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Analysis of social impacts of a proposed river bridge over Meghna River

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ABSTRACT

To achieve the targets of Vision 2041, the improvement of the transport networks must be a priority to overcome the existing river barriers and effectively connect the various regions of the country. The construction of bridges plays a key role in the transport policy as well as in the development of the country. Different roads in different regions of the country and bridges of different lengths on different rivers specially on Meghna has been proposed. Different literature study has established the fact that constructions of the new bridges have negative as well as positive social impacts. In this paper efforts has been made to analyse the negative and positive social impacts of a bridge over branch of Meghna river connecting the two upazilas where is only mode of transportation is by means of mechanised boat. High positive impacts will help to achieve the Sustainable Development Goals (SDGs) of Government of Bangladesh and it will enhance the quality of life of the people in the region.

INTRODUCTION

About 700 rivers with numerous tributaries and distributaries of these rivers constitute 24,140 km of river network carve the Bangladesh into a number of islands and peninsulas, particularly in the south, in the vicinity of the Meghna River delta, the largest river delta in the world (Abdul Wazed 1991).

Almost all big cities, towns and commercial centres of the country grew up on the banks of its rivers. It is widely accepted that the provision of transport infrastructure drives the development progress of a country, and in the case of Bangladesh, supported by the ambitious policies of Vision 2041, the improvement of the transport networks must be a priority to overcome the existing barriers and effectively connect the various regions of the country. The partitioning generated by the rivers in the territory causes great socio-cultural differences among the population and uneven economic growth between them. (Brammer, 1996)

The construction of bridges plays a key role in the transport policy and, therefore, in the development of the country. The Government of Bangladesh has made significant efforts in order to place the country among the most developed nations in the globe and supported by a vibrant private sector. In this regard, a series of strategic plans have led the investment in crucial sectors and projects according to the Government's visions 2021 & 2041. Among the measures to reach the main objective in 2021, "Infrastructure development" was identified to play a crucial role within the "Economic development" vision for the country. Government Vision 2041 target is a long-term perspective plan to make Bangladesh a peaceful, prosperous, happy and developed nation comparable with the developed world. Objectives and policies are closely inspired by the Sustainable Development Goals (SDGs) to face the expected pace of transformational change for Bangladesh regarding agriculture, trade and industry, education and healthcare, transportation and communication. The Vision 2041 is not only focused on reaching certain targets, but it also seeks sustainability of development. (bba.gov.bd)

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In order to deal with the situation described above and to meet the Sustainable Development Goals (SDGs), the Government of through different departments is developing different plan for the years 2020-2050. Therefore, under this plan different roads in different regions of the country and bridges of different lengths on different rivers specially on Meghna has been proposed. Out of which a Bridge over River Meghna in the upper Meghna region has been considered for the Social Impact Assessment (SIA) study (Naher, 2023).

Different literature study has established the fact that through the construction of the new bridges have negative social impacts (Dutta, 2014) like - Acquisition of lands, Displacement of people, Unemployment and loss of property, Reduced income from agriculture ,Economic loss for the tenants, farmers and sharecroppers as they were not considered for compensation, Deforestation, Adverse impacts on terrestrial and aquatic flora and fauna, Land use changes, Promote erosion of the river bank , Potential risk on human health and the spread of diseases like HIV/AIDs, Increase in Carbon footprint of the region ,Increase in Ecological footprint of the region, Rehabilitation and Resettlement of the affected people

Positive social impacts of construction of bridge project are- it will improve the regional connectivity and economy as well as quality of life of the people in the region, Will reduce and will eliminate river launch and boat accidents, Reduce travel time to health care facilities and Educational institutes, Reduce travel time for transportation of Agriculture products and raw material for industries, Promote industrial growth in the reason and Promote tourism in the region. Positive Social Impacts can be felt in long run but negative social impacts of the bridge starts form the construction stage of the bridge. To minimize the negative social impacts, Social Impact Assessment (SIA) study need to be conducted Social Impact Management Plan (SIMP) need to be prepared (Siddique, 2013).

In this paper an effort has been made by the author to describe the social Impact Assessment (SIA) of a bridge project considered for study and to find out the negative as well as positive social impact on the project area and to suggest the Social Impact Management plan to minimize the impacts.

MATERIALS AND METHODS

The study bridge

The proposed bridge is of 2.0 km length and with approach road of 5.5 km - over the river Meghna and an approach road connecting Bhaberchar at north side and Zila road Z1069 near Kalipurabazar at south side (Figure 1).

Some important settlements on the northern side of the proposed bridge are – Shonali Saikat, Charkalikapur, Mollakandi, Adharmanik, Baghaikandi, Jastitola, Barokalipura, Kalipura and Chandakahania and on the southern side of the proposed bridge are – Chotokinar chok, Borokinar Chok, Beltoli bajar, Kalipur, Kalipurbajar and Mustafapur.

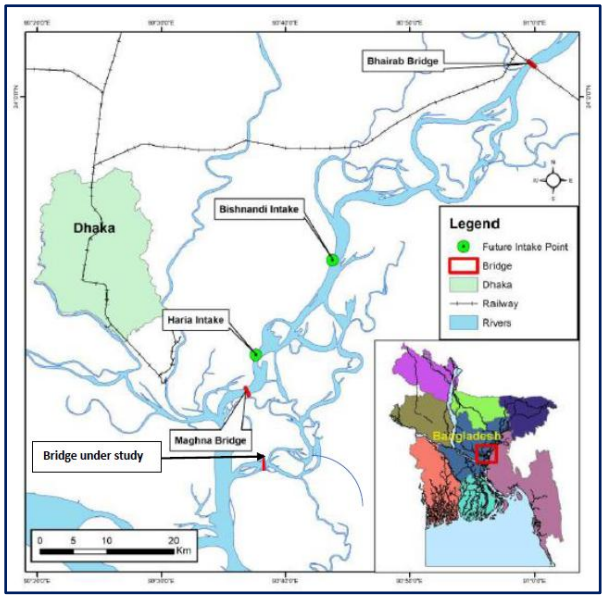

Figure 1: The proposed bridge location (source: Chowdhury et al., 2019).Protecting the Meghna River: A Sustainable Water Resource for Dhaka. Manila: ADB)

The current connection between Northern side (Gazaria) and Southern side (Matlab Uttar) is established through Ferry crossings for goods vehicle at one location and several formal and informal boat crossings at several locations.

Present mode of connectivity is adversely affecting the trade, economic as well as social life in the area. The project is to develop a direct road connectivity between Gazaria and Uttar Matlab by way of building a long bridge across the braided channels of Meghna River. For this study, the bridge has been considered not only as a local connection, but as part of a bigger plan - a North-South corridor near the Meghna River (bba.gov.bd).

The study area

The study area considered for the SIA is the Unions which area directly affected. The Unions are Imampur of Gazaria Upazila, Munshiganj district and Shatnol and Sadillapur of Matlab Uttar Upazila of Chandpur district.

Social Impact Assessment (SIA)

Social Impact Assessment (SIA)has been incorporated into the formal planning and approval processes in several countries, in order to categorize and assess how major developments may affect populations, groups, and settlements (IAIA 2015).

The legal basis of SIA (and thereby increasing standing and public awareness) first emerged in 1969/1970 when the US National Environment Policy Act (NEPA) introduced a requirement to ensure that major federal actions significantly affecting the quality of the human environment were incorporated into a balanced and publicly available assessment of the likely impact of such actions (Vanclay, 2013).

Social Impact Assessment includes the processes of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions. Social impact assessment (SIA) is a process for the identification, analysis, assessment, management and monitoring of the potential social impacts of a project, both positive and negative. The social impacts of a project are the direct and indirect impacts that affect people and their communities during all stages of the project lifecycle (IAIA 2015).

SIA is much more than the prediction step within an environmental assessment framework. Social impacts are much broader than the limited issues often considered in EIAs (such as demographic changes, job issues, financial security, and impacts on family life). SIA is a methodology to review the social effects of infrastructure projects and other development interventions (Vanclay 2013).

Social Impact Assessment Variables considered for this Social impact assessment study (Department of State Development, Australia 2018) are - 1. Population Characteristics, 2. Community and Institutional Structures, 3. Political and Social Resources, 4. Individual and Family Changes, 5. Community Resources.

Steps in the SIA Process are-

Public Involvement – Development of an effective public plan to involve all Project Affected Persons (PAPs).
Identification of Alternatives - Describe the proposed action or policy change and reasonable alternatives
Baseline Conditions - Describe the relevant human environment/area of influence and baseline conditions.
Scoping - After obtaining a technical under-standing of the proposal, identify the full range of probable social impacts that will be addressed based on discussion or interviews with numbers of all potentially affected.
Projection of Estimated Effects - Investigate the probable impacts.
Predicting Responses to Impacts - Determine the significance to the identified social impacts.
Indirect and Cumulative Impacts - Estimate subsequent impacts and cumulative impacts.
Changes in Alternatives - Recommended new or changed alternatives and estimate or project their consequences.
Mitigation - Develop a mitigation plan
Monitoring – Develop a monitoring program

SIA was done in a simplified method (Atahar, 2013) based on the following steps –

Disclosure of the project.

Focus Group discussion with local people.
Public Consultation Meeting (PCM).
Socioeconomic Survey.
Land Survey.
Property Valuation Survey/Market Survey.
Census and Inventory of Losses.
Video capturing of the alignment.
Video filming of the affected properties.
Public Disclosure on the SIA report.
Preparation of Social Mitigation Action Plan.

RESULTS

Social impacts of the project

It is estimated that total 180.83-acre land will be affected during the construction of Bridge Project (Table 1).

According to the detailed census and Inventory of loss(IOL) survey, total 115 project affected units including 112 Houses and 3 CPRs will be affected by losing their immoveable assets.

Due to acquisition of land 26739 sft residential and commercial structures will need to be dismantled.

Total 659 trees will be affected due to the project, 57% of the trees are fruit bearing and 32% are timbers trees. Rests 11% are of mixed trees.

The assessment also identified that 17 business premises including running business will be affected by the project interventions (Table 1).

Table 1: Summary of the Social Impacts of the project

Impacts identified	North side of bridge	South side of bridge	Total
Amount of affected land (acre)	121.99	58.84	180.83
Amount of affected private land (acre)	106.10	31.44	137.54
Amount of affected Government land (acre)	15.90	27.40	43.30
Number of total House holds affected by structure	32	2	34
Persons loosing Only Land	59	19	78
Number of CPRs affected	3	0	3
Total, number of Project Affected Units	94	21	115
Number of business unit affected	16	1	17
Number of trees affected	606	53	659

(Source: Field survey and Land record)

Table 2: Impacted land by typeof land use in acres

Upazila	Agri Land	Homestead	Vita	Ditch	River	Canal	Road	Total
North side of the bridge	104.91	1.01	0.19	0.97	8.24	2.54	4.14	121.99
South side of the bridge	31.10	-	8.07	16.87	1.27	0.93	0.61	58.84
Grand Total	136.01	1.01	8.26	17.84	9.51	3.47	4.75	180.83

Source: Field survey and Land record

Table 2 indicate that out of 180.3 acres of land maximum land is agriculture land (136.01 acres) followed by dich (17.84 acres) , vita (8.26 acres) canal and small river (12.98 acres) and rest is road (4.75 acres).

Table 3 reveal the fact that out of 659 trees 134 are large size trees, 249 are medium size trees, 254 are small trees and rest 22 are plants.

Table 3: Total number of affected trees

Upazila	Row Labels	Fruit bearing	Timber	Timber & fruit	Total
North side	Large	101	1	16	118
	Medium	103	100	19	222
	Plant	22	0	0	22
	Small	123	107	24	254
South side	Large	0	0	16	16
	Medium	27	0	0	27
	Plant	0	0	0	0
	Small	0	0	0	0
Grand Total		376	208	75	659

(Source: Source: Field survey)
Note: With more than 122 cm of girth at the chest position has been classified as big tree.
Trees having 60 – 122 cm girth is classified as medium tree.
Three having less than 60 and up to 30 cm girth is classified as small.
Tree planted for gardening or growing up is classified as sapling.

DISCUSSION

According to the study of the SIA based o the engineering design for this project total 180.83 acres of land needs to be acquired for construction of this Bridge Project. Out of which, 121.99acre will be acquired from North side and 58.84 acre from south side of the available land (Table 1). As per the detailed IOL survey and census a total of 112 Houses and 3 CRPs will also be affected. Out of the total HHs, 29 HHs will be physically displaced.

The survey and assessment quantified different losses & impacts of lands & properties and population displacements due to land acquisition for the project. The survey results, have been used to prepare the Social Impact management Plan. Survey assessments preparation has been done based on preliminary engineering design considering the the Acquisition and Requisition of Immovable Property Act, 2017 (ARIPA, 2017) Government of Bangladesh.

Ownership status of impacted land

According to the survey for the project, the project has to acquire 180.83-acre land from two upazilas. Both private (137.5550 acre) and government (43.2775 acre) land will be affected. About 17.53 acre which is in the present river is not included within any of the land record. Of the total land, 157.58 acre will be required for Right of Way (ROW) and remaining 23.25 acres for other ancillary purposed like toll plaza, Control Building & Weight Station and engineer's facilities (Figure 2).

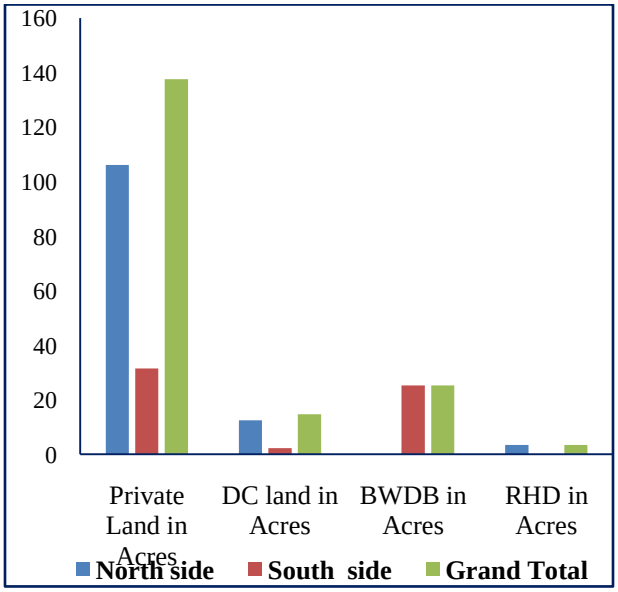

Figure 2: Ownership status of impacted land

Land Impact by Use Impacted land by type/land use under different mouzas shows that the

proposed acquisition of null land Agriculture land (136.01 acre) is the highest followed by other categories of land among the total land. There are also some homestead, vita, ditch and pond categories of land will be affected. Table shows detailed impacted land by Type/Land use (Figure 3).

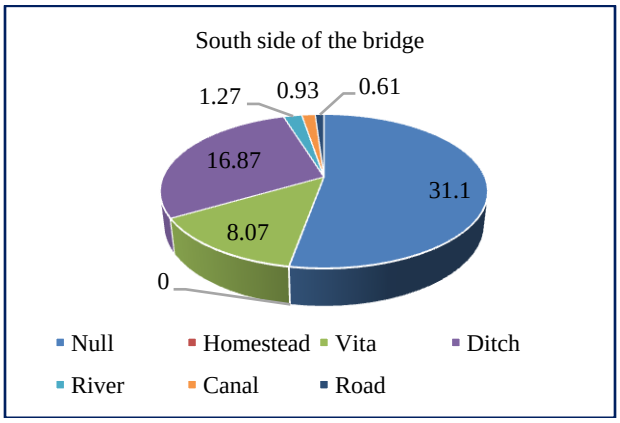

Figure 3: Land use of the impacted land at the south side of the bridge

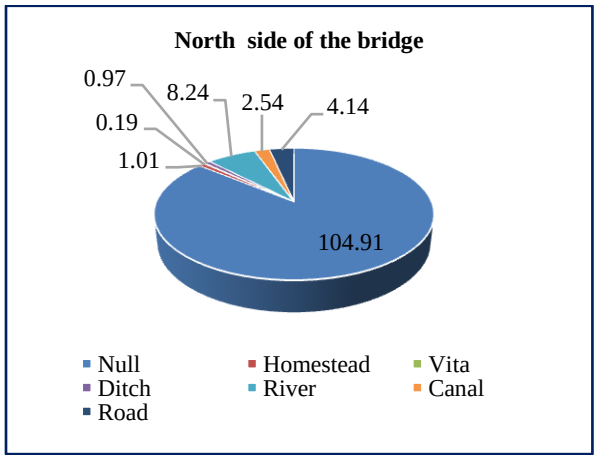

Figure 4: Land use of the impacted land at the north side of the bridge

Affected primary structure

Census and IOL survey result indicate that total 21539 sft primary structure will be affected by the project from 56 structure, including 5897 sft pucca, 4098 sft semi-pucca, 10566 sft tin made, 908 sft Katcha and 70 sft thatched structures. Almost 50% of the affected structure are made of tin. DC will pay compensation to the titled affected people following the ARIPA 2017.

Impact on community property resources (CPRs)

There are total two Jame Mosque and one government rehabilitation project will be affected during project intervention. All the CPRs are located in Gazaria side. Both of the mosque will be relocated during the project. One government housing project will be affected. Two of the house will be totally affected. There are khash land on the other side of the project.

Affected primary structure (CPR)

Total 5200 sft primary structure will be affected from three CPRs, of the total structure, 1760 sft semi pucca and 3440 sft tin made structure. All the affected CPRs are at Gazaria side of the river.

Impact on affected trees

The trees affected by the project are categorized into three different sections based on size and re-divided into categories of Fruit bearing, Timber, Timber & fruit. Total 659 trees will be affected along affected areas by the project. Total 659trees will be due to the project, 57% of the trees are fruit bearing and 32% are timbers trees. Rests 11% are of mixed trees. Out of 659 trees 606 trees are from the north side area of the bridge. None of the tree is in the RED list of IUCN.

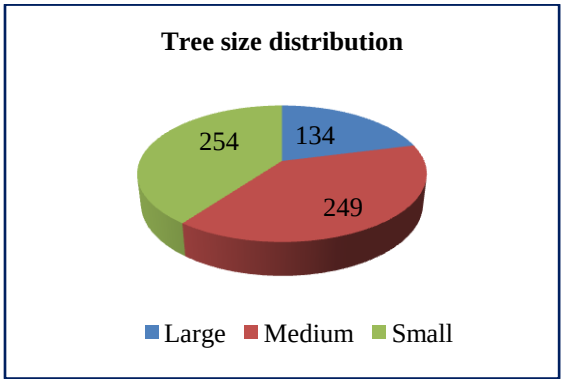

Figure 5: Distribution of tress affected by the project

Impacted with business

According to the IOL survey, 17 shops will be displaced permanently by the project interventions including medium 16 shops at north side and one small shop at south. Survey also revealed that there is no temporary business will be affected in the Right of Way.

Impact on Agriculture & Farming

It has been estimated about 136 acres of agriculture land will be affected due to the project, DC will pay the compensation for the standing crops and fisheries.

Positive Social Impacts

Benefit to the people

It has been estimated that about 438,038 numbers of people of people of both upazila will be directly benefited by the project. Out of 438,038, about 200,955 female population will be directly benefited by the bridge project. It has also been estimated that about 2,635,748 people of Chandpur district and about 1,293,972 people of Munshiganj district will be indirectly benefited by this bridge project.

Corridor for Economic Zones

There are plans to build two economic zones in Chandpur District (Matlab Uttar and Haimchar) and seven private economic zones in Munshiganj District at Gazaria Upazila. The proposed bridge together with an access road that is connected to major trunk road such as National Highway (NH1) will attract companies to the planned EZs and boost the economic development in the region. It is expected that the construction of the bridge will have an impact on the overall economy, increasing purchase power and GDP.

Employment for Local People

According to the study and discussion with project authority if the project is implemented, about 2, 00,000 jobs will be created in the area under the influence of the project. It should be noted that employment opportunities will be created for both men and women.

The project investments would contribute to eradicating poverty by promoting the expansion of employment and business opportunities. Labour intensive technologies would be adopted during the construction phase which would create short-term employment opportunities for skilled and unskilled labour force. Long-term employment opportunities would subsequently be created during project's operations phase.

Development of Tourism

It can be hoped that the bridge over Meghna River would boost tourism and take it into a new level, as connectivity between not only two districts but also travelling people from capital to other districts would become easier. It can be proposed to build international standard amusement parks as well as five-star hotels, motels, resorts, museums and many more for recreation on the bank of the Meghna River. The bridge proposed will be a unique bridge of its type in Bangladesh. Hence people from other parts of the country will visit the place to see this type of bridge and enjoy crossing the bridge.

Transportation Enhancement

As part of the development of the roads connected to the proposed bridge, drainage improvements, construction of footpaths and installation of road lights will ensure safe movement. The generalized cost of transportation using all the vehicles are going to be reduced. Easier communication would help expand education and training facilities, and the resulting skills development would ensure the availability of high-skilled workers. (Naher, 2023)

Attaining Sustainable Development Goals

Based on different literature survey and considering location of the bridge and benefits of the bridge in terms of socioeconomic upliftment it is predicted that the proposed bridge project will help the Government of Bangladesh in attaining the following Sustainable Development Goals (SDGs) (Naher, 2022) -

SDG 3: Ensure healthy lives and promote well-being for all at all ages.

SDG 5: Achieve gender equality and empower all women and girls.
SDG 6: Ensure availability and sustainable management of water and sanitation for all.
SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all.
SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster Innovation.
SDG 10: Reduce inequality within and among countries.
SDG 11: Make cities and human settlements inclusive, safe, resilient and sustainable.
SDG 12: Ensure sustainable consumption and production patterns.
SDG 13: Take urgent action to combat climate change and its impacts.
SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable Development.
SDG 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

Bangladesh Delta Plan (BDP) Goals

Based on different literature survey and considering location of the bridge and benefits of the bridge in terms of socioeconomic upliftment it is predicted that the proposed bridge project will help the Government of Bangladesh in attaining the following Bangladesh Delta Plan (BDP) 2100 which envisions "achieving safe, climate resilient and prosperous Delta" 5. It was guided by BDP's six broad goals which are:

Goal 1: Ensure safety from floods and climate change related disasters.
Goal 2: Ensure water security and efficiency of water usages.
Goal 3: Ensure sustainable and integrated river systems and estuaries management.
Goal 4: Conserve and preserve wetlands and ecosystems and promote their wise use.
Goal 5: Develop effective institutions and equitable governance for in country and trans boundary, water resource management.
Goal 6: Achieve optimal use of land and water resources.

CONCLUSION

The project has negative social Impact in terms of loss of Agriculture land. It has been estimated that about 438,038 numbers of people of people of both upazila will be directly benefited by the project. Out of 438,038, about 200,955 female population will be directly benefited by the bridge project. Person losing their land will get cash compensation as per national law ARIPA 2017.

Different literature study has established the fact that through the construction of the bridges in an region following regional as well as national development plan can be achieved. Hence it may be concluded that the proposed bridge project in this area will be highly beneficial and it will improve the quality of life of the people of this region.

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