 16064235BDT.
- In Manikganj mean monthly income was 77285BDT.
- In Five Districts, monthly expenditure was 98833982BDT.
- In Manikganj, monthly expenditure was 21857BDT.

19. Living Standards of the Industrial Workers (Five Districts):

- Income Increased: 38% very good, 56% good and 9% moderately.
- Salary increased: 39% very good, 45% good and 20% moderately.
- Poverty Alleviation: 46% very good, 29% good and 25% moderately.
- Food Security: 36% very good, 49% good and 16% moderately.
- Quality of health care: 39% very good, 39% good and 22% moderately.

20. Living Standards of the Industrial Workers (Manikganj):

- ❑ Income Increased: 30% good and 70% moderately.
- ❑ Salary Increased: 30% good and 70% moderately.
- ❑ Poverty alleviation: 60% moderate and 40% good.
- ❑ Food Security: 70% good and 30% moderate.
- ❑ Quality of health care was 100 % moderately increased.

21. Sources of funding for delivered services:

- ❑ From the profit of the company 23%, institutional funding 9%, labor welfare fund 3% and own fund 47%.

22. Effects of Bangabandhu Bridge on Industry:

- ❑ Communication between the East and the West increased 100%.
- ❑ Concreteness of the internal roads increased 94%.
- ❑ Connection with the main roads increased 93%.
- ❑ Number of vehicles increased 88%.
- ❑ For getting products time and cost saved at 99%.
- ❑ Marketing opportunities increased 99%.
- ❑ Increasing the ratio of getting products is 94.2%.
- ❑ Creation of self-employment is 100%.
- ❑ Consumptions and savings increased 81.2%

23. Contribution of Industry in National and Local Level

- ❑ Almost all of the respondents are agreed that Bangabandhu Bridge is contributing in employment creation, alleviating poverty, assist in increasing national income, revenue generation and Increasing national GNP and GDP.
- ❑ Sixty Percent (60%) respondents of Manikganj thinks that industries are contributing in employment generation, 93% are helping in alleviating poverty, 100% are helping in increasing national income, 86.7% in GDP and GNP.

CHAPTER 1: INTRODUCTION

1.1 STATEMENT OF THE STUDY PROBLEM

The Jamuna, the Meghna, and the Padma constitute a system of rivers that physically divides Bangladesh into east, southwest, and northwest regions. The east region is relatively more developed because it includes the capital, Dhaka, and the most important part of the country, Chittagong. The west region includes Rajshahi (northwest) and Khulna (southwest) divisions. The northwest region, with more than 27 million people and highly fertile land, is bounded by the Ganges on the south and the Jamuna on the east and remains relatively isolated from the rest of the country (Jenkins & Shukla, 1997, p. 121). 'Jamuna Bridge' the longest in South Asia, eleventh longest in the World is not only a bridge over a river but a bridge to bridge over the socioeconomic disparity between the two major parts of the country. We had been dreaming of a prosperous Bangladesh since its inception as an independent state but with a part remaining almost disassociated from the whole. Now the country is likely to move ahead towards more integration. The construction of this bridge has brought about a revolutionary change in our communication system as well as economic development. It is expected that the development of communication with the rest of the country will lead to higher investment in the Northern Bangladesh and stimulate the macro-economic scenario of the country (Alam, Rahman, Rahman, & Khanam, 2003, p. 114). The Jamuna Bridge is situated about 130 kilometers northwest of Dhaka. The length of this bridge is 4.8 kilometers. It has linked the eastern and northwestern parts of Bangladesh permanently over the world's fifth largest river. The bridge took almost four years to build, at a cost of about US\$ 900 million. It carries four lanes of traffic, a dual (broad and meter) gauge railway track, power lines, gas pipelines and fiber-optic telecommunications cables. It was jointly financed by ADB, World Bank and Japan Bank for International Cooperation together with the Government of Bangladesh.

However, from the national and contextual purposes, this study underpins some significant contributions in Bangladesh. We all know that due to this bridge the mighty river Jamuna physically divides Bangladesh into East and West regions and created a barrier as an impediment to economic development and social unity. In consequence, there was a long national desire to reduce this division by establishing a permanent link between the two regions of the country. In June 1984, the Government of Bangladesh decided to construct the Bangabandhu Bridge with Road, Rail, Gas, Electricity Transfer and Tele-communication facilities. This bridge opened for mass use on 23 June 1998. The present study has been done covering the following grounds:

- The bridge is now acting as a major link to the national transportation and communication system that includes roads and railways connecting North-West to the East.
- The bridge has resulted in the reduction of transport costs and travel time.
- The farmers of the North-West region are getting fair prices of their crops and being encouraged in commercial farming.
- A favorable environment has been developed in order to establish new industries in the North-Western regions.
- The bridge has contributed to the economy by facilitating a high level of growth and development of the national economy, poverty alleviation and revenue generation.
- The government has undertaken many programs along with some services for the people affected by displacement and disasters that include cash, housing facilities, training, health and hygiene facilities and many other socio-economic development activities.
- Rehabilitation and Development Organization for Landless (RADOL) conducted a baseline survey entitled: 'Jamuna Multipurpose Bridge Project: Socio-economic Baseline Survey on the West Guide Bund Area, Sirajganj with the technical and financial supports by the Bangladesh Bridge Authority in May 1997. It is approximately 23 years; the bridge contributed a lot to the national and local socio-economic and cultural development in Bangladesh.
- After the construction of bridge, a long time has been passed and now it is essential to evaluate the impacts of this bridge on the economy, health, education, environment, industry, market, and business in line with the baseline surveys.

The current study aims at providing new dimensions, a greater comparison with the baseline surveys, and show a way forward to overcome the current and probable difficulties gained from the evaluation study.

1.2 OBJECTIVES OF THE STUDY

1.2.1 GENERAL OBJECTIVES OF THE STUDY

The main objective of the study was to assess the overall socio-economic and ecological impact of Bangabandhu Bridge. The study was tried to explore how and to what extent the economy in general, and the people (more specifically the poor people) in particular have been benefited due to the construction of the bridge.

1.2.2. SPECIFIC OBJECTIVES OF THE STUDY

The main objective of the study was to assess the overall socio-economic and ecological impact of Bangabandhu Bridge. The study was tried to explore how and to what extent the economy in general, and the people (more specifically the poor people) in particular have been benefited due to the construction of the bridge.

More specifically, the study intended:

- a) To assess the social impact, and in particular, to explore whether and to what extent the lives and the livelihoods of the people have been improved;
- b) To assess the contribution of the bridge in poverty reduction in the north-western part of the country especially in the adjacent districts;
- c) To assess whether and what extent the economic activities have been facilitated due to the construction of the Bridge;
- d) To assess what extent the Bangabandhu Bridge has contributed to the country's industrialization and employment generation; and
- e) To assess the impact of ecology and environment in the north-western part of the country especially in the adjacent districts.

In addition, this assessment was also expected to provide useful ingredients, analysis, and insights for further investments of this kind in future in the country.

1.3 SCOPE OF THE STUDY

To achieve the above objectives, the study intended to investigate the following areas by comparing the situation before and after the construction of the bridge. Where applicable, the study was also tried to compare the target regions to that of the comparison regions to capture the true impact:

- a) Agricultural production, market integration and prices;
- b) New enterprises, trade and industry including commodity flows and trade margins;
- c) Changes in wages and prices including both input and output prices;
- d) Improvement in employment, in both formal and informal sectors;
- e) Improvement in health and educational facilities/services and outcome;
- f) Improvement in transportation and mobility, especially the factor mobility;
- g) Contribution to poverty reduction and country's GDP;
- h) Improvement in industrialization & employment generation; and
- i) Ecological and environmental impact of the Bridge.

In addition, the study would also like to attempt the following:

- a) Comparing the overall impact against what was mentioned in the Feasibility study done in 1989;
- b) Undertaking the financial analysis considering all income and expenditure from the Bridge including DSL payment and comparing them with that of the Feasibility Study.

CHAPTER 2: REVIEW OF LITERATURE RELATED TO THE STUDY

INTRODUCTION

A literature review is an objective, thorough summary and critical analysis of the relevant available research and non-research literature on the topics being studied (Cronin & Ryan, 2008). Its goal is to bring the reader up-to-date with current literature on a topic and form the basis for another goal, such as the justification for future research in the area. A good quality literature review gathers information about a particular subject from many sources. It is normally well written and contains few if any personal biases of the researcher. It focuses on a clear search and selection strategy (Carnwell & Daly, 2001); (Cronin & Ryan, 2008).

It is recognized that literature review is much more useful for gaining insight and context into a topic of research study. It allows researchers to be familiar with those research studies previously conducted by other researchers in the fields related to the present research topic. It helps to gain understanding as to the research design, research methods, and concepts (variables) used in the study. The literature review is basically a short survey of relevant works done by other theorists, researchers, academics and so on in the same field. In the current study review of Literature has been presented in the following sections:

2.1 Background History of Jamuna River and Bangabandhu Bridge (Jamuna Multipurpose Bridge)

2.2 Physical, Social, Economic, & Cultural Aspects, and Impacts of Bangabandhu Bridge (Jamuna Multipurpose Bridge)

2.3 Key Literature Review of Research Work on Bangabandhu Bridge (Jamuna Bridge)

2.1 BACKGROUND HISTORY OF JAMUNA RIVER AND BANGABANDHU BRIDGE (JAMUNA MULTIPURPOSE BRIDGE)

The construction of the Jamuna Bridge, now the 11th longest bridge in the world, began in October 1994 and finished in June of 1998. With the Jamuna River physically dividing Bangladesh into two halves, the Bridge was built in order to provide the first road and rail link between the relatively less-developed Northwest region of the country and the more

developed eastern half that includes the capital of Dhaka and the port of Chittagong (Luppino M. , Gajewski, Zohir, Khondker, & Crowther, 2004).

2.1.1. THE RIVER JAMUNA

Prior to the late 1700s, the Brahmaputra River flowed farther east by up to 100 km. It then switched, or avulsed, into a straight north-south route, possibly triggered by an earthquake in 1787. The small river whose course was grasped by it is called the Jamuna River. Now, below the avulsion point where what is now the Old Brahmaputra deviates from the present course, the Brahmaputra is called the Jamuna (Steckler, 2013).

The Jamuna River is the downstream continuation of the Brahmaputra in Bangladesh. It is one of the largest sand-bed braided rivers in the world and every year it erodes thousand hectares of mainland floodplain, rendering tens of thousands of people landless and/or homeless (Sarker, Thorne, Aktar, & Ferdous, 2014).

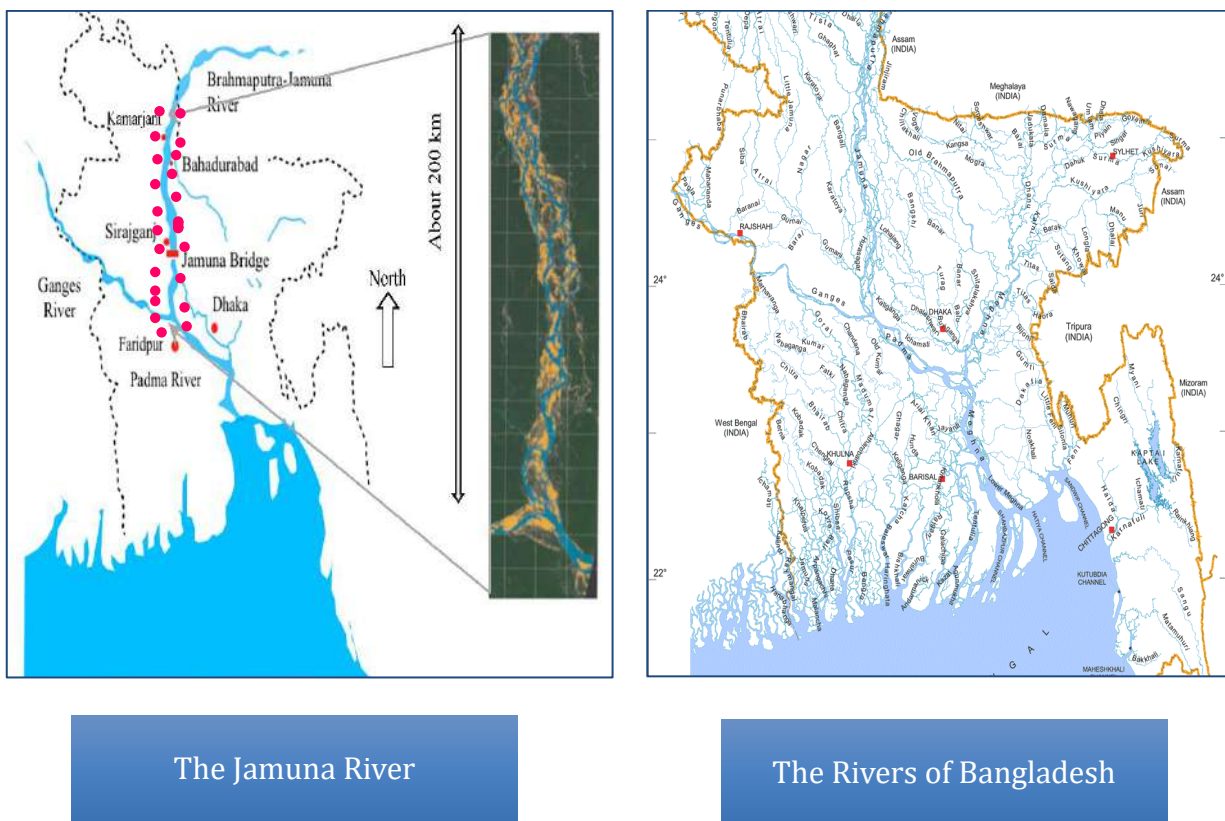


Figure 1.1: The Jamuna River & the Rivers of Bangladesh

Sources of Images: (Van Der Wal, 2020)& (Banglapedia).

The Jamuna, one of the three largest rivers in Bangladesh, runs from north to south through central Bangladesh, dividing the country to the east and west. At the time of appraisal, ferries, which were the only means of crossing the river, were operated on two sections in the project area, one upstream, and one downstream. The operation of ferries, however, was influenced by the weather and moreover, a one-way trip took more than two hours. Furthermore, since the water level and width of the river changed significantly between the dry and rainy seasons, it was difficult to expand and improve the existing ferry facilities, and goods vehicles, which accounted for more than 60% of all cross-river traffic, were required to wait an average of 36 hours before boarding.

Moreover, the volume of traffic crossing the Jamuna was expected to grow at an average annual rate of more than 6% during the period up to 1998 and by more than 5% per annum after 1999. As described above, the Jamuna formed a 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 prevented from benefiting from infrastructure, including gas, electricity and communications, which were concentrated in eastern Bangladesh and had been left underdeveloped. Under these circumstances, a plan to construct a bridge across the Jamuna had been the earnest wish of the nation since Bangladesh became independent in 1971 (Rahman, 2001, p. 60); (JICA, 2001, p. 1).

2.1.2. REASONS BEHIND THE CONSTRUCTION OF JAMUNA BRIDGE

The Jamuna, one of the largest rivers in Bangladesh, has been flowing from North to South through Bangladesh and has divided the country into the east and west. Before the construction of this bridge, ferries which were the only means of crossing the river were operated on upstream and downstream of the bridge area. The operation of ferries was greatly influenced by the weather and a one-way trip took more than 2 hours. Moreover, expansion and improvement of the existing ferry facilities was very difficult as the water level and width of the river changed frequently between the dry and rainy seasons. The river Jamuna put a hindrance in the transportation of agricultural products grown in the west to the consumption centers like the major cities-Dhaka and Chittagong in the east. Moreover, western regions were deprived of gas, electricity and communications, which were available in eastern Bangladesh. All these circumstances urged to make a plan to construct a bridge across the river Jamuna. The bridge is located on the Asian Highway and the Trans-Asian Railway which, when fully developed, will provide uninterrupted international road and railway links from South-east Asia to North-west Europe. (Moniruzzaman, 2008, p. 282).

According to (Bayes P. , 2007), The Jamuna is one of the three largest rivers in Bangladesh. Running from the north to the south through central Bangladesh, seemingly, the river

divides the country into two halves: the east and the west. In the east, lie the capital city of Dhaka and the major port city of Chittagong - both providing windows of economic opportunities for economic growth and poverty reduction for the eastern region. The western part – especially the north western - embraces mostly greater Rajshahi Division, widely known as pervasively poverty stricken and less integrated with the eastern markets due to communication problems. Until the Jamuna Multi Purpose Bridge Project (JMBP) started functioning, ferries accounted for more than 60% of 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 Division. 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. Trucks carrying commodities were required to wait for an average of 36 hours before boarding. By and large, Jamuna 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 (Bayes P. , 2007, p. 6).

2.1.3 BRIEF HISTORY OF BANGABANDHU BRIDGE

The people and the successive governments in this part of the subcontinent (Bangladesh) always longed to bridging the mighty Jamuna and thereby integrate the communication systems of the region. Popular leader Maulana Abdul Hamid khan Bhasani first raised the demand for construction of the Jamuna Bridge at a political level in 1949. In the 1954 provincial elections of East Pakistan, the 21-point manifesto of the United Front contained a demand for the bridge. On 6 January 1964, Mohammad Saifur Rahman, a member from Rangpur in the Provincial Assembly inquired about government's intentions with regard to the construction of a bridge over the Jamuna (Banglapedia, 2021).

On the other hand, according to another source, the idea of the bridge was envisioned in mid 60s specifically in 1964. Mohahammed Saifur Rahman, a member of Pakistan Provincial Assembly (from Rangpur of the then East Pakistan) formally raised the necessity of a bridge over the river Jamuna. A resolution was unanimously passed in 1966 by the house for the construction of the bridge (Khan, 1998); (Anam & Sohel-Uz-Zanman, 2021). On 11 July 1966, Shamsul Haque, another member from Rangpur in the same Assembly, moved a resolution for the construction of the bridge and the house adopted it unanimously (Banglapedia, 2021).

Accordingly, Freeman Fox and Partners of UK carried out a preliminary feasibility study in 1969. They recommended a rail-cum-road bridge near Sirajganj with an estimated cost of \$175 million. The estimates were preliminary in nature and a more detailed study was recommended. On the other hand, in his address to the nation over radio and television on the eve of general election in Pakistan in 1970, the Awami League leader **Sheikh Mujibur Rahman** mentioned the construction of Jamuna Bridge as an election pledge of his party. But all efforts were interrupted due to political unrest and liberation war (Banglapedia, 2021).

After the independence of Bangladesh, the new government publicly stated its intention in 1972 to construct a bridge over the Jamuna and budgetary provisions were kept for the purpose in the 1972-73 budget. On being invited by the **President Bangabandhu Sheikh Mujibur Rahman of Bangladesh Government**, the Japanese International Cooperation Agency (JICA) undertook a feasibility study in 1973 on the construction of a road-cum-rail bridge over the Jamuna (Banglapedia, 2021).

Initial feasibility studies were conducted during the period from 1969 to 1976 with a recommendation of rail-cum-road Bridge near Sirajganj. In the 80s, the Government of Bangladesh made a concrete progress. The government commissioned a techno-economic study for carrying a natural gas pipeline over the river conducted jointly by Rendel Palmer and Tritton (RPT) of UK, PENCOL of UK and Bangladesh Consultants Ltd. (BCL) in 1984. That same year the Government of Bangladesh decided to proceed with the construction, which was followed by the techno-economic study (Khan, 1998).

The Jamuna Multipurpose Bridge Authority (JMBA) was set up by an ordinance promulgated by the President on 3 July 1985 to implement the project. For mobilization of domestic resources, another ordinance was promulgated by which a Jamuna Bridge surcharge and levy were introduced. A total of Tk. 5.08 billion was mobilized in the process till its abolition (Banglapedia, 2021). Jamuna Multipurpose Bridge Authority (JMBA) was formed the following year. Between 1986 and 1989, detailed studies in two phases were carried out by a consortium of RPT, BCL and Netherlands Engineering Consultants (NEDECO). Construction tenders were called in 1992 and the following year saw the finalization of funding arrangements with International Development Agency (IDA) of the World Bank, Asian Development Bank (ADB) and the Overseas Economic Cooperation Fund (OECF) of the Government of Japan. The contracts were signed in April 1994, the construction began in October of that year and was completed in 1998 in approximately 4 years (Khan, 1998); (Huq, 2002); (Ahamd & Syed, 2003). The bridge was opened for traffic on 23 June 1998.

2.1.4 BANGABANDHU BRIDGE (BB)/ JAMUNA MULTIPURPOSE BRIDGE (JMB)

The Peoples Republic of Bangladesh is physically divided by several rivers such as Ganges, Padma, Meghna, Bramaputra and Jamuna (Oostinga & Daemen, 1997, p. 03). A bridge which has been studied for decades is the Jamuna Bridge crossing over the Bramaputra, locally called Jamuna. This river runs from north to south through the country and therefore the proposed 5 km long bridge is an important link, both economic and social, between west and east Bangladesh. In 1993 the “Jamuna Multipurpose Bridge Project” finally got the green light with financial support from the International Development Association (IDA), Overseas Economic Cooperation Fund (OECF), Asian Development Bank (ADB) and the Government of Bangladesh (GOB) (Oostinga & Daemen, 1997, pp. 03-04).

Jamuna bridge is the longest bridge in Bangladesh with the length of 4.8 km (Luppino M. , Gajewski, Zohir, Khondker, & Crowther, 2004). Leading international organizations like World Bank (WB), Asian Development Bank (ADB), and Japan Bank for International Development (JBIC) and Government of Bangladesh (GOB) invested \$900 million for the project. (Siddique, 2013) (Dutta, 2014, p. 264)

2.1.5 THE BRIDGE AND ITS MAJOR COMPONENTS

The project was involved in both massive *physical works* - bridge design and construction, river training, land reclamation, construction of approach roads and *resettlement*. The construction part can be divided into following parts-

- The main bridge;
- The bridge end facilities at the east and west banks of the Jamuna River (e.g., parking areas, rest areas, toll booth, staff housing etc.);
- The approach roads connecting the bridge with the existing road networks; and
- The river training works (Huq, 2002).

The main bridge is 4.8 km long with 47 main spans of approximately 100 m and 2 end spans of approximately 65 m. Connected to the bridge are east and west approach viaducts each with 12 spans of 10 m length and transition spans of 8 m. The total width of the bridge deck is 18.5 m. The carriageways are 6.3 m wide separated by a 0.57 m width central barrier; the rail track is located along the north side of the deck. On the main bridge, electrical interconnector pylons are positioned on brackets cantilevered from the north side of the deck. Telecommunication ducts run through the box girder deck and a gas pipeline is located under the south cantilever end of the box section (Ahamed & Syed, 2003); (Anam & Sohel-Uz-Zanman, 2021).

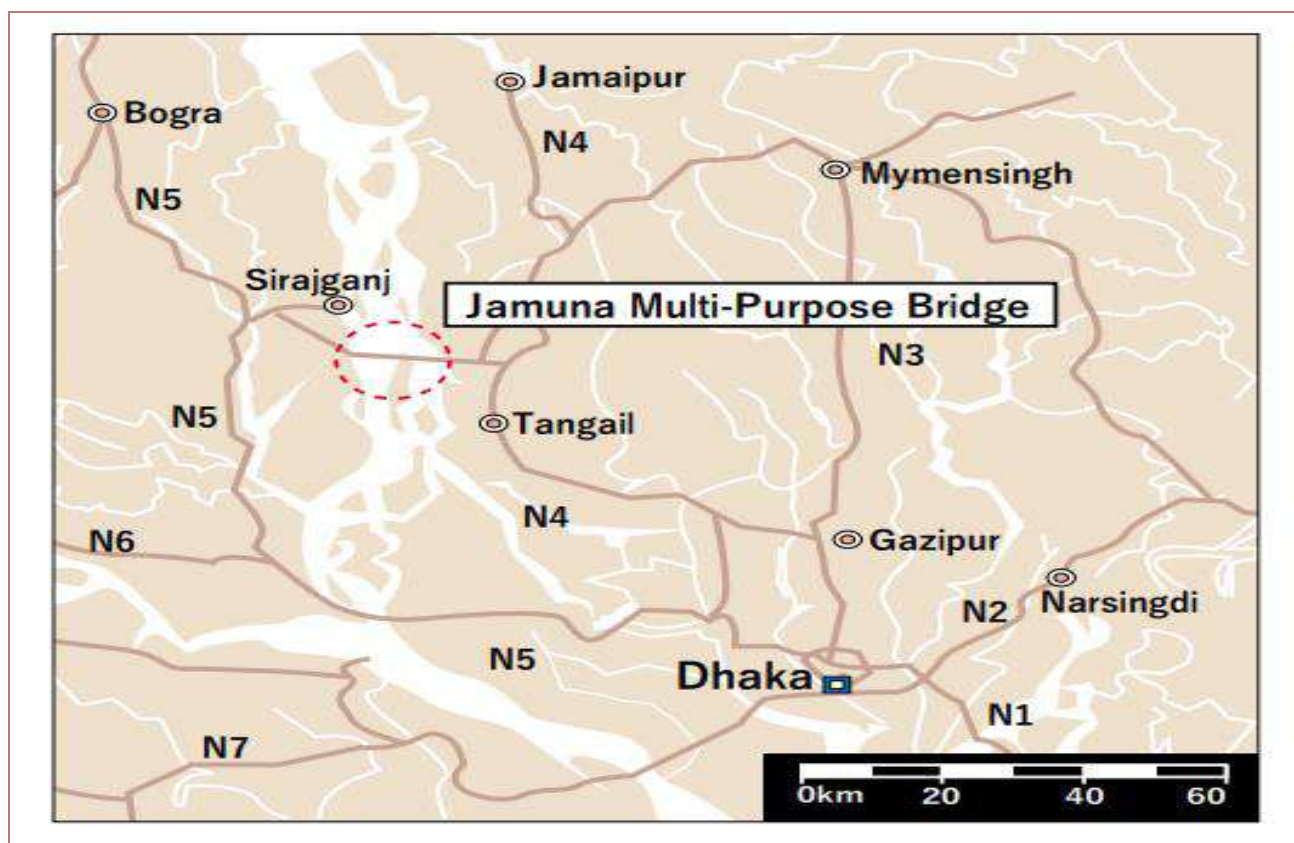


Figure 2.1: Location of Bangabandhu Bridge (Jamuna Bridge) (Rahman, 2001, p. 60); (JICA, 2001).

2.1.6 PROJECT OBJECTIVES OF JAMUNA BRIDGE (BANGABANDHU BRIDGE)

The Jamuna Bridge project is designed to provide a permanent, non-management-intensive crossing under all-weather conditions for the existing and potential east–northwest traffic. The project also includes a railway connection. In addition, the project allows transmission of electricity and transfer of natural gas between the east and the west regions (Jenkins & Shukla, 1997, p. 123). The project includes the following components:

1. Construction of a bridge about 4.8 km long and 18.5 meters wide to carry four road lanes with sidewalks; the bridge will also be capable of supporting a power interconnector, a gas pipeline, telecommunication facilities, and a meter gauge railway;
2. Construction of two bridge end viaducts, about 128 meters each, connecting the bridge to the approach roads;
3. Construction of two guide bunds, about 2.2 km each, and a flood protection bund on the east bank to regulate the river at the selected site;

4. Construction of two approach roads, about 16 km to the east and 14 km to the west. The approach roads will have a two-lane single highway with paved shoulders;
5. Measures to mitigate the project's impact on the environment;
6. Implementation of a resettlement plan; and
7. Technical assistance, including project management and training of bridge maintenance staff (ADB, 1994, pp. 11-12).

2.1.7. SCOPE OF THE PROJECT

The project was consisted of -

- 1) Construction of a Bridge (approx. 4.8-kilometer-long, two lanes each way),
- 2) Building a 16-kilometer-long approach road on the eastern side and a 14-kilometer-long approach road on the western side,
- 3) Implementing river control measures by constructing two guide bunds on the eastern and western banks of the river, approximately 2.2 kilometers each and
- 4) Providing consulting services in relation to-
 - construction supervision,
 - project management, and
 - training of the personnel at the executing agency for operation and maintenance of the project.

In order to finance this project, based on the joint finance method, the World Bank, Asian Development Bank and Japan Bank for International Cooperation are each contributing US\$200 million or its equivalent with the remaining US\$96 million provided by the Bangladesh government (Rahman, 2001, p. 61); (JICA, 2001).

2.2 PHYSICAL, SOCIAL, ECONOMIC, & CULTURAL ASPECTS AND IMPACTS OF BANGABANDHU BRIDGE (JAMUNA MULTIPURPOSE BRIDGE)

2.2.1. PROJECT IMPACTS

Real Economic Benefits and Sustainability: The economic analysis, which looks at the project's impact on Bangladesh's overall economy, presents a method of computing the real economic benefits of the bridge, including savings in vehicle operating costs, and the value of time savings gained by passenger and freight traffic. The financial analysis of such an infrastructure project checks on the sustainability of the service agency (the Bridge Authority) over time (Jenkins & Shukla, 1997, p. 121).

Integration of Regional Markets: By facilitating transportation across the river, the Bridge has lead to the greater integration of regional markets within the Bangladeshi national economy. Given the interdependence of economic activities/sectors, the direct impacts of the Jamuna Bridge on individual sectors (primarily transportation) and markets are likely to induce a chain of changes in the rest of the sectors of the economy. This in turn is expected to result in subsequent feedback effects (Luppino M. , Gajewski, Zohir, Khondker, & Crowther, 2004).

Economic Integration: Jamuna Multipurpose Bridge (JMB) connects the eastern and western part of the country, through the capital Dhaka, which presumably facilitates economic integration and development of the whole economy (Hossain, Sen, & Sawada, 2012); (Mahmud & Sawada, 2015, p. 03).

2.2.2. ECONOMIC BENEFITS

In the Study of "Bangladesh Jamuna Bridge project economic evaluation" by (Bernardino, Pankaj, & Chen, 1993)the economic benefits of the bridge project were:

- the savings in vehicle operating costs gained by the diverted traffic
- the value of time saved for existing passenger and freight traffic
- the net benefits received by the newly generated traffic (equal to the gain in consumer surplus plus the financial toll revenue)
- the value of the investment saved by not constructing a stand-alone power interconnector
- the value of the investment, and operating and maintenance costs saved by not improving the current ferry system

- the value of the increase in truck waiting time saved from the year 2000 onward by not operating the current ferry system
- the environmental benefits of preventing embankment erosion in areas close to the bridge and increasing agricultural production during the monsoon season (Bernardino, Pankaj, & Chen, 1993, p. 24); (Jenkins & Shukla, 1997, pp. 136-137).

2.2.3. BENEFITS ON SOCIETY, ECONOMIC ACTIVITIES AND AGRICULTURE

The study of (Alam, Rahman, Rahman, & Khanam, 2003) revealed that the Jamuna Bridge portends an era of socioeconomic transformation, linking the more marginalized North with the rest of the country. It has brought a massive change in income level of the farmers and created a great opportunity for employment generation, especially in off-farm sector. The bridge also changed the cropping patterns of the study area and the profitability of crop production has increased to a considerable extent in the study area as well as Northern region of Bangladesh.

Economic process like development of infrastructure, better communication facilities and diversified economic activities had positive impacts in accessing technology, micro credit and increased income (Dutta, 2014, p. 265).

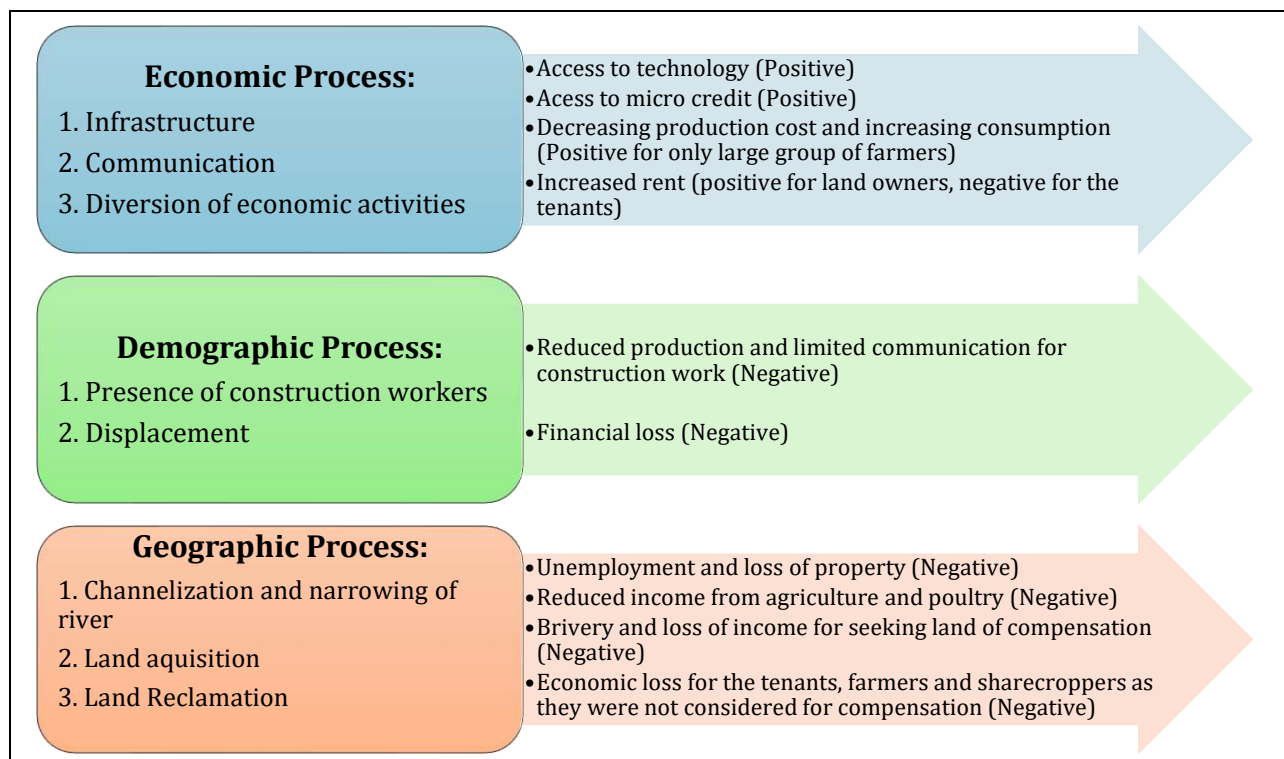


Figure 2.2: Influence of Change Processes on Economic Impacts of Jamuna Bridge

[Source: (Dutta, 2014, p. 266)]

2.2.4. ECONOMIC ASPECTS OF JAMUNA BRIDGE

4.1 Land Acquisition

Household cultivation reduced in the post project period for reducing amount of lands (Barua, Nath, & Jahan, 1993); (Dutta, 2014, p. 264). Also, for the land acquisition, number of poultry (that were source of income and consumption) and trees (both fruit and trees for wood and timber) owned by the affected households reduced in the post construction period. Excess land acquisition is another characteristic of big infrastructure project in Bangladesh. A large amount of evacuated land for Jamuna Bridge is still remained (Dutta, 2014, p. 265).

4.2 Land Reclamation and Compensation

Land reclamation process results in financial loss as the process took seven working days and loss of daily income of 782 BDT (Dulu, 2003, pp. 93-114); (Dutta, 2014, p. 265). Besides, those who received compensation had to visit and bribe different land officers to prove their ownership and collection of documents (Ghosh, Rahman, & Rana, 2010). Many people were severely affected by the land acquisition process that were neither compensated nor rehabilitated. Even compensated amount was not sufficient to buy the same amount of land (Ghosh, Rahman, & Rana, 2010). Compensations were provided only for housing, not for the eroding community facilities (Dulu, 2003) (Dutta, 2014, p. 265). Only the land owners but not other affected groups like tenants, farmers and sharecroppers were treated for compensations (Atahar, 2013); (Dutta, 2014, p. 265).

4.3 Displacement

To minimize the length of the bridge for reducing construction cost through channelization and narrowing of the river with rock and concrete made erosion more intense and less predictable (Dulu, 2003) and caused displacement. Where displacement is inevitable for development projects, World Bank and ADB have provision for adequate compensation. However, the gap between provision and implementation was huge in case of Jamuna Bridge. According to the study of BRAC (1992), only in the eastern side of Jamuna, 77,280 people would be affected (Siddique, 2013), (Dutta, 2014, p. 265) The project affected 1, 00, 000 people where 3604 households lost their lands (Siddique, 2013) indicates the adequacy of the measures of affected people. At the same time, the project target beneficiaries were only from eastern side, the western side was neglected. The southern side inundated leaving people homeless and unemployed for speed of current strengthened by 3 to 4 times for the construction purpose (Dulu, 2003). Even, they were not properly considered for the compensation and inhabited for one year without any regular work (Ghosh, Rahman, & Rana, 2010); (Dutta, 2014, p. 265).

4.4 Economic Impact and Diversification of Land Use

Improved marketing opportunities, better access to input for production, better inflow of workers were facilitated by the construction of Jamuna Bridge (Bayes P. , 2007); (Dutta, 2014, p. 265). Though, access to market increased for all groups of farmers, only large and medium farms had greater benefit from the increased access to market (Bayes P. , 2007). However, the change in economic condition was not statistically significant (Bayes P. , 2007).

4.5 Increased Rents

The land owners of the non-poor households have been benefited from the construction of the bridge which was detrimental for the poor tenants for increased cost. At the same time, number of tenant farmers increased in the area (Bayes P. , 2007). Urban rich households have also been benefited in comparison to the urban poor (Luppino M. , Gajewski, Zohir, Khondker, & Crowther, 2004); (Dutta, 2014, p. 265).

4.6 Micro Credit

Access to credit increased in post Jamuna period for NGOs emerged more actively after the construction of the bridge facilitated by better communication. Before the construction, only 4% of the households had access to micro credit (**Bayes, 2007**); (Dutta, 2014, p. 265).

2.2.5. EFFECTS OF MARKET INTEGRATION AND TRANSPORT INFRASTRUCTURE ON ECONOMIC OUTCOMES, ECONOMIC ACTIVITIES

- In an interesting review of place-based policies in the context of World Bank infrastructure projects, Duranton and Venables (2017) note that, resource allocation across regions within a country may be driven by absolute advantage as both labor and capital are mobile. However, when the focus is on agriculture where the main factor of production is immobile, the resource allocation across regions of a country is primarily determined by comparative advantage.
- 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. (Donaldson, 2018).
- Asher and Novosad (2018) found that new feeder roads do not increase agricultural production, assets, or income in villages in India, but reallocates labor from agriculture to wage labor (Asher & Novosad, 2018); (Blankespoor, Emran, Shilpi, & Xu, 2018, p. 5).
- Atkin and Donaldson (2015) found that domestic trade costs in Nigeria and Ethiopia are four to five times larger than in USA, and the passthrough of international prices

to the domestic prices are lower in remote locations (Atkin D, 2014) ; (Blankespoor, Emran, Shilpi, & Xu, 2018, p. 5).

- Banerjee et al. (2012) analyzed the effects of access to transport infrastructure on economic growth in China (Banerjee, Duáo, & N., 2012)
- Emran and Hou (2013) provided 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 & Hou, 2013)
- Faber (2014) found that transport network connection had adverse effects on industrial growth in peripheral counties in China (Faber, 2014).
- Baum-Snow et al. (2017) study the effects of roads and railway on urban form in China, and provide evidence that radial highways decentralize service sector activity, radial railroads decentralize industrial activity, and ring roads decentralize both (Baum-Snow, Brandt, & Henderson, 2017).
- Duranton (2015) shows that, in Colombia, road distance between cities is a major impediment to trade (Duranton, 2015).
- In the context of Mexico, Blankespoor et al. (2017) found evidence of significant and positive causal effects of improved domestic accessibility on employment and specialization (Blankespoor B. B., 2017). (Blankespoor, Emran, Shilpi, & Xu, 2018).
- Bird and Straub (2014) studied 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 (Blankespoor, Emran, Shilpi, & Xu, 2018).
- Ali et al. (2016) show that lower transport costs induce farmers adopt better farming techniques (Ali, 2016).
- Using survey data from Nepal, Fafchamps and Shilpi (2005) show that areas close to cities are more diversified and more market-oriented activities (Fafchamps & Shilpi, 2003).
- Emran and Shilpi (2012) found evidence of an inverted-U relation between crop diversification and access to markets in Nepal (Emran & Shilpi, 2012).
- Most of the available literature, as discussed above, focuses on the road and railway infrastructure. Tompsett (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 (Tompsett, 2013).

- (Donaldson, 2018, p. 899) showed by reviewing archival data of Indian Railway from British Period to Present that railroads: (1) decreased trade costs and interregional price gaps; (2) increased interregional and international trade; (3) increased real income levels; and (4) that a sufficient statistic for the effect of railroads on welfare in the model accounts well for the observed reduced-form impact of railroads on real income in the data (Donaldson, 2018, p. 899).
- In the context of Bangladesh, Mahmud and Sawada (2014) provide preliminary evidence on labor market effects of Jamuna Bridge, the focus of our analysis. The data used in their analysis cover only two districts adjacent to the Jamuna bridge (Tangail and Sirajgonj), and thus likely to miss much of effects of the bridge construction on labor reallocation as discussed below (Mahmud & Sawada, 2014).

2.2.6. BENEFITS IN MULTIPLE VIEWPOINTS

While conducting the feasibility study of the Jamuna Multipurpose Bridge the benefits were envisioned from several distinctive points of view such as:

- Strategic linkage in integrating the country;
- Promoting better inter regional trade, economic and social development;
- Improved freight and passenger traffic; i.e., improved and efficient transportation system;
- Transmission of electricity, transfer of natural gas from the east to west;
- Improved telecommunications links and so on (RAEDEL, PALMER, TRITTON, NEDECO & BANGLADESH, 1989).

2.2.7. QUALITY OF LIVING ENVIRONMENT

Storage of chemical in a certain place and disposal of solid waste for the construction purpose deteriorate soil quality. Dredging process increased sedimentation. Ground water quality also deteriorates for spillage of toxic chemical. Surface drainages were blocked by the construction of embankments and approach roads cause increased risk of flooding (Badruzzaman & Ahmed, 1995). Dust from the use of vehicle and machinery, waste burning, dredging for construction work caused air pollution. Dust derived from the construction site, blockage of drainage, increased probability of flooding damaged agriculture production. At the same time level of noise pollution increased in the concerned area for use of vehicle, electricity generator, pile driving operation and dredging. Dust, noise vehicle might affect the existence of flora and fauna. Aquatic life and biodiversity

might also get affected from the dredging. Piling work would interruption the river traffic and navigation (Badruzzaman & Ahmed, 1995); (Dutta, 2014, p. 267).

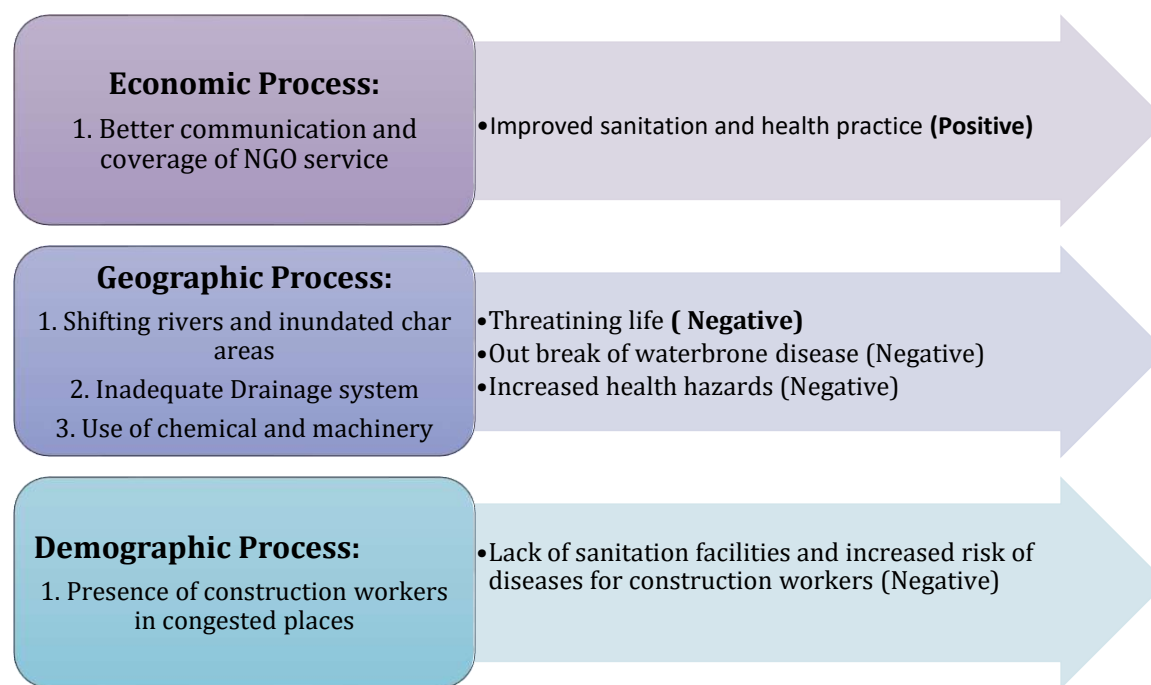


Figure 2.3: Influence of Change Process on Health and Well-Being Impacts of Jamuna Bridge [Source: (Dutta, 2014, p. 267)]

2.2.8. CULTURAL IMPACT

Cultural impacts have often been less focused in the impact assessment process of Bangladesh. For the case of Jamuna Bridge, change process like migration, presence of affluent and improved communication impacted significantly on culture. People were reluctant to move to the resettlement site for they feared that the different culture in a new community would hamper the pardah (seclusion) of the women (Ghosh, Rahman, & Rana, 2010); (Dutta, 2014, p. 267). Also, small, unsuitable plots for the joint family, lack of space, difficulty of construction thwart their migration to the resettlement site (Ghosh, Rahman and Rana, 2010); (Dutta, 2014, p. 267).

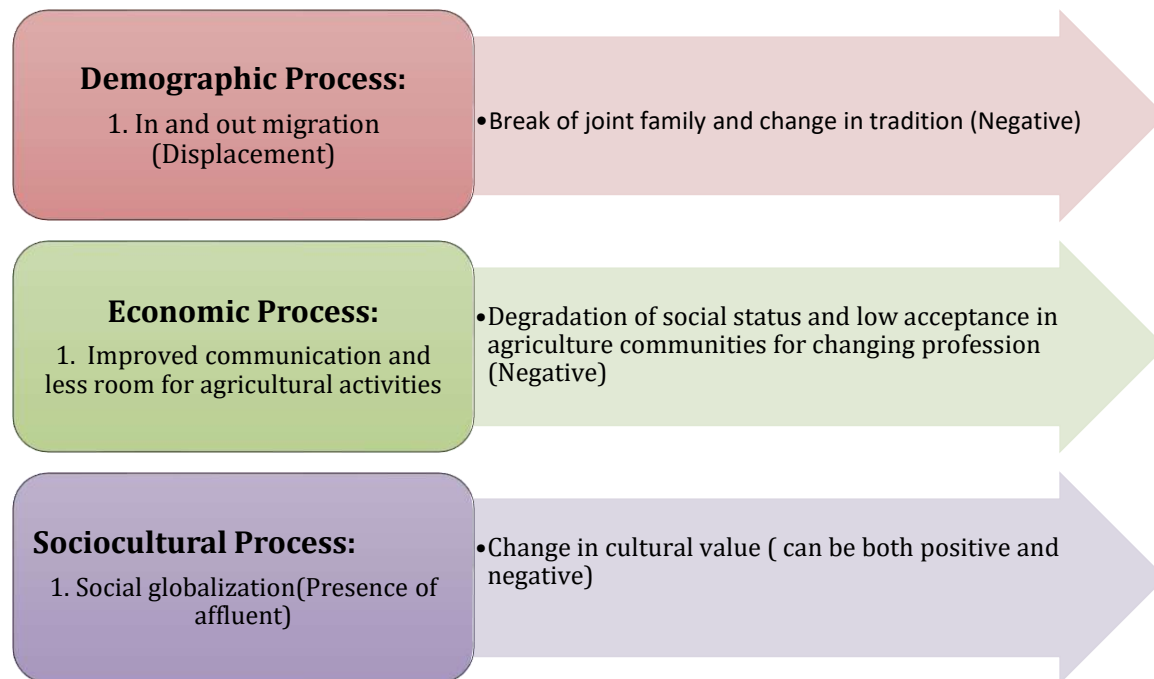


Figure 2.4: Influence of Change Process on Cultural Impacts of Jamuna Bridge (DUTTA, 2014, P. 267)

2.2.9. AREA LEVEL TRENDS

Area Level Trends narrated by the research of (Rahman, 2001, p. 63) are as follows:

1. Increase in Household income

Two broad-brush trends are indicated by the rapid field survey:

- Project Affected Person (PAP)-level outcomes for the project area as a whole has seen a slight increase in household income levels, but
- The outcomes are clearly divergent on the two sides of the Jamuna river with east bank PAPs coping much better with the effects of displacement than their west bank counterparts (Rahman, 2001, p. 63)

2. Sharp Rise of Land Price and Wages

Indicators of local economy show sharp rise in land prices and wage rates within the reference period but a divergent tendency of increased land transfer in the west bank and static trends in the east bank (Rahman, 2001, p. 63).

3. Reduction of Average Travel Time

Accessibility too has shown marked improvement with average travel time from any of the union headquarters to the respective district headquarters dropping significantly, by nearly two-thirds on the eastern side and nearly half in the western side. (Rahman, 2001, p. 63)

4. Increase in Social Conflict and Dowry

Indicators of social trends reinforce the notion of a divergent outcome on the east and west banks. Perception survey results point towards an increase in social conflicts and consequent insecurity in the west bank relative to the east bank though there are also some variations within each of these broad area categories. Dowry appears to be on the increase on both sides but for differing reasons (Rahman, 2001, p. 63).

2.2.10. IMPACTS OF BANGABANDHU BRIDGE

According to the findings of a study undertaken by JICA (JICA, 2001, pp. 7-8):

1. Revitalization of Economic Activities

Since the traffic volume for the Jamuna Bridge has exceeded predictions, the bridge is contributing to reducing the time required to transport agricultural products from granaries in the northwest to areas in eastern Bangladesh, the center of consumption. Furthermore, it is expected that when the construction of a railway using the tracks laid along the bridge is completed in 2002 with financial assistance from ADB, the movement of people and goods will become more vigorous.

2. Construction of Basic Infrastructure to Reduce East-West Disparities

The area of the country, west of the Jamuna is less developed than the east and has been kept aloof from getting benefits of infrastructure, including gas, electricity and communications, which are concentrated in eastern regions. East-west regions have been connected by a network of public utilities as the result of the installation of 232kV power cables, gas pipelines 750 mm in diameter and telephone cables along the bridge.

3. Effects on Social environment

The results of two surveys conducted by the Committee confirmed that the land acquisition had direct and indirect negative effects on residents from 15,728 households. Of these residents, those who were confirmed as being directly affected received compensation money. As of May 2000, 62.65% of the compensation plans had been completed with compensation continued even today.

4. Effects on the Natural Environment

Field surveys of animals, fish, insects and plants were conducted during 1990 through 1992 prior to the construction of the bridge. The results of post-project surveys based on the environmental action plan indicate that the project has had no serious effects on existing animals and plants.

2.2.11. SHORT- RUN EFFECTS OF BANGABANDHU BRIDGE (JAMUNA BRIDGE)

The estimates of the short-run effects of Jamuna bridge on the treatment hinterland (North-west) and the core region compared with the hinterland in the southern region are reported in the study of (Blankespoor, Emran, Shilpi, & Xu, 2018). In that study, for the census data, 2001 is treated as the short-run, and, for the nightlight and yields data, the immediate post-bridge period (1998-2004) is defined as short-run.

- a) The evidence that there are no significant population movements across regions in response to the Jamuna bridge has important implications for the interpretation of the estimates.
- b) An interesting piece of evidence reported in panel relates to the short-run effects of bridge on agricultural productivity as measured by rice yield; there is a negative and statistically significant effect in the treatment hinterland. This seems puzzling, because one would have expected a positive effect as prices of inputs such as fertilizer and pesticides go down in response to a more than 50 percent reduction in transport costs.
- c) A plausible explanation can be provided in terms of short-term labor constraint; as labor was reallocated from agriculture, the agricultural sector faced labor shortage in the short-run in the absence of migration from the other two regions. The labor shortage is likely to slow down the rate of technology adoption.
- d) In the short-run, the changes in the core region including the capital city Dhaka are broadly similar to those for the treatment hinterland in the North-west region: there is no significant effect on population density, or average nightlight luminosity, and a negative and statistically significant effect on the share of agricultural employment.
- e) There are also interesting differences: (i) the evidence suggests reallocation of labor from agriculture to both manufacturing and services although the effects are not estimated precisely, and (ii) there is no significant effect on agricultural productivity.
- f) Reallocation of labor away from agriculture in the core did not have any effect on yield perhaps because markets in the center were already integrated before the bridge, and

consequently the bridge did not affect technology adoption pattern there in a significant manner.

LONG - RUN EFFECTS OF BANGABANDHU BRIDGE (JAMUNA BRIDGE)

For the long-run estimates, 2011 is treated as long run in census, 2005-2012 in nightlights and 2005-2013 in yield data (Blankespoor, Emran, Shilpi, & Xu, 2018).

- a) The conclusion that the Jamuna Bridge precipitated deindustrialization in the newly connected hinterland in the North-west regions is supported by the evidence that the share of manufacturing employment increased significantly in the core region in the long run.
- b) An important prediction of the core-periphery models is that population density declines with deindustrialization, as people leave the newly connected hinterland to the center as a result of agglomeration in the manufacturing sector.
- c) The evidence on population density in the treatment hinterland is opposite to the prediction of the core-periphery models: compared with the Padma hinterland, population density increases substantially (8 percent) in the treatment hinterland in the long-run, 13 years after the opening of the Jamuna bridge. Compared with the Padma hinterland, population density of the core region also increased substantially (11 percent higher).
- d) The pattern of labor allocation to agriculture and services in the long-run is also interesting and informative. The share of labor allocated to agriculture in the treatment hinterland seems to gain back some of the lost ground with time; after 13 years of the bridge opening, the effect of bridge on the share of agricultural labor retains a negative sign, but is numerically smaller and statistically weaker (not significant at the 5 percent level). This suggests that the short-run labor shortage faced by agricultural sector is relaxed when migration from the comparison hinterland becomes feasible in the longer-run.
- e) In contrast to the short-run adverse effects on agricultural productivity, the long-run shows a positive and statistically significant impact in the treatment hinterland. In the longer run (2005-2013), rice yield grew by 5.2 percent more in the treatment hinterland compared with the Padma hinterland. The gains in agricultural productivity probably reflect a combination of agglomeration externalities (learning) due to higher population density and a relaxation of the labor constraint faced in the short-run because of in-migration from the other regions.
- f) Along with population density, we also examine the long-run impact of bridge on economic density using the average nightlight luminosity as a second indicator.

2.3 KEY LITERATURE SURVEY RELATED TO THE PRESENT STUDY

The review of literature generally surveys relevant studies conducted within the objectives and scope of the study. The study team developed a figure (Fig. 2.5) that focuses on the areas of literature review largely compatible with study objectives and scope. However, this section analyses mainly three areas such as demographic and socioeconomic changes; poverty alleviation; and ecological and environmental impacts.

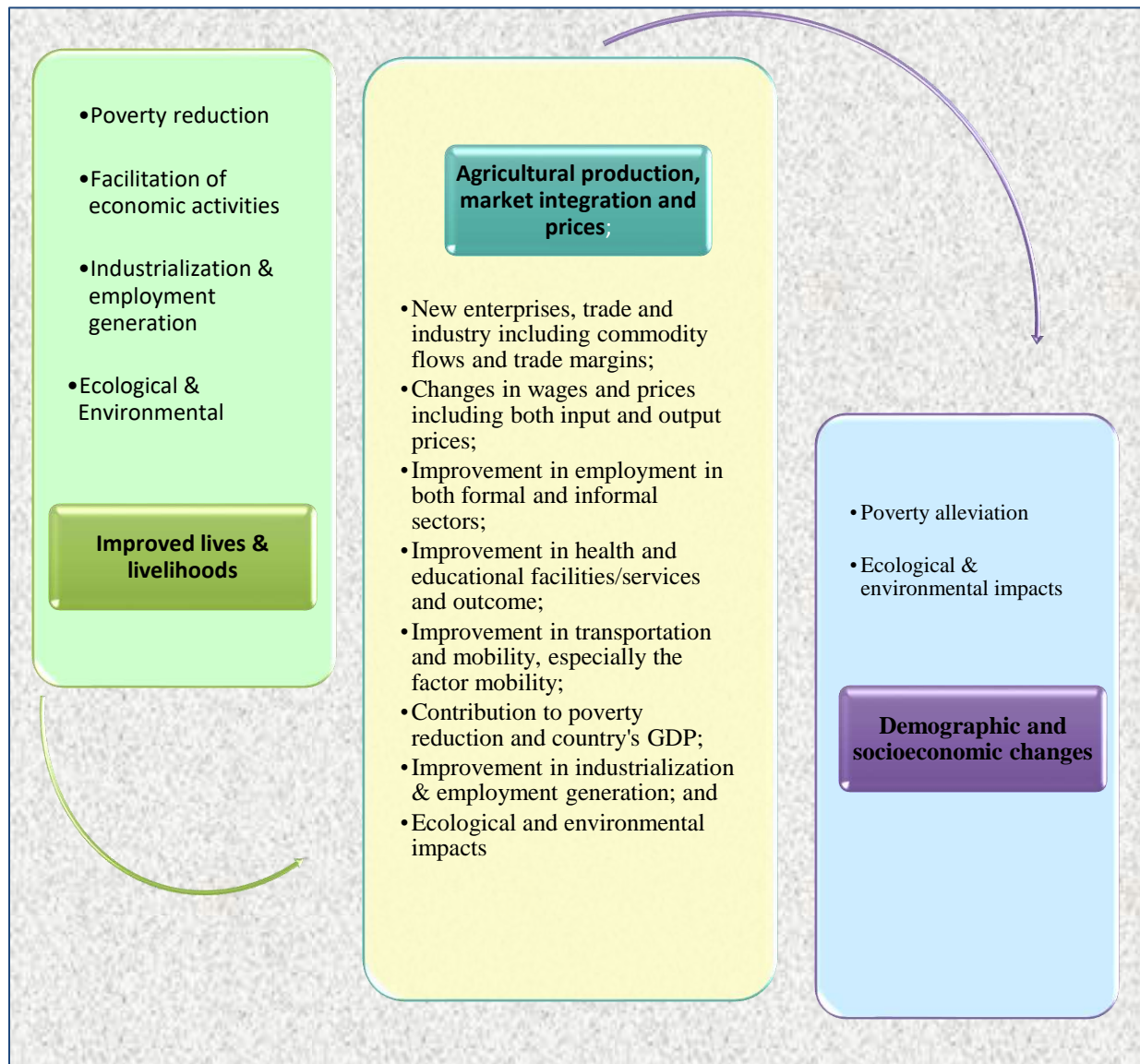


Figure 2.5: Main Focuses of Literature Review per Study Objectives and Scope

From searching and going through the literature related to the present research study, it was observed that no substantial number of literatures was found. That is why, based on

the literature surveyed so far, the researcher collected the information and data that have been presented in the following issues:

2.3.1. REVIEW OF ARTICLE-1 (EFFECTS ON EMPLOYMENT)

(Mahmud & Sawada, 2015) in their research article *'Infrastructure and Well-being: Employment Effects of Jamuna Bridge in Bangladesh'* evaluated the impact of the Jamuna multipurpose bridge, the largest physical infrastructure in Bangladesh, on employment opportunities. The study primarily focused on labour market integration effects using survey data that provides information on current and retrospective assessments of household situation in two adjacent districts connected by the bridge. The researchers used quasi-experimental framework of the canonical difference-in-difference regression methodology, and they analyzed the impact of this infrastructure on employment and job transition patterns. From the findings it was found that along with decreasing household unemployment, the bridge construction facilitated farm to non-farm shift of employments. Also, the treatment effects are heterogeneous across age, gender and education level. (Mahmud & Sawada, 2015, p. 1).

2.3.2. REVIEW OF ARTICLE-2 (IMPACT ON AGRICULTURE)

(Alam, Rahman, Rahmanl, & Khanam, 2003) in their article *'Socio-economic impact of Jamuna bridge on farming community in some selected areas of Sirajganj district of Bangladesh'* have conducted a study in three selected villages of Saidabad Union of Sirajganj Sadar Upazila. The overall objective of the study is to assess the socioeconomic impact of Jamuna Bridge on farming community in some selected areas of Sirajganj district. This study was conducted by using field survey method. It was found from that study that Household income was remarkably changed after the construction of Jamuna Bridge. It was also revealed that the highest increase in income accrued in the case of medium farms. Although- income from both farm and off-farm sources was found to have increased, the share of farm income to the total income decreased by 2.20 per cent and share of off-farm income increased by 6.28 per cent. Findings of the Cobb-Douglas production function suggested that all the selected variables, viz., farm size, family size, average age of the members, average years of schooling, and income from off-farm activities except proportion of female members in the household had positive and significant impact on household income of the selected farmers (Alam, Rahman, Rahmanl, & Khanam, 2003, p. 113).

Alam et al. (2003) conducted a study and investigate the socioeconomic characteristics of the farming community; analyze the change in income; employment opportunities created, and to see the cropping pattern and profitability of major crops impact due to Jamuna Bridge. They found that that most of the members (58.61%) of the selected households were found in the age group between 16.01 and 45 years. The average family size of the

study area was 5.93 and it was the highest in the case of small farms. The area had a very impressive literacy profile; about 71% of the family members were literate. Agriculture was found to be the main occupation of the majority (79.50%) of the people in the study area, followed by business (6.32%) and service (4.89%) (Alam, Rahman, Rahman, & Khanam, 2003, pp. 113-125). Alam et al. (2003) also found that the construction of JMB has created numerous employment opportunities, especially in the off-farm sector and thus found to have contributed to alleviating poverty in the Northern region of Bangladesh as well as in the study area. The cropping patterns of the study area have changed to a considerable extent due to the implementation of JMB. It was observed that the farmers preferred crops with lesser risk higher economic returns. There was a notable positive change in vegetable production in the study area. Finally, based on the findings of the study, some policy recommendations such as the establishment of Agro-processing industries, partial mechanization for farm operations, price stabilization for agricultural product, provision of credit to the farmers with soft conditions and providing self-employment training to the young people, etc., were made for the sound economic development of the study area and the country (Alam, Rahman, Rahman, & Khanam, 2003, pp. 113-125).

2.3.3. REVIEW OF ARTICLE -3 (SOCIAL IMPACT)

(Dutta, 2014) in the Research article '*Social Impact Assessment on Social Change Process: An Analysis of the Case of Jamuna Bridge in Bangladesh*' focused on the social impact assessment and social change process. In such a backdrop, objectives of the paper are to focus on the effectiveness of the social impact assessment process by reviewing the literature to assess if the social change process has been distinguished from the impact assessment process. The study based on literature review and the theoretical framework used here has been developed by (Vanclay, 2002, pp. 187-211).

Vanclay (2002) categorized seven aspects of social impacts. These are:

1. Health and wellbeing: impacts of construction on health issues
2. Quality of the living environment
3. Economic impacts
4. Cultural impacts
5. Family and community impacts
6. Institutional, political and equity impacts
7. Gender relation (Vanclay, 2002); (Dutta, 2014, p. 264).

2.3.4. REVIEW ARTICLE -4 (IMPACT ON POVERTY LEVEL)

(Luppino M. , Gajewski, Zohir, & Crowther, 2004) have done an excellent research work entitled as- '*Estimating the Impacts of The Jamuna Bridge on Poverty Levels in Bangladesh Using SAM And CGE Models: A Comparative Study*'. The objectives of this paper were to investigate and attempt to quantify these indirect and induced impacts utilizing Computable General Equilibrium (CGE) and Social Accounting Matrix (SAM) models. The researchers also took the model simulations and feed them into poverty modules to estimate the impacts of the bridge investment on the national poverty level. Besides, they also conducted simulations of the Bridge's impact at the regional level utilizing an input-output table for the Northwest and a restructured SAM model that takes into account region-specific households.

Luppino et al., (2004) argued that by facilitating transportation across the river, the Bridge has led to the greater integration of regional markets within the Bangladeshi national economy. Given the interdependence of economic activities/sectors, the direct impacts of the Jamuna Bridge on individual sectors (primarily transportation) and factor markets are likely to induce a chain of changes in the rest of the sectors of the economy. This in turn is expected to result in subsequent feedback effects (Luppino M. , Gajewski, Zohir, & Crowther, 2004).

Luppino et al., (2004) further estimated changes in the poverty level based SAM model where they compared data of the Input-output table BIDS1993/94; Household Expenditure and Income Survey (HEIS) 1995/96 by (BBS), 1998; and Labor Force Survey (LFS) by BBS, 1998 (Luppino M. , Gajewski, Zohir, & Crowther, 2004). They showed the changes based on 50 activities, value-added factor effects and consumption effects by household groups. Results showed that in response to the demand intervention, the total output of the Northwest economy increased by 37 and 47 percent under simulations one and two respectively compared to the base scenario. To supply increased outputs, demand for primary factors (i.e. labor, capital and land) increased and, thus, payments to primary factors also rose. Total factor payments or value-added increased by 35 percent under simulation one. The growth of factor returns was highest for land (48.5 percent), followed by labour (43 percent) and capital (24.6 percent). Under simulation two, value-added growth was 44 percent. However, in this case the highest growth was observed for labour (55 percent), which was followed by land (53 percent) and capital (31 percent).

In order to assess the indirect and induced effects of the Jamuna Bridge on the economy of Bangladesh, the researchers utilized conventional macroeconomic tools, making use of a standard CGE model and an improved version of Bangladesh's Social Accounting Matrix (SAM) model. The Key findings were compared in the following Table:

Table 2.1: Summary of the Estimated Poverty Impacts of the Jamuna Bridge

Type of Analysis	Level of Analysis	Type of Impact/ Model Assumptions	Quantified Poverty Impact Findings			
			#Shifted Out of Poverty (thousands)	Estimated Change in Indicator by 2025 (%)		
				Head-count Ratio (P0)	Poverty Gap (P1)	Severity Index (P2)
Computable General	National	Reduction in:	970.00	-1.69	-2.04	-2.25
Equilibrium (CGE) Analysis		Transport margins by 50%				
Social Accounting	National	Increase in demand for:	19,300.00	-30.17	-43.43	-47.93
Matrix (SAM)		Other Crops by 5%				
Analysis		Utilities (Electricity) by 5%				
		Transport by 16%				
SAM Simulation 1	North west Region	Increase in demand for:	6,800.00	-39.92	-56.72	-63.64
		Other Crops by 20%				
		Electricity by 10%				
		Transport by 50%				
SAM Simulation 2	North west Region	Increase in demand for:	8,100.00	-47.47	-64.35	-70.98
		Other Crops by 20%				
		Electricity by 10%				

		Transport by 100%				
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Source: (Luppino M. , Gajewski, Zohir, & Crowther, 2004).

The above table summarizes the quantified poverty impacts of the Jamuna Bridge, simulated under both models. The exercise using the CGE flex price may be contrasted with the SAM based fixed price approach. The two exercises use SAM of two different years for reasons explained earlier. Both the exercises show a reduction in poverty in Bangladesh due to the opening of the Jamuna Bridge. However, the results suggest a higher magnitude of poverty reduction under the SAM approach than the CGE approach; and this would hold true even if a common social accounting matrix had been used for both models. The reason for obtaining different magnitudes of poverty reduction under the two alternative approaches lays in the fact that the impact of the Jamuna Bridge intervention is explained differently within the two models. Under the SAM approach, the impact of the Bridge was demonstrated through enhancing the demand of other crops, electricity, and transport services. Since this model assumes no capacity constraints, matching outputs are always supplied (because of demand interventions) which resulted in higher level of income and household consumption expenditure. On the other hand, in the CGE case, the simulation was performed by reducing transport margin rates. The changes in transport rates alter the relative price situation in the economy, which then led to the reallocation of existing resources to various producing activities. The gains resulting from the Bridge are obtained by reducing existing distortions and hence they are small. Since supplies of primary factors are fixed in the CGE model there is no scope for generating extra income by employing additional factors (as was the case in the SAM approach) (Luppino M. , Gajewski, Zohir, & Crowther, 2004).

2.3.5. REVIEW ARTICLE-5 (INCOME GENERATION)

(Moniruzzaman, 2008) in his research study - *“Effect of Infrastructure Development on Income Generation: A Study on Jamuna Bridge Project in Bangladesh ”* has taken an attempt to examine the impact of infrastructure development on income generation in the north eastern region of Bangladesh which enjoyed a wide range of amenities after the construction of Jamuna Bridge in 1998. The application of ‘difference in difference estimator’ using the pooled household level income data of the treatment and control area in the pre and post time period of the project is the methodology of this research. The 4 districts situated nearer to the project location at the North eastern region of Bangladesh have been regarded as treatment area while the 4 districts of the Barisal division, the southern part of the country have been treated as control area. The household data of 1995

and 2005 have been used in this research. The Key findings were (Moniruzzaman, 2008, pp. 80-87) -

- a) The infrastructure impact on income of the project area ranges from 7.7-10% in different models in this research and the coefficient values of Yr*PI in all the models are statistically significant at 1% level of significance.
- b) All the control variables- land, household size and average age of the household which are poorly correlated, have positive impact on income which are statistically significant as well.
- c) The incorporation of the control variables has increased the coefficient value of interaction terms, Yr*PI which implies that after controlling the impact of the control variables on income, the effect of infrastructure project on income has been more.
- d) The positive value (0.040) of the change in contribution of land indicates that land has become more productive in both the treatment and control areas in 2005 compared to 1995 which is supported by the prevalence of increasing cropping intensity trend in the country.
- e) The negative value (-0.070) of the change in contribution of HHS to income in 2005 compared to 1995 implies that small family size has become more productive in terms of income generation in both the treatment and control areas in 2005 (Moniruzzaman, 2008, pp. 80-87).

2.3.6. REVIEW ARTICLE-6 (MARKET INTEGRATION, REALLOCATION AND PRODUCTIVITY EFFECTS)

(Blankespoor, Emran, Shilpi, & Xu, 2018) in their research study- *“Bridge to Big-push or Backwash? Market Integration, Reallocation, and Productivity Effects of Jamuna Bridge in Bangladesh”* used a quasi-experimental study of a major bridge construction in Bangladesh to understand the effects of a large reduction in trade costs on the pattern of structural change and agricultural productivity. The key words of the study are core-periphery, density, deindustrialization, agricultural productivity, bridge. There are significant positive effects on population density, night light luminosity and agricultural yields in the treatment hinterland which contradict backwash effects of bridge. The effects of bridge on intersectoral labor allocation are spatially heterogeneous, with relatively weak effects in the areas close to the bridge. The Jamuna bridge, to understand the effects of a large reduction in trade costs on the pattern of resource allocation, agricultural productivity, and structural change in an underdeveloped economy. The 4.8-kilometer long Jamuna bridge opened in 1998, and spanning over one of the largest rivers in the world, connected about 26 million people residing in the chronically poverty-ridden areas in the

Northwest Bangladesh to the growth centers in the East including the capital city Dhaka and the port city Chittagong. By conservative estimates, the bridge reduced the freight costs by 50% and travel time from areas in north-west to Dhaka city by 3-4 hours (Blankespoor, Emran, Shilpi, & Xu, 2018, p. 1).

Taken together, the evidence suggests that despite deindustrialization, Jamuna bridge did not hollow out the Jamuna hinterland through backwash effects, instead led to economic revival. The effects of trade cost reduction on intersectoral labor allocation are spatially heterogeneous; the estimates show smaller effects in the areas adjacent to the bridge, which is consistent with the theoretical analysis if these areas were not in autarky in the absence of the bridge. The adverse effects on manufacturing employment (deindustrialization) are most pronounced in the intermediate distance from the bridge.

2.3.7. REVIEW ARTICLE-7 (POVERTY REDUCTION)

(Bayes P. , 2007) in his specious research study, '*Impact Assessment of Jamuna Multipurpose Bridge Project (JMBP) On Poverty Reduction*' tried to identify the trends in poverty levels over the periods of comparison - 1997/98 (Pre-Jamuna period) and 2003/04 (Post-Jamuna period); Identifying probable causality channels; determining trends and decomposing income sources; empirical analysis of developed hypotheses. The study was done by selecting five villages from northwestern side of the bridge to call them "Project Villages" as they are likely to be affected by the outcomes of the bridge. To conduct a comparison, they also selected another two villages – may be called "Control Villages" from the eastern part of the bridge. The villages are very close in terms of Agro-ecological and socio-economic parameters. The study tried to prove these hypothesis such as- JMBP reduced transaction costs by easing transport constraint ; reduced transaction costs increased production and marketing especially of perishable products (output and trade effect); JMBP affected resource allocation, cropping intensity and shift in crop acreage (Allocation effect); JMBP led public and NGO actions to affect market, technology and credit (Market and technology effect); Infrastructure like Jamuna Bridge boosts rural non-farm activities (RNFA) through associated road and other communication networks (Non-agricultural Effect). As a result of above hypotheses having been worked, Jamuna Bridge helped increased income, smoothen consumption and decreased poverty in project villages (Income and Poverty Effects).

ADB through Louis Berger Group, Inc. initially examined the impacts of Bangabandhu Bridge on the economy of North-West Bangladesh in 2003. Based on a "before and after" simulation exercise, the report showed positive impacts in that area. Especially, marketing margins of commodities decreased, price integration has increased and more so, the share of traded output increased because of decreased transportation costs (The Louis Berger Group, Inc., 2003). The initial assessment had been done more than 15 years ago. Another

partial assessment was done in 2014, to see the employment effect only (Mahmud & Sawada, 2014). Bays (2007) found from his impact evaluation that after JMB, the local people reduced poverty through higher income (both agriculture and non-agriculture) and they reduce their income inequality (both income & non-income poverty) (Bayes P. A., 2007).

2.3.8. REVIEW ARTICLE-8 (TRAVEL TIME AND TRANSPORT)

The JICA (2001) conducted a field survey in 2000 titled as- '*Bangladesh Jamuna Multipurpose Bridge Project*' and reported that ferries were the only means of crossing the river, were operated on two sections in the project area, of which one is upstream and the other is downstream. The operation of ferries, however, was influenced by the weather and a one-way trip took more than two hours. Furthermore, since the water level and width of the river changed significantly between the dry and rainy seasons, it was difficult to expand and improve the existing ferry facilities, and goods vehicles, which accounted for more than 60% of all cross-river traffic, were required to wait an average of 36 hours before boarding. Moreover, the volume of traffic crossing the Jamuna was expected to grow at an average annual rate of more than 6% during the period up to 1998 and by more than 5% per annum after 1999. The Jamuna formed a 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 prevented from benefiting from infrastructure, including gas, electricity and communications, which were concentrated in eastern Bangladesh and had been left underdeveloped. Under these circumstances, a plan to construct a bridge across the Jamuna had been the earnest wish of the nation since Bangladesh became independent in 1971 (JICA, 2001).

2.3.9. REVIEW ARTICLE- 9 (EFFECT ON ENVIRONMENT)

Some studies showed immense concerns about such impact. According to Islam, Islam and Islam (2017), in post bridge construction periods; about 255.46852 km² area of bars increased by the impact of the bridge of 1750 km² (14.63% increase of bar area). Island bar dominated area increased 103.73619 km²; almost a 5.93% increase. On the other hand, the bridge causes about 151.16345 km² increase of the attached bars; also 8.69% increase referring the total study area. By the analysis, it was found that 60.352797 km² area of sand carpeting decreases; almost a 3.45% reduction with the total study area after the construction of the bridge (Islam, Islam, & Islam, 2017, pp. 903-925).

Wahiduzzaman (2006) has identified the impacts of JMB on the surrounding environment. Best et al. (2007) indicated that the JB ranked in the top three for both sediment and water discharge. The high water and sediment discharges are generated by monsoon dominated floods and tectonic setting, which provides abundant sediment from Himalayan uplift into the subsiding Bay of Bengal.

Bhuiyan et al. (2010) studied the regulation of Brahmaputra–Jamuna River around the JMB site. This study is conducted to evaluate the ongoing geo-environmental impacts which were modified before the construction of Jamuna Bridge in 1996. The natural width of the river was 11 km at the bridge site before its structural modification (Islam, Islam, & Islam, 2017, pp. 903-925).

CHAPTER 3: METHODOLOGY OF THE STUDY

3.1 RESEARCH PHILOSOPHY AND RESEARCH DESIGN

The present study is based on pragmatism, a research paradigm that encompasses both quantitative and qualitative approaches (i.e., mixed-methods design) that contributed to exploring qualitative and quantitative variables. Data were collected from the respondents of 05 districts close to and far from the Bangabandhu Bridge along with Manikganj (a district far from the Bridge) by using a well-structured face-to-face interview schedule, FGDs, KIIs, in-depth case interviews (ICIs), and secondary sources of information related to the study, project documents, national policies, and documents.

3.2 SELECTION OF THE STUDY AREA

The study was limited to 06 the districts of Bangladesh that are close to as well as far from the Bangabandhu bridge. The people of the study areas who are living in urban and rural areas and are getting multiple benefits in terms of social, economic, health, employment, income and some wellbeing. The reason behind the selection of this study area lies in the fact that a considerable number of people are directly or indirectly in a wide variety of benefits resulted from the Bridge. In the study areas, various government, non-government, voluntary and community level organizations are being developed that are proving local people with different types of social, economic, education, agricultural, health and infrastructural development and services to the people of local areas including the people living distracts / areas much far from the Bridge.

3.3 ANALYTICAL FRAMEWORK AND EVALUATION DESIGN

The study has followed the following analytical framework throughout the study.

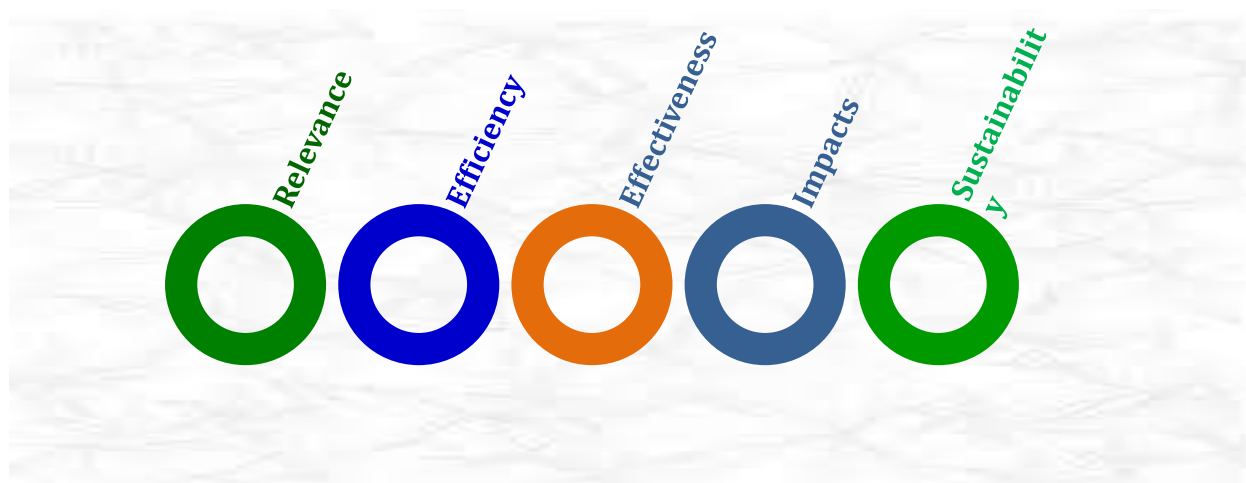


Figure 3.1: Analytical Framework/Model for the Study

Table 3.1: The Analytical Framework

Criteria of the analytical framework	Indicators
Relevance	The objectives of the program clear, realistic and likely to be achieved within the established schedule and with the allocated resources (including human resources)
	Related aspects which should be considered to make the program more relevant to the current and future needs of Bangladesh
	Appropriate and useful are the indicators described in the program document for monitoring and measuring results
Effectiveness	BBA will track to achieve expected results on time and to what extent has the program contributed to the results (catalytic role, etc.)
	Ways the stakeholders were involved in program implementation and assess the level of ownership of the program among the stakeholders
	Assess the effectiveness of the activities implemented by partner institutions and their contribution to the immediate objectives of the program
	There any and what alternatives strategies would be more effective in achieving its objectives
Efficiency	Use analytical framework in line with the study objectives
	Livelihood interventions such as skills development, market mapping, entrepreneurship development
Impacts	Measure the socioeconomic, environmental and ecological impacts
	The program on track to developing and building capacities of partners on planning for reconstruction and development activities
	The effective is the collaboration with other participating organizations/associations and what has been the added value of this collaboration
Sustainability	The project results, achievements and benefits likely to be durable.
	Results anchored in national institutions and can the partner maintain them financially at end of the program
	Number of CBOs and NGOs are involved at household, entrepreneurs and market-level income generation activities/project to carry on the sustainability of the projects
	The program approach or results be replicated or scaled up by national partner and what would support their replication and scaling up

METHODS AND DATA

The overall working phase of this evaluation study can be categorized into three (see Figure 3.2):

Preparation Phase: Secondary data review, briefing with BBA personnel at Bangladesh country office, writing an inception report for evaluation stating the sources of information, tools for collection.

Field Phase: Meeting key stakeholders of bridge areas especially local authorities, beneficiaries and other relevant people

Analysis & Debriefing Phase: The results and preliminary conclusions will be presented to the BBA teams and partners at field level. A debriefing will be organized to discuss the results and the recommendations.

Figure 3.2: Phases of the Study

SOURCE OF DATA

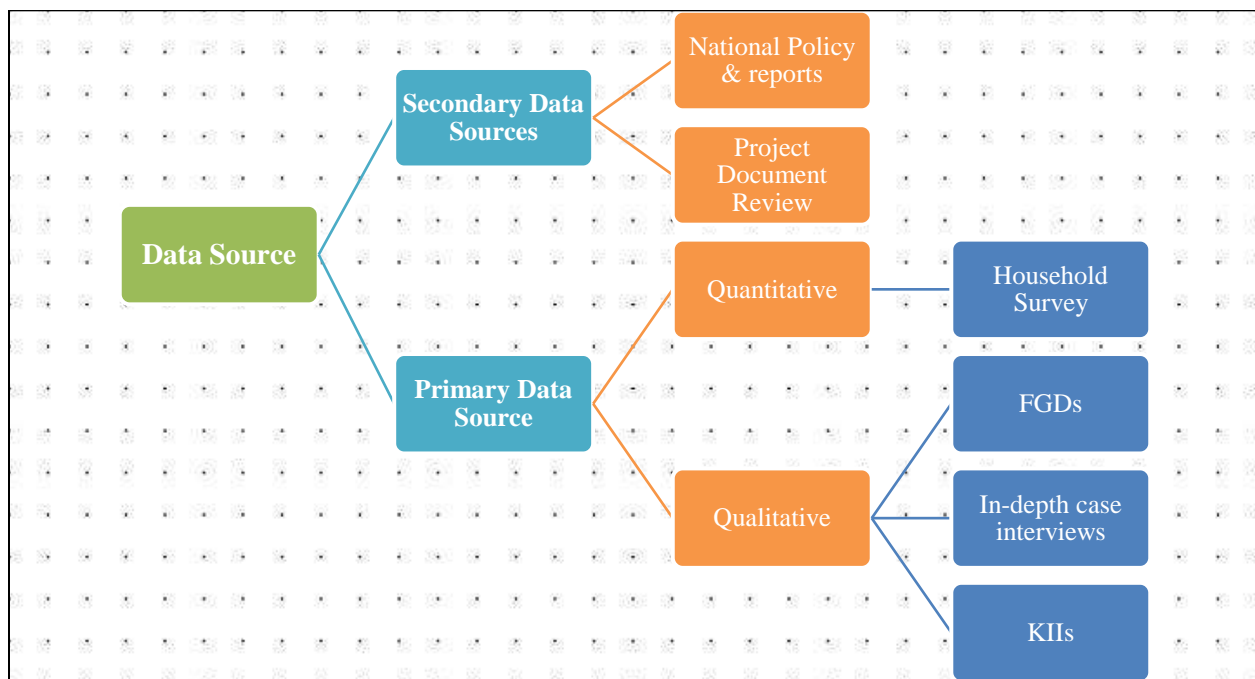


Figure 3.3: Sources of Data

3.4 POPULATION AND UNIT OF THE STUDY

The population of the study was those persons/ individuals who are living in the Six Districts of Bangladesh (areas under study) where the people are directly or indirectly benefited or impacted by the construction of the Bangabandhu Bridge, In particular, the population of this study included the persons living in those areas adjacent to or far from the Bangabandhu Bridge. The people of rich, middle, poor and ultra-poor class were the population of the study. But every person of the selected districts is the unit of the study.

3.5 SAMPLING PROCEDURE AND SAMPLE DESCRIPTION

SAMPLE PROCEDURE

The proposed study as a non-experimental mode of research is based on a mixed-method approach that encompasses descriptive design of research. Before taking decision of selecting the size of sample for the study, the researcher needs to have a clear idea as to who will be included in the sample, and how many participants (respondents) will be taken as a sample from whom data will be collected. Just because population size of the study area is unknown; the scope of using the technique of probability sampling (random sampling) is a bit limited. Considering this limitation of sampling and the scope of generalizability of research findings, use of a non-probability sampling was supposed to be more effective to choose respondents (sample) for the study. In the study, respondents of the study were selected by applying convenience sampling procedure (a non-random sampling technique). Because the researcher or field investigators need to have easy access to and availability of the respondents for gathering data. In addition, taking sample bias, reliability and validity of data collection tools into account, a sizable and representative number of respondents were chosen for the study in order that data collected from them contribute to meeting research objectives and answering research questions as well.

3.6 RESPONDENTS AND SAMPLING: DISTRIBUTION OF SAMPLE SIZE

The proposed research project has followed the sampling procedure and respondents distributed as in the following table:

Table- 3.2: Distribution of Sampled Respondents against Research Methods, Data Collection Instruments and Types of Sampled Respondents

Research methods	Data collection methods	Data collection instruments	Types of Respondents	Sample size
Quantitative Data				
Quantitative Survey Method				
Household survey	Face-to-face interviews	Structured schedule	Household heads	609
Enterprise survey EPZs & SEZs	Face-to-face interviews	Structured schedule	Entrepreneurs in Export Processing Zones & Special Economic Zones	60
Market Surveys	Face-to-face interviews	Structured schedule	Owners of the small, medium, and big shops	94
Qualitative Data				
Phenomenological Approach				
	FGDs	Guideline	UP members, teacher, members of civil society, UP Disaster Committee, NGO/GO workers, media person, political persons, local professionals, association members, businesspeople, elite class, highly educated people, experts	12*
	In-depth case interview	Guideline	Household heads, EPZ & SEZ entrepreneurs, and market owners	26*
	KIIs	Guideline	UP Secretary, UNO office (statistician, social welfare, agriculture, disaster, and forestry), Secretaries of Business Associations, and Office Secretary of EPZ & SEZ associations and	21*

			cooperatives	
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[* Note: Due to the Covid-19 Pandemic, researchers were not able to reach the respondents with whom FGDs, KIIs and ICIs were planned to undertake. In particular, only those respondents were available to participate in the FGDs, KIIs and ICIs were interviewed. In addition, due to time constraints of the study and unavailability of the sampled respondents were not possible to be contacted and interviewed.]

Table 3.3: Distribution of Selected Respondents for Quantitative Interviews against Study Areas

District	Household Heads	Entrepreneurs	Owners of Market (Large, Medium & Small Shops)
		EPZ, SEZ & Industries	
Tangail	105	10	14
Sirajganj	104	10	14
Pabna	100	10	15
Natore	100	10	16
Kurigram	100	10	13
Manikganj	100	10	22
Total	609	60	94

Table 3.4: Distribution of the Selected Respondents for Qualitative Data Collection against Study Areas

District	Upazila	Household level			Entrepreneurs			Owners of market		
					EPZ, SEZ & industries					
Tangail	Vuapur	FGDs	ICIs	KIIs	FGDs	ICIs	KIIs	FGDs	ICIs	KIIs
		1	4 (Rich, medium, poor & ultra-poor)	2 (UP Secretary & UNO)	1	1	1	1	1 (Small)	1
Sirajganj	Sadar	1	4 (Rich, medium, poor & ultra-poor)	2 (UP Secretary & UNO)	1	1	1	1	1 (Medium)	1
Pabna	Sadar	-	4 (Rich, medium, poor & ultra-poor)	-	-	-	-	-	1 (Large)	1
Natore	Sadar	1	-	2 (UP Secretary & UNO)	-	-	1	-	1 (Large)	1
Kurigram	Sadar	-	-	-	1	1	1	1	1 (Medium)	1
Manikganj	Sadar	1	4 (Rich, medium, poor & ultra-poor)	2 (UP Secretary & UNO)	1	1	1	1	1 (Small)	1
Grand Total= 59*		4	16	8	4	4	6	4	6	6
*Total FGDs= 12, ICIs=26, KIIs= 21 (20+1 Toll)										

Table 3.5: Distribution of the Types and Number Respondents against Study Areas

FGDs			In-depth Case Interviews (ICIs)			Key Informants Interviews (KIIs)		
Household level (mixed)*	Entrepreneurs (mixed)**	Owners of market**	Household level	Entrepreneurs	Owners of market**	Household level****	Entrepreneurs***	Owners of market***
UP member =2 (Male 1+Female 1)	Members of EPZ associations and cooperatives =3	Members of businesses associations/Chambers of commerce =12	Head of households (Rich, medium, poor and ultra-poor)	Entrepreneurs of EPZ and SEZ	Owners of big shops	UP Secretary =1	Office Secretary of EPZ & SEZ associations and cooperatives	Secretaries of Business Associations /Chambers of commerce (District and Upazila level)
Teacher =1					Owners of medium shops	UNO office =1		
Members of civil society =2					Owners of small shop	(statistician, social welfare, agriculture, disaster, and forestry)		
UP Disaster Committee =1	Members of SEZ associations and cooperatives =3							
NGO/GO worker =1								
Media person =1								
Political	Other industries							

person =2								
Professional=1								
Association member=1								
Business man=2								

3.7 USE OF MIXED METHOD FOR THE STUDY: METHODS AND DATA COLLECTION

The main sources of data for this study were secondary as well as primary. This study employed a mixed-method approach to gather both quantitative and qualitative data from the data sources. In collecting quantitative data, a number of social surveys (households, market and entrepreneurs) were used where three sets of structured interview schedules were prepared with a numerical value. In addition, several methods of data collection such as in-depth case interviews (ICIs), focus group discussions (FGDs), and key informants' interviews (KIIs), observation were used and office records were also surveyed to collect qualitative data. Different sets of data collection guidelines and checklist were developed for collecting qualitative data.

3.8 PLAN OF DATA PROCESSING AND ANALYSIS

Data processing and analysis consist of a few strategies that are discussed below:

DATA PROCESSING

Quantitative and qualitative data collected from the study respondents will be systematically processed, that is, data editing, coding (assigning numerals, grouping and labeling) and data entry and data cleaning (sorting and correcting).

DATA ANALYSIS

Quantitative data (numerical) were analyzed by using descriptive statistics in the study. Quantitative analysis generally portrays the phenomenon of searching in quantitative manner of description. Quantitative data was processed and analyzed by using SSPS. In

contrast, qualitative data (non-numerical) was analyzed by applying thematic analysis approach and interpretive approach as well. Because qualitative data analysis pays attention to the 'spoken word', context, consistency and contradictions of views, frequency and intensity of comments, their specificity as well as emerging themes and trends.

DATA PRESENTATION:

Numeric data (quantitative) were presented in tabular form along with pictorial (graph, image, and chart) presentation. Non-numerical (qualitative) data will be presented using interpretive as well as thematic approach.

DATA RELIABILITY AND VALIDITY: TRIANGULATION

Triangulation facilitates validation of data through cross verification from more than two sources. It tests the consistency of findings obtained through different instruments and increases the credibility and validity of the results. The triangulation process is presented in the Figure-3.4 below:

The main important issue is to use the triangulation approach from different sources for its correctness and synchronization. The triangulation process is given in the below figure:

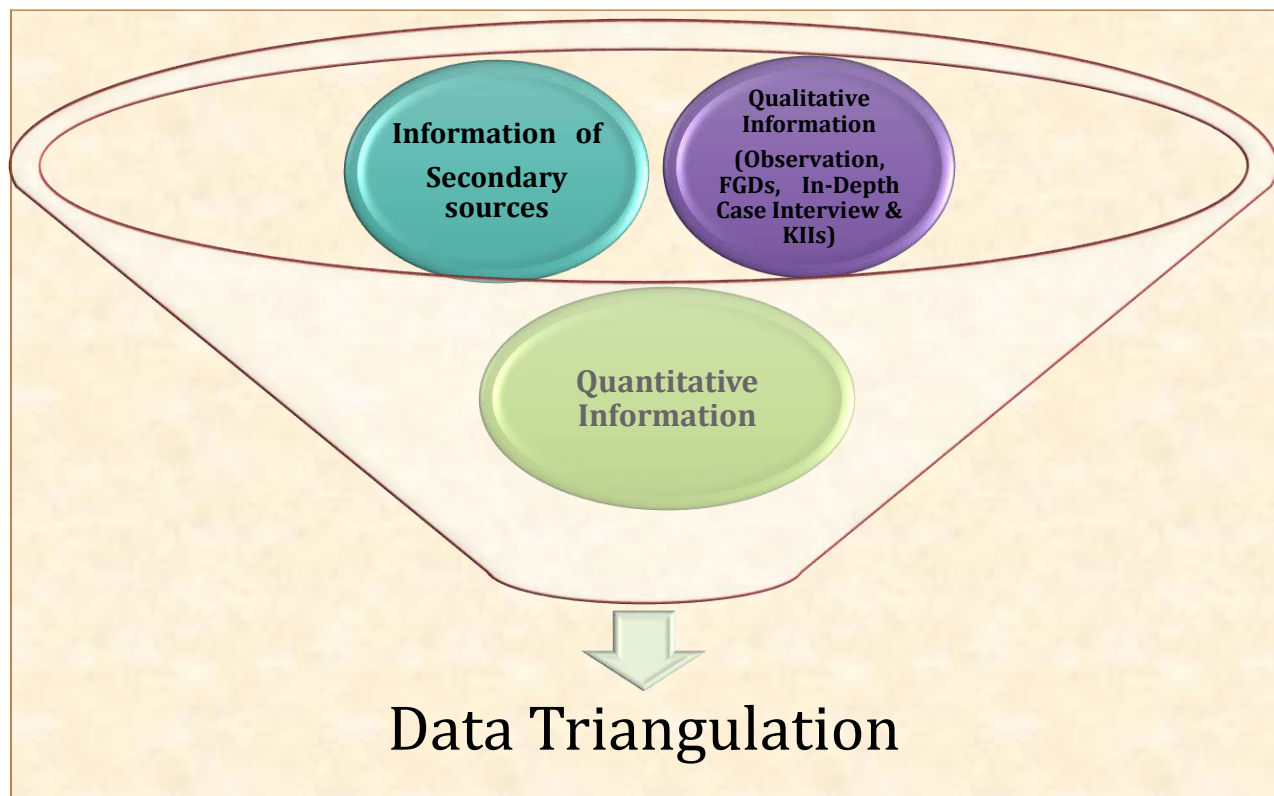


Figure 3.4: Triangulation of Study

3.9 BASELINE DATA AND COMPARISON GROUP

The important issue here is to find the proper baseline data and appropriate comparison group to apply the quasi-experimental methods. The study team explores with the relevant agencies/organizations involved in the implementation and/or evaluation is done earlier to obtain the baseline data, if available, in any form. In the absence of any credible baseline data, and even, in addition, the study will also use survey data available from various secondary sources for the period just before the construction of the Bangabandhu Bridge as a baseline, one of the important sources in this respect is the surveys carried out periodically by the Bangladesh Bureau of Statistics (BBS). For example, the Household Income and Expenditure Surveys (HIESs) of BBS are being carried out every few years, and this will provide the study team with an opportunity to use the HIES data for the pre-bridge period as a baseline in this respect. Similarly, the economic census, the labour force surveys, etc., will also be used for the same purpose. The advantage of these surveys is that they are administered country-wide, and hence the study team will be able to use the same data sets for the comparison group as well.

For any meaningful impact evaluation, having a credible counter-factual is vital. The Bangabandhu Bridge connected the north-west region with the Eastern part of the country, and hence the entire north-western region and the people living in that part of the country are the direct beneficiaries of the bridge. And, at the same time, the southwest region of the country is still disconnected (and that is why the construction of the Padma Bridge is so important) from the eastern part. While there are some differences between the north-west and the south-west, there are many commonalities (distance from the capital, remoteness, adverse geography, vulnerability to natural hazards, poverty, etc.) between the two regions as well. Hence, the study considers the southwest region and the people living in that part of the country as the comparison region/group.

UNDERTAKING PRIMARY SURVEYS

Once the issues of baseline data and the comparison groups are resolved, is it then a matter of undertaking new surveys before using the quasi-experimental method for the evaluation. The study team, therefore, proposes to undertake primary surveys among both the beneficiary and the comparison regions/groups. For the new surveys, the study may do the following:

Household survey of a representative panel of households drawn from both the beneficiary and the comparison region/group (settlement and non-settlement and some portion outside of adjacent areas);

Resource/enterprise mapping across the North-Western part of the country to map out the economic and social organizations developed as a consequence of the construction of Bangabandhu Bridge including gas and electricity supply through the bridge;

Enterprise survey of a representative sample including Export Processing Zones (EPZs) and Special Economic Zones (SEZs) and Market surveys of a representative sample as well.

In addition to the quantitative surveys, the study would also like to undertake a thorough qualitative investigation to understand the nature, processes and how it has impacted the lives of the people living in that part of the country. The qualitative investigation would include the following:

1. In-depth case interviews (ICIs),
2. Focus group discussions (FGDs),
3. Key informant's interviews (KIs);

Table 3.6: Sets of Data Collection Instruments

Types of Data & Instruments	Total Sets	Types of Respondents		
Quantitative				
Structured Face-to-Face Interview Schedule	3	1 Household Head	1 Head of entrepreneur of EPZ, SEZ & industries	1 Owner of market
Qualitative				
-FGDs Guideline	3	1 Household level community	1 EPZ, SEZ & industries	1 Members of Bazar committee
-ICIs Guideline	3	1 Head of households (Rich, medium, poor & ultra-poor)	1 Entrepreneurs of EPZ, SEZ & industries	1 Owners (big, medium & small shop
-KIIs Guideline	4	1 UP Secretary 1 UNO Office	1 Secretary-District Chambers of	1 Secretary of Business

		(statistician, social welfare, agriculture, disaster, & forestry)	Commerce & Industry	Association
Total Sets	13			

3.10 STUDY MANAGEMENT, QUALITY CONTROL AND ANALYSIS PLAN

QUALITY CONTROL

The Team Leader leads the study. The expert and team members conduct training for capacity building of the study team and data collectors including field-level supervisors. Team members and research supervisors monitor and supervise the field level data collectors throughout the data collection period. They both edit and check immediately at field level. The Team members also supervise the activities of the field staff and verify the consistency of the collected data and compare it with the secondary data.

FIELD EDITING OF QUESTIONNAIRE

Editing is the checking of the filled-in questionnaire for detecting any error or inconsistency if any. There are two types of such editing: field edit and office edit. Field edit will be done by the enumerator administering the questionnaire. Team members will conduct verification of information and office edit. Every filled in the questionnaire will be checked for error and inconsistency in the office. For serious error, if detected, the questionnaire will be re-administered.

QUALITY CONTROL IN DATA MANAGEMENT

The primarily collected data were analyzed through a computerized program. Some of the indicators were also adopted for ensuing quality outputs of the baseline information. The following are the stages in computerization and processing of the collected data:

Five (5%) percent of the filled-in questionnaires were checked against entered data to measure the error level in entry

Checking of data by sorting those in ascending or descending order adopted the standard procedure in preparing and analyzing the database. The collected data were entered into the computer by using the customized MS Access data input software. SPSS for Windows and MS Excel were used to analyze the data.

DATA PROCESSING AND ANALYSIS

After data collection is completed, all data will be edited and cleaned by checking and rechecking for omissions, inconsistencies and improbabilities missing values and values out of range. All completed questionnaires are kept ready for data entry. The answer from the fully completed questionnaire has been entered according to appropriate coding. Data entry has been conducted using a standard data entry package. Both digitalized data (soft copies) and hard copies of completed questionnaires are kept securely. Data have been entered according to the identification number.

The analysis of data started as soon as data were entered. Data analysis was planned according to the objective of the study to get the answer to the research question and list of issues to be addressed as proposed in the terms of reference. Data analysis involves transforming data to extract useful information and facilitate conclusions. Outputs from SPSS will be organized into Excel spreadsheets. To ensure correct results, the analysis is cross-checked to discover possible errors and inconsistencies. The outcome of the analysis is closely monitored and discussed. The descriptive and thematic approaches have been used for increasing visibility and understanding of data. Results are followed by some sub-heading that are sorted out from the research objectives and indicators/scope of the study. Some statistical tools have been used for statistical data analyses such as central tendency, and Chi-square. Data have been presented in the tables and figures. Verbatim have been used in qualitative data analysis.

3.11. ETHICAL CONSIDERATIONS IN RESEARCH

In course of data collection from the respondents, the ethical issues properly guide the research study. The entire data collection process needs to be done with a relaxing atmosphere avoiding any potential risks to the respondents (participants). Sensitive questions are not included in the guidelines and some socio-cultural sensitive information when necessary are collected through indirectly observing the phenomenon rather than direct interactions. The timing of the interviews and discussions was set up after consultations with respondents and they had been given opportunities to make decisions whether to participate in the research or not. Even, those participating in the research were given opportunities to avoid answering any questions that they did not feel comfortable with.

To maintain research ethics, written permission was obtained from all the concerned participants (respondents, institutions and stakeholders) before embarking on the research. During the data collection process, as the first step, the information providers have been explained the objectives of the research and their verbal consent was obtained for the research. In all discussions and interviews, the researcher obtained verbal consent from participants for note-taking and recording. Moreover, to ensure the privacy of

participants as per research ethics, the actual identities of respondents were made different (changed) when reporting sensitive issues. Especially the names and other personal identities were changed when reporting case studies of individual respondents. The confidentiality and privacy of data provided by the respondents was considerably ensured. Apart from that, local values and practice norms were given high priority while collecting data in the field.

3.11. LIMITATIONS OF THE STUDY

There are several limitations often arise while conducting a research study.

- 1) In-terms of research paradigm, the present study followed pragmatism that incorporate a mixed methods study approach, both qualitative and quantitative methods of data collection were used in the study. In such kinds of research, a huge number of subjective/ qualitative variables were tried to be explored in order to gather in-depth knowledge, understanding and information that tried to meet the study objectives.
- 2) In the case of collecting quantitative data, the research team/ trained data collectors experienced a number of challenges to collect subjective data most related to respondents private properties, privileges enjoyed, development issues mostly resulted from the construction of the Bangabandhu Bridge were not possible to satisfactorily collected.
- 3) In the study, the methods of data collection used were both quantitative and qualitative in nature. Also, survey research was undertaken to gain knowledge about the topic of inquiry. The sampling procedure followed a form of non-random sampling (convenience procedure) by which the findings obtained in the study are not considered for generalization of the findings (specific sample to a large population). So the study findings face the question of generalizability.
- 4) Data collection instruments used to gather data are an interview schedule with structured, open-ended and closed questions as well. Apart from that semi-structured interview guide, case study guide, GFD and Key informant interviews (KII) guide were used that provided qualitative data (Non-numeric/descriptive) with thematic information but these could not be able to produce data with maximum accuracy, and reliability.
- 5) Information collected using Interviews faced the problem of data reliability when only the verbal meaning is needed.
- 6) Difficulty to have access to and availability of the respondents were found while collecting data.
- 7) Responses of the study were observed to be affected by response bias due to the sensitive nature of the questions used in the data collection.

- 8) While conducting, FGDs and KIIs, note-taking, recording and transcription of discussion were not optimum because the overall environment of talking with respondents was not as much favorable as the research team required.
- 9) In many cases, data about the respondents' wealth, properties, family matters were not found to be satisfactory level according as the research team / data collectors wanted to have in order to fulfill study goals.
- 10) In some cases, respondents did not provide as authentic data as possible that was fundamental to preparing a quality research report with full of reliable data/information. In that sense, the presentation of data discussed in the report were supposed to be poorly representative.
- 11) Many respondents could not manage the desired amount of time that was necessary for collecting data at a satisfactory amount of information.
- 12) In the case of asking some sensitive questions, a number of respondents tried to satisfy the data collectors by providing with simple information but the study needed more intensive and in-depth data for making a better research report with maximum authentic information.
- 13) In terms of data validity and reliability, the study failed to gather effective data/information that could have been generalizable to some extent. As the present study followed a quantitative survey design, the issue of generalizability of findings was not expected to the researchers. So, the study bears some limitations of constructing a good logical arguments or producing fruitful findings that could be more acceptable to the readers, researchers and other relevant persons related to the study.
- 14) As the people of the East and the Western part of the Bangabandhu Bridge are directly connected with the bridge, they are being benefitted by the bridge in multiple ways. But in the present study, a picture of comparison was tried to highlight between the selected five districts and Manikganj district. But Manikganj is not directly connected to and influenced by the Bangabandhu Bridge. That's why; the comparison between the two was not supposed to be high reflective in terms of providing a real informative picture with regard to the variables / issues included in the study objectives.
- 15) The study could not fully satisfy the specific objectives as was expected in the study and did not produce expected level of knowledge, understanding, ideas and insights regarding study respondents and their lives and livelihoods, socio-economic developments and other relevant issues. So further research studies on various issues/aspects directly or indirectly impacted by the Bangabandhu Bridge need to be undertaken in order to get more extensive knowledge about the research topic in the future.

CHAPTER 4: MAJOR FINDINGS OF THE STUDY

INTRODUCTION OF THE RESPONDENTS

This chapter deals with the major findings of the study. Researchers tried here to discuss the findings of the study in the following tables based on the data collected from the field. The variables that satisfy the objectives of the study and research questions have been discussed and interpreted with tabular and graphical form of presentations. There are three separate sections of this chapter. These are as follows:

- **Section- 4.1:** Quantitative Data Analysis of Social Survey Based Data.
- **Section-4.2:** Qualitative Data Analysis on Selected Cases: FGDs, KIIs and In-depth Case Interviews (ICIs).
- **Section -4.3:** Information Related to Market.
- **Section -4.4:** Information Related to the Industry.

1. To collect the required data for the study structured interview schedules on -
 - a. General socio-economic variables in terms of impact of bridge construction on the lives and livelihoods and relevant issues,
 - b. Data on impact assessment about market (small medium and large industries/factories),
 - c. Business Industry/ industrial institutions
2. Researchers investigated or explored the major variables through the present study have been put forward in detailed in the following way.

SECTION- 4.1

QUANTITATIVE DATA ANALYSIS BASED ON SOCIAL SURVEY

The present section has demonstrated the quantitative data and information that have been collected by using quantitative survey from the respondents of six districts under study. In the following tables the socio-demographic, economic, social, cultural, environmental issues and so on has been presented in detail.

Table 4.1.1: Distance of the Area from the Bridge

Distance of the Area		Frequency	Percentage	Valid Percentage
Valid	Area far from the bridge	392	77.0	79.8
	Area near the bridge	60	11.8	12.2
	Area deprived of benefits from the bridge	39	7.7	7.9
	Total	491	96.5	100.0
Missing System		18	3.5	
Total		509	100.0	

In the current research study Table-4.1.1 show the distance of the respondent's village/ living area from the Bangabandhu Bridge. About 80 percent of study areas were situated far from the bridge. On the contrary, 12 percent areas situated near the bridge. Only 8 percent of areas deprived of the benefit of the Bangabandhu Bridge.

Table 4.1.2: Economic Status of the Respondents (Five Districts)

Respondent's Economic Status		Frequency	Percentage	Valid Percentage
Valid	Rich	69	13.6	15.2
	Middle	206	40.5	45.4
	Low	176	34.6	38.8
	Others	3	0.6	0.7

	Total	454	89.2	100.0
Missing	System	55	10.8	
Total		509	100.0	

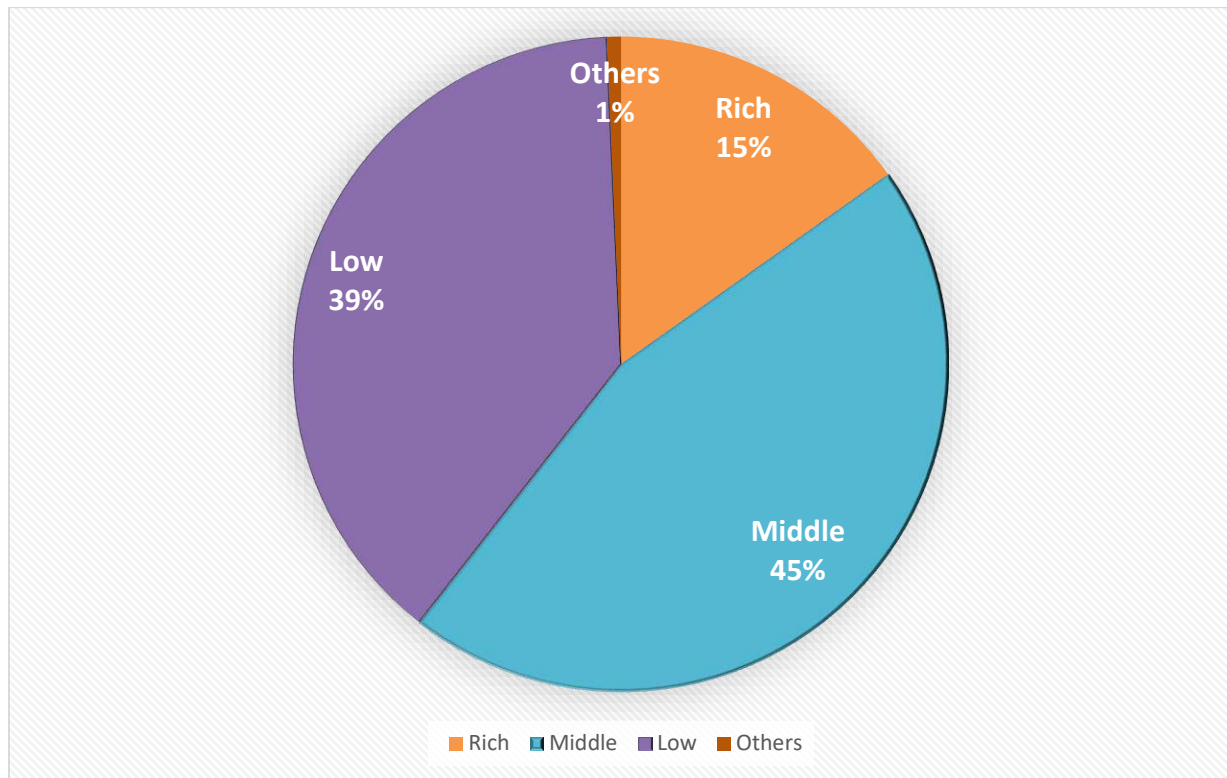


Figure 4.1: Economic Status of the Respondents (Five Districts)

Table 4.1.2 of the current study reflects the nature of wealth and status of economic solvency during the study period. Among the various types of respondents 15.2 percent were supposed to be rich, 45.4 percent were supposed to be middle class in the light of visible wealth. On the contrary, 38.8 percent respondents were found as poor by observing their visible wealth in the family.

Table 4.1.3: Economic Status of the Respondents (Manikganj)

Respondent's Economic Status	Frequency	Percentage	Valid Percentage
Rich	00	00	00
Middle	63	63	63
Low	37	37	37
Others	00	00	00

Total	100	100	100
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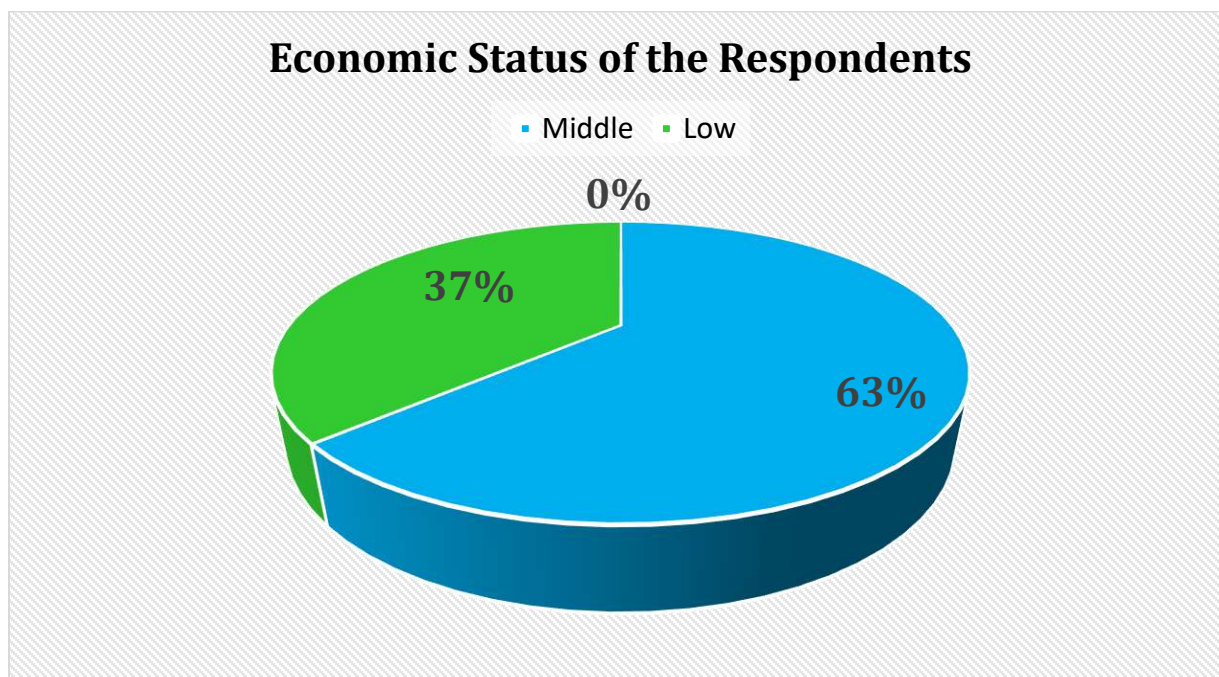


Figure 4.2: Respondent's Economic Status (Manikganj)

The study reveals that the economic status of the respondents was average. Among the 100 respondents 63% were from middle class and 37% were from lower class. But in this study no ultra-poor and rich respondents were found. This is because the study area is near the Jamuna River and the people are mostly from the same socio-economic condition.

4.1.1 SOCIO-DEMOGRAPHIC INFORMATION OF THE RESPONDENTS

Table 4.1.4: Demographic Variables (Five Districts)

Demographic Variable		Responses	Percentage (%)	
(Number of Respondents, n=509)				
Gender of the Respondents	Male	401	78.8%	
	Female	108	21.2%	
Gender of respondent's family members	Male	1074	52.67%	
	Female	965	47.33%	
Religion	Islam	502	98.6%	
	Hinduism	7	1.4%	
Marital Status of the Respondent	Unmarried	9	1.8	

	Married	470	92.3	
	Divorced	2	.4	
	Widow/widower	27	5.3	
	Others	1	.2	
Marital Status of the Respondent's Family Members	Unmarried	842	41.34%	
	Married	1142	56.06%	
	Divorced	7	0.34%	
	Widow/widower	45	2.21%	
	Others	1	0.05	
Respondent's Level of Education	Illiterate	198	39.4%	
	Primary Level	99	19.7%	
	Secondary Level	122	24.3%	
	Higher Secondary or Higher Studies	84	16.6%	
Respondent's family member's level of Education	Illiterate	427	22.56%	
	Primary Level	503	26.47%	
	Secondary Level	582	30.74%	
	Higher Secondary or Higher Studies	383	20.23%	

Table-4.1.4 explains the demographic information of the respondents. In this study, 78.8 percent respondents were male and 22.2 percent respondents were female in gender. 52.67 percent of respondent's family members were male and 47.33 percent were female. In this research 98.6 percent of respondents were the followers of Islam and only 1.4 percent respondents were the followers of Hinduism. About 92 percent of the respondents of the study were married, 5.3 percent were widow /widowers, 1.8 percent respondents were unmarried.. On the other hand, 41.34 percent of respondent's family members were unmarried and 56.06 percent were married. The number of widow or widower was only 2.1% from the family members of the respondents.

In the study, 39.4 percent respondents were illiterate and 19.7 percent of them passed primary level of education. Furthermore, 24.3% respondents passed secondary level and only 16.6 percent were passed the level of higher secondary or higher degrees. In was found in the study, 22.56 percent of respondents' family members were illiterate, 26.47 percent respondents completed primary level of education. Almost 30.47 percent respondent's family members completed secondary level of education. Also, 20.23 percent

of the family members completed higher secondary, graduation degree (pass) or more than that.

Table 4.1.5: Major Occupation of the Respondents (Five Districts)

Code and Name of the Occupation			Frequency	Percentage	Valid Percentage
Valid Occupation	1.00	Farmer	117	23.0	23.4
	2.00	House wife	89	17.5	17.8
	3.00	Day laborer in Agricultural Field	31	6.1	6.2
	4.00	Day Laborer in Non-Agricultural Field	24	4.7	4.8
	5.00	Service Holder	48	9.4	9.6
	6.00	Cane and Bamboo Work	4	.8	.8
	7.00	Bricklayer	19	3.7	3.8
	8.00	Fisherman	1	.2	.2
	9.00	Boatman	5	1.0	1.0
	10.00	Blacksmith	1	.2	.2
	11.00	Kuli (Laborer)	1	.2	.2
	12.00	Rickshaw/ Van Driver	23	4.5	4.6
	13.00	Wood Worker	2	.4	.4
	14.00	Business	35	6.9	7.0
	15.00	Small Business	32	6.3	6.4
	16.00	Migrant Labor (internal)	6	1.2	1.2
	17.00	Migrant Labor (Foreign)	5	1.0	1.0
	18.00	Unemployed	2	.4	.4
	19.00	Retired from Work	5	1.0	1.0
	20.00	Incapable of work	16	3.1	3.2
	21.00	Hair Cutting Saloon	1	.2	.2
	23.00	Cottage Industry	3	.6	.6
	24.00	Small Handicrafts	2	.4	.4
	26.00	Student	2	.4	.4
	27.00	Teaching	4	.8	.8
	28.00	Coaching Business	2	.4	.4
	30.00	Others	20	3.9	4.0
	88.00		1	.2	.2

	Total		501	98.4	100.0
Missing System			8	1.6	
Total			509	100.0	

Table- 4.1.5 shows the major occupations of the respondents. Among the 509 respondents, there are 501 valid responses. In this study, among the respondents 23.4 percent were engaged in agriculture, 17.8 percent were housewife, 6.2 percent were day laborer in agriculture, and 4.8 were day laborer in non-agriculture fields. A number of respondents were service holders and their percentage is 9.6. In this study, it was found that 7.00 percent of respondents were involved in business and 6.4% were in small business. On the other hand, 3.8 percent of respondents were bricklayers. But it was also found that 3.2 percent of respondents had some sorts of inability of doing any type of work. Besides these occupations, respondents were also found to do various types of work.

Table 4.1.6: Major Occupation of the Respondents (Manikganj)

Name of the Occupation	Frequency	Percentage	Valid Percentage
Farmer	38	38	38.4
House wife	6	6	6.1
Day laborer in Agricultural Field	6	6	6.1
Day Laborer in Non-Agricultural Field	7	7	7.1
Service Holder	9	9	9.1
Rickshaw/ Van Driver	5	5	5.1
Business	2	2	2
Small Business	3	3	3
Incapable of work	9	9	9.1
Others	2	2	2
*Other Insignificant Occupations	16	16	16

Total	99	99	100
Missing	1	1	
Total	100	100.0	
*Other Insignificant Occupations <ul style="list-style-type: none"> • Kuli (Laborer)- (1.0%) • Woodworker- (3%) • Migrant Laborer – (1%) 		<ul style="list-style-type: none"> • Unemployed- (1%) • Retired from work-(2%) • Coaching Business (1%) • Student& teacher-(3%) 	

The survey in Manikganj shows that among the 100 respondents 38.4 percent were farmer, 9.1 percent were service holders, 6.1 percent each for house wife and day laborers in the agricultural fields. It is also remarkable that 7.1 percent of the respondents were day laborers in non-agricultural fields. Besides, 9.1 percent of respondents were incapable of doing work and 5.1 percent were rickshaw puller and van driver. Also, 16 percent of respondents were engaged in other types of occupations such as wood worker, migrant laborer, coaching business, student and teacher, retired workers, unemployed and so.

Table 4.1.7: Occupation of the Respondent's Family Members (Five Districts)

Code and Name of the Occupation		Frequency	Valid Percentage
1	Farmer	157	8.61%
2	House wife	549	30.1%
3	Day laborer in Agricultural Field	57	3.13%
4	Day Laborer in Non Agricultural Field	37	2.03%
5	Service Holder	105	5.76%
6	Cane and Bamboo Work	6	0.33%
7	Bricklayer	36	1.97%
8	Fisherman	4	0.22%
9	Boatman	7	0.38%
10	Blacksmith	2	0.11%
11	Kuli/ Mutey(Laborer)	1	0.05%
12	Rickshaw/ Van Driver	50	2.74%
13	Wood Worker	3	0.16%
14	Business	49	2.69%
15	Small Business	37	2.03%
16	Migrant Labor (internal)	18	0.99%
17	Migrant Labor (Foreign)	21	1.15%
18	Unemployed	53	2.91%
19	Retired from Work	6	0.33%
20	Not capable of work	50	2.74%
21	Hair Cutting Saloon	1	0.05%
22	Tailor	3	0.16%
23	Cottage Industry	3	0.16%
24	Small Handicrafts	20	1.1%
25	Artificial Hair Making	2	0.11%
26	Student	497	27.26%
27	Teacher	9	0.49%
28	Coaching Business	5	0.27%
29			0.00
30	Others	36	1.97%

The Table-4.1.7 reveals that occupation of 30.1 percent of the respondent's family members was house wife. Among the total respondents, 27.26 percent of family members were students. In addition, 8.61 percent were involved in agricultural farming, 5.76 were service holders, 3.13 percent were involved in agricultural field as a laborer. In the study area, 2.91 percent family members of the respondents were unemployed. In the business sector, 2.69 percent family members were employed and 2.03 percent were engaged in small business.

Table 4.1.8: Income of the Household Head

	Mean	Median
Income of household head	22467.96	15000

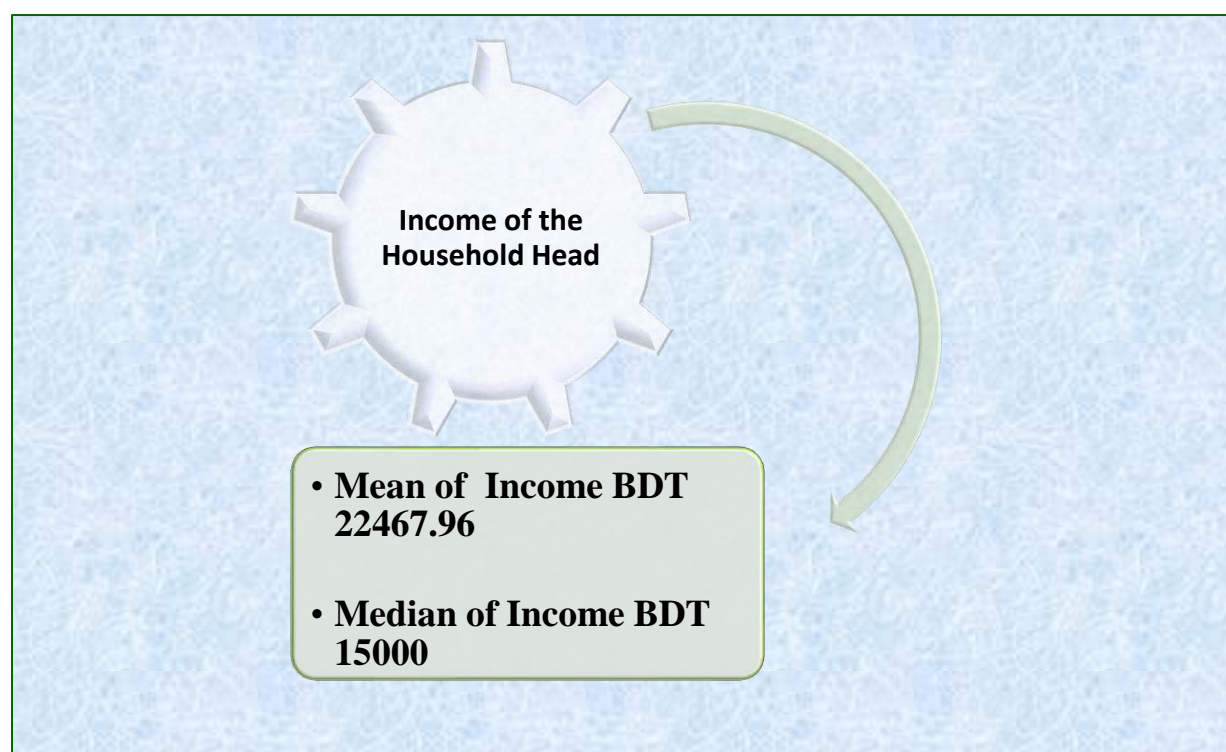


Figure 4.3: Income of the Household Head

Figure-4.3 shows that average monthly income of the household head was BDT 22467.96. The median income of the household head was BDT 15000.

Table 4.1.9: Number of Income Earning Persons in the Family (Five Districts)

Income Capable Person		Frequency	Percentage	Valid Percentage
Valid	One	318	62.5	64.4
	Two	127	25.0	25.7
	Three	38	7.5	7.7
	Four	7	1.4	1.4
	Five	4	.8	.8
	Total	494	97.1	100.0
Missing System		15	2.9	
Total		509	100.0	

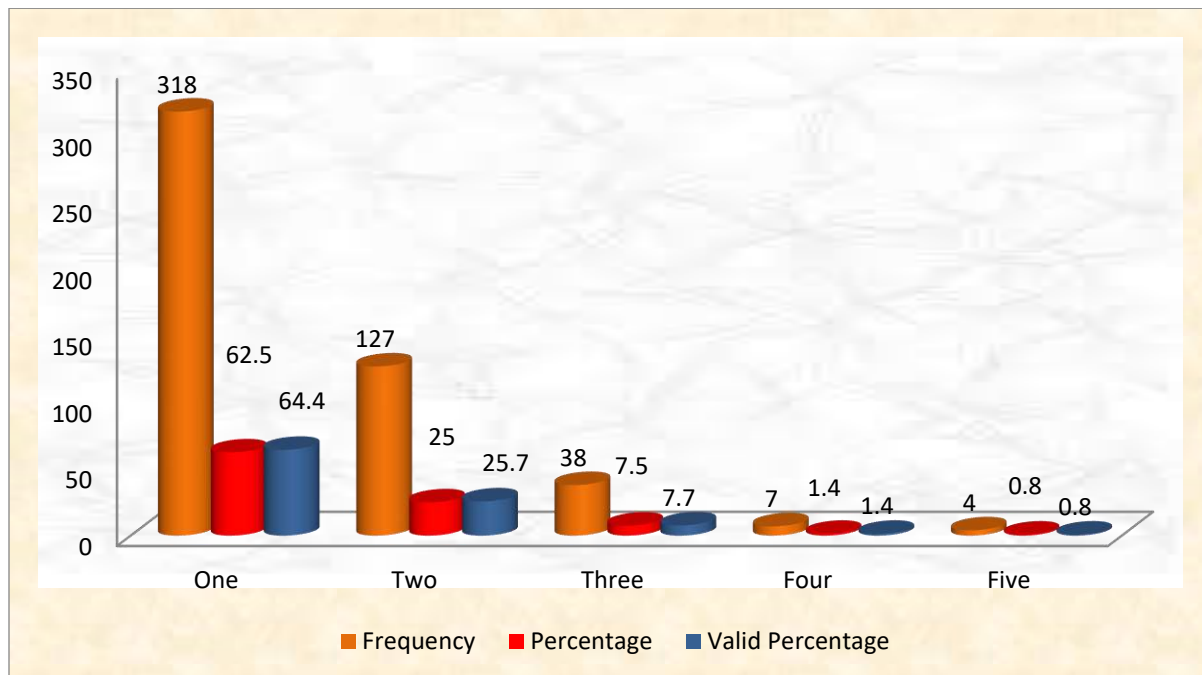


Figure 4.4: Number of Income Earning Person

Table-4.1.9 shows that among the respondent's family members, the number of income-earning members varies from family to family. Among the 494 valid responses, 64.4 percent of respondents' families had one (01) income earning member. On the contrary, 25.7 percent of respondents' families had two (02) earning members. Besides, 7.7 percent family had three (03) income-earning members. In the current study, there were insignificant numbers of families had four to five income-earning members.

Table 4.1.10: Income Earning Members in the Family (Manikganj)

Income Capable Person		Frequency	Percentage	Valid Percentage
Valid	One	76	76	77.6
	Two	21	21	21.4
	Three	1	1	1
	Four	00	00	00
	Five	00	00	00
	Total	98	98.0	100.0
Missing System		2	2.0	
Total		100	100.0	

In the case of Manikganj District, table 41.9 shows that income earning persons varies from one to three. About 77 percent families were found to have at least one income earning member and 21 percent families had two. On the other hand, only one percent families had three income earning persons.

Table 4.1.11: Distribution of Number of Dependents in Different Age Groups (Five Districts)

Age Group	Number of Dependents	Percentage
Under 10	254	18.34
11 – 20	339	24.48
21 – 30	296	21.37
31 – 40	232	16.75
41 – 50	130	9.39
Above 50	134	9.67
Total	1385	100

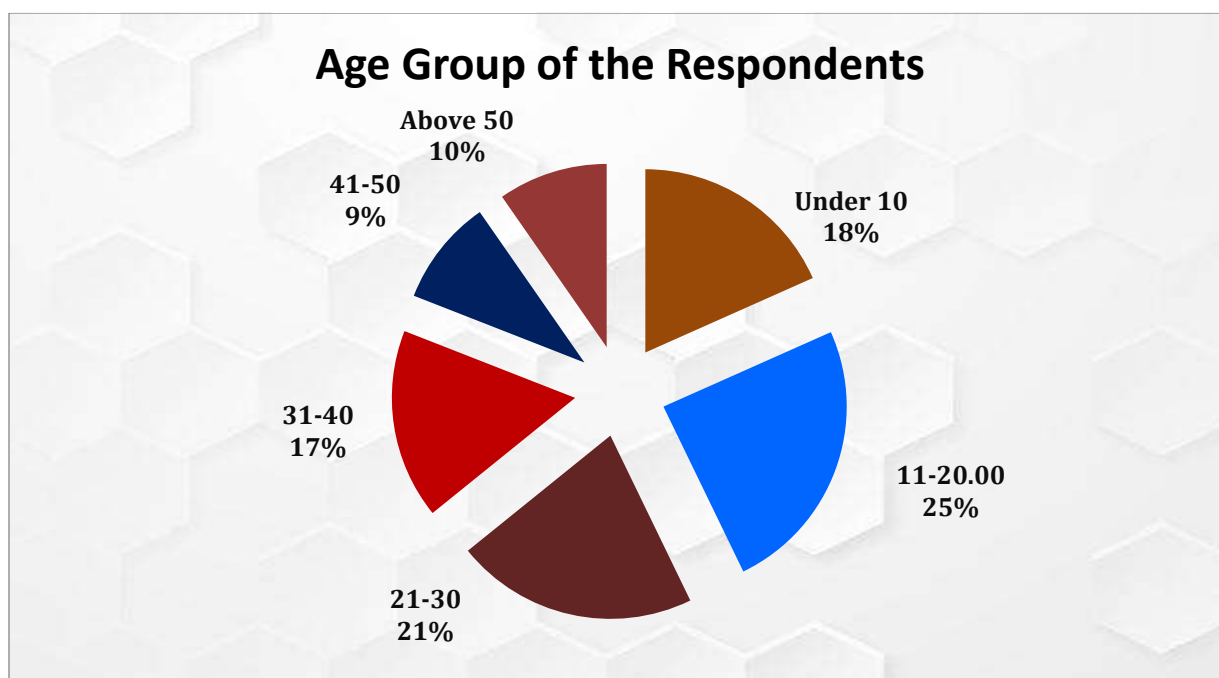


Figure 4.5: Age Group of the Respondents (Five Districts)

Data reveals that the table 4.1.11 that 18 percent dependents are in less than 10 years of age group, 25 percent dependents are in 11-20 age group and 21 percent dependents are in 21-30 age group. On the contrary, 17 percent respondents are in 31-40 age group and 9 percent dependents cover 41-50 age group. Only 10 percent dependents are in the age group of above 50 years of old.

Table 4.1.12: Income of the Respondents (Five Districts)

Annual Income	Before Mean (BDT)	Present Mean (BDT)
Agricultural Work		
Agricultural Product Production	214987.18	405644.07
Fish Farming	145739.10	199724.14
Dairy and Poultry	99625	47201.04
Cattle Rearing	48488.18	78440.83
Daily Labor	83000	104704.55
Share Cropper	52125	64900
Others (Agricultural)	57111.11	105454.55
Non-Agricultural Work		
Job in Garment Sector	146812.5	216222.22

Job (Govt. and Non-Governmental)	256949.37	311666.67
Daily Labor	112804.55	151562.5
Driving	82372.88	111938.46
House Rent	118900	138800
Little Business	91829.55	151844.44
Others (Non-Agricultural)	206200	290905.56
Social Aid/Security		
Govt. Pension	86571.43	106000
Zakat	2692.31	4357.14
Elderly Compensation	14571.43	9882
Widow Compensation	4166.67	5800
Freedom Fighter Honorary	105200	163610
Education Sub-Scholarship	2153.57	2628.13
Relief Event	566.67	775
Training		
Disability Compensation	5400	6000
Farmer Card		5000
VGD/VGF	765	2200
Others (Social security)	6000	4833
Total	250813.60	411526.13

Data collected from the field survey reveal the economic condition of the respondents heading the key areas of income from Agricultural work, non-Agricultural work and Social Aid/ Security related sources. Following are the issues that explain the economic condition of the respondents under study.

Agricultural Work

It is observed from the study that the mean of the annual income of the respondents from Agricultural product production previously of 214987.18 BDT and currently of 405644.07 BDT. On the other hand, respondents' mean income from fish farming was 145739.10 BDT in previous years and currently, it has increased to 199724.14 BDT. Before the study, the mean annual income from cattle rearing was 48488.18 BDT, but it was currently raised to 78440.83 BDT. It is significant that the day laborers (respondents) earned 83000 BDT previously but now they are earning 104704.55 BDT. Respondents from the various studied areas confirm that their previous income from other agricultural fields was 57111.11 BDT and now it is significantly increased to 105454.55 BDT. In terms of infrastructure development in the areas, the scope of poultry raising has been

found to be decreased. So the income from this sector has decreased compared to the previous years. Previously income from this area was 99625 BDT and now it is 47201.04 BDT. From the data, it can be concluded that due to the construction of the Bangabandhu Bridge Economic condition in terms of Agricultural Work Development was found to be changed and highly noticeable level of development.

Non-agricultural Work

Non-Agricultural Work such as jobs in the garment sector, jobs in government and non-governmental organizations, daily laboring, driving, house rent, and small business has been increased from the previous years. It was found that the mean income from the job in the garment sector was 146812.5 BDT and now it has increased to 216222.22 BDT. It is remarkable that many garment industries have been established in Sirajgonj district after the completion of Bangabandhu Bridge. On the other hand, the people are engaging now in government and non-government jobs at a large scale. The income from this job sector has increased to 311666.67 BDT that was 256949.37 BDT in previous years. Income from the driving has been increased to 111938.46 BDT and it was only 111938.46 BDT in previous years that indicates the increases of automobiles due to the construction of Bangabandhu Bridge. The study confirms that the non-agricultural work of the people studies has been increased due to the diversity of work and increase in the communication facilities.

Social Aid / Security

The scope of social aid and security has been increased in this region due to the construction of the Bangabandhu Bridge. The respondent's income from the government pension has currently increased to 106000 BDT and that was 86571.43 BDT in previous years. The freedom fighters Honorarium benefits have been increased to 163610 BDT and that was 105200 BDT in previous years. Previously disability allowance was 5400 BDT and now it is 6000 BDT per annum. Besides, VGD/VGF, Widow Allowance, Farmers cards, and other benefits have reached the doors of the marginal population. And most of the people were found to enjoy their rights due to the social development closely linked to the construction of the Bangabandhu Bridge. The people of the entire region are now enjoying and getting the benefits in multiple ways because of the construction of the bridge.

Table 4.1.13: Income of the Respondents (Manikganj)

Annual Income	Before Mean (BDT)	Present Mean (BDT)
Agricultural Work		
Agricultural Production	89273	118369
Fish Farming	40000	65000
Cattle Raising	44105	66092
Daily Labor	27708	35500
Share Cropper	85000	154000
Others (Agricultural)	100000	100000
Non-Agricultural Work		
Job in Garment Sector	125000	175000
Job (Govt. and Non-Governmental)	231789	263300
Daily Labor	110000	144000
Driving	144285	359777
Little Business	160500	199250
Others (Non-Agricultural)	236818	291636
Social Aid/Security		
Govt. Pension		179000
Elderly Compensation		6000
Widow Compensation	4166.67	5800
Total	121284.67	159942.5

Table 4.1.13 shows the mean of the previous and present income of the respondents from the Manikganj District. Respondents were seen to earn from agricultural and nonagricultural sources of income. Besides, some respondents get some financial help from various social security programs. The average income from various sources is 159942.5 BDT that was previously 121284.67 BDT. So, here there is an increase in income. Respondents were found to earn 65000BDT annually from fish farming that was previously 40000 BDT. On the other hand, income from the cattle raising was found 66092 BDT and previously it was 44105. Income of the daily laborer is 35500BDT and previously it was 27708BDT. But the income of the sharecropper has increased nearly double whereas previously it was 85000 BDT and currently 154000BDT. Besides, income from the other sources in the agricultural fields are found to remain same as before and it is 100000 BDT.

In the non-agricultural fields the income of the day laborer is currently 144000BDT and previously it was 110000 BDT. Respondents were also found to earn 175000BDT from garment sector and that was previously 125000BDT. Besides, respondents were found to earn 179000BDT from government pension program and 6000 BDT from elderly compensation project.

Table 4.1.14: Expenditure of the Family (Five Districts)

Sources of Expenditure	Mean (BDT)
Buying Agricultural and Non-Agricultural Work Related Elements	86089.18
Food	71055.73
Cloths and Cosmetics	21060.18
Buying Land	439550
Making or Repairing Building	73516.51
Buying Furniture of House	26255.86
Education	32535.96
Transportation	13645.79
Health Service and Medicine	13918.83
Electricity/Water/Fuel/Gas	14503.52
Festival and Entertainment	22822.1
Buying Vehicle	86846.15
Installment and Debt Fulfilling	54573.68
Mobile Phone	5962.94
Others	18321.18
Overall	328577.16

It is found from the data of the Table-4.1.14 that the average annual expenditure of the respondent's families is significantly high that is a total of 328577.16 BDT. It indicates that people's purchasing capabilities have increased at a remarkable level. Respondents are using their income for buying their daily necessities. People are spending 86089.18 BDT for buying agricultural and non-agricultural work-related elements, 71055.73 BDT for food, 21060.18 BDT for buying clothes and cosmetics. The respondents are investing their resources for building and reconstruction of their houses at an increasing rate. Annually they are using 73516.51 BDT for making or building their houses.

Nowadays, respondents were found to be able to afford the medical cost and health necessities. Many respondents were found to spend 13918.83 BDT for health services and medicine and 22822.1 BDT for festivals, entertainment, and religious occasions. People were found to invest 86846.15 BDT for vehicle purchasing or repairing vehicles. Variation of vehicle choices is remarkably found in these areas. People previously used manual rickshaws, bicycles, and other vehicles of low speed. But after the construction of the Bangabandhu Bridge, people are using CNG Auto Rickshaws, electric auto-rickshaws, motorcycles, and various types of modern vehicles. As a result, the mobility of the people has dramatically increased as compared to the previous time.

Table 4.1.15: Expenditure of the Family (Manikganj)

Sources of Expenditure	Mean (BDT)
Agricultural & Non-Agricultural Equipment	144553.19
Food	92131
Cloths and Cosmetics	8436.84
Buying Land	
Making or Repairing Building	26277
Buying Furniture of House	122235
Education	85000
Transportation	15235
Health Service and Medicine	18400.43

Electricity/Water/Fuel/Gas	8928
Festival and Entertainment	10218
Buying Vehicle	
Installment and Debt Repay	120100
Mobile Phone	10510
Others	80000
Overall	96500

It was observed in the table 4.1.15 that the average annual expenditure of the respondents was found 96500 BDT. Respondents family expend 92131 BDT for food and 122235 BDT for buying furniture. They also expend 85000 BDT for the purpose of education of the children. They also expend 120100BDT for debt repayment.

Table 4.1.16: Nature of Wealth of the Respondents (Five Districts)

Nature of Wealth	Mean (BDT)
Amount in Hand at Present	96354.14
Invested Money	566250
Land	2970184.57
Ornaments	121666.10
Animal and Birds	106597.03
Vehicles	131361.84
Tree	64895.20
Grocery Shop	656620.69
Business	250547.62
Furniture	117899.03
Agricultural Tools	61662.53
Others	69726.42
Overall	2613952.59

Table-4.1.16 indicates that the nature and the amount of the resources have increased and got a large figure in the current stage. The People of the entire region are enjoying the economic benefits and their properties have been increasing day after day due to the impact of the Bangabandhu Bridge. Now the mean amount of wealth in hands of

respondent figures of 96354.14 BDT. On the contrary, the amount of the invested money against any productive purpose is 566250 BDT. This investment trend shows greater development of the people. The value of the landed property has been increased in comparison to the previous times. Currently, a respondent has the land property of an average of 2970184.57 BDT. The housewives and daughters are using ornaments of an average of 121666.10 BDT and people are using furniture of an average of 117899.03 BDT. Investment in business was also found to be increasing during the research study. Respondents are seen to invest 250547.62 BDT for small and other businesses and 656620.69 grocery shops.

Table 4.1.17: Changes in Financial Institutions / Enterprises and Transaction (Five Districts)

Change in Financial Organizations	Increased (%)	Same as before (%)		Decreased (%)
Bank and Insurance	62.7	17.7		19.6
Cooperative Association	58.2	16.5		25.3
NGO	82.7	2.3		15
	Increased	Moderately increased	Same as before	Decreased
Change in Transaction	58.2	38	3.2	0.6

The study result (Table 4.1.17) shows that after the construction of the Bangabandhu Bridge, the financial organizations and enterprises have been found to be increased in the studied area. About 63% of respondents think that bank and insurance and their roles have been increased. On the contrary, about 18% of respondents opined that banks and insurance were as same as before. Only, about 20% of respondents think these organizations are decreased currently. Besides, 58% of respondents think cooperative associations have increased, about 17% of them think is as same as before and about 25% think these are found to be decreased. It is significant to note that the role and functions of the non-government organization (NGOs) are remarkably observed in entire regions. A good number of national and international NGOs are working in this area. About 83% of respondents of the study think that the role of NGOs role has been increased, and about 2 % think that the role is as same as it was before. Only, 15% of respondents think that the role has been decreased currently. It was found from the FGD that-

Economic transactions have been increased much time because of Bangabandhu Bridge and many financial institutions, banks have been established on an outcome of economic advancement.

Table 4.1.18: Sources of Family Debt (Five Districts)

Source of Debt	Mean
Banks	498405.41
NGOs	70026.32
Money Lenders	112500
Relatives	158666.67
Cooperative Associations	53666.67
Others	91200
Overall	133277.03

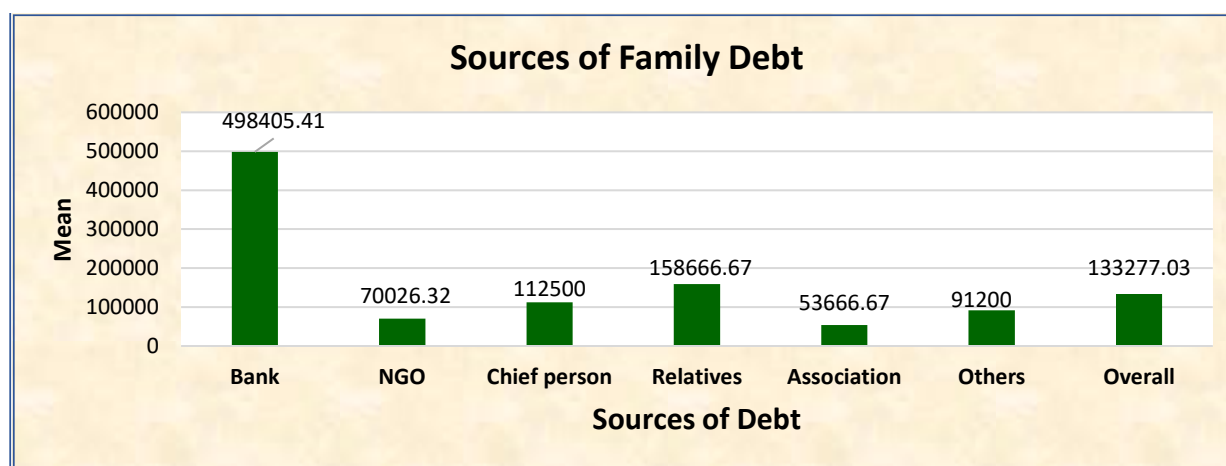


Figure 4.6: Sources of Family Debt

The figure- 4.6 shows the family debt of the respondents. Family members of the respondents were known to take loans from various sources such as banks, NGOs, Money Lenders, Relatives, Cooperative Associations, and others. The overall mean amount of the loan of a family from various sources is 133277.03 BDT. Families are taking loans from various banks of a total of 498405.41 and they are borrowing 70026.42 BDT from NGOs. Respondent's family members are borrowing an average of 112500 BDT from the money lenders. They are borrowing an average of 158666.67 BDT from their relatives. It clearly

mentions that some people were found to rely on their relatives more than other financial sources due to interest-free money lending.

Table 4.1.19: Household's Savings and Investments (Five Districts)

Sectors of Savings	Previous (BDT)	Present (BDT)	
Cash in hand	48967.56	60789	
Savings at bank	207028.57	468829.55	
Savings at NGO	7593.02	40158.1395	
Savings to relatives	191100	194823.53	
Sectors of Investment	Before	Primary	Later
Building or repairing houses	116941.86	228762.38	237750
Investment in agricultural product/ buying tools	98446.15	129918.31	160793.10
Buying land/pond	828750	450000	1445000
Investment in cattle animal and birds	61611.11	98250	223571.43
Buying store/transport	220000	85062.5	345375
Investment in business	262400	138139.54	234309.52
Others	148333.33	310000	180000
Overall	236399.28	274828.11	391645.83

The data from the research study in selected districts show a clear trend of increase due to the onset of the Bangabandhu Bridge in the savings and investment sector of the respondents.

Previous and Current trend of Savings

Data reveals that respondents are saving their money in various sources such as cash in hand, banks, NGOs, Relatives, Lending money to others by interest, and others. The average cash in hand of the respondents was 48967.56 BDT five years ago, and now it has been raised to 60789 BDT per annum. Previously people save their money to various banks for an average of 207028.57 BDT and now it has been increased to 468829.55 BDT. People's savings to their relatives have also been increased currently at 194823.53 BDT that was 191100 BDT five years ago. Besides, respondents of the studied areas are also being savings their money to post offices, NGOs and other sources are also being increasing day by day. It was seen from the qualitative data that *savings has increased due to the ongoing NGO and Bank's roles in the community as one of the In-depth case interview revealed:*

People's savings has been increased which was not common in earlier days. Nowadays people also go frequently to NGOs and banks for loans which is significant.

Previous and Current Trend and Sectors of Investment

The data from the Table- shows that there is a significant change and variation of investment of resources in the study area. It is observed that people in the study area are investing in building and repairing houses, increasing agricultural products or buying agricultural tools, buying land and ponds, investments in buying and farming livestock, cattle, and birds; buying grocery shops or transports, investment in small business and others. The average investment of a respondent in various sectors was 236399.28 BDT five years ago, but currently, it has been increased primarily to 274828.11 BDT and later to 391645.83 BDT.

Development of farms like Agro based and non agro based, transportation, investment in non government institutions are found to be gradually increased. From one of the FGDs it can be mentioned that:

The farm sector has been developed moderately but the transportation sector has developed significantly. There are very few people who like to invest in self-employment. However, it is seen that investment on government service has been increased. Investment on non-government services has increased moderately.

The most significant sector of investment is building or repairing houses that are currently 228762.38 BDT and later 237750 BDT. Previously the investment in this sector was 116941.86 BDT only. Another significant change is being seen in the sector of buying land and ponds. Respondents and their families are investing primarily 450000 BDT and later 1445000 BDT for development but five years ago the scenario is totally changed, they have

invested 828750 BDT only for purchasing land and ponds. Investment in agriculture is also remarkable and people are currently investing in agricultural products or buying agricultural tools a BDT of 129918.31 and later they also invested 160793.10 BDT, but the amount was only 98446.15 BDT five years ago. These indicators are also showing us the empowered capabilities and more resources of the people as a result of the benefits from the Bangabandhu Bridge.

In addition the trend of investment in the sectors like agriculture, industry and communication are found to be increased in the study areas. Data from the qualitative study mentioned as:

This year the investment in business has increased remarkably. Some others said that foreign investment has also seen growth. A few respondents say that investment in agriculture has increased fairly. People invest in income generating activities more nowadays as some participants mentioned. As the four-lane road has been started in this area people prefer to invest in buses and other kinds of buses.

Table 4.1.20: Respondents Land Ownership and Volume of Land

Types of land ownership	Volume of Land (Decimal)	
	Before	Present
Homestead Land	14.40	13.58
Cultivable Land	116.25	120.84
Non-Cultivable Land	43.82	43.67
Mortgage	64.20	57
Own Land	16.96	7.88
Pond	118.20	79.76
Garden	45.83	46.22
Land In Industry And Factories	33.59	32.35
No Land	25.00	25.00
Overall	86.24	83.97

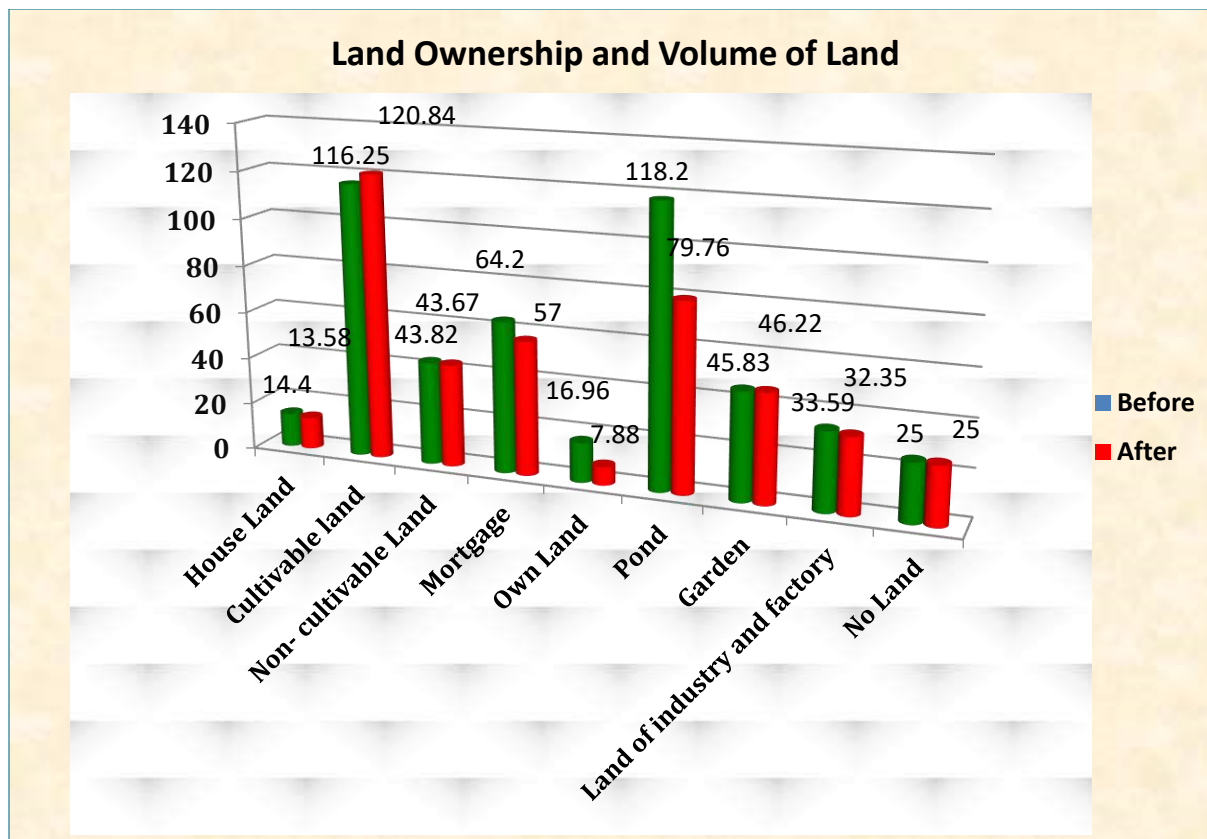


Figure 4.7: Land Ownership and Volume of Land

The data shows that the overall land volume of the respondents has been decreasing day by day. Previously they had 86.24 decimals of land, but currently, it is 83.97 decimals. This happened for the acquisition of land in mega projects, industries, and highways. Besides, people are selling their cultivable lands to the industry owners and buying lands at a high price. People are also losing their land due to riverbank erosion and other unplanned industries. Previously, respondents have an amount of 14.40 decimals of land for housing and currently, it is 13.58 decimals. But, the survey-based data shows that the amount of cultivable land is increased to 120.84 decimals and previously it was 116.25 Decimals. On the other hand, non-cultivable land was slightly decreased. Previously the volume of non-cultivable land was 43.82 decimals and currently, it is 43.67 decimals. Moreover, the volume of mortgage land is 64.20 decimals in the previous years but currently, it has decreased to 57 decimals. The scenario is found to be changed in the case of own land. Previously the volume of own land was 16.96 decimals and now it is only 7.88 decimals. But the garden area has increased compared to the previous years. Currently, the volume of the garden is 46.22 decimals and previously that was 45.83 decimals. It is noticeable that the respondents have lost their lands due to acquisition for industries /factories. Now the

volume of land is 32.35 decimals and previously it was 33.59 decimals. In some cases, the status of the landless people is remaining the same as before.

Table 4.1.21: Changes of Price of the Land beside Road (Highway) (Five Districts)

Nature of Land	Increased (%)		Increased slightly (%)		Same as before (%)		Decreased (%)	
	Before	Present	Before	Present	Before	Present	Before	Present
Agricultural land	1.5	95.2	91.0	2.2	2.6	2	4.9	0.6
Homestead Land	2.1	94	88.2	4.2	4.9	1.4	4.9	0.4
Commercial land	3.7	96.2	88.9	3.2	2.1	0.6	5.3	
High land	4.2	96.4	87.3	2.8	2.5	0.9	5.9	
Low land	2.1	85.7	72.9	8.7	5.7	5.6	19.3	

Table-4.1.21 shows that the price of the land beside the roads has increased very much. The price of agricultural land has increased 95.2 percent, homestead land 94 percent, commercial land 96.2 percent, high land 96.4 percent, and low land 85.7 percent. The price of land was found different on the basis of proximity to roads.

Table 4.1.22: Changes of Price of the Land Far from Road (Highway) (Five Districts)

Nature of Land	Increased		Increased slightly		Same as before		Decreased	
	Before	Present	Before	Present	Before	Present	Before	Present
Agricultural land	1.6	82.7	77.5	9.3	11.6	1.4	9.3	6.5
Land of house	2.3	81.9	72.9	16.9	7.5	1	17.3	0.2
Commercial land	2.6	86.5	73.3	10.9	6.6	2.4	17.5	0.2
High land	3.4	80.7	70.6	11.7	7.3	7.6	18.6	
Low land	1.8	66.5	69.2	23	9.1	3.6	19.9	6.9

Table -4.1.22 shows that the price of the land far from the roads have increased at a high rate. But the Price of agricultural land has increased 87.2 percent, homestead land 81.9

percent, commercial land 86.5 percent, high land 80.7 percent and low land 66.5 percent. It was found from the FGD:

Land value has been increased many times due to economic development of project area people.

Table 4.1.23: Changes in Price of Agricultural Products and Related Materials (Five Districts)

Types of Changes	Increased very much (%)	Slightly increased (%)	Same as before (%)	Decreased (%)
Change in production	66.2	33	0.6	0.2
Change in amount of production	69.1	29.6	1.1	0.2
Change in the price of the product produced	68.9	30.5	0.4	0.2
	Before		Present	
Production Expenses	31642.33		48174.02	

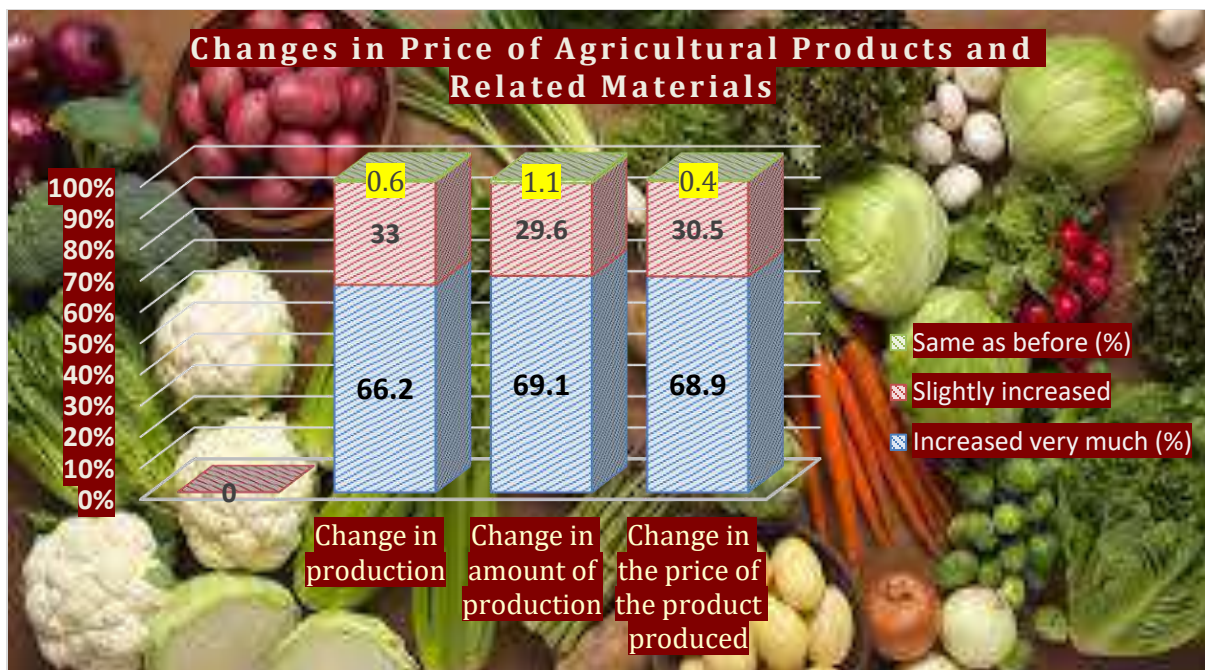


Figure4.8: Changes in Price of Agricultural Products and Related Materials

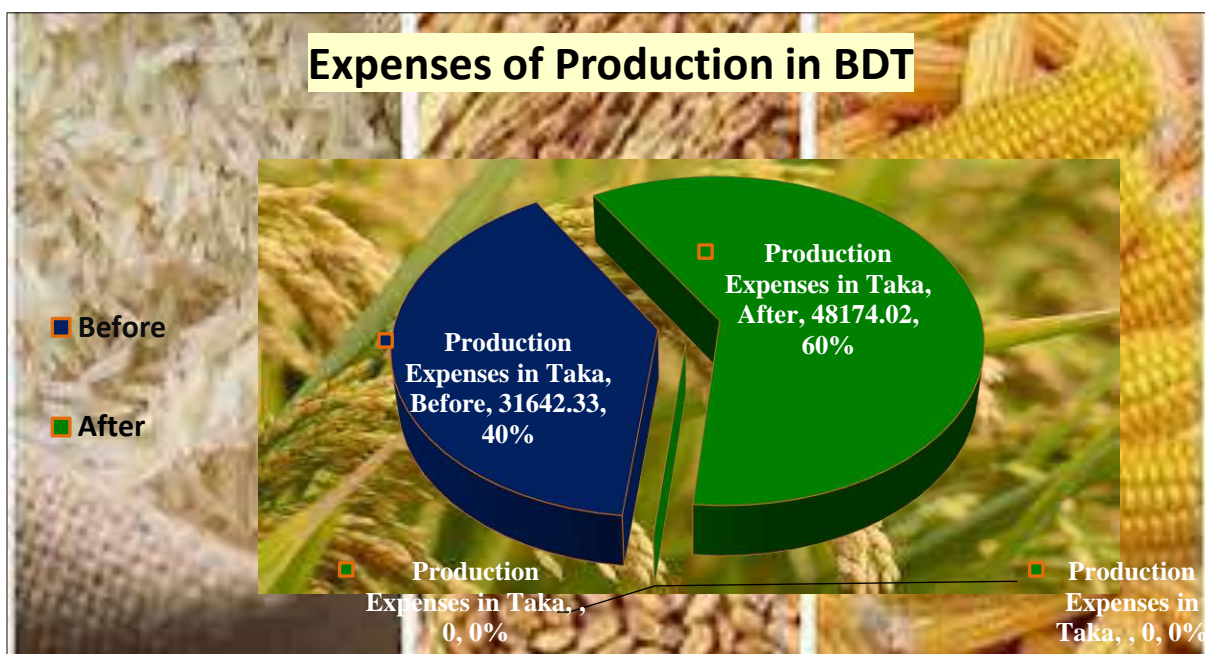


Figure 4.9: Expenses of Production in BDT

Figure-4.9 indicates that production cost in the agricultural sector was an average of 31642.33 BDT, but it has increased to 48174.02 BDT in recent years.

Table 4.1.24: Ingredients/ Materials Available Before Bridge Construction (Five Districts)

Ingredients	Percentage of Cases	Responses	
		N	Percentage
Seed	86.4%	395	22.4%
Fertilizer	78.3%	358	20.3%
Water	63.9%	292	16.6%
Pesticides	54.5%	249	14.1%
Agricultural worker	68.5%	313	17.8%
Modern agricultural tools	33.3%	152	8.6%
Others	0.7%	3	0.2%
Total	385.6%	1762	100.0%

Table-4.1.24 shows that the ingredients produced before in the selected studied area. Among the 1762 multiple responses, 22.4% of respondents think that in these areas 86.4% seeds were available. On the other hand, 20.3% of respondents confirm that previously 78.3% fertilizer was available and 16.6% of respondents confirm 63.09% of water for cultivation was available. Besides, 17.8% of respondents told that in the 68.5% cases agricultural workers were available. But, modern agricultural tools were not available in most cases. Only, for the 33.3% cases, modern agricultural tools and technologies were available in these areas.

Table-4.1.25: Ingredients/ Materials Available After Bridge Construction

Ingredients	Percentage of Cases	N	Response Percentage
Seed	86.4%	393	18.0%
Fertilizer	90.8%	413	18.9%
Water	77.4%	352	16.1%
Pesticides	78.0%	355	16.2%
Agricultural worker	73.8%	336	15.4%
Modern agricultural tools	73.0%	332	15.2%

Others	1.3%	6	0.3%
Total	480.7%	2187	100.0%

Table-4.1.25 indicates that nowadays ingredients in the agricultural field are available than in the previous days. 18% of responses ensure that in the 86.45 cases seeds are available to the farmers. Another 18.9% responses indicate that in the 90.8% cases fertilizer is available and in the 77.4% cases water is available for cultivation. Previously pesticide use was 54.5% cases, but pesticide use has increased to 78.0% cases. For 73.0% of cases, modern agricultural tools are available to the farmers. The availability of agricultural workers has been increased from 68.5% to 73.8% and that indicates the farmers are getting more facilities than before.

Although the bridge connects the eastern and western and northern districts of Bangladesh, because of inadequate establishments of food items and crops preservation systems, a huge volume of agricultural products are found to be damaged particularly in Kurigram. From the FGD it is mentioned as:

There is no sufficient storage house in our District to store the crops as a result huge number of Agro products is damaged. So, we need to establish more storage house for storing the crops. Especially, I insisted on to establish a temporary center for tannery products because every year a great number of tannery products damaged due to poor storage system.

CHANGES IN SELLING AND MARKETING PRODUCED PRODUCT AFTER CONSTRUCTION OF THE BANGABANDHU BRIDGE

Table: 4.1.26: Buying Produced Goods Before * Buying Produced Goods Present (Cross-Tabulation)

Changes in Production			Buying produced goods present			Total
			Increased	Moderate	Same as before	
Buying Produced	Increased	% within Buying produced goods before	50.0%	50.0%		100.0 %
		% within Buying produced goods	1.3%	36.4%		2.5%

		present				
	Moderate	% within Buying produced goods before	97.0%	1.7%	1.4%	100.0 %
		% within Buying produced goods present	93.8%	45.5%	100.0 %	92.2 %
	Same as before	% within Buying produced goods before	33.3%	66.7%		100.0 %
		% within Buying produced goods present	0.3%	18.2%		0.9%
	Decreased	% within Buying produced goods before	100.0%			100.0 %
		% within Buying produced goods present	4.6%			4.4%
Total		% within Buying produced goods before	95.3%	3.4%	1.2%	100.0 %
		% within Buying produced goods present	100.0%	100.0%	100.0 %	100.0 %

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	92.124 ^a	6	.000
N of Valid Cases	321		

The chi-square test was used to test whether there is any association between buying produced goods before and after opening the Bangabandhu Bridge. The p-value corresponding to the Chi-Square statistic reveals that there is a strong association ($p < 0.01$) between buying produced goods before and after opening the Bangabandhu Bridge.

Table: 4.1.27: Marketing Produced Goods Before * Marketing Produced Goods Present (Cross-Tabulation)

Changes in Marketing the Goods				Marketing Produced Goods Present			Total
				Increase d	Moderate	Same as before	
Marketing Produced Goods Before	Increased	% within Marketing produced goods before	38.5%	38.5%	23.1%	100.0%	
		% within Marketing produced goods present	1.7%	45.5%	13.6%	4.1%	
	Moderate	% within Marketing produced goods before	92.0%	1.4%	6.6%	100.0%	
		% within Marketing produced goods present	92.7%	36.4%	86.4%	90.3%	
	Same as before	% within Marketing produced goods before	33.3%	66.7%		100.0%	
		% within Marketing produced goods present	0.3%	18.2%		0.9%	
	Decreased	% within Marketing produced goods before	100.0%			100.0%	
		% within Marketing produced goods present	5.2%			4.7%	
Total	% within Marketing produced goods before	89.7%	3.4%	6.9%	100.0%		
	% within Marketing produced goods present	100.0%	100.0%	100.0%	100.0%		

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	96.804 ^a	6	.000

N of Valid Cases	320		
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The chi-square test was used to test whether there is an association between marketing produced goods before and after opening the Bangabandhu Bridge. The p-value corresponding to Chi-Square statistic reveals that there is a strong association ($p < 0.01$) between marketing produced goods before and after opening the Bangabandhu Bridge. Due to the construction of the Bangabandhu Bridge, transportation of agricultural goods has been easy and cheap. From the FGD it was mentioned by the participants as:

Agricultural commodity easily transports to Dhaka. Even, the people of Dhaka consume the agricultural commodity earlier than us.

Table 4.1.28: Income Generating Activities (Five Districts)

Income Generating Activities	Percentage of Cases	Responses	
		Number (N)	Percentage
Business	13.5%	39	11.2%
Self-Employment	35.6%	103	29.7%
Transportation	6.6%	19	5.5%
Government Job	5.9%	17	4.9%
Non-Government Job	6.2%	18	5.2%
Garments Industry	2.1%	6	1.7%
Work in Abroad	1.4%	4	1.2%
Agro Based Industry	32.9%	95	27.4%
Non-Agricultural Industry	10.0%	29	8.4%
Others	5.9%	17	4.9%
Total	120.1%	347	100.0%

Table 4.1.28 shows that people of the studied areas are engaging themselves in income-generating activities such as business, self-employment, transportation, governmental job, non-government job, garment industry, Work in abroad, Agro-based Industry, Non- Agro-based Industry and other types of work. 13.5% of respondents are involved in business, 35.6% are self-employed, 32.9% are involved in the Agro-based industry. Only 5.9% are involved in government jobs and 6.2% are involved in non –government jobs. Besides, 6.6% of respondents are engaged in transportation-related jobs. The table indirectly

indicates that people are introduced to various types of work opportunities and there created diversity in occupations due to the construction of Bangabandhu Bridge and development in socio-economic arenas.

Table 4.1.29: Previous and Present Income Level of the Respondents (Five Districts)

Income	Mean (BDT)
Previous Income	156212.86
Present Income	206092.91

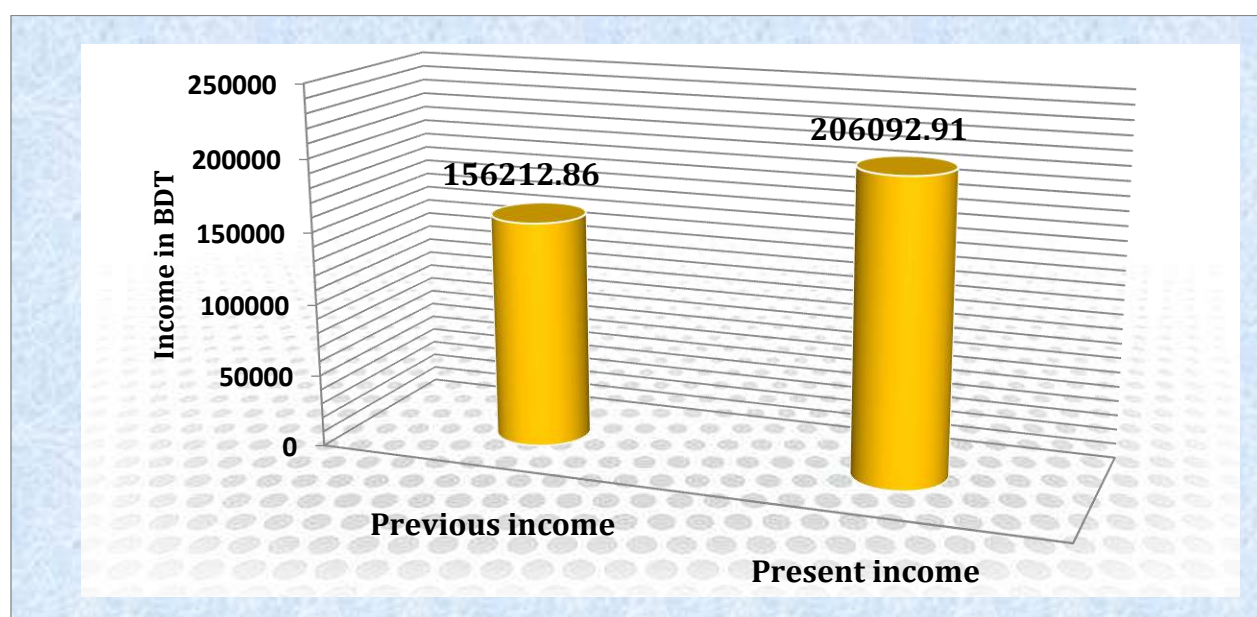


Figure 4.10: Income Level of the Respondents

Figure-4.10 reveals that the previous average annual income of the respondents is BDT 156212.86 and the present income of those respondents is BDT 206092.91. This is significant and it clearly indicates that due to the construction of Bangabandhu Bridge and the development initiatives of the government the income of the people of the selected area has been increasing dramatically.

Table 4.1.30: Financial Development of the Respondents of the Study Area (Five Districts)

Development module	Increased very much	Moderately Increased	Less Increased	No change occurred
Increased income	49.5	50.1	0.2	0.2
Scope of Employment	48.2	41.1	9.5	1.2
Expansion of business	66.5	31.7	1.4	0.4
Mobility of labor	58.9	40.3	0.6	0.2
Price of land	75.7	23.7	0.4	0.2
Development of Communication	83.7	15.5	0.6	0.2
Development of Industries	32.4	24.7	20.5	22.5
Agricultural product marketing	64.3	25.1	5.6	5
Supply in local and international markets	60.4	30.1	4.4	5.2
Activities of Banks and Insurance	67.2	29.8	1.6	1.4

It is observed from Table-4.1.30 that the construction of the Bangabandhu Bridge opened the door of economic development of the entire region, especially the northern part of Bangladesh. Among the respondents, 49.5% respondents think that their income is increased very much and another 50.1% think that their income is increased moderately. According to this study, the scope of employment is increased and expanded. 48.2% of respondents think that their scope of employment has increased very much, 41.1% thinks that their employment opportunities have increased moderately and 9.5% think that the scope of employment opportunity has less increased.

On the other hand, the expansion of business is a key indicator of regional development. Due to the Bangabandhu Bridge, 66.5 % studied population said that business opportunity has increased very much and another 31.7% opined to a moderate increase. People's movement has increased for marketing, business, health education, etc. It was found from the qualitative data analysis that according to a respondent:

This bridge is a milestone of the Northern districts. Many people are engaging in business and markets; I am seeing many showrooms of the electronics companies such as LG, Walton, etc. Many cottage industries are doing well. Many women are involved in this business. People's mindset is changing over time. People are easily moving to Dhaka city for their treatment, education and other necessities.

On the contrary, as because the diversity of business has increased; the availability of various types of goods and service has also been increased. Alongside, the buyers and sellers also found to be increased. It was revealed from the FGD that-

The diversity of business has increased moderately but it can be said that small business and mid-sized business has increased the most. The size of the business was of interest moderately and the hour of the walks also increased. But it can be said that the number of buyers increased the most in this year.

Previously the marketing system in Sirajganj was totally different from the present time. The scenario has been made clear by the participants of Focus Group Discussion as:

Monopoly and stock business were the main problems in Sirajganj Boro Bazar before implementation of Bangabandhu Bridge but today, such type of monopoly and stock business are vanished from the market due to Bangabandhu Bridge.

In Sirajganj District there were seen some negative impacts on business that was reflected in the FGD. According to the FGD:

Movement of the outsider people is very poor in Sirajganj Sadar area. This place cannot attract the outside investors. The business, investment and employment are mainly created by local people. That is why, the environment of large investment are not made in Sirajganj Sadar.

Even the mobility of labor has increased greatly. 58.9% of respondents think that there are much mobility of labor in the workforce and 40.3 % of respondents ensure a moderate increase of mobility of labor. The price of land has increased very much according to the 75.7% respondents and the rest of 23.7% respondents think that price of land has increased moderately.

Almost 83.7% of respondents think that the development of communication facilities has increased very much and 15.5% indicates a moderate development in this field. Development of Industry is a mixed area where 32.4% opined that there is much development, 24.7% said about moderate development, 20.5% said about less increase of industry sector. On the other hand, 22.5% of respondents ensured that there is no change at all in this sector. Financial institutions have been found to be established in the locality. It was found from the Focus Group Discussion (FGD) that is mentioned as:

A good number of financial Institutions have been newly established. It also can be observed that the tendency in saving has increased moderately among the people. Some responded told that the trend of financial flow and the number of beneficiaries had increased moderately.

Moreover, due to the construction of Bangabandhu Bridge, the agricultural product marketing, supply of products in local and international markets, and the activities of banks and insurances have been increased much and at a moderate level. The supplies of agricultural goods and non agricultural goods in the local and international market both have been increased and due to this supply system businessmen are affected positively as well as negatively. From the qualitative data it was mentioned:

This bridge has both positive and negative impacts. We are getting many good quality products within a short time from Dhaka and Chattogram due to this bridge, but local products are lessening its market as these may not be good quality compared with the outside products. But some products such as mastered oil, sugarcane, fruits and vegetables are quickly reaching the big market in Dhaka and Chattogram using this bridge.

Table-4.1.31: Level of Mobility in Work (Five Districts)

Mobility of Work	Intensity of the change				Factor Attracting	
	Increased Very Much	Moderately Increased	Decreased	No Change	Pull Factor	Push Factor
Job Sector	47.8	51.4	0.4	0.4	86.5	13.5
Migration of Labors	45.3	43.7	9.4	1.6	89.3	10.7
Going Abroad	48.2	41.3	0.0	10.5	96.0	4.0

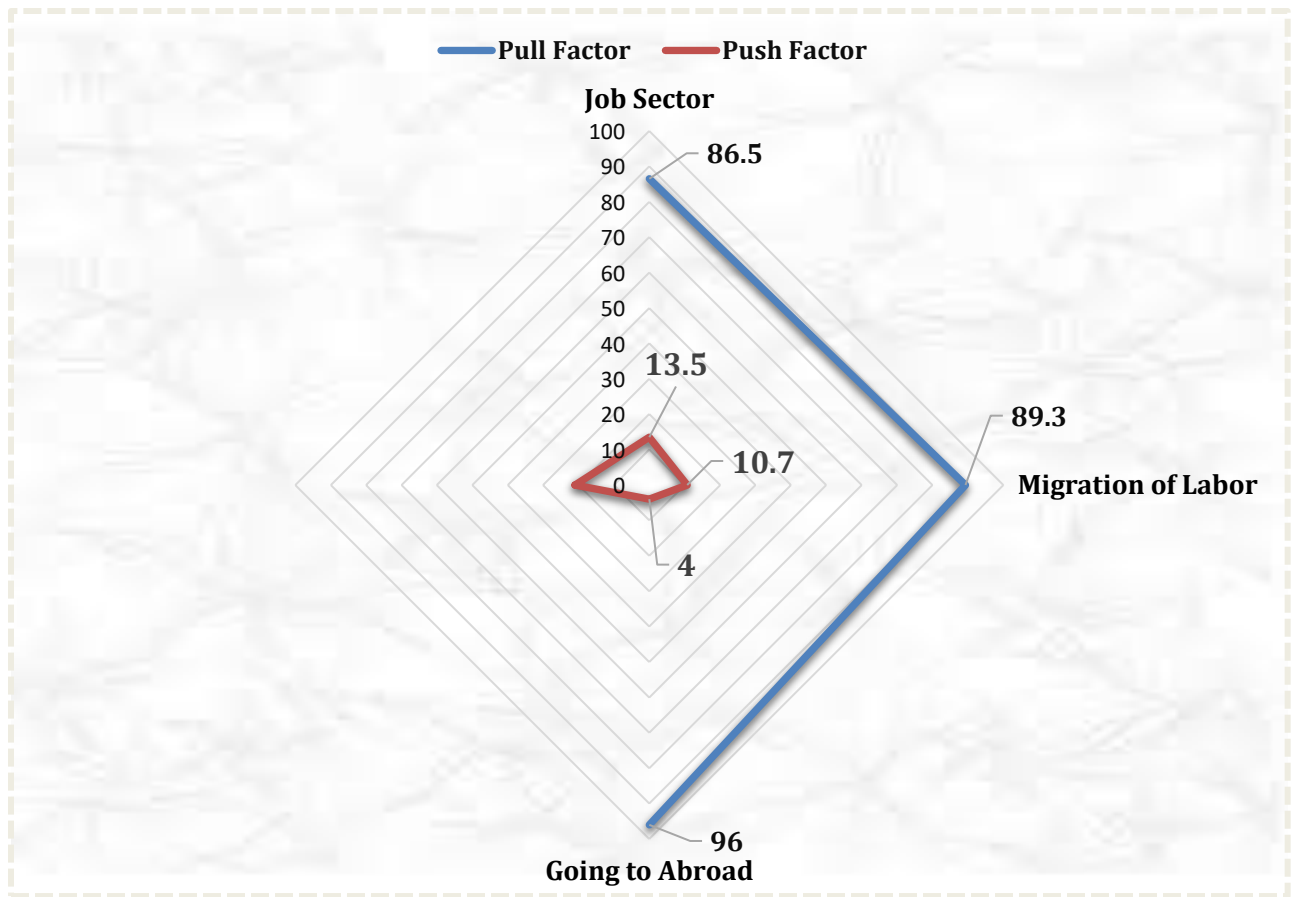


Figure 4.11: Factors Attracting Mobility of Labor

Table-4.1.31 shows that due to the construction of Bangabandhu Bridge and its associated development, the intensity of change has increased very much and moderately increased. The job sector has expanded and increased and 47.8% of respondents supported it and 51.4% of respondents think that the job sector is moderately developed. The pull factor is attracting 86.5% of respondents and the Push factor is attracting 13.5% of respondents. Migration of labors has very increased and 45.3% respondents accepted the notion and 43.7% respondents think that migration of labors has moderately increased. About 9.4% of respondents think that migration of labor has decreased for local development. About 89.3% of migration is caused due to pull factors and 10.7% of migration is occurred due to push factors.

Going abroad is a new trend in the studied area. People are going to abroad for employment regularly. About 48.2% of respondents think that going abroad has increased very much and 41.3% think that going abroad has increased moderately. About 10.5% of respondents think that there has been no change in this sector. It was also found that 96%

of respondents are going abroad for the pull factor and only 4% are going there for the push factor.

Table-4.1.32: Changes in the Communication System after Bangabandhu Bridge Construction (Five Districts)

Type of transportation	Increased very much	Moderately Increased	Increased Slightly	Same as before	Decreased
Rail communication	46.9	45.7	1	3.8	2.6
Sufficiency of vehicle	43.5	53.9	2.4	0.2	
Private car, microbus, and ambulance	38.1	49.4	12.5		
Van, rickshaw, auto-rickshaw, CNG	60.7	37.3	2		
Opportunity Created					
Time of travelling	15.7	2.6	.2	1.8	79.6
Money needed to travel	15.5	32.5	0.8	0.2	51.0
Frequency of travelling	44.8	53.0	1.2	0.2	0.8
Money needed to transport	14.7	21.4	14.7	0.2	49

It is observed in Table4.1.32 that 46.9 percent of respondents think that rail communication has been increased very much and another 45.7 percent of respondents think that rail communication is increased moderately and 3.8 percent think it is the same as before. On the contrary, there is a sufficiency of vehicles in the studied areas. Almost 43.5 percent agree that there are many increases in vehicles and 53.9 percent agree that there is a moderate increase in vehicles in these areas. About 38.1 percent of respondents think that there is the availability of microbus, private cars, and ambulances, and 49.4 percent respondents think the number is moderately increasing. Moreover, 12.5 percent of respondents told that the number is slightly increasing. Besides, 60.7 percent of respondents opined that the Van, rickshaw, auto-rickshaw, CNG auto-rickshaw are increasing at a very speedy rate.

The development of communication systems has created some opportunities in the studied regions.

Time of traveling has decreased at 79.6% that is pleasing the people of the entire region. The Bangabandhu Bridge has shortened the travel time from Sirajganj to Dhaka and Dhaka to Sirajganj. Some of the FGDs participants opined:

Bangabandhu Bridge is the blessings for the inhabitants of Sirajganj. Today, inhabitants of Sirajganj can go to Dhaka early at morning and after finishing their official activities or commerce and trade activities we can return to Sirajganj at noon and take our lunch at home. Bangabandhu Bridge is playing an important role for the development of the whole part of North Bengal. It is the entry door of the northern part of Bangladesh.

About 51.0 percent of respondents think that their travel cost has been decreased on the opposite side 32.5 percent of respondents think that traveling cost has increased moderately. About 45.0 percent of respondents think that the frequency of traveling has increased very much and dramatically and another 53 percent of people think that frequencies of traveling have increased moderately. But the transportation costs of the goods have reduced according to 49.0 percent. Although a larger percent of increase was seen in the sectors but there needs a consistent development of few areas. It was found from the FGD as mentioned by the participants:

There is no alternative in developing the communication system, skill development, employment creation, flourishing the entrepreneur, and promoting the local industry. Everyone asked for increasing the recreational facilitation including the Park.

Table-4.1.33: Economic Inequalities Resulted from Bangabandhu Bridge Construction

Economic Inequalities	Increased	Slightly Increased	Same as Before	Decreased
Income inequality	27.2	34.5	9.3	29
Employment inequality	28.3	28.7	10.3	32.7
Cooperation between two regions	71.3	28.3	0.4	0.00
Diversity in economic activities	65.5	33.9	0.6	0.00
Receipt of local products	79.1	20.8	0.2	0.00
Price of local products	56.6	33.1	1.4	8.9

Table –4.1.33 shows that due to the construction of the Bangabandhu Bridge financial inequalities are somehow mitigated and decreased and there creates a balance between the east and west of the river Jamuna. About 27.2% of respondents think income inequality has been increased and 34.5 percent of respondents think it is slightly increased. But 29% of respondents think that income inequality has been decreased. 32.7 % of respondents suppose employment inequalities have decreased but 28.3% of them suppose it is increased and another 28.7% supposed that inequality of employment has slightly increased. But 71.3% of respondents think that cooperation between two regions has increased on a large scale and diversity in economic activities has increased 65.5%. Moreover, 56.6% of respondents think that price of local products has increased and 33.1% think the price has slightly increased.

Due to the construction of the Bangabandhu Bridge, the Manga Situation has reduced, socio-economic condition of North Bengele has upgraded and the time of travel has also reduced remarkably. From the FGD based qualitative data, it is found from the speech of one participant mentioned as:

Once upon a time before liberation people took 3 or 5 days to reach North Bengal of the country. This Jamuna Bridge is considered as a key to development of our county. Due to establishment of Jamuna Bridge the munga situation has been reduced or the socio-economic condition of North Bengal has been improved for better communication. Now, the young people or youth can get the opportunities to access the higher education in Dhaka or other cities. Health and education facilities have been improved. This bridge has changed the picture of Bangladesh.

4.1.2. INFRASTRUCTURE AND SOCIAL CONDITION IN THE STUDY AREA

Table 4.1.34: Previous Condition of Roads in the Local Community

Nature of the Road	Percentage of Cases	Responses	
		N	Percentage
Muddy Road	48.8%	246	47.6%
Brick Built Road	8.7%	44	8.5%
Concrete road	45.0%	227	43.9%
Total	102.6%	517	100.0%

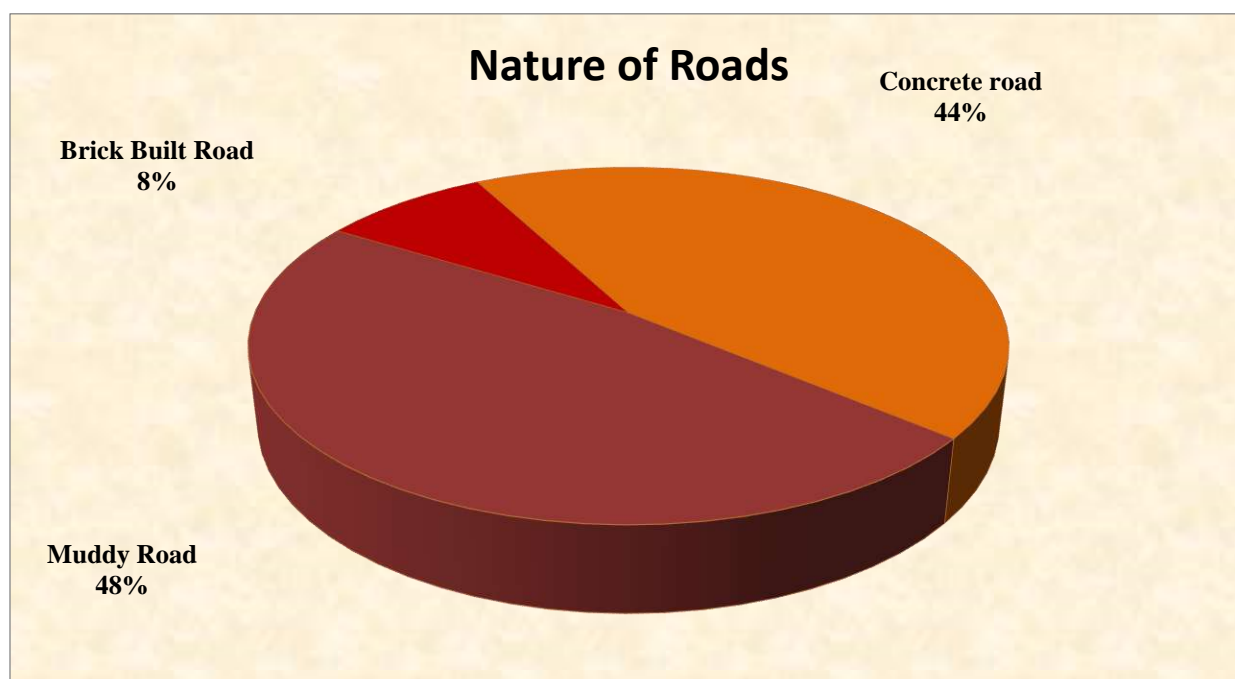


Figure 4.12: Nature of Roads

Table-4.1.34 shows the percentage of roads constructed in the studied area. Previously 48.8 percent of roads were muddy and 8.7 percent of roads were brick built and 45.0 percent of roads were made of concrete.

Table 4.1.35: Present Condition of Roads in the Local Community

Nature of the Road	Percentage of Cases	Responses	
		N	Percentage
Muddy Road	44.6%	184	43.3%
Brick Built Road	5.1%	21	4.9%
Concrete road	53.3%	220	51.8%
Total	102.9%	425	100.0%

Table- 4.1.35 indicates that among the roads at present in the community of the 425 respondents there are 44.6 percent of roads are muddy, 5.1 percent of roads are brick-built

and 53.3 percent roads are made of concrete. It clearly indicates that the amount of brick-built and concrete roads is increasing.

Table 4.1.36: Previous Means of Local Transportation

Nature of Transport	Percentage of Cases	Responses	
		N	Percentage
Auto rickshaw	34.6%	175	15.0%
Electric Van	44.3%	224	19.1%
Paddled Rickshaw	55.5%	281	24.0%
Paddled Van	37.4%	189	16.2%
Easy bike	23.3%	118	10.1%
CNG- Autorickshaw	15.0%	76	6.5%
Tempu	6.1%	31	2.6%
Bus	2.0%	10	0.9%
Micro	3.6%	18	1.5%
Others	9.5%	48	4.1%
Total	231.2%	1170	100.0%

Table- 4.1.36 shows that among the 1170 multiple responses, previously people were using auto-rickshaw for 34.6% cases, electric van for 44.3 percent, paddled rickshaw for 55.5 percent cases, paddled van for 37.4 percent cases, Easy bike for 23.3 percent cases, CNG auto-rickshaw for 15.0 percent cases, Tempu auto for 6.15 cases. It is notable that bus is used for 2.0 percent of cases and for 9.5 percent of cases bicycles and other vehicles are used for local transportation.

Table 4.1.37: Present Means of Local Transportation

Nature of Transport	Percentage of Cases	Responses	
		N	Percentage
Auto rickshaw	61.5%	310	19.9%
Electric Van	59.7%	301	19.3%
Paddled Rickshaw	17.7%	89	5.7%
Paddled Van	20.4%	103	6.6%
Easy bike	58.3%	294	18.8%
CNG- Auto rickshaw	38.9%	196	12.6%
Tempo	2.6%	13	0.8%
Bus	16.7%	84	5.4%
Micro	26.2%	132	8.5%
Others	7.5%	38	2.4%
Total	309.5%	1560	100.0%

Table-4.1.37 shows that among the 1560 multiple responses, currently, people were using auto-rickshaw for 61.5% of cases, electric van for 59.7 percent, paddled rickshaw for 17.7 percent cases, paddled van for 20.4 percent cases, Easy bike for 58.3 percent cases, CNG auto-rickshaw for 38.9 percent cases, Tempu auto for 2.6 percent cases.

It is remarkable that bus is used for 16.7 percent of cases, micro for 26.25 cases, and for 7.5 percent of cases, bicycles and other vehicles are used for local transportation. The data from the table shows that the use of electric auto-rickshaws, micro, and the bus has created a new trend in local transportation. Motor cycle use is also significant in local areas at the present time.

Table 4.1.38: Previous Medium of Information Communication

Medium of Communication	Percentage of Cases	Responses	
		N	Percentage
Post office	72.0%	363	44.1%
Internet	4.2%	21	2.6%
Mobile	69.4%	350	42.5%
Courier Service	17.5%	88	10.7%
Others	0.2%	1	0.1%
Total	163.3%	823	100.0%

It is found in the Table-4.1.38 that among the 823 multiple responses the total case percentage are 163.3 percent. In this case, 72.0 percent of cases used the post office and it is 44.1 percent of the total respondents. On the contrary, 4.2 percent of cases (2.6% respondents) used the internet and 69.4 percent cases (42.5% respondents) used mobile phones in previous years. Only 17.5 percent cases (10.7% respondents) used courier services.

Table 4.1.39: Present Medium of Information Communication

Medium of Communication	Percentage of Cases	Responses	
		N	Percentage
Post office	50.8%	256	20.3%
Internet	53.8%	271	21.5%
Mobile	99.0%	499	39.6%
Courier Service	46.4%	234	18.6%
Others	0.2%	1	0.1%
Total	250.2%	1261	100.0%

It is revealed from Table-4.1.39 that within 1261 multiple responses the total case percentage is 250.2 percent. It is an interesting finding that 99.0 percent of cases (39.6%) respondents are using mobile phones. About 51.0 percent of cases (20.3% of respondents) are using the services of the post office and 21.5 percent of respondents are using internet

facilities. The use of courier service has increased at 46.4 percent cases that are of 18.6 percent of respondents in the present days.

Table-4.1.40: The Use of Electricity Facilities

The Use of Electricity Facilities	Yes		No	
	Before	Present	Before	Present
	81.4	95.4	18.6	4.6

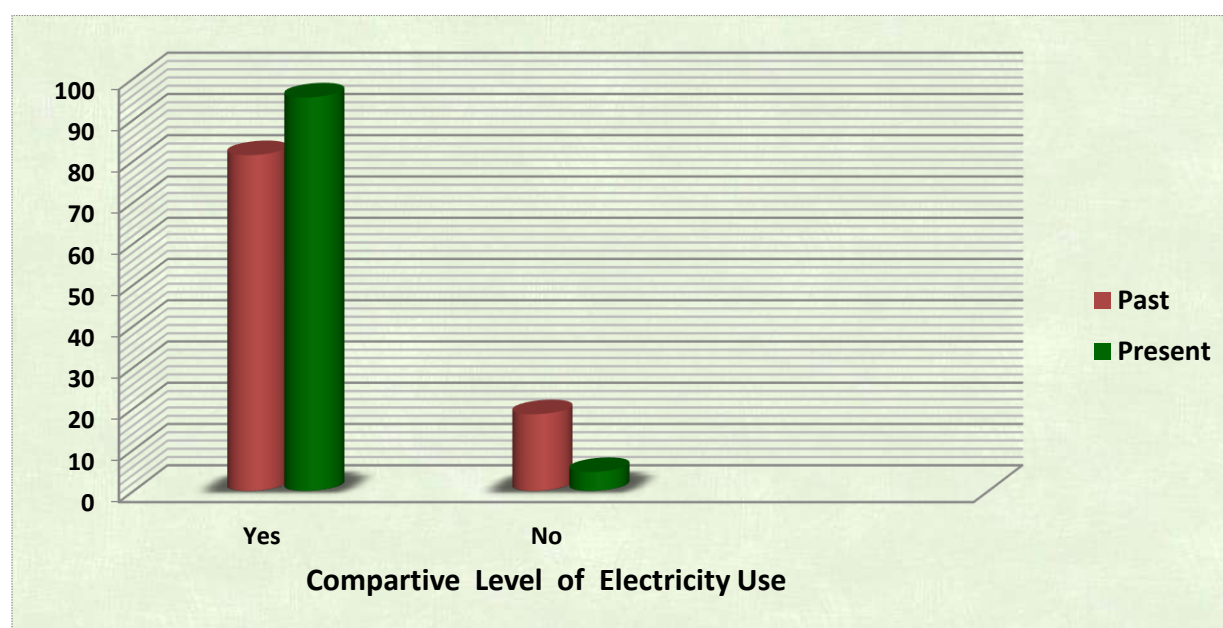


Figure 4.13: Comparative Level of Electricity Use

Figure-4.13 shows that in the previous years, 81.4 percent of respondents used electricity, but nowadays 95.4 percent of respondents are using electricity in their households.

Table-4.1.41: Previous Facilities of Natural Fuel Use in Community

Nature of Fuel Use	Percentage of Cases	Responses	
		N	Percentage
Straw/Wood/Bamboo/Dried branches of tress	92.2%	464	85.0%
Supply Gas	2.4%	12	2.2%
Liquid Gas in Cylinder	13.7%	69	12.6%

Others	0.2%	1	0.2%
Total	108.5%	546	100.0%

It is seen from Table-4.1.41 that in the previous time, among the 546 responses 92.2 percent cases (85.0%) of respondents' families used straw, wood, bamboo, tree leaves, dried branches of trees, etc. for their fuel need. Only 2.2 percent of respondents used supply gas from the pipeline. Then in 13.7 percent of cases (12.6%), respondents' families used liquid gas in cylinders.

Table 4.1.42: Present Facilities of Natural Fuel Use in Community

Nature of Fuel Use	Percentage of Cases	Responses	
		N	Percentage
Straw/Wood/Bamboo/ Dried branches of tress	63.8%	319	48.6%
Supply Gas	5.0%	25	3.8%
Liquid Gas in Cylinder	62.4%	312	47.5%
Others	0.2%	1	0.2%
	131.4%	657	100.0%

It is observed in Table- 4.1.42 that among the 657 multiple responses currently 63.8 percent of cases (48.6% of respondents' families) are using Straw/Wood/Bamboo/ Dried branches of trees and only 3.8 percent of respondents are observed to use Supply gas from the pipeline. But Liquid Gas in Cylinder is getting popular among the respondents of the study areas. Almost 62.4 percent of cases (47.5% respondents) are using Liquid Gas in Cylinder. But electric cookers, rice cookers, curry cookers were found to be recent popularity among the people in the study area.

4.1.3. SOURCES OF WATER AND SANITATION IN LIVING PLACES

Table 4.1.43: Cross Tabulation of Type of Ownership

Type of the ownership you have on your living place (Before) * Type of the ownership you have on your living place (Present) (Cross-tabulation)							
Type of Ownership		Type of the ownership you have on your living place (Present)					Total
		Ancestral home	Own house	On rent	Staying in someone home	Others	
Type of the ownership you have on your living place (Before)	Ancestral home	91.9%	6.3%	0.7%		1.1%	100.0 %
	Own house		97.8%	2.2%			100.0 %
	On rent			75.0%		25.0%	100.0 %
	Staying in someone home		7.4%		92.6%		100.0 %
	Others					100.0 %	100.0 %
Total		49.7%	39.6%	1.8%	5.0%	4.0%	100.0 %

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1414.153 ^a	16	.000
N of Valid Cases	503		
.			

The chi-square test was used to test whether there is an association between Type of the ownership you have on your living place before and after opening the Bangabandhu Bridge. The p-value corresponding to the Chi-Square statistic reveals that there is a strong association ($p < 0.01$) between type of the ownership the respondents have on their living place before and after opening the Bangabandhu Bridge.

Table 4.1.44: Cross-Tabulation of Type of Habitat

Type of the habitat(Before) * Type of the habitat (Present) (Cross-tabulation)							
Types of Habitat		Type of the habitat (Present)					Total
		Paka	Adhapaka (Tin Shed)	Kacha	Tin/wood/Bambo	Soil/Kharkuta	
Type of the habitat (Before)	Paka	98.1%	1.9%				100.0%
	Adhapaka (Tin Shed)	1.9%	98.1%				100.0%
	Kacha	5.0%	5.0%	90.0%			100.0%
	Tin/wood/Bambo	2.5%	4.9%		92.6%		100.0%
	Soil/Kharkuta					100.0%	100.0%
Total		22.3%	42.6%	3.6%	30.1%	1.4%	100.0%

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1838.843 ^a	16	.000
N of Valid Cases	502		

The chi-square test was used to test whether there is an association between the Type of habitat before and after opening the Bangabandhu Bridge. The p-value corresponding to the Chi-Square statistic reveals that there is a strong association ($p < 0.01$) between the type of habitat before and after opening the Bangabandhu Bridge.

Table-4.1.45: Cross- Tabulation of the Condition of Habitat

Condition of habitat (Before) * Condition of habitat (Present) Crosstabulation							
Condition of the Habitat		Condition of the Habitat (Present)					Total
		Very good	Good	Moderate	Bad	Very bad	
Condition of the habitat (Before)	Very good	100.0%					100.0%
	Good	2.7%	97.3%				100.0%
	Moderate	2.1%	10.7%	86.4%	0.7%		100.0%
	Bad				100.0%		100.0%
	Very bad					100.0%	100.0%
Total		15.2%	45.7%	24.2%	13.0%	2.0%	100.0%

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1828.459 ^a	16	.000
N of Valid Cases	501		

In the current study, the chi-square test was used to test whether there is any association between condition of habitat before and after the opening the Bangabandhu Bridge. The p-value corresponding to the Chi-Square statistic reveals that there is a strong association ($p < 0.01$) between condition of the habitat before and after opening the Bangabandhu Bridge.

Table 4.1.46: Cross Table of Type of Toilet Use

Type of toilet use (Before)* Type of toilet use (Present)- Cross-tabulation							
Type of Toilet Use		Type of toilet use (Present)					Total
		Open place	Combine d toilet	Persona l sanitary latrine	Personal slub made with rings	Hangi ng toilet	
Type of toilet use (Before)	Open place	100.0 %					100.0 %
	Combined toilet	2.6%	50.0%	47.4%			100.0 %
	Personal sanitary latrine			100.0%			100.0 %
	Personal slub made with rings			0.9%	99.1%		100.0 %
	Hanging toilet				6.3%	93.8%	100.0 %
Total		0.6%	7.6%	67.1%	21.7%	3.0%	100.0 %

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1361.184 ^a	16	.000
N of Valid Cases	502		

In this Table the chi-square test was used. The chi-square test was used to test whether there is any association between type of toilet use before and after the opening the Bangabandhu Bridge. The p-value corresponding to Chi-Square statistic reveals that there is a strong association ($p < 0.01$) between type of the toilet use before and after opening the Bangabandhu Bridge.

Table-4.1.47: Ownership of the Sources of Water

Types of Water	Source of water							Ownership					Neighbors
	Deep tube well	Shallow tube well	Supply	Pond	Canal	River	Others	Own	Jointly own	Relative	Combined	Government	
Drinking water	20.1	78.9	0.2			0.2	0.6	88.5	8.4	0.6	0.4	1.2	0.8
Cooking water	20.1	78.9		0.2		0.2	0.6	88.5	4.4	0.4	0.2	1.4	1
Shower water	19.5	78.7		1		0.2	0.6	88.2	8.2	0.4	0.2	1.4	1.4

Table-4.1.47 indicates that 78.9 percent of respondents had to use shallow tube-well water for drinking and cooking. On the other hand, another 78.7 percent used shallow tube-well water for taking baths. The respondents owned more than 88 percent of shallow tube-wells.

4.1.4. EDUCATION AND HEALTH CONDITION

Table 4.1.48: Pattern of Educational Institutions in the Locality

Educational institution	Percentage of Cases	Responses	
		N	Percentage
Primary School	93.5%	463	22.5%
High School	88.3%	437	21.2%
College	51.5%	255	12.4%
Moktab	52.7%	261	12.7%
Madrasa	68.9%	341	16.5%
Kindergarten	47.7%	236	11.4%
NGO School	13.5%	67	3.2%
Project School	0.4%	2	0.1%
Total	416.6%	2062	100.0%

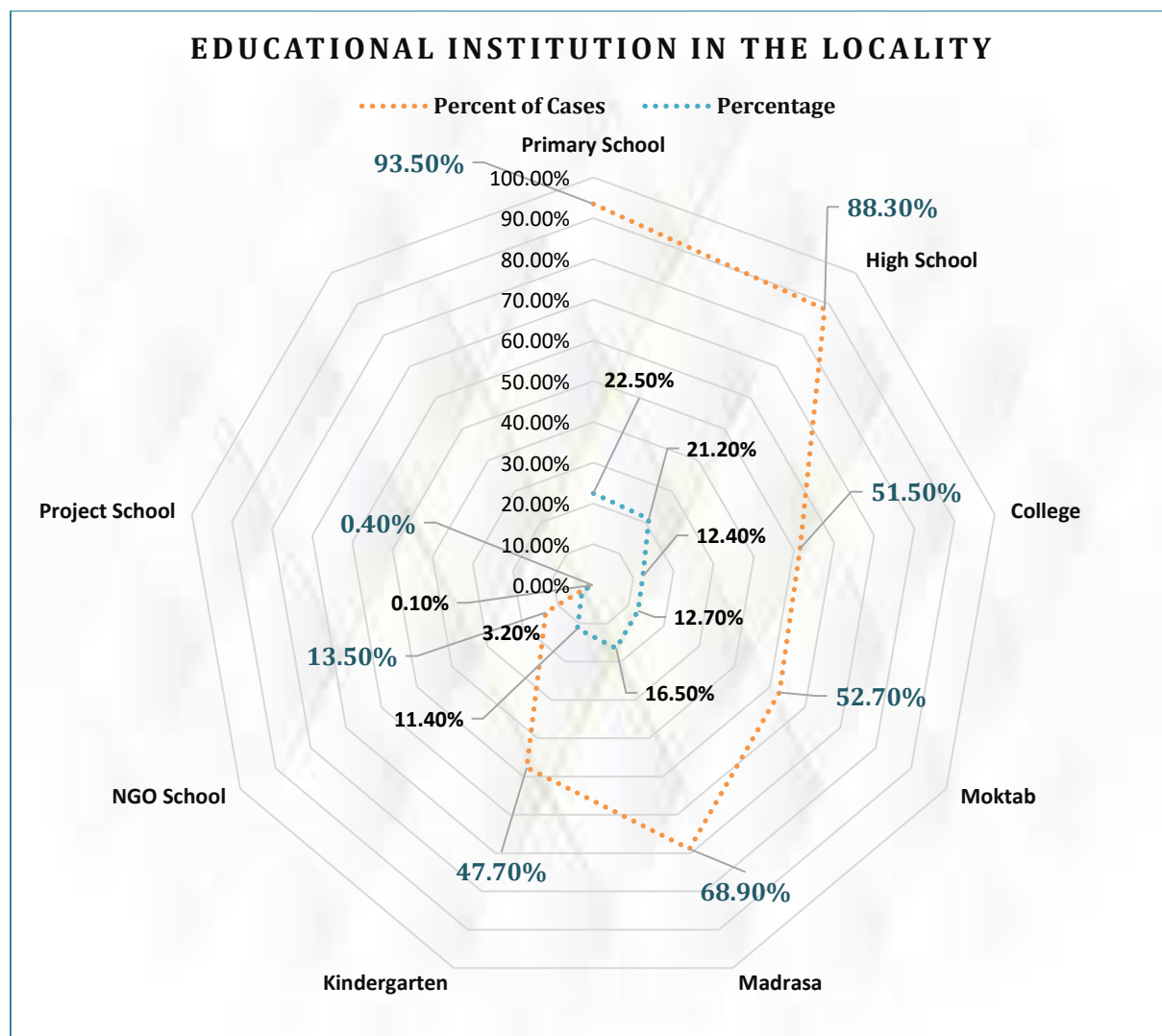


Figure 4.14: Educational Institution in the Locality

Figure- 4.14 shows that in the study area, among the 2062 multiple responses and 416.6% case percentages 93.5 percent of cases (22.5% respondents) are supposing primary school, 88.3% cases are high school, and 12.4 percent educational institutions (51.5% cases) are college. On the contrary, 52.7 percent of responses are for the cases of maktab (school for Arabic learning) that is 12.7 percent of the total respondents, and 68.9 percent cases (16.5% respondents) of educational institutions are Madrasa. There are 11.4 percent responses for the Kindergarten and 3.2 percent are NGO schools. The table also indicates that primary school, high school, and madrasah, moktab are available everywhere. NGO-based schools and project-based schools are relatively rare in these communities.

Table-4.1.49: Children Going to Study in Education Institution

Status of Study	Frequency	Percentage
Yes	342	68.1
No	160	31.9
Total	502	100.0

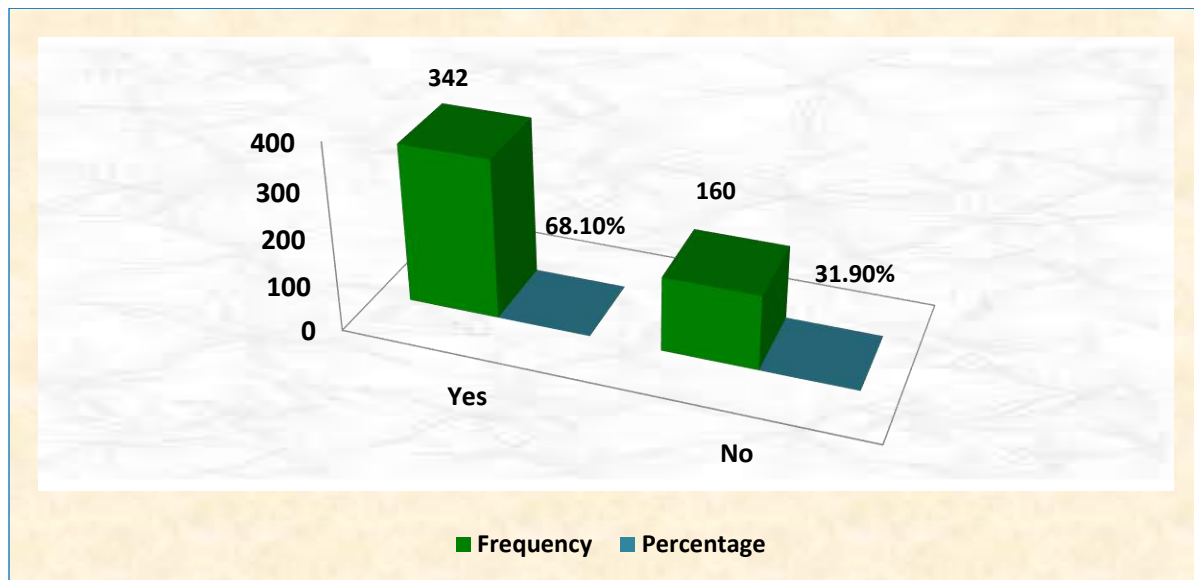


Figure 4.15: Children Going to Study in Education Institution

Figure-4.15 shows that among the 502 respondents 342 respondents have their children study in the educational institution and the Percentage is 68.10 percent. On the other hand, 160 respondents have no children in an educational institution at the current stage and the percentage of it is 31.90 percent.

Table-4.1.50: Type of Educational Institution Where Children Study in (Five Districts)

Types of Educational Institution	Percentage of Cases	Responses		
		N	Percentage	
Rehabilitation Project Primary School	2.6%	9	1.7%	
Govt. Primary School	54.4%	190	34.9%	
High School	49.3%	172	31.6%	
College	22.1%	77	14.1%	
University	7.2%	25	4.6%	
Govt. Madrasha	2.3%	8	1.5%	
Non-govt. Madrasha	15.8%	55	10.1%	
Others	2.6%	9	1.7%	
Total	156.2%	545	100.0%	

Table-4.1.50 shows that among the 545 multiple responses and 156.2% case Percentage children are studying in educational institutions for 2.6 percent cases (1.7% responses) children are studying in Rehabilitation Project Primary School, 54.4 percent cases (34.9% responses) children are studying in Government Primary School, the 49.3 percent cases (41.6% responses) children are studying in High school and 14.1 percent responses are studying in colleges. It is remarkable that 7.2 percent of cases are studying at the university level. The ratio of Madrasha's education is also remarkable. About 15.8 percent of cases were found to be studied at Non-Government Madrasha that is 10.1 percent of total responses.

Table-4.1.51: Opinion about Education System (Five Districts)

Status of Education System	Frequency	Percentage
Very good	53	11.4
Good	299	64.4
Moderate	100	21.6
Not good	10	2.2

Not good at all	2	.4
Total	464	100.0

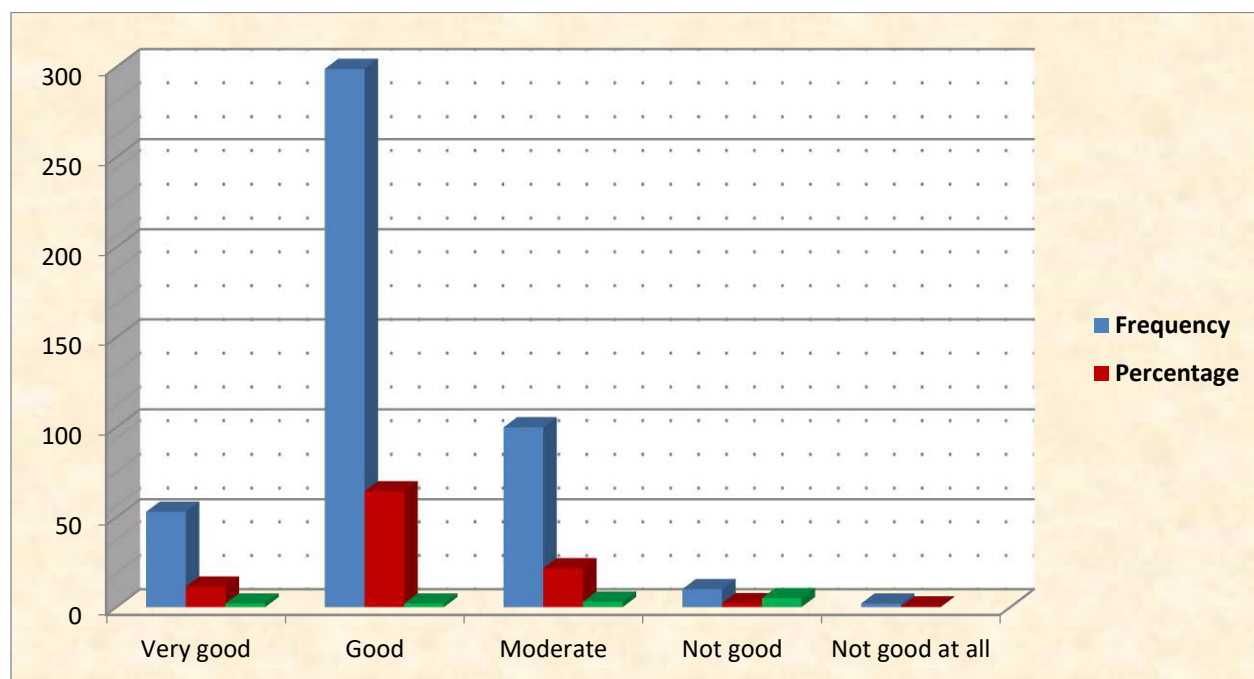


Figure4.16: Opinion about Education System

It is revealed from Table-4.1.51 that among the 464 respondents 11.4 percent supposed the education system is very good. On the contrary, 64.4 percent of respondents think that the education system is good and 21.6 percent were in favor of the moderate status of the education system. Only 2.2 percent of respondents did not please with the status of the education system and they think the education system is not good.

Increasing Crimes and Delinquency

Prevalence of the different types of crime has been found because of infrastructural market development and a huge gathering of population related to technology use to some extent in that area. From the FGDs findings, it has also been found that juvenile delinquency has been increased due to easy communication with the capital city. One of the participants mentioned:

Crimes have been increased rapidly due to technological development which is also contribution of Bangabandhu Bridge in this area.

It was found from another FGD that:

Crimes have been increased rapidly due to technological development which is also contribution of Bangabandhu Bridge in our local area.

It was also found from the qualitative data that use of drugs and abuse of drugs is a critical condition for the society. As mentioned in the FGD:

Drug addiction is seen as a life annihilating biopsychic and social disease in this area and has spread to the remote area due to the availability of drug and improved transportation and communication.

Table-4.1.52: Family Members Suffer from Diseases

Name of the Diseases	Percentage of Cases	Responses	
		N	Percentage
Seasonal Cold& Flu	74.2%	322	17.0%
Dysentery	26.7%	116	6.1%
Cholera	12.0%	52	2.7%
Skin Disease	15.2%	66	3.5%
Fever	65.7%	285	15.0%
Asthma	8.1%	35	1.8%
Tuberculosis	17.1%	74	3.9%
Malaria	3.5%	15	0.8%
Diabetes	18.9%	82	4.3%
Back Pain	27.0%	117	6.2%
Headache	61.1%	265	14.0%
Cold & Cough	47.7%	207	10.9%
Hypertension	25.8%	112	5.9%
Hypotension	20.7%	90	4.7%
Others	13.1%	57	3.0%
Total	436.6%	1895	100.0%

It is observed in Table-4.1.52 that people in the study area were suffering from various types of diseases such as Seasonal cold and flu, Dysentery, Skin Disease, Tuberculosis, Diabetes, etc. In this table, there are 1895 multiple responses and the total case percentage

is 436.6 percent. Almost 74.2 percent of cases were found to suffer from Seasonal Cold and Flu that is 17.0 percent of the total responses. On the contrary, 65.7 percent of cases were suffering from fever that is 15.0 percent of the total responses. Even 61.1 percent of cases were being affected by Headache that constitutes 14.0 percent of the total responses.

Table 4.1.53: Institutions / Places the Respondents Take Medical Treatment

Places of Getting Treatment	Percentage of Cases	Responses	
		N	Percentage
Rehabilitation Area Health Center	0.2%	1	0.1%
Village Doctor	36.5%	184	12.3%
Govt. House to House Service	0.4%	2	0.1%
Community Clinic	48.8%	246	16.5%
Family Health Center	13.3%	67	4.5%
Govt. Union Health Center	20.2%	102	6.8%
Govt. Upazila/ District Hospital	74.2%	374	25.1%
Pharmacy	46.8%	236	15.8%
Religious Healers	10.5%	53	3.6%
Traditional Healers	6.7%	34	2.3%
Private Clinic	28.0%	141	9.5%
Others	9.9%	50	3.4%
Total	295.6%	1490	100.0%

With regard to the institution/places where respondents took medical treatment (Table-4.1.53) among the total 1490 Multiple responses 74.2 percent of respondents (cases) had medical treatment for a variety of disorders from Upazila/ District General Hospitals that constitute 25.1 percent of total responses. The basic reason for going to district hospitals was that there were no nearby hospitals that could provide available health medical services/treatment needed for bit severe diseases. Besides, 46.8 percent of respondents (cases) were found to have medical advice and treatment from the local pharmacy where unskilled and unauthorized village quack doctor constitute 15.8 percent of total responses. It was also seen in the table that 48.8 percent of respondents taking treatment from the community clinics constituted 16.5 percent out of total responses. Furthermore, people were also known to take medical treatments from a number of places like private clinics, Traditional and religious healers, village medical practitioners, etc.

Table- 4.1.54: Health Service Centers in the Community

Health Service Centers	Percentage of Cases	Responses	
		N	Percentage
Community clinic	88.7%	430	37.2%
Bangabandhu Bridge (Health) service center	1.2%	6	0.5%
Union health center	50.1%	243	21.0%
NGO clinic	9.9%	48	4.2%
Family welfare center	36.1%	175	15.2%
Homeopathy	40.6%	197	17.1%
Others	11.5%	56	4.8%
Total	238.1%	1155	100.0%

Regarding the available health service centers, people generally take their emergency treatment in the study area several types of health centers are found. In Table-4.1.54 among the 1155 responses, 88.7 percent of respondents were confirmed that they have access to a community clinic constituting of 37.2 percent of total responses. Respondents of our study area generally had to go to the nearby community clinics as it was very near to their residence. On the contrary, 50.1 percent of respondents had access to the Union Health Centers that is also 21.0 percent of the total respondents. A significant number of respondents rely on homeopathic treatment. About 40.6 percent of respondents were seen to have homeopathic treatment from the local homeopathic doctor. Because homeopathic treatment is less costly than the other treatment facilities in the context of our study area. A very insignificant number of respondents were seen to have treatment from the Bangabandhu Bridge (Health) service center, NGO Clinics, and so on.

4.1.5. SOCIAL INDICATORS IN DAILY LIFE

Table 4.1.55: Social Indicators Related Opinions

Indicators	Very Good	Good	Moderate	Not Good	Not Good at All
Freedom of movement in the local community	54.7	39.7	5.5		
Freedom of expression and Speech in the local area	27.8	46	25.6	0.6	
Social Security in Local Area	50.6	41.1	6.5	1.8	
Freedom of Movement of the Teen-age Girls in the Local Area	44.2	43.8	11.7	0.4	
Freedom of Women in sharing opinion in the Local Area	50.7	50.7	23.6	2.2	
Security of Women in the Community	42.3	43.3	13.5	0.8	
Entertainment Facilities (Park/ Playground/ Library/ Cultural Activities)	17.3	31.9	19.6	19.5	11.7
Status of Local Government	19.2	28.7	36.8	8.3	6.9
Role of Local Administrative Officer in Community	17.8	33.4	37.5	6.7	4.5
Role of Law Enforcement Agency in Community	19.9	30.5	30.7	13.1	5.8

A number of indicators have been identified in Table-4.1.55 as the social indicators for showing the development pattern in the study community and the further needed development in the local community. Firstly, 54.7 percent of respondents were ensuring that they have a very good status of freedom of movement in the local community and 39.7 percent of them enjoyed the good status of freedom of movement in the community. Secondly, 46.0 percent of respondents had ensured that in their local community the state of freedom of expression and speech is good, another 27.8 percent of respondents opined very well and the rest of 25.6 percent of respondents enjoyed the moderate type of freedom of expression and speech. Thirdly, 50.6 percent of respondents had enjoyed a very good type of social security in the local area and 41.1 percent of the respondent told that the social security system was good. Fourthly, Teenage girls can move in society freely.

According to the survey, 44.2 percent of respondents had ensured that their teenage girls can move in the society freely and their freedom of movement is very good. On the other hand, 43.8 percent of respondents have ensured a good type of freedom of movement of their teenage girls in society. Fifthly, 50.7 percent of the study respondents also had ensured that their women in the society can share their opinions and the state of that opinion sharing is good. Besides, 23.4 percent of respondents stated that women's freedom of sharing opinions is very good, and 23.6 percent is moderate. Finally, the social security of the women in the study area is very good and good. Almost 42.3% of respondents opined very well and 43.3% of respondents opined good status of social security of women in the community life.

There is a scarcity of Entertainment Facilities (Park, Playground, Library, and Cultural Activities) in the study area. Only 17.3 percent of respondents think that they have very good entertainment facilities and 31.9 percent think it was good. But 19.5 percent of respondents think that facilities are not good and 11.7 percent of respondents think entertainment facilities are not enough and not good at all. The respondents of the study area had a mixed expression about the role of local government in their community life. 36.8 percent of respondents thought that local government body played a moderate role and 28.7 percent believed it played a good role in their community life. The role of local administrative officers was also found mixed in nature. Respondents are scattered in their opinions. About 30.5 percent of respondents belied that law enforcement agencies played a good role in social life and another 30.7 percent belied that they play a moderate role in the daily life of the community people. It was found from the qualitative data analysis of the in-depth case interviews of working mothers who take part in the decision making due to the economic solvency in family life even in the community life. As one woman mentioned:

I am a working mother and worked for big industry. My income is low but I am happy with that. I can take participation in any economic decision of my family.

4.1.6. POVERTY ERADICATION RELATED INFORMATION

Table- 4.1.56: Number of Daily Food Intake

Number of Food Intake		Frequency	Valid Percentage (%)
Valid	2 Times	6	1.3
	3 Times	336	70.6
	4 Times	134	28.2
	Total	476	100.0

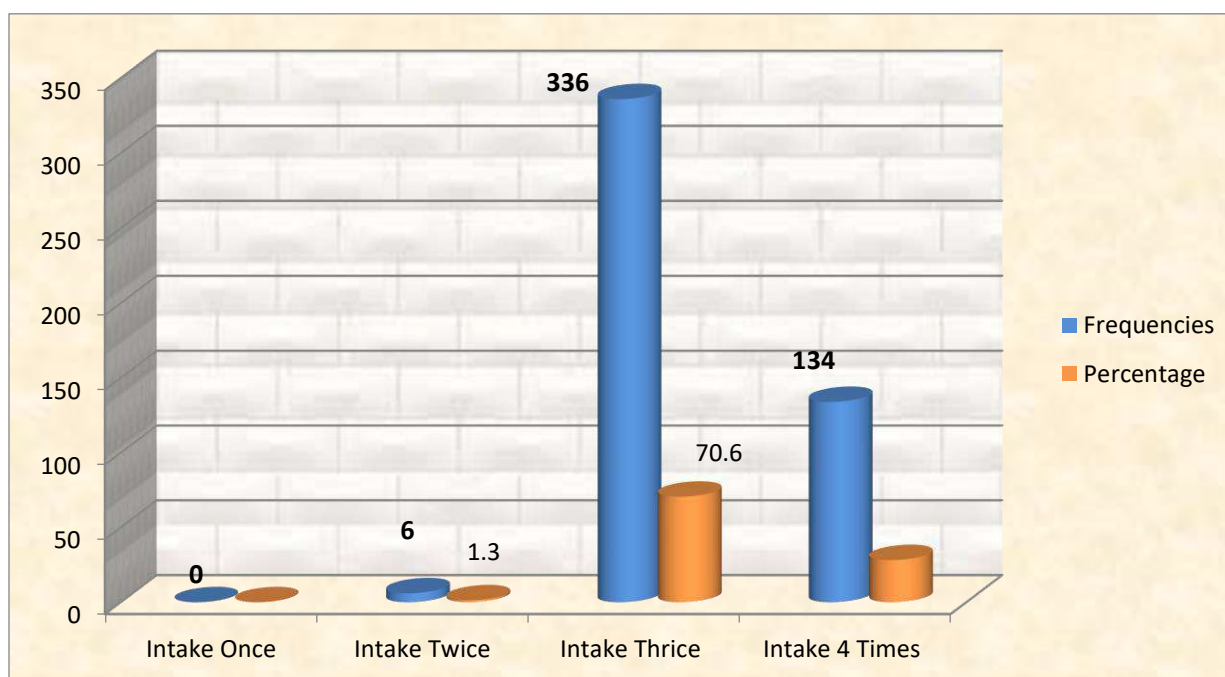


Figure 4.17: Number of Daily Food Intake

A number of daily food intake is an important indicator of Poverty. Table-4.1.56 indicates that among the 476 respondents 70.6 percent were taking 3 times of meals daily. On the Other hand, 134 respondents that constituted 28.2 percent of the total respondents were in taking four times of meals a day. Besides, only 1.3 percent of respondents took two times of meals a day.

Table- 4.1.57: Food Intake in the Morning

Name of the Food	Percentage of Cases	Responses	
		N	Percentage
Rice	96.4%	481	23.6%
Ruti (Homemade Bread)	32.9%	164	8.0%
Vegetables	87.2%	435	21.3%
Biscuit	6.0%	30	1.5%
Tea	17.4%	87	4.3%
Fish	39.5%	197	9.7%
Panta Vat (Watered Rice)	13.4%	67	3.3%
Bread	8.2%	41	2.0%
Meat	18.4%	92	4.5%

Pulse	73.7%	368	18.0%
Others	15.4%	77	3.8%
Total	408.6%	2039	100.0%

It is observed in Table-4.1.57 that the respondents of the study area were habituated to take various types of food in their breakfast. Among the 2039 multiple responses, 96.4 percent of respondents were habituated to eat rice in their breakfast that was 23.6 percent of their total responses. Besides, 87.2 percent of respondents informed that they prefer vegetables in their breakfast that is 21.3 percent of total responses. On the contrary, 73.7 percent of respondents prefer various types of cooked Pulse ('Dal' in Bengali), and that constitutes 18.0 percent of total respondents. Besides, 39.5 percent of respondents preferred to eat fish in their breakfast. Respondents were also eating insignificant percentages of other foods and drinks in the morning such as tea, bread, meat, biscuit, milk, etc.

Table- 4.1.58: Food Intake at Noon

Name of the Food	Percentage of Cases	Responses	
		N	Percentage
Rice	98.4%	482	23.1%
Ruti (Homemade Bread)	10.0%	49	2.4%
Vegetables	77.1%	378	18.1%
Biscuit	0.4%	2	0.1%
Tea	1.4%	7	0.3%
Fish	88.2%	432	20.7%
Panta Vat (Watered Rice)	6.7%	33	1.6%
Bread	1.8%	9	0.4%
Meat	51.2%	251	12.0%
Dal	82.2%	403	19.3%
Others	8.0%	39	1.9%
Total	425.5%	2085	100.0%

Table- 4.1.58 shows that among the 2085 respondents 98.4 percent respondents preferred to eat rice at Noon that constitutes 23.1 percent of the total respondents. Besides, 88.2 percent of respondents prefer to eat fish in their lunch and that constitutes 20.7 percent. Furthermore, 82.2 percent of respondents preferred Pulse (Dal), and 51.2 percent of respondents preferred Meat in their lunch. But, 77.1 percent of respondents preferred to

eat vegetables in their lunch that constitutes 18.1 percent of responses. Respondents also eat other types of food in their lunch but the Percentages are not much significant.

Table- 4.1.59: Food Intake in the Afternoon

Name of the Food	Percentage of Cases	Responses	
		N	Percentage
Rice	21.4%	47	8.9%
Ruti (Homemade Bread)	14.1%	31	5.9%
Vegetables	16.8%	37	7.0%
Biscuit	62.3%	137	25.9%
Tea	55.9%	123	23.3%
Fish	20.0%	44	8.3%
Panta Vat (Watered Rice)	5.5%	12	2.3%
Bread	2.7%	6	1.1%
Meat	15.5%	34	6.4%
Pulse (Dal)	17.7%	39	7.4%
Others	8.2%	18	3.4%
Total	240.0%	528	100.0%

It is found from Table-4.1.59 that among the 528 multiple responses 62.3 percent of respondents had their food intake in the afternoon with biscuit and that constituted 25.9 percent of the total responses. Another favorite drink for the afternoon is tea. 55.9 percent of respondents confirmed that they had tea in the afternoon. There are other traditional foods that study respondents eat during their afternoon intake, but those are not statistically important.

Table- 4.1.60: Food Intake at Night

Name of the Food	Percentage of Cases	Responses	
		N	Percentage
Rice	96.7%	470	25.7%
Ruti (Homemade Bread)	14.6%	71	3.9%
Vegetables	71.8%	349	19.1%
Biscuit	1.0%	5	0.3%
Tea	2.5%	12	0.7%
Fish	79.0%	384	21.0%
Panta vat (Watered Rice)	2.5%	12	0.7%

Bread	0.4%	2	0.1%
Meat	35.4%	172	9.4%
Pulse (Dal)	69.1%	336	18.3%
Others	3.9%	19	1.0%
Total	377.0%	1832	100.0%

It is found from the Table- 4.1.60 that among the 1832 multiple responses, 96.7 percent of respondents eat rice in their dinner that is 25.7 percent of the total respondents. On the contrary, 71.8 percent of respondents, 19.1 percent of total respondents eat vegetables in their dinner. About 79.0 percent of respondents preferred fish in dinner that is 21.0 percent of total responses. Besides, 35.4 percent of respondents preferred meat in their dinner. Although people eat many types of foods in their daily choices, other types of food intake are not statistically important in this research study.

4.1.7. EFFECT OF BRIDGE IN MITIGATING POVERTY

Table-4.1.61: Daily Food Intake Twice a Day

Daily Food Intake		Frequency	Percentage	Valid Percentage
Valid	Yes	162	31.8	32.9
	No	330	64.8	67.1
	Total	492	96.7	100.0
Missing System		17	3.3	
Total		509	100.0	

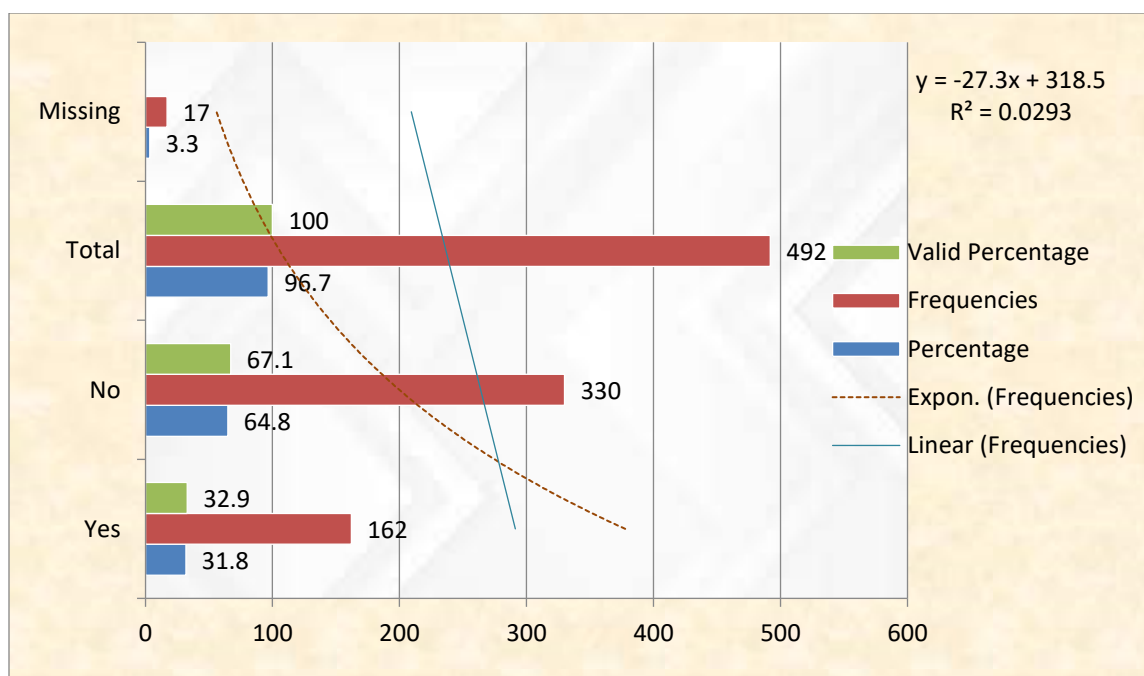


Figure 4.18: Daily Food Intake Twice a Day

In the study field, it was found (Figure-4.18) that with regard to the food intake twice a daily, about 33 percent of respondents reported their food intake was twice daily. On the contrary, 67 percent of respondents talked about their daily food intake three times. It is observed in the study field that on the grounds of low income earning and seasonal scarcity of food particularly in Chaitra and Baishakh Month of Bengali Calendar, above mentioned respondents could not take their foods three times a day. Here the table indicates that usual food habits and intake were found to be changed due to their income status and availability of food items in the research areas.

Table-4.1.62: Healthy Sanitation and Fresh Drinking Water

Sanitation and Fresh Drinking water		Frequency	Percentage	Valid Percentage
Valid	Yes	462	90.8	91.8
	No	41	8.1	8.2
	Total	503	98.8	100.0
Missing System		6	1.2	
Total		509	100.0	

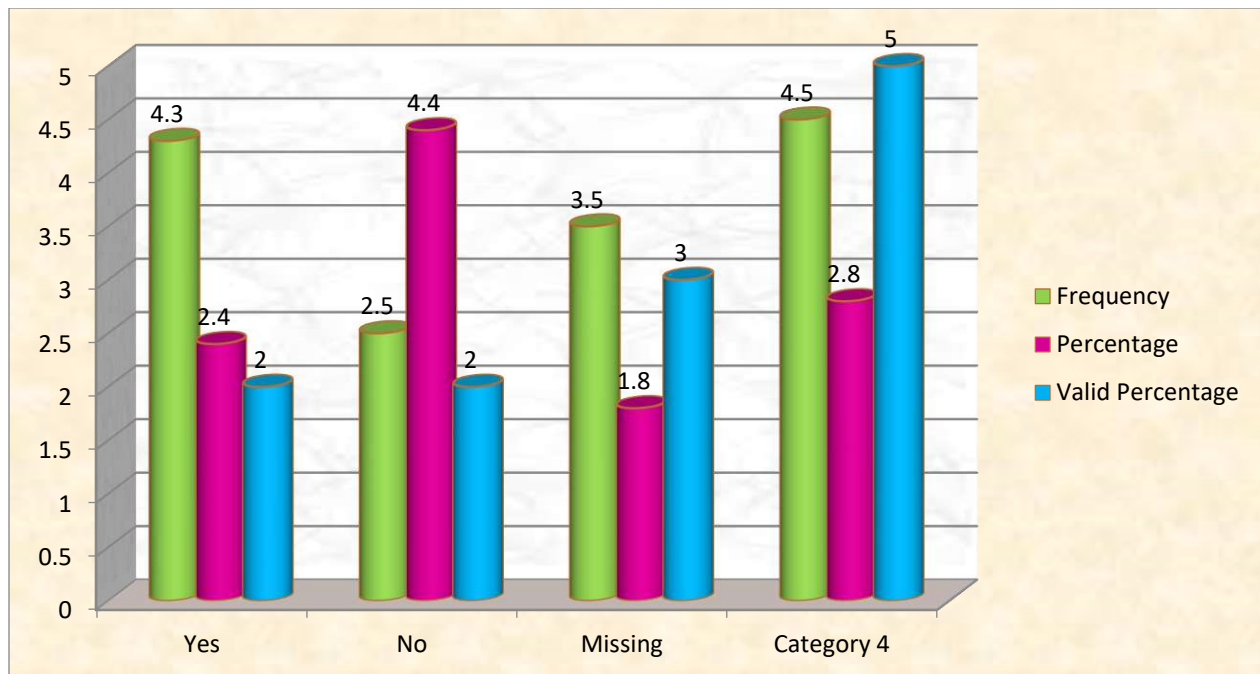


Figure 4.19: Healthy Sanitation and Drinking Water

Figure- 4.19 reveals that 91.8 percent of respondents had healthy sanitation and drinking water during the study. They used sanitary toilets and hand-washing devices after returning from the toilets and before eating something. Besides, respondents have a healthy sewerage system because they live in rural areas. Most of the respondents used tube wells water for their daily chores. It was observed that in the study area there is no scarcity of fresh drinking water, also people were seen to use fresh water in their daily household chores.

Table-4.1.63: Vegetable and Fruit Farm in Household

Vegetable and Fruit Farm		Frequency	Percentage	Valid Percentage
Valid	Yes	227	44.6	46.3
	No	263	51.7	53.7
	Total	490	96.3	100.0
Missing	System	1	1.2	
		18	3.5	
	Total	19	3.7	
Total		509	100.0	

It is observed in Table-4.1.63 that 46.3 percent of households had vegetables and fruit farms and 53.7 percent did not occupy any vegetable or fruit farms in the household area.

Table-4.1.64: Nature of Housing

Nature of Housing		Frequency	Percentage	Valid Percentage
Valid	Brick Build	173	34.0	37.1
	Tin Shed	243	47.7	52.1
	Mud Wall (Kacha)	50	9.8	10.7
	Total	466	91.6	100.0
Missing	System	43	8.4	
Total		509	100.0	

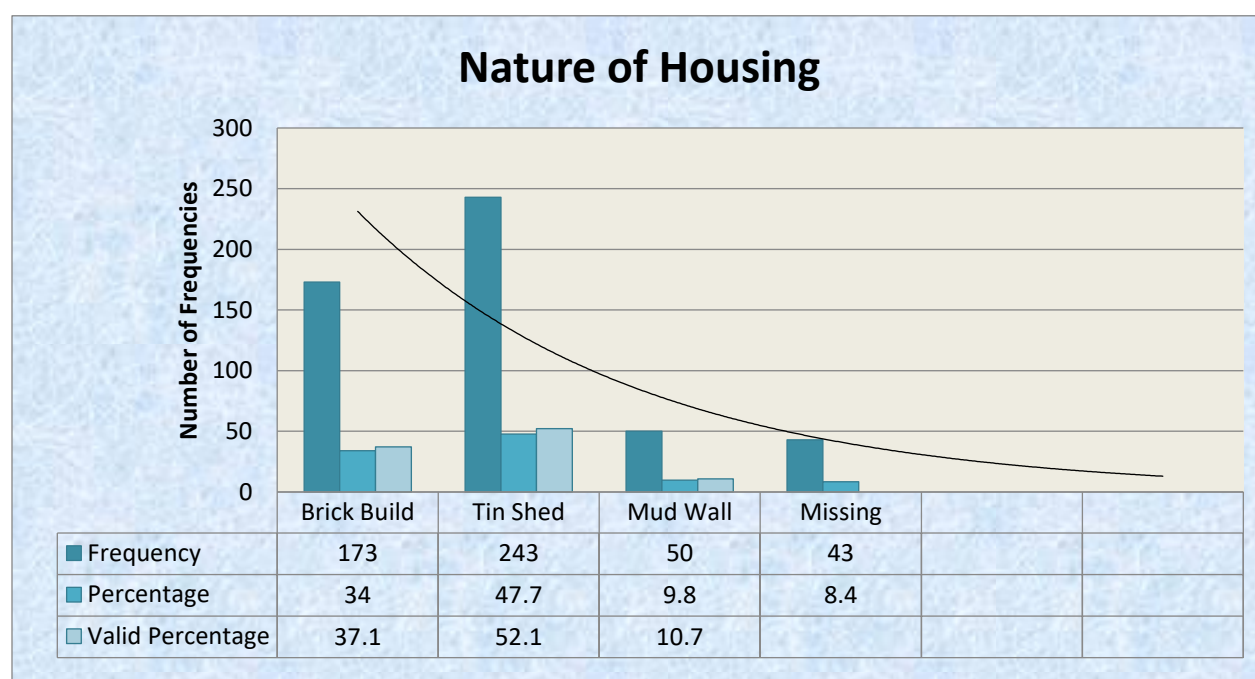


Figure 4.20: Nature of Housing

It is observed from Figure- 4.20 that the nature of housing in the study area is mainly brick-built, Tin shed building with Metal or wood walls, Tin shed building with mud walls. About 47.7 percent of buildings are made of tin shed roofs and metal/wood walls. On the other hand, 34.0 percent of building is brick-built with brick-built roofs and wall or tin shed roofs with brick-built full walls. Only 9.8 percent of houses are made of tin shed roofs and mud walls or others. It was observed that housing condition was relatively good enough in the study area.

4.1.8. EFFECTS OF BANGABANDHU BRIDGE IN MITIGATING POVERTY (UNDP MODEL)

Table-4.1. 65: Status of Education

Education		Frequency	Percentage	Valid Percentage
Valid	Yes	170	33.4	33.7
	No	334	65.6	66.3
	Total	504	99.0	100.0
Missing	System	5	1.0	
Total		509	100.0	

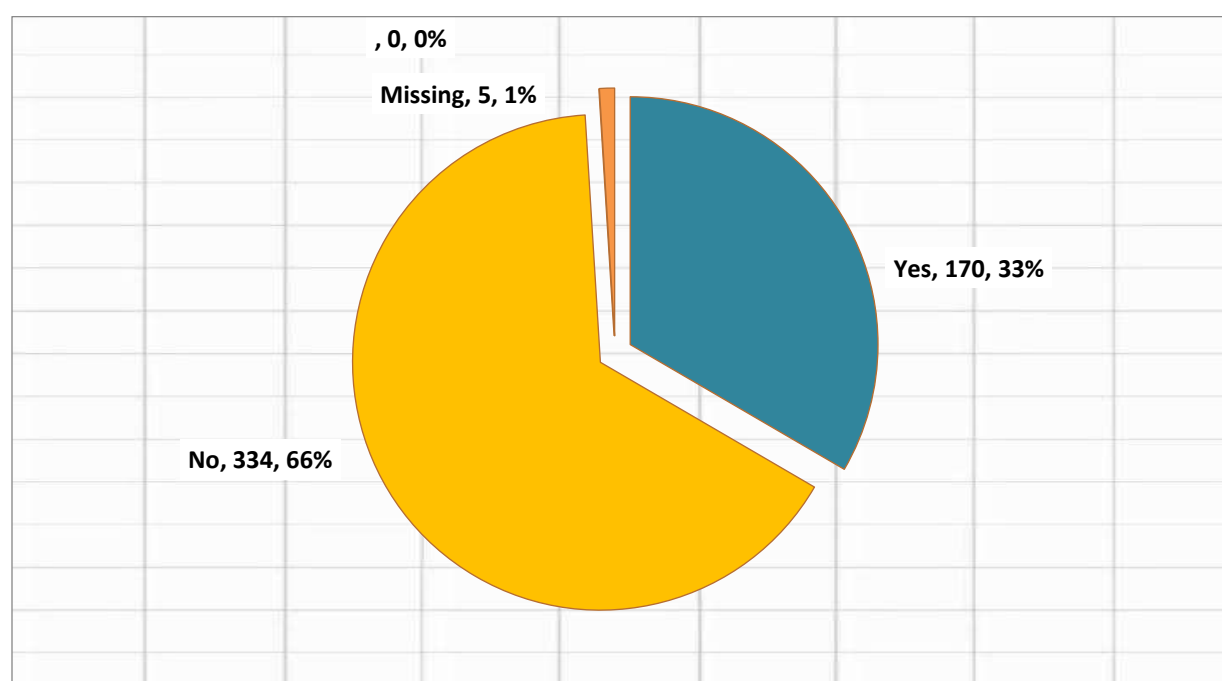


Figure 4.21: Status of Education

Figure-4.21 indicates that due to the construction the education rate in the study area has increased. Among the 504 respondents, 334 of them have completed their 05 years of primary education which means almost 66.3 percent of the respondents are educated and the rest of 33.7% are illiterate or could not complete the primary level. The data has shown that enrollment in primary school is 66.0 percent.

Table- 4.1.66: School Going Children are Absent

Status of School Going		Frequency	Percentage	Valid Percentage
Valid	Yes	216	42.4	43.1
	No	285	56.0	56.9
	Total	501	98.4	100.0
Missing	System	8	1.6	
Total		509	100.0	

It is observed from Table- 4.1.66 that among the valid 501 respondents 216 of them think that school-going children did not go to school in the study area that is 43.1 percent of the total respondents. On the converse scenario, 285 respondents think that school-going children went to school that is a total of 56.9 percent of the respondents. this result indicates that school-going children are not going to school on a full scale.

Table-4.1.67: At Least One Malnutrition Case in a Family

Malnutrition		Frequency	Percentage	Valid Percentage
Valid	Yes	105	20.6	20.8
	No	400	78.6	79.2
	Total	505	99.2	100.0
Missing System		4	0.8	
Total		509	100.0	

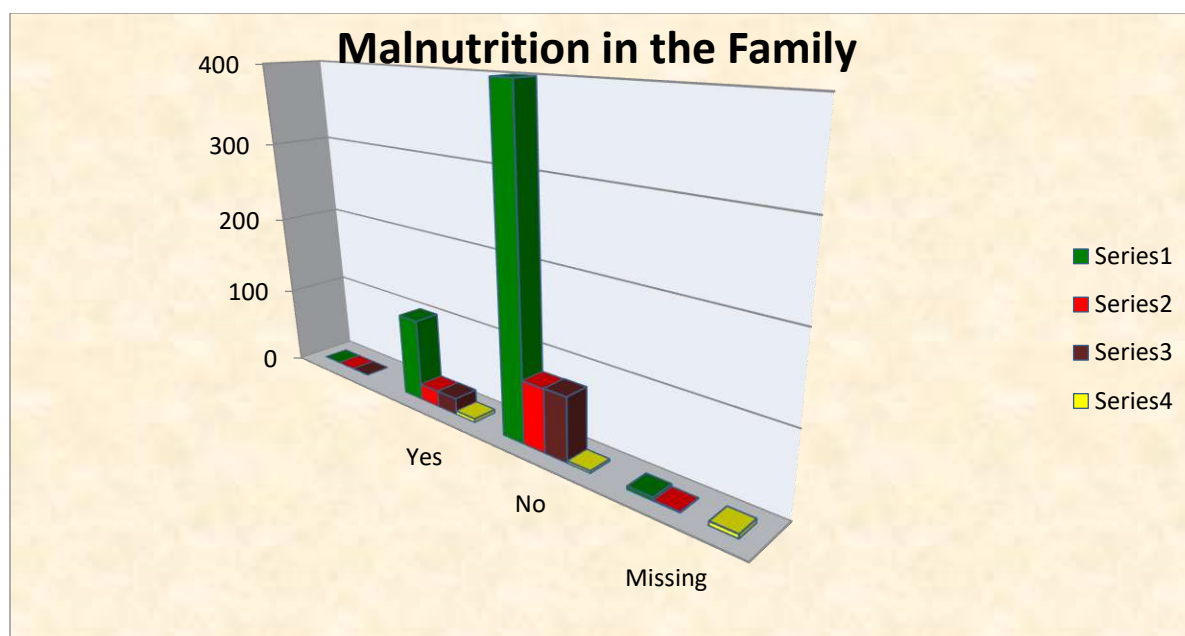


Figure 4.22: Malnutrition in the Family

Figure-4.22 shows that 20.8 percent of respondents' families were found to face at least one malnutrition case. On the other hand, 79.2 percent respondents' families had no malnutrition cases. It clearly shows that in the study area respondent's families are taking nutritious foods due to the availability of foods. After the construction of the Bangabandhu Bridge, the food production and availability of foods in the study areas have increased.

Table -4.1.68: Mortality of Child in the Family

Mortality of Child		Frequency	Percentage	Valid Percentage
Valid	Yes	68	13.4	13.5
	No	436	85.7	86.5
	Total	504	99.0	100.0
Missing System		5	1.0	
Total		509	100.0	

It is evident from Table- 4.1.68 that among the 504 valid responses 13.5 percent of the total respondents told that children have died before in the family. On the contrary, 86.5 percent of respondents told that children did not die in their family before. Here in the study area child mortality rate per thousand is 135. That has been an issue of concern in the locality.

4.1.9. QUALITY OF LIFE IN SOCIETY

Table – 4.1.69: Electricity in the Family

Electricity		Frequency	Percentage	Valid Percentage
Valid	Yes	490	96.3	96.8
	No	16	3.1	3.2
	Total	506	99.4	100.0
Missing System		3	.6	
Total		509	100.0	

Table-4.1.69 shows that in the community life of the study area in most of the respondents' families there were electricity facilities. It was found that in 96.8 percent of respondents' houses there was electricity and only in 3.2 percent of respondents' houses there was no electricity.

Table - 4.1.70: Cleanliness of the Household Yards

Clean Household Yards		Frequency	Percentage	Valid Percentage
Valid	Yes	162	31.8	32.1
	No	342	67.2	67.9
	Total	504	99.0	100.0
Missing System		5	1.0	
Total		509	100.0	

It is found from Table- 4.1.70 that 67.9 percent of the yards of households were clean and 32.1 percent of the yards were not found clean during the study. There were unplanned and natural straws, grass, plants, dust, waste materials of daily use, plastic bottles, ropes, polythene materials, fossil burned ashes, etc.

4.1.10. MIGRATION AND SOCIAL MOBILITY

Table – 4.1.71: Duration of Living in the Study Area

Duration of Living		Frequency	Percentage	Valid Percentage
Valid	From start of the project	77	15.1	16.2
	3-10 years	3	.6	.6
	10-15 years	1	.2	.2
	15-20 years	6	1.2	1.3
	20-25 years	6	1.2	1.3
	From father's generation	383	75.2	80.5
Total		476	93.5	100.0
Missing	System	33	6.5	
Total		509	100.0	

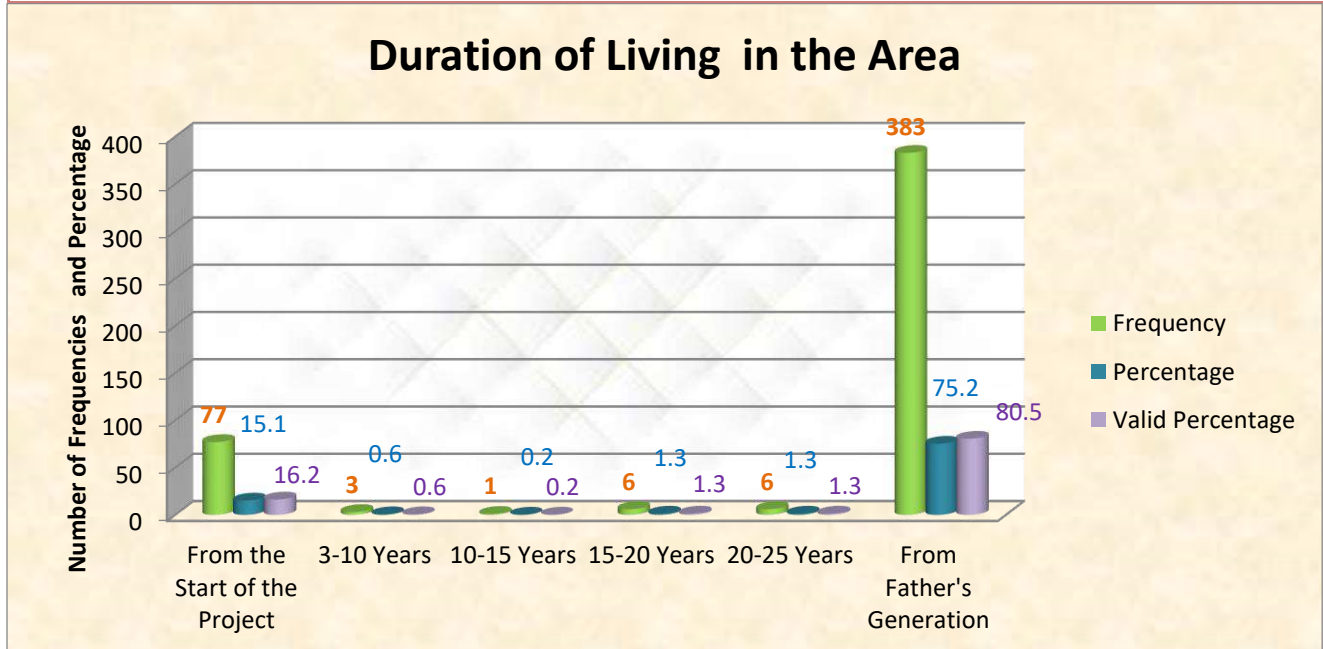


Figure 4.23: Duration of Living

In the study, Table–4.1.71 shows the duration of living in the study area by the respondents. In this study area, most of the respondents were being lived from their father’s generation. The percentage of that group is 80.5. In the second group, respondents were living in the study area from the start of the project of Bangabandhu Bridge to the present and their percentage is 16.2. There were insignificant numbers of people who came after the completion of the project of Bangabandhu Bridge. It was also seen that if people migrated but that is from one plot of land to another plot, but not from their forefathers land.

Table- 4.1.72: Migration Due to the Bangabandhu Bridge Project

Migration		Frequency	Percentage	Valid Percentage
Valid	Yes	41	8.1	8.4
	No	448	88.0	91.6
	Total	489	96.1	100.0
Missing System		20	3.9	
Total		509	100.0	

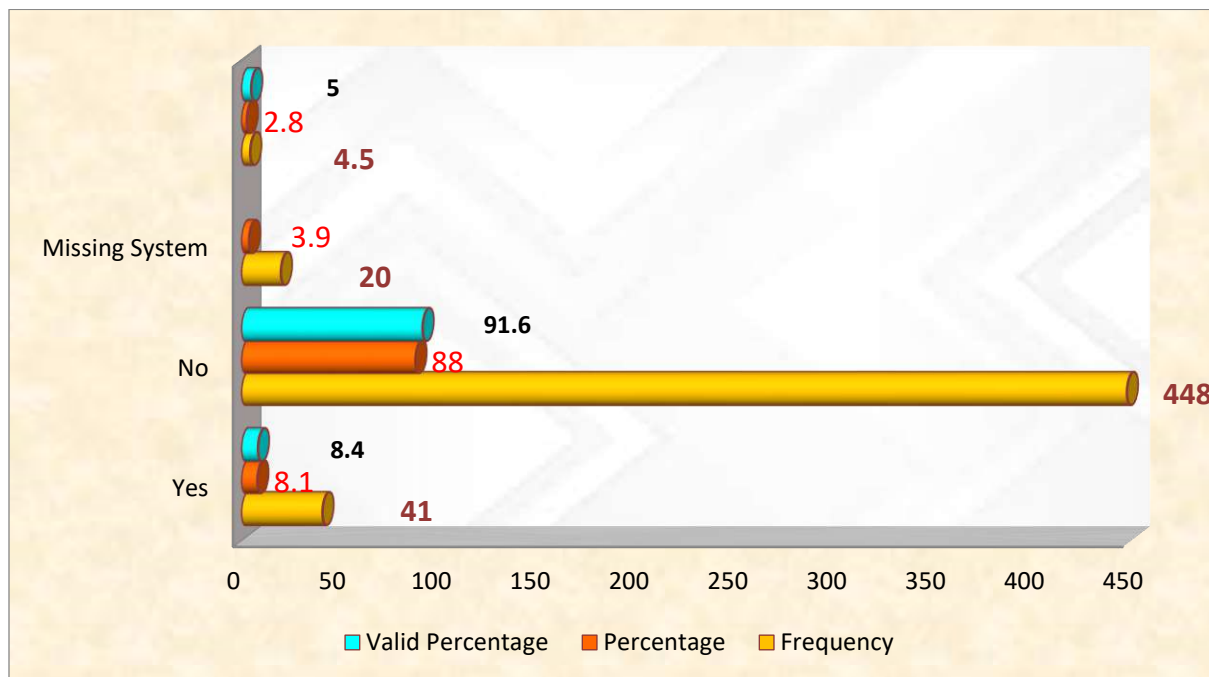


Figure-4.24: Migration Due to the Bangabandhu Bridge Project

The information from Figure 4.24 shows that 91.6 percent of respondents did not migrate due to the construction of the Bangabandhu Bridge, support roads, highways, and railway facilities. On the other hand, only 8.4 percent respondents of the study had to migrate from their original residential area to another place. Most of the cases of migrations were found to be in migration From the FGD it was found:

Migration to town and Dhaka for seeking employment has been increased rapidly only for Bangabandhu Bridge.

Table- 4.1.73: Changes of Occupation due to Bangabandhu Bridge Project

Changes of Occupation		Frequency	Percentage	Valid Percentage
Valid	Yes	34	6.7	18.7
	No	148	29.1	81.3
	Total	182	35.8	100.0
Missing System		327	64.2	
Total		509	100.0	

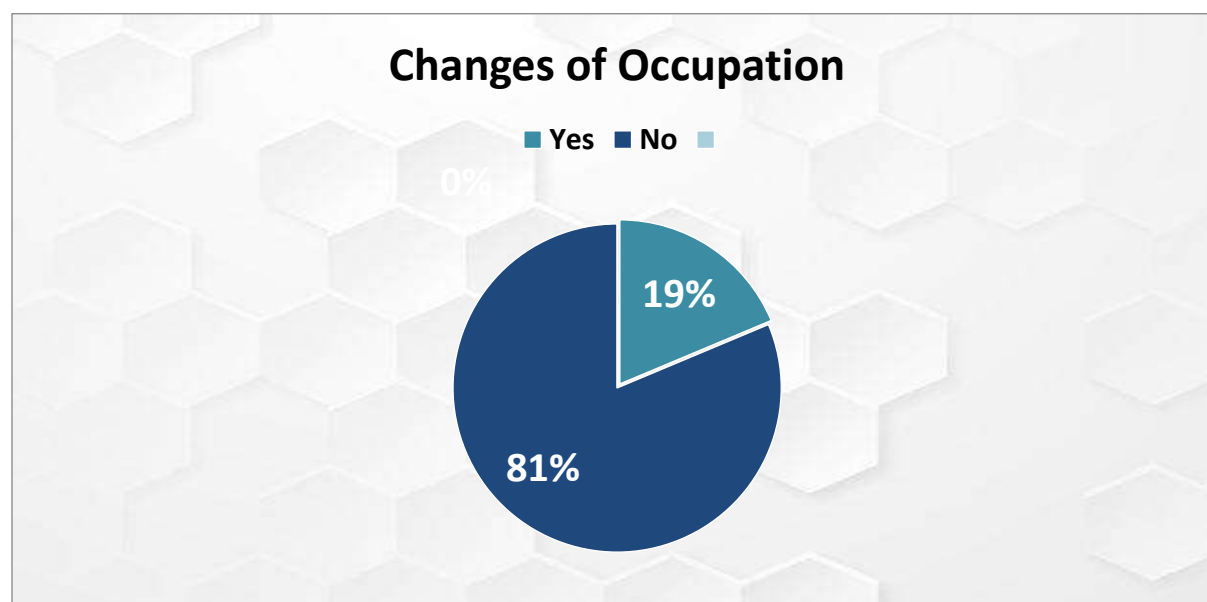


Figure 4.25: Changes of Occupation due to Bangabandhu Bridge Project

It was found from the study that 19 percent of respondents had to change or factors attract them to change their occupation due to the construction of Bangabandhu Bridge, but 81 percent of respondents were in their original occupation.

Table- 4.1.74: Due to Migration, Changes of Occupation in Previous Years

Changes in Previous Years		Frequency	Percentage	Valid Percentage	
Valid	1.00	Agriculture	14	2.8	60.9
	4.00	Day Laborer (Non-Agricultural)	2	.4	8.7
	6.00	Bamboo/ Cane Work	1	.2	4.3
	9.00	Boatman	1	.2	4.3
	14.00	Small Business	2	.4	8.7
	18.00	Haircutting Saloon	1	.2	4.3
	20.00	Tailoring	1	.2	4.3
	21.00	Others	1	.2	4.3
	Total		23	4.5	100.0
Missing System		486	95.5		
Total		509	100.0		

Table-4.1.74 shows that in the study area due to the migration for the construction of Bangabandhu Bridge, several remarkable changes have occurred previous years in occupation in the study areas. Among the valid responses 60.9 percent of respondents engaged in agriculture and 8.7 percent of them turned today laboring. Another 8.7 percent of respondents changed their occupation to small business. Besides every 4.3 percent of respondents have changed their occupation and were found to engage in Bamboo and Cane Work, Boatman, Haircutting Saloon, Tailoring, and others.

Table- 4.1.75: Due to Migration, Changes of Occupation in Current Years (Five Districts)

Changes in Current Years		Frequency	Percentage	Valid Percentage	
Valid	1.00	Agriculture	3	.6	13.0
	3.00	Agricultural Day Laborer	1	.2	4.3
	4.00	Non- Agricultural Day Laborer	4	.8	17.4
	8.00	Fisherman	1	.2	4.3
	9.00	Boatman	1	.2	4.3
	12.00	Rickshaw puller	1	.2	4.3
	13.00	Carpenter	1	.2	4.3
	14.00	Small Business	2	.4	8.7
	15.00	Unemployed	7	1.4	30.4
	18.00	Saloon	1	.2	4.3
	21.00	Others	1	.2	4.3
	Total		23	4.5	100.0
Missing	System	486	95.5		
Total		509	100.0		

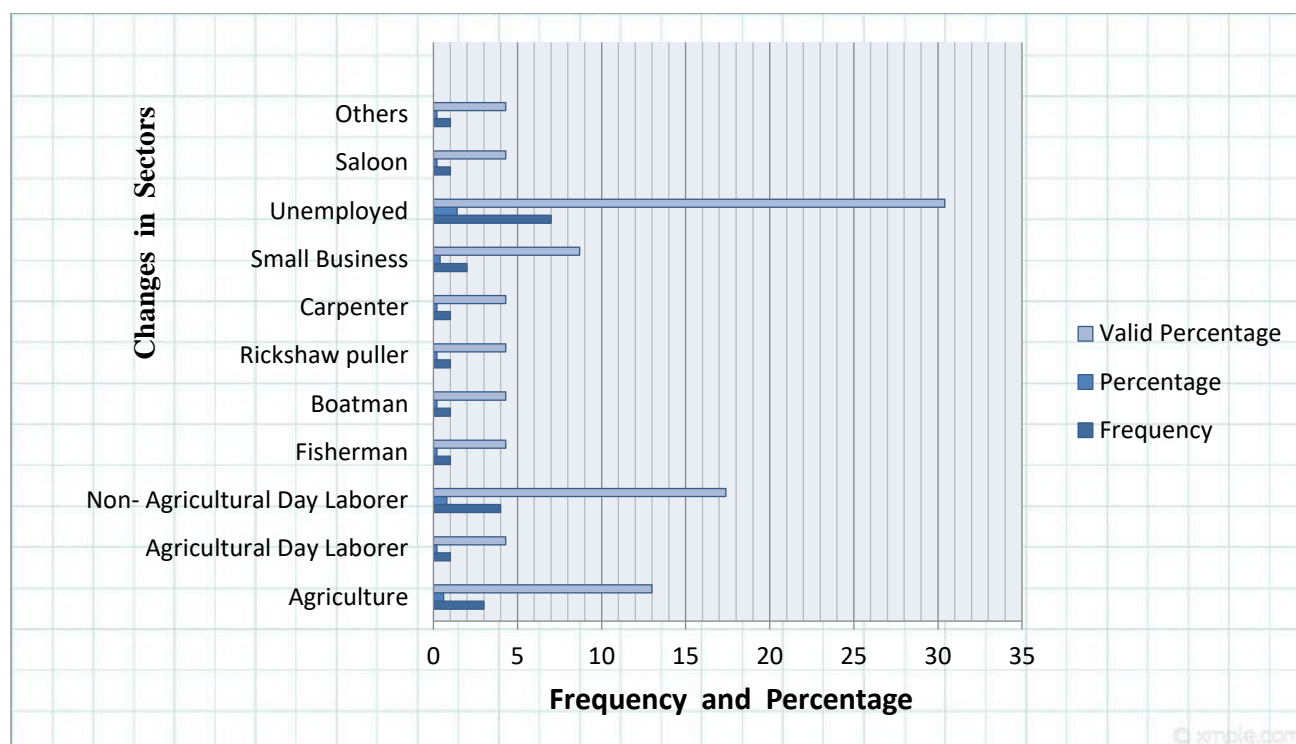


Figure 4.26: Changes of Occupation in Current Years

Table-4.1.75 shows that in the study area due to the migration for the construction of Bangabandhu Bridge, several remarkable changes have occurred current years in occupation. About 13.0 percent of respondents changed to agriculture in recent years. 17.4 percent of respondents are earning their livelihood due to changes in non-agricultural day laborers. 30.4 percent of respondents were found to be unemployed due to the change. About 9 percent of respondents were newly engaged in small business.

Table- 4.1.76: Level of satisfaction Due to the Change of Occupation (Five Districts)

Level of satisfaction		Frequency	Percentage	Valid Percentage
Valid	Very satisfied	3	.6	23.1
	Moderately Satisfied	6	1.2	46.2
	Unsatisfied	2	.4	15.4
	Not satisfied at all	1	.2	7.7
	No change in the occupation	1	.2	7.7
	Total	13	2.6	100.0
Missing System		496	97.4	
Total		509	100.0	

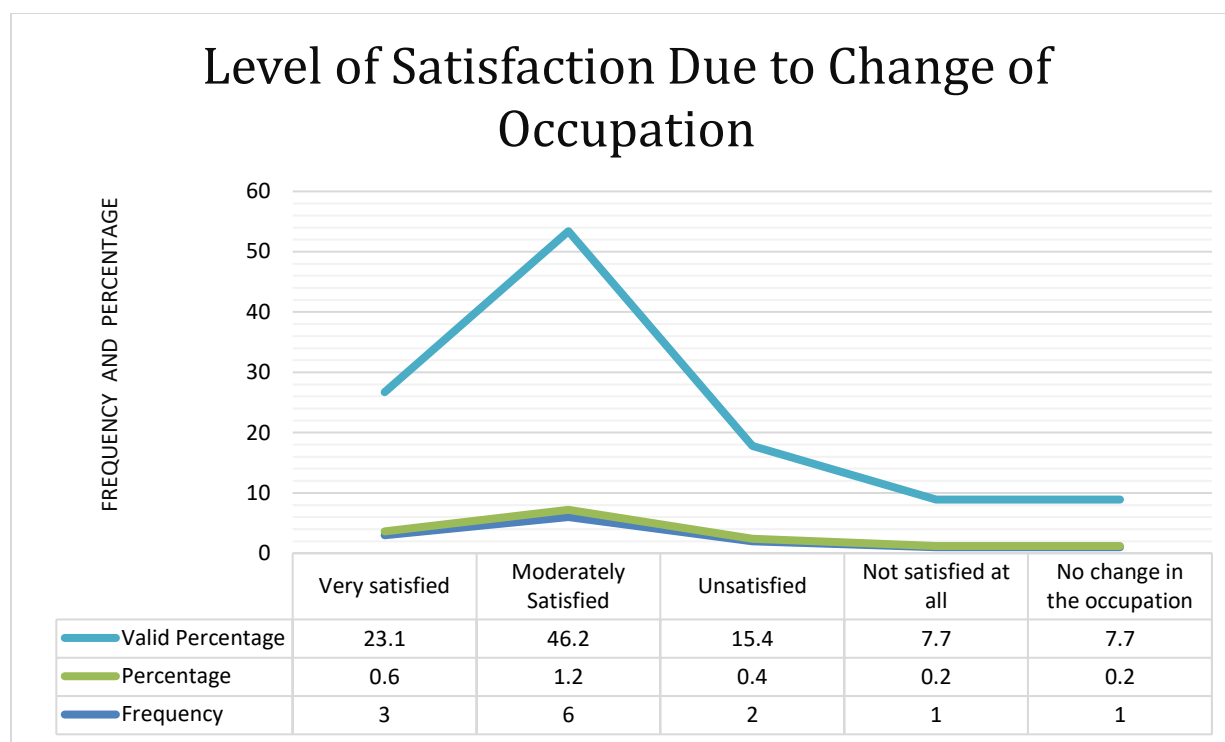


Figure 4.27: Level of Satisfaction Due to Change of Occupation

It was found from Table- 4.1.76 that 23.1 percent of respondents were found very satisfied due to the change of occupation after the construction of Bangabandhu Bridge. On the other hand, 46.2 percent of respondents were moderately satisfied. But 15.4 percent of respondents were unsatisfied. About 8.0 percent of respondents have been told that they were not satisfied at all.

4.1.11. TRAINING AND SKILL

Table -4.1.77: Respondents or their Family Members Received Training

Training Received		Frequency	Percentage	Valid Percentage
Valid	Yes	74	14.5	15.2
	No	412	80.9	84.8
	Total	486	95.5	100.0
Missing		23	4.5	
System				

Total	509	100.0
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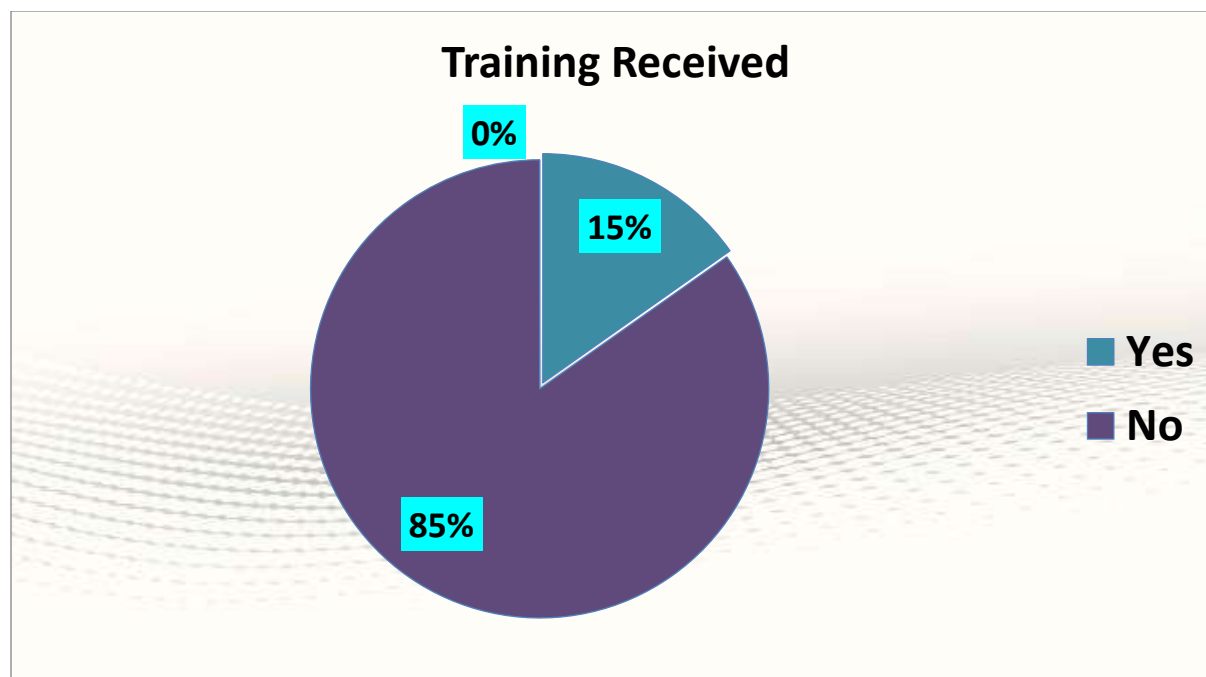


Figure 4.28: Training Received

Table- 4.1.77 shows that among the 486 valid responses 15.2 percent of respondents were trained up by various training courses. On the contrary, 84.8 percent of respondents did not get any type of formal training for their livelihood.

Table- 4.1.78: Types of Training Received by the Respondent/ Respondent's Family

Types of Training		Frequency	Percentage	Valid Percentage
Valid	Animal Husbandry	10	2	24.4
	Computer Training	14	2.8	34.1
	Electrical Work	1	.2	2.4
	Fish Farming	2	.4	4.8
	Imam Training	1	.2	2.4
	Polytechnic	1	.2	2.4

	Bricklayer Training	1	.2	2.4
	Seed Production	1	.2	2.4
	Sewing Training	3	.6	7.3
	Weaving Training	4	.8	9.7
	Others	1	.2	2.4
	Village Doctor	2	.4	4.8
	Total	41	8.1	100.0
Missing		468	91.9	
Total		509	100.0	

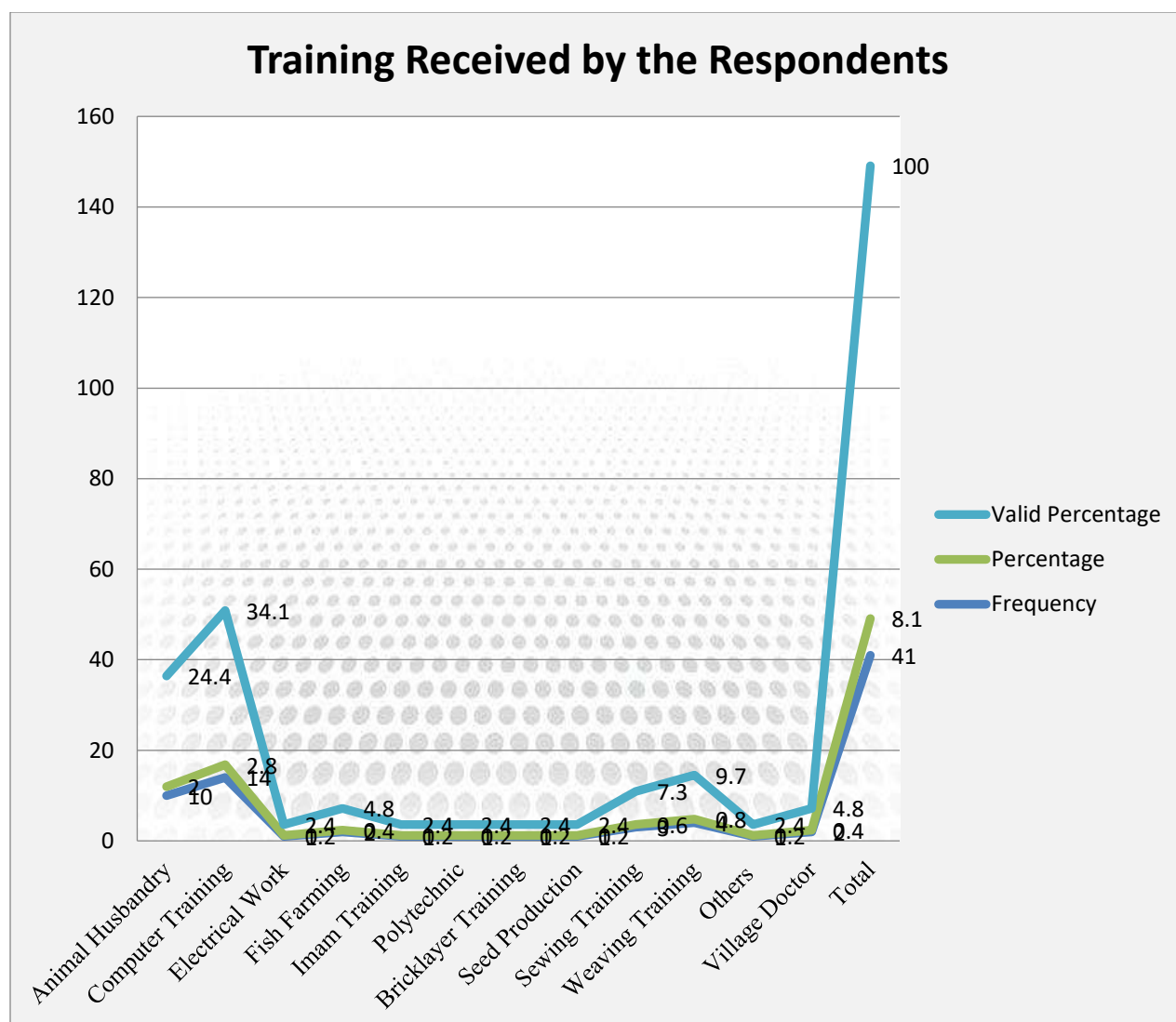


Figure 4.29: Types of Training Received by the Respondents

From Table- 4.1.78, it is evident that a few respondents had got the chance to be trained up for some sort of income-generating activities. It was observed that 34.1 percent of respondents received computer training, 24.4 percent respondents received the training of animal husbandry, 7.3 percent received sewing training and 9.7 percent received weaving training for towels, Lungi, Sharee, etc. Also, 4.8 percent of respondents received the training of operating local pharmacies and village doctors.

Table- 4.1.79: Level of Benefits after Receiving Training

Level of Benefits		Frequency	Percentage	Valid Percentage
Valid	Much Benefit	11	2.2	17.2
	More Benefit	22	4.3	34.4
	Moderate Benefit	26	5.1	40.6
	Less Benefit	2	.4	3.1
	No benefit at all	3	.6	4.7
	Total	64	12.6	100.0
Missing	System	445	87.4	
Total		509	100.0	

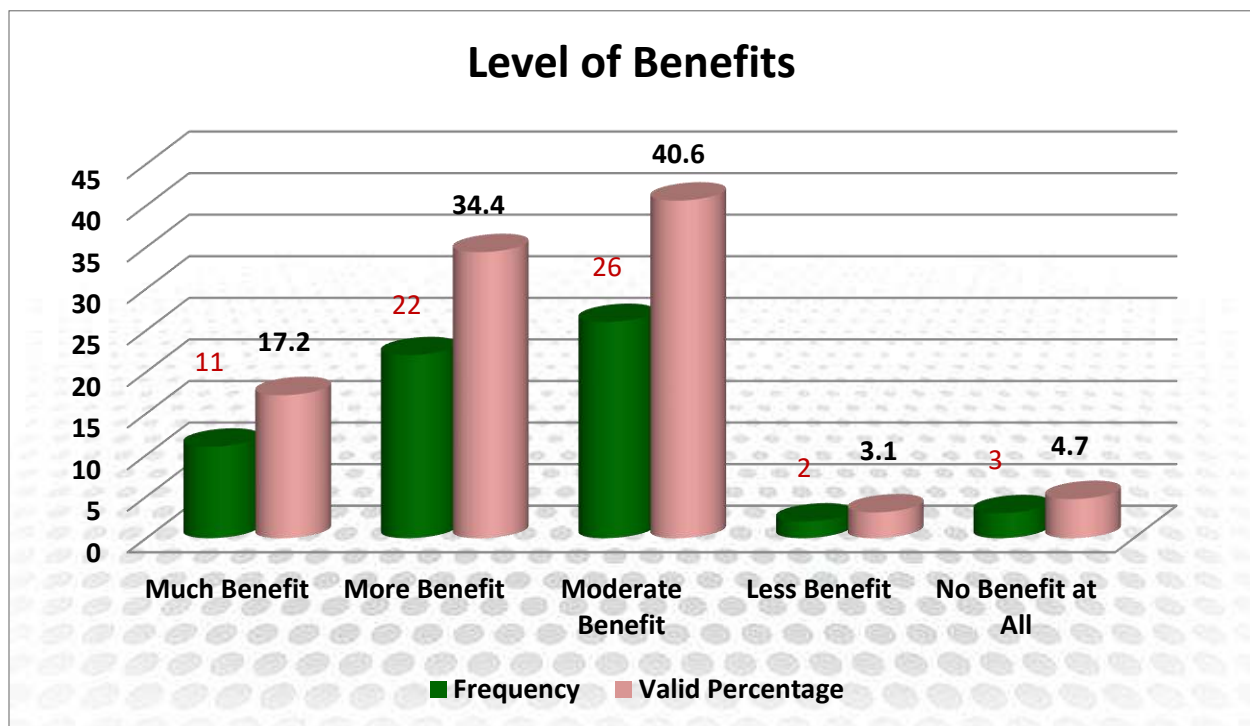


Figure-4.30: Level of Benefits

Table-4.1.79 indicates that due to the training provided, the respondent's level of benefits was found to vary from person to person. About 40.6 percent of beneficiaries got benefitted moderately, and 34.4 percent of beneficiaries were found more benefitted. On the other hand, 17.2 percent of beneficiaries were benefitted much from the training programs.

Table-4.1.80: Types of Training Centers in the Area

Types of Training Centre		Responses		Percentage of Cases
		N	Percentage	
Present Training Centers	Technical Training Institution	160	23.1%	51.8%
	Computer Training Institution	266	38.4%	86.1%
	Migrant Labor Training Center	7	1.0%	2.3%
	Handicrafts training centre	88	12.7%	28.5%
	Animal husbandry training	143	20.6%	46.3%
	No training center present	24	3.5%	7.8%
	Others	5	0.7%	1.6%
Total		693	100.0%	224.3%

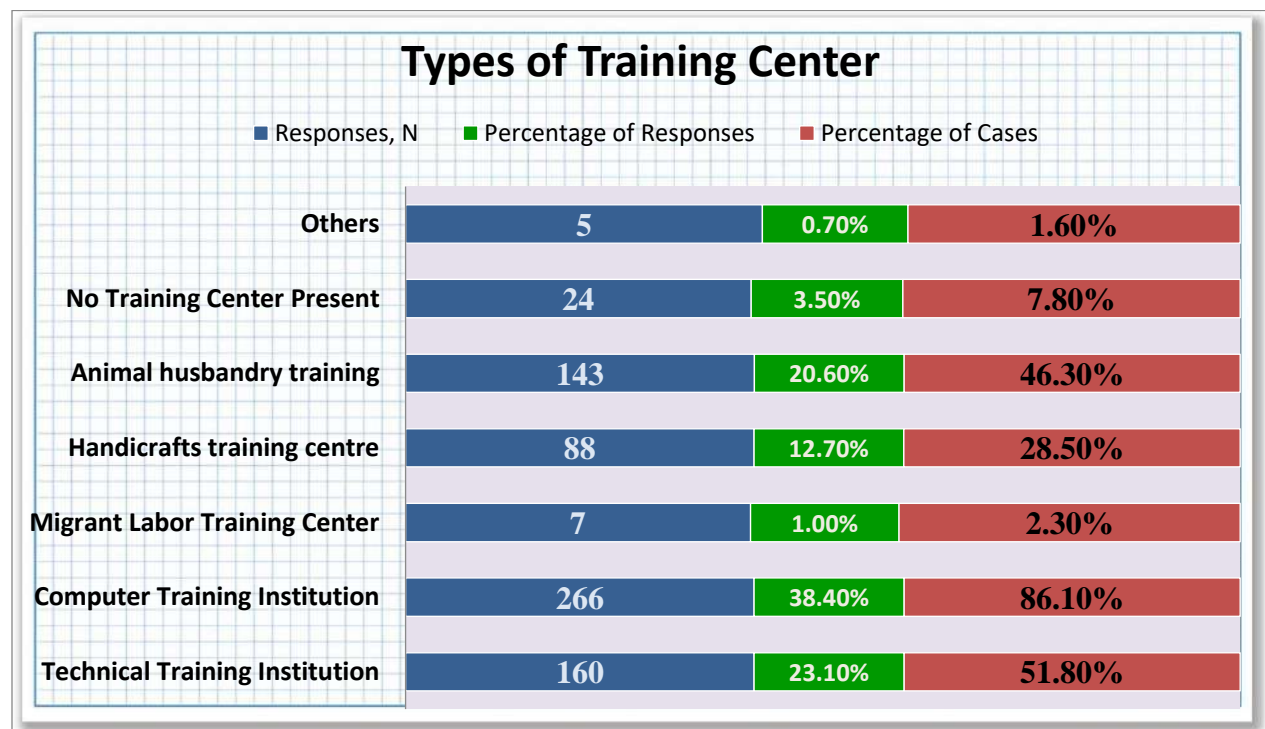


Figure 4.31: Types of Training Center in the Study Area

Table-4.1.80 shows that 86.10 percent of training centers were based on computer training Institutions, 51.80 percent are technical training institutions, and 46.30 percent are animal husbandry training institutions. Besides, training institutions for migrant workers were handicrafts making training centers, etc.

4.1.12. POSITIVE IMPACT OF BANGABANDHU BRIDGE IN SOCIAL SECTOR

Table-4.1.81: Much Advancement in Education Sector (Five Districts)

Advancement in Education		Frequency	Percentage	Valid Percentage
Valid	Highly Agreed	162	31.8	31.9
	Agreed	328	64.4	64.6
	Slightly agreed	15	2.9	3.0
	Slightly Disagreed	2	.4	.4
	No comment	1	.2	.2
	Total	508	99.8	100.0
Missing System		1	.2	
Total		509	100.0	

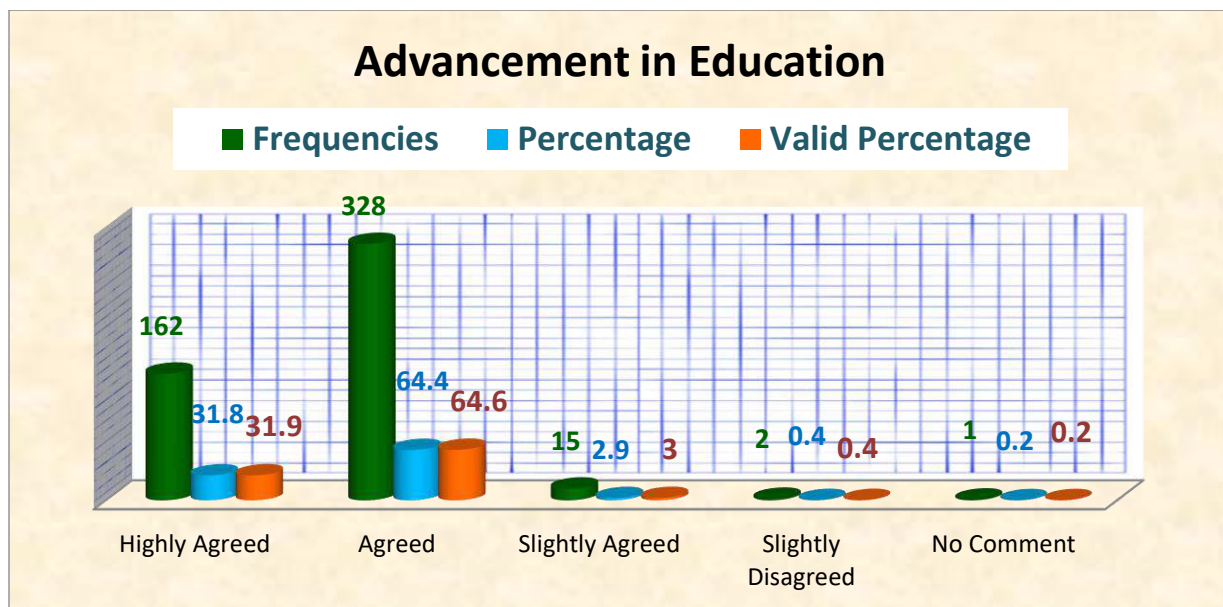


Figure 4.32: Advancement in Education Sector

Figure-4.32 shows that 31.9 percent of respondents were highly agreed, 64.6 percent of respondents were agreed that due to the construction of Bangabandhu Bridge, much advancement has occurred in the education sector. On the other hand, only 03 percent of respondents were slightly agreed and a very insignificant number of respondents disagreed with the assumption.

The advancement in education has increased the awareness of the people and the increased rate of education makes the people become more civilized. From the interview it is mentioned:

In the project area the rate of child marriage has decreased. The rate of Divorce or the news of conflict in the family has also declined. It is happening due to the increased rate of education which helped people to become civilized. In the project area there are also some facilities increased. People generally go to the village doctor for a general disease like cough, fever etc.

From the FGD it is revealed that-

At present, Sirajganj is the town of education and health. Health care services have reached to remote area. Inhabitants of Sirajganj have enjoyed the improved health care. Women empowerment and education rate have increased in this area due to Bangabandhu Bridge.

Female education rate has increased because of easy communication in different areas connecting to Sirajganj Sadar. From the qualitative data it was found that-

Female education rate has increased in this area. The opportunity of education was difficult for the female in this area before Bangabandhu Bridge. But now, female are going to school, college and university and they are being engaged in different types of profession. Female are doing business in Sirajganj Bazar and these are mainly tailoring. Female are doing job in several company's showrooms at Sirajganj Bazar.

Table-4.1.82: Health Facilities Reached the Doorstep

Health Facilities are at the Doorstep		Frequency	Percentage	Valid Percentage
Valid	Highly Agreed	149	29.3	29.4
	Agreed	243	47.7	47.9

	Slightly agreed	113	22.2	22.3
	Disagreed	2	.4	.4
	Total	507	99.6	100.0
Missing System		2	.4	
Total		509	100.0	

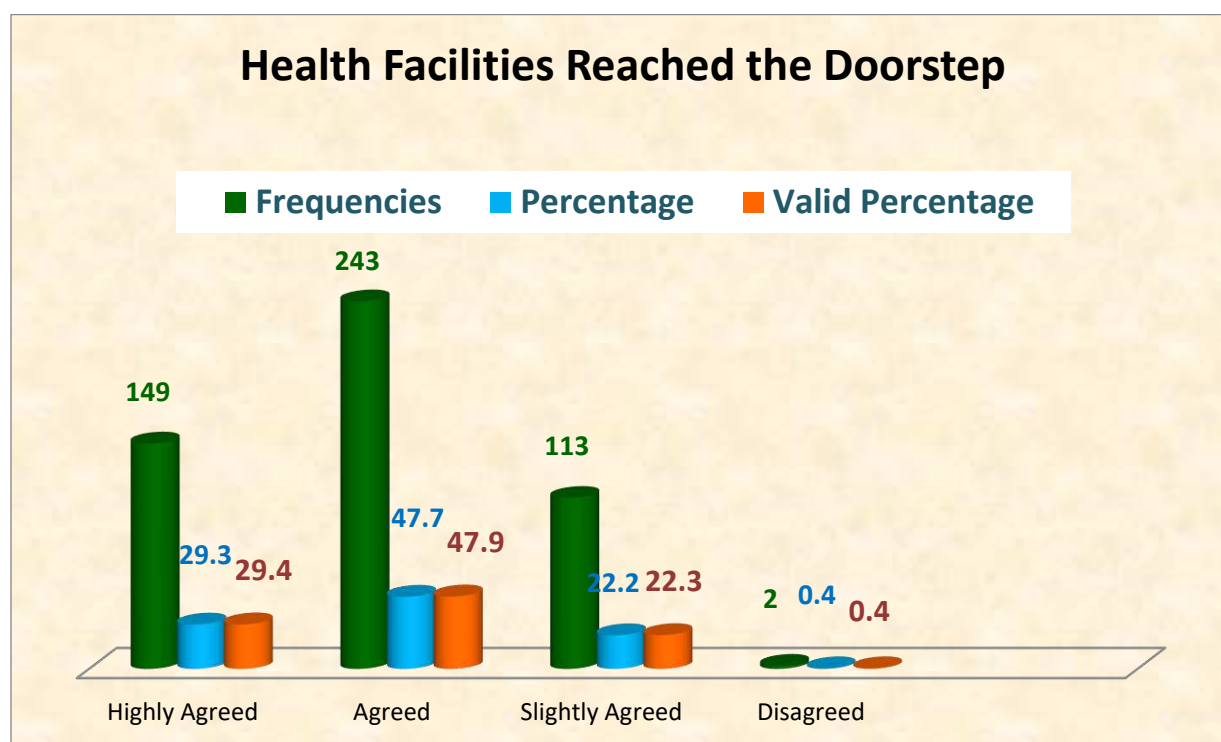


Figure 4.33: Health Facilities Reached the Doorstep

Figure -4.33 shows that health facilities are at the doorstep of the people because of the construction of the Bangabandhu Bridge. People can easily get medical treatments in nearby government medical college hospitals and district hospitals as a result of the rapid growth of transportation, infrastructure, and socio-economic growth of the entire region. In the current study, 29.4 percent of respondents were highly agreed, 47.9 percent were agreed and 22.3 percent admitted that health facilities were at the doorstep of the community people.

Table- 4.1.83: Increase of Roads and Communication

Increase of Roads and Communication		Frequency	Percentage	Valid Percentage
Valid	Highly Agreed	289	56.8	57.0
	Agreed	194	38.1	38.3
	Slightly agreed	17	3.3	3.4
	Slightly Disagreed	4	.8	.8
	Disagreed	3	.6	.6
	Total	507	99.6	100.0
Missing System		2	.4	
Total		509	100.0	

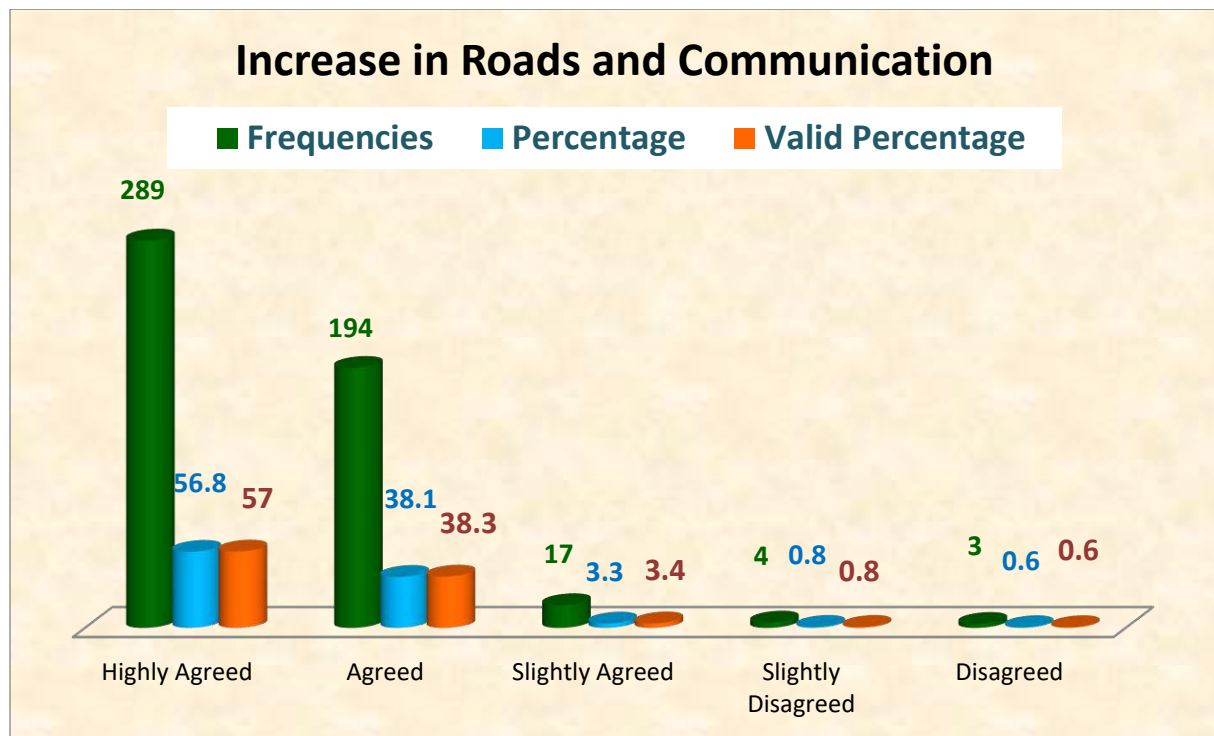


Figure 4.34: Increase in Roads and Communication

The Bangabandhu Bridge has opened up a door for multidimensional development. In Figure-4.34, it is seen that 57 percent of respondents were highly agreed and 38.3 percent were agreed and 3.4 percent were agreed that after the construction of the Bangabandhu Bridge roads and communication system was developed widely and both sides of the River Jamuna was developed at a high-speed rate.

Because of easy road communication and development related to the construction of the Bangabandhu Bridge, investments in agriculture and cottage industry were found to be gradually increased. Participants of the FGD narrated:

We have observed a wide variety of changes in different sectors since the completion of the Bridge. Most of them agreed that investment has increased and it is observed that due to the expansion of the industrial activities, the agricultural activities also increased. Some participants mentioned the rise of the loom industry in the area.

Besides, qualitative data analysis also revealed:

Easy and improved transport system makes us very easier for crops transportation to town as well as Dhaka city.

Although roads and communication systems have increased and developed but long traffic jam is imposing a barrier for the speedy communication system in the study area. It was found from the qualitative data (ICI) that:

But long traffic jams have been created on the highway. As a result, many raw materials to be used for industrial production are being wasted. So, my advice is to expand both sides of the road and reduce the amount of toll.

For reducing the impacts of traffic jam due to the excessive number of electric automobiles, businessmen prefer the night for carrying the products. As one businessman mentioned in the In-depth case interview:

I generally bring all my products in the night because the loaded truck causes jam during the day. Recently a huge number of auto-rickshaws are plying in Pabna city as a result a lot of traffic jams has been created. Most of the auto-rickshaws run on electricity charges as a consequence of power outage regularly.

Table-4.1.84: Increase of Income in New/ Changed Occupation

Increase of Income in New/ Changed Occupation		Frequency	Percentage	Valid Percentage
Valid	Highly Agreed	150	29.5	29.7
	Agreed	215	42.2	42.6
	Slightly agreed	86	16.9	17.0
	Slightly Disagreed	9	1.8	1.8
	No Comment	45	8.8	8.9
	Total	505	99.2	100.0
Missing System		4	.8	
Total		509	100.0	

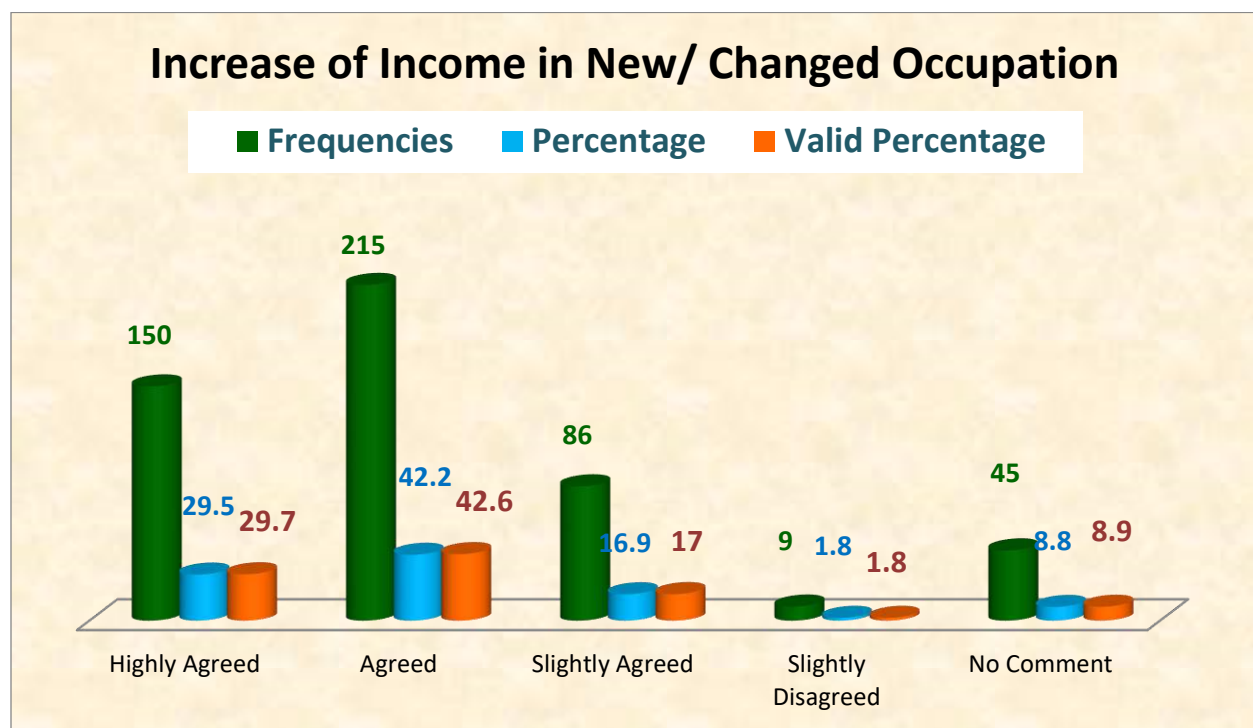


Figure 4.35: Increase of Income in New/ Changed Occupation

Figure- 4.35 reveals that about 29.7 percent of respondents were highly agreed, 42.6 percent were agreed and 17 percent were slightly agreed that due to the construction of Bangabandhu Bridge, the Income of the respondents in new or changed occupations was increased. Before the construction of bridges, diversity of work was limited and people were engaging themselves in the traditional income-generating activities. But the bridge reduced the gap between the traditional and modern income-generating activities. Due to the construction of the

Bangabandhu Bridge, income and employment opportunities have increased much. From one of the qualitative interviews it was found:

The income of the people has increased. Employment opportunities have been created. Today, people have taken diverse occupations/professions. Mobility of people/labor has increased a hundred times more than before. Dhaka was a name of fear among the common people fear has become lessened among the people. Employment opportunity for women has improved and women entrepreneur are seen in this area. The Bangabandhu Bridge has worked as an influential power here.

Women's participation in income earning activities was found to be gradually increasing. From the FGD it is revealed that-

Women are involved in income earning activities than the past and they are now self-dependent.

Table- 4.1.85: Increased the Scope of Modern Living Facilities

Increased Scope of Modern Living Facilities		Frequency	Percentage	Valid Percentage
Valid	Highly Agreed	186	36.5	36.6
	Agreed	227	44.6	44.8
	Slightly agreed	70	13.8	13.8
	Slightly Disagreed	19	3.7	3.7
	Disagreed	3	.6	.6
	No Comment	2	.4	.4
	Total	507	99.6	100.0
Missing System		2	.4	
Total		509	100.0	

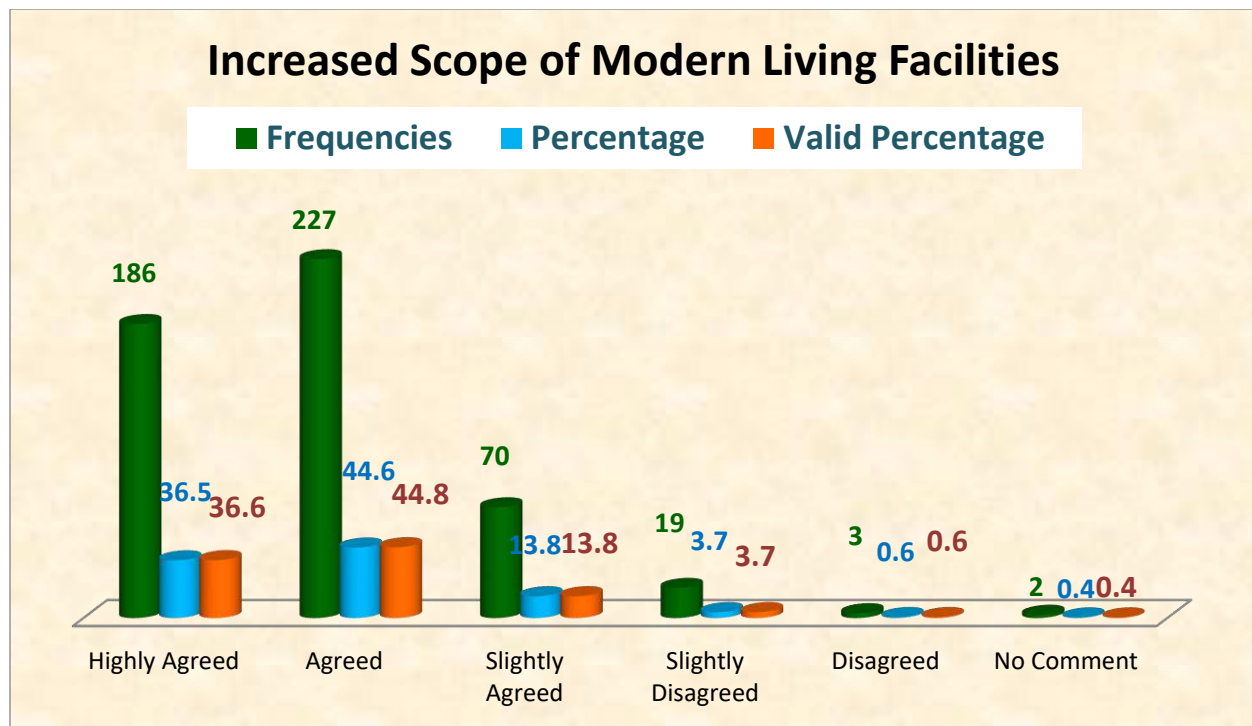


Figure 4.36: The Increased the Scope of Modern Living Facilities

It is observed from the figure- 4.36 that 36.6 percent of respondents were highly agreed, 44.8 percent were agreed and 13.8 percent were slightly agreed that Bangabandhu Bridge has increased the scope of using modern facilities. Before the bridge construction, people use traditional tools and materials for agricultural production. But now they are using modern transports, agricultural tools, modern technologies, modern health facilities and many other types of modern living facilities. Besides these people were seen to use more developed houses and infrastructures. The scope of modern living facilities has increased. Even the people of the District town or Upazila town are easily buying branded shoes, dresses, cosmetics and so on as mentioned in one in-depth interview:

Our area is getting modern day by day; I can buy a brand dress from the area and those dresses come from Dhaka by using the bridge. I wish to admit children to Dhaka University and I got this motivation because of security of transpiration.

Table-4.1.86: Increased Social Mobility

Increased Social Mobility		Frequency	Percentage	Valid Percentage
Valid	Highly Agreed	194	38.1	38.3
	Agreed	207	40.7	40.8
	Slightly agreed	81	15.9	16
	Slightly Disagreed	2	.4	.4
	Disagreed	3	.6	.6
	No Comment	20	3.9	3.9
	Total	507	99.6	100.0
Missing System		2	.4	
Total		509	100.0	

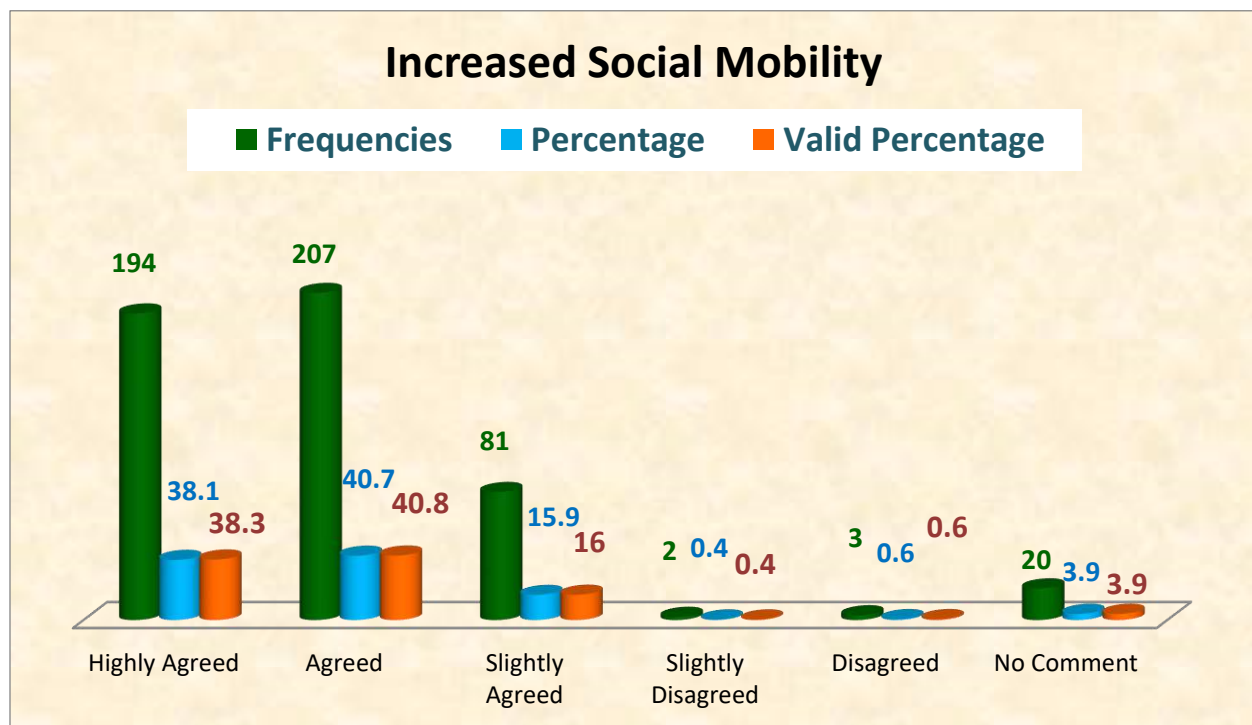


Figure 4.37: Increased Social Mobility

It is observed in Figure-4.37 that social mobility in the study area has increased more than 88.1 percent. As a result, people's interaction with various regions has increased on a wider scale and speed. Previously women did not generally go shopping and due to the changes occurred in the present time; women are more empowered, and enjoy more freedom than before. So they are going shopping regularly. An in-depth Case Interview with a businessperson revealed the theme:

Now a day, women's customers have increased a lot than any other time before. It may be due to increased women's confidence, freedom and empowerment.

Table- 4.1.87: Increased Scope of Planned Housing

Increased the Scope of Planned Housing		Frequency	Percentage	Valid Percentage
Valid	Highly Agreed	146	28.7	29.1
	Agreed	96	18.9	19.1
	Slightly agreed	62	12.2	12.4
	Slightly Disagreed	14	2.8	2.8
	Disagreed	37	7.3	7.4
	No Comment	147	28.9	29.3
	Total	502	98.6	100.0
Missing System		7	1.4	
Total		509	100.0	

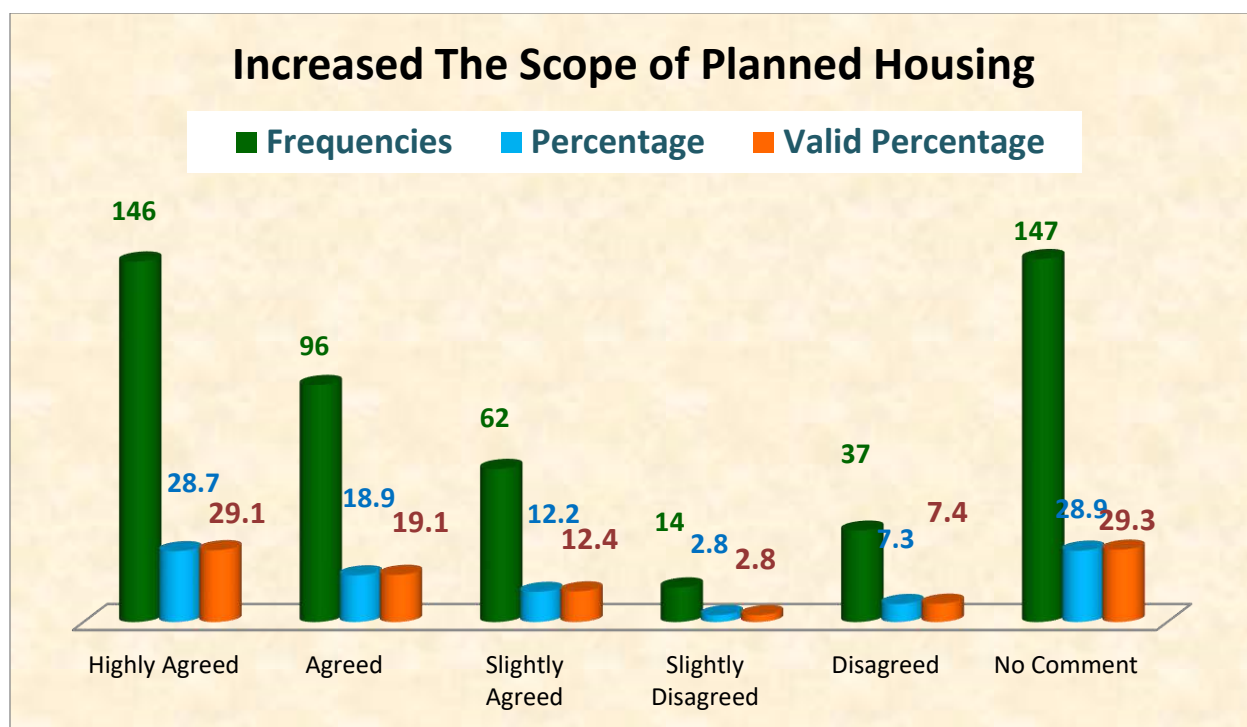


Figure 4.38: Increased the Scope of Planned Housing

Figure-4.38 states that 29.1 percent of respondents were highly agreed, 19.1 percent were agreed, and 12.4 percent were slightly agreed that after the Bangabandhu Bridge the scope of planned housing rate has increased. Besides, flood, riverbank erosion have got a barrier due to the embankments of Bangabandhu Bridge and its associated embankments. So, people were seen to make houses in a planned way and in these areas where previously floods attacked every year. But the risks of floods and riverbank erosion have changed and people are investing in modern housing systems and modern infrastructure systems for their living.

Table- 4.1.88: Increased the Flow of Loan from GO and NGOs

Increased The Flow of Loan from GO and NGOs		Frequency	Percentage	Valid Percentage
Valid	Highly Agreed	166	32.6	32.9
	Agreed	199	39.1	39.5
	Slightly agreed	90	17.7	17.9
	Slightly Disagreed	11	2.2	2.2
	Disagreed	13	2.6	2.6
	No Comment	25	4.9	5.0
	Total	504	99	100.0
Missing System		5	1.0	

Total	509	100.0	
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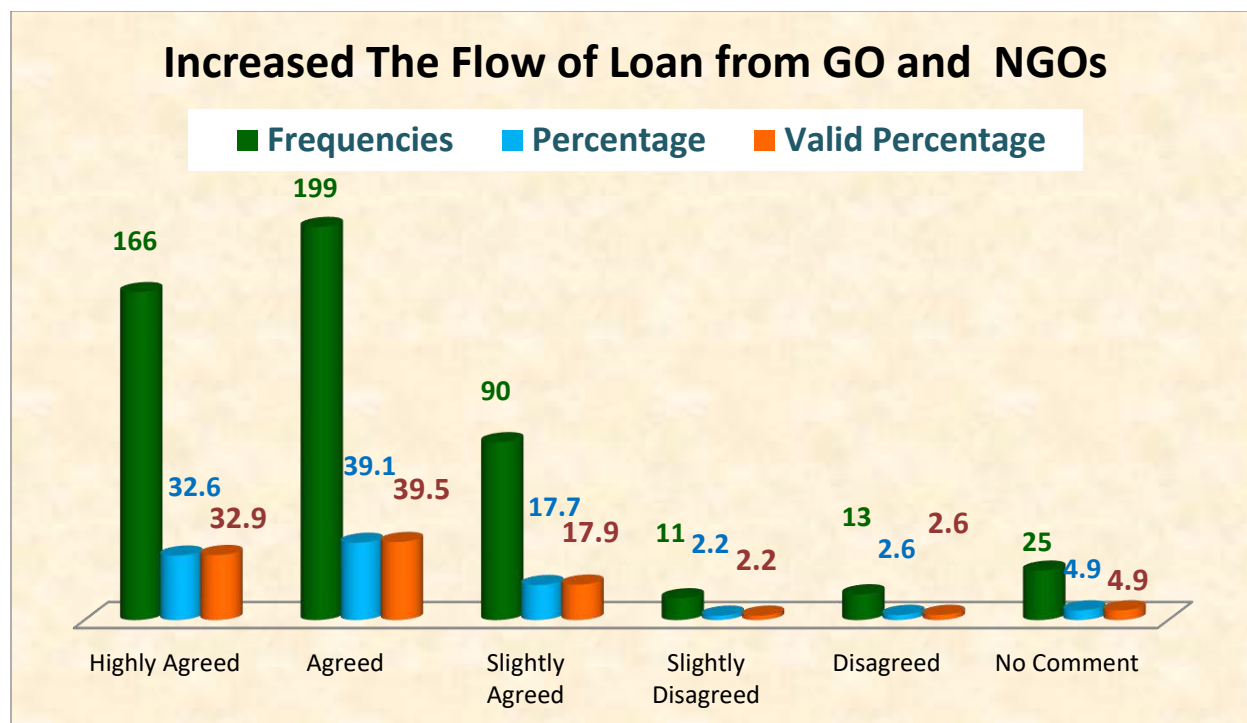


Figure 4.39: Increased the Flow of Loan from GO and NGOs

Figure–4.39 shows that 32.9 percent of respondents were highly agreed, 39.5 percent were agreed and 17.9 percent were slightly agreed that after the construction of Bangabandhu Bridge cash flow from the Government and non –government organizations in these study areas has increased. Besides, the flow of loans was also seen at an increasing rate than in the past. Loan Provision /facilities from the Govt. has been increased. From the qualitative study, it is found that:

I received loan from a BSCIC, Kurigram for making handicrafts. I make various types of toys, flowers, Mura, Hand-fan. I made some capital from these handicrafts and now investing it in my new tailoring business. I hired 30 female workers for doing this job. I am happy with that.

Table 4.1.89: Early Marriage Increased

Early Marriage Increased		Frequency	Percentage	Valid Percentage
Valid	Highly Agreed	197	38.7	39.2
	Agreed	207	40.7	41.2
	Slightly Agreed	68	13.4	13.5
	Slightly disagreed	17	3.3	3.4
	Disagreed	13	2.6	2.6
	No comments	1	.2	.2
	Total	503	98.8	100.0
Missing	System	6	1.2	
Total		509	100.0	

It was found from the Table- 4.1.89 that 39.2 percent of respondents were highly agreed, 41.2 percent were agreed and 13.5% were slightly agreed that early marriage has increased in the five districts. On the other hand, only 6 percent of respondents were disagreed in this case.

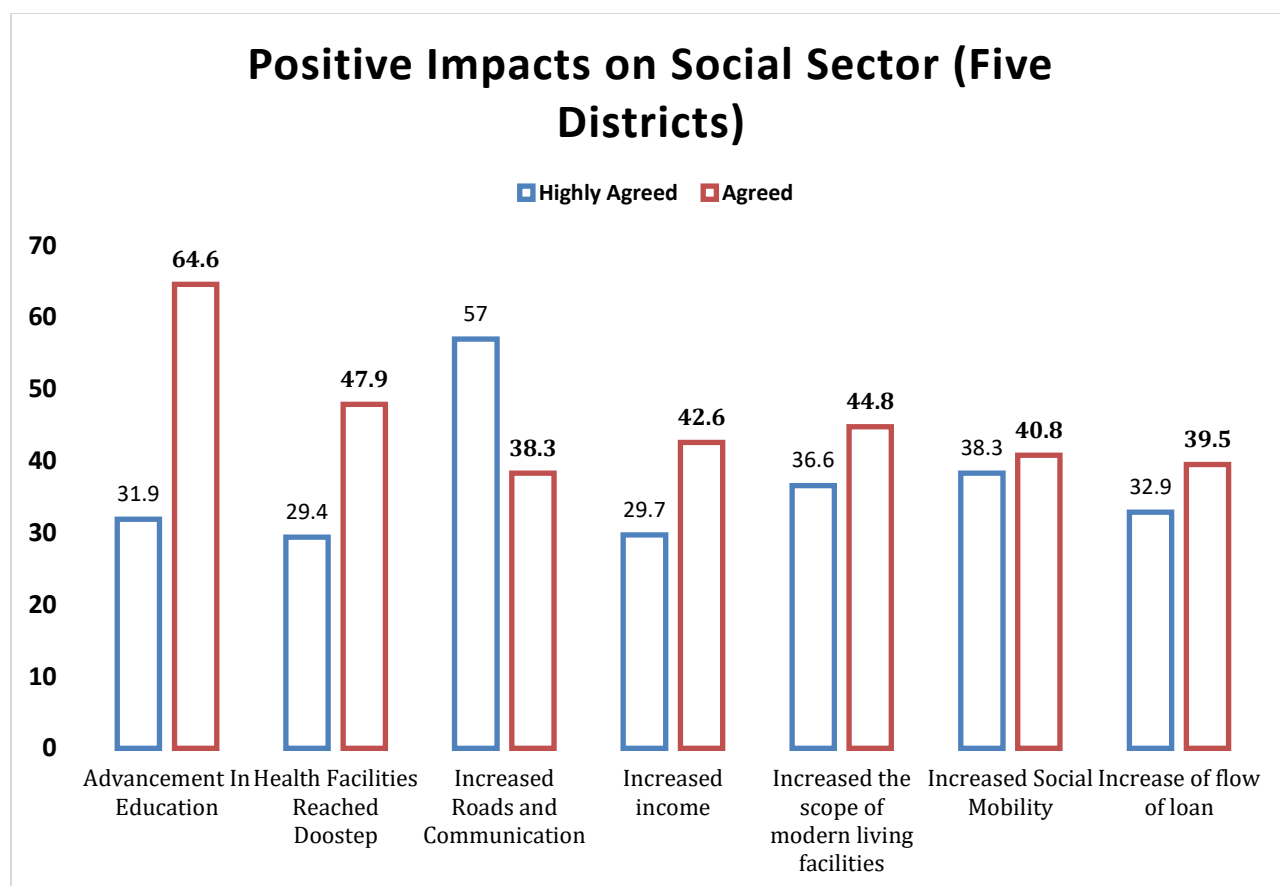


Figure 4.40: Positive Impacts on Social Sector (Five Districts)

Due to the construction of the Bangabandhu Bridge, all the social indicators have shown positive remarks in five districts of the current study. About 96 percent of respondents were agreed and highly agreed that after the construction of bridge much advancement had happen in these areas. Almost 77 percent of respondents have shown positive remarks on health facilities reached the doorstep. About 85 percent of them reported that roads and communication system have been developed. Almost 72 percent respondents confirm that income has increased much. Besides, 81 percent of respondents were seen to enjoy modern living facilities. Mobility in social life has increased according to 79 percent of respondents. About 72 percent of respondents confirm that there is an increased flow of loans in the study area.

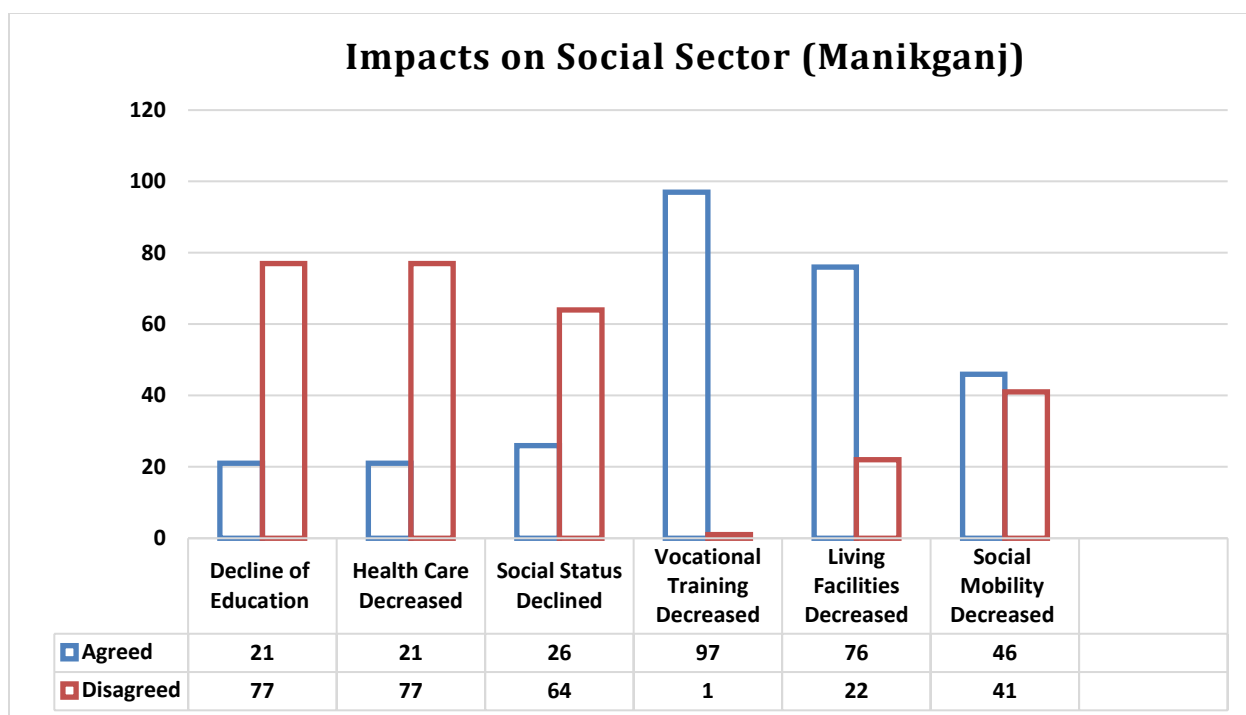


Figure 4.41: Impacts on Social Sector (Manikganj)

It was found in the study that 77 percent of respondents disagreed with the question of the decline of education and only 21.0 percent agreed. On the other hand, for the issue of health care decrease 21.0 percent of respondents were agreed and 77.0 percent disagreed. Besides, 64 percent disagreed with the opinion of decreased social status. But it was found alarming that 97.0 percent of respondents were agreed with the statement vocational training center decreased, 76.0 percent agreed with a decrease in living facilities. Moreover, 46.0 percent of respondents agreed that social mobility decreased and 41 percent agreed that social mobility increased due to the construction of Bangabandhu Bridge.

Table – 4.1.90: Environmental and Ecological Impacts of Bangabandhu Bridge Project (Five Districts)

Environmental Variable	Impacts	Responses n= 509	Percentage (%)
1.Impacts on Fish Resources	Positive	357	89.5
	Negative	42	10.5
2. Impacts on Aquatic Lands and River	Positive	275	78.8
	Negative	74	21.2

3. Impacts on Forest and Trees	Positive	284	79.1
	Negative	75	20.9
4. Impacts on ecology, birds and animals	Positive	252	71.8
	Negative	99	28.2
5. Impacts on Housing and Living Areas	Positive	249	75.5
	Negative	81	24.5
6. Impacts on environmental value	Positive	194	50.3
	Negative	192	49.7
7. Impacts on Agriculture	Positive	300	78.9
	Negative	80	21.1

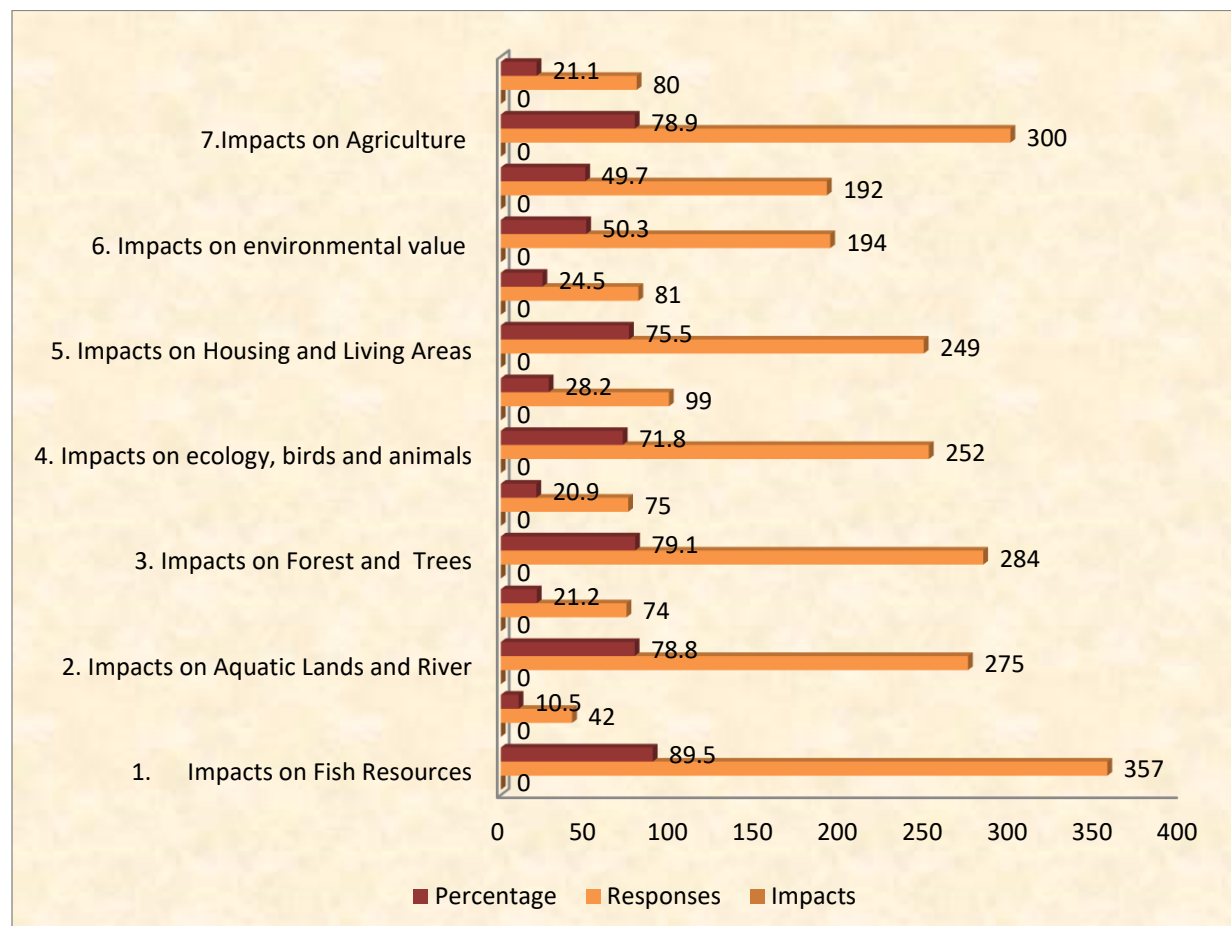


Figure 4.42: Environmental and Ecological Impacts of Bangabandhu Bridge Project (Five Districts)

Table-4.1.90 reveals that 89.5 percent of respondents think that the Bangabandhu Bridge has positive impacts on fish resources and 78.8 percent on aquatic lands and rivers, 79.1 percent positive impacts on forestry and tresses. Besides, it has 71.8 percent of positive impacts on ecology, birds, and animals. The impact on agriculture was 78.9 percent. But impacts on the environment were known to be of both positive and negative.

The present development works on the road and huge numbers of traffic movements has increased the sound and air pollution affecting the health of the local population. In addition, sound pollution and soil vibration were found to affect the normal breeding of domestic birds. It was found from the FGD that-

A huge development work is going on to spread the road and also to establish the industry. Dust is the constant company of those areas. Thousands of motorized automobiles/ vehicles are being moved through Bangabandhu Bridge. Sound and air pollution are seriously harmful for human health. The pace of industrial trend can erode the crops and forestation filed and can create serious environmental hazards in this area.

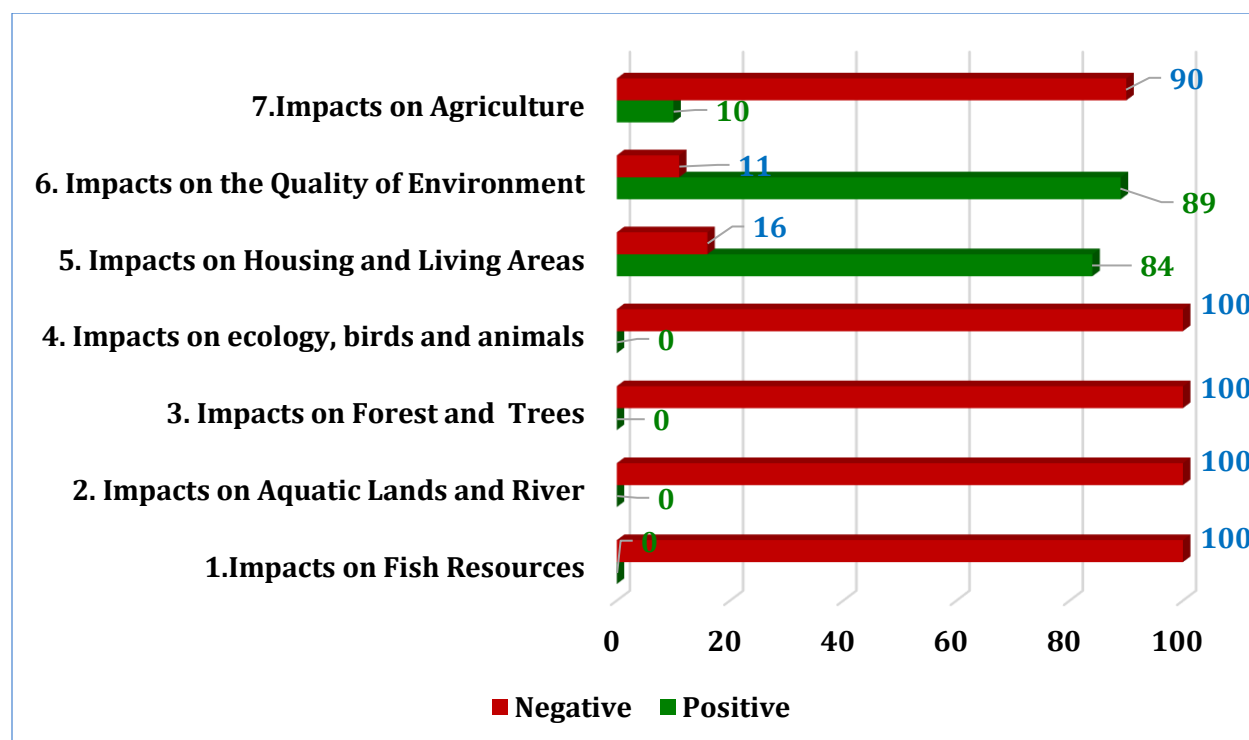


Figure 4.43: Environmental and Ecological Impacts of Bangabandhu Bridge Project (Manikganj)

Table- 4.1.91: Estimated loss regarding the disasters happened in previous 5 years (five districts)

Sector of Losses	Estimated loss	
	Mean	Median
Infrastructural damage to housing	19107377.05	100000
Land degradation	677777.78	500000
Income loss	23598.49	15000
Decrease in residential land	244000	100000
Lacking of pure drinking water	27100	21000
Agricultural damage	52700	20000
Damage of cattle	41266.67	15000
Increasing severity of the disease	20666.67	20000
Decreased employment	43916.67	42500
Injury	14333.33	10000
Food shortages	36800	40000
Other damage	22500	25000
Overall	9521166.397	57000

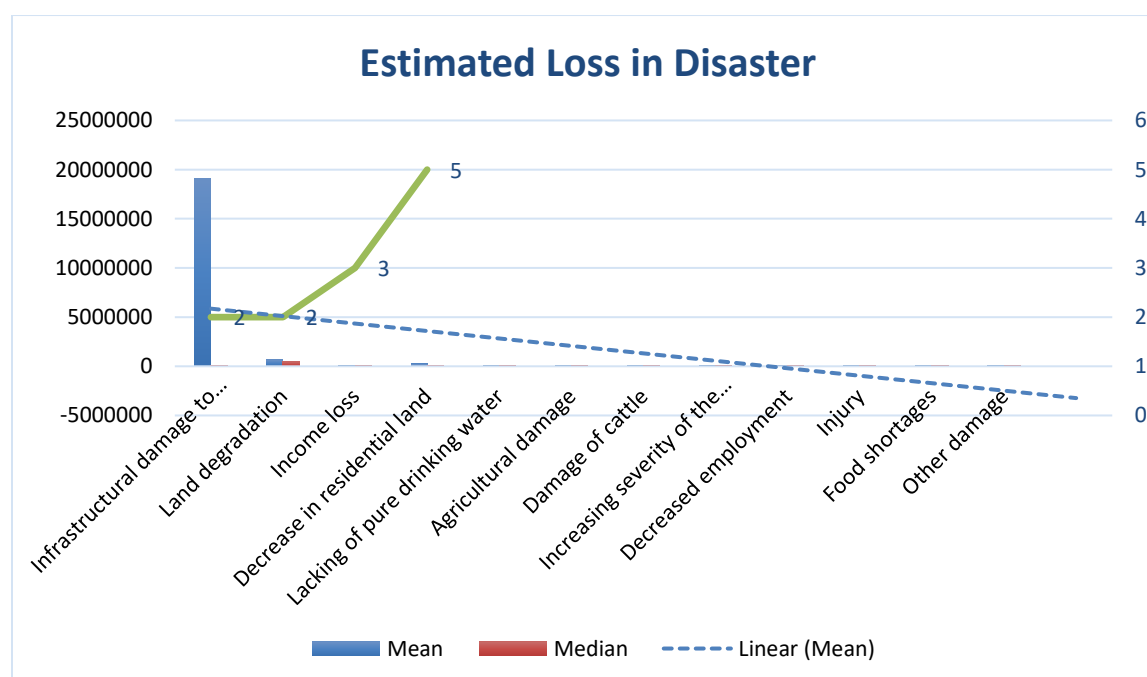


Figure 4.44: Estimated Loss in Disasters

It is found from Table 4.1.91 that the average estimated loss due to the disaster that happened in the last five years was 9521166.397 BDT and the median was 57000 BDT. Figure 4.44 shows the sources of disaster-related forecasting the local people receive during natural disasters and climate change. The highest 22 percent each get this information from mobile and television respectively, followed by 14 percent neighbor, 12 percent newspaper, 11 percent social sites/media, 10 percent radio and nine percent from their friends. On the other hand, Figure shows the percentage of the respondents who reported the household level negative impact due to climate change and natural disasters. These negative impacts are diverse and comprehensive. The highest 16 percent reported this impact as damage of crops, followed by 15% increase of drought, 13 percent severe flood, 12 percent increase of pollution, 11 percent increase of dust, 10 percent reduction of river water, nine percent reduction of agricultural production, seven percent reduction of the forest animals, six percent change of the flow of the rivers, and two percent are increased of the cyclone.

Table-4.1.92: Medium of Getting Forecast of Disasters

Medium of Forecast		Responses		Percentage of Cases
		N	Percentage	
How do you get forecast of disasters?	Radio	189	10.2%	38.1%
	Television	400	21.6%	80.6%
	Newspaper	224	12.1%	45.2%
	Friends	167	9.0%	33.7%
	Neighbors	254	13.7%	51.2%
	Mobile	411	22.2%	82.9%
	Social Media	207	11.2%	41.7%
Total		1852	100.0%	373.4%

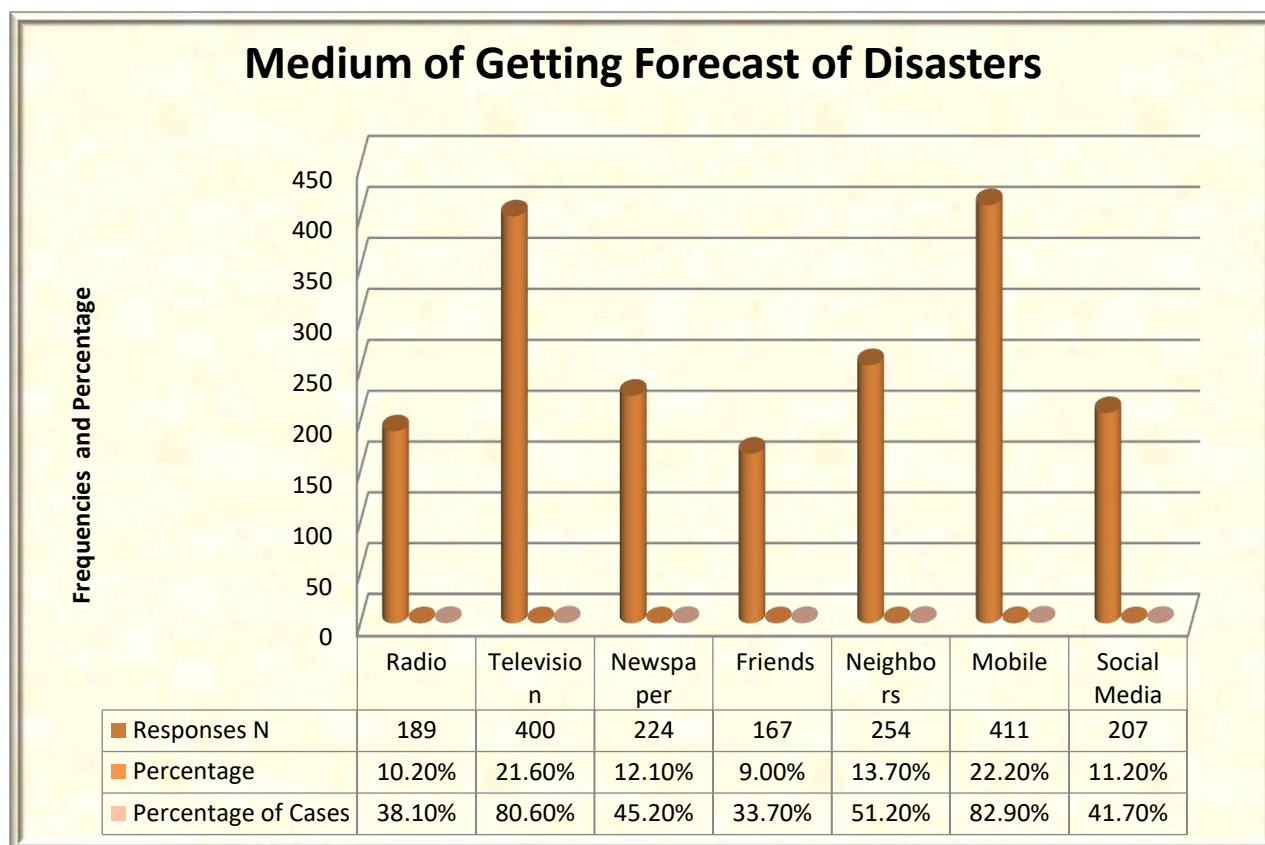


Figure 4.45: Medium of Getting Forecast of Disaster

It is observed in Table-4.1.92 that 80.6 percent cases of respondents were found to know the forecasts of disasters on television, 82.9 percent by mobile phone, and 51.2 percent by their neighbors. Besides, these media people also knew the forecast from hearing radio, reading newspapers, and using social medias, etc.

Table-4.1.93: Impacts of Climate Change in the Study Area (Five Districts)

Effect on Climate		Responses		Percentage of Cases
		N	Valid Percentage	
Valid	Reduced the water level	139	9.9%	29.3%
	Path of river has changed	79	5.6%	16.7%
	Frequent Droughts	213	15.2%	44.9%
	Severe floods	176	12.6%	37.1%
	Cyclones Increased	28	2.0%	5.9%
	Agricultural Production Reduced	119	8.5%	25.1%
	Forest Animals Reduced	93	6.6%	19.6%

	Damage of Crops	227	16.2%	47.9%
	Increase of Pollution	174	12.4%	36.7%
	Dust Increased	147	10.5%	31.0%
	Others	4	0.3%	0.8%
Total		1399	100.0%	295.1%

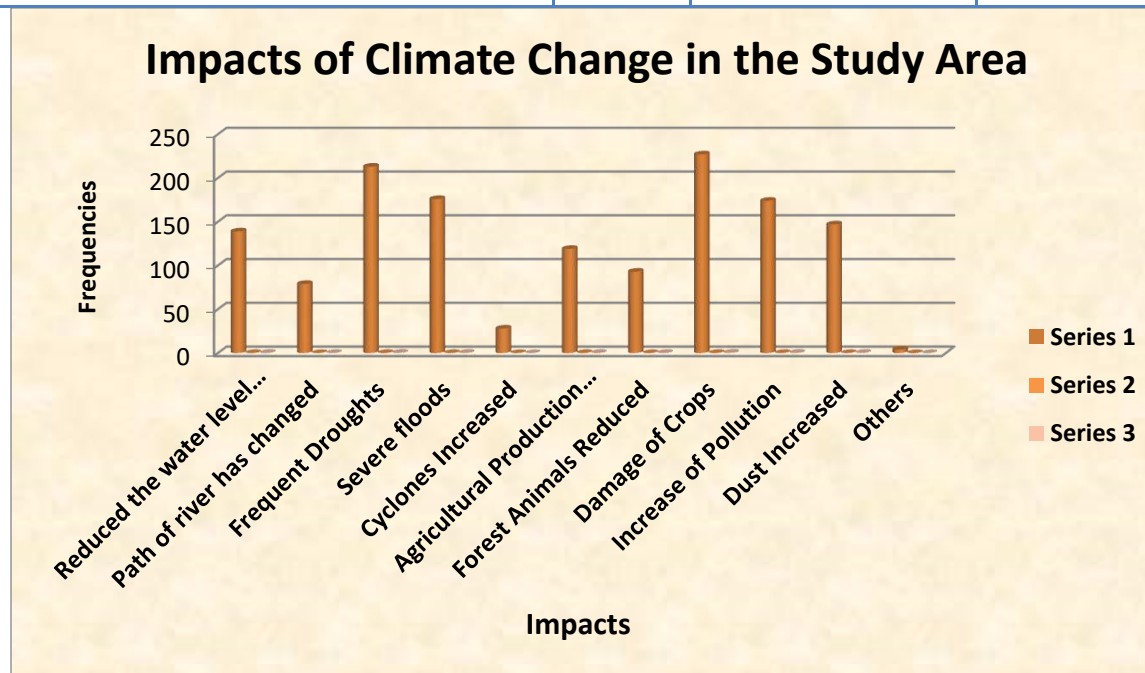


Figure 4.46: Impacts of Climate Change in the Study Area

Table-4.1.93 shows that due to climate change 44.9 percent of cases of droughts have been increased. About 48.0 percent of cases crops are found to be damaged, and water, air pollution has increased to 36.7 percent. The water level in the river has dropped to 29.3 percent cases. Owing to environmental changes, and an increase in frequent floods, droughts, dust, and other calamities, the future of this area in terms of sustainable environmental good conditions for peoples' living is thought to be really challenging. Table-4.1.93 shows the impacts of the Bangabandhu Bridge on the negative impacts on the environment at the household level where 62% are not agreed about this impact and the rest 38% think that there have negative impacts. Here Table presents data on the types of steps/initiatives taken to recover these negative disaster impacts. The study found three types of such initiatives/steps such as government initiatives, non-governmental initiatives and local initiatives. It is found that the nature and types of initiatives are the same across the types of initiatives authorities. The initiates are food delivery, distribution materials for building houses, providing pure water, distribution of crop seeds, Dam construction, plantation, and public awareness. The three leading initiatives of each implanting institution are government (28% dam construction, 16% planation and eight percent public awareness);

nongovernment initiatives (62% dam construction, 35% plantation and 34% distribution materials for building houses); and local initiatives (72% dam construction, 43 distribution of crop seeds and 42% each distribution materials for building houses and plantation respectively).

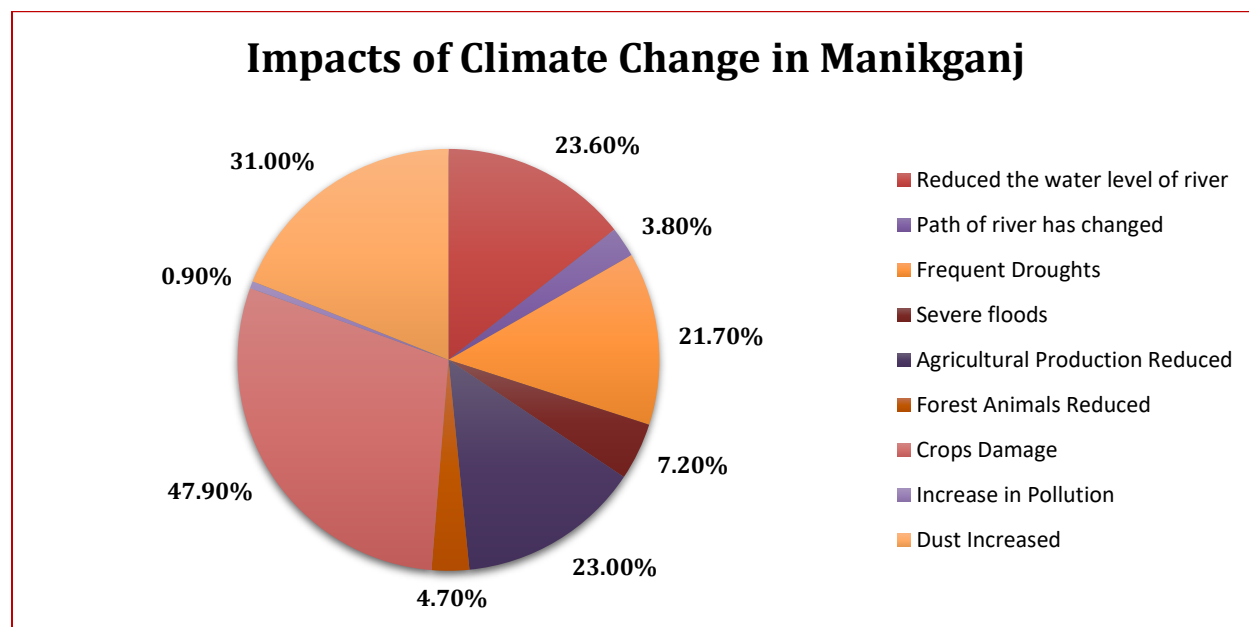


Figure 4.47: Impacts of Climate Change in Manikganj

Figure-4.47 shows in Manikganj water level of the river reduced according to 23.60 percent respondents, 3.8 percent think that path of the river has changed. About 22.0 percent respondents think that frequency of droughts has increased. About 7.20 percent of respondents think that in Manikganj severe floods has been seen. In Manikganj, 23.0 percent of respondents think that agricultural productions have been reduced. Almost 48.0 percent of respondents reported that their crops were damaged in the previous years.

NATURAL DISASTERS AND CLIMATE CHANGE AT HOUSEHOLDS' LEVEL

Table- 4.1.94 Occurrence of natural disasters at households' level

Whether natural disasters occurred	%
Yes	56.9
No	43.1

Table-4.1.94 presents the occurrence at the household level shows that 57% of the household people are affected by natural disasters and the rest (43%) are not.

Table: 4.1.95 Number of The Flood, Its Intensity, Types of Action Taken, and Service Organizations

Number of floods		Percentage
1		50.0
2		19.6
3		4.7
4		2.8
5		3.7
6		.9
7		6.1
8		1.4
10		8.4
12		1.9
20		.5
The intensity of the flood		
Increased very much		62.9
Increased		18.6
Slightly increased		17.2
Same as before		1.4
Types of action taken during floods		
Construction barrage		85.6
Boat		25.4
Constructing barriers in river		5.4
Partially		10.4
No step		4.2
Name of the organization that took action during the flood		
Government		8.7
Local administration		78
Local NGOs		9.8
No step		2.4

Data (Table 4.1.95) on the number of floods, their intensity, types of action taken, and service organizations show that all of the households faced this kind of disaster. A half of the respondents (50%) faced flood one time, that is 20 percent twice, eight percent 10 times and six percent six times. From the intensity of flood, it is found that it was increased very much nearly 63.0 percent, increased 19.0 percent and slightly increased 17.0 percent and same as before only one percent. Data also showed that there are mainly four types of

actions were taken during flood such as the highest 86.0 percent construction barrage followed by boat 25.0percent, construction barriers in rive five percent and no step was taken four percent. There were three types of organizations that are the pioneer to take such actions such as local administration (78%), local NGOs (10%) and government (nine percent).

Table-4.1.96: Number of River Erosion, Its Intensity, Types of Action Taken, and Service Organizations

Number of river erosion	Percentage%
1	63.2
2	6.8
3	7.5
4	1.5
5	1.5
6	3.8
7	3.8
8	3.0
10	6.0
12	.8
13	.8
17	.8
20	.8
The intensity of river erosion	
Increased very much	76.7
Increased	9.3
Slightly increased	7.3
Same as before	2.7
Increased less	4.0
Types of action taken during river erosion	
Constriction barrage	8.7
Infrastructural development	86.5
No step	1.7
Name of the organization that took action during river erosion	
Government	69.0
Local administration	13.8
Local NGOs	17.2

On the other hand, data (Table 4.1.96) on the number of river erosions, its intensity, types of action taken, and service organizations show that all of the households faced this kind of disaster. The highest 63.0 percent of the respondents faced river erosion one time, that is seven percent twice, six percent 10 times and four percent each six times respectively. From the intensity of river erosion, it was found that it was increased very much nearly 77.0 percent, increased 10.0 percent and slightly increased seven percent, increased less four percent and same as before only three percent. Data also showed that there are mainly two types of actions were taken during river erosion such as the highest 87.0 percent infrastructural development followed by construction barrage nine percent, and no step was taken one percent. There were three types of organizations that took such actions such as government (69%), local NGOs (17%) and local administration (14%).

Table- 4.1.97: Number of Droughts, Their Intensity, Types of Action Taken, and Service Organizations

Number of droughts	%
1	97.8
2	1.5
3	.7
The intensity of river erosion	
Increased very much	29.7
Increased	41.6
Slightly increased	2.2
Same as before	.5
Increased less	25.9
Types of action taken during draught	
barrage construction	1.9
climate change	5.7
Construction barrage	24.5
construct barrier	9.4
Constructing barriers in the river	7.5
construction barrage	32.1
construction of barrage	1.9
construction barrage	15.1
Nothing	1.9
Name of the organization that took action during river erosion	
BADC	4.8
Local administration	92.8
Nothing	2.4

Table-4.1.97 on the number of droughts, their intensity, types of action taken, and service organizations show that all of the households faced this kind of disaster. The highest 98% of the respondents faced drought one time, that is two percent twice and below one percent thrice. From the intensity of drought, it is found that it was increased nearly 42.0 percent, increased very much 30.0 percent, increased less 26.0 percent, slightly increased two percent, and same as before below one percent. There were two types of organizations that took such actions as local administration (93%) and BADC (five percent).

Table-4.1.98: Types of steps/initiatives taken to recover negative disaster impacts

Types of initiatives	Level of initiatives			
	Sufficient	Moderate	Not sufficient	No steps
Government initiatives				
Food delivery	15.2	57.3	26.7	0.8
Distribution materials for building houses	3.8	48.8	44.1	3.3
Provide pure water	17.3	46.4	26.3	10
Distribution of crop seeds	7.2	55.8	33	4
Dam construction	41.2	13.7	17.4	27.7
Plantation	10	52.3	22	15.8
Public awareness	29.4	50.7	12	7.9
Non-governmental initiatives				
Food delivery	0.4	38.8	48.0	12.8
Distribution materials for building houses	0.5	18.8	46.3	34.4
Provide pure water	4.3	29.8	35.8	30.1
Distribution of crop seeds		20.8	47.5	31.8
Dam construction	0.3	14.2	24	61.5
Tree Plantation	1.5	32.3	31.4	34.8
Public awareness	8.1	60.1	11.3	20.5
Local initiatives				
Food delivery	1.5	26.3	50.1	22.1
Distribution materials for building houses	0.7	14.7	42.5	42.1
Provide pure water system	4	27.5	35.6	32.9
Distribution of crop seeds	0.5	16.7	39.4	43.4

Dam construction	0.5	6.3	20.9	72.3
Plantation	0.8	27	30	42.2
Public awareness	1.5	61.5	6.4	30.6

Table-4.1.98 shows the impacts of the Bangabandhu Bridge on the negative impacts on the environment at the household level where 62% are not agreed about this impact and the rest 38% think that there have negative impacts. Table 4.1.98 presents data on the types of steps/initiatives taken to recover these negative disaster impacts. The study found three types of such initiatives/steps such as government initiatives, non-governmental initiatives and local initiatives. It is found that the nature and types of initiatives are the same across the types of initiatives authorities. The initiates are food delivery, distribution materials for building houses, providing pure water, distribution of crop seeds, Dam construction, plantation, and public awareness. The three leading initiatives of each implanting institution are government (28% dam construction, 16% Tree plantation and eight percent public awareness); nongovernment initiatives (62% dam construction, 35% Tree plantation and 34.0 percent distribution materials for building houses); and local initiatives (72% dam construction, 43.0 percent distribution of crop seeds and 42.0 percent each distribution materials for building houses and plantation respectively).

SECTION-4.2

FINDINGS OF THE QUALITATIVE INVESTIGATION IN SELECTED AREAS: FGDs, KIIs AND IN-DEPTH CASE INTERVIEWS (ICIs)

This section of the study highlights the qualitative findings of the 08 FGDs, 08 KIIs and 13 In-depth case interviews. These were collected from the different study area. The main objective of this section is to give detail real and contextual information on different aspects of the lives and livelihood of the people of the study area.

4.2.1. FOCUS GROUP DISCUSSIONS (FGDs)

FGD -1 in Sirajganj District (Household Level)

A Focus Group Discussion (FGD) was conducted at Pachil village of Khajjuri union, Shahjadpur Upazila of Sirajganj with a view to exploring the impacts of the Bangabandhu bridge project on their socio-economic development. FGD was formed with thirteen members of different professionals at the household level. The participants were one ward member of the union Parishad, one reserved woman member, one journalist, one service holder at a non-government organization, one school teacher, two political activists, one Imam of the local mosque, one banker, one women rights activist, two businessmen and one religious leader.

The objectives of the FGD were to explore the socio-economic impact evaluation of Bangabandhu bridge which ultimately show the socio-economic situation, income generation and employment creation, communication and business development and environmental and ecological impact due to Bangabandhu bridge. In doing FGD, face-to face group interview with participatory observation has been used. Audio-video device is also used there. The findings of FGD have been presented based on different thematic issues undertaken the study:

Benefits/ Loss in the life of Project Area People

The FGD participants are asked to know the benefits of the projects. Group discussion revealed that it has opened the door for the creation of new works. Students from different walks of remote areas can easily move to the developed city especially the capital city Dhaka for higher education which contributes to increasing the rate of higher education. Many entrepreneurs have established non-government medical colleges, universities, and technical educational institutions.

The Bangabandhu Bridge has created the scope of improved health facilities for local people. The government health department has reached remote villages with improved health facilities/services including community health service, union family and health services center. So, the improved health facilities have contributing to reduce the family size and life expectancy of people. Produced agricultural crops have been easily transported in different cities including Dhaka due to Bangabandhu Bridge.

One of the FGD participants said:

Easy and improved transport system makes us very easier for crops transportation to town as well as Dhaka city.

But it is also found that juvenile delinquency has been increased due to easy communication with capital city.

One participant expressed his/ her opinion as:

Crimes have been increased rapidly due to technological development which is also contribution of Bangabandhu Bridge in our local area.

Mistrust among peoples has been increased for development and social change which is mainly caused by Bangabandhu Bridge. A journalist said:

Migration to town and Dhaka for seeking employment has been increased rapidly only for Bangabandhu Bridge.

FGD participants have mentioned more benefits due to the Bangabandhu bridge project.

Employment Creation and Economic Development

The participants are asked to know the impact of the Bangabandhu Bridge on economic development, poverty alleviation and employment creation. Group interviews reveal that the Bridge project has expanded the scope of works in non-agricultural areas which contributed to the reduction of unemployment. One participant mentioned:

Our remote village is developed rapidly due to the bridge and now local people can easily migrate to Dhaka for employment in garments industries.

It also increases the income and expenditure of the families. Another participant said:

Bangabandhu Bridge can easily transport agricultural products and it ensures the real prices of the products.

Developed transport and communication have reduced the agricultural dependency; it has changed the traditional occupations and enters into high-breed crop production at less risks. One UP member commented:

Prices of daily necessities have been increased in irrational ways. Now we are not only dependent on agricultural activities only but also on industrial works and production.

Bangabandhu Bridge has increased many areas of developments such as increasing savings and investment, land value and self dependency. Another participant explained:

Land value has been increased many times due to economic development of project area people.

It ultimately develops the living standards of local people. Many Agro entrepreneurs and small entrepreneurs have been increased. The labor patterns have been radically changed due to development. Bank, insurance and business institutions have been increased due to increasing economic flow. One group member said:

Economic transactions have been increased much time because of Bangabandhu Bridge and many financial institutions, banks have been established as an outcome of economic advancement.

But, it is also found that many inhabitants have lost their cultivable lands due to land acquisition and river erosion. One participant school teacher said:

Fish production in the Jamuna River has been decreased due to emergence of new chars in the river.

Another participant said:

River erosion has been increased due to bridge project; as a result, many lands have been lost.

Impact of Bangabandhu Bridge on Industrialization

The group members are interviewed to know the role of the Bangabandhu Bridge on industrialization and medium scale industries. Group interviews reveal that the bridge project plays roles in different areas of industrialization and the establishment of industries. The Bridge project has changed the working nature of employment. It has started new industrial entrepreneurs and established new industrial infrastructure. One group member said:

New industries have been established due to the bridge project and industrial products can be easily transported to Dhaka city as well as abroad through Bangabandhu Bridge.

Due to the development of the communication system, the government has started to establish Export processing Zones (EPZ) and BASIC zones in two areas of Sirajganj districts. It will create huge scope of small-scale industries. The bridge project has made it easy for the processing of agricultural products. Many remote areas are being urbanized due to the development of communication systems and civil facilities. Everything is possible only for the Bangabandhu bridge. Another member said:

Many groups and classes of people are coming here as tourist to visit the historical places in our local areas. So, many of the locals have established tourist spots and coffee parks.

But modern facilities have stopped the increasing trends of traditional handloom industries. Handloom industry owners cannot cope with the modern industrial equipment. One journalist said:

Our traditional handloom industries have been near to dye due to the increasing trends of raw materials and it cannot run with the competition along with modern industrial set up.

Impact of Bangabandhu Bridge on Environment and Ecology

Group members were asked to know the impacts of the Bangabandhu Bridge on environment. Participants replied to the different aspects of environmental impacts affected by the bridge project. The majority of the participants pointed out that the bridge project was responsible for the present environmental degradation. One participant explained,

New Chars have been created in changing the previous way of river and new areas are being erased due to the bridge project.

It is observed that many high rise buildings have been erected and industrial setup is seen because of the Bangabandhu Bridge. In many parts of the river, new Chars are rose due to the river govern. One journalist has said:

Influential corn of the people has been extracted sand from the river and as a result, new areas of land have been erased.

The way the river has been changed and bio-diversity has been radically changed due to the bridge project. Another member also mentioned:

Environment is highly affected because of environment unfriendly tree plantation in our local areas.

The new environment has created the high health risk and infectious diseases. One member has said:

Newly established industries have been responsible for infectious diseases.

Thousands of motorized vehicles are being moved from the East to west through the Bangabandhu Bridge. It has created sound pollution which is seriously detrimental to human health.

Women Empowerment and Security in Bangabandhu Bridge Area

Group members were interviewed to know the status of women empowerment and security in the bridge project area. Discussion reveals that women and children were found to feel good in moving outside. They cannot face any type of insecurities. Due to the bridge project, the police petrol is always active in and around the bridge area. As a result, crimes are found comparatively less than the other locations. Law and order situation is better.

One participant said:

Now police is playing positive roles due to government monitoring.

In case of local conflicts, village court led by union parishad chairman can settle the issues. The local government bodies are playing positive roles in resolving family matters. But, another member said:

Drug abuse has been increased due to easy availability of drugs in local areas. Easy communication is playing roles in this regard.

Now women have strong roles in making decisions at the family level. They are involved in income-generating programs and it contributes to family expenditure and increasing savings. Women's employment is being increased gradually due to bridge project.

Another participant says,

Women are involved in income earning activities than in the past and they are now self-dependent.

Now, women are taking decision in family planning programs. Due to development, women entrepreneurs are being increased and they are self-employed. So, women are now expressing their free opinion and enjoying free movement on their own wishes.

But, one participant said:

Early marriage and dowry system has been increased dramatically among the local community people.

They can receive maternity services and it reduces maternal mortality. The group members are also asked to know the role of GO, NGO and local government bodies in community development of project area. One FGD member said:

The government has many development projects for the root-level people but, Union Parishad cannot provide services to the people in a few cases.

Community participation is seen in tackling natural disasters and shelter centers plays vital roles in this regard.

Suggestions for the Livelihoods Development of the Study People

The group members were asked to know their suggestions in regard to the development of socio-economic, education, health, recreation and infrastructure in the Bridge area. Findings come in the following ways:

1. Recommended for new employment creation, proper marketing of agro and industrial products, youth training for self-employment, agricultural mechanization and quick implementation of BASCIC project in Sirajganj for economic development;
2. Recommended for stopping early marriage through law implementation, increasing number of educational institution, technical education and women education for socio-educational development;
3. Recommended for ensuring primary and specialized health services, expanding family planning programs, child immunization for health development of project area people;
4. Recommended for the establishment of new parks, playgrounds, community centers, shelter centers and non-stop electricity supply for recreational and infrastructural development.

One participant finally passed opinion:

Children should be encouraged on physical labor-based recreation in playgrounds than technology-based recreation, now our children are highly addicted to modern technological devices.

FGD-2 in Sirajganj District (Small and Medium Shop Owner's Level)

A Focus Group Discussions (FGDs) was conducted on the small and medium shop owners at Sirajganj Sadar Boro Bazaar, Sirajganj with a view to know the impacts of Bangabandhu Bridge on socio-economic development, trade and commerce. FGDs were formed with eight members of small and medium owners of shops and they enjoyed the different posts of the Shop Owner's Association in the market. The age of the participants ranges from 42 -61 years. Their educational qualification was from class five to higher secondary pass. They were involved in the shop/ business like grocery, clothes, wood, hotel, fish, vegetable and tailoring.

The objective of the study was to find out the socio-economic impact evaluation of the Bangabandhu bridge which ultimately has shown the socio-economic situation, income and employment opportunity, transportation and communication, trade and business and environmental and ecological impact due to Bangabandhu Bridge. Face-to face group interviews and participatory observation technique were applied to conduct the FGDs. Moreover, audio-visual devices were also used to keep the recording.

The FGD participants were asked to know the benefits of the Bangabandhu Bridge, all of the participants mentioned that they were benefitted more or less due to the bridge. The participants have recognized that Bangabandhu Bridge has opened the door of new employment and new trade and business opportunities well as opened the competitive attitude in the business. One of the aged participants mentioned:

Monopoly and stock business were the main problems at Sirajganj Boro Bazar before implementation of Bangabandhu Bridge but today, such type of monopoly and stock business are vanished from the market due to Bangabandhu Bridge.

The FGD participants also mention that the development processes are comparatively poor in Sirajganj Sadar than that of the other Upazila of Sirajganj such as Belkuchi, Ullahpara, Shahjadpur and Kazipur. Sirajganj Sadar is situated about six to seven kilometers away from the Dhaka-Bangabandhu Bridge highway and it is backward compare to above mentioned Upazilas of Sirajganj and Bogura district. All the FGDs participants told:

Movement of the outside people is very poor in Sirajganj Sadar area. This place cannot attract outside investors. The business, investment and employment are mainly created by the local people. That is why, the environment of large investment are not made in Sirajganj Sadar.

Overall people's income has increased in this area due to Bangabandhu Bridge project. People of this area are being involved in diverse occupation. New market places are developed due to the improved transportation and communication. The link roads connecting with high way of the

local area are being made pucca (concrete made) gradually. Farmers enjoy the real price of their products due to improved transportation and communication. FGDs participants opined:

Agricultural commodity easily transports to Dhaka. Even, the people of Dhaka consume the agricultural commodity earlier than us.

From the FGDs findings it is found that fish firming, poultry, livestock firm, handicraft, financial institutions, small and medium business, product delivery and service, easier marketing of commodity, consumer's satisfaction are being improved in this area due to Bangabandhu Bridge Project. All types of commodities such as agricultural instruments, electric materials, medicines, large company showrooms etc. are available at Sirajganj Bazar.” They also complained:

Fish price is very high at Sirajganj bazaar. The fish of the rivers go to Dhaka and they cannot consume the river's fish.

Government and non-government initiatives are also strengthening in this area due to Bangabandhu Bridge. School, college, university, medical college and hospital are developed in this area. FGDs participants told,

At present, Sirajganj is the city of education and health. Health care services have reached remote areas. Inhabitants of Sirajganj have enjoyed the improved health care. Women empowerment and education rate have increased in this area due to Bangabandhu Bridge.

They also mentioned,

Female education rate has increased in this area. The opportunity of education was difficult for the female in this area before the Bangabandhu Bridge. But now, female are going to school, college and university and they are being engaged in different types of profession. Female are doing business in Sirajganj Bazar and these are mainly tailoring. Female are doing joss in several company's showrooms at Sirajganj Bazar.

Modern facilities such as education, employment, health care, accessibility of commodities, electricity, gas, expansion of commerce and trade, mobility of labor, agricultural modernization have increased for the Bangabandhu Bridge of the whole northern part of Bangladesh. Some of the FGDs participants opined:

The Bangabandhu Bridge is a blessing for the inhabitants of Sirajganj. Today, inhabitants of Sirajganj can go to Dhaka early at morning and after finishing their official activities or commerce and trade activities we can return to Sirajganj at noon and take our lunch at home.

Bangabandhu Bridge is playing an important role for the development of the entire area of North Bengal. It is the entry door of the northern part of Bangladesh.

The situation of law and order are good in market area. FGDs participants told:

Law enforcing authority is active in market area. Police patrol visits now and then in the market area.

FGDs participants were asked about the drug addiction situation in this area. All of the participants mentioned:

Drug addiction is seen as a life annihilating disease in this area and has spread to the remote area due to the availability of drug and improved transportation and communication.

From the FGDs findings it has also found that juvenile delinquency has been increased due to easy communication with capital city. One of the participants mentioned:

Crimes have been increased rapidly due to technological development which is also an outcome of the Bangabandhu Bridge in this area.

Mistrust among local people has been increased for development and social change which is mainly caused by Bangabandhu Bridge. Once upon a time, early marriage was one of the major problems in this area. Female educations, awareness among the people, GO and NGOs initiatives, employment, income generating activities, poverty alleviation program etc. have decreased the rate of early marriage and it is one of the contributions of Bangabandhu Bridge. One of the FGDs participants told:

Once upon a time, river erosion and flood were the devastating disasters in this area. Fisherman communities were mainly engaged in catching fish in the river. Early marriage rate was very high of those communities due to lack of security of female child. Rate of river erosion and flood has lessened due to take the modern and strong initiatives by government and today these communities are adopting the diverse occupation along with catching fish.

The FGDs participants were interviewed to know the role of the Bangabandhu Bridge in developing the industrialization and medium-scale industries in this area. FGDs findings reveal that some investors and entrepreneurs are working to establish the new industrial infrastructures and that are mostly nearer to Dhaka-Bogura highway. One of the group members said,

In future, all of the places near Dhaka-Bogura highway will be full of industry.

Government has started to establish Export processing Zone (EPZ) and BASIC zones at two areas of Sirajganj districts. It will create huge scope of small scale industries. Group members were interviewed to know the impact of Bangabandhu Bridge on environment. Some of the participants mentioned:

A huge development work is going on to extend the road and also to establish the industry. Dust is a constant pollutant of those areas. Thousands of motorized vehicles are being moved through Bangabandhu Bridge. Sound and air pollution are extremely harmful for human health. The pace of industrial trend can erode the crops and forestation filed and can create serious environmental hazards in this area.

Suggestions for Lives and Livelihood Development of the Bridge Area People

FGDs participants were asked to know their recommendations in regard to the socio-economic development of this area. Findings have come out in the following ways:

1. Once upon a time, there was a port in Sirajganj Bazar. Today, this port is closed due to sedimentation of the canal. It is their demand to reintroduce the port so that they can carry their commodities both in river and high way.
2. To establish the training and technical institutions for developing the human resource and to build up the youth as a skilled manpower for the industry.
3. To implement the BASIC project and EPZ quickly.
4. To attract the new national and international investors and entrepreneurs to establish the new business and commerce in this area.
5. To establish new parks, hotels, restaurants, playgrounds, community centers and non-stop electricity supply.
6. A long traffic jam is seen now and then on both sides of the Bangabandhu Bridge. Vehicles passing should be easier through the bridge. At the traffic jam time, tickets may provide both computerized and manual.

FGD-3 in Manikganj District

On October 12, 2021, the focused group discussion was conducted with the participation of two teachers, a chairman of a union parishad, two members of union parishad, two political leaders, two NGO workers, a disaster management officer as well as two traders in Sadar union, Ghiyor Upazilla of Manikganj. The topic of the focused group discussion was the socio-economic impact of the Bangabandhu Bridge over the Jamuna River.

Objectives of focus group discussion

The objectives of focus group discussion are to draw upon the respondents' attitudes, feelings, beliefs, experiences, and reactions in a way in which would not be feasible using other methods, for example, observation, one-to-one interviewing, or questionnaire surveys. Techniques and devices in focus group discussion were used such as Audio visual aid, video, Recording instruments, Group Interviews.

Information about benefits and problems concerned with the Bangabandhu Bridge:

The working opportunities are found to be increased. The people of this area have informed that the rate of school dropping has declined as a result of starting the Government stipend (150 BDT per student). Early marriage also is known to be growing on the grounds of Covid-19. The agricultural productivity has increased and the mortality rate has been found to be declined. The drug addicted youth has increased as well as addiction of online gaming is rising which is a concern in the study area during covid-19 pandemic.

To create employment opportunities and eradicate poverty, industries/ factories are being established instead of agricultural farms, like honey-farm, paper tissue factory, bricks fields. A huge working facilities has been developed for the youth in these factories. Farming land decreases because of increasing brick factories. Bricks factory emit carbon which pollutes the air. Sound of vehicles is contributing factor for sound pollution in the town. Movement on the roads at daytime is difficult for dust in the air. Administrative authorities have cut down the old trees and planted new ones but the situation has not changed yet. The state of human health is getting improved and children are taking EPI vaccines. Consequently, the infant mortality rate has been decreased.

The communication system has developed for building new roads. If Paturia Ghat is developed and well connected with Pabna district a higher possibility of establishing industries will be increased. Due to the lack of cold storage, the problem to store potato and tomato corn were found. Ponds are used for cultivating fish, but the fish transported to Dhaka and the local people can not avail of the fishes with low price.

The security of the women and girl children were developed and the law and order situation is getting better. Dispute on landed properties among the local residents is found to be increasing and the rural arbitration system is being weakening day by day. It was reported that male members were found to play a dominant role in the family decision making process. But the scenario is different in the educated families. There the both male and female members are taking their family decisions equally.

FGD- 4 in Kurigram District

The present study aimed at evaluating the impact of the Bangabandhu Bridge. To make the data of the study more valid and reliable, the present study had a focus on qualitative primary data. In this regard, FDG with industrial personnel is a major way of getting some reliable data. FGDs group in industrial settings was formulated with the people of heterogeneous identity. In FGD, the equal participation of all group members along with female members was ensured.

This FGD has taken place at Bangladesh Small and Cottage Industries Corporation, BSCIC, Kurigram Sadar, Kurigram. Altogether 07 participants were from members of BISCIC, male and female entrepreneurs, small, medium, and big businessmen, and owners of factories have participated in this group discussion. Their age was from 28 years to 53 years. The participants were educated much and their level of education ranges from HSC to Masters Pass. Qualitative and explorative data has been gathered from this discussion and presented in a sequential manner. An FGDs guideline has been followed in conducting present FGD in the industrial setting.

Discussion on investment was undertaken and the entire participants come to a conclusion that Bangabandhu Bridge has developed their investment sector.

One of the group members said:

BSCIC, Kurigram provided me with the loan for making handicrafts. I make various types of toys, flowers, Mura, Hand-fan. I saved some capital (money) from these handicrafts and now investing it in my new tailoring business. I hired 30 female workers for doing this job. I am happy with that.

One of the significant impacts of this bridge is employment. All the members of this group made a sum up that this bridge has a huge positive impact on the employment sector. The concept of seasonal unemployment is now no more exists here. People from this area can go to the capital city for woks like pulling rickshaws and come back to Kurigram at an appropriate time of

cultivation. They said that a lot of industry has been built in this area and people are engaging in this industry. BSCIC is a lightning example of the employment success of this bridge.

Large-scale businessmen said that small businessmen are in a safe zone and have hassle-free life in their business. On the other hand, the small businessmen said that middle and big businessmen in the capital zone and control all kinds of business, bank loans, government facilities and do not support the small businessmen. The price of land in this area is very high. The price of land has increased about 20 times from 1995 to 2015. They inform that the price of land varies from the palace to the place. But the overall scenario of this land price is sharply increasing.

The Focus group told that a lot of NGOs are working around Kurigram. At the district level, NGOs are operating various types of programs including climate issues, women empowerment, training, sanitation, poverty, legal services etc. But in rural areas, NGOs are operating mainly micro-credit programs. After a lot of discussion, they finalized that poverty in that area has been reduced and people are not having troubles in managing food like before.

They experienced a huge positive impact on the agricultural field. Now they can use modern technology like harvesting machines. Investment in agriculture is another important factor. They think that investment in co-operative agriculture needs to be increased. Proper motivation and awareness are urgent requirements.

All members of the groups after having some discussion reported that the diversity of crops, irrigation facilities increased at a slow level. But the production level has been increased at a higher level. Rural industry and employment creation have been increased.

Business diversity was a major topic of discussion and they think that this bridge makes a huge diversity in business.

One of the Female Participants said:

I have started a new business in this area and that is ladies Parlor and hair dressing saloon. When I opened this shop, it was quite unknown to mass people. Some people did not take this business in a positive way. But now people are accustomed to this business and many popular has been set up by taking training from me. It has also created an employment opportunity for poor young girls.

About the challenges in the industrial sector, they think that they face financial problems mainly. All of the members said that the bank is not supportive to provide loans. Nepotism in providing loans is a normal phenomenon here. Women entrepreneur does not get loans without proper documents and mortgage. The is another challenge is the preservation of crops. Agricultural products are at high risk of being rotten because of the shortage of cold storage. They also discussed on lack of proper monitoring but some members oppose monitoring challenges. All the

members identified a major challenge that is middle man or broker. Middlemen buy any product at a low cost and sell it to buyers at a high price. They maintain a syndicate and practice political power.

Public-private partnerships and sufficient bank loans can reduce industry-based challenges. Women need to be provided with sufficient financial and social support in their businesses. The Bangabandhu Bridge ensures industrial development and develops the infrastructure, road, small bridge, social institutions, etc. But for making buildings, people need to cut down trees, fill out the ponds, canals, and rivers. All the group members came to a unified decision that it has created a negative impact on natural beauty, climate, air, and water. Some of the members have explained some positive issues too. The drainage and sewerage system were developed, a proper initiative in industrial waste-management system was also established. Now the people have become more conscious about the natural disasters.

FGD- 5 in Kurigram District

A focus group discussion was conducted with the members of the chamber of commerce and members of the market association, Kurigram. In this discussion, there are seven members (President, Vice-President, Secretary and Members) were present. This session basically conducted to know the socio-economic impact of the Bangabandhu Bridge in the following questions. To keep confidentiality, we used the respondents' pseudo names for research purposes.

Economic Impacts of Bangabandhu Bridge

Actually, Bangabandhu Bridge connected the whole of Bangladesh in the communication sector as a result a huge number of employment opportunities have been created. Before the construction of the Bangabandhu Bridge, mass people went to Dhaka after facing a lot of hassle such as over-transshipments in carrying products; change at more public transport. A great number of Bank and Insurance Companies inaugurated their financial services in this area but one of the FGD respondents made opinion:

We don't get loan facilities properly from the bank due to nepotism of bank employees, power exercise and abuse of local leaders, lack of effective bank help desks etc. So, all banks should provide loan facilities in a ethical standard so that small cottage industry can survive in undesirable situation.

Agro-based industry is more expanded in this region due to fertile land. Different types of crops are being produced in this area for example-potato, tomato, chilly, carrot, sugarcane, pineapple

etc. Each and every product easily supplied to Dhaka city due to construction of Bangabandhu Bridge. But one Respondent passed opinion:

There is no sufficient number of storehouses in our district to store the crops. As a result, a huge number of agro-based products get damaged. So, we need to establish more storage house for storing the crops. Especially, I insisted on establishing a temporary center for tannery products because every year a great number of tannery products get damaged due to poor storage system.

There have been a lot of markets and shops (Big and Small) built in Kurigram District since the construction of Bangabandhu Bridge. Another Respondent told:

Many shops get benefits of electricity, sewerage, dustbin services provided by the market association. Every day, one crore BDT is transected in this market. But I am concerned that, our local products for example Bakery are being lost because they don't get adequate benefits or services in production as well as big companies like Pran, All Time, RFL have captured the whole market.

Almost 70.0 percent women now come to the market especially on Friday. Market infrastructural development has been better than before. Due to the construction of the Bangabandhu Bridge, many market shops have been built in Paka (made with bricks). Water and sanitation facilities have been better than before.

Environmental Impacts of Bangabandhu Bridge

A few numbers of rivers are filled with sand and soil for example Dhorla River. Overflowing is a common problem in Kurigram district as a result farmers loss their crops sometimes this overflow create inundation. So, the participants of FGD reported:

River's dredging is essential so that Agricultural crops are not damaged from overflowing. A huge tons of sand that is found after dredging can be used for various development works for example-Kurigram Agricultural University.

And another participant said:

There are 400 small and large Chars in this region if we can use this land properly in agriculture and industry sector then our district will change a lot.

They also said that auto motor vehicles are increasing day by day and it is a source of income for unemployed people in Kurigram district. They expect small scale garment industry for addressing unemployment problems in Kurigram.

FGD -6 in Tangail District (Financial Institutions)

In a focused group discussion in Tangail 05 business persons participated. The discussion was held in Ms. Makka sites and co, Tangail that was built in 1995. There are 16 employees working there. Among the FGD participants, most of them are in the 40-50 years of age group. Among 05, four participants had higher education. There was no female participant in that group.

According to the participants:

We have observed a variety of changes in various sectors after the construction of the Bridge. Most of them admitted that investment has increased and it is observed that due to the expansion of the industrial activities, the agricultural activities alongside were also increased. Some participants mentioned the rising use of the loom industries in this area.

Every participant agreed that due to the bridge activities the employment opportunities have risen. During this time auto rice mills and dairy farms have increased. As the transportation system has been developed, therefore people can bring their raw materials easily. As there is an increase of cash flow in the area, which led to a rise in the price of the land which is located beside the local market and main roads in particular.

The major impact of the bridge has been observed on the social sector. After the Bridge was established the literacy rate also increased and the transportation system also developed. However, it also noticeable that the amount of the property of the local people was found reducing remarkably.

All participants agreed that there are a few Agro-based industries that have increased in this year. Some mentioned that as the industrial area are being increased and modern industry also developed therefore it has caused a negative impact on the local industries.

When asked about employment creation, some participants said:

The farm sector has been developed moderately but the transportation sector has developed significantly. There are very few people who like to invest in self-employment. However, it is observed that investment in the government service has been increased. Investment in non-government services has increased moderately.

About mobility and its impact on the local area, it can be said that diversity in employment and job creation has increased. It is also observed that there is a flow of migrant workers in this area

which was not common in earlier days. More interestingly, the number of foreign workers has increased largely.

What types of business diversity has been observed during last year? Some of them answered:

The diversity has increased moderately but it can be said that small business and medium sized business has increased the most.

About the availability of raw materials, it has been observed that agricultural materials and also construction materials have increased moderately. It is agreed by all respondents that the price of the land which is beside the road has increased the most. Many financial institutions have been newly established. It was also observed that the tendency of savings has increased moderately among the people. Some participants told that the trend of financial flow and the number of beneficiaries had increased moderately.

About the communication system it was observed that their transportation cost has decreased due to the project. They mentioned that the marketing cost, the journey hour and the journey cost and overall transportation cost has reduced moderately during the last year.

The respondents also shared their thoughts about the poverty in the area. Most of them agreed that no remarkable changes happened about the development of the capacity of the purchasing power of people during this year but the food security has increased. On the other hand there was no development in the health sector. Some respondent told that overall half of the population has same the improvement in their property and some respondent told that 75% people and their overall land system has been developed.

One of the main purposes of the project is to reduce the distance between East and West areas of the country. Some respondents said that from the economic perspective, from the social perspective and from the cultural perspective the difference has been reduced by 50.0 percent in this area.

In Strategic development in communication with the whole country the respondent told that among the respondents 70.0 percent of them are highly satisfied, half of them told that they are happy and some of them told that they are not overall happy about the result. About their business, economic and social development 70.0 percent respondents told that they are highly satisfied while some of them told that they are satisfied and the least number of respondents told that they are not happy with the results. About cargo and bus service and its development most of the respondents mentioned that they are highly satisfied about the results of the project. About telecommunication and communication systems and its development most of the respondents mentioned that they are highly satisfied about the results of the project. About the development

of the transportation and traffic system most of the respondents mentioned that they are highly satisfied about the results of the project.

About the challenges remaining in the industrial sector some of them told that there is a shortage of capital to run business. Others mentioned:

There is a shortage of raw materials. It is seen that the competition in the market has markedly increased. Almost everyone agreed about the problems in storing and most of the respondents agreed that there are no changes in bad products, extortion, bad security, unconsciousness and inter-conflict.

To reduce the challenges respondents recommended increasing the cooperation between the private and public institutions. They also emphasized:

Education and the health system should be developed. There is no alternative in developing the communication system, skill development trainings, employment creation, flourishing the entrepreneur, and promoting the local industry. Everyone asked for increasing the recreational facilities including the Park.

About the impact on the environment it is said that there are no changes observed in waste management. It is noticeable that pollution has not increased significantly. No changes in water pollution. They also mentioned that the quality of toilets system has been improved.

FGD-7 in Tangail District (Community People/ Local People)

One of the focus group discussions was held in Kusharia area which is in Sandhanpur union, Ghatail of Tangail District. It was held on 13th October, 2021 with twelve persons with a age range of 32-65 of years. Almost all of the participants were educated. Some of them have passed S.S.C and H.S.C some of them passed only class viii and a few have master degree. The professional background of the respondents was public representative, teacher, member, union parishad member, non-government organization, political leaders co-operative etc.

Some of the respondents have discussed the positive impact of Jamuna Multipurpose Bridge Project on the socio-economic condition of local people. They mentioned:

Bangladesh is a developing country many districts in this country. This bridge has made a good relationship with the people of North Bengale. Once upon a time the districts of North Bengal were excluded from

other districts. Now the bridge has removed the sufferings of people and due to JMB project education, health transportation communication have been improved another respondents mentioned that, "Due to establishment of the Jamuna Bridge the people of East Bengal can get fish, vegetables, fruits readymade clothes, onions garlic, ginger, turmeric, red chilies and other spices easily through letter communication and transportation they bridge and railway.

One of the freedom fighters told:

Once upon a time before liberation people took 3 or 5 days to reach North Bengal of the country. This Jamuna Bridge is considered as a key to development of our county. Due to establishment of Jamuna Bridge the munga situation has been reduced or the socio-economic condition of North Bengal has been improved for better communication. Now the young people or youth can get the opportunities to access to higher education in Dhaka or other cities. Health and education facilities have been improved. This bridge has changed the picture of Bangladesh.

Another respondent have mentioned:

We can see the progress in our education sector due to Jamuna Bridge and in this district it has been established lots of college like Mawlana Bhasani Science and Technology University, Bangabandhu Textile Engineering Sheikh Hasina Medical College, Khaja Yunus Ali Medical college, Kumudini Medical College, Kumudini Hospital, Kumudini Nursing Institute, Sheikh Kamal ICT Park, Sheikh Rasel Mini Stadium, Elenga Resort. Jamuna Resort, Shaheed Salauddin Cantonment etc. in Tangail districts. This is a positive impact of Jamuna Bridge.

Another respondent has highlighted the positive impact of Jamuna Bridge. He mentioned that, I am a businessman of this union. This Jamuna bridge project helped the businessman to conduct business in a smooth way. Now we can get vegetables like rice. Wheat, potato, Cauliflower, College bridge etc. Easily from Bogura, Rangpur, Dinajpur, Thakurgoan, Jaypurhat etc. In this area businessman can get safety and security due to establishment of Cantonment. So we don't have to face drug addiction, early marriage, stealing, pick pocking

in this union, each of the members of this union has good and co-operative and collaborative attitude and positive social relationships. If any social or family problems occur in this union, village Salish system solve the problems.

Another respondent mentioned:

There are both positive and negative impacts of Bangabandhu Bridge in poverty reduction creation of employment and economics activities. Due to acquisition of land by government many people have lost their job and the rate of employment has been increased. Some new job opportunities have been explored in bridge and railway construction but the to lock of skill are education our local youth group could not get job. Dependency of agriculture of people has been reduced and now they are engaging themselves in fruits cultivation like oranges, dragon fruits, guava mango, jackfruits, Banana. The value or cost of land have been increased due to better communication and transportation system various financial institutions like bank, insurance and business institutions have been increasing. But those who lost their land didn't get sufficient compensation so they cannot fulfill. Their basic human needs due to lack of financial solvency and reduction of income.

One of the respondents has said:

In Ghatail Union, forest department of government has planted 'akshmoni' and 'eucalyptus' tree in the area of foresting. But the leaves of this tress are harmful for agricultural land, housing of local people. This leaf destroys the fertile land and tin of the houses. So if government take action to remove this tress and plant various fruits tress like mango, jackfruit, dragon orange it would be more benefit.

Another respondent have shared his views alert the situation of women empowerment in this union.

This is our patriarchal society but nowadays women are interested to participate in job market. Parents are going to school with their children women self-employment opportunity has been increased. Now they can earn money through sewing. Poultry farm, goat, cow, chicken, farming, small business, tea stall etc. They can participate in decision

making process in the family. Every male person becomes afraid because there are some social laws against women oppression are violence. Women are now taking support from law enforcement agencies or women rights organization providing training and making or organizing awareness raising session about education, health, human rights income earning opportunity etc. Sometimes man is been oppressed or tortured by women.

Most of the respondents have mentioned some recommendations for the improvement of the life and livelihood of the local people they mentioned:

We request our governments to mitigate or solve the case regarding land use are interested to settle the disputes about land, In this union, the amount of dirt road is more than pakka road. Government could utilize the empty land of forest department through establishment of industry. If government would provide lease of the land of forest department then government would get financial benefit. We want some high school hospitals in this union so that the people of this union can get better facilities. The Government should complete the dam or embankment so that the people of Alipur Village, Beltia Village or Gorilabari Village could lead a safe life.

FGD-8 in Tangail District (SME Owners of Shop)

One of the focus group discussions has been conducted in Charpathaikandi market which is situated at Nikrail Union, BhyianpurUpazila of Tangail District. On 14th October 2021. There were nine persons who were aged between thirty-one to sixty years participated in the discussion session. Most of the participants have passed the SSC and HSC and a few of them were illiterate. They have small shops like vegetable shop, fruits shop, middle shop of medicine, grocery, tailoring, tea stall and large shop of construction materials, readymade garments. All of the participants gave their comments spontaneously. This Charpathaikandi Market has been established in 2000 after the completion of the Jamuna Multiple Bridge Project.

One of the respondents expressed his gratitude to the government of Bangladesh for the establishment of Jamuna Multipurpose Bridge. He mentioned:

Once upon a time, there was Dhaleshwari River which is the branch of Jamuna river and catkin flowers in Bhuapur Upazila of Tangail District. The Upazila is surrounded by Gopalpur and Sarishabari Upazila on the north, Kalihati Upazila on the South, Gopalpur and Ghatail Upazila on the east and the Jamuna River on the West. The Government has acquired the Nolsia, Charpathaikandi, Duriarchar, Sharifabad, Gorilabari for the establishment of Jamuna Multipurpose Bridge Project. There was no good marketplace, railway station, roads, bus stand communication system before the establishment of the Jamuna Bridge. Now poor and homeless people have got the opportunity for conducting small business on government land. As a result, many people can lead their livelihood through this market. So, we are grateful and would like to give many thanks to our government. This bridge has given us the opportunity to communicate with the northern side of our country.

Due to Jamuna Bridge project the economic activities and commercial and source of income have been changed. Due to acquisition of land, people have lost their fertile land and shifted from agricultural activities to small business. The number of farmers has decreased and small and medium entrepreneur and businessperson have increased. Most of the respondents have agreed that in this locality, rate of unemployment has increased. Some of the young people are selling small things bank and other financial institutions provide supports to the businessperson by providing loan.

Most of the respondents have told:

In this market there are different types of small, medium and large shop. The demand of product is increasing day by day due to various construction project is continuing in this locality. The shopkeepers get loan from different private bank and NGOs.

One of the respondents has mentioned:

There are vegetable shops, fruits shop, grocery shop, medicine shop, tailoring, readymade garments shop, fish and meat shop, construction shop, tea stall, hotel and restaurant etc. in this market. All types of products are available here and people from Bollobari village, cantonment, bridge authority, rail construction come here. We use van, rickshaw Pick-up van, truck, cycle for the transportation and delivery of products from here and there.

Most of the respondents mentioned that, modernization in agriculture, competition in the market, infrastructural facilities, costing of delivery products have been changed due to the bridge. Because in this locality, many people from other parts of the districts have come here and were living for their livelihood so the market is expanding and the consumption of products have also been increased.

One of the respondents has expressed his views regarding the demand and supply of labor in the market. He opined that

We can easily get labor in this market. Due to the acquisition of agricultural land by the government, many people have lost their jobs. In this locality, the number of unemployed people has been increased. the rate of education is low comparatively from other union . We have to pay 400 or 500 to the day laborer per day in this market.

Now the production and marketing of various products have been increased due to the consumption of the people. Those people who were farmers now are involved in small or medium businesses in this union. In this market, children whose age less than 18 years are not working as child laborer. Nowadays, women have come out from home to earn money and in this market some women have tea stall or vegetable shops. It has been observed that due to Jamuna Multipurpose Bridge Project some people have lost their traditional agricultural job but on the other side self-employment, women entrepreneurship, have been increased.

Some of the respondents have expressed that-

The environmental condition of this market is not good because most of the roads are dirt road so in the rainy season the road becomes muddy and most of the shops are made of tin. In this union there are two police stations and cantonments area so the crime or criminal activities do not occur in this market. In this market, there is no any gas facilities and sanitation facilities are insufficient. But People can enjoy electricity, safe drinking water from tube well. People or shop keeper can pray to the mosque in the market area.

Some respondent have expressed their views about the education or health facilities in this union. They told that, in this union there is a shortage of primary and high school. Their children have to go to school crossing fifteen or twenty miles road. In this union, due to lack of proper health complex, people cannot get proper and specialized health facilities. But they told that present days, parents have been motivated to send their children to the school. They also mentioned that in this union the cost or value of land have been increased due to the Jamuna Multipurpose Bridge Project.

Some of the respondents have mentioned:

Due to Jamuna Bridge, authority had to control the stream of river, so now the width of the river has become five kilometers from seventeen kilometers. So, it has been created many char land, the fishes have been decreased, but due to dam the risk of flood have been reduced. In this highway road many buses pass daily so air and sound pollution have become major problems in this market.

In this focus group discussions people are asked to share their problems in conducting the business in this market or locally. They mentioned.

We are the victim of river erosion and Jamuna Multipurpose Bridge Project. Our land has acquired by government. We didn't get sufficient compensation and rehabilitation facilities. We always become tensed about the losing our market place. Each shop has loans from different private banks and if we can't pay loans then they don't give loan again. We don't have any co-operatives in this market. We want that our market should be developed with proper road, sufficient toileting, drinking water facilities and drainage system. Every people of this market are sufferer due to JMBP. Seven mouzas like Charpathaikandi, Sharifakandi, Nolsia, Charkainda, Charduria etc. were affected but only Nolsia got benefit from government partially. We want that our children would get job in Jamuna bridge or railway station. We don't have any job we want job for us and for our children.

FGD-9 in Natore District (Household)

A total of ten people from diverse backgrounds such as political leaders, UP members, local women leaders, primary school teachers, NGO workers, member of civil society, college lecturers, etc. were participated in the focus group discussion. They were from different age groups ranged from 25 years to 70 years. This FGD captured different opinions and diverse arguments about the impacts of Bangabandhu Bridge on the lives and livelihoods of the inhabitants of Natore District. The overall opinions were mixed, both negative and positive opinions.

Regarding the economic impacts, most respondents mentioned very positive that massively increased employment, women employment, high agricultural production, expansion of local and national level medium and cottage industries, animal husbandry, high production

of vegetables and fished, hybrid crops cultivation including local and foreign fruits. Several participants mentioned:

We are now eating rambutan, apple, orange, etc. in Natore. On the other hand, local fruits are massively producing and it meets the local demands and sending these fruits in Dhaka. The farmers are getting a high price. In some cases, these are producing commercially such as guava, pear, lemon, etc.

Many people mentioned that most remarkably, fish cultivation has increased a lot here. It fulfills the local demand and carries to Dhaka for sale due to Bangabandhu Bridge that was not possible before. Vegetable production has increased a lot and it is easily and quickly sent to Dhaka. The farmer's economical condition has changed a lot. Technological application in farming is being massively introduced such as irrigation, crops collection, processing, hybrid production and use of modern transportation in agriculture. The whole process helps to increase the economic condition of the local people as its benefits are directly and indirectly enjoying everybody.

Some respondents mentioned:

Food habits among the people of Natore has changed a lot. Fast food is going to be popular among the young generation due to the social mobility among the people. We are now seeing many people are eating in restaurants particularly fast-food restaurants.

Regarding the increase of women employment, a couple of women respondents remarkably mentioned:

Due to bridge, many girls and women are moving to Dhaka for employment in different sectors particularly garments. As a result, their family income and women empowerment and their movement have increased a lot.

The remarkable positive social impacts of Bangabandhu Bridge have been mentioned by many respondents in many ways. Several respondents argued:

This bridge make bridging, bonding, and linking relationships between the people of two sides of the river that was isolated before. This helps to fasten two communities and helps to know them, share their ideas, values, and norms. There happens massive cultural and social change. Now people can easily move from northern districts to Dhaka, many students are now studying in Dhaka that was not possible before. People are now becoming

modern and learning modern cultures and education. Society is going to be free from many social taboos.

4.2.2. IN-DEPTH CASE INTERVIEWS

In-Depth Case Interview- 1 (Entrepreneur)

The in-depth case study was conducted with an industry entrepreneur to know the socio-economic impacts and development of trade and commerce and industry due to Bangabandhu Bridge. Face-to face interview and participatory observation technique were applied to conduct the in-depth case study. Moreover, audio-visual device was also used to take the recording. Mr. Iqbal Hossain (pseudo name) is 60 years. He has been graduated in 1986. He is the owner of the Northern Flours Mills Ltd. at Sirajganj Bazaar. His father Mr. Kabir Hossain (pseudo name) has established the Northern Flours Mills Ltd. in 1965. His father started this mill with only 10 workers and at present, 80 workers are working in this mill. Mr. Hossain was asked to know the impact of Bangabandhu Bridge in trade and commerce and the present situation of his mill he replied:

Alhamdulillah. We are well. My mill was a small scale before Bangabandhu Bridge. Bangabandhu Bridge has turned into a blessing for me. My business has developed and expanded. Now, 80 workers are working at my mill. They all are local people. We used to sell our products at local market. But today, I send my product to Dhaka including other cities of the country. Once upon a time, we were dependent at local market to collect the raw materials but today, the raw materials for flours is collected from local area as well as Tangail and from the whole northern part of Bangladesh. Once, my mill only produces ata and at present, we produce ata, maida, suzi and vushi. My mill is situated near the Jamuna River. Before constructing the Bangabandhu Bridge, the raw materials and products were mainly transported by river way and it was supposed to be risky in several times. Once, a lot of raw materials were sunk in the river and I lost my capital and my mill was about closed to be collapsed. With the mercy of Almighty Allah as well as the contribution of Bangabandhu Bridge have restored my business. Now as a successful man I have created the employment opportunity for the local people and my flours mill is well established. To a large extent I am trying to export my products outside of the country. These are the contribution of Bangabandhu Bridge.

Mr. Hossain was asked for knowing about the delivery and marketing system of his products. He mentioned:

There is no noticeable difference between Dhaka and Sirajganj in terms of supply and delivery of the products. For instance, you supply or take which products in Dhaka; I can supply or take the same products sitting at Sirajganj. Transportation, delivery and marketing of products have become much easier than before due to Bangabandhu Bridge.

Mr. Hossain was also interviewed to know about the employment opportunity and the situation of the poverty alleviation in this area. He reported:

Income of the people has increased along with the increase in employment opportunity. Today, people are getting employed in diverse occupations /professions and the mobility of people/labor have increased hundred times than before. Fear to going Dhaka has been lessened among the people. Employment opportunity for women has improved and women entrepreneur are seen in this area. Bangabandhu Bridge has worked as an influential factor here.

Mr. Hossain is happy with his mill and thinks that there is no negative environmental impacts owing to industrialization in his area. There is a good relationship between the industry owner and the workers in his mill. But he mentions that trend of taking drug is increasing in the area and gradually it is turned into an alarming situation. He suggests, it is needed to establish the industrial park in this area to extend the trade, commerce and industry and it is also needed to introduce the river port.

In- Depth Case Interview-2 (Administrator)

Mr. Khokhon (pseudo name) is the project director of Tangail Paper and Board Mills Ltd. He informed that the institution is located in the BISIC industrial area, where 60 employees work regularly. Paper, food, flour and chemical, medicine etc. are being produced by this industry. The production rate is high and process making becomes easier.

Local people have been benefited by the mill in many ways. There many non-local people also get the job beside the local people in this mill. As they need a kind of physical strength, women can't participate. But he ensured that there are no child labor happens.

Some positive Impacts have been observed of the presence of the mill in the area. Mr. Khokhon said that the temperature of the area has increased. Also, they always try to manage the waste properly, which has contributed to increasing the temperature. As many people started to live around the area, the price of the land started to increase. On the other hand, the mill is beside the local market that also contributed to increase the livelihood status of the people.

As there are no harmful industries in the area, therefore no bad impact has been observed regarding health issues. But normal diseases are absent in the area. There is a health institution just beside the mill where people can get the service easily. During the covid-19 pandemic special initiatives were taken to increase the awareness among the people and everyone maintained the rules and regulations.

Mr. Khokhon said that he noticed some remarkable changes about the social condition recently. For example, the problem of drug addiction has increased. But he also clarified:

There is no direct link with the mill about increasing the crime rate. Rather we play a role to increase the positive vibe in the area. As the area is covered by a boundary, therefore, outside people can't do any crime here.

This institution has contributed in many ways to reduce poverty reduction and employment creation as well as economic development. By creating employment many people now have a good income which has contributed to reducing poverty. He also mentioned:

We recycle the industrial wastage which has contributed immensely to create a balanced environment.

In- Depth Case Interview-3 (Land Lost to Project)

Mr. Fazlul Haq Fakir (pseudo name) is a 70 year old person who lives in Tangail with his 5 family members. He involved himself with a private job for living. He is the victim of the land acquisition for the project. He observed that numerous changes happened due to the project activities.

He said:

I have noticed that the ownership of the land now has changed remarkably. Everyone has to build a house but not on their ancestral property. They have to look for alternatives.

After the land acquisition, many new houses have been built and most of them built on the land which has been sold from others. In addition, the available facilities for the citizens also decreased. Mr. Fakir added:

People lost a huge amount of land but they could manage little in exchange. Therefore the given compensation did not add up.

About the social institution he emphasized on the new educational institution which would increase the educational rate in the area. Due to the displacement, the relationship among the relatives and kinship has been broken. He said emphasized:

Interaction among the relatives has decreased. Because most of them become homeless and displaced due to the acquisition.

There are some social impacts which have emerged after the project activities. He said that,

There is no space for a playground, religious institution and social program. Therefore people have to organize the program in a limited space.

There are new houses in the area but not the facilities. This led the people to do some bad practices. For example, the problem of drug addiction has increased in the area.

But there are some positive social developments he also mentioned which are really impressive. He mentioned:

In the project area, the rate of child marriage has decreased. The amount of Divorce rate or the news of conflict in the family also has declined. He further added that it is happening due to the increased rate of education which helped people to become civilized. In the project area there are also some facilities increased. People generally go to the village doctor for a

general disease like cough, fever etc.

MR. Fakir mentioned the economic life of the area. He noticed that the amount of wealth has not increased on average, but people's income increased. People can now live a good and standard lifestyle. Now people don't have to think about their food. These can be considered a really great achievement. One of the basic reasons for economic improvement is that, new employment sector has been created in the project areas as well as new changes happening in the employment sector. Therefore, people can earn more compared to their previous job. The higher income led the area to a more stable life. Mr. Fakir mentioned :

*People's savings has been increased which was not common in earlier days.
Nowadays people also go frequently to NGOs and banks for loans which is significant.*

Instead of those developments, a large number of people could not increase their income due to the lack of land which had been acquired for the project. He also mentioned specifically about the women who don't have any significant participation in economic activities.

There is no doubt that the communication and transportation system has been developed in the project area. The electricity system has seen more development and stable conditions. Most of the people use cylinder gas as there are fewer alternative facilities for cooking.

In recent days, as Mr. Fakir observed, most of the local people migrated to another area. There are new advantages in the area but disadvantages also are not lower. It is seen that the temperature of the area is very high which makes people uncomfortable. In addition, as most of the people lose their agricultural land, they tend to migrate to another area more. Moreover, the existing land has observed a lower fertility rate in the area. The miseries did not end there. Most of the area goes under the water during the rainy season.

Mr. Fazlul Haq fakir recommended some issues to be developed. Primarily, Water hygiene and Water sanitation are highly demanded in the area. He also emphasized on the need to establish high school and college, especially a female institution. Finally he mentioned the Special steps needed to reduce river erosion.

In- Depth Case Interview-4 (Rich Businessman)

Ali Hosen (pseudo name) is a businessman, aged 50 years, lives in Rajbari village in Kalihati Upazila. He is a married person and passed HSC exam. His wife Munia Begum (pseudo name) is 35 years old and she is a housewife. He has two daughters and one son. His all children go to school. One daughter reads in class nine another one passed in HSC exam. One son reads in class three, aged 10 years old. Ali Hosen is the only earning member of his family. He stayed in abroad for twenty years working purposes and after returning from abroad he joined in joint business with his friends. Now he earns about 50 thousand from his business in a month and get rent of from his buildings about 60,000 taka per month.

Ali Hosen said:

I have my own building which is four storied. I have made this building with my savings earned from abroad. We have good transport facilities such as concert road, developed water and drainage system. But we don't have any gas facilities so we have to use cylinder gas for household activities.

Ali Hosen expressed his views about educational condition of his area in this way:

Our mayor is very helpful. when ay exam of the schools is held then he monitor and visit primary school. It can be said that, our area is better comparatively from other Thanas in Tangail district. There are lots of primary schools in this Thana, beside this we have one high school and two colleges. The quality of teacher, students and educational environment is very favorable for us. My children go to private teacher for coaching purposes. He can get all type of facilities in education sector like other mega city."

Ali Hosen expressed positive views about the kinship and neighborhood relationship in locality. He has mentioned that we know each her and help other people. We participate is family and cultural activities of our keen and relatives. We can enjoy various religious activities in our community with all. We do not face any social problems like eve teasing, early, marriage, divorce, drug addiction related problem. Any occurrence happens our mayor would like immediate action for solving the problems.

Ali Hosen told:

The community of this area is very conscious about diseases, illness or health treatment issues. We have three private clinics where we can get specialized health care support.

Ali Hosen highlights that, this is a commercial area where we can get support from various types of shops like readymade garments, crockery's, cement (shop), vegetable shop,

various private bank, NGO's, and hardware shops. This is an inter terminal center where every buses stop here and get all type of products. There is no any industry in this area. Most of the people are service holder and businessmen. The main area of investment is business in this area.

Ali Hosen mentioned that,

We have Samsul Haque Govt. College and B.N. College for women. Almost all the children from each family go to different schools and colleges. But women do not participate in economical activities there.

When is has been asked about the situation of migration such as internal or external migration he explained as:

Many people from this area lives in abroad. They stay there for working purpose and send money to their family. Many people come from different districts for business purposes.

He also added:

Elenga is a commercial area where most of the people are businessman and service holder. Like other city there are lots of facilities and opportunities in this area. But he mentioned some limitations of this area like lack of police station, lack of gas facilities, lack of WASA for supply water, lack of cinema hall, play ground, better educational institutions (private), lack of railway station etc.

Ali Hosen reported that in Elenga union, they did not face any major environmental changes like river erosion, decrease of cultivable land. But they faced high temperature in daily life. There is a river called Bongshai is situated in the west side of Elenga municipality. The quality of education system of Alenga is more developed and advance. Hosen mentioned that there are Govt. Shamsul Hoque College, Govt. Elenga High School, Jitendra Bala Girls High School, Elenga Govt. Primary School in Elenga. Elenga is a small town in Kalihati upazila of Tangail District, Bangladesh. The town is situated to kilometers (6.2ml) away from Tangail city and 105 kilometers (65ml) northeast of Dhaka city.

It has been found that the total population of Elenga municipality is 55,000. Among them 26,950 are male and 28,050 female. It has been observed that in this small town people can get all facilities which are necessary for daily life. According to Ali Hosen,

Mayor of Elenga town is very cooperative and helpful and he is taking various initiatives for the well-being of people of this town. A major environmental impact has been found from Hosen that, in this Elenga town, numbers of trees are comparative less than other town.

Major observation: There is a less impact of Jamuna Bridge or Jamuna River on the life of the people of Elenga town.

In- Depth Case Interview-5 (Middle Class Laundry Operator)

Hakim Pramanik (pseudo name), aged 52 years living in Ballavbari area which is situated in Kalihati Thana of Tangail district. He has achieved B.A degree from a Fajil Madrasha. He is a married person and her wife's name is Sheuli, who is 42 years of old. She is a housewife. Hakim has one son and he is a BSC engineer and passed in textile engineering subject. He was a teacher of local Madrasa. Then he went to Saudi Arabia for work and came back after three years. Now he is working at Jamuna Resort as laundry operator. He earns about 14,000BDT per month and after family expenditure he can save 2000BDT per months. His son now works in a private company and earns 16,000BDT per month. He can lead his family with his income and fulfill the basic human needs of family.

He mentioned:

Once upon a time this area was covered only with sand lots of catkin were found in this area the bridge authority filled up the land with soil for housing or other infrastructural purposes. Now we can enjoy the concrete highway road in Sirajkandi, Nikrail, Bollovbari area. So the bridge has made our life easy and enjoyable. Now we can move from here and there within shortest period of time. We can enjoy electricity, gas facility, transport, bridge facility due to Jamuna Bridge project. Now the number of building for housing purposes have been increased the cost or value of land also has been increased.

Hakim mentioned the previous situation of ownership of housing and benefit and losses due to settlement process of Jamuna Bridge Authority.

He added:

We lived in Charsingholi village. Due to Jamuna Bridge Project this village has totally been finished and now there is no existence of my village. Then we moved to Char Paoli village but due to river erosion this village also has been damaged. Lastly has also been disappeared in the river erosion. I had six bighas of land in charsingholi, And then I made my own home in Charpaoli in the land of after people. I have got 20 decimal land from father and now I live is Charbolloubari area.

Hakim told that he did not get any compensation from Bridge Authority. He did not get any monetary help for business or housing purposes.

He also said:

Due to Bangabandhu Bridge Project many people come from various district so the value of land has been increased. New markets have been established

in Patalkandi, Sirajkandi, Gohaiabari after opening the bridge. Beside this, due to establishment of cantonment safety and security of life and property has been improved. Now we feel secured and do not face any major social crime in this locality. There are two police stations on the east and west sides of Jamuna river. Before the establishment of Jamuna Bridge we had to face various social problems like stealing, pick packetizes robbery in the village but now everything has been changed.

Hakim Pramanik expressed the positive views about the educational situation of his area. He mentioned that due to Jamuna Bridge Project Govt. has given attention for the development of this district. He mentioned that,

When I was young I saw only one or two primary schools in our village. But now-a-days we get one primary school in every village, one high school in each Thana and observe that the number of private school and madrasa have been increased due to the education friendly government. But there is no any college in villages but Bhuapur, Kalihati and Elenga union we have some/ a few colleges. In Bhuapur govt. college has been established where students can get Honors or Master's Degree. At present the rate or number of school or colleges have been increased but still now many families do not allow their children to go to school due to long distance, family pressure for marriage, financial insolvency, lack of awareness among presents, transport cost. Due to interest for stipend, parents sometimes are interested to send their children to school but after completion of SSC exam. They arrange marriage for their girl child. The environmental condition of school building or surrounding is not neat and clean. Poor families are not interested to send their children for private coaching, as a result sometimes it has been seen that teachers are working in the field or doing part time job for extra income.

Hakim reported about the situation of social problem in Kalihati Upazila:

We do not see any drug addiction or criminal activates related problem in this union. The rate of early marriage has been decreased than previous years but still it occurs confidentially in some poor families. The incident of Polygamy or divorce is very rare.... But village court takes important initiatives for solving family dispute or violence related problems. People of this area do not want to explore the incident of women oppression or domestic violence due to social prestige or social status in the community.

Hakim mentioned positive views about the kinship or neighborhood relationship status of this union. He mentioned that, they maintain a collaborative and co-operative relationship with neighbors when they face any Problem; neighbors come to help each other. Sometimes they had to face problems about the ownership of land but now-a-days village

court solve the problem.

According to him, health care services are:

The scenario of health care services has been improved in this union. When we were young we did not see any hospital, clinic or any health care centers in his area. But now we can get health care services from community clinic and Upazila Health Complex. In this Upazila people suffer from fever, coldness, blood pressure, diabetes etc. If people do not get services from Upazila Health Complex then they go to Zilla Hospital. Nowadays, it had been observed that, people have a new trend to go to private clinic for better and specialized health care services. He also mentioned that all type of medicine us not available in government hospital.

He mentioned,

Once upon a time people were involved in agricultural activities and were dependent on land. But after established of bridge many people from different districts have got the opportunity of job in projects like bridge projects, railway projects, housing projects, Eco park, resort. It park, cantonment area, jute mills, handloom industry. People of Kalihati, Korotia, Patarhat, Puthiajani union have some handloom industry and they make clothes like sharees, salwar kamez, dresses and sell to Dhaka and other mega city. Now they can easily do their handloom business through good communication and transport facilities. Many new small entrepreneurs have been emerged and many young educated people have been engaged in this business. Three are some ngos who are working in Tangail district like Grameen Bank, BRAC, ASA and they provide loan to small and medium entrepreneur for business. Women of the village are engaged in poultry farm, fishing, tree plantation, handloom industry etc.

In- Depth Case Interview-6 (Ultra Poor Widow)

Mst. Shahina Begum(pseudo name) is a 50 years old lady. She is living in Gorishar Village, of Tangail district. She is a married women but her husband does not live with her. She belongs to an ultra-poor family because she does not earn money and her husband does not take care of her family, she has five children and among them two sons are married.

She has two sons and three girls. She is an illiterate woman and her one son and one girl study in Madrasa. She has been living in the government housing project area for three months. Earlier she lived here and there with her children. Her two sons earn money and contribute to the family. One son works in an electric shop and another one earn money through rickshaw pulling. Her one daughter studies in class five and two daughters do not go to school. Monthly income of two sons of Shahina Begum is about 2000/- taka. She cannot fulfill the basic human needs like food, clothing, housing, education treatment etc. with this little money. Beside this she also cannot save money for her family.

It has been found that, there was no relationship between the housing ownership of Shahnia Begum with the bridge construction project. She said:

We are grateful to the government. They have given us this house as a shelter. Now we are the owner of this house. It is a great project of Present government. We did not have any house to live but now we get a roof to live. We pray to God for live her (Prime minister Sheikh Hasina) good health. She likes poor people.

She also explained the condition of her locality as:

In this area we do not have electricity, gas, drainage system. So in the rainy season the rood becomes muddy and slippery. Each family has one or two new born or small child and beside this elderly peoples, suffer in summer. So if govt. give us these facilities it would be better for quality of life. There is no boundary of this housing project so we become afraid at night. We have young girls and children so in order to ensure security and safety govt. should establish safety boundary in this area.

There is a limited number of schools in this area. But Shahina Begum mentioned that if we have school near our home, then our children would go to the school. She also mentioned that there is no availability of transport like rickshaw, vehicles, van etc. because it is a highway road where many buses and trucks move all the day.

It has been observed that Shahina told the truth about kinship relationship because when I talked with Shahina then other family members came to us and joined with us by sharing their opinions and problems about their localities. It has also been observed that each members know the information of other family members. So, it can be said that, this project truly creates a joint collaborative of co-operative relationship among homeless people.

Mrs. Shahina also said:

We have limited opportunities of recreation due to lack of ground, financial problem, unknown locality. We have come were only three months have passed. Actually we do not know each other especially permanent resident of this Thana. We do not know the address or location of various mosques, madrasa, govt. office, NGO office.

Shahina told that they are new comer in this locality. So they are observing the situation, they did not face or listen any social problems like eve teasing, drug addiction, early marriage, criminal activities, divorce in this project or area. But they are very careful and concerned about this issue thats why they wanted a bounders wall in their project.

Shahina Begum told that, there is no hospital or clinic in this area. They have to go to another Thana for taking treatment service or health care serviced she narrated as:

In our project area children suffer from diarrhea, cold, couth, allergies, young and elderly people suffer from, pressure, vision problems dental problem, malnutrition, weakness. Then we go to the local medicine shop and levy medicine. We do not have enough financial ability to go to the hospital. If the government gives us free medical checkup or health care service it would save our lives through reducing sufferings.

In- Depth Case Interview-7 (Small Business)

Md. Babul Talukder(pseudo name) (42) has a grocery shop at Charpathaikandi market. He has started this business from 2000. At first he had a vegetable shop, and then he started a grocery shop costing 2000BDT by borrowing from his brother. There are three markets in Sirajkandi, Charpathaikandi and Bollovbari area. These markets start from 8:00 am and ends at 10:00 p.m. This is a permanent market which is situated on the land of government. In this market there is no specific day for hat. In this market people from different villages, railway construction, cantonment area, Bangladesh Bridge Authority come and buy different daily necessities for their life and livelihood.

In this market, most of the people are the owner of the shop. Some of them have joint ownership with other people. Some of the big shop like grocery shop, shop of iron, cement or sand, cylinder, readymade garments has some staffs.

It has been observed that in Charpathaikandi market, there are various types of shop like grocery shop, vegetable shop, fruits shop, pharmacy tailoring shop, hotel and restaurant, tea stall, electronic products like freeze, television electronics equipment, poultry, fish shop, cloths store etc. The shop of construction like metal, cement, sand, digging machine, iron sheet in increasing day by day due to road and railway construction in the locality.

In this market, rice have been supplied from Kalihati rice mill through pickup van. Cylinder gas has been collected from Tangail Sadar. Different types of vegetables like potato, Carrots, Cauliflower, cucumber, green chill, cabbage, tomato, pumpkin, onions etc. come from Bogura. The production of vegetables is limited in local land due to acquisition of land by government for Jamuna Bridge and Railway station. Local people of BBA, Cantonment come to this market for buying their daily Products. Mr Babul has mentioned:

Per day average 15 or 20 people come to his shop and he has limited profit and can lead his livelihood with family. It has been observed that the financial condition of Babull is increasing day by day because he motioned that, I have started my business from 200. When I saw that some people of my village started their shop in open place then I started my shop. At first I had a shop of breakers (bhangari), then I had vegetables shop and lastly I have established a construction shop. Now I can lead my livelihood with the income of this shop. I have one staff in my shop this market is very popular different types of people come here. Everyday twenty or more buyers come to my shop. I can save money with profit two of my children go to school and read in local school.

It has been observed from the market that, each shopkeeper has good and positive relationship with each other. They have supportive and co-operative relationship with each other. They have made a mosque in the market area and they help each other. It has been found that, there is no criminal activities in this market. Because the respondents mentioned that he didn't see any occurrence like stealing, snatching, pick pocketing, adulteration in food, extortion in this market.

It has been found that, there is no facilities like toileting, drainage system drinking water, rest place etc. in this market, Mr. Babul Mentioned that.

In the rainy season shopkeepers have to suffer a lot because due to lack of drainage system. Water logging problem creates challenges in the market. Beside this there are no toilet facilities in this market. We have only one tube well for drinking water but it is insufficient for the market. The road becomes muddy and slippery in the rainy season. We have some jhuprihar of homeless people and it pollutes the environment of the market.

It has been observed that there are electricity facilities in the market. Bangabandhu bridge which is commonly called the Jamuna multi-purpose Bridge has a great impact for this market. Each shopkeeper took loan from Islamic Bank, Dutch Bangla Bank, Trust Bank, Post Office. There are courier services, land telephone service in the area. But each shopkeeper have loan for their shop.

Respondent Babul motioned:

In this market area we have safety and security for conducting our business. Nobody threat us or steal, pick Pocket us. Due to two police stations and cantonment area we are safe here. We have sympathetic attitude, we co-operate with each other. We use rickshaw, Van, Cycle, Pick-up, CNG, Auto-rickshaw for communication and delivery of our products. Due to Jamuna Bridge we can easily collect fresh vegetables and other raw materials through truck or pick-up van from Bogura, Rajshahi, Pabna, Natore, Rangpur (North Bangle) of our country. So there is availability of any products of our daily life in the market due to Jamuna Bride.

In- Depth Case Interview-8 (Rich Businessman)

Md. Rofik (pseudo name) is a permanent citizen of Dapunia Union Parishad of Pabna Sadar Upazila. He is a medium businessman. He brings various types of fabrics from Dhaka and sells them in his own shop. He has two children, one daughter, and one son. He said that the road and housing faculties are very satisfactory. They can easily bring building materials to their area to build up new houses or shops. There is no provision of supply gas in their area and the quality of electricity supply is low. Electricity coverage is nearly 95% and village people are now habituated to using cylinder gas.

In the field of education, he shows a radical change. In primary school most of the students are female. Female students in primary and secondary education were not at the satisfactory level of presentation many years back. Guardians are very aware of the education of their children. In the covid-19 situation, students also tried to participate in online education with the support of family. But this participation rate was only 50-60%. For entertainment people of this area usually go to National Mental Hospital premises and several restaurants have been built new in that area. He observed that people usually increase their doughier real age to ensure complicated free marriage.

He said:

Our area is getting modern day by day; I can buy a brand dress from the area and those dresses come from Dhaka by using the bridge. I wish to admit children to Dhaka University and I got this motivation because of security of transpiration.

He said that the medical sector and the access to Medicare of people are quite satisfactory. Except for conic disease, he usually gets Medicare from Pabna Sadar Hospital. There are some private clinics and diagnostic centers in his area. He claims that the diagnostic system, machine, and test report are standard in his area. He normally buys medicine from a local dispensary. He observes that recently the quantity of this dispensary is high. In a small area he so that near about 10-15 dispensary. People are getting trust in local doctors because of their quality doctors. All types of surgery and treatment in his area.

He was a small businessman and now he expands his business and established his own shops. Previously he has to face a lot of problems in bringing fabrics from Narsingdhi and now it is easier for him. He included all types of share and lungi in his shop. In his business, he hired 5 more staff. He has to give them 5000 BDT salary in per month. During his small business time, he earned only 30000 taka per month but now he proved staff salary near about 30000 BDT. He can invest his capital part and also save some taka. He faces a lot of problems in taking bank loans. He claims that nepotism is esteem level in the bank sector. He brought some land in his area but lack of bank loan for the business he ought to sell out his 50% of the land.

He also narrated:

In my shop, I hired 3 female and 2 male workers, they all very exert. But 3 women are very skilled in their own work. The main fuel of my business is their skilled and artistic work. Two female staffs, who worked as a tailor in my shop can make wonderfully designed dresses. I payed them 5000 BDT. They were unemployed but now they can support their family.

Md. Rofik said that the natural beauty in his area is dealing day by day. He saw a lot of trees in his area. For making more residential houses and industry those trees have been cut out. There were so many ponds and he claim that now few ponds exist. He also added some positive sides of the impact of the Bangabandhu Bridge. During 1995-96 there's was vehicles named baby taxi and they make a lot of sounds. But now this baby taxi is out of the race. A new style of car named Essay Bike/Auto is available everywhere in Pabna. This bridge has both positive and negative sides but he mainly claims the negative side of this bridge and its impacts on ecology and the environment.

In- Depth Case Interview-9 (School Teacher)

Ariful Islam(pseudo name) is 42 years old school teacher. He is an English teacher. He has experienced a lot in his teaching life. From 2015 he started coaching his students in English. He had some land for cultivation but he subleased that land to poor farmers. His residential house is semi-pacca. 8 years back his house was made of tin and wood.

He told that he had experienced the day staying on the spot of the inauguration of Bangabandhu Bridge. He was so happy because he faced a lot of transportation problems before constructing this bridge. It generally took 3 times more hours to reach Dhaka or come back from Dhaka to Pabna. Now the transportation system is secured and vehicles are available. Most of the parents are aware of here and send their children to schools. In Pabna, he added a favorite entertainment center, called Rupkotha Cinema Hall.

He explained:

The social impact of Bangabandhu Bridge is huge. It can be counted in quantity. I am very happy because my students can get admitted at college in Dhaka City or get admission at the University of Dhaka before that heir was a clear perception and destination of Rajshahi University.

He said that he has some land for cultivation and he cultivated that land many years back. He had a loss in producing crops. At last, he was bound to sublease his cultivable land to farmers. He claims that the day laborer is going to Dhaka city for pulling rickshaws and very few expert people in cultivation. He thought that this bridge brings occupational diversity and engages people in the multi-occupational processes. He said that women in his area are very empowered and 15 years back he did not see any women in the market, but now in town marker near about 50% of buyer is women. He added that women are now starting new businesses like poultry farms, shops of trailers, etc.

He thinks that bridge makes this Pabna more beautiful. He saw huge infra-structure development but did not see natural development. With sorrow, he said that there is a lot of sounds and air pollution. The number of trees, ponds, canals is decreasing day by day.

In- Depth Case Interview-10 (An Industry Worker)

Asma Khatun(pseudo name) is an industrial worker who works in the square group in Meril Industry, Kurigram. Before joining this industry, she was a home servant and then earned only 2500-3000 taka only. After joining her Meril industry she starts to earn 80000 BDT with overtime. She has to work 10 hours. Her home is in Dapuniau Union. For going industry, she had virus options of roads and transportation. She usually takes an easy bike/auto for going her workplace.

He says that there is no pipeline gas provision in his home and 5 years ago her house gets the connection of electricity. The road in front of her house was not good n 7 years back, she shows that it was repaired by bricks and now this road is carpeted. Her daughter is in class 2 and her son is in class 4. The structure of their school developed a lot. She observed the structure of this school was not good even it was not a building, but now it has 3 buildings. She has a good relation with her neighbor. But when she was a home-maid, she had not like that kind of good relations.

She said:

My children are now going to school and I provide them with all the costs. But when I was a maid and worked for the house of other people, it was out of my imagination.

Asma assured that she had good access to the hospital. When she or any members of her family feel sick, she brings them to the hospital and consults with a doctor. She told with a smile that previously we did not go to the hospital and buy medicine without the prescription of a physician. During the Covid-19 situation, I maintain all kinds of health precautions and told my husband to wear a mask. She added that we were safe during the Covid-19 situation and we maintain this.

Asma was a home-maid and she has to work door to door for livelihood. Her husband runs a teashop and earned a few. After getting a new job at a Meril Factory, she now earned enough to maintain her family. Her total family income is near about 10000 taka and she has no savings. Sometimes she has to take some loans from people from her society. She does not have access to bank loans and, not any insurance.

She added:

I am a working mother and worked for big industry. My income is low but I am happy with that. I can take participation in any economic decision of my family.

She observed that the water body and natural beauty are going to a dangerous situation. She shows in a huge flood in her childhood but now she does not see any flood that was very helpful for farming and cultivation. She added that the temperature of this area is quite high.

She expressed her sorrows as:

In my area, there were a lot of tresses and in the last week of October, we generally saw that winter is coming. But in recent years I did see any symptoms of winter until mid of November.

In- Depth Case Interview-11 (An old Farmer)

Rostam Ali (pseudo name) is a 76 years old farmer. Now he is much older not to do any work. He had no work and his daughter and son do not provide any cost for their livelihood. He and his wife lived in a small house and ask help from people. His relatives and old-age allowance in one sense make them alive. He is suffering from a breathing problem and has to maintain regular medication.

He feels that money and property make a good reaction with relatives and society. He thought that in recent ages, humanity is no more. He had a lot of land and poverty. He sold it out because of poverty. He had a big loan from NGOs and it made him more vulnerable. He spends a lot on the marriage ceremony of his daughter and has to give dowry near about 20,000BDT. He told that Bangabandhu Bridge made the life of people easier and comfortable. This bridge also made some problems too. In some areas drags are available and young people are taking them.

He narrated:

After having this bridge road and transportation became very good and some bike showroom starts opening. The young generation is motivated to buy bikes and has raced on road. I think it is a minor negative impact of the bridge but having a huge social impact on him and his family.

The physical condition Ali is not quite okay, he is suffering from breathing problems and

back pain. Even he cannot walk properly. He usually buys medicine from a local dispensary without having doctors' prescriptions. He told about the development health sector along with the negligence of poor and older people.

He was a farmer and it can be said a popular and big scale farmer. He produced in his own field. But due to poverty and family crisis, he was bound to sell his land and gradually he continues to doing this. Now he has no land no power to work on the land. He with his wife is in a vulnerable situation and has no chance to involve any economic activities. He experiences a lot of economic impact of this bridge.

He said:

Famers can buy now various types of plants from Dhaka city and carry them within 4 hours to Pabna. When I was a farmer in 1994 it took several days and all plants became dying down near to die down. One important think I like to highlight is that farmer does not get the proper price now.

He becomes very sad while talking about the environment and climate change. He remembered his early days about winter session when he enjoyed date juice very early in the morning but now date tree is rare. He also talked about the various kinds of water bodies and his fishing memories. He is very sad because of the lack of water body and the reverse climate situation. Cultivable land is reducing day by day, in Pabna Sadar this kind of land has reduced to 20% and that was 70-75% in the '90s. Now it can be seen only bid buildings, banners, festoons, and posters.

In- Depth Case Interview-12 (Big Market Owner)

Amjad Hossen Sarkar (pseudo name), 42 years old liveing in Pabna Sadar, Pabna. He has a dealership of Fulkoli Company as well as a shopkeeper. His shop is big look like a super shop because he sells various items and products. He is graduated from Pabna Edward College. After his graduation he tried to find out a government job but he failed and tried to start a business. Before construction of Bangabandhu bridge he went to Dhaka for recruitment test once a month.

He said:

It was a painful journey for me because I left my home for going to Dhaka very early in the morning. After much hassles to cross the ferries, I reached Dhaka at night so it was a bitter experience for me. But now many job

seekers can easily go to Dhaka and seat on the examination in due time because it has been possible only because of the construction of Bangabandhu bridge.

He is married and has two sons and one daughter. Every one is educated. One of his sons is studying in BBA at Eastern University, Dhaka. Also, my daughter lives in Dhaka city with her husband. So, I need to go to Dhaka sometimes to see them as well as for business purpose. He explained as:

Before the construction of Bangabandhu bridge, it is not possible to do any business in Kurigram by bringing products from Dhaka. Although, some people have done their business and it is a lot of nuisance like over transshipment in ferry, over transportation charge etc. But now it is very easy to do any type of business from Dhaka to Kurigram because the easy communication resulted from the construction of Bangabandhu bridge.

Every day I sold more than one hundred thousand BDT and make a good profit. This business was a small shop that had never been like this before. It started only with a few local products such as biscuit, cake, oil, spice etc. because it was not possible to bring goods from Dhaka. Before the Bangabandhu bridge was built, to bring products from Dhaka was unimaginable it would have taken a lot of money to bring one truck of goods as well as raw materials could have been wasted due to over transshipment. But now we can easily bring products from Dhaka within a short period of time because the Bangabandhu bridge has expanded my business a lot. He passed opinion:

But long traffic jams have been created on the highway. As a result many raw materials are being wasted. So, my advice is to expand both sides of the road and to reduce the amount of toll.

In this market has all kinds of facilities like toilet, sanitation, safe drinking water (deep tube well). Pabna Municipality has been providing with all these facilities and they take some money for these activities. My market is situated beside in Pabna Circuit House which is connected to Natore- Pabna highway so there is no problem to bring my products from Dhaka. He said:

I bring all my products at the night because the loaded truck causes jam during the day. Recently a huge number of auto rickshaws are plying in Pabna city as a result a lot of traffic jams has been created. Most of the auto rickshaws run on electricity charges as a consequences power outage regularly.

After the construction of Bangabandhu bridge banking facilities have increased a little bit around 15 banks are running in Pabna city. Currently I have been transacted with two banks City Bank and Islami Bank. Transactions in government banks are a hassle and they don't want to give loans facilities plainly so I do more transactions in private banks and

now I have a loan around 10 lakh BDT. But before the construction Bangabandhu bridge there is no sufficient banking facilities in this area only some NGOs gave micro-credit loan facilities and there were two government banks Rajshahi Krishi Unnayan Bank and Janata Bank.

In-depth Case Interview-13 (Medium Shop)

Mr. Khaled Hossen (pseudo name), a 55-year-old man, is an owner of a medium shop at Natore Sadar Upazila who himself manages his business. He hails from a middle class - family. His family consists of four members, two sons and his wife. The elder son is studying in class X and the younger one is in class VIII. He served as government employee before but started this business in 2008 and think that business is a good for quicker economic gain and individual freedom. He mentioned:

Business is an occupation where I can enjoy more freedom than a government job. Financial gain is much higher than a job. I am really happy with my current occupation.

Mr Khaled took lease this shop from the government for 2700 BDT. This is a shop where most of the daily commodities are available here. The main customers are government office staff and local people. Because of the location of this shop at the main road in front of the Natore Sadar Upazila office, many visitors who usually come to do their works at this Upazila and purchase goods/ things from here. The research team found that the shopkeeper was busy with the customers. A significant portion of the customers of this shop were females. Khaled Mentioned:

Nowadays, women customers have increased a lot than any other time before. It may be due to increased women confidence, freedom and empowerment.

Mr. Khaled provided some interesting information about the impact of the Bangabandhu Bridge on this business. He mentioned that due to this bridge we are now selling 50% of products that are directly coming from Dhaka and this bridge helps to reach these products in this local market. Another 50% goods are locally produced, but the whole market is going down due to the monopoly business.

He mentioned:

This bridge has both positive and negative impacts. We are getting many

good quality products within a short time from Dhaka and Chattogram due to this bridge, but local products are lessening its market as these may not be good quality compared with the outside products. But some products such as mastered oil, sugarcane, fruits, and vegetables are quickly reaching big markets in Dhaka and Chattogram by using this bridge.

Mr. Khaled observed that this bridge helps the people to be dynamic and prudent in terms of increasing verities of business. Many people who have good relationships with the wholesalers or have good capacity to maintain bigger business are earning good money but the small shops went behind due to high competition. Sometimes, he gets frustrated to think that he could not stand if the competition and monopoly markets expand in future. He seems to be very happy due to the benefits resulted from the bridge. Some local factories have expanded in Natore and many are running their good business. He mentioned:

This bridge is a milestone of the Northern districts. Many people are engaging in business and markets; I am seeing many showrooms of the electronic companies such as LG, Walton, etc. Many cottage industries are doing well. Many women are involved in this business. People's mindset is changing over time. People are easily moving to Dhaka city for their treatment, education, and other necessities.

Mr. Khaled is found to be unhappy to some extent, when research team asked him about the environmental impacts of the Bangabandhu Bridge. He mentioned that the use of polyethene was increasing and it is now easily coming from Dhaka and other places. It is very much detrimental to the environment. He could not provide any information about the other environmental impacts of the bridge.

Mr. Khaled's overall assessment of the bridge was positive and he expected that in the near future the whole district will be improved with different facilities of this bridge. Even he was agreed that he wished to engage his next kith and kin in this business.

4.2.3. KEY INFORMANTS INTERVIEW (KII)

Key Informants Interview (KII)-01

Through the interviews conducted, the secretary (Union Parishad), Koijuri, Shahjadpur, Sirajgonj has provided the information concerning the demographic, health, education and relevant issues as mentioned bellow:

Table- 4.2.1: Statistical Information Gathered

Types of information	2020	2019	2018	2017	2016
Total population in union	53092	51400	49800	47900	45200
Total live children	19000	19500	19800	20100	20800
Total death	5% of total population	5% of total population	5% of total population	5% of total population	5% of total population
Total number of ultra-poor	11000	12000	12500	13200	14100
Total number of disabled people	376	304	285	260	250
Total number of primary schools (co-education)	22	22	22	22	22
Total number of primary schools (boys)	00	00	00	00	00
Total number of primary schools (girls)	00	00	00	00	00
Total number of secondary schools (co-education)	04	04	04	04	04
Total number of	00	00	00	00	00

secondary schools (boys)					
Total number of secondary schools (girls)	01	01	01	01	01
Total number of colleges	02	02	02	02	02
Total number of madrasas	03	03	03	03	03
Total number of mosques	76	73	70	63	60
Total number of hat-bazars	03	03	02	02	02
Total number of shops	3026	3000	2900	2870	2780
Total number of big industries	00	00	00	00	00
Total number of medium industries	04	04	02	02	02
Total number of small industries	08	08	06	06	06
Total fertile lands	1156 hector	1156 hector	1240 hector	1240 hector	1240 hector
Total number of clubs	03	02	01	01	01
Total number of roads(concreate)	02 km	00	00	00	00
Total number of paca roads	05	03	03	03	03
Total number of kacha roads	17	19	19	19	19
Total number of NGOs	05	05	04	04	03

Key Informants Interview (KII)-02

As a key informant, the accounts officer of Bangabandhu Multipurpose Bridge Project, Tangail has given the information as follows:

1. **Toll collection and deposit at revenue fund at every day:** 18358864 BDT everyday
2. **Total toll collection up to date:** 66,254,287,324 BDT
3. **Average vehicle pass through the Bridge:** 21,300 average everyday
4. **Mentality/Attitude towards giving toll from vehicle owner/driver:**
 - a) Positive attitude towards giving toll;
 - b) Cannot think the amount of toll as more;
 - c) Vehicle drivers see the police harassment at district level;
 - d) Mind set up in giving toll;
 - e) The amount of toll has been increased only one time at 2011;
 - f) The stakeholder thinks the toll amount as rational;
 - g) Toll is determined as BRTA data base;
5. **Road accident situation in/within the Bridge:**
 - a) Accidents are happened due to inefficient driving of the vehicle drivers at few cases;
 - b) Comparatively less accidents happened due to good traffic management at two sides of the Bridge project;
 - c) Accidents happened due to overtaking, fogging and driver's carelessness in/within the Bridge;
 - d) Police petrol/traffic management is always active in bridge areas.
6. **Total man-power involved in toll collection and the existing process in toll collection management:**
 - a) Total man-power is 125 in toll collection;
 - b) Three shifts are working as morning, evening, and night for collecting toll;
 - c) Every man-power works 8 hours every day;
 - d) Total booth -7 in normal time but, 8 booths work at different festive times;
 - e) Two booths work for Honda at festive times;
 - f) Every man-power works 8 nights at every month;
 - g) Exists daily/monthly roaster duty;
 - h) Every one works 8 hours but bound to come at any time for emergency;
 - i) Accommodation facilities are insufficient.

7. Expenditure information regarding Bridge Protection and Management:

- a) China Communication and Construction Company (CCCC) is assigned for operating and maintenance of the Bridge project;
- b) CCCC is contracted with the Bangladesh Bridge Authority (BBA) with 172 crore BDT for five years;
- c) About 450/500 manpower are engaged in operating/maintaining the bridge, river and traffic;
- d) Using modern boat system, CCCC observes river and give report to the authority every month.

8. Opinion on reducing risk of the Bridge:

- a) Specialized engineering team can be engaged in observing the possible risk of the bridge;
- b) International consultant can be recruited to see the low falls of the bridge management;
- c) Finally traffic and toll management should be up to level.

Key Informants Interview (KII)-03

Data provided by the UNO Office, Sirajganj Sadar, with regard to the road situation, land, water source, educational institutions and so forth.

The KII was conducted at the UNO Office in order to know the basic information such as road, bridge, water source, health care, education, financial institution and social safety net situation of the Upazila.

Road situation

From KII it is found that semi *pucca* and *katcha* roads are becoming lessen gradually. There were *pucca* road 116 km, 191 km and 261 km, semi-*pucca* road 05 km, 10 km and 16 km and *katcha* road 322 km, 398 km and 463 km in 2018, 2019 and 2020 respectively in this Upazila.

Bridge/culvert

There were bridge/culvert 2930 meter, 3050 meter and 3190 meter in 2018, 2019 and 2020 respectively.

Land and water source

There were 79101.75 acre of land in this Upazila and among them it was 4022 acre of khash land. There were 118 deep tube wells, 38 Barendra deep tube wells, 5800 shallow tube wells, 89 government ponds and 2312 private ponds in this Upazila in 2020.

Religious institutions

There were 884 mosques, 02 Model Mosques, 01 government *eid-gah*, 03 government grave yards and 62 *mandirs* in this Upazila in 2020.

Live stocks

There were 01 government poultry firm, 446 private cattle firms and 1051 private poultry firms in this Upazila in 2020.

Financial institutions

There were 4 nationalized bank and 22 scheduled private bank branches in this Upazila in 2021.

Educational institutions and stipend program

There were 03 government colleges, 14 non-government colleges, 02 government secondary schools, 62 non-government secondary schools, 246 primary schools, 26 *madrasha*, 01 government Polytechnic Institute, 01 government technical school and college, 106 kindergartens, 09 non-government technical schools, 02 non-government technical colleges, 01 government teacher's training school, 01 Abdul Hamid Krisi Technical College and 01 government Marine Technology Institute in this Upazila in 2020. 47530 students enjoyed Primary Education Stipend in 2020 and 40% female and 20% male of the total students in this Upazila enjoyed Secondary Education Stipend.

Hospitals and medical colleges

There were 08 government hospitals, 55 non-government private hospitals and clinics, 04 government specialized hospitals, 01 government medical college and hospital, 01 non-government medical college and hospital, 01 government nursing college and 01 Medical Assistant Technical School in this Upazila.

Social safety net situation

12193, 4214 and 5882 persons enjoyed old age allowance, widow and husband deserted women allowance and disabled allowance respectively in fiscal year 2020-2021. Moreover, 830 Freedom Fighters enjoyed Freedom Fighters Honorarium in 2020. 2580 metric ton rice and 607 metric ton rice was distributed as Vulnerable Group Development (VGD) and Vulnerable Group Feeding (VGF) in this Upazila in 2020. Besides, Upazila administration distributed two crore and fifty lac Tk as Gratuitous Test Relief in 2020. 830 poor mothers enjoyed Maternity Allowance per month 800 Tk in the fiscal year 2019-2020. 1184 fishermen households enjoyed 40 kg rice per month at the Mother Hilsha Conservation Period from February to June in 2020.

Key Informants Interview (KII)-04

The data was provided by the UNO- Office, Ghiour, Manikganj on the issues of demography, health and social security in the locality.

Ghiour Upazila

- a) **Area and Location:** GhiourUpazila (Manikganj district) area 145.95 sq km, located in between 23°47' and 23°57' north latitudes and in between 89°49' and 89°59' east longitudes. It is bounded by Daulatpur (Manikganj) Upazila on the north, Shibalaya and Harirampur Upazila on the South, Manikganj sadar and Saturia Upazila on the east, Shibalaya and Daulatpur (Manikganj) Upazila on the west.
- b) **Population:** The total Population is 138479. Among these, the male 69171, female 69308. The people of Muslim is 119403, Hindu 19042, Buddhist 21 and others 13.
- c) **Water bodies:** Main rivers: Dhaleshwari, Kaliganga, ichamati, Gangdubi; Bairagir Beel is notable.
- d) **Administration:** Ghiour Thana was formed in 1919 and it was turned into an Upazila in 1983.

1. Last Three Year's Basic Information of This Upazila

- a) **Roads:** In 2018, the total pacca road was 10.165 km, semi pacca road was 0.65 km and katcha road was 281.905 km. in 2019, there constructed another 7.020 km pacca road, 0.420 km semi pacca and 289.345 km kaccha road. Subsequently, the amount of development has risen another 9.155 km pacca road, 0.500 km semi pacca and 299 km kaccha road in the overall Upazila .
- b) **Volume of Land:** The amount of land is remained same in the last three years which is almost 48679 acres. The total net of land in this Upazila is 10740 acre. And the total khash land is 1536.26 acres.
- c) **Hospitals:** The total hospital of this Upazila was 24 in 2018 and now it increases in 26.
- d) **Ponds:** The total ponds of this area were 2115 in 2019 and 2018 which is risen up to

2129 in 2020.

- e) **Cattle and Poultry Farm:** The number of cattle farm of this Thana is 410 in 2018, 440 in 2019 and in 2020 which is 455. The number of poultry farm is decrease in 2020 like 345 which was 370 in 2019 and 385 in 2020.
- f) **Educational Institution:** The educational institutions in this area are also remained the same in the last three years. The number of college of this Upazila is 3 in the year of 2018 to 2020. The total number of secondary school of this Thana is 21 in the last three years and total primary school is 85.

2. Number of People under Safety Net Programs

- a) **Safety Net Program:** In 2016, the number of people under safety need program was 4054. In 2017, it was 4354. In 2018, it was 4754. In 2019, it was 5174 and 2020, it which is 5174.
- b) **Widow and Disability Allowance:** In 2016, the number of widowed and distressed women allowance is 784 and disabled allowance was 1074. In 2017 this number was 1084 and 1328 which increase in 2018 to 1384 and 1528. In 2019, the number was 1664 and 1658 which remain the same in 2020.
- c) **VGF:** Under the govt. social service program, there distributed vulnerable group feeding (VGF) was 347.48 metric ton in 2016, which declined up 220.93 m. tons and now it is 228.66 m. tons.
- d) **Gratuitous Relief:** Besides, the amount of gratuitous relief was 51 tons in 2016 which risen 101 in 2018 and now this is 95 ton provided from the Upazila parishad under the govt. social service projects.

Key Informants Interview (KII)-05

The data collected by using KII from the Toll officer, Bangabandhu Bridge, Tangail District are mentioned as follows:

Introduction of Bangabandhu Bridge

Bangabandhu Bridge opened in June 1998 and it connects Bhuapur on the Jamunba River's

east Bank to Sirajgonj on its west bank, It was the 11th longest bridge in the world when constructed in 1998 and currently the 6th longest bridge in South Asia. It was constructed over the Jamuna River, one of the three major rivers of Bangladesh. This bridge established a strategic link between the eastern and western parts of Bangladesh.

Attitude of Driver

The attitude of driver and owner of bus or truck is positive because they are habituated to provide toll in the bridge from 1998. But sometimes they express anger due to traffic and harassment of police or other local person on the road. All of the bus, truck or vehicles are allowed to go on the bridge, so they are satisfied due to limited time for passing the bridge. Only on time in 2011 the government has increased the rate of toll. One hundred taka increased for small medium one hundred fifty taka increased for large truck and big bus.

Road Accident on Bridge

Due to negligence indifferent attitude lack of proper training, lack of sleep or rest of drivers, lack of awareness about traffic rules, trend of overtaking, high speed are the main cause of road accident in our country. It has been found from the observation and respondent that, in this bridge area the number of road accidents are less comparatively with other area due to proper traffic management and patrolling of Bangabandhu Bridge Authority. Sometimes due to fog in winter season and stormy weather there is a chance of road accident. Then the bridge authority closes the bridge for bus truck or other vehicles. Bridge authority has a weather station. So, when they get red signal, then immediately they close the bridge.

The Bangabandhu Bridge Authority have a management for the victim of road accidents they are well-prepared with modern equipment and technology such as ambulance, heavy weight wrecker which can pull the bus or truck, hospitalization facilities.

Number of officers involved in toll collection and toll management process

China communication construction company got the contract for the maintenance of Jamuna Bridge. About 400/500 people are maintaining the bridge area from Elenga to Nalka. The maintenance cost of Jamuna Bridge is about 172 crore taka. There are about two hundred security guard are working and they ensure safety and security of bridge area through close circuit camera.

Suggestions:

Most of the people are working here for a long time so the people of toll management want to increase more manpower. If they get more people then their physical and mental condition would be better. All people of management do their duty from 9:00 am to 5: 00 pm but they have to be prepared for 24 hours for on call duty. They have to stay three people in a room so

if housing facilities or conditions would be better. Then their life would be more comfortable.

Number of Office:

There are one hundred and twenty five people who are engaged in toll management process. They work in three shifts, morning shift starts from 6:00 am to 2:00 pm noon shift starts from 2:00 pm to 10:00 pm and night shift starts from 10:00pm to 6:00 am. There are fourteen booths in the both sides of bridge. Normally twelve booths remain open in both sides of the bridge. There are separate booths of honda passing so that they cannot create the risk of accident on the bridge. In the eid vacation extra two booths are opened to reduce the traffic jam because there are huge traffic on the road.

Md. Bashraul Alam is working as co-coordinator in the toll operation section Sirjaul Islam is working here as an accountant, Nur-E-Alam Siddique is working as administrative officer and Faruq Ahemd is working as security in charge. There are four hundred and fifty people are working in operational maintain ace section and one hundred and twenty five people are involved in toll management task. There are various department in operational management team such as bridge maintenance river management building maintenance, traffic control , camplubiding department, gardening cleanliness etc. The bridge authority are maintaining financial issues by outsourcing for three years with 80% old people and 20% new people. The maintenance of bridge are maintained through own financial source from 2018. The cost of team management is about 27 lac taka go for providing the salary of staff (125 person).

Opinion for the reduction of risk

It has been identified some opinions for reducing risk of bridge from respondents:

1. During covid-19 pandemic situation truck with various products passed easily without traffic on the bridge so toll was collected more comparatively than other time.
2. The bridge authority are building new things like Karnafuli tunnel, Padma Multipurpose Bridge. Jamuna Resort, Eco Part, Housing etc. with their own funding.

Table: 4.2.2: Bangabandhu Bridge, Toll Operations**Bangabandhu Bridge, Toll Operations**

Traffic & Cash with Credit Yearly Reports

Period: From 23 June 1998 to 30 September 2021

Toll Plaza: East and West

Months	Traffic	(Cash + Credit + Fast Track)	Yearly Growth 54' (All Traffic)	Yearly Growth % : (Cash + Credit +Fast Track)	Remarks
June - Dec 1 998	444,805	277,962,270	0.00 ⁰ /	0.00%	
Jan - Dec 1 999	881,968	600,064,300	4.30 ⁰ /	13.56%	
Jan - Dec 2000	1,044,672	750,130,130	18.45%	25.01%	
Jan - Dec 2001	1,175,188	875,594,950	12.49%	16.73%	
Jan - Dec 2002	1,292,538	996,768,090	9.99%	13.84%	
Jan - Dec 2003	1,508,480	1,193,446,654	16.71%	19.73%	
Jan - Dec 2004	1,747,450	1,403,716,390	15.84%	17.62%	
Jan - Dec 2005	1,930,313	1,534,725,930	10.46%	9.33%	
Jan - Dec 2006	2,080,494	1,634,885,290	7.78%	6.53%	
Jan - Dec 2007	2,350,809	1,854,431,600	12.99%	13.43%	
Jan - Dec 2008	2,647,939	2,060,382,270	12.64%	11.11%	
Jan - Dec 2009	2,964,690	2,286,927,490	11.96%	11.00%	
Jan- Dec 2010	3,355,941	2,541,874,840	13.20%	11.15%	
Jan - Dec 201 1	3,680,499	2,862,200,140	9.67%	12.60%	
Jan -Dec 20 12	3,851,185	3,245,994,800	4.64%	13.41%	
Jan - Dec 201 3	3,764,361	3,111,284,330	-2.25%	-4.15%	
Jan -Dec 2014	4,276,038	3,552,313,050	13.59%	14.18%	
Jan -Dec 201 5	4,354,079	3,629,364,160	1.83%	2.17%	
Jan- Dec 201 6	5,093,203	4,319,622,620	16.98%	19.02%	
Jan -Dec 2017	5,451,589	5,266,887,780	7.04%	21.93%	
Jan -Dec 20 18	5,684,284	5,578,008,850	4.27%	5.91%	
Jan -Dec 201 9	6,078,669	5,840,847,270	6.94%	4.71%	Fast Track Start on 1 5th December - 2020
Jan - Dec 2020	6,458,232	5,879,960,730	6.24%	0.67%	Lockdown Start 26th ' March 2020

Jan - Sep 2021	5,749,034	4,956,893,390	19.02%	12.71%	(9 Months Average)
Total	77,866,460	66,254,287,324			
Yearly Average	3,309,945	2,816,335,274	9.98%	11.57%	

Key Informants Interview (KII)-06

As a key informant, secretary of a Union Parishad has provided the information concerning the details of the union parishad that includes demographic, health, education, volume of land etc.

Introduction:

The 9 no. Sondhanpur Union Parishad in Ghatail Upazila in Tangail District. It is situated in 30 kilometer north from Tangail District. The total area of Ghatail Upazila is 451.30 square kilometer. The nature of land to this Upazila is mixed with forest land and lower plain land. The total population of this Upazila is about 434300 people. It has one Pourashava, 11 Union, Union land office 11, number of village 411, maholla 17, number of family 104030. The amount of forest 88.45 square kilometers. The rate of education is 44%. There are 07 college, 05 Fazil Madrasha, 27 Dakhil Madrasha, 159 Government primary school, Higher Secondary school (Boys) 36, Higher Secondary school (girl) 07, Upazila Health complex 01, Community clinic 54, Family welfare center 01, in public health department there are sanitary latrine 5219 the number of tube well 2637, total road (construed) 808 km. kacha road 950 km. pacca road 191 km number of river 04, total lac 45171 hector, cultivable land 3150 hector non-cultivable land 40 hector. The major profession and economy is agriculture based economy, major profession agriculture, business, service etc. There are 362 mosque 30 mandir, 01 church in this Upazila. There are 05 industry in the Upazila.

Introduction of Sandhanpur Union:

Sandhanpur Union is a union of Ghatail Upazila, Tangail District. Bangladesh. It is situated 10 km east of Ghatail and 54 km northeast of Tangail in the middle of Madhupur Hill Tract. This union established on 1984 and the type of government is union council. The total area of this union is 73.78 km (28.49 sq mile). According to Bangladesh national population survey 2011, the total population on of this union is about 47,055 and the density of population is 640 per km (1700 sq mi). According to population census 2011 performed by Bangladesh Bureau of

Statistics the total population of Sandhandpur union is 47055. There are house hold 12508 in total. The literacy rate of sandhanpur union is 39.6% (male 41.6%, Female 37.7%)

Introduction of Chairman and UP Secretary

The organizational structure of union parishad chairman 1, person, Women member 3 person, General member 9 person, Secretary 1 Person and village police. The secretary reported that, there are various functions of union parishad such as making various development plan. rural infrastructural development, maintenance, education, primary and mass education related activities, health family planning related activities, Agricultural, Fisheries, Livestock, settlement of family violence, environmental development, Birth and death registration, tree plantation, controlling of criminal activities in community encouraged of e-government, primary health care established, co-operatives movement and rural industry reestablishment, making list of widow, orphan, poor, disable, person, providing support in disaster management. There is a Ghatail Cantonment public school and college in Sandhanpur Union. There is a school named sandhanpur Mass high school, Sandhanpur Brac school in this union. There are 104 mosques in 9 no. Sandhanpur Union 05 mandirs 10 Eid, one orphanage 02 majars, 06 graveyard in this union. In this union 148 freedom fighters get allowances 22 person get maternity allowance 811 older person get old age allowance 80 person get disable allowance, 300 people get on house and one farm, there are 9 markets (hat-bazar).

Sandhanpur	Area in Acres	Number of Household	All Ages Both sex	Male	Female	Literacy Rate (7 Years) (Both sex)	Married women aged (15-49 Years)
	18233	12508	47055	22846	24209	396	12539

(Source: Population census, 2011) BBS)

In 2018, Sandhanpur and Songrapur have been distributed into two unions. There are 17,000/- acree area in Sandhanpur and 22000 acres in Sandhanpur union. Salahuddin cantonment has got 11001 acres land. In this union most of the people are ultra poor. There are 12 govt. primary school and 3 private primary school 4 secondary school (co-education), 2 school and colleges, 2 orphanage, madrasa 6, 122 mosque 6 hat bazar, 3 small industry (Poultry food making) in this union. One time harvesting land is 5113.00 acres three times harvesting land 930.50 acres, forest land 5113.00 acres, cultivable land 9055.455 acres, khash land 158.955 acres. There is 50 km concrete road, kaccha road 88.50 km. in this union. BRAC, Grameen Bank, Society for Social Service (SSS) in Bangladesh work through providing micro – credit to the poor.

Key Informants Interview (KII)-07

The acting officer of Bangabandhu Bridge who participated in KII, has provided his opinions with regard to present status of the local people, crime, lives and overall situation existing in the study area.

The acting officer of Bangabandhu bridge has shared his thoughts on the changes as the impact of the bridge. He said that there are different types of criminal activities happening in this area. For example; robbery in the bus has increased and road accidents have occurred frequently due to not having the road divider. He also mentioned that the river erosion also has increased after the foundation of the bridge.

He added that local people always respect the law but they tend more to follow the local norms and kinship values. Therefore there is a common tendency to exercise power over the local area to each other. But as the area is covered and has a boundary, therefore there are no activities of crime in this area.

As there are no road dividers, local authorities have taken various initiatives to reduce road accidents. He mentioned that, to increase awareness among the drivers they have been provided counseling service and by doing that people also are also being warned to be cautious.

After the criminal incidents, generally people come to the local Thana to file a sue for the general offences like theft, fighting, robbery, smuggling, drug and other types of general crimes. Some cases have been sent to local courts to solve and other normal cases have been solved by mutual understanding. He also thinks that, due to having enough light, four lane road, close circuit camera and police apps, the overall security system of the area has been developed.

Key Informants Interview (KII)-08

Mr. Secretary of DCCI has informed that the number of industries in this area is 54 in 2020 which is the same for 2019 and 2018 year. It is to mention that, No large industry can be found in the area, but one medium-size and other 253 industries are small in size. Food, paper, dairy, medicine and chemicals are the main products these industries generally produce.

He said that overall 100 crore taka has been invested in this area. generally in the office and Bank as provided loan facility. There are 3 banks and 40 NGOs who provide training to the people for business purposes.

The main challenges as he mentioned in the industry sector is that there is a lack of skilled manpower in the industry sector. He also added that lower facilities of marketing the raw materials, weak security system and unnecessary intervention from the governments hamper the business environment.

He also provided information about the cooperatives in the area. The associations that can be found at the district level include sport association, cultural, post-office, telephone exchange, Market, small and cottage industries. There are no associations for rehabilitation centre, growth centers at the district level. However, there is a pond that can be found at the district level. There is no fish farm, Eco park, tourist Park and no forest association that can be found at the district level.

SECTION 4.3

INFORMATION RELATED TO MARKET

Objectives: The researchers of the study tried to explore the nature of market and the people who are involved in it (buyers and sellers) in particular have benefited due to the construction of the Bangabandhu Bridge.

Approach: A mixed-method approach was applied in collecting both quantitative as well as qualitative data about the market. For collecting data relevant to market researchers used structured interview schedule, case study, in-depth case interviews (ICIs), focus group discussions (FGDs), key informants' interviews (KIIs) and observation. Besides, they also had to review official documents.

Procedure: The study design was prepared to show the comparisons between the “Before” and “After” situations of the markets studied.

In this case, “before” refers to a measurement being made before construction of Bangabandhu bridge and “after” refers to a measurement being made after the construction of Bangabandhu bridge. Equivalent terms to use in this study “before” and “now”; “before” and “present”; “pre” and “post”. The purpose of this comparisons was to assess the changes occurred after the construction of Bangabandhu bridge. The data for this study was collected from various markets of six (6) districts. Researchers tried to take interviews from the member of market management committee, traders, visitors, sellers, buyers, and other stakeholders.

Table 4.3.1. Name of the Market Studied

District	Name of the Market
Sirajganj	1. Ajgora Bazar
	2. Anayetpur Bazar
	3. Bautara Bazar
	4. Betil Bazar
	5. Brammon Gram Bazar
	6. Hossainpur Bazar
	7. Kathaltola Bazar
	8. Mukar Vanga Bazar
	9. Mukondogati Bazar
	10. Pachill Bazar

	11. Purnobason Bazar 12. Saydabad Bazar 13. Kegimor Bazar
Natore	1. Doupara Bazar 2. Noldanga hut 3. Pirgacha Bazar
Kurigram	1. Balabari Hut 2. Fulbari Bazar 3. Horikesh Bazar 4. Kathalbari Bazar 5. Mithipor Bazar 6. Ulipur Bazar
Tangail	1. Charaljani Bazar 2. Ghatail Bazar 3. Goholiya Bari Bazar 4. Hamid Poramanik Bazar 5. Hamidpur Bazar 6. Kalihati Bazar 7. Kuragacha Doinik Bazar 8. Sollar Bazar 9. Topkushariya Bazar
Pabna	1. Bonkhola Bazar 2. Chortarapur Bazar 3. Hakimpur Bazar 4. Holdiya Bazar 5. Kuripara Bazar 6. Manikhat 7. Najirgonj Bazar 8. Puradasta Bazar 9. Raypur Bazar 10. Satbariya Bazar 11. Sharakandi Bazar 12. Tarabariya Bazar
Manikganj	1. Borotiya 2. Ghior

Study Areas: The study covered 6 Districts namely Tangail, Sirajganj, Pabna, Natore, Kurigram and Manikganj.

Limitations:

There were certain limitations in collecting data from the market places. The respondents of the study were primarily the buyers and sellers. Due to time constraints of the respondents, data collection from them were difficult and authentic information collection was challenging job to some extent. Trained data collectors and researchers tried to collect data with their best abilities.



Figure 4.48: Market Picture of Natore Sadar

FINDINGS OF THE SECTION- 4.3

The findings of this section was prepared based on the data collected from six districts such as Sirajganj, Tangail, Pabna, Natore, Kurigram and Manikganj. The major findings about the markets are discussed bellow:

Table 4.3.2 Types of the market in six districts

Districts	Small	Medium	Large	Total
Market				
Sirajganj	4	6	4	14
Tangail	4	6	4	14
Pabna	4	7	4	15
Natore	4	7	5	16
Kurigram	2	7	4	13
Total	18	33	21	72
Manikganj	5	12	5	22
Total	23	45	26	94

This table 4.3.2 showed the types of markets in six districts. It was revealed that most of the markets were medium (45) in size. On the other hand, 26 of which were large and 23 were small in size.

Table 4.3.3 Nature of the Respondents

Nature of the Respondents	Five Districts	Manikganj
Male	54.72	45.24
Female	45.28	54.76
Unmarried	38.31	30.95
Married	60.39	66.67
Widow	1.30	2.5
No education	14.23	3.5
Primary	23.84	20.69
Secondary	37.01	55.17
Higher	24.91	20.69

From the table-4.3.3 it was revealed that in five districts 55 percent respondents were male and 45 percent respondents were female. But in Manikganj, the scenario was totally changed and 55 percent respondents were female and 45 percent were male. In five districts, 60 percent respondents were married and in Manikganj the percentage of

married respondents was 67. In Manikganj 96 percent respondents were literate and in other five districts the rate of literacy was 86 percent. But in five districts number of higher degree passed respondents were more than the respondents of Manikganj.

Table 4.3.4 Income of the Respondents

Income	Five Districts		Manikganj	
			Frequency (N=22)	Percentage
	Frequency (N=72)	Percentage		
Small (N=16)			Small (N=4)	
10,000-20,000	3	18.75	0	0
20,000-30,000	5	31.25	2	50.0
30,000-40,000	6	37.5	1	25.0
40,000-50,000	2	12.5	1	25.0
Average Income	29375		32500	
Medium (N=35)			Medium (N=13)	
50,000-60,000	9	25.71	3	23.08
60,000-70,000	6	17.14	4	30.77
70,000-80,000	8	22.85	1	7.69
80,000-90,000	9	25.71	3	23.08
90,000-1,10,000	3	08.57	2	15.38
Average Income	72857.14		73461.54	
Large (N=21)			Large (N=5)	
1,10,000-1,20,000	4	19.04	1	20.0
1,20,000-1,30,000	3	14.28	3	60.0
1,30,000-1,40,000	5	23.80	0	0
1,40,000-1,50,000	6	28.57	0	0
1,50,000-1,60,000	2	09.52	1	20.0
1,60,000-1,70,000	1	04.76	0	0
Average Income	135952.38		129000	

Table 4.3.4 showed that, the average income of the respondents from small markets was 29375 BDT, from medium markets it was 72857 BDT and from the large market income was 135952 BDT. But in Manikganj district, the average income was 32500 BDT from small markets, 73461 BDT from medium markets and 129000 BDT from large markets.

Table 4.3.5 Respondent's Investments in the Market

Investment	Five Districts		Manikganj	
			Frequency	Percentage
	Frequency (N=72)	Percentage	(N=22)	
Small (N=12)			Small (N=3)	
50,000-1,00,000	3	25.00	0	0
1,00,000-1,50,000	5	41.67	2	66.67
1,50,000-2,00,000	4	33.33	1	33.33
Average Investment	129164.67		141657.67	
Medium (N=42)			Medium (N=14)	
2,00,000-4,00,000	8	19.05	3	21.43
4,00,000-6,00,000	5	11.90	3	21.43
6,00,000-8,00,000	9	21.43	4	28.57
8,00,000-10,00,000	12	28.57	2	14.29
10,00,000-12,00,000	8	19.05	2	14.29
Average Investment	733503.34		657142.8571	
Large (N=18)			Large (N=5)	
12,00,000-15,00,000	6	33.33	2	40
15,00,000-20,00,000	5	27.78	0	0
20,00,000-25,00,000	4	22.22	2	40
25,00,000-30,00,000	3	16.67	1	20
30,00,000-35,00,000	0	0.00	0	0

Average Investment	1894340.45	1990150
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In the study table 4.3.5 showed that the average investment of the respondents in small market was 129164.67 BDT, in medium market was 733503.34 BDT and in large market was 1894340.45 BDT. But in Manikganj district it was found that approximately respondents invested 141657.67 BDT in Small markets, 657142.8571 BDT in medium markets and 1990150 BDT in large market.

Table 4.3.6 Information about the market

Variable	Five Districts		Manikganj	
	Frequency	Percentage	Frequency	Percentage
Types of Market				
Small	18	25.0	5	22.72
Medium	33	45.8	12	54.54
Large	21	29.2	5	22.72
Total	72	100	22	100
Infrastructure				
Kacha	10	13.88	7	31.81
Semi-Paka	43	59.72	10	45.45
Paka	19	26.38	5	22.72
Total	72	100	22	100
Average number of shops				
	Before	Now	Now	
Permanent	331.97	531.74	1014.33	
Temporary	472.77	743.67	187.62	
Seasonal	996.40	1609.75	90.25	

It was found that 29 percent were large, 46 percent were medium and 25 were small in five districts but in the Manikganj, approximately 55 percent market were medium, 23 percent were large and another 23 percent were small in size.

About 60 percent markets were semi-brick build and 26 percent were brick build and only 14 percent were muddy (kancha). The figure of Manikganj was different. About 45 percent markets were semi brick build and 23 percent were brick build and only 32 percent were Kancha. Before the construction of Bangabandhu bridge on an average the number of permanent shops were 331, temporary shops were 472, and the seasonal shops were 996 in five districts. This scenario was changed rapidly after the construction of Bangabandhu bridge and the number of permanent shops were found 532, temporary shops 743 and seasonal shops 1609. At present in Manikganj district permanent shops were found 1014 that is higher than the other types of shops.

From an in-depth case interview with a businessman in Pukhria, Ghior, Manikganj the number of markets was clarified. As he mentioned:

This bazar sits every day and there are 120-130 small shops are available in this bazar. Only a woman is running her hair cut saloon and parlor for the women. Every day, altogether 2000 buyers and sellers come to this market.

Table 4.3.7 Facilities in the market (Five districts)

Facility Number	Before				Now			
	1-2	3-4	5 or more	Total	1-2	3-4	5 or more	Total
Male Toilets	37 (64.9)	7 (12.3)	13 (22.8)	57 (100)	33 (54.1)	5 (8.2)	23 (37.7)	61 (100)
Female Toilets	18 (66.7)	8 (29.6)	1 (3.7)	27 (100)	7 (23.3)	20 (66.7)	3 (10)	30 (100)
Roads inside the market	29 (41.4)	21 (30)	20 (28.6)	70 (100)	25 (35.7)	20 (28.6)	25 (35.7)	70 (100)
Number of drains	32 (71.1)	7 (15.6)	6 (13.3)	45 (100)	21 (42.9)	20 (40.8)	8 (16.3)	49 (100)
Number of tube wells	36 (54.5)	9 (13.7)	21 (31.8)	66 (100)	20 (29.4)	23 (33.8)	25 (36.8)	68 (100)

Number of dustbins	13 (43.3)	5 (16.7)	12 (40)	30 (100)	9 (29)	3 (9.7)	19 (61.3)	31 (100)
Number of terminals	17 (100)	0	0	17 (100)	17 (100)	0	0	17 (100)
Number of stations	31 (94)	1 (3)	1 (3)	33 (100)	31 (94)	1 (3)	1 (3)	33 (100)

It was revealed by the table 4.3.7 that the market facilities are helpful for the buyers and sellers. The numbers of the facilities had increased and these facilities were created by the market committees or by the authority of local government. But interesting fact is that females were not found to use toilets in the market places. The condition of the toilets was not good enough. Dustbin facilities were not available in the markets and respondents had ensured that they used to throw things here and there. But most of the markets of the study areas have had tube wells and connectivity roads inside the markets.

Table- 4.3.8: Facilities in the market (Manikganj)

Facilities Number	Now			
	1-2	3-4	5 or more	Total
Male toilets	6 (66.66)	3 (33.33)	0	9 (100)
Female toilet	3 (75)	1 (25)	0	4 (100)
Number of roads inside the market	9 (60)	1(6.7)	5 (33.3)	15 (100)
Number of tubes well	8 (57.1)	5 (35.7)	1(7.2)	6 (100)
Number of terminals	7 (87.5)	1 (12.5)	0	8 (100)
Number of stations	8 (88.9)	1 (11.1)	0	9 (100)

Nearly 65 percent of the market have 1-2 toilets facilities before construction of bridge but now the number of toilets increased to 5 or more. around 38 percent as well as the number of toilets 3-4 is decreased 4 percent rather than before time. At present, the number of female toilet facilities increased approximately 67percent (3-4) and 10percent (5 or more) respectively but the number (1-2) female toilets available approximately 67 percent before construction of Bangabandhu bridge. The number of roads (5 or more) inside the market were found higher (36percent) rather than before (29 percent) but the number of 1-2 roads was 41 percent and 3-4 roads 30 percent respectively. Before the construction of Bangabandhu bridge the number of drains (1-2) was highest percentage (71percent) but after the construction of bridge the number of drains (3-4) increased approximately 41percent. The number of tube wells increased 34percent (3-4) and 37percent (5 or more) which was poor number in 14percent and 32percent respectively but the number of 1-2 tube wells was high approximately 55percent. The number of dustbins facilities in the market increased 61percent (5 or more) after the construction of bridge which was only 40percent before the construction. Besides now every respondent opined that the number of terminals in five districts (Tangail, Sirajganj, Pabna, Natore, Kurigram) are 1-2 as well as the number of stations are same as before the construction of Bangabandhu bridge.

At present in Manikganj district there were full toilet facilities for the people in the market area and the number of roads inside in the market as 60percent respondents said '1-2' and 33percent respondents said '5 or more'. The number of tubes well in the market of Manikganj districts are 1-2 is 57percent, 3-4 is 36percent and 5 or more is 7percent respectively. On the other hand, the number of bus terminals are available in Manikganj district is 86percent respondents said 1-2 and only 12.5percent said 3-4.

An FGD with Market Association and Chamber of Commerce in Kurigram reveals that after the construction of Bangabandhu Bridge several small and medium shops and business enterprises stated their journey. One of the respondents opined:

Market associations are providing electricity, sewerage, and dustbin facilities. The transaction is nearly 1 crore of BDT per day. Our local biscuit factories are being lost as the market is under the control of large manufacturer companies like Pran, All Time and so on.

One of the respondents from Tangail district Md. Belayet Talukder (42) who is an owner of shop of Rice and Cylinder Gas. He told about the facilities of the market:

In the rainy season shopkeepers suffer a lot because there is a lack of drainage system. Water logging is a regular case that creates challenges in the market. Beside this there is no toilet facility in this market. We have only

one tube-well for drinking water but it is very insufficient for the market. The road becomes muddy and slippery in the rainy season. There are some straw made living places for the homeless people and it polluting the environment of the market.

Table 4.3.9 Market Environment (Five districts)

Environment of the market	Very good (%)	Good (%)	Moderate(%)	Bad(%)	Very bad(%)
Condition of water logging	2.9	17.6	17.6	42.6	19.1
Waste management and drainage system	0	12.1	28.8	43.9	15.2
Drinking Water	4.3	15.9	62.3	10.1	7.2
Cleanliness in the Market	1.4	12.7	53.5	28.2	4.2
Sewerage System	0	6.1	59.1	33.3	1.5
Connection with main roads	13	47.8	36.2	0	2.9

It was revealed by the table 4.3.9 of the study, a total of 62 percent respondents from five districts confirms that water logging system was found bad and very bad. But 38 percent of the respondents opined it as good, moderately good and very good. On the other hand, 59 percent respondents opined that waste management systems in five districts were very bad or bad. But 41 percent agreed that the status was good, very good or moderately good. More than 83 percent of the respondents said that there was enough good quality of pure drinking water in the market place. But 17 percent did not agreed positively. More than half of the respondents 67 percent thought that market places were clean and 65 percent of the respondents thought that their market had sewerage system those were good, very good or moderately good. Only 3 percent of the market places were found in the study that were not directly connected with the main roads.

Table 4.3.10 Market Environment (Manikganj)

Environment of the market	Very good	Good	Moderate	Bad	Very bad
Condition of water logging	0	13.63	18.18	45.45	22.72
Waste management and drainage system	9.09	4.54	22.72	40.90	22.72
Drinking water	18.18	13.63	50	13.63	4.54
Cleanliness condition of the market	22.72	9.09	45.45	9.09	13.63
Sewerage System	4.54	18.18	13.63	36.36	27.27
Connectivity with the main road	13.63	18.18	45.45	13.63	9.09

In Manikganj, 67 percent markets had faced water logging problems and 63 percent market's drainage system was bad or very bad. These markets waste management systems were not found good also. More than 81 percent markets had pure drinking water facilities and 75 percent markets were found clean. It was also found that 64 percent market's sewerage system was not good. About 22 percent markets of Manikganj were not found connected with the main roads. So, infrastructural development is necessary.

The qualitative study provided a wide range of information on these issues. For example, one FGD held in Tangail District and the participants of the FGD opined as:

We did not observe any change in waste management system although pollution has not increased much. We are seeing a quite development in environment of the markets, disaster management and market market management. Although we do not see any change in water pollution, toilet facilities have increased remarkably.

From an in-depth case interview with a businessperson of Manikganj it was revealed that the connectivity roads of Pukhira Bazar to Harirampur Bazar was not developed well. As he mentioned:

Some parts of the roads between Pukhira bazar to Jhitka/ Harirampur is brick built or concrete made but few parts of it is totally muddy. If this could be brick built fully, it can be reduced the problems in our business transportation.

Table: 4.3.11 Government and nongovernment Facilities (Five Districts)

	Before						Present					
	Sirajgonj	Natore	Kurigram	Tangail	Pabna	Total	Sirajgonj	Natore	Kurigram	Tangail	Pabna	Total
Government and non-government facilities												
Number of government banks	19	18	16	19	18	90	43	39	29	47	37	195
Number of non-governmental bank	27	29	22	32	29	139	48	43	34	63	45	233
Number of NGOs	32	35	38	43	38	176	70	67	98	75	79	389
Number of electric lines	361	252	167	398	263	1441	544	289	275	497	342	1957

Number of post office	300	292	199	256	230	1277	303	295	205	256	230	1289
Number of courier service	7	6	4	5	7	29	35	39	28	27	39	168
Number of police station	7	6	4	7	8	34	11	8	6	8	10	43
Number of veterinary offices	6	8	6	10	7	37	17	15	12	13	19	76

It was revealed by the table 4.3.11 that the number of branches of government banks was 90 before the construction of Bangabandhu bridge and currently it was raised to 195 branches. The total number of branches of non-government banks in five districts was 139 which is increased 233 after the construction of Bangabandhu bridge.

The total number of non-government organizations (NGOs) in five districts was 176 in pre Bangabandhu Bridge period and after the construction of Bangabandhu bridge the total number of NGOs was seen to be increased to 389. Before Bangabandhu Bridge, the total number of electric lines was 1441 in five districts and now it was raised to 1957. Previously the number of post offices was 1277 and currently 1289. In pre Bangabandhu bridge period number of courier service was 29 and now it has raised to 168.

About 43 police stations are providing security services for the mass people in five districts and the number of veterinary offices also double as after the construction of Bangabandhu bridge.

This study explored a more inclusive picture of positive and negative impact of Bangabandhu bridge through qualitative investigations. For example-one in-depth case interview conducted in the Paura Market, Kurigram Sadar, Sadar. Mr. Ariful Islam, 35 years of old who worked in a tea stall. He explained the activities of NGOs in Kurigram as:

Now many NGO are providing services by sending doctors to our community from larger cities for providing medical services as our transportation and communication system is developed than before. I think that Bangabandhu bridge is a blessing for us in health sector.

On the other hand, from an FGD session conducted in Kurigram district with Market Association and Chamber of Commerce. A great number of Bank and Insurance company initiated their financial services in this area but one of the FGD Respondent opined that-

They don't get loan facilities properly from the bank due to nepotism of bank employees, political power abuse of local leaders, lack of effective bank help desks etc. So, all banks should take a small business friendly initiative to provide loan to the owners of small cottage industry that will help to survive them in long run.

An another FGD session conducted with small and medium shop owners at Boro Bazar, Sirajganj Sadar, Sirajganj District. The situation of law and order are good in market area. FGDs participants told:

Law enforcing agencies are active in market areas. Police are patrolling everyday in the market area.

Table: 4.3.12 Government and non-government facilities (Manikganj)

Government and non-government facilities	Present
Number of government banks	28
Number of non-governmental bank	43
Number of NGO's	72
Number of electric lines	68
Number of post office	27
Number of courier service	22
Number of police station	7
Number of veterinary offices	8

The table 4.3.12 reveals that in Manikganj almost 28 government banks and 43 non-government banks were seen to provide financial services to the people. About 72 NGOs were seen to work in Manikganj to provide social services and micro credit programs. There were 68 electric lines in Manikganj and 27 post offices, 7 police stations were seen to provide services to the people. The current number of courier service was found 22 and there were 8 veterinary offices for the livestock.

Table: 4.3.13 Days of market, number of buyers and sellers (Five districts)

Number of Hut days in a week	Before				Present			
	1	2	3 or more	Total	1	2	3 or more	Total
Sirajgonj	2 (33.3)	3 (50)	1 (16.7)	6 (100)	2 (33.3)	3 (50)	1 (16.7)	6 (100)
Natore	-	10 (100)	-	10 (100)	-	10 (100)	-	10 (100)
Kurigram	6 (66.7)	3 (33.3)		9 (100)	6 (66.7)	3 (33.3)		9 (100)
Tangail	-	3 (21.4)	11 (78.6)	14 (100)	-	3 (21.4)	11 (78.6)	14 (100)
Pabna	11 (78.6)	3 (21.4)	-	14 (100)	11 (78.6)	3 (21.4)	-	14 (100)
Number of other market days in a week								
Sirajgonj	-	1 (9.1)	10	11	-	1 (8.3)	11 (91.7)	12

			(90.9)	(100)				(100)
Natore	-	-	15 (100)	15 (100)	-	-	15 (100)	15 (100)
Kurigram	-	-	15 (100)	15 (100)	-	-	15 (100)	15 (100)
Tangail	-	3 (37.5)	5 (62.5)	8 (100)	-	3 (37.5)	5 (62.5)	8 (100)
Pabna	-	-	14 (100)	14 (100)	-	-	14 (100)	14 (100)
Number of Special Markets days in a Year								
Sirajgonj	2 (100)	-	-	2 (100)	2 (100)	-	-	2 (100)
Natore	8 (88.9)	1 (11.1)		9 (100)	8 (88.9)	1 (11.1)		9(100)
Kurigram	-	-	1 (100)	1 (100)	-	-	1 (100)	1 (100)
Tangail	2 (25)	4 (50)	2 (25)	8 (100)	3 (33.3)	4 (44.4)	2 (22.2)	9 (100)
Pabna	8 (57.1)	6 (42.9)	-	14 (100)	1 (7.1)	11 (78.6)	2 (14.3)	14 (100)
Number of Buyers and Sellers								
On the day of hut	Mean				Mean			
Sirajgonj	3005				3805			
Natore	2550				4025			
Kurigram	1233.3				1742.22			
Tangail	2830				3320			
Pabna	2921.43				4800.29			
On other days								

Sirajgonj	563.71	1325.5
Natore	473.33	773.33
Kurigram	1246.67	1958.67
Tangail	1125.67	1460
Pabna	2535.71	4264.29
Number of Female Buyers' Sellers in the Market		
On the day of hut	Mean	Mean
Sirajgonj	229.5	325
Natore	79	164
Kurigram	56.67	180
Tangail	1749.23	3741.54
Pabna	67.14	155.71
On Other Days		
Sirajgonj	118.21	170.71
Natore	115.47	176.13
Kurigram	289.67	545.67
Tangail	1920.5	6031.5
Pabna	114.29	150.71

The Table 4.3.13 shows that the number of days of hut in a week are same as within the period (before and present) of Bangabandhu bridge in five districts Sirajganj, Natore, Kurigram, Tangail, and Pabna. All respondents of Natore district told that 2 days of hut in a week whereas in Sirajganj districts only 17percent respondents opined that there are seen to occur 3 or more days of hut in a week. Most of the respondents of five districts told that the '3 or more days' in other market occurred in a week regularly but the special market in a year happened in Sirajganj only one day, Kurigram only 3 or more days and Natore, Pabna, Tangail 1 day or 2 days.

Data also shows that the number of buyers and sellers has increased in the hut days after the construction of Bangabandhu Bridge. Besides, female buyers also increased in market places due to the break of social barriers regarding women. An interview with Mr. Ajmol Hossain (pseudo name) 42 years of old clarifies the previous and present situation of business. As he mentioned:

Before the construction of Bangabandhu bridge, it was quite difficult to do any business in Pabna by collecting products from Dhaka. Although, some people have done their business and it was a work of lot of pains like over transshipment in ferry, over transportation charge etc. But now it is very easy to do any type of business from Dhaka to Pabna due to the construction of Bangabandhu bridge.

On the other hand, from an FGD session conducted in small and medium shop owners at Boro Bazar, Sirajganj. In the context of female participation in the market the FGD Respondents mentioned that-

Female education rate has increased in this area. The opportunity of education was scarce for the female before. But now, girl child is going to school, college and university and they are being engaged in different types of occupations. Female are doing business in Sirajganj Bazar and these are mainly tailoring. Female are doing job in several company's showrooms at Sirajganj Bazar as well as they are gathering in the market area.

Table 4.3.14 Days of market, number of buyers and sellers (Manikganj)

Information related to number of days of hut in market	Present			
	1	2	3 or more	Total
Number of days of hut in a week	10 (76.9)	-	3 (23.1)	13 (100)
Number of days in other market in a week	-	2 (100)	-	2 (100)
Number of special markets in a year	-	-	1 (100)	1 (100)
Information related to number of buyers and sellers	Mean			
On the day of hut	5467.92			
On other days	1005.64			

Information related to number of female buyers' sellers in the market	
On the day of hut	785
On other days	208.08

In the present scenario of Manikganj district approximately 77 percent respondents said that there sat one day of hut in a week. On the other hand, 33 percent opined on two days of Hut. On the day of hut, on an average 5467 number of buyers and sellers are gathering in the market on the other hand on an average 1005 number of buyers and sellers gather in the other market in a week. In the context of female participation, the study showed that on an average 785 female buyers and sellers are gathering on the day of hut in a week as well as on the other days of the market in a week. It was also seen that on an average 208 female buyers and sellers were gathered in the markets of Manikganj District.

Table: 4.3.15 Numbers of Products in the Market (Five districts)

Number of products in the market	Primary Products		Secondary Products	
	Before	Present	Before	Present
	Mean	Mean	Mean	Mean
Number of products being marketed	1176.26	1296.02	291.74	426.11
Amount of product marketed (Metric ton)	880.40	1210.27	36.83	59.63
Estimated market price (BDT)	26821694.92	43378387.10	10248482.76	19598639.34

It was found in the Table-4.3.15 that there were two types of products in markets (primary products and secondary products) available in the adjacent area of Bangabandhu bridge. Before the construction of Bangabandhu bridge on an average 1176 types of primary products and 291 types of secondary products were marketed which were changed later. Currently it was seen that 1296 primary products and 426 secondary products were being marketed in the study area. The Amount of main product was 880 metric tons and 36 metric ton of secondary products were also marketed before the construction of Bangabandhu bridge. After the construction of Bangabandhu bridge these amount was changed tremendously. About 1210 metric tons of primary products and 59 metric tons of secondary products were seem to be

marketed. Approximately market price of primary products was 2,68,21,694 BDT and secondary products was 1,02,48,482BDT before the construction of the bridge. Currently it was observed that the market price of primary products and the secondary products were changed to 4,33,78,387 BDT and 1,95,98,639 BDT.

Table: 4.3.16 Vehicles used for coming to the market (Multiple response)

Types of Vehicles		Responses		Percent of Cases
		N	Percent	
	Rickshaw	51	12.9	77.3
	Bicycle	59	14.9	89.4
	Motor cycle	54	13.6	81.8
	Van	60	15.2	90.9
	Tempu	24	6.1	36.4
	Car	8	2.0	12.1
	Bus	21	5.3	31.8
	Pick up	31	7.8	47.0
	Boat	23	5.8	34.8
	Troller	12	3.0	18.2
	Tructor	12	3.0	18.2
	Auto	41	10.4	62.1
Total		396	100.0	600.0

Table 4.3.16 showed that mass people were seen to use different types of vehicles for their transportation to the markets. The finding showed that, approximately 15 percent respondents used van and bicycle, 14 percent motor cycle, 13 percent rickshaw, and 10 percent auto rickshaws. But a small number of respondents less than 10 percent were seen to used other types of vehicles.

As one of the businessmen from Pabna explained:

I have to bring all my products at night because the loaded truck causes jam during the day. Recently a huge number of auto rickshaws are added in Pabna city as a result a lot of traffic jams has been created. Most of the auto rickshaws run on electricity charges as a consequences load shedding is a regular phenomenon.

Table 4.3.17: Market Management Information

	More		Moderate		Same as before	Less
Number of used vehicles	54 (75%)		18 (25%)		0	0
	Yes				No	
	Before		Present		Before	Present
Market management committee	61 (84.7%)		47 (65.3%)		9 (12.5%)	23 (31.9%)
	8-15	16-25	26-35	36 or more	Mean	
Number of members in market management committee	7 (12.5%)	12 (21.4%)	6 (10.7%)	31 (55.4%)	66.32	

Table 4.3.17 shows that about 85 percent markets have market management committee before the construction of Bangabandhu Bridge, but this scenario had changed after the construction of Bangabandhu bridge. About 65 percent respondents said about the market management committee in their markets. On an average approximately 66 members are involved in the market management committee.

Table: 4.3.18 Vehicles used for commuting to the market (Multiple response)

Types of vehicles		Responses		Percent of Cases
		N	Percent	
	Rickshaw	12	20.7	100.0
	Bicycle	10	17.2	83.3
	Motor cycle	10	17.2	83.3
	Van	7	12.1	58.3
	Tempu	6	10.3	50.0
	Bus	1	1.7	8.3
	Pick up	2	3.4	16.7
	Boat	3	5.2	25.0
	Troler	2	3.4	16.7
	Auto	5	8.6	41.7
Total		58	100.0	483.3

Table 4.3.18 reveals that 100 percent respondents used rickshaw, 83 percent bicycle, 83 percent motor cycle, 58 percent van and 50 percent tempu. Also, 25 percent of respondents were seen to use boats for their transportation to their markets.

Table 4.3.19: Number of Vehicles Used

	More		Moderate		Same as before		Less
Number of used vehicles	4 (26.7 percent)		11 (73.3 percent)		0		0
	Yes				No		
	Before		Present		Before		Present
Presence of market management committee	12 (80 percent)		15 (100 percent)		2 (20 percent)		0
	8-15	16-25	26-35	36 or more	Total	Mean	
Number of members in market management committee	5 (33.3 percent)	6 (40 percent)	4 (26.7)	-	15	20.27	

Table: 4.3.20 New Business Organization/ Enterprise (Five Districts)

New business organization/ enterprise	Sirajgonj	Natore	Kurigram	Tangail	Pabna	Total
NGO office	31	44	65	42	82	264
Super market	15	14	11	13	15	68
Governmental/non-governmental office	180	176	152	183	168	859
Furniture shop	266	235	185	245	257	1188
Biscuit factory	31	19	11	28	32	121
Computer and service center	141	33	103	74	62	313
Shop of garments	262	102	13	216	223	1282
Hotel and restaurant	50	119	12	84	75	486
Mills and factories	96	72	28	110	98	113
Others shop	273	255	149	289	278	378

Table 4.3.20 shows that after construction of Bangabandhu bridge establishment of new business and enterprise around the market. This establishment includes NGO offices,

super market, cybercafé, storage house, furniture shops, biscuit factory, manufacturing, hotel and restaurant, mobile shops, pharmacy, brick, sand, cement shops and so on.

Table 4.3. 21 New business organization/ enterprise related information (Manikganj)

New business organization/ enterprise	Total
NGO office	52
Super market	8
Governmental/non-governmental office	97
Furniture shop	40
Biscuit factory	8
Computer and service center	13
Shop of garments	105
Hotel and restaurant	56
Television and electronic shops	26
Mobile shop	54
Mills and factories	5
Pharmacy	105

Most of the markets are now connected by all-weather roads as a result more diversification of goods while before construction of Bangabandhu bridge there were less industrialized products now the flow of the product coming from Dhaka is bigger and the local community benefits from that e.g., television and electric shops, mobile shops, shop of garments etc.

After the construction of Bangabandhu bridge a lots of new business organizations or enterprises were increased in five districts- Sirajganj, Natore, Kurigram, Tangail and Pabna. According to the table 4.3.20 at present a total of 264 NGO new offices are working in the five districts whereas 82 in Pabna district which is highest and followed by 65 in Kurigram, 44 in Natore, 42 in Tangail, and in Sirajganj 31. There are 68 super market in five districts while mostly 15 super market in Sirajganj and Pabna district. Total number of government/non-government office in five districts are 859 although more than 180 offices are running in the Tangail. Almost 1188 furniture shop are running in the adjacent five districts of Bangabandhu bridge.

In Manikganj District also have new business organization or enterprises established whereas 105 shop of garments are highly representative number of the industrial development on the other hand some new business or enterprise followed by Hotel and Restaurants (56), NGO office (52), Furniture shop (40), government and non-government office (97 etc. which were comparatively poor rather than adjacent five districts of Bangabandhu bridge.

This study explored a more inclusive picture of positive and negative impact of Bangabandhu bridge through qualitative investigations. From In-depth case interview an interviewee explained:

I took loan around 1 lac from two NGOs and every month I paid the premium in 5000 BDT. But bank didn't provide loan facilities because I have no property or mortgage resources so that's why I involved in micro-credit loan services. I think that if banks will provide loan facilities for the small market owners in lower interest rate, they will survive in any difficult situation.

Table: 4.3.22 Work opportunities in the market (Five Districts)

	Before				Present			
	100 or less	101-200	More than 200	Total	100 or less	101-200	More than 200	Total
Permanent shops								
Sirajgonj	5 (35.7)	3 (21.4)	6 (42.9)	14	3 (21.4)	3 (21.4)	8 (57.2 percent)	14
Natore	9 (60)	6 (40)	-	15	3 (20)	2 (14.33)	10 (66.67 percent)	15
Kurigram	6 (40)		9 (60)	15	6 (40)		9 (60 percent)	15
Tangail	6 (42.9)	2 (14.2)	6 (42.9)	14	5 (35.7)	3 (21.4)	6 (42.9 percent)	14
Pabna	-	7 (50)	7 (50)	14	-	-	14 (100)	14
Not permanent shops								
Sirajgonj	5 (45.5)	2 (18.1)	4 (36.4)	11	5 (45.5)	-	3 (54.5)	8
Natore	15 (100)	-	-	15	7 (46.7)	8 (53.3)	-	15
Kurigram	9 (60)	6 (40)	-	15	6 (40)	3 (20)	6 (40)	15
Tangail	8 (57.2)	3 (21.4)	3 (21.4)	14	9 (64.3)	2 (14.3)	3 (21.4)	14
Pabna	-	-	14	14	-	-	14	14

			(100)				(100)	
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Table 4.3.23 Work opportunities related information in the market (Manikganj)

	Present			
	100 or less	101-200	More than 200	Total
Permanent shops	8 (57.1)	2 (14.3)	4 (28.6)	14
Not permanent shops	7 (63.6)	-	4 (36.4)	11

Due to the construction of Bangabandhu bridge in Sirajganj district almost 60percent respondents said that they had more than 200 permanent shop which is little bit poor (43 percent) before the construction of Bangabandhu bridge but in Natore district (60 percent) respondents opined that they were 100 or less permanent shop. Actually, permanent shop creates more work opportunities for the mass people in five districts especially the Bangabandhu bridge create these opportunities.

In Kurigram district '100 or less' and 'More than 200' permanent shops were same as in the period of before and after the construction of Bangabandhu bridge. In Tangail district approximately 43 percent respondents opined that '100 or less' and 'More than 200' permanent shops create more working opportunities for the mass people. But in Pabna District before the construction of Bangabandhu bridge 50percent permanent shops were in 'More than 200' which is increased in twice after the construction of Bangabandhu bridge. In Manikganj district 57 percent respondents responded that 100 or less permanent shops have to create work opportunities for the people of Manikganj but 29 percent said 'More than 200' and 14 percent said '101-200' respectively.

As a consequence of Bangabandhu bridge a huge number of non-permanent shops established in five districts and Manikganj. There were 64 percent respondents of Tangail district they have '100 or less' non-permanent shops which was in 57percent before construction of Bangabandhu bridge. In addition to all respondents of Pabna districts have to mention that 'More than 200' non-permanent shops were able to create more work opportunities for the poor people. On the other hand, there were 64 percent respondents in Manikganj district said that '100 or less' non-permanent shop given more work opportunities as well as 36 percent respondents opined that 'More than 200' shops in the market provide different job opportunities for the unemployed people in Bangladesh.

FINDINGS OF FGDs AND ICIs

The part was prepared based on the Focus Group Discussion (FGD), In-depth Case Interviews (ICIs), and Key Informants Interview (KII) were conducted in the five districts (Sirajgonj, Tangail, Pabna, Natore, Kurigram) and Manikganj. There were 3 FGDs and 6 ICIs conducted during data collection period. From the qualitative study research team found that after the construction of Bangabandhu bridge toilet facilities, drainage system, tube well installations, hut days, products of other days, investment of the market etc. were developed in the adjacent area of Bangabandhu bridge. The FGDs and ICIs were conducted to know the impression of the mass people about the outcome of the market users due to construction of Bangabandhu bridge. In this part researchers had mentioned 2 FGDs and 2 ICIs as a sample qualitative data.

Focus Group Discussion (FGD)

FGD-01: A Focus Group Discussions (FGDs) was conducted on small and medium shop owners at Sirajganj Sadar Boro Bazaar, Sirajganj with a view to knowing the impacts of Bangabandhu Bridge on socio-economic development and trade and commerce. Through FGD information about socio-economic situation, income and employment opportunity, transportation and communication, trade and business and environmental and ecological impact were explored.

One of the aged participants mentioned,

Monopoly and stock business were the main problems in Sirajganj Boro Bazar before construction of Bangabandhu Bridge but today, such type of monopoly and stock business are vanished from the market due to Bangabandhu Bridge.

Another Participant Reported:

Movement of the outside people is very poor in Sirajganj Sadar area. This place cannot attract the outside investors. Local people mainly creates the business, investment and employment. That is why, the environment of large investment is not made in Sirajganj Sadar.

A few FGDs participants gave their opinions as follows:

Agricultural commodity easily transports to Dhaka. Even, the people of Dhaka consume the agricultural commodity earlier than us.

They also complained:

Fish price is very high at Sirajganj bazaar. The fish of the river goes to Dhaka and they cannot consume the fish of the river.

FGD participants told:

At present, Sirajganj is the district of education and health. Health care services have reached to remote areas. Inhabitants of Sirajganj have enjoyed the improved health care system. Women empowerment and education rate have increased in this area due to Bangabandhu Bridge.

They also mentioned,

Female education rate has increased in this area. The opportunity of education was difficult for the female in this area before Bangabandhu Bridge. But now, female is going to school, college and university and they are being engaged in different types of profession. Female are doing business in Sirajganj Bazar and these are mainly tailoring. Female are doing job in several company's showrooms at Sirajganj Bazar.

Some of the FGDs participants put their opinion as:

Bangabandhu Bridge is the blessings for the inhabitants of Sirajganj. Today, inhabitants of Sirajganj can go to Dhaka early at morning and after finishing their official activities or commerce and trade activities they can return to Sirajganj at noon and take their lunch at home. Bangabandhu Bridge is playing an important role for the development of the whole part of North Bengale. It is the entry door of the northern part of Bangladesh."

The situation of law and order were seen good in market areas of Sirajganj. FGDs participants told:

Law enforcing authority is active in market area. Police petrol visits now and then in the market area.

Some of the participants mentioned,

A huge development work is going on to spread the road and to establish the industry. Dust is the constant company of those areas. Thousands of motorized vehicles are being moved through Bangabandhu Bridge. Sound and air pollution are seriously harmful for human health. The

pace of industrial trend can erode the crops and forestation filed and can create serious environmental hazards in this area.

FGD-02: The focus group discussion-02 was undertaken with the members of Chamber of commerce and members of market association, Kurigram. The FGD consisted of 07 members (President, Vice-President, Secretary and Members).

From the FGD conducted following information were gathered regard the issues of the socio-economic impact of Bangabandhu Bridge.

The participants provided their opinions as mentioned below:

1. They don't get loan facilities properly from the bank due to nepotism of bank employees, political abuse of local leader, lack of effective bank help desks etc. So, all banks should be disbursed loan facilities in customize way so that small cottage industry will survive in any pandemic situation.

2. There is no sufficient storage house in our District to store the crops as a result huge number of Agro products are damaged. So, we need to establish more storage house for storing the crops. Specially I insist on to establish a temporary center for tannery products because every year a great number of tannery products are being damaged due to poor storage system.

3. Many shops are enjoying the benefits of electricity, sewerage, dustbin services provided by market association. Every day one crore BDT is transected in this market. But I am concern that, our local products for example Bakari are being lost because they don't get adequate benefits or services in product production as well as big companies like Pran, All Time, RFL have captured the whole market."

4. Some respondents of FGD made their comments as below:

River's dredging is essential so that Agro crops are not damaged from overflowing. A huge ton of sand that can be found after dredging is used for various development works for example-Kurigram Agriculture University.

And another respondent said:

There are 400 small and large Chars in this region if we can use this land properly in agriculture and industry sector then our district will change radically a lot more.

IN-DEPTH CASE INTERVIEWS (ICIs)

In the study areas such as Sirajgonj and Tangail two in-depth case studies were conducted in order to get in-depth information about the impact of Bangabandhu Bridge on the issues of Business, Markets and Some economic activities concerned with the development of infrastructure, market facilities, and environmental issues.

ICIs-01: Jabbar Mia (pseudo name) is a man of 30-years are involved in grocery business at Sirajganj. . He belongs to a family of five members. He lives in a rented house next to the shop. He is living in Sirajganj Sadar with his family for business needs. He ran his business in a market called Kalibari Bazar. This market offers wholesale and retail of various products including groceries, kitchen products, fish, meat, cosmetics.

The fish of Jamuna is available in this market. Local fresh vegetables are available. But due to the easy and rapid communication resulted from Jamuna Bridge, huge local products are transported to Dhaka by some people for making more profit. Due to scarcity of locally produced products were found to sold at a high price affecting the local consumers.

He said:

The fish of Jamuna is very fresh and delicious but its price is beyond our reach. We just look, can't buy. Because its price is much higher. Only rich people can buy this fish. If there was no bridge, we could buy this fish at a much lower price.

He further said:

My shop isn't that big and it's hard for me to keep an assistant for my business. I have only one assistant who is my relative. By working day and night, the family somehow survives with what I get from the shop. It was pretty good before. Even today, I have not been able to recover from the loss done during the Corona pandemic period.

Jabbar Mia explained:

The overall security of this market is good. There are always 5 security guards to ensure security in case of theft or robbery. Extortion is not the main problem here. Adulterated products are occasionally seen to be sold.

Since most local people are market customers and do not need to use their toilets. But the outside customer has to use the toilet. There are only two toilets in the market which is less than the demand. We, the owners, traders, shopkeepers who have to stay in the market for a long time have no choice but to use this toilets. A queue is always found and it remains odor-able and dirty.

He reported some problems that include lack of funds, loan difficulties, and high shop renting, health and sanitation problems. According as he said that the government and the authority should take proper initiatives to develop the market.

ICIs-02: Abul Talukder has a grocery shop at Charpathilekandi market. This is a permanent market which is situated on the land of government. In this market there is no specific day for hat. In this market people from different villages, railway construction, cantonment area, Bangladesh Bridge Authority come and buy different daily necessities for their life and livelihood.

It has been observed that in Charpathikandi market, there are various types of shop like grocery shop, vegetable shop, fruits shop, pharmacy tailoring shop, hotel and restaurant, tea stall, electronic products like fridge, television electronics equipment's shop, poultry shop, fish shop, cloths shop etc. The shop of construction like metal, cement, sand, digging machine, iron sheet in increasing day by day due to road and railway construction in the locality.

He is leading his livelihood with family. It has been observed that the financial condition of Abul is increasing day by day because he motioned that, I have started my business from 200. When I saw that some people of my village started their shop in open place then I started my shop. At first, I had a shop of breakers (bhangari), then I had vegetables shop and lastly, I have established a construction shop. Now I can lead my livelihood with the income of this shop. I have one staff in my shop this market is very popular different types of people come

Abul mentioned:

In the rainy season shopkeepers have to suffer a lot because due to lack of drainage system. water logging problem creates challenges in the market. Beside this there is no any toilet facilities in this market. We have only one tube well for drinking water but it is insufficient for the market. The road becomes muddy and slippery in the rainy season. We have some jhuprihar of homeless people and it pollutes the environment of the market.

He mentioned further:

We use rickshaw, Van, Cycle, Pick-up, CNG, Autorickshaw for communication and delivery of our products. Due to Jamuna Bridge we can easily collect fresh vegetables and other raw materials through truck or pick-up van from Bogura, Rajshahi, Pabna, Natore, Rangpur (North Bangle) of our country. So, there is availability of any products of our daily life in the market due to Jamuna Bridge.

Infrastructure facilities were found to be increased in the market areas specially, the hygienic condition, and other basic facilities due to construction of Bangabandhu Bridge. The sanitation and hygiene condition in the market, in terms of water supply, toilet facilities were seen inadequate that need to be improved. To promote the overall situation of the market places following steps can be considered:

- To improve drainage system
- To build specific market places with concrete roof
- To reform the institutions and regulations for the rural markets
- To build more storehouses in this region because a large volume of crops are normally produced such as potato, tomato, brinjal, chili, onion, China nut etc.

SECTION- 4.4

INFORMATION RELATED TO THE INDUSTRY

Table-4.4.1: Distribution of Industry by Types, Ownership & Number of Employees

Variable	Five districts		Manikganj	
	Frequency	Percentage	Frequency	Valid Percentage
Types of industry				
Small	24	35.3	9	64.3
Medium	33	48.5	5	35.7
Large	11	16.2	0	0.00
Total	68	100	14	100
Ownership				
Single	50	78.1	14	93.3
Joint	14	21.9	1	6.7
Total	64	100	15	100
No. of permanent employees				
1-50	47	72.3	10	100
51-100	6	9.2		
101-150	3	4.6		
151-200	4	6.2		
201-250				
251-300	3	4.6		
301-350	1	1.5		
351-400	1			
More than 400				
No. of temporary employees				
1-50	34	63.0	4	100
51-100	11	20.4		
101-150	6	11.1		
151-200	1	1.9		
201-250				
251-300				
301-350				

351-400				
More than 400	2	3.6		

Table 4.4.1 shows that majority (48.5percent) of the industry are medium in size whereas 35.3percent are small and only 16.2percent industry are large in size. With regard to ownership of the industry it is observed that 78.1percent industries are run by single ownership which is higher number whereas 21.9percent industries are being runned jointly. In the case of employees, findings show that in 72.3 percent industries up to 50 employees are working permanently; on the other hand, in 63 percent industries maximum employees (up to 50) are working temporary basis.

Table 4.4.2: Industries by Types and Ownerships (Five Districts)

			Ownership		Total
			Single	Joint	
Types of the industry	Sm all	Count	19	5	24
		percent within Types of the industry	79.17 percent	20.83 percent	100.0percent
		percent within Ownership			
	Me diu m	Count	27	6	33
		percent within Types of the industry	81.82 percent	18.18 percent	100.0percent
		percent within Ownership			
	Lar ge	Count	6	5	11
		percent within Types of the industry	54.5percent	45.5percent	100.0percent
		percent within Ownership			
		Count			

Table 4.4.3: Industries by Types and Ownerships (Manikganj District)

			Ownership		Total
			Own	Joint	
Types of the industry	Sm all	Count	9	0	9
		percent within Types of the industry	100.0 percent	0.0percent	100.0percent
		percent within Ownership	69.2percent	0.0percent	64.3percent
	Me diu m	Count	4	1	5
		percent within Types of the industry	80.0percent	20.0percent	100.0percent
		percent within Ownership	30.8percent	100.0 percent	35.7percent
Total		Count	13	1	14
		percent within Types of the industry	92.9percent	7.1percent	100.0percent
		percent within Ownership	100.0 percent	100.0 percent	100.0percent

The Table 4.4.3 reveals that the types of industry and ownerships highlight that due to Bangabandhu Bridge industrial sectors are found to be developed both in single and joint ownership. It is found that industries are available in all size- small, medium, and large. Among the small industries majority (79.17percent) are found in single ownership. Simultaneously for medium and large industry also single ownerships industries are more in number 81.82 percent and 54.5percent respectively. As far as Manikganj is concerned 100 percent business venture are running by single ownership whereas 80 percent medium industries are being run by joint venture. It is important to note that no heavy and large scale industries are found there.

Table 4.4.4: Investment and Loan for Industries

Variable	Five Districts				Manikganj			
	Less than 1 crore	1-5 crore	5 – 10 crore	More than 10 crore	Less than 1 crore	1-5 crore	5– 10 crore	More than 10 crore
Investment								
Before	28 (42.4)	14 (21.2)	13 (19.7)	11(16.7)				
Current	27 (39.1)	8 (11.6)	10 (14.5)	24(34.8)	14 (100)			
Amount of loan								
Before	30 (65.2)	11 (23.9)	3 (6.5)	2 (4.4)				
Current	33 (61.1)	11 (20.3)	5 (9.3)	5 (9.3)	7 (100)			

Table 4.4.4 shows that estimation of investment for industries is found less than 1 crore for 42 percent of industries and current amount of investment in the range of less than 1 crore (39 percent). It is observed in the table that the present amount of investment in industry within the range of more than 10 to more crore and this amount is 35% which is 20% more than the previous investment amount.

Table: 4.4.5: Sources of Investment

		Five Districts			Manikganj		
		Responses		Percent of Cases	Responses		Percent of Cases
		N	Percent		N	Percent	
Investment	Own fund	66	55.9 percent	9	60.0 percent	9	64.3 percent
	Loan	52	44.1 percent	6	40.0 percent	6	42.9 percent
Total		118	100.	171.0perc	15	100.	107.1perce

		Open percent	ent		Open percent	nt
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Table-4.4.5 reveals that the source of investment were own funding and loan from other sources. In five districts 55% investment were found to be provided by the owners themselves and 44 percent investment were from a variety of sources. On the contrary, in Manikganj districts 63 percent investments were from the owners of the industry.

Table: 4.4.6: Sources of loan before the Establishment of Bangabandhu Bridge

		Responses		Percent of Cases	Responses		Percent of Cases
		N	Percent		N	Percent	
Source of loan	Govt. Bank	33	34.7per cent	63.5perc ent	1	25.0perc ent	25.0perc ent
	Non-govt. Bank	42	44.2perc ent	80.8perc ent			
	Associati on	4	4.2perc ent	7.7perce nt			
	NGO	15	15.8perc ent	28.8perc ent	3	75.0perc ent	75.0perc ent
	Mohajon	1	1.1perc ent	1.9perce nt			
Total		95	100.0p ercent	182.7pe rcent	4	100.0pe rcent	100.0per cent

Table 4.4.7: Sources of Current Loan

		Five districts			Manikganj		
		Responses		Percent of Cases	Responses		Percent of Cases
		N	Perce nt		N	Percent	
Sour ce of loan	Govt. Bank	39	39.4pe rcent	73.6perc ent			
	Non- govt. Bank	47	47.5pe rcent	88.7perc ent	1	14.3pe rcent	14.3percent
	Associ ation	2	2.0per cent	3.8perce nt			
	NGO	9	9.1per	17.0perc	6	85.7pe	85.7percent

		cent	ent		rcent	
	Mohaj on	2	2.0per cent	3.8perce nt		
Total		99	100.0 percen t	186.8pe rcent	7	100.0 percen t

Table 4.4.7 shows that maximum sources of loan are from non-government private bank in both five districts and Manikganj. Five districts and controlled area Manikganj are found that taking loan from government bank is near about similar as present and earlier. It is note able that taking loan from Mohajon is 1 to 2percent before and present which reflect about the consciousness of local people.

Table: 4.4.8: Income and Expenditure of Industries

	Five Districts		Manikganj	
	Mean	Missing values	Mean	Missing values
Monthly income (in Tk.)	16064235	0	77285.71	1
Monthly expenditure (in Tk.)	9883982.14	0	21857.14	1

With regard to the income and expenditure of the industries in five districts and Manikganj, it was observed that the average income of all industries in five districts was 16064235 BDT on the other in Manikganj it was 77285.71 BDT that highlights the visible development of industry in five districts due to easy communication and transportation through the Bangabandhu bridge. The level of average expenditure of the industry in five districts was 9883982.14 BDT whereas in Manikganj mean expenditure was 21857.14 BDT.

Table: 4.4.9 Ownership of Land, Level of Price

	Five districts		Manikganj	
	Frequency	Percentage	Frequency	Percentage
Types of ownership				
Own	29	41.4	4	26.7
Rent	11	15.7	10	66.6
Lease	30	42.9	1	6.7
Total	70	100		
How much price of land				

increased?				
Highly Increased	19	35.2		
Increased	30	55.6	2	13.3
Moderately Increased	3	5.6	11	73.4
Same as before	1	1.9	2	13.3
Decreased	1	1.9		
Total	54	100		
How many times increased?				
3 times	39	38.4	11	84.6
4 times	7	12.3	2	15.4
5 times	6	10.5		
6 times	5	8.8		
Total	57	100	13	100
	Mean	Missing	Mean	Missing
Amount of land of your industry (percent)	64.8	15	1.69	2

Forty one (41%) percent of the industries are established on the land of the industry owners; 42.9 percent industries are found to be set up on leasing land but a few (15.7 percent) industries were in yearly rented land. In Manikganj 66.6 percent of industries were developed on rented land. Regarding the increase in price of land data shows that 55.6 percent and 35.2 percent pf respondents made opinion that price of land was found to have increased and highly increased respectively by virtue of developed transportation system over the Bangabandhu Bridge. But in Manikganj a quite different scenario was observed that a significant (73.4 percent) number of respondents made opinion that the land price increased moderately. The price increase of land is 3 times more than before which was reported by 38.4 percent.

Table 4.4.10: Sources Raw Materials

	Percent of Cases		Responses		Percent of Cases		Responses	
	Frequency	Percent	N	Percent	Frequency	Percent	N	Percent
Own	10	38.2percent	26	21.7percent				

Local	26	61.8p ercent	42	35.0per cent	10	85.7p ercent t	1 2	85. 7pe rce nt
Imported within the country	28	64.7p ercent	44	36.7per cent	1	14.3p ercent t	2	14. 3pe rce nt
Imported outside of country	1	11.8p ercent	8	6.7perc ent				
Total		176.5 perce nt	120	100.0pe rcent		100.0 perce nt	1 4	100 .0p erc ent

The table 4.4.10 indicates that regarding raw materials maximum (64.7percent) industry owner using raw materials which is imported from within the country though a significant number of owner using local (61.8percent) materials for their factory production. Only 11.8percent industry owner are using imported raw materials from outside the country.

Table 4.4.11: Distribution of Intensity, Time and Cost Savings, Sufficiency of Transport, Medium of Transporting Produced Goods

	Five districts		Manikganj	
	Frequency	Percentage	Frequency	Percentage
Intensity of using bridge in transporting raw materials				
Every time	58	89.2		
Sometimes	5	7.7	1	6.7
Hardly	2	3.1		
Not at all			14	93.3
Total	65	100	15	100
Time saving in transporting products				
Yes	69	100	13	86.7
No	0	0	2	13.3
Total	69	100	15	100

Cost saving in transporting products				
Yes	68	98.6	2	13.3
No	1	1.4	13	86.7
Total	69	100	15	100
Sufficiency of transport increased				
Yes	68	100	13	86.7
No	0	0	2	13.3
Total	68	100	15	100
What is the medium of transportation of produced goods? (Before)				
Own	31	60.8		
Rent	20	39.2	15	100
Total	51	100	15	100
What is the medium of transportation of produced goods? (Present)				
Own	38	71.7		
Rent	15	28.3	9	100
Total	53	100	9	100

Table 4.4.11 shows that Bangabandhu bridge is being used highly for transporting raw materials and 89.2percent industry owner using all the time for transporting their raw materials whereas in Manikganj 93.3 percent industries are not using at all due to the lack of direct connectivity and proximity with Bangabandhu bridge. Almost 100 percent respondents reported that Bangabandhu bridge is found to work as a very time saving infrastructure / media; also 98.6 percent respondents mentioned that the bridge is also saves the costs of transportation and 100 percent respondents mentioned the sufficiency of transport due to the construction of connecting roads with the bridge. In Manikganj, the 87 percent respondents mentioned that the bridge is working as a time saver but not as a cost saver.

Table 4.4.12: Medium of Transporting Goods before

	Five Districts				Manikganj			
	Percent of Cases		Responses		Percent of Cases		Responses	
	Frequency	Percent	N	Percent	Frequency	Percent	N	Percent
Truck	33	70.1percent	47	42.0percent	1	6.7percent	1	3.8percent
Mini truck	34	71.6percent	48	42.9percent	1	13.3percent	2	7.7percent
Van	2	19.4percent	13	11.6percent	11	86.7percent	13	50.0percent
Rickshaw	1	1.5percent	1	0.9percent	7	66.7percent	10	38.5percent
Others	1	4.5percent	3	2.7percent				
Total		167.2percent	112	100.0percent		173.3percent	26	100.0percent

Table 4.4.13: Medium of Transporting Goods Present

	Five Districts				Manikganj			
	Percent of Cases		Responses		Cases		Responses	
	Frequency	Percent	N	Percent	Frequency	Percent	N	Percent
Truck	42	81.3percent	52	47.7percent	1	7.7percent	1	4.0percent
Mini truck	32	70.3percent	45	41.3percent				
Van	2	14.1percent	9	8.3percent	11	92.3percent	12	48.0percent
Rickshaw					8	76.9percent		

Motorcar	1	1.6percent	1	0.9percent		1	40.0percent	
Others	1	3.1percent	2	1.8percent	1	15.4percent	2	8.0percent
Total		167.2percent	109	100.0percent		192.3percent	25	100.0percent

Table 4.4.14: Selling Place of Produced Goods

	Five districts				Manikganj			
	Percent of Cases		Responses		Percent of cases		Responses	
	Frequency	Percent	N	Percent	Frequency	Percent	N	Percent
Local market	38	73.9percent	51	38.9percent	15	100percent	15	100percent
National market	54	88.4percent	61	46.6percent				
International market	5	27.5percent	19	14.5percent				
Total		189.9percent	131	100.0percent		100percent	15	100percent

The above tables shows that about 61 percent industry owners are using their own vehicle for transporting their produced goods but in Manikganj 100 percent owners were found to use rental transport. But before and after bridge the scenario is found to be same. Maximum (71.6 percent) owner are using mini truck, 70.1percent using truck as before but at present 81.3 percent are using truck and 70.3 percent are using mini truck. The major part of these tables is that the owners are selling their produced good in local, national, and international markets which are of 73.9 percent, 88.4 percent, and 27.5 percent.

Table 4.4.15: Utility Services (Five districts)

	Five districts									
	Before					Present				
Advantages	Every time	Sometimes	Hardly	Not at all	Total	Every time	Sometimes	Hardly	Not at all	Total
Electricity	48.5	45.6	5.9		100	84	16			100
Gas	22.8	31.6	5.2	40.4	100	41.5		2.4	56.1	100
Water	80.6	16.4	1.5	1.5	100	91.7	6.2		2.1	100
Waste management	44.1	26.5	14.7	14.7	100	46	32	6	16	100
Banking	38.2	44.1	7.4	10.3	100	58	26	4	12	100
	Manikganj									
	Before					Present				
Advantages	Every time	Sometimes	Hardly	Not at all	Total	Every time	Sometimes	Hardly	Not at all	Total
Electricity	46.7	33.3	20		100	60	40			100
Gas		6.7		93.3	100		6.7		93.3	100
Water		6.7		93.3	100		6.7		93.3	100
Waste management		20	46.7	33.3	100		66.7	20	13.3	100
Banking	7.1	7.1	71.5	14.3	100	14.3	71.4		14.3	100

The Table 4.4.15 shows that the utility services at present and earlier is not showing same picture. At present 84 percent owners are using electricity all the time which was 45.6 percent before. About gas facilities presently, 41.5 percent respondents mentioned that they were using gas though it was 22.8 percent before. Though water facilities has increased; at present it is 91.7 percent and earlier 80.6 percent. At present 58 percent industry owner are using banking facilities and it was only 38.2 percent before. It is

quite different in Manikganj. Out of respondents 60 percent mentioned that at present they are using electricity, 33.3 percent used before, at present 66.7percent respondents using solid waste management some times. 71.4percent respondents opined that at present they are using bank some times, 7.1percent was earlier.

Table 4.4.16: Development of industry among the five districts

	Before	Present
	Mean	Mean
Poultry	3.36	11.11
Cattle and dairy firms	11.67	2.58
Fish farm	2.58	13.86
Agricultural products	5.06	21.13
Silk industry	1	1
Weaving industry	1	1
Pottery	1	1
Construction industry	1	1
Home-craft industry	1	1
Paper industry	1	0
Development of Industry in Manikganj		
	Before	Present
	Mean	Mean
Poultry	5.23	9.86
Cattle and dairy firms	3	6.53
Fish farm	3.80	7.25
Agricultural products	2.67	3.33
Silk industry		

Weaving industry		2
Pottery	2	2
Construction industry		
Home-craft industry	1	
Paper industry	0	0

The Table 4.4.16 shows that the average development scenario of industry among five districts of Tangail, Sirajganj, Pabna, Natore, Kurigram and it also presents a comparison figure with Manikganj district. Industrial development means a development that involves a manufacturing or industrial process include, but is not limited to, electric power production, food and food by-product processing, paper production, Agri-chemical production, storage facilities, metallurgical processes, mining and excavation processes, and processes using mineral products. Data also shows there were different industries, such as Poultry industry, Cattle, and dairy firms, Fish farm, Agricultural products, Silk industry, Weaving industry, Pottery, Construction industry, Home-craft industry, Paper industry, etc. In the above table, data says that the poultry industry sectors made a development.

In the cattle and dairy sector, the development scenario of Manikganj is totally different from those five districts. In the cattle and dairy firms sector Manikganj has increased their development compared to before.

The highest development is observed in the field of agricultural products. This development was 2.67 before but now it has advanced to 21.13.

From one FDG conducted in Tangail, the present study found that a myriad of changes in different sectors after the foundation of the Bridge. Most of them agreed that investment has increased and it is observed that due to the expansion of the industrial activities, the agricultural activities also increased. Some participants mentioned the rise in the loom industry in the area.

Every participant of FGD has agreed that due to the bridge activities the employment opportunities have risen. The new industry has been initiated. During this time auto rice mills and dairy farms have increased. As the transportation system has been developed, therefore people can bring their raw materials easily.

Table: 4.4.17: Living standard of industrial workers (Five districts)

	Five districts					
Indicators of quality of life	Very good	Good	Moderate	Bad	Very bad	Total
Increased income	37.7	56.5	5.8			100
Salary increased	34.8	44.9	20.3			100
Poverty alleviated	46.4	29	24.6			100
Food security	36.2	49.3	14.5			100
Assurance of work	39.1	40.6	20.3			100
Quality of health care	39.1	39.1	21.8			100
Arrangement of entertainment	30.4	24.6	43.5	1.4		100
	Manikganj					
Indicators of quality of life	Very good	Good	Moderate	Bad	Very bad	Total
Increased income		30	70			100
Salary increased		30	70			100
Poverty alleviated		40	60			100
Food security		70	30			100
Assurance of work		20	70	10		100
Quality of health care			100			100
Arrangement of entertainment			88.9	11.1		100

The Table-4.4.17 reveals that the status of quality of life and the indicators have shown a positive sign in the study area. One of the major indicators of quality of life was income. Income has increased according to the all respondents. Among them about 56 percent gave their opinion that income increased at a good level 38 percent made their opinion on very good. In this table majority of the respondents said that their income has increased. All the respondents gave their opinion that their salary has increased. About 45 percent said good and 39 percent made their comment on very good about

their salary increase. All the respondents of the study also agreed that their poverty has been alleviated and among them 46 percent thinks that poverty alleviation was good and 29 percent very good. About the indicators the food security, assurances of work, and quality of health this table showed that their level of advancement on the scale of very good is 36.2percent, 39.1percent, and 39.1percent. Arrangement of entertainment is a very vital indicator to measure the quality of life of the workers of the industry. Moderate level arrangement of entertainment was found as the highest percentage (43.5%).

But the scenario of this development of the quality of life of the industry workers of Manikganj is different from the five districts. In the option of increased income, data shows that salary has not increased at the very good level and 70 percent respondent's salary increased moderately and the rest of them are at good level. Salary of the industrial labors has been increased at the same level of the previous indicator. Food Security issue also shows the same level of result but opposite. Food security increased good and that is 70 percent and moderate that is 30 percent. Two indicators in Manikganj have scored in bad level those are the assurance of work and arrangement of entertainment. Its percentage is not less it's more than 10percent, wherein five districts only one indicator showed their development in a bad level that arrangement of entertainment for industrial workers and its percentage is only 1.4.

A self-employed woman of Kurigram said:

I am self-dependent. Before becoming an entrepreneur I went to door to door for a job. Now I have an organization where a huge number of women are being employed and they are contributing to their family income.

About the development of the quality of life of life industry worker one female respondent said:

I started my new business of ladies Parlor and hair cut saloon in my local area. When I opened this shop, it was quite unknown to the people. Many of them insulted me for this type of business. At present, people are accustomed to this. I have provided training to many unemployed women. They are also doing well in this business. I am leading a happy life with my family.

Table 4.4.18: Social Service for the Industry Worker

Indicators	Five Districts	
	Frequency	Percent
Yes	39	60.9
No	25	39.1
Total	64	100.0

The Table 4.4.18 shows that 61 percent respondents were seen to get social services (provided by industry) from the industry and 39 percent of them did not get any types of services.

Table 4.4.19: Types of service is provided by the Industry (Five districts)

	Frequency	Percentage
Bonus	8	14.29
Food and Medicine	19	33.93
Treatment Expenses	9	16.07
Health Services	8	14.29
Arranging Marriages	1	1.79
Parental leave	1	1.79
Provident fund	6	10.70
Sick leave	2	3.56
Helping in housing	1	1.79
Disability Benefits	1	1.79
Total	56	100

It was found from Table 4.4.19 that in five districts the majority of the respondents have got various kinds of social services from the industry. Those are bonuses, food and medicine, treatment expenses, health services, arranging marriages, parental leave, provident fund, sick leave, helping in housing, disability benefits and so on. Among the total facilities, 34 percent are supplying food and medicine, 16 percent treatment expenses, 14 percent each were bonus and health services and 11 percent were provident fund.

Table 4.4.20: Source of Delivered Services (Five districts)

		Frequency	Percent
	From the profit of the company	8	23.5
	Institutional funding	3	8.8
	Labor welfare	1	2.9
	Own Finance	16	36.36
	Self-funding	16	36.36
	Total	44	100.0

It was found from the table 4.4.20 that in five districts industries were delivering various types of services from various sources. Among the 44 industry 36 percent industries were providing services from their self-financing and another 36 percent industries from their self-fundings. Another 23 percent industries were seen to provide services from their profit of the industry.

Table 4.4.21: Benefits from the Bangabandhu Bridge

Advantages from Bangabandhu Bridge		Percent of Cases	
		Frequency	Percent
	Unification of two area	69	100.0percent
	Concreteness of the internal roads	61	94.2percent
	Connection with the main road	59	92.8percent
	Number of vehicle increase	54	88.4percent
	Others	1	1.4percent
Total			

- **Multiple responses**

It was revealed by the Table- 4.4.21 that Bangabandhu Bridge had created much benefits. All the respondents made their opinion that two areas East and West were unified with the bridge, an amalgamation of culture and economy has created. Among them 94 percent respondents believed that roads were being concrete made due to the construction of Bangabandhu Bridge. Among the total respondents about 93 percent of them made their comment that due to the Banganadhu Bridge their local roads were

connected to the main roads. On the contrary, 88 percent respondents thought number of vehicles has increased because of the construction of Bangabandhu Bridge.

Table 4.4.22: Effects of the establishment of Bangabandhu Bridge (Five districts)

Effects on the Variables		Percent of Cases	
		Frequency	Percent
	For getting products time and expenses saved	67	98.6percent
	Increase in getting products from other areas	61	94.2percent
	Increase in marketing	67	98.6percent
	Self-employment created	69	100.0percent
	Spread of new businesses	67	98.6percent
	Increase in social speed	56	89.9percent
	Consumption and savings increased	45	81.2percent
	Investment in new industry increased	45	81.2percent
	Others	1	2.9percent
Total			

***Multiple responses**

The Table-4.4.22 indicates, 98.6 percent of respondents felt that for getting products time of travel and expenses of carrying has reduced and marketing opportunities have been increased 99.00 percent. On the other hand, self-employment has created in fully. The degree of getting products has increased very much and 94 percent respondents felt that. Respondents were also provide their positive comments on the speed of new business, increasement of consumption and savings, investment in new industries and so on.

Table 4.4.23: Contribution of Industry in National and Local Level (Five districts)

	Five Districts						Total
	Very Agreed	More Agreed	Moderately Agreed	Same as before	Less Agreed	Disagreed	
Creating	37.7	26.1	36.2				100

Employment							
Alleviating poverty	34.8	27.5	37.7				100
Increase in the national income	27.5	42	30				100
Producing products	33.3	44.9	20.3			1.5	100
Revenue generation	24.6	39.1	34.8		1.5		100
Increase in GDP and GNP	22.1	41.2	35.3		1.4		100
	Manikganj						
Creating Employment			46.7	13.3	20	20	100
Alleviating poverty			80	13.3	6.7		100
Increase in the national income			80	20			100
Producing products					26.7	73.3	100
Revenue income			86.7		13.3		100
Increase in GDP and GNP			85.7		14.3		100

Note: Percentages are shown in the table

The Table 4.4.23 presents the contribution of the industry in national and local level in five districts (Tangail, Sirajganj, Pabna, Natore, Kurigram) of Bangladesh. About 38 percent respondents much agreed that employment created, and 36 percent moderately agreed level. All the respondents were agreed that poverty is being alleviating. 30 percent of the respondents were found moderately agreed, 42 percent more agreed that national income is increasing due to Bangabandhu Bridge. All the respondents also agreed that Bangabandhu bridge has a contribution in increasing GNP and GDP of Bangladesh.

In Manikganj, 40 percent respondents were disagreed or less agreed that Bangabandhu bridge has contribution in their income increment. Among them 80 percent each believe that Bangabandhu bridge has positive role in alleviating poverty and increase in national income. Beside, 87 percent believes that Bangabandhu bridge helps in revenue generation and 86 percent put their comment on increase in GDP and GNP of the country. But all the respondents from Manikganj disagreed that Bangabandhu bridge is not impacting in their producing products.

Table 4.4.24: Challenges faced in directing the industry (Five districts)

Challenges	Frequency	Valid Percent
Bad condition of the road	1	1.2
Biasness	1	1.2
Delayed supply of raw material	1	1.2
Diverse environment	2	2.4
Financial crisis	2	2.4
Lack of Financial help	1	1.2
Gas problem	3	3.5
Health risk	1	1.2
High expenses in transportation	2	2.4
High price of the food	1	1.2
High price of the ingredients	5	5.9
Increased production cost	1	1.2
Increased price of gas and electricity	6	7.1
Insufficiency of gas	3	3.5
Insufficient electricity	5	5.9
High fare of truck	1	1.2
High price of milk	1	1.2
High rate of animal's food	1	1.2
Imbalanced market	1	1.2
Increased service charge	1	1.2
Increased VAT	4	4.7
Increased price of gas and electricity	2	2.4
Insufficient bank loans	1	1.2
Lack of government fare	1	1.2
Low demand	1	1.2
No gas connection	2	2.4
Poor drainage system	1	1.2
Toll problem	1	1.2
Lack of capital	3	3.5
Lack of drinking water	1	1.2
Lack of ingredients	1	1.2
Lack of labor	1	1.2
Lack of manpower	1	1.2
Lack of raw material	2	2.4

	Lack of skilled worker	1	1.2
	Lack of efficient labor	6	7.1
	Late payment	1	1.2
	Loan facilities	1	1.2
	Low price	1	1.2
	Marketing problem	2	2.4
	Narrow road	1	1.2
	Reducing the price rise of raw material	1	1.2
	Small amount raw material	1	1.2
	Traffic jam	1	1.2
	High price of sugar	1	1.2
	Inappropriate weight scaling	1	1.2
	It cannot be used for multipurpose	1	1.2
	Lack of debt with low interest	1	1.2
	Load shedding	1	1.2
	Uncertainty	1	1.2
	Water logging	1	1.2
	Total	85	100

Table 4.4.24 revealed various kinds of challenges that have been found in the industries of five districts. Among 85 respondents, each 1.2 percent of total respondents made their comments on the bad condition of the road, lack of government fare, lower demands, poor drainage system, toll rate is high, lack of drinking water, lack of ingredients, shortage of labor, lack of manpower, lack of skilled worker, narrow roads, late payment, poor loan facilities, low price of products, reducing the price, rise of raw material, small amount raw material, traffic jam, high price of sugar, inappropriate weight scaling, it cannot be used for multipurpose, lack of debt with low interest, load shedding, uncertainty, water logging and so on. The 7.1 percent of total respondents spoke out about the challenges in lack of efficient labor.

Table 4.4.25: Challenges faced in directing industry (Manikganj)

Challenges		Frequency	Percent
	Capital Shortage	12	42.86
	Possibility of theft	4	14.29
	Bad condition because of corona	2	7.14
	Capital	1	3.57
	Lack of skilled worker	1	3.57
	Less sale	6	21.43
	Ingredient's price increased	1	3.57
	Lack of training	1	3.57
	Total	28	100.0

In Manikganj the challenges in the operating industry are different from the five districts of this present study. Capital and Fewer sales are major challenges in Manikganj. Among the total respondent's 42.46 percent of them spoke about the challenges in lack of capital and 21 percent spoke about less amount of sale. About 14 percent respondents also mentioned possibility of theft.

Table 4.4.26: Opinion of the respondents for addressing industrial challenges (Five Districts)

Opinions		Frequency	Percent
Valid	Government should reduce interest	11	15.5
	Availability of raw material	1	1.41
	Debt with low interest	3	4.23
	Decrease price of gas and electricity	7	9.86
	Decrease production cost	1	1.41
	Easily bank loan	1	1.41
	Gas connection should be available	1	1.41
	Good price selection	1	1.41

	Government financial help	7	9.86
	Increase loan	1	1.41
	Increase of electricity supply	1	1.41
	Increase of gas supply	7	9.86
	Increase raw material	1	1.41
	Keep reasonable price for the ingredients	1	1.41
	More raw material	1	1.41
	Price stability of raw material	1	1.41
	Quick supply of raw materials	1	1.41
	Reduce oil's price	1	1.41
	Reduce price of the food	1	1.41
	Remove labor lacking	1	1.41
	Road widening	3	4.23
	Solve gas problem	3	4.23
	Training people	1	1.41
	better stock	1	1.41
	Decrease of VAT	1	1.41
	Favorable environment	2	2.82
	iron free water needs to supply	1	1.41
	Keep balance in the market	1	1.41
	Reduce fare	1	1.41
	Reduce milk's price	1	1.41
	Remove toll problem	1	1.41
	Start one stop service	1	1.41
	Taking steps against unplanned institution	1	1.41

	Decrease service charge	1	1.41
	Correct weight scaling	1	1.41
	Reduce sugar's price	1	1.41
	Total	71	100

Table 4.4.26 shows that respondents have provided their opinions about the addressing of the challenges of the industry in five districts. Among the total number of 71 respondents, about 15 percent of respondents said about government initiatives to address those challenges and barriers. About 10 percent of respondents opined about the financial help from the government and another 10 percent respondents hoped that electricity and gas price would be within their reach and government would be enough to provide them electricity and gas at a cheap rate.

The other comments were (i) Availability of raw material; (ii) Decrease of production cost; (iii) Provide easy bank loans; (iv) Available gas connection; (v) Fixation of good's price; (vi) Increase loan; (vii) Increase of electricity supply; (viii) Increase raw material; (ix) Keep reasonable price for the ingredients; (x) supply of more raw materials and so on.

Table 4.4.27: Opinion of the respondents for on addressing industrial challenges (Manikganj)

Opinions of the Respondents		Frequency	Percent
Valid	Debt with low interest	9	45
	Debt without interest	2	10
	Giving debt	1	5
	Government's debt without interest	1	5
	Incentive	1	5
	increasing security in market	1	5
	Modern training	1	5
	skilled worker	2	10
	Help of market committee	1	5
	Incentive	1	5
	Total	20	100

On the other hand in Manikganj districts, 45 percent of respondents commented on providing loan with low interest in addressing industrial challenges. Among them each 10 percent commented on loan without interest and the creation of skilled workers to address the industrial challenges. About 5percent of made their opinion on the different fields to address the problems by providing loans, incentive, increasing security in the market, arranging facilities of modern training. They also made their recommendation that increasing the cooperation between the private and public institutions and developing the education and the health system could be beneficial for the industrial sector. There is no alternative of developing the communication system and skills and so on. Everyone expected that authorities would help in increasing the recreational facilities in the community and industry level.

CHAPTER 5: DISCUSSION: A COMPARATIVE OVERVIEW ON THE FINDINGS OF THE STUDIES

5.1. INTRODUCTION

This chapter concentrates on the key findings of the studies that reflect a thorough analytical discussion. This discussion is based on a focus of comparison between the current research and the socio-economic baseline survey of 1997. Moreover, the current research findings have been compared with the major findings of the baseline survey previously done and a number of research papers and research reports. The pattern of discussion is narrative and the whole discussions have been presented in the light of key variables and objectives of the study.

5.2 BASELINE INFORMATION RELATED TO THE BANGABANDHU BRIDGE

Along with the Baseline Study entitled '**Jamuna Multipurpose Bridge Project socio-economic Baseline Survey**' that was conducted in 1997 by RADOL (Rehabilitation and Development Organization for Landless) and several studies from 1989 to present has been taken as the baseline documents for the comparison of the current research study. The literature map of the current study is highlighted below:

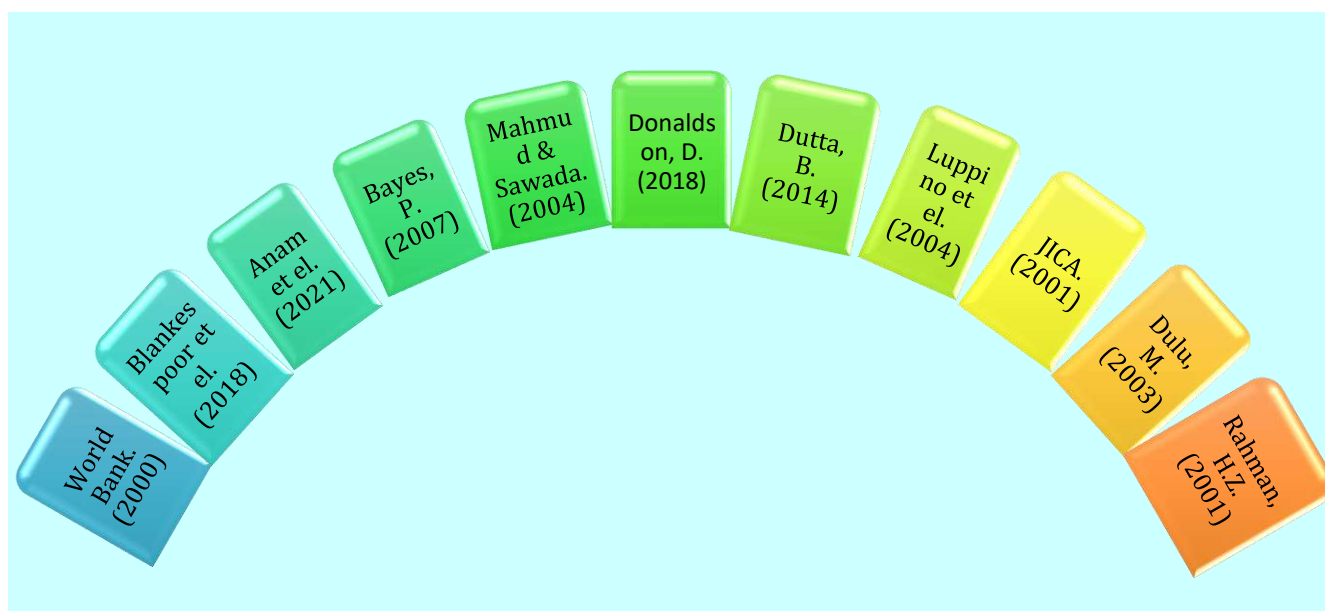


Figure 5.1: Baseline Literature Related to The Bangabandhu Bridge (BB)

Table: 5.1 Baseline Literature Related to the Bangabandhu Bridge (BB)

Year	Report/ Paper Title	Citation of Reference
2021	<i>Impact of Jamuna Multipurpose Bridge on the Local Economy</i>	Anam et el. (2021)
2018	<i>Bridge to Bigpush or Backwash? Market Integration, Reallocation, and Productivity Effects of Jamuna Bridge in Bangladesh.</i>	Blankespoor et el. (2018)
2018	<i>Railroads of the Raj: Estimating the Impact of Transportation Infrastructure.</i>	Donaldson, D. (2018)
2014	<i>Social Impact Assessment on Social Change Process: An Analysis of the Case of Jamuna Bridge in Bangladesh.</i>	Dutta, B. (2014)
2013	<i>Policies and Issues in Resettlement of the Displaced</i>	Siddique, T. (2013)
2008	<i>Effect of Infrastructure Development on Income Generation: A Study on Jamuna Bridge Project in Bangladesh.</i>	Moniruzzaman, S. (2008)
2007	<i>Imapact Assessment of Jamuna Multipurpose Bridge Project (JMBP) on Poverty Reduction.</i>	Bayes, P. (2007)
2004	<i>Infrastructure and Well-being: Employment Effects of Jamuna Bridge in Bangladesh.</i>	Mahmud & Sawada. (2004)
2004	<i>Estimating the Impacts of the Jamuna Bridge on Poverty Levels in Bangladesh Using SAM AND CGE Models: A Comparative Study.</i>	Luppino et el. (2004)
2003	<i>Socioeconomic impact of Jamuna bridge on farming community in some selected areas of Sirajganj district of Bangladesh.</i>	Alam et el. (2003)
2003	<i>The Experience of Jamuna Bridge: Issues and Perspectives.</i>	Dulu, M. (2003)
2002	<i>The Jamuna Bridge: Whose Benefit</i>	Hum, M. (2002)
2001	<i>Bangladesh Jamuna Multipurpose Bridge Project.</i>	JICA. (2001)
2001	<i>Bangladesh-Jamuna Multipurpose Bridge Project Resettlement in JMBP Assessing Process and Outcomes.</i>	Rahman, H.Z. (2001)
2000	<i>Implementation Completion Report (IDA-25690)</i>	World Bank. (2000)
1997	<i>Construction of the River Training Works for the Jamuna Bridge Project in Bangladesh.</i>	Oostinga & Daemen . (1997)
1997	<i>Linking East and West Bangladesh: The Jamuna Bridge Project.</i>	Jenkins & Shukla. (1997)
1995	<i>Construction Related Environmental Impacts of the Jamuna M ultipurpose Bridge.</i>	Badruzzaman et el. (1995)
1994	<i>Loan report: Jamuna Bridge Project.</i>	ADB. (1994)

<p>1989 <i>Jamuna Multipurpose Bridge Projec. Phase II Study, Feasibility Report, United Nation Development Program (UNDP), World Bank.</i></p>	<p>Radel et al. (1989)</p>
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5.3. SOCIO-DEMOGRAPHIC INFORMATION OF THE RESPONDENTS

1. Distance of the Area from the Bridge

The current study indicates that about 80 percent of study respondent's area was far from the Bangabandhu Bridge. Only eight percent of area was fully deprived of benefits from the bridge due to the less scope of connectivity by the roads with the Bangabandhu Bridge extension roads. These areas are char lands, area covering Chalan beel, riverside areas or remote areas where proper road system was not available. As a result these areas are being devoid of the basic benefits of roads, communication, services and trades. As Duranton, (2015) showed, that in Colombia, road distance between cities is a major impediment to trade. In Northern Bangladesh, remote areas and districts are being facing difficulties in trade and commerce although the construction of Bangabandhu Bridge has reduced the gap between the prosperous and less prosperous districts and areas.

2. Household Size

The average household size according to Socio- Economic Baseline Survey of 1997 was 6.29 which were comparatively high with respect to the region. But in the current study, house hold size was not calculated due to the time constraints. Alam et al. (2003) found that the average family size of the study area was 5.93 and it was the highest in the case of small farms.

3. Gender Composition

In the current study it was found that among the total respondents 78.8 percent were male and 21.2 percent were female. The response rate of women is 16 percent more than the baseline survey of 1997. In Socio- Economic Baseline Survey of 1997, among the household heads 94 percent were male and more than 5 percent were female.

4. Gender Composition of Family Members

It was found from the present study that among the respondent's family members 52.67 percent were male and 47.33 percent were female. This indicates that the ratio of male and female is 1.11:1.00. In Socio- Economic Baseline Survey of 1997, it was found that the overall male female ratio in West Ganga Bund Area of Sirajgonj is 1: 1.26. In that

study, 52.98 percent of affected people were male and the rest of the people were female. It was observed that men in that area lived longer than the women.

5. Religion

In the present study, among the respondents 98.6 percent are Muslims and only 1.4 percent is the believer of Hinduism. But it is not the actual scenario of the Hindu Muslim ratio. The ratio could not be maintained for the nature of sampling or the subjectivity of the data collectors. But in the baseline survey of 1997 the Household Heads from the Muslim community was 94.99 percent and 4.08 percent from the Hindu community.

6. Marital Status

It was found from the present study that among the respondents 92.3 percent were married and among the family members 56.6 percent were married. Among the family members 41.34 percent were unmarried due to their age and most of them were children, students or unemployed. But among the respondents it was observed that 5.3 percent were widow or widowers. In the Socio- Economic Baseline Survey of 1997, it was found that 38.87 percent of total study population were married and 57.75 percent of population were unmarried. Among the male population 36.26 percent were married and among the female 41.79 percent were married.

7. Level of Education

In the current study 39.4 percent respondents were totally illiterate and 19.7 percent of them passed the primary level of education. Furthermore, 24.3% respondents passed secondary level and only 16.6 percent were passed the level of higher secondary level or higher degrees. On the other hand, it was found in the Socio- Economic Baseline Survey of 1997 that 54 percent household heads were absolutely illiterate; more than 22 percent received primary and secondary level of education in separate division and only 01 percent had education level above class -x. But it is evident in comparison with the baseline survey that literacy rate has increased about 15 percent. In the previous study only one percent of household heads were from the Higher secondary level, but now 16 percent of household heads had completed higher secondary level. But it is also observable that the level of primary pass people has reduced than the past but the secondary school passed respondents have increased almost 2.0 percent. Alam et al. (2003) found that the area had a very impressive literacy profile; about 71% of the family members were literate.

8. Level of Education of Family Members

In the Socio- Economic Baseline Survey of 1997, the proportion of literate people among the male and female population was 50.03 percent and 38.52 percent respectively. In that survey, 61.48 percent female were absolutely illiterate against 48.97 percent male. In the current study, 22.56 percent of respondents' family members are illiterate, 26.47

percent of them completed primary level. Almost 30.47 percent respondent's family members completed secondary level of education. Finally, 20.23 percent of the family members were higher secondary degree pass or more. In the past, the literacy rate of the family members was 44.28 percent, but now 78.44 percent family members are educated. The increase of literacy rate is 34.16% more than the baseline survey of 1997.

7. Occupation

In the current study, 26 types of occupations have been identified. Among the respondents 23.4 percent were engaged in agriculture, 17.8 percent were housewife, 6.2 percent were day laborer in agriculture, and 4.8 were day laborer in non agriculture fields. Total percentage of day labor in agriculture and non-agriculture field is 11 percent. A large number of respondents were service holders and their percentage is 9.6. In this study, it was found that 7.00 percent of respondents were involved in business and 6.4% were in small business. The total percentage of business is 13.4 percent. On the other hand, 3.8 percent of respondents were bricklayers. But it was also found that 3.2 percent of respondents had some sorts of inability of doing any type of work. So, the major occupations have been identified were- agriculture, day laborer, service holders, business (small and large), brick layers etc. On the contrary, it was found in the Socio- Economic Baseline Survey of 1997, about 40.27 percent Household Head's primary occupation was agriculture and 25.47 percent household head's secondary occupation was agriculture. In the baseline survey, the three main types of occupation of the household head were Agriculture (40.27 percent), Business (21.19 percent), Weaving (11.16 percent). Agriculture as a secondary occupation was chosen mostly in baseline survey. Daily labor, business and employment were the other major sources of primary and secondary income. It is seen that in the baseline survey, work of housewife was not recognized as occupation. Besides, currently the rate of agriculture has reduced and among the respondents the trend of weaving has reduced due to the large scale area of study. Mahmud & Sawada, (2015) showed that along with the decrease of unemployment, the construction of bridge facilitated farm to non-farm shift of employments. The reduction of agriculture as the primary occupation in the current study supports the findings of the previous research. On the other hand, Alam et al. (2003) found that agriculture was found to be the main occupation of the majority (79.50%) of the people in the study area, followed by business (6.32%) and service (4.89%). The current study and the baseline studies have shown that agriculture is the primary occupation of the respondents and the percentage of agricultural work is reducing and nonfarm activities are increasing gradually.

8. Occupation of Family Members

It is found from the present study that 30.1 percent of the respondent's family member's occupation was housewife. Among the total responses 27.26 percent of family members were students. Among them 8.61 percent were involved in agricultural farming, 5.76 were service holders, 3.13 percent were involved in agricultural field as a

laborer. In the study area, 2.91 percent family members of the respondents were unemployed. In the business sector 2.69 percent family members were employed and in small business their percentage was 2.03. on the contrary, Among the 12803 population of the Socio- Economic Baseline Survey of 1997, 8.83 percent was cultivators, 23.76 percent were students, and 19.7 percent were housewife. Among the 6779 male (surveyed population) 1262 respondents were engaged in agriculture that was 17.8 percent of total male population. Besides, 1681 respondents were students. Furthermore, 1358 female were students and 1059 were unemployed women.

9. Income of the Household Head

It was revealed from the present study that the monthly income of the household head that the mean/ average income of them was BDT 22467.96. The median income of the household head was BDT 15000. The criteria is absent in baseline survey. Donaldson, (2018) showed by reviewing archival data of Indian Railway from British Period to Present that railroads: (1) increased real income levels; and (2) that a sufficient statistic for the effect of railroads on welfare in the model accounts well for the observed reduced-form impact of railroads on real income in the data.

10. Number of the Income Capable Person in the Family

It is observed from the study that about 64.4 percent of families had only one member for earning. On the contrary, 25.7 percent of families had two earning members in the family. Four or Five earning members are insignificant and rare in a family of the study area. This information gives the current study an advantage than the baseline survey of 1997.

11. Number of Dependents in Different Age Groups

The current study clearly reflected the number of dependents in different age groups. It was noticeable that dependents under the age of 30 were 74.19 percent that is very remarkable. On the other hand, the dependents above 50 years of old were 10 percent of total dependents. But the baseline survey only indicated the age group of the study population. Among the 12803 survey population, $1716 + 1907 = 3623$ people were in the age group of 30-49 years of old that is 28.30 percent of total study people. Alam et al. (2003) conducted a study and investigate the socioeconomic characteristics of the farming community; analyze the change in income; employment opportunities created, and to see the cropping pattern and profitability of major crops impact due to Jamuna Bridge. They found that that most of the members (58.61%) of the selected households were found in the age group between 16.01 and 45 years.

5.4. SOCIO-ECONOMIC IMPACT OF BANGABANDHU BRIDGE

1. Economic Status

In the present study respondents were classified into three major criteria on the basis of their family condition during the field survey. Majority of the respondents were from the middle class, the second majority of them were from lower class and rich people were one third of the middle class. In the baseline survey of 1997, this type of categorization is absent.

2. Economic Conditions and Livelihood Options

Luppino et al., (2004) showed the changes based on 50 activities, value-added factor effects and consumption effects by household groups. Results showed that in response to the demand intervention, the total output of the Northwest economy increased by 37 and 47 percent under simulations one and two respectively compared to the base scenario. To supply increased outputs, demand for primary factors (i.e. labor, capital and land) increased and, thus, payments to primary factors also rose. Total factor payments or value-added increased by 35 percent under simulation one. The growth of factor returns was highest for land (48.5 percent), followed by labour (43.0 %) and capital (24.6%). Under simulation two, value-added growth was 44.0 percent. However, in this case the highest growth was observed for labour (55.0%), which was followed by land (53.0%) and capital (31.0%). In the current study, changes in livelihood options are also remarkable. As the production was increased, so the income also increased, on the other hand, variation in economic activities are seen in the study area. Respondents were seen to choose non-farm activities as well as agro-based activities. The livelihood options are discussed in the below:

a) Average Income (All sources)

From the Socio- Economic Baseline Survey of 1997, the average annual income of the household in the study area of Sirajgonj district was 45,729 Taka. But it was revealed by the present study that, five years ago the average annual income from all type of sources was 250813.60 taka, but in the present time it is raised to 411526 taka annually. This is a clear indication that the average income has increased nearly 9 times from the baseline survey of 1997. It was found in the Socio- Economic Baseline Survey of 1997 that 98.82 percent of annual households income from all types of sources ranges 80000 taka and above. Bird and Straub (2014) studied 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. The construction of Bangabandhu Bridge and its associated roads and railroads have helped to increase the population density of the entire area and GDP and GDP per capita has increased also.

b) Income from Agriculture

The majority of the household heads 63.96 percent of the study respondents earned from agriculture and their annual average income was 58,260 taka. From the current study, five years ago the average annual income from agricultural Product Production was 214987.18 taka. Presently the income from this sector has raised to 405644.07 taka that is remarkable and indicates that due to the development of infrastructure and use of modern equipment and technologies income from the agriculture has increased double than the income of previous five years. But it is increased 8 times more than the income of the Socio- Economic Baseline Survey of 1997. On the other hand, Bayes P. ,(2007)& Dutta, (2014) emphasized that improved marketing opportunities, better access to input for production better inflow of workers were facilitated by the construction of Jamuna Bridge. The studies also showed that access to market increased for all groups of farmers, only large and medium farms had greater benefit from the increased access to market. However, the change in economic condition was not statistically significant. Study report of **Alam et al. (2003)** found that household income was remarkably changed after the construction of Jamuna Bridge. It was also revealed that the highest increase in income accrued in the case of medium farms. Although- income from both farm and off-farm sources was found to have increased, the share of farm income to the total income decreased by 2.20 per cent and share of off-farm income increased by 6.28 per cent.

c) Income from Daily Labor (Agricultural & Non- Agricultural Work)

About 2.4% of people earned from agriculture daily labor and non agriculture daily labor earned an average of $(17725 + 26278 = 44003 / 2 = 22001.5)$ Taka. In the current study, it is observed that agricultural day laborers earned 83000 taka in previous years and currently they were seen to earn 104704.55 taka per year. But the Non agriculture day laborers were seen to earn 112804.55 taka five years ago and currently are raised to 151562.5 taka. The income has increased 5 times for agricultural laborers and for non agricultural laborers increase is 7 times more than the baseline survey of 1997. The study also revealed that the income of the non-agricultural day laborers is more than the agricultural day laborers. So, there is a shortage of laborer in agricultural sector. As Asher and Novosad, (2018) found that new feeder roads do not increase agricultural production, assets, or income in villages in India, but reallocates labor from agriculture to wage labor.

d) Fishing and Fish Farming

In the previous years, fishing was one of the easiest way of income. During the baseline survey of 1997, 2.5 percent household heads earned an average of 33,572 taka from fishing annually. But recently, fish farming has increased and introduced in these study area. Five years ago the annual income from fish farming was 145739.10 taka and currently, it has risen to 199724.14 taka per year. The current

increase is 6 times more than the period of the Socio- Economic Baseline Survey of 1997.

e) Employment in Job Sectors

According to the Socio- Economic Baseline Survey of 1997, 4.78 percent people earned 33,433 taka annually from different jobs. But nowadays, respondents are seen to earn a taka of 216,222.22 taka annually from the job of garment sector 311,666.67 taka from the governmental and nongovernmental job.

f) Business

According to the Socio- Economic Baseline Survey of 1997, **17.35** percent of household head earned 29,553 taka from business and trade annually. But current study reveals that five years ago the income from business was 91,829.55 taka and currently it is raised to 151,844.44 taka and increase of income is very significant. Donaldson, (2018) used the archival data from colonial India and showed that India's railroad network reduced trade costs and interregional price gaps, increased interregional and international trade, and real income levels. The case of India and Bangladesh are seeming to be same in this area. Bangabandhu Bridge and its adjacent railroads are providing the northern districts of Bangladesh a great opportunity for development. In the case of Nigeria and Ethiopia according to the study of Atkin D., (2014) and Blankespoor et al. (2018) domestic trade cost is four to five times larger than in USA, and the pass-through of international prices to the domestic prices are lower in remote locations. This was happened due to the difficulties of transportation and communication system. Due to the construction of Bangabandhu Bridge, this situation has reduced from Bangladesh also.

g) Cattle Raising

In the Socio- Economic Baseline Survey of 1997, 54.74 percent of livestock was cattle/ cow. The average value was BDT 5079. Five years ago, respondents earned 48,488.18 taka from cattle raising and now they are incoming 78,440.83 taka per annum.

h) Dairy and Poultry

In the Socio-Economic Baseline Survey of 1997, 92.87 percent of households raised chicken/ duck, and 5.41 percent of households raised pigeons. The average value of a chicken was BDT 61 and Pigeon was BDT 41. It was an income source and the source of protein for rural poor people. According to the present study, five years ago respondents earned annually 99,625 BDT, but currently, they are earning 47,201.04 BDT. The income has decreased due to the pandemic of Covid-19. In the

study of (Dutta, 2014, p. 265), it was found that due to the land acquisition, number of poultry and trees owned by the households reduced in the post acquisition period.

i) **Financial Assistance/ Aid (Social Security Programs)**

In the baseline survey, financial aid for the people provided from the social security projects and programs of the government of the people's republic of Bangladesh and the other NGOs have opened the door for income was observed in the study area. Social safety net programs such as government pension, zakat, elderly compensation programs, widow allowance, freedom fighters honorary programs, education sub scholarship programs, disability compensation, farmers card, VGD/VGF and other programs has ensured an income source for the vulnerable and marginal people of the society.

3. Family Expenditure

In the socio-economic baseline survey of 1997, there were no discussions regarding family expenditure. But in current study, the total average family expenditure of a respondent is 328577.16 taka. Respondent's family members are seen to expend 86089.18 taka for buying agricultural and non-agricultural work related elements. Families are also seen to expend 71055.73 taka for food and an amount of 86846.15 taka for buying vehicles. Besides these, for buying lands, furniture, education, health services and medicines, mobile phone utility, and cloths and cosmetics people were seen to expend money from their income. More expenditure indicates more economic solvency and development of the people. The findings of the current study show that the consumptions of goods were found to be increased as people were spending more money for their family consumption of goods and services. Emran and Hou (2013) pointed out the evidence that better access to domestic and international markets increased household consumption in rural China, and that there was a complementarity between domestic and international market access.

4. Nature of Wealth

It is found from the current study that People of the entire region are enjoying the economic benefits and their properties have been increased day after day due to the onset of the impact of the Bangabandhu Bridge. Now the mean amount of wealth at hand of a respondents figures of 96354.14 taka. Respondents were seen to investing 250547.62 taka for small and other business and 656620.69 grocery shops. On the contrary, the amount of the invested money against any productive purpose is 566250 taka. In the baseline survey nature of wealth of the respondents was not presented in a summarized way.

5. Changes in Financial Institutions / Enterprises

Financial institutions, enterprises, and transaction have increased more than the previous. Bank and insurance increased 62.7 percent, Cooperative Association 58.2 percent and NGO 82.7 percent. Besides, changes in transaction have increased 58.2 percent at present. This trend of increase is indicating that economic solvency and financial activities has increased more than the baseline survey. The financial institutions were not given importance in the baseline survey.

6. Average Family Debt

Current study reveals that the average amount of debt/ loan of the respondent's family is 133277.03 BDT. The trend of borrowing loans from the bank was found to be significantly high and the figure is 498405.41 BDT. People were also seen to borrow money from cooperative associations, relatives and money lenders (locally called mohajon).

7. Household Savings and Investments

It was observed in the study that the respondents and their family members who were able to save their money and resources by various ways and means such as savings deposited to banks on interest, NGOs and kept money to relatives. Moreover, a good number of respondents were found to use their money for building or repairing houses, purchasing household assets such as agricultural products, land and ponds, cattle, animal and birds so on. Respondents in the study were also seen to invest their resources by purchase of shops/stores, transports/ vehicles, investment in business etc. Previously, the average overall household savings of the respondents was 236399.28 BDT but the average primary savings was found 274828.11 BDT that was estimated savings in the last five years and subsequently the amount of 391645.83 BDT were found as investment.

8. Land Ownership and Volume of Land

According to the Socio-Economic Baseline Survey of 1997, an average of approximately four bighas of land (1.33 Acres) of land was owned by the households cultivating their own land. The households preferred cultivating their own land and renting them (in and out at the same time). It was found in the Socio-Economic Baseline Survey of 1997 that 93.69 percent of households were engaged in cultivating their own land and only 6 percent of households cultivated their own lands and rented some portion of them. Also the study of Dutta (2014) showed that household cultivation reduced in the post project period of the bridge construction. On the other hand, Ghosh et al. (2010) in the research study showed that many people were tremendously affected by the land acquisition process as they neither compensated nor rehabilitated. Even amount of money given as compensation was not found to be adequate for purchasing same volume of land. It

was observed that because of the financial inflation and high commodity price, the price of the land/ property had been comparatively increased than before.

In the current study, it is observed that the land volume of the respondents has been decreasing day by day. Homestead land decreased from 14.40 to 13.58 decimals. But it is interesting that cultivable land in this region has increased from 116.25 decimals to 120.84 decimals, it is due to the proper embankment in the river, reduction of land wastage, cultivate unused land, increase use of char land etc. But non- cultivable land has decreased slightly. The volume of the mortgage land reduced on an average of 5 decimal per respondent. In the cases volume of ponds has reduced for irrigation and other purposes. Many ponds were being developed for industrial buildings. Reduction of own land is remarkable due to the rapid population growth in this region. But the volume of garden land is seen an increase due to the tree plantation and love for garden. The status of the landless people is remaining same as before. In the previous studies of Bayes P. , (2007), Luppino et al.,(2004)& Dutta, (2014) it was found that the land owners of the non-poor households have been benefited from the construction of the bridge which was detrimental for the poor tenants for increased cost and increasing rents. At the same time, number of tenant farmers increased in the area. It was also remarkable that urban rich households have also been benefited in comparison to the urban poor.

Generally, after the construction of a large bridge or road system the value of agricultural land is increased. As Tompsett, (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. So, the land value has automatically increased in the entire area.

9. Increase of Production Cost

It is revealed from the current study that changes in price of agricultural products and related materials have increased very much. It is increased 66-69 percent at present. Previously production cost in the agricultural sector was in an average of 31642.33 taka, but it has increased to 48174.02 taka in recent years. 50% increase in agricultural production has created a challenge for the marginal farmers and the share croppers. Besides, the livestock and poultry famers are not getting enough interest from the cultivation.

10. Ingredients/ Materials Available Before and After Bridge Construction

Present study reveals that before construction of the bridge 86.4% cases seeds were available, 78.3% cases fertilizer is available, 68.5% cases agricultural labor was available and 63.9% cases water was available. But situation has changed due to the construction of Bangabandhu Bridge. Now, it is found that 86.4% cases seed, 90.8% cases fertilizer, 77.4% cases Water, 73.8% cases agricultural worker, and 73.0% cases modern agricultural tools are available. This scenario is showing a significant change in the study area. Besides, farmers are being modernized now and they are using modern and updated farming technologies in their fields. As Ali et al. (2016) showed that lower transport costs induce farmers to adopt better farming techniques. Although transportation costs have been reduced, but the import of these technologies are very expensive, so farmers are not benefitted much from imported technologies. But it was also seen that locally produced equipment makes the farmers benefitted.

11. Income Generating Activities

Alam et al. (2003) revealed that Jamuna Bridge (Bangabandhu Bridge) potentiates an era of socio economic transformation. The bridge has brought a massive change in income level of the farmers and created a great opportunity for employment generation, especially in off-farm sector. The bridge also changed the cropping patterns of the study area and the profitability of crop production has increased to a considerable extent in the study area as well as Northern region of Bangladesh.

It is found from the current study that people of the studied areas are engaging themselves in income generating activities such as business, self-employment, transportation, governmental job, non-government job, garment industry, Work in abroad, Agro based industry, Non- Agro based Industry and other types of work. 13.5 percent respondents are involved in business, 35.6 percent are self-employed, 32.9 percent are involved in agro based industry. Alam et al. (2003) observed that the farmers preferred crops with lesser risk higher economic returns. There was a notable positive change in vegetable production in the study area. Nowadays, people are getting touch with various sources of income. As for example- educated unemployed people are freelancing in the website and they are earning their livelihoods. Various types of income generating activities and training are available in the study area. As for example, recently in Konabari of Sirajgonj district a training center was established by an NGO for providing weaving training to the youth and girls of the region. Due to the onset of income generating activities, income level of the people of the study area has increased at least 30% and it ranges from 156212.86 taka to 206092.91 taka.

12. Financial Development

After the construction of the Bangabandhu Bridge, a rapid development on divergent module of financial activities has occurred concurrently. Income increased 99.5%, scope of employment increased 89.1 percent, Business expanded 98.2 percent, mobility of labor increased 99.2 percent, price of land increased, 99.4 percent cases. Besides these developments, communication facilities developed 99.2 percent, agricultural product marketing 89.4 percent. It is remarkable that 97.0 percent increase of banking and insurance activities surely indicates that financial development is ongoing in the study area. Hossen et al. (2012) and (Mahmud & Sawada, 2015) has narrated that Jamuna Multipurpose Bridge currently known as Bangabandhu Bridge connected the eastern and western part of the country and which facilitate economic integration and development of the economy. The current trend of development is the result of that facilitation. Blankespoor et al., (2018) showed in the research that by conservative estimates, the bridge reduced the freight costs by 50.0 percent and travel time from areas in north-west to Dhaka city by 3-4 hours. So, the financial development in this entire region is occurring at a high speed.

13. Mobility in Work

After the construction of Bangabandhu Bridge, mobility in job sector has increased 99.60 percent, migration of labor has increased 89.00 percent and the going to abroad has increased 89.50 percent consequently. Most of the cases pull factor has influenced the mobility in work. People of this entire study area are being attracted to the mobility in work to get better salary, better scope, better work environment etc.

14. Changes in Communication System

Due to the construction of Bangabandhu Bridge, railway communication system, sufficiency of vehicle, van rickshaw, auto rickshaw, CNG, private car, microbus, and ambulance has increased more than 90-95 percent. On the contrary, time required for travelling, travel cost has decreased and frequency of travel has increased. Bernardino et al. (1993) in 'Bangladesh Jamuna Bridge Economic Evaluation' discussed the economic benefits of the bridge project and the present communication system is the result of that project. The benefits were – to save in vehicle operating costs gained by the diverted traffic, value of time saved for existing passengers and traffic and the value of investment savings.

15. Economic Inequalities

After construction of Bangabandhu Bridge, cooperation between two regions, diversity of economic activities, receipt of local products have given increased dramatically. Even in most of the cases it is 99%. In the previous time there was difference of household income of the Project Affected Persons (PAP), The outcomes are clearly divergent on the

two sides of the Jamuna river with east bank PAPs coping much better with the effects of displacement than their west bank counterparts (Rahman, 2001, p. 63). Bangabandhu Bridge is providing the facilities for the revitalization of economic activities. JICA,(2001) report shows that since the traffic volume for the Jamuna Bridge had exceeded predictions, the bridge was contributing to reducing the time required to transport agricultural products from granaries in the northwest to areas in eastern Bangladesh, the center of consumption. Besides, the adjacent railroads have contributed to increase the revitalization of economic activities and as a result the movement of people and goods has increased to the peak. Economic inequalities between the two parts are being disappearing with the time being. The finding of Bays (2007) supports the findings of the current study. He found from his impact evaluation that after JMB, the local people reduced poverty through higher income (both agriculture and non-agriculture) and they reduce their income inequality (both income & non-income poverty) (Bayes P. A., 2007).

15. Contribution of Toll of Bangabandhu Bridge in National Economy

According to a parliamentary discussion the scenario of toll collection from 1998 to 2021 has been clarified. Road Transport and Bridges Minister Obaidul Quader answered to a question from a member of parliament from Bogura-5 MP Habibur Rahman in parliament on 6, June, 2021 (bdnews24.com, 2021). He Said,

The Bangabandhu Bridge, which spans the Jamuna River, has raised Tk 64.34 billion in tolls since its start more than two decades ago.

He also added,

Development partners who lent money for the construction of the bridge will be repaid by 2034. Of the Tk 64.34 billion in tolls since the completion of the bridge in 1998, about Tk 41.04 billion has been spent on its management, maintenance and debt service.

Quader also replied in another question of a MP of Gaibandha,

“The Bangabandhu Bridge cost Tk 37.45 billion to build. The earnings from the bridge were used for maintenance and to repay the loans from development partners who supported its construction. But, as the exchange rate for foreign currency has more than doubled, the amortization schedule says the loans from development partners will be repaid through toll income by, approximately, 2034.”

Minister also presented a table of data from 1998 to 2021 in the National Parliament(bdnews24.com, 2021):

Table: 5.2: Toll Collection of Bangabandhu Bridge

Fiscal year	In millions of BDT
1997-98	9.9
1998-99	612.7
1999-00	669.4
2000-01	828.4
2001-02	935.8
2002-03	1,087.2
2003-04	1,310.8
2004-05	1,520
2005-06	1,579.7
2006-07	1,737.6
2007-08	2,019.6
2008-09	2,144.2
2009-10	2,429.9
2010-11	2,691
2011-12	3,062.3
2012-13	3,279.8
2013-14	3,253.8
2014-15	3,511.4
2015-16	4,048.8
2016-17	4,865.2
2017-18	4,865.2
2018-19	5,438
2019-20	5,753.4

2020-21 (up to May 2021)	5,602.8
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From the above documents related to the toll collection it can be stated that Bangabandhu bridge authority has collected enough tolls for its maintenance and the repayment of the foreign loans as well as contributed much in national economy.

5.4. INFRASTRUCTURE AND SOCIAL CONDITION IN THE STUDY AREA

1. Previous and Present Roads

In the previous time, about half of the roads of the community were muddy but now half of the roads are concrete roads. Gradually muddy roads are reducing and concrete roads are increasing.

2. Means of Transportation

It was found in the study that a few means of transportation have lost their importance such as paddled van and rickshaw, Tempo- auto rickshaw etc. For speed and sophistication use of electric auto rickshaw, micro, and bus has created a new trend in local transportation. Motor cycle use is also significant in local areas at the present time.

3. Medium of Information Communication

Previously post office, mobile phones and courier services were the primary medium of information communication. Due to modernization and globalization, Internet, Mobile Phones has taken the primary roles and post office is losing its importance. Courier service is taking the place of post office. While conducting the feasibility study of the Jamuna Multipurpose Bridge the benefits in the communication system were envisioned from the point that: Improved telecommunications links and so on (RAEDEL, PALMER, TRITTON, NEDECO & BANGLADESH, 1989).

4. Use of Electricity and Fuel

The use of electricity has increased 14 percent than the previous years. In the previous time among the 546 responses 92.2 percent cases (85.0%) respondent's family used straw, wood, bamboo, tree leaves, dried branches of trees etc. for their fuel need. But **Liquid Gas** in Cylinder is getting popularity among the respondents of the study areas. Almost 62.4% cases (47.5% respondents) are using Liquid Gas in Cylinder. But electric cooker, rice cooker, curry cookers are found to be recent popularity among the people in the study area. While conducting the feasibility study of the Jamuna Multipurpose Bridge the benefits in the communication system were envisioned from the point that:

Transmission of electricity, transfer of natural gas from the east to west (RAEDEL, PALMER, TRITTON, NEDECO & BANGLADESH, 1989). This electricity and gas are now using in the industrial fields also. According to the previous report of JICA (2001), the west bank of the river Jamuna was less developed than the eastern part and had been preventing the entire region from benefitting from the infrastructure including electricity, gas, communications which were available in the eastern region. But the disparities were vanished with the 232 KV power cables, gas pipelines of 750 mm in diameter, telephone and internet cables along the bridge. Now, in the rural areas people are using broad-band internet facilities, although the speed of internet is not stable and for frequent load shedding people are not able to use hassle free internet. Till now many western districts are avoid of pipeline gas supply and in some cities gas pipelines are available , but supply of the gas is not plenty or there is no supply.

5. Water and Sanitation

Most of the respondents use shallow tube wells water for drinking , cooking and taking shower and most of the tube wells are owned by the respondents themselves.

5.5. EDUCATION AND HEALTH RELATED ISSUES

1. Educational Institutions: It was found from the study that there are primary, secondary, colleges, madrasa and other types of education institution are in the community. Most of the respondents think that the education institution is good and sometimes very good. People of the study area are suffering from the various types of diseases such as Seasonal cold and flu, Dysentery, Skin Disease, Tuberculosis, Diabetes etc.

2. Treatment Facilities: People meet their medical emergency and normal disease where they get chances such as village doctor to government medical college hospitals. Furthermore, people were also known to take medical treatments from a number of places like private clinics, Traditional and religious healers, village medical practitioners etc.

3. Children's School Attendance: It was also been seen that children are going to educational institutions at a large scale. But absenteeism in school is one third of the total children. More than 54 percent cases children are going to primary school and 4.6 percent respondents were seen to study in university. It indicates that peoples intension to higher study is increasing.

5.6. PEOPLE BENEFITED FROM THE BANGABANDHU BRIDGE PROJECT

1. Social Indicators in Daily Life

Due to the modernization, globalization and post development period of Bangabandhu Bridge Construction, social indicators are giving positive signal to the good, very good and moderate. The state of freedom of movement in local community, freedom of expression, social security of the people, freedom of movement of teen age girls, women's freedom of opinion sharing, security of women in the community is very good, sometimes good and in some cases moderate. Role of law enforcement agencies also praised by the respondents. But people had objections about role of local government and entertainment facilities in the community.

2. Daily Food Intake

In the current study, 70.6% were taking 3 times of meal daily. On the Other hand, 134 respondents that constituted the 28.2% of the total respondents were in taking four times of meal a day that indicates that food intake nature has changed from the previous periods. Now people are being accustomed to the healthy food intake. People were seen to take four types of food more. These were rice, vegetables, Fish, Pulse (Dal). People also eat meat occasionally.

Bangabandhu Bridge has created the scope of use health sanitation and fresh drinking water in the study area. Peoples mobility and education influenced them to use healthy sanitation system. About half of the household occupied the vegetable and fish farms.

3. Housing

People were seen to use moderate type of housing. About 90 percent of the respondent's houses are brick built and tin shed. It indicates that housing pattern has developed than the Baseline survey.

4. Nutrition in the Families

Families are seen to intake nutritious food in 80 percent of cases. It clearly shows that in the study area respondent's families are taking nutritious foods due to the availability of foods. After the construction of Bangabandhu Bridge the food production of the study area has increased.

5. Child Mortality

Due to the development after Bangabandhu Bridge in most of the families mortality of children was not seen. It was possible due to the healthy lifestyle and modern take caring to the children.

6. Child Marriage / Early Marriage

It was found from the study that 39.2 percent of respondents were highly agreed, 41.2 percent were agreed and 13.5% were slightly agreed that early marriage has increased in the five districts. On the other hand, only 6 percent respondents were disagreed in this case. It was also observed that parents are being mentally prepared for their daughter's marriage due to the social threat and absence of the girlchild friendly environment. Besides, traditional factors and cultural factors were also seen to influence the parents to get their daughter married.

7. Increase in Social Conflict and Dowry

In the study of Rahman, (2001) it was seen that Perception survey results point towards an increase in social conflicts and consequent insecurity in the west bank relative to the east bank though there are also some variation within each of these broad area categories. Dowry appears to be on the increase on both sides but for differing reasons. It was also observed that social conflicts have increased to some extent due to the socio-political factors, power imbalances and corruption in the various sectors. The practice of dowry has decreased among the higher educated families and increased among the less educated families. People are being aware and conscious about the dowry giving and taking.

5.8. QUALITY OF LIFE

1. Quality of life

Quality of life in the study area has increased due to the construction of Bangabandhu Bridge. More than 95% families are under the electricity facility, but cleanliness of household yards were not seen in two thirds of the total family. People were seen to use liquid cylindered gas than before.

2. Advancement in Education Sector

Much Advancement was occurred in the education sector in the study area after Bangabandhu bridge project. Majority of the people thought they were benefited from the bridge project.

3. Health Facilities reached to doorsteps

Besides, health facilities reached to the doorsteps of the people due to the increase of health centers.

4. Road and Communication System Developed

Road system and communications mediums have developed due to the developed and multiple junction roads in the entire study community. As the roads and communication systems are better than the Baseline survey of 1997, the average travel time from any union headquarters to a district town has reduced gradually and dropped significantly, by nearly two-thirds on the eastern side and nearly half in the western side (Rahman, 2001, p. 63).

5. Income Increased

A significant change has been seen in increased income in new or changed occupation. So, people are seen to join in new occupation except the old ones. On the other hand, Rahman, (2001) showed that indicators of local economy show sharp rise in land prices and wage rates within the reference period but a divergent tendency of increased land transfer in the west bank and static trends in the east bank.

6. Modern Living Facilities Increased

Modern living facilities have been increased due to the availability of resources around the study area and availability of modern products in the study area.

7. Social Mobility Increased

Social Mobility has increased tremendously due to the development of communication system, employment opportunities, and developed education system. Social mobility will be increased more after the construction of Elenga to Rangpur four lane high way and the Hatikumrul Intersection in Sirajganj. Besides, construction of the Bangabandhu Rail bridge and Sirajganj to Bogura Railways will enhance the rapidity of communication and social mobility in this area. Every districts of north Benge will be connected with the Bangabandhu Bridge and the time of travelling will be decreased.

8. Planned Housing

New style of planned house is seen in this area. People are building their houses in a planned way now than the previous time. Flow of loan has increased due to the increased number of government and non-government organizations in the entire area.

9. Increased Flow of Loan

It was found in the current study that due to the construction of Bangabandhu Bridge cash flow from the government and non-government organizations had been seen in an increase.

5.6. ENVIRONMENTAL AND ECOLOGICAL IMPACTS OF BANGABANDHU BRIDGE

Bangabandhu Bridge has created no harm to environment. Although after the bridge construction due to the industrialization and urbanization beside the road sides the natural watery land, rice fields, other natural landscapes were damaged in some extent. Even the industrial waste is being dumping in the River of Fuljor and Isamoti in Sirajgonj district and the water of the river is being polluted by this dumping. But people of the study area has given positive remarks to the environmental and ecological impacts of Bangabandhu bridge project. Positive remarks were seen the cases of fish resources, aquatic lands and rivers, forests and lands, housing and living areas. But in environmental issue half of the respondents think that environment has damaged due to the population increase and industrial exploitation of Bangabandhu Bridge in this area. But agriculture has increased due to the bridge construction. According to (JICA, 2001) the field surveys of animals, fish, insects and plants were conducted during 1990 through 1992 prior to the bridge. The results of post-project surveys based on the environmental action plan indicate that the project has had no serious effects on existing animals and plants.

In the study of Bernardino et al. (1993) stated that the environmental benefits would be happen due to the prevention of embankment erosion in the bridge areas and this would lead to a increasement of agricultural production during the monsoon season. The agricultural expansion has a negative scene in some areas also due to the embankment in some small rivers in Sirajgonj and the lands of that area are losing the fertility of soil for lack of regular siltation in the cultivable land. Dust from the use of vehicle and machinery, waste burning, dredging for construction work caused air pollution. Dust derived from the construction site, blockage of drainage, increased probability of flooding damaged agriculture production.

At the same time level of noise pollution increased in the concerned area for use of vehicle, electricity generator, pile driving operation and dredging. Dust, noise vehicle might affect the existence of flora and fauna. Aquatic life and biodiversity might also get affected from the dredging. Piling work would interruption the river traffic and navigation (Badruzzaman & Ahmed, 1995); (Dutta, 2014, p. 267). Besides, current construction project of Elenga to Rangpur four lane high ways makes a great amount of dust and haphazard condition polluting the natural environment. Even the trees beside the roads have been cut down for the development project. As a result green roadside has turned into a dusty roadside and dirty landscape. Bhuiyan et al. (2010) studied the regulation of Brahmaputra–Jamuna River around the JMB site. This study is conducted to evaluate the ongoing geo-environmental impacts which were modified before the construction of Jamuna Bridge in 1996. The natural width of the river was 11 km at the bridge site before its structural modification. So, the study shows that the river was made narrow and currently it is playing adverse role in the southern part of the bridge.

5.7. NATURAL DISASTERS AND CLIMATE CHANGE AT HOUSEHOLDS' LEVEL

1. Occurrence of Natural Disasters

It was found from the present study that more than half of the respondent's family has been affected by the natural disasters and the rest are not affected.

2. Floods

It was found from the study that half of the respondents faced one time, one-fifth of them faced twice. The intensity of floods was increased very much in the current years and it is more than 99%. Among the four types of measures construction of barrier was the highest and most of the actions were seen taken by the local administration.

3. River Erosion

From the current study it is seen that river erosion has been increased very much nearly 77.0 percent and the highest 63.0 percent respondents faced river erosion for once. Among the steps taken the construction of barriers, infrastructural development were taken and infrastructural development was seen as the main type of action and most of the time nearly 70.0 percent cases government is playing the role.

4. Droughts

It was alarming that all the households faced droughts and 98% respondents faced once. The study revealed that the intensity of droughts have been increased very much in the current years. Local administration is playing the key role in decreasing the intensity of droughts.

5. Initiatives to Recover Negative Impacts of Disaster

The study revealed three types of initiatives/steps such as government initiatives, non-governmental initiatives and local initiatives. It is found that the nature and types of initiatives are the same across the types of initiatives authorities. Three major initiatives of the government are dam construction, tree plantation and public awareness. Among the non-government initiatives three types of initiatives are dam construction, tree plantation and distribution of building houses. Among the local initiatives dam construction, distribution of crop seeds, and distribution of building materials are praiseworthy.

5.8. COMPARISON OF EFFECTS

Table 5.3. Short- Run (2001), Long- Run (2011) and Current (2021) Effects

Variables	Short- Run (2001)	Long- Run (2011)	Current (2021)
▪ Population movement	▪ No significant movement	▪ Deindustrialization	▪ Population Movement increased
▪ Agricultural productivity	<ul style="list-style-type: none"> ▪ Rice yield negative ▪ Transport cost 50% reduced ▪ Fertilizer price reduced ▪ Pesticides price reduced 	<ul style="list-style-type: none"> ▪ Positive and significant impact ▪ Rice yield grew 5.2% more 	<ul style="list-style-type: none"> ▪ Rice Yield Positive ▪ Transportation cost reduced ▪ Fertilizer price reduced ▪ Pesticides price reduced
▪ Availability of labor	<ul style="list-style-type: none"> ▪ Short term labor constraint ▪ Reallocated from agriculture ▪ Labor shortage ▪ Absence of migration of labor ▪ Technology adoption 	<ul style="list-style-type: none"> ▪ Labor constraints relaxed ▪ Migration from the neighborhood ▪ In migration reduced labor shortage 	<ul style="list-style-type: none"> ▪ Labor constraints relaxed ▪ Reallocation from agriculture increased ▪ Labor migration increased ▪ Technology adaptation increased
▪ Changes in the Core Region	<ul style="list-style-type: none"> ▪ no significant effect on population density ▪ no change in average nightlight luminosity ▪ negative effect on the share of agricultural employment 	<ul style="list-style-type: none"> ▪ High population density ▪ increased 8% ▪ Share on manufacturing employment. ▪ Agglomeration of manufacturing sector 	<ul style="list-style-type: none"> ▪ Population density increased ▪ Night light luminosity increased ▪ Increased in manufacturing employment
▪ Reallocation of labor	<ul style="list-style-type: none"> ▪ From agriculture to manufacturing ▪ From agriculture to 	<ul style="list-style-type: none"> ▪ Agricultural labor retains a negative sign 	<ul style="list-style-type: none"> ▪ From agricultural to non agricultural

	service <ul style="list-style-type: none"> No significant effect on productivity 		activities <ul style="list-style-type: none"> Farm activities increased
<ul style="list-style-type: none"> Reallocation of Labor to the core 	<ul style="list-style-type: none"> No effect on yield Did not affect technology adaptation Markets in the centre were already integrated 	<ul style="list-style-type: none"> Economic Density Population Density 	<ul style="list-style-type: none"> No effect on yield No effect on technology adoption Market is well developed

The comparison table 5.3 was prepared in the light of the study of (Blankespoor, Emran, Shilpi, & Xu, 2018) and the findings of the current study. Blankespoor et al., (2018) used the census data of 2001 as the short- run, census data of 2011 as the long- run. They also calculated the night light and yields data. The comparison is done with the short run, long run effects and the effects of the current study of 2021. The summary of this table that in comparison to the previous effects currently population movement is seen to be increased, yield of rice is positive, transportation cost reduced but recent price hike of the oil has increased transportation cost slightly. The previously existing labor constraints have been relaxed and reallocation from agriculture has been increased. The migration of labor was seen to be an increase and the adaptation of technology in agricultural field was also increased. A clear trend of reallocation of labor from agricultural to non agricultural activities was seen presently and farm based activities were seen in an increase. Now Market is well developed.

Table 5.4. Influence of Change Process on Economic Impacts

Change Process	Economic Impacts (2014)	Economic Impacts (2021)
Economic Process <ul style="list-style-type: none"> Infrastructure Communication Diversion of economic activities 	<ol style="list-style-type: none"> Access to technology (Positive) Access to micro credit (Positive) Decreasing production cost and increasing consumption (Positive for only large group of farmers) Increased rent (positive for land owners, negative for the tenants) 	<ol style="list-style-type: none"> Access to Technology (Very Positive) Access to Microcredit (Positive) Increased Rent of Land (Negative for small farmers) Increased Production Cost (challenging for marginal farmers) Increased Consumption

		(Positive) 6. Increased Communication (Positive)
Demographic Process <ul style="list-style-type: none"> ▪ Presence of construction workers ▪ Displacement 	1. Reduced production and limited communication for construction work (Negative) 2. Financial loss (Negative)	1. Increased Communication (Positive) 2. Effects of displacement Reduced (Positive) 3. Financial Stability (Positive)
Geographic Process <ul style="list-style-type: none"> ▪ Channelization and narrowing of river ▪ Land acquisition ▪ Land Reclamation 	1. Unemployment and loss of property (Negative) 2. Reduced income from agriculture and poultry (Negative) 3. Bribery and loss of income for seeking land of compensation (Negative) 4. Economic loss for the tenants, farmers and sharecroppers as they were not considered for compensation (Negative)	1. Employed in alternative work (Positive) 2. Increased income from agriculture (Positive) 3. More economic activities in newly formed lands (Positive)

Table-5.4 shows the comparison of the economic impacts narrated in the study of (Dutta, 2014, p. 266) and the observation based findings of the current study. It was found from the findings that communication, consumption, access to technology and access to microcredit were seen an increase and which are positive change. It was also found that the effects of displacement was reduced than the findings of the previous studies. A financial stability is seen in the entire region among the respondents. Besides, respondents were found to engage into the alternative employment opportunities and that was positive. An increase in the income from agriculture was also observed in the current study.

Table 5.5. Influence of Change Process on Health and Well-being

Change Process	Health and Well Being (2014)	Health and Well Being (2021)
Economic Process <ul style="list-style-type: none"> Better communication and coverage of NGO service 	<ul style="list-style-type: none"> Improved sanitation and health practice (Positive) 	<ul style="list-style-type: none"> Improved sanitation and health practice (Positive) Better Hygienic Practices in the Families (Positive) Intake of Nutritious Foods (Positive)
Geographic Process <ul style="list-style-type: none"> Shifting rivers and inundated char areas Inadequate Drainage system Use of chemical and machinery 	<ul style="list-style-type: none"> Threatening life (Negative) Outbreak of waterborne disease (Negative) Increased health hazards (Negative) 	<ul style="list-style-type: none"> Drainage System Developed (Positive) Threatening Life (Negative) Increased Pollution(Negative) Increased health hazards (Negative for the poor and positive for the rich) Diseases decreased (Positive)
Demographic Process <ul style="list-style-type: none"> Presence of construction workers in congested places 	<ul style="list-style-type: none"> Lack of sanitation facilities and increased risk of diseases for construction workers (Negative) 	<ul style="list-style-type: none"> Sanitation system was developed (Positive) Safety in construction work increased (Positive)

Table-5.5 shows the comparison of the economic impacts narrated in the study of (Dutta, 2014, p. 266) and the observation based findings of the current study. It was observed that the respondents of the area are being accustomed to improved sanitation and health practice that is positive and better hygienic practices in the families was also seen positive. Respondents are taking nutritious foods that were also shown a positive remark. In the entire region sanitation system was developed and safety in the construction work area has been increased and it is also a positive sign.

Table 5.6 Influence of change process on cultural impacts

Change Process	Cultural Impacts (2014)	Cultural Impacts (2021)
Demographic Process <ul style="list-style-type: none"> In and out migration (Displacement) 	<ul style="list-style-type: none"> Break of joint family and change in tradition (Negative) 	<ul style="list-style-type: none"> Joint families are disappearing (Negative) Social activities are decreasing (Negative) Social Chain of command is disappearing (Negative) Mental Peace is reducing (Negative) Individualism is increasing (Positive for believer, negative for non-believers)
Economic Process <ul style="list-style-type: none"> Improved communication and less room for agricultural activities 	<ul style="list-style-type: none"> Degradation of social status and low acceptance in agriculture communities for changing profession (Negative) 	<ul style="list-style-type: none"> Educated persons are engaging in agricultural activities (positive) New income generating activities are getting recognition (positive) Variation of occupation introduced (Positive) Difference between landowner and landless is decreasing (positive)
Socio-cultural Process <ul style="list-style-type: none"> Social globalization (Presence of affluent) 	<ul style="list-style-type: none"> Change in cultural value (can be both positive and negative) 	<ul style="list-style-type: none"> Cultural Value is Changing (Negative) Increasing Addiction (Negative) Social Bonding is weakening (Negative) Modernization of Social Thought(Positive)

5.9. EFFECTS OF BANGABANDHU BRIDGE ON INDUSTRY SECTOR

1. Ownership of the Industry

In five districts, most of the small, medium and large industries were found in single ownership. Nearly half of the large industries were found in joint ownership and about one-fifth of the small industries were in joint ownership. In Manikganj, Among the total number of studied small and medium industries majority were found in single ownership based

industries. Only one fifth of the medium industries are jointly owned. This finding from the study indicates that small and medium industries are available in all the districts and mostly in joint ownership. Due to the construction of Bangabandhu Bridge, people are approaching to the small and medium industry and in some cases to the large industries.

2. Sources of Raw Materials

In five districts, the industries used one-fifth of the raw materials of their own, one-third from local markets, one-third from national level and a small amount from the international markets. But, in Manikganj all the raw materials were seen to collect from local market and national markets.

3. Time and Cost Saving in Transporting Goods

It was found from the present study that most of the cases and in every time industrial produced goods are transported over the Bangabandhu Bridge, but the goods of Manikganj district are transported over the bridge in a rare case. Due to Bangabandhu Bridge, it was found that for the five districts time of transportation is fully saved and transportation cost was also reduced and saved.

4. Selling of Produced Goods

It was found from the study that half of the produced goods of northern five districts are sold in national markets and more than one-third of goods are sold in local markets. The goods are also exported to international markets. On the contrary, the produced goods of Manikganj are sold in local markets only.

5. Use of Energy in Industry

The use of electricity and gas in industries of the five district is nearly double than the before. On the other hand, electricity use has increased in Manikganj but gas use has not increased at all. The five districts are getting more benefits than Manikganj due to the supply line of electricity, gas of the Bangabandhu Bridge.

6. Development of Industries

It was found from the study that in five districts among the various types of industries agro-based industries are developed mostly and number of fish farm and poultry farms were seen to be increased at a large scale. In Manikganj, agro-based industries are increasing day by day. It was also observed that large industries are not growing in the peripheral districts of the Northern Bangladesh and Manikganj. Industries are growing rapidly in some districts like Sirajganj, Tangail, Pabna, Bogura, Natore and Rangpur as these districts are located and connected with the developed highway system. Other districts are lacking behind of the touch of the developed highway system. Faber (2014) found that transport network

connection had adverse effects on industrial growth in peripheral counties in China. This study is also applicable for Bangladesh. From the survey based data of Nepal, the study of Fafchamps and Shilpi (2005) showed that areas close to cities were more diversified and more market-oriented activities. Bangabandhu Bridge has connected the adjacent districts with the large city like Dhaka, Gazipur and Chattogram. As a result diversification of work and market oriented activities are being seen.

7. Development of Living Standard of Industrial Workers

The present study shows that indicators of living standard of the workers have been seen a sharp increase in all six districts. The income and salary of the workers were increased, food security and quality of health care were also increased, poverty rate decreased and facilities for the entertainment were seen a sharp increase.

8. Effects of the Bridge on Five Districts

It is found from the study that due to the construction of Bangabandhu Bridge, product transportation time and cost are reduced, availability of products and marketing was also seen to an increase. It was also seen that self employment was also created much and spread of new business is seen in the entire region. Besides, consumption rate and savings of the people have been increased. It was observed that the service sector and decentralization of industrial activities are seen in the newly developed areas rather than Dhaka. Now the women of Sirajganj district are seen to work in the local garments industries, agro-based industries or food packaging industries. The male and female are earning an average money staying their own home and maintaining their families. People are seen to cost 10-20 BDT for their transportation to the industries daily. Even some industries are providing local transport for their workers. As Baum-Snow et al. (2017) study the effects of roads and railway on urban form in China, and provide evidence that radial highways decentralize service sector activity, radial railroads decentralize industrial activity, and ring roads decentralize both. Current study is showing a sharp and rapid growth of industrial sector near the highways and railroads of the northern districts of Bangladesh.

5.9. EFFECTS OF BANGABANDHU BRIDGE ON MARKET SECTOR

1. Information about Market

The result of the study shows that nearly half of the markets of five districts were medium in size, one-third were big and one fourth of market were small in size. In the context of Manikganj more than half of the total markets were found medium, nearly one-fourth of the markets were big and small in size. In five districts, three-fifth portion

of markets were semi brick built and one-fourth of which were brick built. On the contrary, in Manikganj less than half of the total markets were semi brick built and one-third were tin shed and one-fourth were brick built. In five districts, nearly one fourth markets in five districts were small, less than half of the markets were medium in size and more than one fourth markets were large in size. On the contrary, more than half of the markets were medium and more than one- fifth markets were consecutively small and large. In five districts three-fifth numbers of the total markets were semi-brick build and in Manikganj only less than half of the total markets were semi- brick build. But in five districts the Brick build markets were more than Manikganj. The infrastructure shows that the markets of the west bank of the River Jamuna are more developed than the markets of Manikganj due to the direct impacts of Bangabandhu Bridge.

2. Nature of the Respondents

Among the total number of respondents from market more than half of them were male and less than half were female. But in Manikganj the female respondents were more than the male respondents. Two -thirds of the total respondents from five districts and Manikganj were married and only one third were unmarried. Bur the number of unmarried respondents were 8 percent more than the respondents of the Manikganj. In Manikganj data shows that more than 96% respondents were educated and in other five districts more than 85% respondents were literate. But the number of higher degree pass respondents from five districts were 4% more than the respondents of Manikganj. This variation was done due to the use of purposive random sampling. Although there is no direct impact of Bangabandhu Bridge on the education of Manikganj, the development is naturally done with the development of the country with the time being.

3. Income from the Market

The monthly average income from the small, medium and large markets are less than 200000 BDT. The average income of the respondents of the market in six districts is less than half of the income of the medium markets. The average income of the large market is nearly double of the medium markets.

4. Environment of Market

It was found that the markets places of six districts are composed of mixed criteria of environment. Most of the markets places were seen to have the medium or severe level of water logging system, as well as most of the markets are prone to logged in water and some markets were seen to submerged under water during the floods. The conditions of the markets in these six districts were found more or less bad. On the other hand, waste management and drainage system of the markets of the six districts were not found satisfactory. More than 60% respondents opined that their waste management system in the market were not good or very bad. Besides, there is a shortage of pure drinking water in the market places in the study areas. But more than 80 percent

markets were enjoying the facilities of pure drinking water in the market places. More than 70 percent of markets were found clean during the study. On the contrary, sewerage system in the markets were found unsatisfactory. In the western districts only 3 percent of the markets were not connected with the main roads and in Manikganj only 9 percent of the markets were not connected with the main roads. That indicated that the road system of the west is better than the eastern district of Manikganj.

5. Contribution of Bangabandhu Bridge (Five Districts vs Manikganj District)

In five districts of the study (Tangail, Sirajganj, Pabna, Natore and Kurigram) Bangabandhu bridge has direct impacts on economy, communication, demography, population migration, social mobility, social environment, education, health, occupation, workforce diversity, environment and so on. But in case of Manikganj, Bangabandhu bridge has no direct connectivity and direct impacts. Even it was found that only 9% of the respondents used Bangabandhu bridge for some sorts of business and industrial activities. The development that was seen in Manikganj were naturally happen due to the modernization and globalization and trends of the development taken by the Government of Bangladesh and the non- governmental organizations. Now a comparison can be made on the basis of the findings of the survey based data, in-depth case interviews, focus group discussions, KIIs and observation of the researchers.

Table: 5.7: Contribution of Bangabandhu Bridge (Five Districts vs Manikganj District)

Variables	Five Districts	Manikganj
Education	<ul style="list-style-type: none"> • Literacy Rate Increased • Bangabandhu Bridge has direct impacts. • Programs of government has also contributed in this sector. 	<ul style="list-style-type: none"> • Literacy Rate Increased • Increased as natural process. • Programs of government has also contributed in this sector.
Income and occupation	<ul style="list-style-type: none"> • Income increased • Mobility of work increased • Diversity of occupation increased • Changed occupations are getting popularity • Bangabandhu Bridge has direct impacts on income and occupation 	<ul style="list-style-type: none"> • Income increased as a natural process. • Income increased due to becoming the neighbor of Dhaka district. • Connectivity with Dhaka with roads. • Bangabandhu Bridge has no direct impact.
Industrialization	<ul style="list-style-type: none"> • Becoming more industrialized for availability of gas and electricity and the geographic location • These areas are connected 	<ul style="list-style-type: none"> • Large scale industries are not being established. • People are generally investing in Dhaka, Gazipur, or other industrial areas not

	<p>with trans Asian highways and road systems.</p> <ul style="list-style-type: none"> • Bangabandhu bridge has contributed in the industrialization process • Bangabandhu bridge has created a focus on these districts to the investors of the entire country. 	<p>in Manikganj. Bangabandhu Bridge has no direct impact on the industrialization in this district.</p>
Social Impacts	<ul style="list-style-type: none"> • Social Indicators are changing positively and rapidly due to the construction of Bangabandhu Bridge. 	<ul style="list-style-type: none"> • Social indicators are changing at a natural rate , and Bangabandhu bridge has no direct impacts in this area.
Environmental Change	<ul style="list-style-type: none"> • Some positive and negative impacts are occurred due to the rapid industrialization, urbanization, and population growth. • Bangabandhu Bridge has given speed in the environmental change processes. 	<ul style="list-style-type: none"> • Environment is changing naturally and with the direct influence of the human activity and Bangabandhu bridge had no direct impact on environmental change.
Crime	<ul style="list-style-type: none"> • Crimes are happening by natural processes • Early marriage is present • Dowry and torture to the women is present • Bangabandhu bridge has no impact in the case of increase of crimes. 	<ul style="list-style-type: none"> • Crimes are increasing for natural causes and for globalization process. • Early marriage is present • Torture to women is present • Bangabandhu bridge has no effect on increase of crimes.
Health and Sanitation	<ul style="list-style-type: none"> • Developed naturally and for the policy of government • Bangabandhu bridge has modernized the entire region. 	<ul style="list-style-type: none"> • Developed naturally and for the policy of the government

CHAPTER 6: RECOMMENDATIONS AND CONCLUSIONS

RECOMMENDATIONS

On the basis of the findings and discussions of the study, the research teams have proposed some recommendations to reduce the problems in the study area. The researchers proposed the recommendations which are divided on the basis of two time frames.

RECOMMENDATIONS FOR SHORT TERM (2022-2030)



Figure 5.1: Recommendations for Short Term

RECOMMENDATIONS FOR LONG TERM (2030-2050)



Figure 6.2: Recommendations for Long Term

The overall recommendations for short-term and long-term are discussed below:

1. Protection of Cultivable Lands

Effective measures should be taken to protect the cultivable land beside the roads in the entire area from being industrialized or urbanized.

2. Establishment of Specific Zones for Industrialization

Government should take necessary steps in some specific zones/ areas for industrialization. Damage to fertile agricultural land will impose an adverse on food production and the food security of the entire region.

3. Regulating Regional Migration

Migration of people from districts to districts for housing should be constructed in disciplined ways.

4. Stopping Unplanned Housing

If unplanned housing is developed study area will be affected by losing more lands for housing and the density of population will increase and agricultural land will be adversely impacted along with Bangabandhu bridge adjacent roads and areas.

5. Preservation and Development of Natural Environment and Natural Landscapes

Due to the construction of the bridge natural environment and landscape are being negatively damaged and changed with significant damages to biodiversity and bio ecosystem. To protect the balance state of the ecosystem in the areas under study, unruly dressing work with machines, use of ball grade machine should be used with strict control and management following the laws relating to the environmental protection. Local powerful person's illegal activities to dressing the rivers, canals, and beels need to be taken under legal system and control by the law enforcement, legal authorities/agencies concerned with the government.

6. Establishing Modern Industrial Waste Management System

Unplanned industrialization and dumping of industrial waste in the river should be stopped and managed immediately so that water animals, wetland ecosystems, and the environment could be saved.

7. Development of Community Health, Hygiene and Sanitation Systems

Community health, hygiene, and sanitation systems need to be developed in a planned way so that the health risks and hazards of the people/residents living in the bridge adjacent areas including remote areas may be reduced to the expected levels.

8. Making a Balance Between Development and Emerging Social Issues

Though the government of Bangladesh has already started to develop a special economic zone as well as small and medium enterprises (SMEs) leading to the development of industries and factory and infrastructural facilities it is still at the beginning stage. But, the construction of these establishments may lead to employment generation, income earning, positive impacts on lives and livelihoods. It can be mentioned that the usual development of any industry and infrastructure and adverse impact of this development may go hand in hand. Consequently, some undesirable conditions or occurrences like various kinds of crimes, excessive population growth, health hazards, environmental pollution, and hazards may go in rising in the localities adjacent and far from the bridge.

9. Reopening of Unplanned Embankments

Unplanned construction of embankment in the branches of Jamuna and Teesta river should be reopened, otherwise, the river like Korotoa, Bangali, Hurasagor, Isamoti, Fuljor will die due to lack of water flow in the rivers. After the closure of the source of River Isamoti in Sirajgonj, a large area of land is getting barren rapidly that has already impacted the production of diverse types of crops. Siltation has stopped and the flow of the river also stopped due to the inflow downstream. As a result, agricultural production has already been declined affecting the local agriculture and livelihood of the local people. It is worth mentioning that, 10 years ago, dolphins were seen in the river Fuljor, Bangali, Hurasagor but presently these fish are not found due to the blockade of the source of water of Isamoti from the river Jamuna. . Besides, Katakhal and other small rivers need to be reopened and channelized to maintain the regular flow of the water. Bangabandhu Bridge protection embankments have also completely stopped the flow of many small rivers, that need to be reopened opened complying with the national flood management system. Riverbank erosion of Jamuna and Teesta could be minimized if the water flow during the monsoon period could get their flow through these small rivers and again they meet with the Padma or the Jamuna River.

10. Controlling Excessive Flow of Traffic and Traffic Jam

Bangabandhu Bridge and Four Lane of highways do not maintain the traffic flow and traffic jam in the western and Eastern part of Bangabandhu Bridge has been now a regular phenomenon that needs to be managed with the development of the proper plan and its implementation. Although the toll collection system is contributing to the national GNP and GDPs, the tolling system of Bangabandhu Bridge should be easy and affordable for reducing the transportation cost of the agricultural products to Dhaka and other cities, which will impact on the price hike of the necessary things and goods. Moreover, toll collection in the toll plazas is supposed to be responsible for creating a long traffic jam on both sides of the Bridge. Consequently, time of transportation along with the passenger's troubles are being increased. So, this issue needs to be taken into consideration by the authority of the Bangabandhu Bridge.

11. Developing Railways and River Based Transportation System

Railways and River-based transportation systems should be developed in reducing the cost and time of transportation. For ensuring the previous river paths, dressing the river bed and proper flow of water should be done with the proper plan. If possible, an increase in railway communication facilities and the port establishment is to be developed for cheaper transpiration of agriculture and non-agricultural products and goods. The Bridges over the small rivers should be made high e so that the water transport can easily run from Dhaka to Jamuna (Sirajgonj)- Hurasagor(Sirajgonj)- Fuljor(Sirajgonj)- Bangali (Bogura)- Ghaghot (Gaibandha)- Teesta(Rangpur). That will

develop a good communication route of water transports connecting both the Southern Part and Northern Part of Bangladesh.

12. Increase in the Roads Connected to Far Areas

It is apparently observed that Bangabandhu Bridge has brought about a substantial volume of development in terms of road communication, mobility of people, employment generation, multiple sources of income and improvement of quality of life, but a section of people living much far from Bangabandhu Bridge are found to be deprived of having a positive impact of the bridge. So, it is essential to make available roads and ways connecting far areas of Bangabandhu Bridge so that people living near and far from the bridge can be able to avail of the road facilities.

13. Preserving Biodiversity and Ecosystem

Before the construction of Bangabandhu Bridge a significant volume of trees and bushes existed in bridge adjacent villages. After the construction of the Bridge, the value of the land has increased massively. So, people of the entire study area have cut the small bushes and other natural forest lands including homestead tree plantation for building housing set up, agriculture cultivation, and for business/ enterprises. The wild animals such as wild cats, foxes, large cats, mongoose, snakes, 'Neul' (Gondhogokul), 'Bagdash', 'Mechobagh', porcupines, and many other species are in danger and disappeared to some extent. So, the government should establish some eco-parks and conservation areas to protect the species in danger, trees, and animals that can protect the eco-balance system, sustainable natural resources, and environment for the consumption of the present and future generation.

14. Ensuring Proper Supply of Energy

The Westbank of Jamuna river is being industrialized rapidly and in near future the demand of energy especially natural gas, electricity, oil will increased more. So, Government should ensure the supply of energy by establishing green energy sources and utilizing those. Besides, renewable energy systems should be developed due to the growing numbers of industries in and around the districts. Although Ruppur Nuclear Power Plant at Ishwardi, Pabna will mitigate the current shortage of energy but in future there will be needed more energy supply.

15. Balancing Underground Water Level

For cultivating the crops farmers of the study area are thrusting the underground water. As a result, natural water level is going lower and lower and irrigation is becoming challenging. Government should ensure redressing the ancient canals and drying river and connecting those with large rivers like Jamuna, Teesta so that people can use river water for their cultivation. If this could be done, the agricultural production will get a sustainability.

16. Human Development

Only physical infrastructural development is not enough for developing the entire study areas people of those areas need proper quality education, educational institutions, quality teachers and trainers, training institutions for upcoming occupations and trends and so on. Besides, social safety net programs in comparison to the welfare states should be ensured. Corruption and nepotism in providing services should be strictly monitored and support the victims. Various types of skill development programs should be ensured for developing the internal power of the rural people. On the other hand, morality, social norms, national cultures, religious cultures, social values are to be taught to the officials and the authorities for feeling the pulse of the society and the people in need. Besides, social justice and democracy should be institutionalized for making the condition of the citizen stable and prosperous.

17. Developing Sustainable Economy

Bangladesh is a country of natural disasters and here the economy is mainly an Agro based economy. Agricultural sector is vulnerable to the disasters. Frequent floods, cyclones, droughts, and other types of disasters generally challenge the Agro-based economy. On the other hand, the middle man of the markets is making the larger portion of the interest rather than the actual farmers. Besides, industry sector is providing a small amount in the GDP. Government should ensure the alternative income source of the farmers by creating alternative job opportunities during the disasters or crises situation. Besides, political instability and corruption making the development activities slower in the study area. Government should ensure proper market integration, market monitoring, VAT free agricultural, industrial and production oriented materials should be provided in these areas so that establishing industries and income generating factories can be established easily and serve the society for long run.

18. Control High Population Growth

Due to excessive migration, unawareness of people, not using birth control methods the population of the study area is increasing day by day. As a result it is creating some sorts of challenges like reducing cultivable lands, spoiling the natural bio diversity, trees, soil and water. For over population as a citizen local people can not afford the agricultural products in local price, the wealthy persons are buying the best products at a high prices in the study areas, as a result poor and marginal people can not buy their necessary products at a cheap rate.

19. Making Availability of Local Products in Local Markets

Due to the construction of Bangabandhu Bridge, people can easily carry their agricultural and other non-agricultural products in capital city Dhaka and other large cities for generating more profits. This has resulted a shortage of good quality of local products for the rural people. Even people have to buy the local products at a high price

from local markets. This has created a great challenge for the ultra poor and the poor section of the people. So, authorities should ensure the supply of local products in cities and local markets in a balanced way.

20. Establishment of Modernized Storage System

Modern storage system for the agricultural products such as potatoes, onions should be introduced in the remote areas. During the harvesting system farmers are producing much but for the shortage of quality and standard storage system their products and goods are sold at a cheap price. So, farmers are not being benefitted from agricultural activities. Keeping goods in traditional storage system resulted in rotten potatoes or rotten onions and so on.

21. Reduction of the Disaster Risks

Every year the residents of the Charland of Dharla, Teesta, Brahmaputra in Kurigram experience floods and their house become unlivable for more than 6 months. They need to stay on high land without undesirable living condition. So, the government should take necessary steps to resettle them on a high land so that they can live a hazard free life. Only embankment in the river side will not ensure the proper living arrangement of the people living in Char Land. But they need to live there without being sufferers from river bank erosions. Government should help them either by making settlement on high land or by resettling them in the places where they can live with better condition.

CONCLUSIONS

The present study was designed to assess the overall socio-economic and ecological impact of the Bangabandhu Bridge. The study tried its best to explore how and to what extent the economy in general, and the people, particularly the poor have been benefited because of the construction of the Bangabandhu Bridge. This study more specifically tried to (i) assess the social impact, and in particular, to explore whether and to what extent the lives and the livelihoods of the people have been improved; (ii) to assess the contribution of the bridge in poverty reduction in the north-western part of the country especially in the adjacent districts ; (iii) to assess whether and what extent the economic activities have been facilitated due to the construction of the Bridge; (iv) to assess what extent the Bangabandhu Bridge has contributed to the country's industrialization and employment generation; (v) to assess the impact of ecology and environment in the north-western part of the country especially in the adjacent districts. In addition, this assessment is also expected to provide useful

ingredients, analysis, and insights for further investments of this kind in the future in the country.

From the study findings it can be stated that the respondent's literacy rate has increased 15 percent more than the baseline survey and currently it is 61.6 percent but the literacy rate of the family members is 78.44 percent and that is supposed to be remarkable. Another key finding is that a large number of respondents are farmer and their percentage has reduced a little bit than the baseline survey and information. In the baseline survey, three major occupations were agriculture, business, and weaving clothes. But in the present study, three major occupations are agriculture, day laborer, and job in government and private sector. It is also found that 64 percent of families have only one income-earning member. The number of dependents under the age of 30 in the study is 74.19 percent. The majority number of respondents of the study were from middle-class families. Study revealed that the income of the respondents was found to be increased nine times more than the baseline survey. The income from agriculture increased eight times, day laboring increased five to seven times and fish farming increased six times more than the baseline survey.

Moreover, it was observed that family expenditure increased more than the baseline survey in the case of purchasing agricultural and non-agricultural work equipment, food, lands, clothes, medicine etc. The mean amount of wealth was found to be increased and the amount of money for any productive investment was also found high. The financial institutions, banks, insurances, and changes of transactions and financial activities have augmented. The amount of overall household savings were found to be raised at a satisfactory level. The study also showed that the volume of the land of the respondents was found to be decreasing day by day. But the volume of cultivable land increased by 4.5 decimal per respondent. And ponds and other lands were found to be gradually decreased. Due to the increase in the income-generating activities, the income level of the local people of the study area were estimated to be increased at least 30 percent.

Another key finding of the study is that after the construction of Bangabandhu Bridge, among the respondents income increased 99.5 percent, the opportunities of job/ work increased 89.1 percent, business expanded 98.2 percent, mobility of labor increased 99.2 percent, price of land increased 99.4 percent. Besides, worker's mobility in the job sector was increased 99.60 percent, labor migration increased 89.00 percent, and the international migration for work were found to be increased 89.50 percent. In most of the cases pull factor had impacted mobility in work. The communication system in this area was increased 90-95 percent and cooperation between two regions, diversity of economic activities, availability of local products were also increased by 99.0 percent.

In the study it was noticeable that concrete roads were getting increased. The use of internet, mobile phones had been found to be high due to advanced information and

communication technologies. The use of electricity has increased 14 percent than any time of the past and Liquid Gas in cylinders had already been popular among the respondents of the study areas. Most of the respondents were seen to use own tube well water for various purposes. The study showed that educational institutions were found to be good operations in providing better education to the local people. It was observed that more than 54 percent children were found to go to primary schools and 4.6 percent respondent's family members were known to pursue studies at university.

The interesting finding of the study was that Bangabandhu Bridge has had positive impacts on ecology, environment, fish resources, aquatic lands, rivers, housing and living areas. It was also observed that the respondents were getting benefitted from the bridge. For instance- free movement of women, girls in local community, liberty of expression, security of the people, safe movement of teen-age girls, women's participation in family decision making were found highly positive sign of development. Another interesting findings was that 70 percent of respondents were found to take three times daily food intake and 28 percent took four times a day.

The condition of health, sanitation, nutrition, housing conditions were found to be improved compared to the information extracted from the baseline survey. Particularly, child mortality was decreased and the people were seen to enjoy a better life in the community. The improvement of education, health and modern living conditions made the lives of the local people more prosperous and productive as well. It was also found from the study that people of the entire region were observed to experience economic betterment and the property and development among the respondents were found to be increasing on account of growing impacts of the Bangabandhu Bridge.

In the case of market development of the study area a gradual establishment of new markets were found to be observed along with the improvement of sanitation and hygienic system. People were found to be getting used to that new setup of health, hygiene and sanitation condition.

With regard to the industrial development, a significant numbers of industries / factories in the study area were found to be lacking of basic welfare provisions, better work environment, safe and healthy environment for their employees/ workers. It was also observed that scarcity of electricity and gas supply, poorly constructed roads, imposition of high tax/ VAT on raw materials needed for a variety of industrial productions were supposed to be greatly impacting on the business community. New entrepreneurs that want to develop their enterprise / business along with the production of better quality goods were found to face challenges to production and marketing as compared to the national and / or multinational companies producing their branded products/ goods.

In conclusion it can be stated that a variety of effective measures need to be undertaken to protect cultivable lands, environment, ecology, food security, rivers, forests, animals,

and aquatic environment that can make an environment of sustainable development in the whole study areas. Several ways and means of income generation, education, economic opportunities for development, physical and infrastructural development, alternative communication system, planned change, people's participation in development sectors, the positive role of government institutions/concerned departments directly and indirectly related to the overall development for the people of the entire region are of high importance now. The Bangabandhu Bridge Authority (BBA) and its concerned partner institutions/ departments/ ministries can undertake a wide range of programs and projects that can contribute to the socio-economic, cultural, agricultural, industrial, environmental and sustainable ecological development for the present and future generation of Bangladesh. In this regard, the Bangabandhu Bridge can play high positive roles particularly in the case of enhancing the quality of lives of the people living in the areas near the bridge and also far from the bridge. In fine, the Bangabandhu Bridge can be labeled as a significant bridging component that leads to the overall development of the people of East and West along with the whole areas of Bangladesh and other neighboring countries like India, Nepal, Bhutan and so on.

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APPENDICES

1. STRUCTURED INTERVIEW SCHEDULE

1.1. STRUCTURED INTERVIEW SCHEDULE

Serial No.

Structured Interview Schedule-1

Code No.

Structured Interview Schedule

Socio-Economic Impact Evaluation Study of Bangabandhu Bridge



Bangabandhu Bridge Project, Setu Bhaban, Dhaka

and



Institute of Social Welfare and Research

University of Dhaka

[The present research is funded by the Bangabandhu Bridge Project and conducted by the Institute of Social Welfare and Research, University of Dhaka. Collected data will be used only for research purpose and confidentiality will be maintained.]

Name of the respondent: Address:

Phone:

Area distant from bridge =1

Name of Interviewer:

.....

Area adjacent to Bridge = 2	Date of Interview:
Area without facilities of Bridge = 3
	Mobile No.:

Identity of the respondent and demographic data (use code where applicable)			
1.1 Status of respondent		1.1 Status of respondent	
Head of the household/Not head of the household		Female headed=1	Rich=1
Village/Ward		Agrarian=2	Middle class=2
Union		Non-agrarian=3	Lower class=3
Upazila/Municipality		Others=4	Others=4
District (Put tick)	Tangail/Sirajgonj/Pabna/ Kurigram/ Natore/ Manikganj		
Division	Dhaka/Rajshahi/Rangpur		
Mobile No.			

Sl. No.	Name of household head and his family member's name (Elder to	Relation ship with head of the hous	Sex	Religion	Marital status	Educa tional qualifi cation (Writ e follow ing	Occup ation	Perso nal incom e(Mon thly)	Informa tion about depend ency
			Male=1	Islam=1	Unmarried =1				
			Female =2	Hindu=2	Married=2				
				Christian-3	Divorced=				

	younger)	ehold		Buddhist =4 Others=5 (Please specify)	3 Widow=4 Widower-5 Others=6	code)				
1	2	3	4	5	6	7	8	9	10	
									Number of earning members	
								person	
									Number of dependent person according to age	
									Year	No
									Below 10 years	
									10-20	
									21-30	
									31-40	
									41-50	
									Above 50	
Educational Status: Illiterate=1. Able to sign=2, can read=3, Primary level=4, JSC=5, Secondary level SSC Pass=6, HSC Pass=7, Graduate=8, Post graduate=9, Others										

(Please specify) = 10

Occupation: Agriculture=1, Housewife=2, Agricultural day laborer=3, Non-agricultural day laborer=4, Service holder=5, Bamboo/Cane work=6, Masson= 7, Fisherman=8, Boatman=9, Blacksmith=10, Potter=11, Rickshaw/van Puller=12. Carpenter=13, Business=14, Small business =15, Migrant-worker-Internal (send money)=16, Migrant worker-Overseas (send money)=17, Unemployed=18, Retired=19.Unable to work=20, Hair dressing/Saloon=21, Tailoring=22, Cottage industry=23, Handloom=24, Making wig=25, Student=26, Teaching=27, Coaching=28, Others (Please Specify)=29

2. Economic status related information of the respondent

2.1 Sources of Income	Income/Business/Farm/Specific name of work/ change in occupation	Annual Total Income (in BDT)	
		Before	At present
Agricultural works	1. Producing Agricultural crops		
	2. Fisheries		
	3. Dairy and Poultry		
	4. Cattle rearing (Cow, goat, buffaloes, sheep)		
	5. Daily laborer (Agriculture)		
	6. Share farmer (Borga chashi)		
	7. Others (Please specify):		
	8. Service in readymade garment industry		
	9. Service (Govt.+ Private)		

Non-agricultural works	10. Day laborer (Please specify)		
	11. Driving (Rickshaw/van/auto/motorcycle/boating/rented boat/rent/others (Please specify)		
	12. House rent/shop rent		
	13. Small business (Tea stall/grocery/selling fish) Specify		
	14. Others (Please specify)		
Social assistance/ security	15. Government pension		
	16. Receiving zakat and fitre		
	17. Old age allowances (Monthly 500)		
	18. Widow allowances (Monthly 500)		
	19. Freedom fighters honorarium allowances (Monthly 12000)		
	20. Education stipend		
	21. Relief program		
	22. Cash money for work/training		
	23. Disable allowance (Monthly 500)		
	24. Farmer card		
	25. VGF/VGD		
	26. Others (Please specify)		
Total Annual Income			

2.2 Statement of family expenditure	
Sectors of expenditure	Annual expenditure (in taka)
Purchasing agricultural and non-agricultural materials	
Food	
Dress and toiletries/cosmetics	
Purchasing land	
Building/repairing house	
Purchasing house furniture	
Expenditure for education	
Transport Purpose	
Health services and medicines	
Electricity/water/fuel/gas	
Festivals and recreations (Religious +social + cultural)/hospitality	
Purchasing vehicles	
Installment and repaying loan	
Mobile phone	
Others (Please specify)	
Total Annual expenditure	

2.3 Types of assets (Multiple answer)	Amount/Number	Approximate value (in taka)	No assets

1.	Cash in hand at present			
2.	Money used for investment			
3.	Land (decimal)			
4.	Ornaments/jewelry (gold/silver)			
5.	Livestock (cow/ buffaloes/goat/pigeon/hen/duck)			
6.	Transport (Mechanical/non- mechanical)			
7.	Trees			
8.	Shops			
9.	Business			
10.	Furnitures (Cot, almirah, refrigerator, television)			
11.	Agricultural equipment			
12.	Others (Specify)			
Price of total assets (in taka):				

2.4 What kind of changes have been occurred in economic organization and your transaction? (Use code where applicable)

Types of economic organization	Has increased=1	Like before=2	Has decreased=3	Changes in transaction
Bank and Insurance				Has increased=1
Co-operatives				Like Before=2
NGO				Has

				decreased=3
Others (Specify)				

2.5 Information about family loan (If received any loan)

Sources of Loan	Total amount of loan	Use of loan	Amount (in taka)
Bank		Land purchase	
NGO		Agricultural goods	
Money-lender (Mohajon)		Livestock purchase	
Relatives		Food/Education/ Health sector	
Cooperative Assoc.		Repay of loan	
Marchant-agent		Business (Mention the types of business)	
Others (Specify)		Social program/Gift for marriage program (What types)	
		Migrate to abroad	
		Non-agricultural sector	
		Building/repairing house	
		Others (specify)	
Total		Total	

2.6 Information related to changing trend of your savings and investment due to the construction of bridge

Savings			Investment			
Sector	Before (5 years)	At present	Sector	Before (5 years)	At present	
					Primary	Next
1. Cash in hand			Building/Repairing house			
2. Savings in bank			Purchasing agricultural goods/equipment			
3. Savings in NGO			Land/pond purchase			
4. Savings with relatives			Cattle and poultry			
5. Give loan to others on interest			Shop/transport purchase			
6. Others (Specify)			Investment in business			
			Others			
Total			Total			

2.7 Ownership and amount of land of the respondent

Types of land	Amount of land	
	2	
	Before (5 years)	At present
1		

Homestead		
Cultivable land		
Non-cultivable		
Mortgage		
Khash land		
Sharing/Borga		
Pond		
Garden		
Land for industries and factories		
Having no land		
Others		

2.8 What kind of changes in land price (decimal) have been happened in your area (Use code where applicable)

Types of land	Beside road		Distant from road	
	Increased=1, Moderate=2, like before=3, Decreased=4		Increased=1, Moderate=2, Like before=3, Decreased=4	
	Before	At present	Before	At present
Agricultural land				
Homestead land				
Commercial land				
High land				
Low land				
Others				

2.9 What kind of changes have been happened in agricultural production, and price of materials and produced goods in your area? (Use code where applicable)

Changes in nature of production	Changes in amount of production	Materials of Production		Changes in price/value of produced goods	Production cost	
		Before	At present		Before	At present
Increased more=1	Increased more=1	Seeds=1	Seeds=1	Increased more=1		
Increased moderately =2	Increased moderately =2	Fertilizer=2	Fertilizer=2	Increased moderately =2		
Like before-3	Like before-3	Irrigation=3	Irrigation=3	Like before-3		
Decreased=4	Decreased=4	Pesticides=4	Pesticides=4	Decreased=4		
		Agricultural Worker=5	Agricultural Worker=5			
		Modern equipment of agriculture =6	Modern equipment of agriculture =6			
		Others=7	Others=7			

2.10 What kind of changes have been taken place in selling and marketing of produced goods due to the construction of bridge? (Use code where applicable)

Selling of produced goods		Marketing		Place of marketing	
Increased=1, Average=2, Like before=3. Decreased=4		Increased=1, Average=2, Like before=3. Decreased=4		Village=1, District=3, International=5	Upazila=2, National=4,
Before	At present	Before	At present	Before	At present

2.11 What kind of changes have been occurred in income generating activities of you and your family due to the construction of Bangabandhu Bridge Project? (Use code where applicable)

Income generating Activities	Previous occupation of the family members	Present occupation of the family members	Previous income (in Taka)	Present income (in Taka)
Business=1				
Self-employment=2				
Transportation=3				
Govt. job=4				
Private job=5				
Garment industry=6				
Going abroad=7				
Agro-based Industry=8				
Non-agricultural industry-9				
Others=10				

2.12 What kind of economic development have been taken place in your area due to Bangabandhu Bridge Project? (Use code where applicable)

Types of economic development	Developed much=1	Developed moderately=2	Developed minimum=3	No change=4
Income has been increased				
Employment has been generated				
Trade and business have been expanded				
Labor mobility of workers has increased				
Land price has been increased				
Communication system has been improved				
Factories and industries have been established				
Selling of agricultural product has been increased				
Supply of product in local and international market has been increased				
The activities of bank and insurance have been increased				

2.13 How much and for what reasons the labor mobility has been changed due to the construction of Bangabandhu Bridge? (Use code where applicable)

Labor mobility	Degrees of changes				Factor	
	Increased much =1	Increased moderately=2	Decreased=3	No change=4	Pull factor=1	Push factor=2
Job sector						
Worker migration						
Going abroad						
Others (specify)						

2.14 What kind of changes have been noticed in communication system due to the construction of Bangabandhu bridge? (Use code where applicable)

Types of transport	Increased more=1, Increased=2, Average=3, before=4, Decreased=5				Availability of facilities	Increased more=1, Increased=2, Average=3, Like before=4, Decreased=5			
Rail communication					Time (duration) of movement				
Adequacy of vehicles					Movement cost				
Private car, Micro bus, ambulance					Number of movements				
Van, Rickshaw, Auto rickshaw, CNG					Cost of carrying products				
Others (Specify)					Others (specify)				

2.15 Types of economic inequality created due to construction of Bangabandhu Bridge (Use code where applicable).

Types	Increased=1, Increased moderately=2, Like before=3, Decreased=4			
Inequality of income				
Inequality of employment				
Cooperation between two regions				
Diversification in economic activities				
Communication facilities				
Availability of products in local level				
Price of products and goods in local level				
Others (Specify)				

3. Information related to physical infrastructure and social condition of the respondent. (Use code where applicable)

3. Information related to physical infrastructure			Before	At present
3.1	Road for movement of the respondent's community	Kancha road=1, Brick Road=2 Concrete Road=3, Others (specify)=4		
3.2	Vehicles for internal movement in your area	Machine used rickshaw=1, Machine used van, Paddle rickshaw=3, Paddle van=4, Easy bike=5, CNG=6, Tempu=7, Bus=8, Microbus=9, Others		

		(specify)=10		
3.3	Means of communication in your area	Post office=1, Internet=2, Mobile=3, Courier service=4, Others (specify)=5		
3.4	Electricity facilities in respondent's community	Yes=1, No=2		
3.5	Fuel facilities in respondent's community	Straw/wood/bamboo/fuel wood=1, Pipe gas=2, Cilinder gas=3, Others (specify)=4		

4. Residence, water sources, latrine, and sanitation system (Observe and put tick in correct answer)		Before	At present
4.1	What is the type of your home ownership?	Paternal home=1, Self made=2, Rented=3, Living others' home=4, Others (Specify)=5	Paternal home=1, Self made=2, Rented=3, Living others' home=4, Others (Specify)=5
4.2	How is the type of your residence?	Pucca=1, Semi pucca (Tin)=2, Kancha=3, Tin/wood/bamboo=4, Soil/straw=5, Others (specify)=6	Pucca=1, Semi pucca (Tin)=2, Kancha=3, Tin/wood/bamboo=4, Soil/straw=5, Others (specify)=6
4.3	What is the condition of your residence?	Very good=1, Good=2, Average=3, Bad=4, Very bad=5	Very good=1, Good=2, Average=3, Bad=4, Very bad=5
4.4	What type of toilet facilities your family members generally use?	Open place=1, Community/collective toilet=2, Personal sanitary latrine=3, Made of private slab	Open place=1, Community/collective toilet=2, Personal sanitary latrine=3, Made of private slab

		ring=4, Hanging toilet=5, Others (specify)=6	ring=4, Hanging toilet=5, Others (specify)=6
4.5 Please say about the type of source and ownership of water supply for use in your residence (Use code where applicable).			
Types of water use	Water source (after the Bangabandhu Bridge Project)	Types of ownership (After the Bangabandhu Bridge Project)	
	Deep tube-well=1, Shallow tube-well=2, Supply=3, Pond=4, Canal=5, River=6, Others (specify)=7	Own=1, Partnership=2, Relatives=3, Community=4, Govt.=5, Neighbor=6	
Drinking water			
Water for cooking			
Water for bath/washing clothes			

5. Education and Health Condition (Observe and put tick on correct answer)

5.1	What kind of educational institutions do you have in your area? (Multiple answer)	Primary school=1, Secondary school=2, College=3, Moktab=4, Madrasa=5, Kindergarten school=6, NGO administered school=7, Project administered school=8
5.2	Whether any of your child study in educational institution?	Yes=1, No=2

5.3	If yes, in which educational institution your child is studying?	Settlement area primary school=1, Government primary school=2, Secondary school=3, College=4, University=5, Government madrasa=6, non-government madrasa=7, NGO/Charity school=8, Others (specify)=9
5.4	Please say your opinion about educational institutions?	Very good=1, Good=2, Average=3, Not good=4, Not good at all=5
5.5	What are the general diseases that your family members are suffered? (Multiple answer)	Cold=1, Giggles=2, Diarrhea/cholera=3, Skin disease=4, Fever=5, Asthma=6, Cough/Tuberculosis=7, Malaria=8, Diabetes=9, Back pain=10, Headache=11, Cold Problem=12, High blood pressure=13, Low blood pressure=14, Others (specify)=15
5.6	Generally where do you go for treatment? (Multiple Answer)	Health center at settlement area=1, Village doctor=2, Government house to house service provider=3, Community clinic=4, Family health center=5, Government union health center=6, Government Upazila/District hospital=7, Pharmacy=8, Religious broomstick=9, Traditional=10, Private clinic=11, Others=12
5.7	What kind of healthcare institutions are existed in your area? (Multiple answer)	Community clinic=1, Bangabandhu Bridge (Health) service center=2, Union health and family welfare center=3, NGO clinic=4, Family welfare center=5, Homeopath=6, Others (specify)=7

6. Give your opinion about following social indicators (Use code where applicable)

Indicators	Level of participation				
	Very good=1	Good=2	Moderate=3	Not good=4	Not good at all=5
You have freedom of movement at your local community					
You have freedom of expression at your local community					
You have social security at your local community					
Adolescent girls have freedom of movement at your local community					
Women have freedom of expression at your local community					
Women have security at your local community					
Recreational Arrangements (Park/play ground, club, library, arrangement for social program)					
Give your opinion about local government					
Does local administrative officer communicate regularly?					
What is your attitude regarding the role of law enforcement agencies?					

7. Women empowerment related Information (Use code where applicable)

1= Women do not have any power, 2= Women have moderate power, 3= Women have sufficient power, 4= Women have equal power like men at household, 5= Women have more power than the men at household

Decision making issues/subjects	Before		At present	
	Singly/Alone	Jointly	Singly/alone	jointly
Land or property purchasing/selling				
Children's education				
Children's marriage				
Contact with different social service providers				
Participation in social activities and political decision making				
Participation in meetings, recreation and social function				
Reproductive health, family planning, pregnancy, and determining the number of children				
Whether literacy rate of women has been increased	Yes=1	No=2	Yes=1	No=2
Whether the rate of women has been increased in involving work	Yes=1	No=2	Yes=1	No=2
Whether the rate of work has been changed	Yes=1	No=2	Yes=1	No=2
Has women mobility increased	Yes=1	No=2	Yes=1	No=2
Has women's freedom of expression increased	Yes=1	No=2	Yes=1	No=2

Whether child marriage has been decreased	Yes=1	No=2	Yes=1	No=2
Whether girl children go to school	Yes=1	No=2	Yes=1	No=2
Others (specify)	Yes=1	No=2	Yes=1	No=2

8. Information related to poverty eradication

8.1 Food Security

8.1.1 Number of daily consume meal

One meal=1 Two meal=2, Three meal=3, Four meal=4

8.1.2 Please mention the name of food you generally take every morning, noon and at night. Put tick where applicable)

Time	Menu										
	Rice =1	Loaf /Rot i=2	Veget ables =3	Bisc uit= 4	Te a= 5	Fis h= 6	Water rice and salt=7	Brea d=8	Mea t=9	Puls e=1 0	Others (specif y) =11
Mornin g	1	2	3	4	5	6	7	8	9	10	11
Noon	1	2	3	4	5	6	7	8	9	10	11
Afterno on	1	2	3	4	5	6	7	8	9	10	11
Night	1	2	3	4	5	6	7	8	9	10	11

8.2 Impact of Bangabandhu Bridge in poverty alleviation (BRAC model in measuring the poverty index) (Put tick where applicable)

8.2.1	Three sources of income within 1 year in every household	Yes=1	No=2
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8.2.2	Arrangement for taking meal twice a day	Yes=1	No=2
8.2.3	Arrangement for sanitary-sewerage and pure drinking water	Yes=1	No=2
8.2.4	Having minimum 10 ducks, hens, pigeons, Koel farm	Yes=1	No=2
8.2.5	Farm of vegetables and fruits in household	Yes=1	No=2
8.2.6	Types of households	Pucca=1, Made by tin=2, Kancha=3	

8.3 Impact of Bangabandhu Bridge in poverty alleviation (UNDP model in measuring the poverty index) (Put tick where applicable)

	Variable/Index	Yes=1	No=2
a)	Education		
8.3.1	Did not complete five years of school		
8.3.2	Children of school-going age did not participate in school		
b)	Health		
8.3.3	One family member suffers from malnutrition		
8.3.4	One or more children of family dies		
c)	Living standard		
8.3.5	Electricity		
8.3.6	Safe drinking water		
8.3.7	Sanitation system		
8.3.8	Dirty home yard		
8.3.9	Use fuel made by cow dung at household level		
8.3.10	Cycle, van and motor cycle are the vehicle of household		

8.3.11	Use of television, radio, refrigerator, and electronic equipment household		
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9. Information regarding birth, death, marriage and family planning (Put tick where applicable)

9.1	Whether birth is registered?	Yes=1	No=2
9.2	Whether death is registered?	Yes=1	No=2
9.3	Whether marriage is registered?	Yes=1	No=2
9.4	Which type of marriage system is more practiced?	Single Marriage=1	Polygamy=2
9.5	Information regarding child marriage	Very highly happened=1, Highly happened=2, Average=3, Not at all happened=4	
9.6	Whether do you use family planning method?	Yes=1	No=2
If yes, what kind of method do you take?			

10. Migration and social mobility (Put tick where applicable)

10.1	How long are you living in this area with your family?	1=From the beginning of the project, 2=3-10 years, 3=10-15 years, 4= 15-20 years, 5= 20-25 years, 6= Since father's generation	
10.2	Have you been migrated due to Bangabandhu Bridge Project?	Yes=1	No=2
10.3	Have your occupation been changed due to migration?	Yes=1, No=2	
10.3.1	If yes, what kind of occupation?	Before	At present
		Agriculture=1, Household work=2, Agricultural laborer=3, Non-agricultural laborer=4,	Agriculture=1, Household work=2, Agricultural laborer=3, Non-agricultural laborer=4,

		Employee=5, Bamboo/cane work=6, Construction worker=7, Fisherman=8, Boatman=9, Blacksmith=10, Cooly=11, Rickshaw puller=12, Carpenter=13, Small business=14, Unemployed=15, Retired=16, Unable to work=17, Hair dressing/Saloon=18, Leather business=19, Sewing=21, Others (Specify)=22	Employee=5, Bamboo/cane work=6, Construction worker=7, Fisherman=8, Boatman=9, Blacksmith=10, Cooly=11, Rickshaw puller=12, Carpenter=13, Small business=14, Unemployed=15, Retired=16, Unable to work=17, Hair dressing/Saloon=18, Leather business=19, Sewing=21, Others (Specify)=22	
10.3.2	If no, why?			
10.4	Please say about the level of your satisfaction if your previous occupation is changed.	Highly satisfied=1, Satisfied=2, Average=3, Dissatisfied=4, Not satisfies at all=5, No comments=6, Occupation has not been changed=7		
10.5	Whether you have migrant members in your family?	Yes=1, No=2		
10.6	If yes, mention the number, types and occupation of migrants			
Number of Migrants	Place of internal migration	Occupation	Place of International migration	Occupation
Male----- Female	1= Here and there 2= In Dhaka 3= Other Region	Day laborer=1, Hawker=2, Rickshaw/van puller=3, Bus driver/helper=4, Garment workers=5, Business=6, Work in industry/factory=7, Hotel worker=8, Govt. job=9, Others (Specify)=10	Country----- -----	Hotel worker=1, Day laborer=2, Hawker=3, Bus driver/helper=4, Garment worker=5, Business=6, Work in factory/industry=7, Govt. job=8, Private job=10, Others(Specify)=11

10.7 Causes of migration			
Pull factors		Push factors	
Before	At present	Before	At present

11. Training and Skill (Put tick where applicable)		
11.1	Did you/any member of your family get any training on income generation?	Yes=1, No=2
11.2	If yes, which type of training have you received?	
11.3	Have you been benefitted from that training?	Much more=1, More=2, Average=3, Less=4, No benefit=5
11.4	What type of training institutions are in your area?	Technical training institution=1, Computer training center=2, Foreign workers training center=3, Handicraft's training center=4, Animal husbandry training/sewing training=5, No training center=6, Others (specify)=7

12. What types of crime are committed in your area? (Put tick, where applicable)

Types of crime	Cause	Before	At present
		Much more=1, More=2, Average=3, Less=4,	(Much more=1, More=2, Average=3,

		Much less=5	Less=4, Much less=5
Increase the addiction related products=1			
Consuming drugs=2			
Gambling=3			
Women oppression=4			
Snatching, stealing and robbery=5			
Others (specify)=6			

13. Positive impact of Bangabandhu Bridge on social sectors (Put tick where applicable)

Types of positive impact	Degree of supporting the positive impact					No comments
	Strongly Agree	Agree	Some what agree	Somewhat disagree	Strongly disagree	
Comprehensive advancement has been brought in education sector	1	2	3	4	5	6
Health service became available at the people's door	1	2	3	4	5	6
Increased the Percentage of getting child and mother service	1	2	3	4	5	6
Infrastructural changes bring comfort and diversity in people's livelihood	1	2	3	4	5	6

Road communication has increased	1	2	3	4	5	6
Social and cultural bondage has been strengthened	1	2	3	4	5	6
Professional training facilities has been increased	1	2	3	4	5	6
Income of changed occupation has been increased	1	2	3	4	5	6
Opportunities of modern livelihood has been increased	1	2	3	4	5	6
Social dignity has been increased	1	2	3	4	5	6
Social mobility has been increased	1	2	3	4	5	6
Mobility of movement has been increased	1	2	3	4	5	6
Opportunity of developed livelihood has been created through co-operatives association	1	2	3	4	5	6
Created the scope of planned housing facilities	1	2	3	4	5	6
Decreased child marriage	1	2	3	4	5	6
Increase security of women movement	1	2	3	4	5	6
Increased the freedom of expression	1	2	3	4	5	6
Level of social order has increased	1	2	3	4	5	6
Bangabandhu Bridge reduces our poverty	1	2	3	4	5	6

Satisfactory allowances received as govt. compensation	1	2	3	4	5	6
Increased the facilities of loan from Government and NGOs	1	2	3	4	5	6
Ensure the allocation of plot for housing facilities without interferences	1	2	3	4	5	6
Increased government's positive concern	1	2	3	4	5	6

14. Information related to the impact of environment and ecology due to the Bangabandhu Bridge Project

14.1 Please say about the environmental and ecological changes you have noticed in your area due to Bangabandhu Bridge Project

Sectors	Positive Changes	Negative changes
Fisheries		
Marshland/river		
Forest/Trees and plants		
Bio-diversity (animals and birds)		
Loss of homestead		
Environmental quality		
Agriculture		
Others (Specify)		

14.2 Whether occurrences of natural disasters and magnitude of disaster have increased in your area?

Yes=1

No=1

If yes, please give your opinion regarding the following natural disasters (Use code where applicable)

Name of disasters	Number	Intensity Increased much=1, Increased=2 Moderate=3, Like before=4, Increased Low=5	Types of steps undertaken	Which organization (in case of taken steps)
Flood				
River erosion				
Draught				
Others (specify)				

14.3 What sort of losses your family members have to face in the last 5 years due to natural disaster? (Multiple answers are acceptable)

Types of losses (Put tick where applicable)	Estimated monetary loss (Total in Taka)
Infrastructural loss in building house=1	
Reduction of land=2	
Loss of income=3	
Decrease of homestead land=4	
Lack of pure drinking water=5	
Loss of crops=6	
Livestock loss=7	
Ill health/ intensity of diseases has been increased=8	

Loss of employment=9	
Injury=10	
Food scarcity=11	
Others (Specify)= 12.....	
Total	

14.4 Strategies in combating environment, natural disaster, climate change and vulnerabilities (Use tick where applicable)

How do you get forecast of natural disaster? (Multiple answer)	Radio=1, TV=2, Newspapers=3, Friends=4, Neighbors=5 Mobile phone=6, social medias=7, Others (Specify)=8
What kinds of climate change impacts found in your locality? (Multiple answer)	Decline of river water level=1. Change of river water flows=2, Drought=3, Over flooding=4, Cyclone=5, Reduction of agricultural production=6, Reduction of wild animals=7, Crops damage=8, Increase contamination=9, Increase in dust and filth=10, Others (Specify)=11
Is ther any environmental impact due to Bangabandhu Bridge Project	Yes=1, No=2
If yes, what kinds of impacts?	No public toilet=1, Heavy dust=2, Increase diseases=3, Lack of residential places=4

14.5 What kinds of steps are taken to face calamities in your locality and whether these are adequate? (May be multiple answer) (Put tick where applicable)

Steps	Types of adequacies
-------	---------------------

		Adequate	Moderate=2	Not adequate=3	No steps=4
Government steps	Food distribution	1	2	3	4
	Distribution of house building equipment	1	2	3	4
	Arrangement of pure water	1	2	3	4
	Distribution of crop seeds	1	2	3	4
	Construction of embankment	1	2	3	4
	Tree plantation program	1	2	3	4
	Awareness raising	1	2	3	4
Non-governmental steps	Food distribution	1	2	3	4
	Distribution of house building equipment	1	2	3	4
	Arrangement of pure water	1	2	3	4
	Distribution of crop seeds	1	2	3	4
	Construction of embankment	1	2	3	4
	Tree plantation program	1	2	3	4
	Awareness	1	2	3	4

	raising				
Local steps	Food distribution	1	2	3	4
	Distribution of house building equipment	1	2	3	4
	Arrangement of pure water	1	2	3	4
	Distribution of crop seeds	1	2	3	4
	Construction of embankment	1	2	3	4
	Tree plantation program	1	2	3	4
	Awareness raising	1	2	3	4

Thanks for giving valuable information.

2. IN-DEPTH CASE STUDY GUIDE

2.1. CASE STUDY GUIDELINE -1 (RICH, MIDDLE CLASS, POOR AND ULTRA-POOR)

Socio-Economic Impact Evaluation Study of Bangabandhu Bridge



**Bangabandhu Multipurpose Bridge
Project, Bridge Bhaban, Dhaka
and
Institute of Social Welfare and
Research, University of Dhaka**



[The Present study is being conducted by the Institute of Social Welfare and Research; University of Dhaka financed by the Bangabandhu Multipurpose Bridge Project. The collected information will be used for research purpose and confidentiality will be strictly maintained]

Household (Rich, Middleclass, Poor, Ultra Poor)

Settlement Area

Introduction of Respondent

Name	Address	Phone No.

1. Socio-economic and Demographic data of the respondent and his family

- Personal information of respondent

Name	Age (Years)	Level of Education	Marital Status	Present occupation	Previous occupation	Monthly Income	Monthly Expenditure	Monthly Savings (Taka)

b) Information of respondents' family

Sl.	Name	Relationship with respondent	Age (Years)	Level of education	Marital Status	Present occupation	Previous occupation	Monthly Income	Monthly Expenditure	Monthly Savings)
	Total									

2. Social Impact of Bridge

- A) Impact of establishment of habitat (nature of house ownership, profit/loss due to rehabilitation, available citizen amenities such as electricity, gas facilities, sewerage system, roads etc.)

- b) Impact on Education sector (Infrastructural development, adequacy of educational materials, admission in school and drop out, education friendly environment and quality of education, management of educational institutions)

- c) Neighborhood and kinship pattern (relationship between neighbor and relatives)

- d) Recreation and leisure (Sports, enjoying leisure, celebration of religious and social programs and festivals for instances, marriage ceremony, birthday party, Eid/Puja, death anniversary etc.)

- e) Social Problems (Drug addiction, child marriage, divorce, crime, social conflict etc.)

3. Health related impact

Health services, diseases and treatment facilities, midwife services, services for mother-child, outbreak of diseases (such as-Covid-19 and others) and death.

4. Economic Impact

- a) Property ownership related (Quantity and types of movable/immovable property, setting up of new industries and their management system etc.)
- b) Employment status and occupational change
- c) Income, savings, investment, and loan/credit
- d) Economic activities for instances agriculture (Cultivating, livestock rearing, fishing etc.), trading and business, women's participation in economic activities
- e) Infrastructural impact for instances road construction, changes in communication and transport system, adequacy in hat/market system, supply of gas and electricity etc.
- f) Migration (Internal and external) and social mobility

5. Ecological and environmental impact

Natural and environmental vulnerabilities (for instances- river erosion, emergence of char, decrease of number of trees, increase warming, lessen the arable land, reduction of river water flows and impact on public lives)

Thanks for your co-operation

Name and Phone no. of data collector	
Signature of data collector	
Date of collecting information	

2.2 CASE STUDY GUIDELINE -2 (ENTREPRENEURS- EXPORT PROCESSING ZONE (EPZ) & SPECIAL ECONOMIC ZONE)

Socio-Economic Impact Evaluation Study of Bangabandhu Bridge



**Bangabandhu Multipurpose Bridge
Project, Bridge Bhaban, Dhaka
and
Institute of Social Welfare and
Research, University of Dhaka**



[The Present study is being conducted by the Institute of Social Welfare and Research; University of Dhaka financed by the Bangabandhu Multipurpose Bridge Project. The collected information will be used for research purpose and confidentiality will be strictly maintained]

Entrepreneurs- Export Processing Zone (EPZ) & Special Economic Zone

Introduction of the Respondents

Name: Address: occupation/ designation: Mobile No. :	
--	--

1. Establishment, manpower and management (Where located, year of establishment, number of establishments and administered by whom)

2. Activities of SEZ/EPZ (Types of products, local and non-local goods, quantity of product and cost, processing and selling system)
3. Opportunities of employment and income (employment of local and non-local people, women's participation in employment, child labor etc.)
4. Impact on ecology and environment (increase warming, living suitability and non-suitability, comparison between previous and present condition of negative impact of wastage of industry and EPZ/SEZ in people's life)
5. Health related impact (Diseases, health complex and health services)
6. Impact on propensity of crime in society (Drug addiction, sexual crime, violence, juvenile gang etc.)
7. Role of EPZ/SEZ in national income (Alleviation of unemployment, economic development and poverty alleviation)

Thanks for your cooperation

Name and phone No. of data collector	
Signature of data collector	
Date of data collection	

2.3 CASE STUDY GUIDELINE -3 (ENTREPRENEURS- INDUSTRY AND EMPLOYMENT)

Socio-Economic Impact Evaluation Study of Bangabandhu Bridge



**Bangabandhu Multipurpose Bridge
Project, Bridge Bhaban, Dhaka
and
Institute of Social Welfare and
Research, University of Dhaka
Entrepreneurs- Industry and Employment**



[The Present study is being conducted by the Institute of Social Welfare and Research; University of Dhaka financed by the Bangabandhu Multipurpose Bridge Project. The collected information will be used for research purpose and confidentiality will be strictly maintained]

Introduction of Respondent

Name:	
Address:	
Occupation/Designation:	
Mobile No. :	

1. Industrialization and Employment (What types of industries are running at present, involvement of local people in industries, Funding and administering)
2. Types of Industries (small, medium, large, name of the industry, location, manpower)
3. Ownership of industries (single -joint) and entrepreneur, partnership, income expenditure, profit-loss

4. Producing goods and marketing (types of products, processing and export and local marketing)
5. Opportunities of employment generation and poverty eradication (employment opportunities for women, men and youth, increase the income of local people)
6. Ecological and environmental impact due to industrialization (river water pollution, cleanliness, waste drainage system, air warming)
7. Problems of industrial area (child labor, labor unrest, dispute between employer - employee, illegal sexual behavior)

Thanks for your cooperation

Name and phone no. of data collector	
Signature of data collector	
Date of data collection	

2.4 CASE STUDY GUIDE -4 (MARKET)

Socio-Economic Impact Evaluation Study of Bangabandhu Bridge



**Bangabandhu Multipurpose Bridge
Project, Bridge Bhaban, Dhaka
and
Institute of Social Welfare and
Research, University of Dhaka
Market**



[The Present study is being conducted by the Institute of Social Welfare and Research; University of Dhaka financed by the Bangabandhu Multipurpose Bridge Project. The collected information will be used for research purpose and confidentiality will be strictly maintained]

Introduction of respondent

Name: Address: Occupation/Designation: Mobile No. :	
--	--

1. Nature, time schedule, number and types of market, hat day and daily purchase
2. Types of ownership of business institutions (run by self, jointly or employee)
3. Marketing and transaction of locally produced goods
4. Relation of criminal activities with hat-market (stealing, snatching, pick pocketing, selling adulterant, gambling, extortion, buying and selling goods by mixing formalin)

5. Information regarding buyers/customers and sellers (number of customers and sellers, customer's occupation and locality)
6. What kinds of facilities the markets have (toilets, sewerage system, water, communication with main road)
7. What kinds of impact are existing due to Bangabandhu Bridge project (Banking, electricity, telephone, courier service post-office)?
8. Communication and vehicle related information (Rickshaw, bicycle, tempu, car, bus, pickup, auto rickshaw and others)

Thanks for your cooperation

Name and phone No. of data collector	
Signature of data collectors	
Date of data collection	

3. FOCUS GROUP DISCUSSION GUIDE

3.1 GUIDELINE FOR FOCUS GROUP DISCUSSION- 1 (EPZ/SEZ/INDUSTRIAL SET UP/BUSINESS)



Guideline for Focus Group Discussion (EPZ/SEZ/Industrial Set up/Business)



**Title of the Research: Socio-Economic Impact Evaluation Study of
Bangabandhu Bridge**

Conducted by: Institute of Social Welfare and Research, University of Dhaka

Funded by: Bangladesh Bridge Authority

**[The collected data will be used only for the research purpose and all
kind of confidentiality will be maintained.]**

Information regarding focus group discussion:

Name of the industry:.....

Address :.....

Year of establishment: :.....

Number of labor :.....

Area of land :.....

Introduction of participants

Sl.	Name	Age	sex	Educational qualificatioin	occupation

1. Mention the development that occur in following sectors due to construction of Bangabondhu Bridge in your locality.

- a) Investment sector
- b) Agriculture
- c) Rural industry
- d) Employment
- e) Mobility
- f) Business
- g) Availability of raw materials
- h) Marketing of produced commodities
- i) Price of the land
- j) Activities of financial organization (NGO)
- k) Education
- l) Overall communication system
- m) Poverty alleviation

2. What kind of changes would you notice in agricultural production, marketing and other aspects during this year?

a) Investment sector

Types	Increased more	Moderately increased	Increased less	No changes
investment in trade				

investment in housing				
investment in agriculture				
investment in income generating program				
investment in vehicle business				
investment in banking sector				
investment in small enterprise				
Investment in service sector				
Others				

b) Agriculture

Types	More Increased	Moderately increased	Less increased	No change
diversity in crops				
irrigation facilities				
agricultural work				
production				
marketing				
Agricultural income				
Crop intensity				
practicing high				

productive crops				
availability of quality seeds				

c) Rural Industry

Types	more increased	moderately increased	less increased	no change
number of agriculture based Industry				
number of non-agriculture based industry				

d) Employment Generation

Types	More Increased	Moderately increased	Less increased	No change
Farm sector				
Non-farm sector				
Transport				
Self-employment				
Government service				
Non-government service				
others				

e) Effect of mobility

Types	More	Moderately	Less	No change
-------	------	------------	------	-----------

	Increased	increased	increased	
Diversified jobs				
Flow of migrants workers				
Flow of external migrants workers				
Inhabitants working in abroad				

f) business

Types	More Increased	Moderately increased	Less increased	No change
Diversification in business				
Small business				
Medium business				
Small enterprise				
Volume of trade				
Increase the working hour of business				
Increase the number of customer				

g) Availability of raw materials

Types	More Increased	Moderately increased	Less increased	No change
Agricultural raw materials				
Raw materials for				

construction work				
Raw materials for non-farm				
others				

h) Marketing of produced goods

Types	More Increased	Moderately increased	Less increased	No change
Communication with business at distance				
Communication with business of moderate distance				
More consumers				
Availability of entering big market				
Others				

i) Price of land

Types	Increased more	Increased moderately	less increased	No change
Price of the land beside road				
Price of the land distant from road				

j) Activities of economic agency (NGO)

Types	More Increased	Moderately increased	Less increased	No change
Number of newly established agencies				
Savings attitudes among				

people				
Number of economic transaction				
Range of concerened/included area				
Number of beneficieries				

k) Comparative scenario of toll of Bridge and fare of ferry

	Transport for goods			Bus		Car/light Transport/Motorbike	
	Light	Medium	Heavy	Small	Big	Motorcycle	Light Transport
Toll of Bangabondhu Bridge							
Fare of Ferry	705.50			1347		29	291

l) Overall Communication System

Types	More Increased	Moderately increased	Less increased	No change
Reduce the cost of Marketing				
Decline the travel time				
Decrease the expenditure of travelling		0		
VOC				
Overall transport cost				

m) Overall poverty limit

Types	100%	75%	50%	No change
People's Purchasing capacity				
Increase food security				

Increase health services				
Increase the ownership of overall asset				
Increase gross living standard				

n) Gap between the regions of East and West

Types	100%	75%	50%	No Change
From economic perspective				
From social perspective				
From cultural view				
Others				

o) Strategic communication development with throughout the country

Types	100%	75%	50%	No change
Highly satisfied				
Satisfied				
Moderately satisfied				
Not satisfied				

p) Trade, economy, and social development of inter region

Types	100%	75%	50%	No change
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Highly satisfied				
Satisfied				
Moderately satisfied				
Not satisfied				

q) Development of transport system

Types	100%	75%	50%	No change
Highly satisfied				
Satisfied				
Moderately satisfied				
Not satisfied				

r) Development of telecommunication and other communication system

Types	100%	75%	50%	No change
Highly satisfied				
Satisfied				
Moderately satisfied				
Not satisfied				

s) Improved transport system

Types	100%	75%	50%	No change
Highly satisfied				
Satisfied				

Moderately satisfied				
Not satisfied				

3. Your opinion regarding existing challenges in industrial setting.

Types	Increased more	Moderately increased	Increased less	No change
Paucity of capital				
Scarcity of customers				
Serious competition				
Insecurity				
Inadequate loan facilities				
Storage difficulties				
Adulterant goods				
Extortion				
Lack of monitoring				
Unawareness				
Internal conflict among businessmen				

4. Please mention your recommendations for combating challenges

- Cooperation between GOs and NGOs
- Opportunities for alternative income
- New housing facilities
- Rehabilitation
- Education and Health system
- Communication
- Skill development
- Employment
- Generation of Entrepreneur
- Export manpower
- Small handicrafts
- Development of industries and business
- Park and recreation facilities

5. Please speak about the environmental and ecological effect of rising industrial factories due to the construction of Bangabandhu Bridge

Types	Increased More	Increased moderately	Increased less	No change
Industrial waste management				
Air pollution				
Water pollution				
Improvement of overall environment				
Nature of Natural Environment				
Sewerage System				
Natural Calamities				

THANKS FOR YOUR COOPERATION

NAME OF MODERATOR	
SIGNATURE OF MODERATOR	
DATE	

NAME OF RAPPORTEUR	
SIGNATURE OF RAPPORTEUR	
DATE	

3.2 FOCUS GROUP DISCUSSION GUIDE- 2 (CIVIL SOCIETY)



Guideline for Focus Group Discussion (Civil Society)



**Title of the Research: Socio-Economic Impact Evaluation Study of
Bangabandhu Bridge**

**Conducted by: Institute of Social Welfare and Research, University of
Dhaka**

Funded by: Bangladesh Bridge Authority

**[The collected data will be used only for the research purpose and all kind of
confidentiality will be maintained.]**

Information regarding focus group discussion:

Name of the Project area:-----

Union: -----

Thana/Upazilla: -----

District: -----

Date: -----

Information regarding focus group discussion:

Name	Age	Educational qualification	Occupation

(1) What do you think that in which aspect the people of Bangabandhu Bridge area were benefitted or lost?

(a) Economic Aspect

Positive	Negative
Increase yearly income, employment generation, being owner of land /house, being the owner of non-land property, become self-reliant, starting new business, become the owner of livestock, become the owner of industries or factories, getting benefit of market, avail house rent, increase the wage of workers, changes in forms of business and trade, rise in transaction, creation of economic zones etc.	Unemployment/seasonal unemployment, increase poverty, rise of child labor, diminish land ownership/ landlessness, loss in business; enhance competition in business, business done by the other region's people, increase dependency of unskilled and illiterate people.

(b) Regarding poverty eradication

Positive	Negative
Meeting basic needs, no shortage of food, increase the income of family members, rise the number of income earners, increase savings, meeting the expenditure of education and health.	Inadequacy in meeting basic needs, cannot wear new clothes, increase hunger and destituteness, indebted, fragile housing and unhealthy environment, increase begging.

(c) Social Aspect

Positive	Negative
----------	----------

Increase the literacy rate (school/college), declining the rate of child marriage, registration of birth-death-marriage, migration, increase social values, women status and empowerment, spread of women education, inclusion in new social group, getting good neighbor, kinship and increase the living standard without conflict rather with various facilities.	Family disorganization, declining social relationship, losing relationship with relatives, entering into illiberal social life, mistrust of people, family/social disorder, (women repression, dowry), increase crime, lessen social harmony, diminishing the kinship than previous time.
--	---

(d) Health and Psychological Aspect:

Positive	Negative
Development of health service facilities, declining rate of maternal and child mortality, diminishing the outbreak of contagious (Corona, HIV/AIDs, Polio) and non-contagious diseases (Diabetes, cancer, breathing problem.) availability of hospitals and doctors, facilities of testing for diagnosis of diseases, getting medicines and vaccines, satisfactory life standard, supply of safe drinking water, wastage management, use of sanitary latrines (kancha/semi-pucca/pucca).	Outbreak of diseases related to air pollution, (asthma, heart attack, breathing related), frustration, anxieties, loneliness, non-cooperation, and malice-hostility uncertain life, presence of comparatively less facilities

(e) Environment and climate change aspect:

Positive	Negative
Climate resilience, types of natural environment, weather (humidity) building environment friendly roads, increase the number of rivers, ponds, lakes, establishing dams over river with less cost (with grass/without grass), concrete made embankment, sewerage system for controlling floods, setting up shelter for combating natural disasters	Damage of establishment of Bridge, erode of road, loss of dam due to flood, destruction of culvert and bridge, create new natural disasters, new natural calamities, water/air/sound pollution, harmful gas emission, increase occurrences of accidents, decline the fish hatching, non-

	availability of fish,
--	-----------------------

(f) Infrastructure development and vehicles aspect:

Positive	Negative
Establishment of housing society, setting up community center, development of internal roads, supply of electricity, increase the number of vehicles (bus, truck, private car, auto rickshaw, van, CNG) , increase the usage of vehicles by the passengers, transportation of goods become easy, reduce transportation cost, lessen the travelling or journey time, system of tourism and rise of the number of tourists, decline the toll fee	Increase the traffic jam, ruin the working hour, increase the air pollution, increase the number accidents, repairment cost of vehicles is increased

(g) Market and industry/factory aspect

Positive	Negative
Increase the number of industries and factories, (small/medium/large), and their nature, increase the number of market-shops, availability of different goods/commodities, increase the number of buyers and sellers, rise the price of land, lease the market, increase the number of entrepreneur.	decline the demand of market, increase the tyranny of linking man, increase the market competition, pollution of environment (water/ air/ soil)
<p>Condition of Agricultural work:</p> <ul style="list-style-type: none"> • Farming (vegetation/livestock rearing) fish cultivation • Non-farming (IT/handicrafts/handloom/Potter) <p>Increase the price of growing products, marketing facilities, transport facilities of grown products, increase the number of customers, treatment of cattle, marketing system for cattle</p>	Outbreak of cattle's diseases

(2) Please say about security/safety condition of Bangabandhu Bridge area-

Women safety	Before	After
Law and order situation		
Social violence and repression (women oppression acid throwing/eve teasing/dowry)		
Role of law enforcement agencies		
Role of social group		
Crime and crime control system		
Role of local chairman/ member		
Role of elected local political leader		
Juvenile delinquency (juvenile/youth gang/drug addiction/cyber bullying)		
Reasons behind others crime		

Please talk about women empowerment in Bangabandhu Bridge area

Decision making capability in family and social environment, skill, working capacity and self- dependence, role in increasing income and family expenditure, child marriage, decrease the incident of dowry and women oppression, training and receiving credits, participating in self employment, freedom of mobility, freedom of expression, girl child education	
--	--

(4) Please say about the impact of Bangabandhu Bridge on transport and communication system

Development of roads (Internal, inter-district/ highway), width of roads, employment opportunities in vehicles, decline the cost and time of journey, establish the communication with other districts and with Dhaka city	
--	--

(5) Please speak about the impact of Bangabandhu bridge on improving living standard of people

Changing occupation, food habits, social dignity, registration of marriage/divorce, registration of birth and death, census, social functions, people's expenditure, poverty eradication, increase the labor wage, generation of employment opportunity, production of new crops, rise of farms, decline rate of poverty.	
---	--

(6) What more steps could be taken for improving the living standard of Bangabandhu Bridge area?

Economic	
Social	
Education	
Health and treatment	
Recreation	
Infrastructural and vehicles	
Environment and climate change	
Others	

(THANKS FOR YOUR COOPERATION)

NAME OF THE MODERATOR	
SIGNATURE OF MODERATOR	
DATE	

NAME OF THE RAPPORTEUR	
SIGNATURE OF RAPPORTEUR	
DATE	

3.3 FOCUS GROUP DISCUSSION GUIDE- 3 (SETTLEMENT AREA)



Focus Group Discussion Guide (Settlement Area)



Title of the Research: Socio-Economic Impact Evaluation Study of Bangabandhu Bridge

Conducted by: Institute of Social Welfare and Research, University of Dhaka

Funded by: Bangladesh Bridge Authority

[The collected data will be used only for the research purpose and all kind of confidentiality will be maintained.]

Information regarding focus group discussion:

Name of the Project area:-----

Union: -----

Thana/Upazilla: -----

District: -----

Date

Introduction and brief description of participants

Name	Age	Educational Qualification	Occupation

(1) What do you think that in which aspect, the people of Bangabandhu bridge project area were benefitted or lost?

Positive	Adversities/difficulties/hazardous situation
<p>Generation of new work</p> <p>Production of crops and changes in marketing</p> <p>Increase the relationship of inhabitants of project area</p> <p>Attain conflict less social life</p> <p>Expansion of education</p> <p>Improved health system</p> <p>Increase the facilities of citizen amenities (supply of safe drinking water, sewerage system, setting up of educational and religious institutions)</p> <p>Changes in size of family</p> <p>Migration</p>	<p>Decline the social relationship</p> <p>Loss of relationship with relatives</p> <p>Access to illiberal social life</p> <p>Mistrust</p> <p>Family/social disorganization</p> <p>Increase social crime among youth</p>

(2) Please speak about the impact of Bangabandhu Bridge on generation of employment and economic activities in alleviating poverty-

Positive	Negative
<p>Work opportunity in non-agricultural sector</p> <p>Increase income and expenditure</p> <p>Decline the dependency on agriculture</p> <p>Changes in previous occupation</p> <p>Modernization in agriculture</p> <p>Changes in agricultural production</p> <p>Cultivation of less risky but profitable product</p> <p>Easy marketing of produced goods</p> <p>Increase/decrease savings and investment</p> <p>Rising price of land</p> <p>Increase the number of van and rickshaw</p> <p>Increase/decrease self-confidence</p> <p>Rise/decline living standard than previous time</p>	<p>Change in types of labor</p> <p>Expansion of bank, insurance and business</p> <p>Increase the supply of money</p> <p>Increase small business and agricultural farm</p> <p>Being the owner of land/house</p> <p>Arrangement of training</p>

(3) Please say about the impact on industrialization and medium industries because of implementing Bangabandhu Bridge

Positive	Negative

<p>Nature of work has been changed</p> <p>The process of industrialization has been hindered/accelerated</p> <p>How does this bridge contribute into industrialization in this country?</p> <p>(Establishing large, small, and medium industries, setting up of agriculture based and dairy industries)</p> <p>Increase the quantity of produced goods</p> <p>Creation of new industrial entrepreneur</p> <p>Establishment of industrial institution and infrastructure</p> <p>Setting up of cold storages</p> <p>Easy processing of agricultural product</p> <p>Become the source of tourism, recreation and inter-regional business</p> <p>Process of urbanization</p>	<p>Reduce handloom industry</p> <p>Lack of skill</p> <p>Don't cope up with modern industry</p> <p>Problems in product marketing</p>
--	---

(4) Please say about the impact of Bangabandhu bridge on environment-

<p>Occurrence of environmental degradation</p> <p>Decline the number of waterbody and vegetation</p> <p>Increase the building and factories</p> <p>Increase carbon emission</p> <p>Decrease the power of carbon absorption</p> <p>Emergence of new char in rivers</p> <p>Rise of surface temperature</p>
--

Decline the quality of surface and ground water
Change in flows of river
Ruin the balance of environment
Loss in bio-diversity
Health risk and increase in contagious diseases and sound pollution

(5) Please say about the security situation of Bangabandhu bridge project area

Security of women and adolescents
Law and order situation
Whether thana and patrolling of police is increased?
Role of law enforcement agencies in project area
kinship based controlling system
Whether village shalishi is conducted?
Crime and crime control system
Role of chairman/member
Role of elected local political leaders

(6) Please say about the women empowerment of project area

Decision making capacity in family and social atmosphere
Skill, capacity of work and self-dependence
Role in increasing income and family expenditure
Child marriage, dowry, and women oppression
Increase women mobility and empowerment
Increase the marital age and the rate of girls' education

Increase women employment
Women participation in family planning programs
Number of women entrepreneurs
Expected life expectancy of women
Maternal services
Maternal mortality
Training and receiving credit
Participation in self-employment
Freedom of mobility and expressing opinion

(7) Please say about the role of GOs, NGOs and local self-government in improving overall condition and combating adversity

Role of Government: Infrastructural development, house construction, free education, training, and health services, combating disaster and preventing crime
Role of non-government agencies: Training, providing credit, assistances in self-employment, public health, involving people in development
Role of Local government: Shalishi system in dispute resolution, youth development, assistance in combating disaster, initiative for resolution of social problems, organize people in development

(8) What more programs could be initiated or undertaken for the development of the life and livelihood of people of project area?

Economic	Employment generation, marketing of goods, providing credit/loan, initiating self-employment project, preventing women and child labor, opportunity of training or work for youth, modern cultivation and opportunity for alternative income
----------	--

Social	Stable family, Child marriage, formation of cooperative, following sound politics and social values
Education	Increase educational institution, women education, making children school oriented, technical education, education allowances
Health / Treatment	Ensuring primary education, initiating specialized medical center, providing vaccines for children, and vitamin capsule, cleanliness, preventing malnutrition, changing food habits, establishing gymnasium, expansion of family planning program,
Recreation	Building Park, celebration of festivals, cultural competition, preparing playground, Sports competitions, song party/gathering, drama
Infrastructural	Reformation of roads, establishing community center, continuous supply of electricity, disaster shelter center, establishing market and colleges
Others	Say specifically

Thanks for your cooperation

Name of the moderator	
Signature of moderator	
Date	

Name of the rapporteur	
Signature of the rapporteur	
Date	

3.4 FOCUS GROUP DISCUSSION GUIDE- 4 (OWNERS OF SMALL, MEDIUM AND LARGE SHOPS))



Focus Group Discussion Guide (Owner of Small, Medium & Large Shops)



Title of the Research: Socio-Economic Impact Evaluation Study of Bangabandhu Bridge

Conducted by: Institute of Social Welfare and Research, University of Dhaka

Funded by: Bangladesh Bridge Authority

[The collected data will be used only for the research purpose and all kind of confidentiality will be maintained.]

Information regarding focus group discussion:

Name of the Project area: -----

Union: -----

Thana/Upazilla: -----

District: -----

Date: -----

Introduction and brief description of the participant:

Name	Age	Sex	Educational qualification	Occupation

1. What do you think about the changes in the trend and nature of business and economic activities due to the construction of Bangabandhu Bridge?
(Opportunity of employment, increase income, rapid industrialization, bank-insurance, expansion of new trades, availability of goods, quality products, satisfaction of the consumers, carrying goods quickly, just price, easy marketing of goods, setting up EPZ, expansion of industries, new markets, speed up in trades, handicrafts, cattle, fishing, livestock, social forestry, self-dependence, changes in living standard)
2. Which types of shops are established in market place and what do you think of its reasons? (Small, medium, large infrastructure, demand of consumers, availability of goods, scarcity of capital, GO/NGO initiatives, just price, infrastructural facilities, transport facilities)
3. What kind of impact have you noticed on market system specially on availability of different commodities and the price of them due to the construction of Bangabandhu bridge? (Agricultural production/goods, expansion of agriculture-based market, cold storages, increase consumption, competition, facilities of market infrastructure, quick carrying of goods, transport cost)
4. To what extent the changes took place in supplying labor in market and wage structure?
(Demand and availability of workers, labor dynamics, wage, child labor, awareness of the workers, industrial relations, women workers)
5. What do you think about the overall market environment? (Relationship between buyers-sellers, law and order situations, security, water, gas, electricity, sewerage system, consumers rights, infrastructure,)
6. What kind of impact has been brought about on employment of people due to the construction of Bangabandhu Bridge? (Child labor, entrepreneur/ women entrepreneur, employment, unemployment, self-employment, human resource development, employment in non-institutional sector)
7. To what extent the development of living standard of employers/worker related to various kind of business has been attained? (Income, expenditure, consumption, awareness, self-employment, savings, self-esteem, family and social relationship, frustration)
8. How do you evaluate the role of this bridge in creation of the opportunities and environment for business? (Migration, population density, modern facilities, Bank. Insurance, creating consumers, proper market management, transportation of

goods, availability of goods, water, electricity, gas, recreation center, EPZ, entry point of North Bengal)

9. How far and to what extent changes have been taken place in your education and health system due to the construction of this bridge? (New educational institutions, school prone by the children, health service center. Development of communication system, awareness raising, food and nutrition safety, women education, child-mother services)
10. To what extent and how far the bridge does play the role on poverty alleviation of this region? (Expansion of trade and business, industrialization. Marketing of goods, employment creation, development of communication, gas facilities, rise the price of land)
11. What kind of impact has the bridge created on environment and ecology? (Pollution of environment, draught, char, flood, water/river pollution, industrial wastage, air and sound pollution, health hazards/risk, decline the river navigability)
12. Please mention the problems you faced in running trade, business and shop. (Scarcity of capital, paucity of customers, strong competition, insecurity, dearth of loan facilities, difficulties in storages, extortion, lack of monitoring, unawareness, inter conflict among business, proper allocation, infrastructural facilities, gas and electricity)
13. Your recommendation in combating prevailing problems in trade, business and industrialization- (Loan facilities in easy conditions, training without cost, improvement of law-and-order situations, stopping extortion, setting up shops and proper allocation, infrastructural facilities, gas, electricity)
14. Please evaluate the role and cooperation of GO, NGO and local government? (Providing loan, training, infrastructural development, maintaining law and order, establish shops and market dispute resolution, awareness building, expansion of education, women empowerment, band child labor.)
15. What kind of steps could be taken in improving the livelihood pattern of people related with small, medium and large business/industries? (cooperation of GO/NGOs, opportunities for alternative income, new housing facilities, rehabilitation, education and health, communication, skill development, employment, generation of entrepreneurship, exporting manpower, small handicrafts, development of industries, factories and business, park and recreation facilities)

Thanks for your cooperation

Name of the moderator	
Signature of moderator	
Date	
Name of the rapporteur	
Signature of rapporteur	
Date	

4. KEY INFORMANT'S INTERVIEW GUIDE

4.1 KEY INFORMANT'S INTERVIEWS (KIIs) GUIDE FOR SECRETARY, UNION PARISHAD CHAIRMAN

Socio-Economic Impact Evaluation Study of Bangabandhu Bridge

Guideline of Key Informants Interviews (KIIs) Secretary, Union Parishad Chairman

Settlement area

Non-settlement area

Outside of adjacent area

District:.....Upazila:..... Union:.....

[The study team of the Institute of Social Welfare and Research, University of Dhaka is conducting a study entitled: 'Socio-Economic Impact Evaluation Study of Bangabandhu Bridge' funded by the Bangladesh Bridge Authority (Proposal No: 50.01.0000.301.31.001.18-01), the Ministry of Road Transport and Bridges, People's Republic of Bangladesh. The objective of this study is to explore the socioeconomic impact of the Bangabandhu Bridge. This study is only to get the current status/development of the lives and livelihoods of the people, expansion of industries and business and impacts of the environmental and ecology of this bridge. We have selected you a possible KIIs respondent. We would request to give your kind consent and to participate in this study. We would believe that your opinions will give us valuable data for this study that will escort us for suitable policy recommendations. Your name will not be mentioned anywhere and we are committed to maintain the confidentiality of your opinions. Your participation and cooperation is highly appreciated.]

1. Year-wise basic information about your Union Parishad

Basic information types	2020	2019	2018	2017	2016
Total population in Union					
Total live children					
Total death					
Total number of ultra-poor					
Total number of disabled people					
Total primary schools (co-education)					
Total primary schools (boy)					

Total primary schools (girls)					
Total secondary schools (co-education)					
Total Secondary schools (boy)					
Total Secondary schools (girls)					
Total colleges					
Total madrasa					
Total mosques					
Total hat-bazar					
Total number of shops (approximately)					
Total number of big industry					
Total number of medium industry					
Total number of small industry					
Total fertile land					
Total clubs					
Total road (concreate)					
Total road (kacha)					
Total road (kacha)					
Number of NGOs					

2. Year-wise basic number of people under safety net in different categories and freedom fighters' allowance

	2020	2019	2018	2017	2016
Cash transfers					
-Old age allowance people					

-Widowed and Distressed Women Allowance					
-Disabled Allowance					
Conditional cash transfers					
-Primary Education Stipend Programme (formerly Food-for-Education)					
-Stipends for Female Secondary Students					
Public works or training based cash or in kind transfer					
-Rural Maintenance Programme					
-Food-for-Work					
-Vulnerable Group Development (VGD)					
Emergency or seasonal relief					
-Vulnerable Group Feeding (VGF)					
-Gratuitous relief Test Relief					
Number of people under freedom fighters' allowance					

4.2. KEY INFORMANTS INTERVIEWS GUIDE (KIIs) FOR UNO OFFICE

Socio-Economic Impact Evaluation Study of Bangabandhu Bridge

Guideline of Key Informants Interviews (KIIs) UNO Office

Settlement area

Non-settlement area

Outside of adjacent area

District:.....Upazila:.....

[The study team of the Institute of Social Welfare and Research, University of Dhaka is conducting a study entitled: 'Socio-Economic Impact Evaluation Study of Bangabandhu Bridge' funded by the Bangladesh Bridge Authority (Proposal No: 50.01.0000.301.31.001.18-01), the Ministry of Road Transport and Bridges, People's

Republic of Bangladesh. The objective of this study is to explore the socioeconomic impact of the Bangabandhu Bridge. This study is only to get the current status/development of the lives and livelihoods of the people, expansion of industries and business and impacts of the environmental and ecology of this bridge. We have selected you a possible KIIs respondent. We would request to give your kind consent and to participate in this study. We would believe that your opinions will give us valuable data for this study that will escort us for suitable policy recommendations. Your name will not be mentioned anywhere and we are committed to maintain the confidentiality of your opinions. Your participation and cooperation is highly appreciated.]

Please provide basic information about your Upazila in last three years

Basic information types	2020	2019	2018
Road			
Pacca			
Semi pacca			
Katcha road			
Bridge/culvert			
Amount of land			
Net of land			
Khash land			
Deep Tube well			
Swallow tube well			
Hospital			
Family planning centers			
Mosque			
Eidgha			
Mazar			
Mandir			
Pond			
Cattle farm			
Poultry farm			
Sports origination			

Education institutions			
College			
Secondary school			
Primary school			
Orphanage			
Bank			
Insurance			
Cooperative (all types)			
Sports Association			
Cultural organization			
Post Office			
Telephone exchange			
Hat-bazar			
Small & Cottage industries			
Big industries			
Rehabilitation center			
Growth Centre			
Pond			
Fish farm			
Park/Eco Park			
Tourist spot			
Forest			

4.3. KEY INFORMANT'S INTERVIEWS (KIIs) GUIDE FOR EPZ/SEZ/INDUSTRY: SECRETARY: DISTRICT CHAMBER OF COMMERCE & INDUSTRY

Socio-Economic Impact Evaluation Study of Bangabandhu Bridge

Guideline of Key Informants Interviews (KIIs)

EPZ/SEZ/Industry: Secretary: District Chamber of Commerce & Industry

Settlement area

Non-settlement area

Outside of adjacent area

District:.....

[The study team of the Institute of Social Welfare and Research, University of Dhaka is conducting a study entitled: 'Socio-Economic Impact Evaluation Study of Bangabandhu Bridge' funded by the Bangladesh Bridge Authority (Proposal No: 50.01.0000.301.31.001.18-01), the Ministry of Road Transport and Bridges, People's Republic of Bangladesh. The objective of this study is to explore the socioeconomic impact of the Bangabandhu Bridge. This study is only to get the current status/development of the lives and livelihoods of the people, expansion of industries and business and impacts of the environmental and ecology of this bridge. We have selected you a possible KIIs respondent. We would request to give your kind consent and to participate in this study. We would believe that your opinions will give us valuable data for this study that will escort us for suitable policy recommendations. Your name will not be mentioned anywhere and we are committed to maintain the confidentiality of your opinions. Your participation and cooperation is highly appreciated.]

Please provide basic information about the following areas last three years in your District

Basic information	2020	2019	2018
Total EPZ			
Types of EPZ.....			
Total number of SEZ (Special Economic Zone)			
Types of SEZ.....			
Total number of industries:			

-Big			
-Medium			
-Small			
Types of industries.....			
Total investment in Taka in EPZ/SEZ/Industry/commerce (assume)			
Total number of people involved in EPZ/SEZ/Industry			
- EPZ			
-SEZ			
-Industry			
-Business			
Number of institutions who provide loan facilities EPZ/SEZ/Industry/business			
Types of institutions who provide loan facilities for investment.....			
Number of institutions who provide training for EPZ/SEZ/Industry/business			
Types of institutions who provide training for EPZ/SEZ/Industry.....			
Challenges of EPZ/SEZ/Industry/commerce.....			

4.4. GUIDELINE OF KEY INFORMANT'S INTERVIEWS (KIIS) FOR MARKET: BUSINESS ASSOCIATION (SECRETARY)

Socio-Economic Impact Evaluation Study of Bangabandhu Bridge Guideline of Key Informants Interviews (KIIs)

Market: Business Association (Secretary)

Settlement area

Non-settlement area

Outside of adjacent area

District:.....Upazila:..... Union..... Market Name:.....

[The study team of the Institute of Social Welfare and Research, University of Dhaka is conducting a study entitled: 'Socio-Economic Impact Evaluation Study of Bangabandhu Bridge' funded by the Bangladesh Bridge Authority (Proposal No: 50.01.0000.301.31.001.18-01), the Ministry of Road Transport and Bridges, People's Republic of Bangladesh. The objective of this study is to explore the socioeconomic impact of the Bangabandhu Bridge. This study is only to get the current status/development of the lives and livelihoods of the people, expansion of industries and business and impacts of the environmental and ecology of this bridge. We have selected you a possible KIIs respondent. We would request to give your kind consent and to participate in this study. We would believe that your opinions will give us valuable data for this study that will escort us for suitable policy recommendations. Your name will not be mentioned anywhere and we are committed to maintain the confidentiality of your opinions. Your participation and cooperation is highly appreciated.]

Please provide basic information about the following areas last three years in your market

Basic information types	2020	2019	2018
1. Total number of shops			
-Big			
-Medium			
-Small			
2. Types of market.....			
3. Number of people involved in this market			
4. Total investment in the market			
5. Sources of loan support for investment in the market.....			
6. Total number of customers in this market (daily)			
7. Facilities in the market			
	Good	Average	Bad

-Road			
-Market space			
-Quality of market			
-Income of owners			
-Market administration			
-Salary of the salesman			
Challenges/limitations/problems in the market			
i)			
ii)			
iii)			

5. PICTURES OF MARKET PLACES UNDER STUDY AREA (SOURCE: BBA, 2021)

Furniture Market, Tangail



Fish Market, Enayetpur, Sirajganj



Cattle Market, Boaliabazar, Sirajganj



Shop of Agricultural and Non Agricultural Tools, Pachlia Bazar, Sirajganj



Farmers are selling their products,
Sirajganj



Cloth Hat, Shahjatpur, Sirajganj



River Bank Erosion, Jalalpur, Enayetpur,
Sirajganj



Chandaikona Cattle Market, Sirajganj



Sweet Shop, Eelenga, Tangail



Fish Market, Kalihati, Tangail



Nalka Village Hat, Sirajganj



Pachlia Hat is Adjacent to Dhaka Rangpur Highway, Sirajganj



Dhangora Wholesale Fish Market,
Sirajganj



Cattle Market, Hatpangashi, Sirajganj



Fresh Fish of Jamuna River, Sirajganj



Mohishluti Fish Market, Sirajganj



Road Inside a village market, Tangail



Buyers are going to Market, Sirajganj



A seller is waiting for Customers, Tangail



A Village Market, Sirajganj



Roadside market, Sirajganj



Bamboo Market, Kazipur, Sirajganj



Local Sweets in village market, Sirajgonj



Market of fishing instruments, Ullapara, Sirajganj

