ENVIRONMENTAL ASSESSMENT (EA) REPORT

Name of the Subproject:

Construction of Ramgonj Poura Super Market

Lakshmipur

Municipal Governance and Services Project (MGSP)

Bangladesh Municipal Development Fund (BMDF)

JUNE 2018

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ABBREVIATIONS

AP (AP's)	Affected Person
BDT	Bangladeshi Taka
BOQ	Bill of Quantity
BMDF	Bangladesh Municipal Development Fund
CC	Cement Concrete
CIP	Capital Investment Plan
CP	Contingency Planning
EA	Environmental Assessment
ECR	Environmental Conservation Rules
EMP	Environmental Management Plan
EPP	Emergency Preparedness Planning
ES	Environmental Screening
EMF	Environmental Management Framework
FGD	Focal Group Discussion
GoB	Government of Bangladesh
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
GRP	Grievance Redress Procedure
MGSP	Municipal Governance and Services Project
MD	Managing Director
PPEs	Personal Protective Equipment's
PMU	Project Management Unit
RCC	Reinforcement Cement Concrete
RP	Relevant Reports
ULB	Urban Local Body
WB	World Bank
WZPDCL	West Zone Power Distribution Co. LTD
XEN	Executive Engineer

EXECUTIVE SUMMARY

INTRODUCTION

Ramgonj was established as a Pourashava on 30 November, 1990 and has been upgraded as an A-Category Pourashava with a population of 73101[1] and with 9-Wards. The Pourashava has an area of 17.05 Sq. Km. With the normal development trend of infrastructures, the Pourashava has been lagging behind with the market development facilities. For providing the proper market facilities to the Poura-people, the Pourashava authority has proposed this Poura-Super Market with a view to develop the market facilities and at the same time to develop an income generating sub-project for the Pourashava.

Table: The significant features of the subproject:

Name of the Subproject:	Construction of three storied Poura super market, with a semi-basement facility, at south west side of Zia Shopping complex at Ward no 9 under, Ramgonj Pourashava
Package No.:	BMDF/RAMGONJ POURASHAVA/2017-2018/ W-01
District Name:	Lakshmipur
ULB Name:	Ramgonj Pourashava
Jurisdiction Area :	Ward number 9
Structural Design Option :	RCC load bearing structure with brick-work as partition walls.
Beneficiary Population :	About 10000 as per information by the Ramgonj Pourashava
Tribal People :	No tribal people settlement is there in the subproject area
Land Acquisition :	The land is owned by Ramgonj Pourashava and no question of acquisition
Estimated Cost :	36 Million BDT
Subproject Duration :	12 months
Tentative Start Date :	January 2019
Tentative Completion Date :	December 2019

Objectives of the Study

The general objective of this study is to determine the major environmental impacts succeeding from execution of the subproject and to recommend mitigation measures to avoid or reduce adverse environmental impacts and to enhance positive impacts.

Scope and Methodology of the Study

The environmental assessment study includes environmental screening for all the associated components. According to that screening, the environmental assessment has been done to fulfill the regulatory requirement for the proposed super market

1.1.1

SUBPROJECT DESCRIPTION

Location of the Sub-project Site

The proposed subproject site is located within the Ramgonj Pourashava under Ramgonj Thana within Ward no- 9 (Figure 2.1), road no 126. Geographic co-ordinate of the proposed subproject is 22°51'35.76"N latitude 89°32'9.48"E longitude. An area of approximately 9 Decimals has been identified for the subproject development.

Current Situation, Proposed Intervention and Need for the Subproject

The proposed market is in a vacant land that belongs to Ramgonj pourashava. Through the World Bank financial support and overall guidance of BMDF, Ramgonj Pourashava intends to develop this subproject. The subproject will be designed to handle an optimum items need for daily consumptions with ensuring modern, hygienic, customers and environmental friendly infrastructural facilities.

Justification of Selection of this Subproject

Based on CIP, Ramgonj Pourashava has prepared the priority list of the subprojects. The PMU of BMDF and Consultant have inspected the site as a part of the reconnaissance survey. After site inspection, it is revealed that the overall anticipated environmental impact due to the subproject implementation is not significant. This location is exclusively main commercial areas of the Ramgonj Poura town so, strategically, the location is very much suitable for the construction of Poura Super Market building. In addition, Pourashava is the owner of the land. Hence, private land acquisition is not an issue for subproject implementation. In fact, after completion of the subproject, a well-designed structure will facilitate the hygienic environment in the market area. Thus peoples, who will come for shopping, will feel comfort and user friendly environment. Hence, considering the benefits after construction, this subproject has been selected.

Key subproject activities and implementation process

The major activities and issues, during the construction phase, are:

- Layout and pilling works,
- Earthwork and excavation for pile cap and semi-basement works,
- Construction of the superstructure and associated civil works,
- Electricity connection and other ancillary works,
- Provision of other supporting/ancillary facilities,
- Worker health and safety issues.

The major environmental issues during the operation phase are:

- Generation of solid waste and its disposal.
- Generation of wastewater and its treatment.
- Traffic control
- Fire safety, natural disaster and risk management

Category of subproject

Environmental Screening ensures that environmental issues are properly identified in terms of extent of negative and positive impacts. Environmental Screening Checklist, as adopted in Appendix C of the Environmental Management Framework (EMF) of the MGSP, was administered for identifying the impacts and their extents.

- According to ECR 1997: Green □ Orange A □√ **Orange B** □ Red □ Not Listed
- According to WB classification : **Category B** □ √ Category C □

Considering the environmental impacts, the Construction of super Market can be considered as Orange B as per ECR-97 *(Multistoried Commercial Building)*. According to the WB classification, it is of Category B.

Analysis of Alternatives

The Ramgonj Pourashava area, especially the Ramgonj area is mostly compacted by residential, commercial and institutional buildings. There is no other vacant place where the market area might be shifted. The present market is solely owned by the Ramgonj Pourashava and there will be no question of land acquisition for the market. For such reasons, the alternative location is not possible.

BASELINE ANALYSIS OF THE ENVIRONMENTAL CONDITION

Baseline condition of environment states the present status of different components of environment in absence of the subproject. The main objective of examining the present environment is to provide an environmental baseline against which potential impacts from construction and operational phases of any subproject can be compared. A second important function of establishing a baseline for parameters such as air, noise and water quality is to ensure that any problems arising from existing sources are not erroneously attributed to the subproject under study. In the present study the different environmental parameters were examined for setting baseline conditions of the subproject area, are physico-chemical, biological and socio-economical. In physico-chemical component, parameters included are land, water quality, air quality, climate, and noise.

ENVIRONMENTAL SCREENING

Environmental Screening (ES) for the subproject has been conducted with the purpose of fulfilling the requirements of Government of Bangladesh (GOB) and the World Bank (WB). Environmental Screening ensures that environmental issues are properly identified in terms of extent of adverse and positive impacts. Environmental Screening Checklist, as adopted in Appendix C of the Environmental Management Framework (EMF) of the MGSP, was administered for identifying the impacts and their extents.

Summary of the Possible Environmental Impacts of the Subproject

Based on analysis, it seems that the ecological impact is minor. The construction activities may degrade the physico-chemical parameter of environment i.e. air, noise etc. In addition, solid wastes generation from the construction activities may temporary pollute the surrounding environment. Improper storage of the construction materials and stockpiles of the un-used soils, construction debris, and other forms of the wastes materials may create localized hazard for the local people. However, the anticipated impact on physicochemical components is mainly site specific and limited within the subproject boundary. During construction phase, any failure of the mechanical equipment may create some accidents to the workers. During operation phase, due to public gathering and possible using of loud speaker may create severe noise nuisance to the users and shoppers.

SPECIFIC IMPACT, MITIGATION AND ENHENCEMENT MEASURES

The impacts, which are likely to be arisen in the different phases of the subproject are identified in this section. In addition, evaluation of these impacts was done mentioning their origin and characteristics along with their probable mitigation/ enhancing measures.

Problem during Construction Phase

- Impact due to inadequate drinking water supply
- Pollution from fuel and lubricants
- Transportation Planning before starting works

- Clogging of water inside the construction site
- Clogging of local drain water:
- Impact on air quality due to dust
- Noise and vibration
- Impact on Surface Water Quality:
- Contingency Planning for any uneven situation:
- Occupational Health and Safety
- Felling of the Trees and Ecological Impacts

Problem during Operation and Maintenance Phase

- Noise Nuisance
- Solid waste:
- Traffic Congestion
- Accident Due to Fire Hazard and Electric Short Circuit
- Using of generator for Power generation
- Impacts on Social Environment
- Labor Influx and Anticipated Impacts

ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Environmental Management Plan has been developed to address all adverse impacts pertaining to the implementation of the subproject. The plan presented in tabular form includes isuues/ environmental impacts, their mitigation measures, actors responsible for implementation of mitigation measures and their responsibilities. Environmental Monitoring Plan is with the key environmental components and parameters to be monitored; the indicators, frequency, timing and locations of monitoring and also the actors responsible for carrying out such monitoring.

Grievance Redress Mechanism

The project-specific Grievance Redress Mechanism (GRM) will be established by the PIU of Ramgonj Pourashava to receive, evaluate, and facilitate the solution of APs concerns, complaints and grievances concerning the social and environmental performance of the subproject. The GRM is aimed to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the subproject. The grievance mechanism is related to resolve the risks and adverse impacts of the subproject. It addresses APs' concerns and complaints promptly, using an understandable and transparent process that is also gender responsive, and culturally appropriate. It is readily accessible to all segments of the affected people at no costs and without retribution. The mechanism should not impede access to the country's judicial or administrative remedies. The affected people will be appropriately informed about the mechanism. BMDF has its own Grievance Redress Procedure (GRP), which it operates to address any dissatisfaction and complaints by the local people regarding its activities. This procedure is being applied to address any complaints or grievances through negotiations with the community leaders and representatives of the APs during implementation of the MGSP.

Institutional Concern Person for Environmental Safeguard Compliance

The Environmental Safeguard Compliance issues are directly vested the pourashava officials, especially engineer in charge will be responsible for supporting the construction supervision with the facilitation of BMDF. The civil works contractors will implement the environmental mitigation measures. The BMDF,

with the help of Environmental Safeguard Specialist will submit the monthly monitoring reports on Environmental Compliances to the World Bank.

Capacity Building

A training program has been developed by the PMU of BMDF to build the capability of PIU of Ramgonj Pourashava In addition, the hired consultants of Ramgonj Pourashava was also there. Under this training program PMU was organize an introductory course for the training of the Ramgonj Pourashava officials, preparing them on: (i) Environmental Screening, (ii) EMP Implementation, including environmental monitoring requirements related to mitigation measures; and (iii) taking immediate action to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of the implementation. The contractor should be also included in the training program to enhance the Environmental awareness and orientation among the workers.

Public Consultation and participation

Public opinion has been collected through key informant interviews and focus group discussion meetings. For better understanding about the socio-economic and environmental condition, the focus group discussion has been conducted in the subproject area. The local communities were also informed about the subproject interventions including their benefits. Suggestions were made by the participants listed and incorporated in the EMP accordingly.

CONCLUSION AND RECOMMENDATION

On the basis of the analysis, it may be concluded that the project stands environmentally sound and sustainable when the recommended mitigation measure and environmental management processes are adopted properly. The adverse environmental impacts from the subproject will mostly take place during the construction phase. Benefits in the subproject area will be prolonged and some short term employment will be generated in addition to some business opportunities during the construction phase There is no significant cumulative adverse impacts during operation that are identifiable at this stage. The construction impacts is fully predictable and manageable, and with appropriate mitigation measures. The subproject is expected to have a small "environmental footprint". No endangered or protected species of flora or fauna are reported at the subproject site. The proposed subproject activities have no significant adverse environmental impact so far as a time bound execution program with application of advanced construction technology is ensured. The mitigation measures are well within such codes and practices of construction and operation of the proposed project. The proposed subproject is recommended for implementation.

1 INTRODUCTION

1.1 Subproject Background

The Government of Bangladesh (GoB) intends to enhance the capacity of urban local bodies (ULBs) in development and management of urban infrastructure, and improve municipal governance and services through undertaking the Municipal Governance and Services Project (MGSP) in selected Pourashava and City Corporations. The Local Government Engineering Department (LGED) and the Bangladesh Municipal Development Fund (BMDF) will implement the project with participation of the selected ULBs. The project will be financed by IDA, with GoB contribution for land acquisition and management, and Municipalities equity for accessing BMDF competitive finance. Under the MGSP the LGED will implement about 20 types of subprojects in 26 ULBs, which include 22 Pourashava and 4 City Corporations; while the BMDF will implement about 13 types of sub-projects in 119 Pourashava.

Both the LGED and the BMDF intends to ensure that the proposed infrastructure takes into account the environmental concerns in accordance with the Environment Conservation Rules 1997, and the World Bank Safeguard Policies. In this regard under MGSP a framework approach has been adopted for EA; the EA has two major components: (a) Overall environmental assessment, and (b) Development of Environmental Management Framework (EMF). Hence, to meet the regulatory requirement EA is mandatory to implement any subproject under MGSP.

Ramgonj is medium Pourashava with a population 73101[2]**.** Still 46.10% of total existing land is agricultural land. The Pourashava, rated as class "A", was established on 30 November, 1991 with 9 Ward. It has moderate level of economics activities and economical potential to flourish as an urban center in near future. Though, it is over 20 year's aged Pourashava, but market facility yet not up to the standard in Ramgonj Pourashava, So Ramgonj Pourashava decided to make a market with the help of BMDF under MGSP project.

Table 1-1: The significant features of the subproject:

Name of the Subproject:	Construction of five storied Poura super market at the south west side of Zia Shopping complex at Ward-9, Ramgonj Pourashava
Package No.:	BMDF/RAMGONJ POURASHAVA/2017-2018/ W-01
District Name:	Lakshmipur
ULB Name:	Ramgonj Pourashava
Jurisdiction Area :	Ward number 9
Structural Design Option :	RCC
Beneficiary Population :	About 10000 as per information by the Ramgonj Pourashava
Tentative visitors	Estimated visiting Population: 2000/day after construction. 2078 in 2030 and 2146 in 2040 (approx.) (growth rate 3.2 in urban area).
Tribal People :	No tribal people settlement is there in the subproject area
Land Acquisition :	The land is owned by Ramgonj Pourashava and no question of acquisition
Estimated Cost :	36 Million BDT
Subproject Duration :	12 months
Tentative Start Date :	January 2019
Tentative Completion Date :	December 2019

1.1.2

1.2 Objectives of the Study

The general objective of this study is to determine the major environmental impacts succeeding from execution of the subproject and to recommend mitigation measures to avoid or reduce adverse environmental impacts and to enhance positive impacts. The specific objectives include:

- To assess the existing environmental conditions of the subproject and its influence area;
- To identify and assess impacts resulting from the subproject during its construction phase and operation phase;
- To develop an environmental management plan with recommendations for mitigating impacts and enhance positive impacts;
- To summarize environmental monitoring requirements.

1.3 Scope and Methodology of the Study

The subproject appraisal includes environmental screening for all the associated components. According to that screening, the environmental assessment is required to fulfill the regulatory requirement for super market

The scope of the EA includes:

- Identify the activities are to be done under Poura super market sub-project, with the associated ancillary works,
- Explore the present environment condition of subproject influence areas,
- Finding the probable socio-economic and environmental impacts associated with Poura super market and surrounding areas,
- Investigating the future benefits of the people around the catchment area of the Poura super market
- Categorize the pollutions, may come out during pre-construction, construction and operation phases, in Ramgonj and surrounding areas,
- Finding the optimum solutions to every impact during implementation and operation phases at Poura super market and surrounding areas ,
- Assessment of institutional aspects, and development of Environmental Management and Monitoring Plan for the super market
- Estimating the environmental and social safeguard costs to be involved with the construction cost of Poura super market and ancillary works.

The task of preparing the EA report consisted of the following sequential components:

- Identification and screening of the environmental parameters relevant to the proposed sub project through a scoping process;
- Assessment of the magnitude of the potential negative impacts for relevant environmental parameters;
- Formulation of avoidance/mitigation measures to address the potential adverse impacts, and preparation of a monitoring program during the period of project implementation

2 SUBPROJECT DESCRIPTION

2.1 Location of The Sub-project Site

The proposed subproject site is located within the Ramgonj Pourashava under Ramgonj Thana under Ward no- 9 (Figure 2.1), Geographic co-ordinate of the proposed subproject is 23°55'16.89"N 90°43'9.96"E longitude. An area of approximately 9 Decimals has been identified for the subproject development.

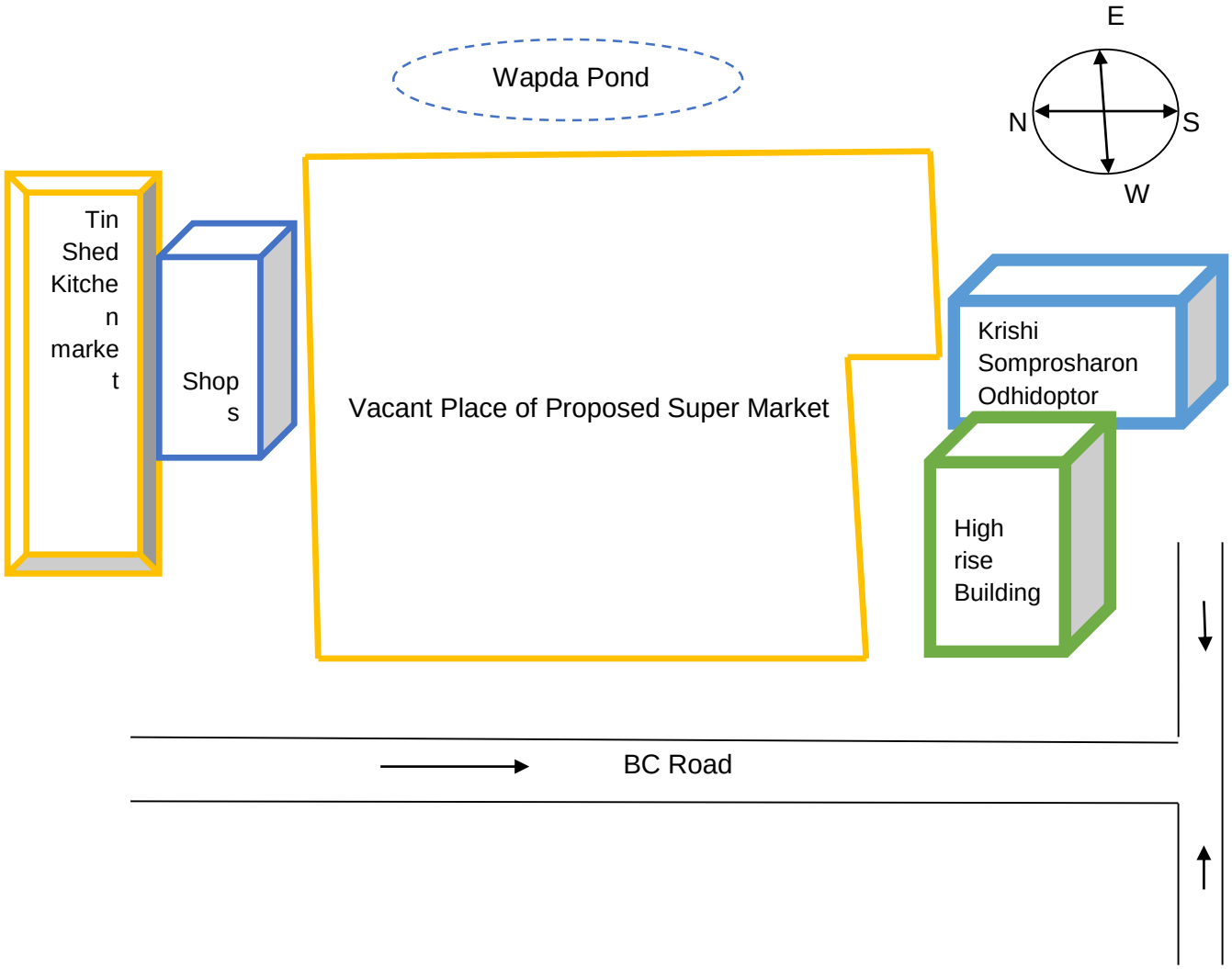


Figure 2-1 : Schematic View of the proposed Super Market

2.2 Current Situation and Proposed Need

The proposed market place is a vacant place and owned by Ramgonj pourashava. Through the World Bank financial support and overall guidance of BMDF, Ramgonj Pourashava intends to develop this subproject. The subproject will be designed to handle a maximum items need for daily consumptions with ensuring modern, hygienic, customers and environmental friendly infrastructural facilities.

Figure 2-2: Current situation of the proposed super market location

Figure 2-3: Current situation of the road and drain in the subproject area.

2.3 Justification of Selection of this Subproject

Based on CIP, Ramgonj Pourashava has prepared the priority list of the subprojects. The PMU of BMDF and Consultant have inspected the site as a part of the reconnaissance survey. After site inspection, it is revealed that the overall anticipated environmental impact due to the subproject implementation is not severe.

This location is exclusively main commercial areas of the Ramgonj Poura town so, strategically, the location is very much suitable for the construction of multistoried market building. In addition, Pourashava is owner of the land. Hence, private land acquisition is not an issue for subproject implementation.

In fact, after completion of the subproject, a well-designed structure will facilitate the hygienic environment in the market area. Thus peoples who will come for shopping will feel comfort and user friendly environment. Hence, considering the benefits after construction, this subproject has been selected.

2.4 Features of the Poura super market

The proposed Kitchen Market is a two storied building with one semi basement. Total land area of subproject is 3824 sft (Approximate). The different functionalities and their approximate floor space areas are delineated below:

1. Area of each floor (Approx.)
Semi Basement Floor = 2500 Sft. (Approx.)
Ground Floor = 2500 Sft. (Approx.)
1st Floor area = 2500 sft (Approx.)
2nd Floor area = 2500 sft (Approx.)

2. Occupancy of each floor.
Semi Basement Floor:

- Car Parking for 4 nos. car
- Electro-Mechanical Room
- Underground water reservoir, Septic Tank and Soak Well
- One Stairs
- One Ramp

Ground Floor:

- 3 Nos big. Permanent Shop
- One Stair
- Gents & Ladies Toilet

First Floor: to 2nd floor

- 10 shops
- Gents & Ladies Toilet
- one Stair

2.5 Key subproject activities and implementation process

The general activities for the subproject includes; construction of the semi-pucca site office and arrangement of separate labor shed with latrine facilities for male & female workers. The major activities and issues, during the construction phase, are:

- Layout and pilling works,
- Earthwork and excavation for pile cap and semi-basement works,
- Construction of the superstructure and associated civil works,
- Electricity connection and other ancillary works,
- Provision of other supporting/ancillary facilities,
- Worker health and safety issues.

The materials and resources to be used for the key activities: soil in earth work, sand, stone chips/brick chips, glass, cement, bricks, concrete, tiles, reinforcement, sanitary and electrical accessories. The major equipment, to be used for the subproject, are; Pile rig, earth excavator, roof hoist, ladder, scaffolding materials (bamboo/ steel frame), steel / concrete hammer, bulldozer, concrete mixer machine, mechanical vibrator machine, MS sheet, steel cutter, steel shutter, dump truck etc. The Ramgonj Pourashava will be responsible for operation and maintenance of the super market. The major environmental issues that need to be addressed during the operation phase are:

- Generation of solid waste and their disposal.

- Generation of wastewater and their treatment.
- Traffic control
- Fire safety, natural disaster and risk management

2.6 Category of subproject

Environmental Screening (ES) for the subproject has been conducted with the purpose of fulfilling the requirements of Government of Bangladesh (GOB) and the World Bank (WB). Environmental Screening ensures that environmental issues are properly identified in terms of extent of negative and positive impacts. Environmental Screening Checklist, as adopted in Appendix C of the Environmental Management Framework (EMF) of the MGSP, was administered for identifying the impacts and their extents.

- According to ECR 1997: Green □ Orange A □ √**Orange B** □ Red □ Not Listed
- According to WB classification : **Category B** □ √ Category C □

Considering the environmental impacts, the Construction of super Market can be considered as Orange B as per ECR-97 *(Multistoried Commercial Building)*. According to the WB classification, it is of Category B.

2.7 Analysis of Alternatives

The Ramgonj Pourashava area, especially the Ramgonj area is mostly compacted by residential, commercial and institutional buildings. There is no other vacant place where the market area might be shifted. The present market is solely owned by the Ramgonj Pourashava and there will be no question of land acquisition for the market. For such reasons, the alternative location is not possible.

3 BASELINE ANALYSIS OF THE ENVIRONMENTAL CONDITION

3.1 General

Baseline condition of environment states the present status of different components of environment in absence of the subproject. The main objective of examining the present environment is to provide an environmental baseline against which potential impacts from construction and operational phases of any subproject can be compared. A second important function of establishing a baseline for parameters such as air, noise and water quality is to ensure that any problems arising from existing sources are not erroneously attributed to the subproject under study. In the present study the different environmental components examined for setting baseline conditions of the subproject area, are physico-chemical, biological and socio-economical. In physico-chemical component, parameters included are land, water quality, air quality, climate, and noise.

3.2 Physical Environment

3.2.1 Important Environmental and Infrastructural Features

The preparations of any kind of subproject needs a detailed conditional survey to get a clear profile on baseline environmental condition. However, due to immediate requirement for the Pourashava, the Environmental Consultants prepared this Environmental Assessment (EA) Report by conducting rapid field survey. The data collected from the field visits by visual observation and secondary sources where needed are addressed in the subproject EA report. Therefore, if any adjustment is needed it will be updated on the later stage. Moreover, as it is a live document, for any circumstances, it can be updated. The important environmental and infrastructural features have been identified during site visit within influence area of the subproject. The key findings of the site inspection and investigation are given in Table 3.1.

Table 3-1: Major Environmental and Infrastructural Features around.

Side/ Direction	Major Environmental and Infrastructural Features adjacent to market
North	BC Road, Zia Shopping Complex, Kacha Bazar
South	WAPDA Pond
EAST	Kacha bazar, tin shed structure, shops
WEST	Shops, Agricultural Office, Fishery Office

3.2.2 Geology, Topography and Soils

The Tippera Hill of India that spurs project into the east of the grater Noakhali districts are of upper primary (Pleistocene) formation and generally of a dull reddish color. Unconsolidated sediments underline the rest of the districts. They are mainly recent and sub recent in age.

A major part of the river flood plain sediment was deposited by the old Brahmaputra River that changed it course to the west of the Madaripur Track some 2000 year ago. The rest of the sediment laid down principally by the Meghan River and by Minor River draining from the Tripper Hill. Silt and Clay size particle predominate in most sediments. The north part of the district, where Ramgonj lies has recent tidal sediments that are mainly silty in nature.

According to topographic survey, it is known that the ground elevation of the subproject area varies from 3mPWD to 10mPWD. The region comprises plane, costal, semi-hilly area. According to the Bangladesh Soil Region map subproject site fall in to the Non-calcareous Dark Grey & Grey Floodplain Soils and Non-calcareous Grey Floodplain Soils.

Non-calcareous Dark Grey & Grey Floodplain Soils: They have a cambic B-horizon, no calcareous dark grey topsoil and subsoil. They occur extensively on the Old Brahmaputra and old Meghna estuarine floodplain. Silt loam and silty clay loam are predominant on the Meghna estuarine floodplain and in the Teesta meander floodplain, whereas silty clays and heavy clays are extensive on the Old Brahmaputra floodplain. The majority of these soils are Eutric Gleysols.

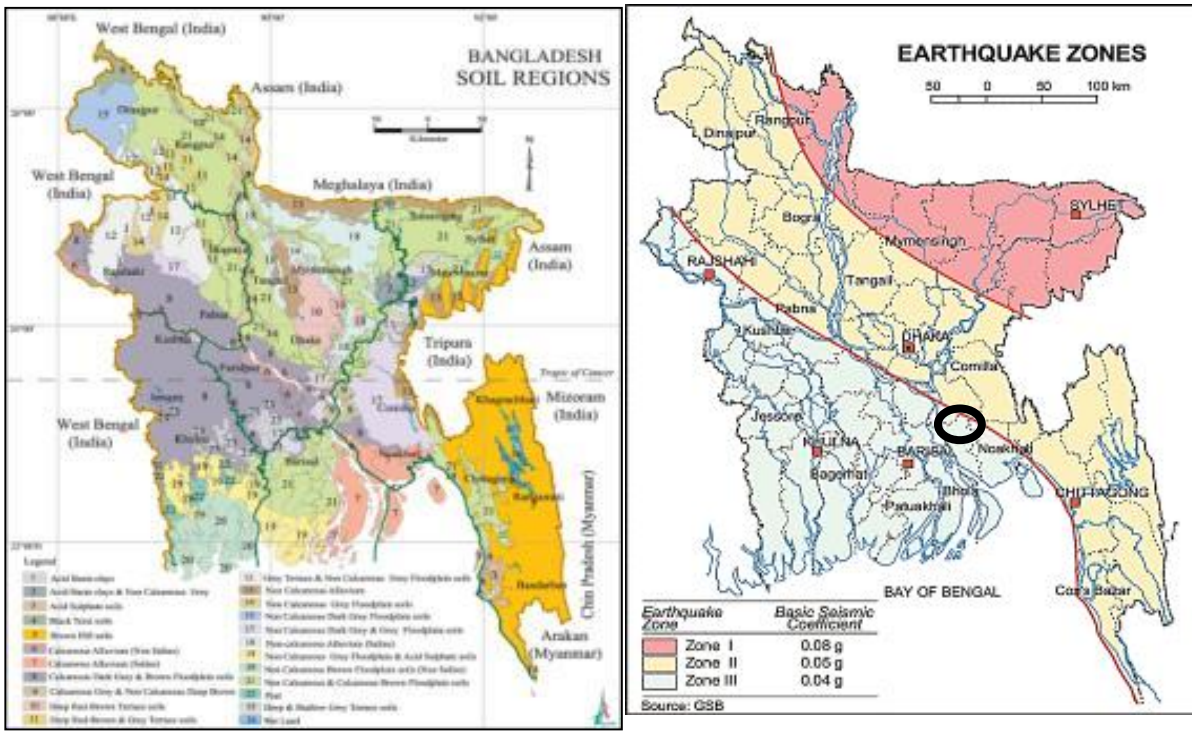


Figure 3-3-1: Soil Region Map and Earth Quake Zone Map of Bangladesh

Non-calcareous Grey Floodplain Soils: Generally, comprise a grey topsoil and a cambic Bhorizon in the subsoil with a grey matrix or grey gleans. They extensively occupy Teesta, Karotoa-Bangali, Jamuna, middle Meghna and eastern Surma-Kushiyara floodplains. However, there are considerable regional differences in the proportions occupied by individual soil textures. Silt loam texture is dominant in the Teesta meander floodplain whereas silty clays are predominant in the Ganges tidal floodplain and in the Surma-Kushiyara floodplain. But the Jamuna floodplain has a more even distribution of silt loam, silty clay loam and silty clays. Most of these soils have been included in Eutric Gleysols. According to earthquake zone classifications, Ramgonj (Figure 3-1) lies on zone-3 which is the third most vulnerable earthquake region of Bangladesh (GSB, 1978).

3.2.3 Climate and Meteorology

The subproject area has a tropical monsoon climate with four seasons: dry or winter season (December–February); pre-monsoon or hot season (March–May); monsoon or rainy season (June–September); and post–monsoon or autumn season (October–November). Although less than half of Bangladesh lies within the tropics, the presence of the Himalaya mountain range has created a tropical macroclimate across most of the east Bengal land mass. Bangladesh can be divided into seven climatic zones. According to the classification, the subproject areas are located in the south-central. In this zone rainfall is abundant, being above 1,900 mm. The range of temperature is, as can be expected, much less than to the west, but somewhat more than in Southeastern zone. This is a transitory zone between the South-eastern, North-western and Southwestern zones and most of the severe hail storms, nor' westers and tornadoes are recorded in this area. Like other parts of the country, the subproject areas are heavily influenced by the Asiatic monsoon, and it has these three distinct seasons: Pre-monsoon hot season (from March to May), Rainy monsoon season (from June to October), and cool dry winter season (from November to February).However, most months of the year, there is significant rainfall in Ramgonj. There is only a short dry season. The Köppen-Geiger climate classification is Am. In Ramgonj, the average annual temperature is 25.7 °C.

Table 3-2: Average Annual Climate Data of the Ramgonj Pourashava

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. Temperature (°C)	19.3	21.8	25.8	28.3	29	28.4	27.9	28.2	28.4	27.4	24	20.3
Min. Temperature (°C)	12.9	15.3	20	23.6	25	25.6	25.5	25.7	25.6	24	19	14.3
Max. Temperature (°C)	25.8	28.3	31.7	33	33	31.2	30.4	30.7	31.2	30.9	29	26.4
Avg. Temperature (°F)	66.7	71.2	78.4	82.9	84.2	83.1	82.2	82.8	83.1	81.3	75.2	68.5
Precipitation / Rainfall (mm)	7	16	47	138	271	471	525	452	305	169	45	8

The average annual rainfall is 2454 mm. The driest month is January. There is 7 mm of precipitation in January. Most precipitation falls in July, with an average of 525 mm. From figure 3-2 it is revealed that, May is the warmest month which attain with an average of 29.0 °C. In January, the average temperature is 19.3 °C. It is the lowest average temperature of the whole year. The precipitation varies 518 mm between the driest month and the wettest month. The average temperatures vary during the year by 9.7 °C.

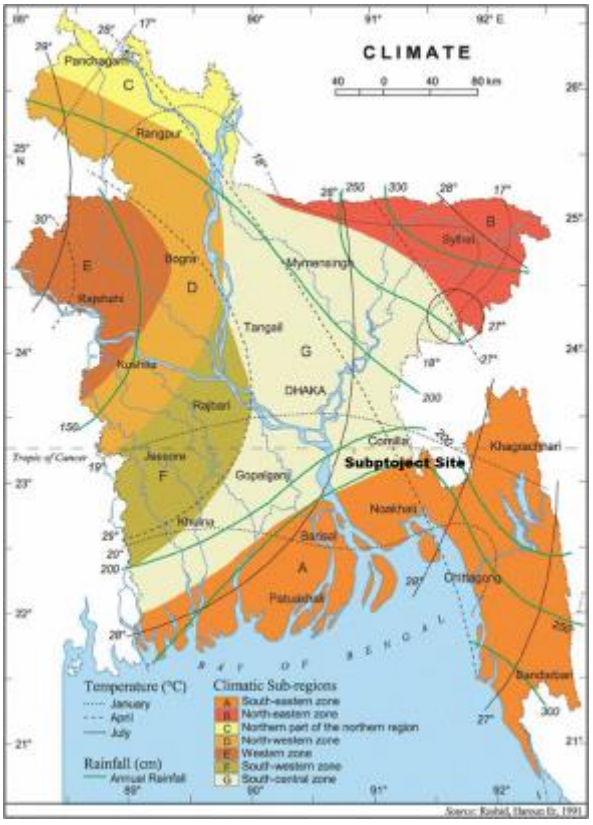


Figure 3.2: Climatic Zones of Bangladesh

3.2.4 Hydrology (Surface water, Ground Water, and Rain Water)

Ramgonj is closely situated with the Sadar town Lakshmipur and significant number of local small khal drain out the storm and other water generated from households and commercial shops. The khal are Verendra, Wapda, Sonapur and other small khal which are act as surface drainage of the Pourashava and these khal is connected with Bay of Bengal (Near Sandwip Channel) through Chotto Feni and Meghan River. Most of the portion of the khal has lost their navigability due to sedimentation and narrowing by unauthorized encroachment. Beside this there are lots of ponds in the subproject which are mainly used for the aquaculture, bathing purpose and as well as domestic purpose. Surface water of pond and khal in Ramgonj Pourashava is salinity free. Ground Water level is found 40 to 50ft during dry season and between 30 -35ft during wet season[3]. Ground water contain excessive amount of iron and Arsenic[4]**.** As per information by the Pourashava officials, 100% tube well are arsenic contaminated and the provision of deep tube well is not possible because of presence of salinity in ground water at the power level. Hence, people of the Pourashava have been using pond water as a drinking and domestic purpose.

3.2.5 Flooding, water logging, and drainage pattern

As per flood zoning map of Bangladesh (shown in Figure 3-3), this area is considered as a flood free zone. However, this area is affected in historical flood events such as 1988, and 1998. The subproject area is not generally subjected to water logging problems. The present drainage system is not adequate and functional due to blockage in the drain. Due to continuous heavy rain, delay discharge of storm water causes water logging problem in the subproject area.

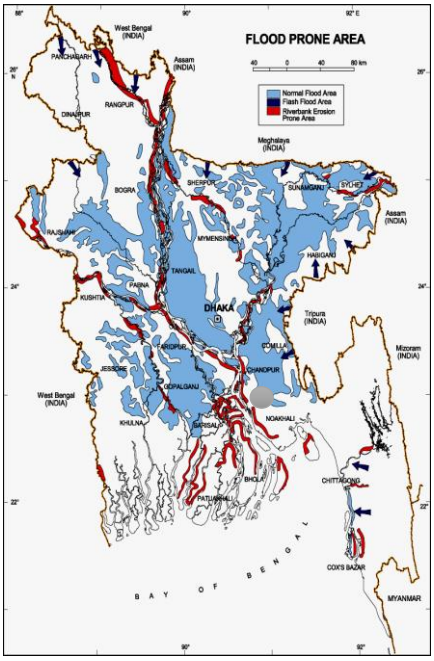


Figure 3-3: Subproject Site Location (Green Circle) on Flood Zone Map of Bangladesh

3.2.6 Air quality and dust

Generally, Within Bangladesh there are two major sources of air pollution: industrial emissions and vehicular emissions. However, as there are no major industries in Ramgonj Pourashava, the main

[3] **Master Plan, 2013, Ramgonj Pourashava, Lakshmipur**
[4] **DPHE, 2009, Ramgonj, Lakshmipur**

sources of air pollution are non-point sources such as open burning and block smoke emission from using of vehicles. In addition, during construction period use of subproject vehicles and construction equipment may degrade the air quality. However, proper implementation of mitigation measure which are addressed in the EMP is good enough to control the expected air pollution to be raised from construction activities. There are currently no air quality monitoring stations are in operation within the Pourashava limit. Ambient air quality measurements are essential to provide a description of the existing conditions or the baseline against which changes can be measured and to assist in the determination of potential impacts of the proposed subproject. Hence, baseline air quality will be measured by the subproject contractors prior to commencement of work. Following Table shows the Bangladesh National Ambient Air Quality Standard comparing the WHO Guideline standard.

Table 3-3: Air quality Bangladesh ECR, 97 and WHO Standards

Parameter	**Environmental Conservation Rules,1997**				**WHO**
	microgram/m^3				
	Industrial	**Commercial and Mix use**	**Residential and Rural area**	**Sensitive area**	
SPM	500	400	200	100	-
PM 2.5	65				10
PM10	150				20
SO_2	120	110	80	30	20
NO_2	100	100	80	30	40
Pb	0.5				

3.2.7 Noise level

Subproject components are in the built-up part of Ramgonj Pourashava, which mainly buildup with residential and commercial activities. The volume of traffic that passes through these sections is not significant and traffic jams are not frequent. However vehicular movement can be considered as major cause of noise pollution especially particular area adjacent to the main road near bazar area and Ramgonj Zero Point. In addition, sophisticated machineries will be used at construction period which will produce little significant noise. But it would be temporary and site specific. Even, if proper measure are taken it would be within tolerable limit. Noise level has been monitored at the various locations of the subproject sites during day time of 2 June 2018. Results of the noise level monitored along with details of the measurement locations have been showed in Table 3-4.

Table 3-4: Ambient Noise Quality Analysis

Noise level measurement locations	GPS Co-ordinate	Day-time	
		Equivalent Noise level (dBA),Leq	Maximum Noise level (dBA),Lmax
Front of proposed market	23°55'16.89"N 90°43'9.96"E	71.30	73.45
Bangladesh (DoE) Standard			
Zone	**Max**	**Min**	
Industrial	75	70	
Commercial	70	60	
Mixed Area	60	50	
Residential Area	55	45	

World Bank Standard		
Industrial	70	70
Commercial, Residential, Educational	55	45

3.3 Biological Environment

3.3.1 Flora and fauna

Flora

The sub-project influence area (SPIA) is mixed with different vegetation. Crops, vegetables are cultivated and natural which mainly include rice, wheat, Rabi crops and variety of homestead vegetables. A sizeable number of fruit and timber trees with economic value have been observed in the subproject road side area. The fruit trees include jackfruit, mangoes, litchi, banana, coconut, blackberry etc. and timber trees include Mehogoni, Neem, rain tree, koroi etc. Considerable number of trees and bushes in the SPIA site provide habitat for birds and other animals. The composition of plant species includes low growing grasses, trees, herbs and shrubs. From filed visit it is revealed that, predominant species are those of cultivated and natural grown vegetables and trees. A detailed list of terrestrial floral species found in the subproject area is shown in following Table 3-5.

Table 3-5: List of Floral Species.

Name of Trees	Scientific Name	Name of Trees	Scientific Name
Mango	*Mangiferaindica*	Guava	Psidium guajava
Lichi	*Lichi chinensis*	Papaya	*Carica Papaya*
Bel	*Aegle marmelos*	Banana	*Musa Sapientum*
Kotbel	*Feronia lemonier*	Dumur	Ficushispida
Sajna	*Moringa oleifera*	Akashmoni	*Acacia auriculiformis*
Atafal	*Annona reticulate*	Rain Tree	Samanea saman
Sobeda	*Manilkara sputa*	Shimul	Bombax ceiba
Date Palm	Phoenix	Supari	Areca catechu
Shishu	Dalbergia sissoo	Bakul	Mimosas eleng
Jackfruit	*Artocarpus heterophyllus*	Jaw	*Casuarinas littorea*
Mahogany	*Swietenia macrophylla*	Boroi	*Zizyphusm auritiana*
Neem	*Azadirachta indica*	Jambura	*Citrus grandis*
Babla	*A. nilotica*	Kamranga	*Averrhoa carambola*
Jarul	*Lagerstroemia speciosa*		
Tetul	*Tamarindus indica*		
Eucalyptus	*Eucalyptus teritocornis*		

Fauna

Since there are lots of ponds in the subproject area for cultivating of fishes. Hence, fish is the most important aquatic fauna of the subproject areas, along with other groups. The fishes include catfishes (Magur and Shing), major carps (Katla, Rui and Mrigel), minor carps (Puti, sor puti), other (Tengra, Boal, Mola, Taki, Shol). All bird is terrestrial bird species were observed within the subproject area. Among birds, Tiya, Doel, Bok, Shalik, Finger House crow, House sparrow, etc. were found during site visit. The common type's water snake reptiles was found during site visit.

3.4 Socio-economic Environment

3.4.1 Land use

The subproject sites are located at the urban area of the Pourashava and it is also a core area of the Pourashava and it's consist of mix land use pattern includes agricultural, bell, commercials and residential. The built up infrastructure includes office buildings, personal homes, supermarkets, malls, government offices, NGO Offices, hospitals, clinics, etc.

3.4.2 Area and population

Ramgonj Pourashava occupies an area of 17.05 km^2 with population of 73101 as per Bangladesh Bureau of Statistics (BBS) Census 2011. It is divided into 9 Wards and density of population per sq.km is 2361.The rate of population increase is 2.12%[5]. This subproject site is located at Ward number 9. As per information by the municipality, considering the Ward population about 10, 000 people will benefit directly and many others indirectly.

3.4.3 Education

Ramgonj Pourashava has an average literacy rate of 58.35% (BBS, 2011)[6]. There are a few government and private schools and colleges present in the city. A notable amount of students of Ramgonj move to Dhaka for better education.

3.4.4 Tribal communities

This is no significant tribal population present in the Municipality. So, there is no expectation of affecting tribal communities through the sub-project.

3.4.5 Archeological/Historical places

No known remarkable archeological or historically important structure or sites are reported in the survey area. So, no cultural impact is expected.

3.4.6 Land acquisition and resettlement

Since, the proposed Super Market location is owned by the Pourashava. Hence land acquisition for the implementation of the subproject is not an issues.

3.4.7 Local economies such as employment, livelihood

Though subproject area is inhabited by the people of mixed occupations, but agricultural activities is dominating from any other occupation. Because 46.10% of total Pourashava area is occupied by agricultural filed where rice and seasonal vegetation is abundantly cultivated. Beside this, major income comes from business, enterprises, small trades, private sector jobs and government jobs in the town.

3.4.8 Housing pattern and ownership

In the subproject area maximum people live on their own houses but a few in rented houses. As more urbanization more households will reside in the rented house in future.

[5] **BBS 2011, Bangladesh Bureau of Statistics**

[6] **Bangladesh Bureau of Statistics, 2011**

3.5 Utilities Services

3.5.1 Water Supply

Ramgonj Pourashava has pipe line water supply system under the Pourashava water supply department. Against the demand of 2000 household, the authority is supplying to 786 connection. The total length of the existing pipe line is 17.8km[7]. The Pourashava is yet to develop own network based water supply system. The entire water supply system based on the tube well and pond water. However, many of the tube well carry the saline water. As a result hand tube well water are generally used for the washing purpose. Hence, people has dependency on the pond water for drinking.

3.5.2 Gas Supply

Pourashava has no piped gas facilities. People use LP cylinder gas, Kerosene, diesel, cow gung, straws, dry leaves, fire wood and other traditional fuel material for day to day cooking. The plan propose to connect Ramgonj with national gas supply grid from Chatkhali Upazilla of Noakhali and Hajigonj Upazilla of Chandpur. This will open formal industrial development of Ramgonj Pourashava.

3.5.3 Sanitation

There is no network based sanitation system in the Ramgonj Pourashava. At present, Hanging latrine, Pit latrine of different types, water sealed latrine and septic tank based latrine are generally used as a sanitary system in the Pourashava. However, a significant percentage of population about 20% use unsanitary latrine which are the responsible for long run environmental pollution. Very recent Pourashava has taken programme to become a 100% sanitized Pourashava.

3.5.4 Solid Waste Management

Solid waste management has not yet streamlined in the Pourashava. There is no home collection system in the Pourashava. People are not used to disposing waste in dustbin that are also very scanty in the town.

The households usually dispose their waste into the nearby ditch, and low land. A major share of solid waste is generated by Kitchen market. These waste find their destination in local khal. Therefore, khal is blocking, resulting reducing their water discharge capacity at monsoon period. However, as the density of the population is low, waste is yet to emerge as a major environmental problem in the area.

3.5.5 Electricity

Power Development Board is mainly responsible for the distribution of electricity supply in the Pourashava supported by Rural Electrification Board (BREB).PDB work for power production and distribution while REB is responsible only for distribution. All the 9 Ward of Ramgonj Pourashava have been brought under Rural Electrification Board (REB).

[7] Master Plan, 2013, Ramgonj Pourashava, Lakshmipur

4 ENVIRONMENTAL SCREENING

4.1 General

Environmental Screening (ES) for the subproject has been conducted with the purpose of fulfilling the requirements of Government of Bangladesh (GOB) and the World Bank (WB). Environmental Screening ensures that environmental issues are properly identified in terms of extent of adverse and positive impacts. Environmental Screening Checklist, as adopted in Appendix C of the Environmental Management Framework (EMF) of the MGSP, was administered for identifying the impacts and their extents.

The screening data and information for the **Five Storied Poura Super Market** sub-project site, have been formulated and are presented in this section.

4.2 Screening for Potential Environmental Impacts

4.2.1 Potential Environmental Impact during Construction Phase

(a) Ecological Impacts:

- Felling of the trees — Significant □ Moderate □ Minor □√ Number of trees: 3
- Clearing of the vegetation — Significant □ Moderate □ Minor □√
- Potential impact on species of aquatic (i.e., water) environment — Significant □ Moderate □ Minor □√

The proposed super market will be constructed at the developed and vacant place of the Pourashava. However, during site clearing work 3 numbers of small size (in term of length and diameter) mango trees to be cut down. There is also minimal quantity of vegetation clearing to be needed. There is no possibilities of impact on aquatic environment, except throwing of waste material in to the Wapda pond which is located at behind the back boundary of the proposed market. Hence, overall ecological impact is considered as minor.

(b) Physicochemical Impacts:

➢ Noise pollution	Significant □	Moderate □√	Insignificant □
➢ Air pollution	Significant □	Moderate □√	Insignificant □
➢ Drainage congestion	Very likely □	Likely □√	Unlikely □
➢ Water pollution	Significant □	Moderate □	Insignificant □√
➢ Pollution from solid/ construction waste	Significant □	Moderate □√	Insignificant □
➢ Water logging	Significant □	Moderate □√	Insignificant □

The subproject will have temporary and localized negative impact on noise, and air quality during construction phase due to movement of the subproject vehicles and equipment's, and using of welding and drilling machine, pile rig, winch machine, concrete mixer and vibrator machine etc. The anticipated impact on noise is considered as moderate because except cast-in-situ pile work, other subproject activities may not generate significant noise. Since the mostly foundation construction work will be covered in the dry season, hence the probable drainage congestion and water logging that can occur during bore holing for pile work and excavated pit for foundation from erratic rainfall is likely. In addition, there will temporary drainage and pumping provision for drain out the storm water if required. Primarily, the subproject will have no adverse impact on the other physicochemical components.

(c)Socio-economic Impacts:

- Traffic congestion — Very likely □ — Likely □ √ — Unlikely □
- Health and safety — Significant □ — Moderate □√ — Insignificant □
- Impact on archaeological and historical — Significant □ — Moderate □ — Insignificant □√
- Employment generation — Significant □ — Moderate □√ — Insignificant □

Due to transportation of the materials and equipment, the subproject will have likely temporary negative impact in traffic congestion. However, it is anticipated that the subproject activities do not have any severe impact on the local traffic system because movement of the vehicles and equipment will be only for a short time and as per requirement. None of the subproject activities require heavy equipment. No demolition of any structure will be needed, hence, anticipated impact on health and safety is considered as moderate. However, in case of any accident such as deep excavation work without protection, falling from the height during brick work, plastering work, painting work, glass fitting work etc. may cause severe impact on health and safety. No archaeological and historical site is at the vicinity of the influence area. However, it has significant positive impact by generating employment opportunity for the local people.

4.2.2 Potential Environmental Impact during Operational Phase:

(d) Ecological Impacts:

- Potential impact on species of the aquatic — Significant □ — Moderate □ — Minor □√

At operation phase, the subproject activities do not have any likely impacts on the surrounding ecological environment. However, the discharge of waste water from the market into the drain may marginally degrade the quality of the aquatic environment of the outfall; if it carries pollutants, toxic elements and nutrients.

(e) Physicochemical Impacts:

- Potential air quality — Significant □ — Moderate □ — Insignificant □√
- Noise level — Significant □√ — Moderate □ √ — Insignificant □
- Drainage congestion — Improvement □√ — Minor Improvement□ — No Impact □
- Waste water disposal — Significant □ — Moderate □√ — Minor □
- Pollution from solid and other sorts of market wastes — Significant □ — Moderate □√ — No Impact □

During operation phase, public gathering and possible use of loud speaker for the advertisement of the products may create some noise level to the users and shoppers. Since the residential area is far from the proposed market; operation of the market does not have any impact on the residential area. Fixing of the waste bins will minimize the environmental degradation due to improper disposal of solid wastes. However, if the waste bins are not used properly and wastes are thrown here and there may pollute the surrounding environment by spreading the bad smell from leachate of wastes. The new surface drain will improve the existing drainage facilities.

Socio-economic Impacts:

- Traffic — Significant □ — Moderate □√ — Minor □
- Safety Issue — Significant □ — Moderate □√ — Minor □
- Employment generation — Significant □√ — Moderate □ — Minor □

Proposed subproject will have significant positive impact by providing job & business activities and community interaction. During operation phase, it may create traffic congestion due to improper parking of the vehicles and ignoring of the traffic rules. Possible accidents and social risks due to fire hazard, short-circuit and other vulnerability may also have negative socio-economic impacts.

4.3 Summary of the Possible Environmental Impacts

Based on analysis, it seems that the ecological impact is minor. The construction activities may degrade the physico-chemical parameter of environment i.e. air, noise etc. In addition, solid wastes generation from the construction activities may temporary pollute the surrounding environment. Improper storage of the construction materials and stockpiles of the un-used soils, construction debris, and other forms of the wastes materials may create localized hazard for the local people. However, the anticipated impact on physicochemical components is mainly site specific and limited within the subproject boundary. During construction phase, any failure of the mechanical equipment may create some accidents to the workers.

During operation phase, due to public gathering and possible using of loud speaker may create severe noise nuisance to the users and shoppers. On the contrary, beautification work such as tree plantation will enhance the ecological condition. Wastes generation due to proposed subproject activities is one of the key issues which should be handled and disposed-off properly by placing waste bins. This subproject has positive impacts in terms of the generation of the employment opportunities due to construction activities, supplying of the materials at construction phase and by providing business activities at operation phase.

5 SPECIFIC IMPACT, MITIGATION AND ENHENCEMENT MEASURES

The impacts, which are likely to be arisen in the different phases of the subproject are identified in this section. In addition, evaluation of these impacts was done mentioning their origin and characteristics along with their probable mitigation/ enhancing measures.

5.1 Problem during Construction Phase

5.1.1 Impact due to inadequate drinking water supply

If sufficient drinking water is not supplied during construction, it may cause health damage of peoples related with the construction work (labors, engineers, supervisors etc.)

Mitigation:

- The contractor will install tube well as considered in the BOQ (environmental safeguard component) prior starting the construction works,
- The water quality will have to be tested for its quality judgment in a regular interval

5.1.2 Pollution from fuel and lubricants

Proper placing of fuel and lubricants is essential, otherwise it will damage surrounding environment.

Mitigation:

- Raised platform (brick soling with neat cement finishing) shall be constructed prior to start working (to be included with environmental safeguard items in the bidding document).
- Leakage fuel and lubricants from equipment will be collected by separate container for reuse or safe disposal. So it cannot be spread and pollute adjacent areas.

5.1.3 Transportation Planning before starting works

During construction phase, some additional traffic will be accumulated for bringing the construction material and equipment. This traffic may cause temporary congestion on the roads nearby market area. It is anticipated that the subproject activities will not create any severe impact on the local traffic system, because movement of the vehicles and equipment will be only for a short time and as per requirement. The on-site subproject activities do not have any impact on the local traffic system during construction phase, because the works will be done in a confined area. However, during operation phase, improper and roadside parking may create localized traffic congestion.

Mitigation:

- To avoid local traffic congestion, any materials required for construction should be transported at night time (within 10.00 pm – 6.00 am).
- Proper vehicle schedule should be maintained in consultation with local people.
- Unloading of materials should be done inside project areas.
- Traffic control manpower will be deputed during construction and operation period.
- Control sign will be provided to regulate traffic movement.
- Safety arrangement has been inserted in the safeguard cost in BOQ.

5.1.4 Clogging of water inside the construction site

During pile work storm water may clog inside the construction site. During foundation etc. construction work earth excavation is essential. This earth work may lead the chances of stagnation storm water into the excavated pit resulting it also aggravate the mosquito breeding in the subproject area.

Mitigation:

- Earthworks should be done during dry season.
- During pile, foundation etc. work temporary drainage system will have to be provided.
- A small pit will have to be provides also in one corner. Water will go inside the pit through temporary drains and if necessary, a submergible pump will pump out.

5.1.5 Clogging of local drain water:

If the construction materials are kept beside road drain it may clog local drain and will create water clogging.

Mitigation:

- Construction materials will have to be kept within construction area (in a corner).
- Contractor will have to dispose of construction wastes properly and that should not be disposed to the local drains.

5.1.6 Impact on air quality due to dust

Different activities like; pile diving & casting, machinery movement, handling of construction materials (stone/brick chips, sand, cement), rod fabrication, movement of trucks with construction materials etc. may generate dust and damage the air quality.

Mitigation:

- Water will be sprayed to control the dust, which is the main way to suppress dust in the working site.
- Construction material should be transported through truck covered by tarpaulin.

5.1.7 Noise and vibration

Movement of vehicles, concrete mixer machine, vibrator machine and crushing bricks at site may generates noise. Pile diving, concrete casting, cutting of steel for reinforcement etc. may cause noise hazards.

Mitigation:

- Transportation of construction materials have to be carried with scheduled time,
- All powered mechanical equipment and machinery shall be fitted with noise abating gear such as mufflers for effective sound reducing device.
- Ensure use of the personal protective equipment (helmet, goggles, ear plug, gloves, safety boot etc.);
- Crushing of bricks/ stones shall not be allowed at the project site, so broken brick or stone chips should be collected from source to the project for construction purpose.
- For concreting works, separate batch plant may be used (Ready Mix Concrete if available).

5.1.8 Impact on Surface Water Quality:

The quality of surrounding surface water may deteriorate if construction debris, construction waste, pile waste, effluent from work camps, food wastes etc. are allowed to dump in the nearby road side borrow pits/ water bodies or haphazardly, because; there is a water body beside the market area.

Mitigation:

- Waste material in any form should not be thrown in water body or unspecified places,

- Proper construction management including waste management, training of operators and workers will be provided to avoid pollution of water bodies or nearby habitants.
- Waste bins are to be provided at different location of working and living places.

5.1.9 Soil erosion:

Within design it is observed that there is a semi basement. Floor of semi basement is more than five feet lower then road level. For foundation and semi basement floor construction total area have to excavate 9 to 10 feet. At some places (septic tank, Underground water reserve) excavation depth may 12 to 15 feet. If proper measures not taken it may cause damage of construction site road.

Mitigation:

- Earthwork activities should be done in dry season
- Contactor shall have to use proper sheet pile or shore pile during earth cutting or earth excavation works and that is to be included in the structural design.

5.1.10 Contingency Planning for any uneven situation:

There are so many unwanted happenings may occur during construction periods. Proper contingency planning is required for overcoming any unwanted situation, otherwise, that will hamper the progress of works. As a preparedness works, proper contingency planning is essential for smooth progress.

Mitigation:

- All the emergency telephone numbers of all the departments like Police station, fire service & civil defense, truck & bus stands, hospitals, clinics, etc.
- Standby transport facilities to deal any accidental case,
- Emergency on-call physician,
- Arrangement of Safe havens (within the Ramgonj area/ Super Market construction area), preferably the Pourashava Rest House premises may be used as emergency shelter during any disaster like Cyclone.
- Storage of the material should not create obstacle for movement of vehicles and pedestrians.

5.1.11 Occupational Health and Safety

The most important risks associated with the construction activities are listed below:

- Risks of using of the machineries in motion such as steel cutter, glass cutter etc.;
- Risk of falling from the height during chipping, plastering work, painting work etc.;
- Risk from drop down of the materials from the height during chipping, plastering work, painting work etc.;
- Risk from mechanical failure of the equipment such as pile rig and winch machine;
- Risk from the traffic collision or accidents during operation of the equipment such as hydraulic excavator, steel cutter, pile rig, winch machine, welding machine, and vehicles movement for the transportation activities of the subproject;
- Risks from head loads for carrying soil, construction materials and construction equipment;
- Risk associated to the sudden bad weather working conditions such as storm, thunder storm and earth quake etc.
- Exposure to the sunlight- workers are being exposed to the sun for long hours;
- Exposure to the high temperature, and humidity for a long time resulting in dehydration;
- Contact with the hazardous substances and wastes pose risks of the infections and diseases.

General Requirements for the Workers' Health and Safety

The key salient features of the general requirements for the workers' health and safety stated are presented in ***Table 5.1***.

Table 5-1 General Requirements for the Workers Health and Safety

Issues	Requirements
Health and Hygiene	• Protection against dust and furnace by using of the nose masks and covering of the head and body; • Laborers will use proper safety belts during work at high altitude • Ensure availability and using proper PPE (helmet, gloves, safety glass, safety shoes etc.) of all workers during work. • Provide construction workers with basic information on infectious diseases including HIV/AIDS • Proper scaffolding should be made available during construction • Proper disposal of the wastes and effluents; • Introduce waste bins for the solid waste management system.
Safety and First Aid Box	• Using of the personal protective equipment (helmet, gloves, goggles, nose mask, safety boots); • Precautions during work on or near machineries in motion; • Head loads are prohibited; • First aid facilities should be provided and maintained; • The first aid kit should include adhesive bandages, regular strength pain medication, gauze, and low grade disinfectant.
Compensation for Accidents at Work	• Contractors will bear medical treatment costs. If any sever accidents such as loss of hands, legs or loss of working ability or any case of death needs compensation-(the amount of the compensation should be fixed considering the type of accidents).
Dust and Fumes	• For any dust, fumes, or other impurities likely to be injurious to the workers, effective measures shall be taken to prevent their accumulation and its inhalation by the workers.
Overcrowding	• No labor room should be overcrowded, the labor camp should be provide 10 ft x 20 for male and 10 ft x 15 ft for female workers.

5.1.12 Felling of the Trees and Ecological Impacts

Three trees will be felled down due to this subproject implementation. Hence, ecological impact is very less. However, to enhance ecological condition, a comprehensive tree plantation plan has been prepared that is enclosed in the appendix.

Mitigation:

- 9 number of trees will be planted to enhance the ecological condition at the premises of the Super Market;
- Planting trees will enhance the ecological condition of the area after their successful growth.

5.2 Problem during Operation and Maintenance Phase

5.2.1 Noise Nuisance

Use of hydraulic horns by the vehicles may create noise nuisance. Use of loud speaker and overcrowded during events may create noise nuisance to the nearby residents

Mitigation:

- As the market area is under Ramgonj Pourashava, the Pourashava authority along with the will control the vehicle machineries, horn system, silencer etc. during the operation phase.
- The Ramgonj Pourashava will also take care on loud-speaker or horn system.

5.2.2 Solid waste:

Operation of market will generate solid like cartoon, bottles, plastic films, grocery bags, plastic display case, plastic food packaging, plastic buckets, container etc.If these, generated waster are not disposed properly, it may create unhygienic environment in the market area, and resulting customers will feel discomfort.

Mitigation:

- The shopkeepers (both super market and grocery shop areas) will deposit waste in the waste bins
- The wastes will have to be collected by the cleaners (to be engaged by the shop keepers) to the primary transfer station (the primary transfer station has been incorporated in the design).
- The Conservancy unit of Ramgonj Pourashava will carry the waste (from the primary transfer station) to the proper disposal site. Maximum solid wastes are recyclable and will be recycled as possible.

5.2.3 Traffic Congestion

As the proposed market is a local super market, local people will use non-motorized vehicles (rickshaw etc.) for coming to market. A very few people will use motorized vehicles**.** Every day some trucks will bring goods to the market. If load-unload works done at road side it will cause traffic jam.

Mitigation:

- Loading and unloading works will have to be performed at the entrance gate of the market (the open place). The loading and unloading place will be fixed during design.
- The market-watchers shall take care on the traffic movement and parking situation during loading/ unloading arrangements

5.2.4 Accident Due to Fire Hazard and Electric Short Circuit

Fire hazards is a common threat to establishments, it may occur due to negligence and poor understanding of safety systems. Fire hazard may come from short circuit or open burning of waste material in the market area.

Mitigation:

- Use of fire extinguisher and ensure emergency exit;
- The fire extinguisher is to be placed at the stair-case site in every floor.
- Do not touch electrical appliances with wet hands, marking will be displayed.

- Do not use faulty or malfunctioning electrical products.
- Stop the open burning in the market area.
- Training should be provided to use firefighting equipment when necessary.

  Regularly check and maintenance the electrical line of the market area

5.2.5 Using of generator for Power generation

Generation of noise and associated health hazard. Hazards associated with handling of fuel (for diesel generators), spills and leaks. GHG gas emission from diesel generators

Mitigation

- Generator should be located in an area in the building which is isolated by noise-proof barriers
- Ensure wearing of personal protective equipment for staff working in the generator area
- Good housekeeping.
- Proper handling of lubricating oil and fuel. That is to avoid accident dropping of lubricant and fuel on the soil during handling and transportation.
- Collection, proper treatment, and disposal of spills.
- Use the latest model of generator having the best technology for GHG emission reduction.
- Regularly monitoring GHG from the exhaust of generators to detect any faulty operation.

5.2.6 Impacts on Social Environment

Through the construction activities, the local labor force will be used and that's the positive impact of the subproject. On the other hand the engaged laborers of different shops in the market will be disturbed to some extend during their shifting and construction works. These positive and adverse impacts and mitigation measures have been described in the social impact assessment (SIA) report.

5.2.7 Labor Influx and Anticipated Impacts

The labor influx will be minimum because, most of the works will be done by the local laborers and there is very minimum chance of engagement of outside laborers. So, the labor influx issue will be minimum or nil from the construction of sub-project.

6 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

6.1 General

This chapter summarizes the mitigation and abatement measures both during construction and operation phases of the subproject. The purpose of the Environmental Management Plan (EMP) is to ensure that the activities are undertaken in a responsible and non-detrimental manner. The EMP will guide the environmentally sound construction of the subproject and ensure efficient lines of communication between the Project Management Unit (PMU, BMDF), Project Implementation Unit (PIU) of Ramgonj Pourashava, and the contractors.

6.2 Access to Information

The environmental assessment report should be translated into Bengali and disseminated locally. The copies of the report (both in English and Bengali) will be sent to all the concerned personnel responsible for subproject implementation. It will also be made available to the public. The final assessment report will also be uploaded in the BMDF website and the World Bank website after approval.

6.3 Grievance Redress Mechanism

The project-specific Grievance Redress Mechanism (GRM) will be established by the PIU of Ramgonj Pourashava to receive, evaluate, and facilitate the solution of APs concerns, complaints and grievances concerning the social and environmental performance of the subproject. The GRM is aimed to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the subproject.

The grievance mechanism is related to resolve the risks and adverse impacts of the subproject. It addresses APs' concerns and complaints promptly, using an understandable and transparent process that is also gender responsive, and culturally appropriate. It is readily accessible to all segments of the affected people at no costs and without retribution. The mechanism should not impede access to the country's judicial or administrative remedies. The affected people will be appropriately informed about the mechanism.

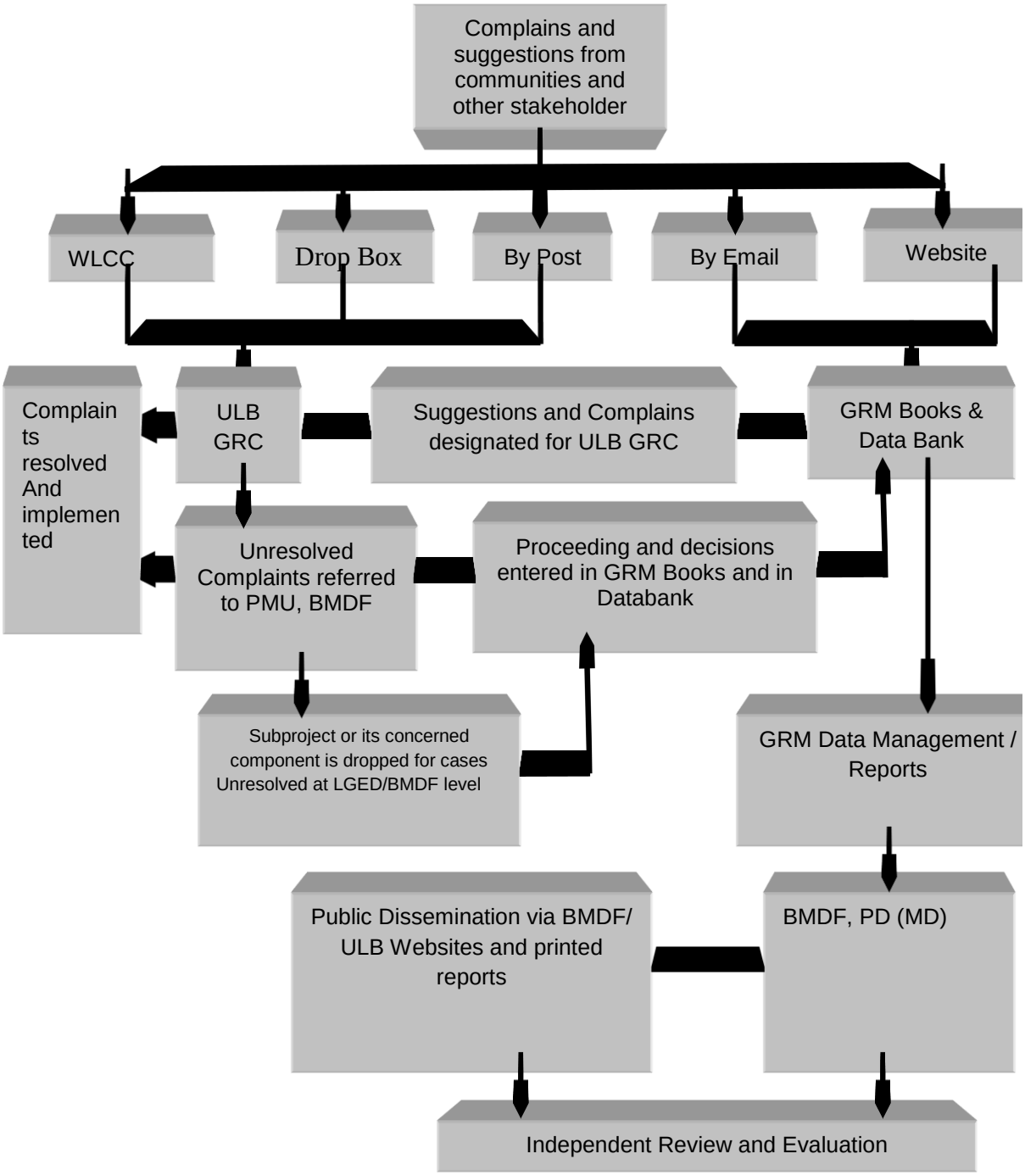
BMDF has its own Grievance Redress Procedure (GRP), which it operates to address any dissatisfaction and complaints by the local people regarding its activities. This procedure is being applied to address any complaints or grievances through negotiations with the community leaders and representatives of the APs during implementation of the MGSP.

6.3.1 Grievance Redress Committee (GRC)

The discussions and negotiations will be conducted by the PIU of Ramgonj Pourashava and will be involved the APs and Grievance Redress Committee (GRC) headed by The Pourashava Mayor. With the facilitation of Consultant, the Mayor nominated the GRC members and included representative from the Government Agencies, local NGO, and Civil Society. The GRC will be formed and established at Ramgonj Pourashava. The grievance box will be delivered to the Pourashava to received complaints. The grievance response focal point will be available at Pourashava for instant response to an aggrieved person. It will receive written complaints or suggestions, and produce them to the GRC for hearing and resolution.

6.3.2 Grievance Resolution Process

Given flow chart will be followed for grievance resolution process of this subproject.



6.4 Institutional Concern for Environmental Safeguard Compliance

The Environmental Safeguard Compliance issues are directly vested the pourashava officials, especially engineer in charge will be responsible for supporting the construction supervision with the facilitation of BMDF. The civil works contractors will implement the environmental mitigation measures.
The BMDF, with the help of Environmental Safeguard Specialist will submit the monthly monitoring reports on Environmental Compliances to the World Bank.

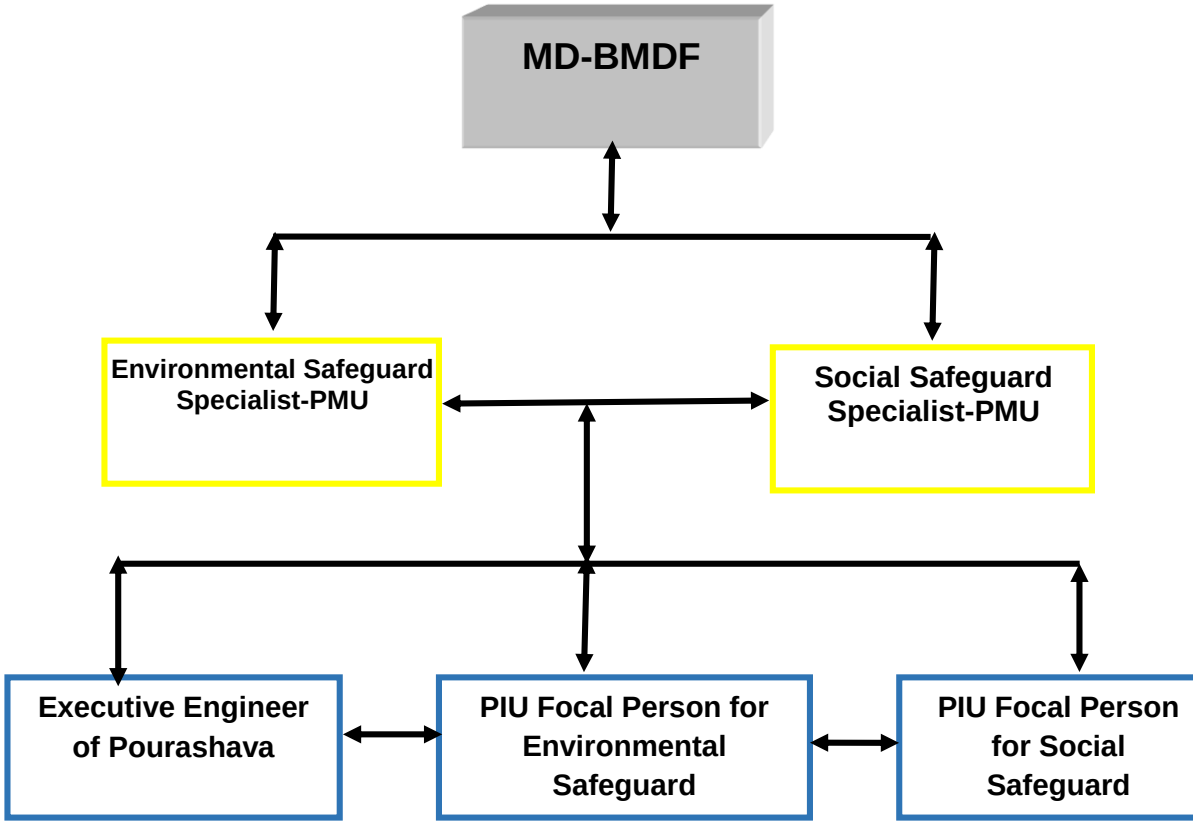


Figure 6-1: Environmental and Social Management Team (Tentative)

6.5 Capacity Building

A training program has been developed by the PMU of BMDF to build the capability of PIU of Ramgonj Pourashava In addition, the hired consultants of Ramgonj Pourashava was also there. Under this training program PMU was organize an introductory course for the training of the Ramgonj Pourashava officials, preparing them on: (i) Environmental Screening, (ii) EMP Implementation, including environmental monitoring requirements related to mitigation measures; and (iii) taking immediate action to remedy unexpected adverse impacts or ineffective mitigation measures found during the course of the implementation. The contractor should be also included in the training program to enhance the Environmental awareness and orientation among the workers.

6.6 Environmental Management Action Plan

The activity wise anticipated environmental impacts and corresponding mitigation measures have been outlined in ***Table 6.1***

Table 6-1: Environmental Management Plan for the Sub-project

Issues/ Environmental impact	Mitigation measure/ action	Location	Timing	Responsible organization	
				Implementation	Supervision/ Monitoring
Pre-construction phase					
Environmental clause in the contract	• Incorporate environmental clauses in bid and contract document	Ramgonj Pourashava	Before bidding or contract	Ramgonj Pourashava	PIU- Ramgonj Pourashava and PMU-BMDF
Construction vehicles and machinery	• Trial run of contractor's vehicles and machinery to confirm that their conditions, and that pollutant emission and noise level will not cause serious damages to the surrounding environment	construction site, or vehicle depot	Before the commencement of construction	Contractor,	PIU- Ramgonj Pourashava and PMU-BMDF
Impact due to Flooding	• The design will ensure that facilities remain safe from flooding and inundation. • The site selected for the facilities will be sufficiently higher than the maximum water level during high tides and storm surges. • Appropriate drainage system will be included in the design.	Ramgonj Pourashava	During Design	PIU-Ramgonj Pourashava	PIU- Ramgonj Pourashava and PMU-BMDF
Construction phase					
Training for engineers and contractors	• Provide training on environmental and social considerations to concerned engineers and contractors	Ramgonj Pourashava Office	Before the commencement of construction	Ramgonj Pourashava	PIU- Ramgonj Pourashava and PMU-BMDF
Location and Facilities of Labour Camps	• Separate labour camp for both male and female workers will have to be constructed • The labor shed shall be with the facilities like; mosquito nets, cooking arrangement, water supply, waste bins, lighting etc. • Temporary drains for the super waste water and rain water are to be provided and maintained around camp site, • Potable water supply for drinking and other purposes,	Near the construction area	At starting phase of construction	Contractor	PIU- Ramgonj Pourashava and PMU-BMDF

Issues/ Environmental impact	Mitigation measure/ action	Location	Timing	Responsible organization	
				Implementation	Supervision/ Monitoring
	• Sanitary latrine have to provide at both construction and labor camp area, for male/female workers, to be ensured • The camp should be with standard living condition and arrangement. • The contractor will install sanitary latrines (may be low-cost latrines) with two-pit septic tank facilities, • Separate latrine have to provide for both male and female workers • The latrines should be at a distant and safe location, • The latrines should be with proper washing facilities (water and soap).				
Health, safety and hygiene	• Safe scaffolding system will have to be used during construction. Safety Engineer will check regularly that the nut & bolts of scaffolding system are properly tied or not and any damaged materials will not use for scaffolding system • Laborers will use proper safety belts during work at high altitude • Proposed project is situated at high cyclone risk area and contactor have to arrange safe place for laborer during that type of natural disaster. • Provision of first aid box, safe drinking water and sanitary latrine for the construction workers. • Ensure availability and using proper PPE (helmet, gloves, safety glass, safety shoes etc.) of all workers during work. • Provide construction workers and local people with basic information on infectious diseases including HIV/AIDS • HSE trainings will be provided to the workers and supervisors of Super market construction • First aid boxes will be made available at the construction site. • Emergency phone numbers (hospitals, Fire Service, Police station etc.) will be displayed at key locations of construction area. • Firefighting equipment will be made available at the facilities. • Liaison with the community will be maintained.	Proposed Super market construction site	During construction period	Contractor Ramgonj Pourashava	PIU- Ramgonj Pourashava and PMU-BMDF

Issues/ Environmental impact	Mitigation measure/ action	Location	Timing	Responsible organization	
				Implementation	Supervision/ Monitoring
Waste management	• Within the construction site, a number of waste bins will have to be provided by the contractor, • The Contractor will be responsible to deposit the every generated waste in a safe place and that will be carried by conservancy unit of Ramgonj Pourashava to the dumping yard • Contactor will carry out the pile slurry to a safe place and that safe place shall be selected earlier (before pile diving).	Proposed Super market construction site, and work camp	During construction period	Contractor,	PIU- Ramgonj Pourashava and PMU-BMDF
Impact due to inadequate drinking water supply	• The contractor will ensure potable water as indicated in the BOQ (environmental safeguard component) prior starting the works, • The water quality will have to be tested for its quality judgment in a regular interval	Super market construction site	During construction period	Contractor,	PIU- Ramgonj Pourashava and PMU-BMDF
Pollution from fuel and lubricants	• Raised platform (brick soling with neat cement finishing) shall be constructed prior to start working (to be included with environmental safeguard items in the bidding document). • Leakage fuel and lubricants from equipment will be collected by separate container for reuse or safe disposal. So it cannot be spread and pollute adjacent areas.	construction site	During construction period	Contractor,	PIU- Ramgonj Pourashava and PMU-BMDF
Traffic congestion, effect on traffic and pedestrian safety	• To avoid local traffic congestion, any materials required for construction should be transported at night (10.00 pm – 6.00 am), • Proper vehicle schedule should be maintained with proper consultation of the local people, • Unloading of materials should be done inside project areas, • Traffic control manpower will be deputed during construction and operation period, • Control sign will be provided to regulate traffic movement, • Safety arrangement has been inserted in the safeguard cost in BOQ.	Proposed Super market construction site surrounding roads	During construction period	Contractor Ramgonj Pourashava	PIU- Ramgonj Pourashava and PMU-BMDF
Impact on air quality due to dust	• Ensure that construction vehicles and heavy machineries to be used for the Super market construction are maintained periodically, and their exhaust gases are within acceptable limit.	Super market construction site	During construction period	Contractor Ramgonj Pourashava	PIU- Ramgonj Pourashava and PMU-BMDF

Issues/ Environmental impact	Mitigation measure/ action	Location	Timing	Responsible organization	
				Implementation	Supervision/ Monitoring
	• Water should be sprayed on the construction site, in particular excavation sites, brick crushing site, asphalt mixing sites, to minimize the effects of dust. • Vehicles carrying construction materials shall be covered to prevent the spill off. • Provide masks to construction workers if dust content is high. • Construction material should be transported through truck covered by tarpaulin. • Monitor the air quality around the construction site every six months during the construction period. If the quality exceeds the air quality standards or baseline air quality data, take further preventive measures.				
Impact on Surface Water quality	• Waste material in any form should not be thrown in water body or unspecified places, • Proper construction management including waste management, training of operators and workers will be provided to avoid pollution of water bodies or nearby habitants. • Waste bins are to be provided at different location of working and living places.	Proposed Super market construction site	During construction period	Contractor, Ramgonj Pourashava	PIU- Ramgonj Pourashava and PMU-BMDF
Noise and vibration	• Transportation of construction materials have to be carried with scheduled time, • All powered mechanical equipment and machinery shall be fitted with noise abating gear such as mufflers for effective sound reducing device. ▪ Ensure use of the personal protective equipment (helmet, goggles, ear plug, gloves, safety boot etc.); • Crushing of bricks/ stones shall not be allowed at the project site, so broken brick or stone chips should be collected from source to the project for construction purpose. • For concreting works, separate batch plant may be used (Ready Mix Concrete if available).	Proposed Super market construction site	During construction period	Contractor, Ramgonj Pourashava	PIU- Ramgonj Pourashava and PMU-BMDF

Issues/ Environmental impact	Mitigation measure/ action	Location	Timing	Responsible organization	
				Implementation	Supervision/ Monitoring
Clogging of water inside the construction site	• Earthworks should be done during dry season. • During pile, foundation, semi basement floor etc. work temporary drainage system will have to be provided. A small pit will have to be provides also in one corner. Water will go inside the pit through temporary drains and if necessary, a submergible pump will pump out. • drains and a submergible pump will pump out.	Proposed Super market construction site	During construction period	Contractor,	PIU- Ramgonj Pourashava and PMU-BMDF
Clogging of local drain water	• Construction materials will have to be kept within construction area (in a corner). • Contractor will have to dispose of construction wastes properly and that should not be disposed to the local drains.	Proposed Super market construction site	During construction period	Contractor,	PIU- Ramgonj Pourashava and PMU-BMDF
Soil erosion control	• Earthwork activities should be done in dry season. • Contactor shall have to use proper sheet pile or shore pile during earth cutting or earth excavation works and that is to be included in the structural design	Proposed Super market construction site	During construction period	Contractor,	PIU- Ramgonj Pourashava and PMU-BMDF
Contingency Planning for any uneven situation	• All the emergency telephone numbers of all the departments like Police station, fire service & civil defense, truck & bus stands, hospitals, clinics, etc. • Standby transport facilities to deal any accidental case, • Emergency on-call physician, • Arrangement of Safe havens (within the Ramgonj area/ Super Market construction area), preferably the Pourashava rest house premises may be used as emergency shelter during any disaster like Cyclone. • Storage of the material should not create obstacle for movement of vehicles and pedestrians.	Proposed Super market construction site	During construction period	Contractor, Ramgonj Pourashava	PIU- Ramgonj Pourashava and PMU-BMDF
Social Conflict	• Orientation and training will be provided to the contractors, supervisors and workers, on health, safety and environment including sexual diseases control (as of BOQ), • Liaison with the communities will be maintained throughout the construction phase.	Proposed Super market construction site	During construction period	Contractor, Ramgonj Pourashava	PIU- Ramgonj Pourashava and PMU-BMDF

Issues/ Environmental impact	Mitigation measure/ action	Location	Timing	Responsible organization	
				Implementation	Supervision/ Monitoring
	• Grievance redress mechanism has been established at the sub-project site.				
Gender equity	• Employ poor women, preferably in earthwork through the LCS scheme, which will contribute to women empowerment	Proposed Super market construction site	During construction period	Contractor Ramgonj Pourashava	PIU- Ramgonj Pourashava and PMU-BMDF
Post-construction/ Operation phase					
Noise Nuisance	• As the market area is under Ramgonj Municipality, the Ramganj Municipality will control the vehicle machineries, horn system, silencer etc. during the operation phase. • The Ramganj Municipality will also take care on loud-speaker or horn system.	The Poura Super Market	During operation and maintenance phase	Ramgonj Pourashava	Ramgonj Pourashava
Solid waste generation	• The shopkeepers (both super market and grocery shop areas) will deposit waste in the waste bins. Separate bins will be used for fish and meat wastes (protein waste). • The wastes will have to be collected by the cleaners (to be engaged by the shop keepers) to the primary transfer station (the primary transfer station has been incorporated in the design). • The Conservancy unit of Ramgonj Municipality will carry the waste (from the primary transfer station) to the proper disposal site. • As possible recyclable solid waste will be recycled	The Poura Super Market	During operation and maintenance phase	Ramgonj Pourashava	Ramgonj Pourashava
Waste water disposal	• Separate sewer lines for super market, bath room and toilet facilities; • Provision of septic tank system and soak pit for toilets • Provision of soak pit is to be provided for disposal of waste water from the chicken and fish market area. In On the bottom of soak pit 1.5 m depth filter bed (Sylhet Sand and brick chips, 1:1 proportion) is preferable. • The waste water, after filtration through the soak pit, will not be harmful either to ground water or to the nearby drains/ surface water. • The soak pit will have to be cleaned in a regular interval (at least in every three months).	The Poura Super Market	During operation and maintenance phase	Ramgonj Pourashava	Ramgonj Pourashava

Issues/ Environmental impact	Mitigation measure/ action	Location	Timing	Responsible organization	
				Implementation	Supervision/ Monitoring
Traffic congestion	• Loading and unloading works will have to be performed at the entrance gate of the market (the open place). • The market-watchers shall take care on the traffic movement and parking situation during loading/ unloading arrangements	The Poura Super Market	During operation and maintenance phase	Ramgonj Pourashava	Ramgonj Pourashava
Accident Due to Fire Hazard and Electric Short-Circuit	• Use of fire extinguisher and ensure emergency exit; • The fire extinguisher is to be placed at the stair-case site of the building in every floor.(to be confirmed by local fire service and civil defenses) • Do not touch electrical appliances with wet hands, marking will be displayed. • Do not use faulty or malfunctioning electrical products. • Stop the open burning in the market area. • Training should be provided to use firefighting equipment when necessary. • Regularly check and maintenance the electrical line of the market area	The Poura Super Market	During operation and maintenance phase	Ramgonj Pourashava	Ramgonj Pourashava
Using of generator for Power generation	• Generator should be located in an area in the building which is isolated by noise-proof barriers • Ensure wearing of personal protective equipment for staff working in the generator area • Good house keeping • Proper handling of lubricating oil and fuel. That is to avoid accident dropping of lubricant and fuel on the soil during handling and transportation • Collection, proper treatment, and disposal of spills • Use the latest model of generator having the best technology for GHG emission reduction • Regularly monitoring GHG from the exhaust of generators to detect any faulty operation	The Poura Super Market	During operation and maintenance phase	Ramgonj Pourashava	Ramgonj Pourashava

6.7 Environmental Monitoring Plan

Environmental monitoring is an essential tool in relation to environmental management as it provides the basic information for rational management decisions. The following environmental monitoring plan has been adopted to check the activities mentioned in the environmental management plan.

Table 6-2: Environmental Monitoring Plan

Monitored Parameter/ Issues	Monitoring Method/ Key Aspects	Location of Monitoring	Frequency of Monitoring
Safety orientation and training of workers	Frequency of training & orientation of workers for safety	Subproject site	• Once in a month • Reporting: Once in a month
Personal Protective Equipment	Ensure every single person involved in the activities wear and use safety equipment	Subproject site	• Daily • Reporting: Once in a month
Worker's health	Monitoring process of worker's health	Subproject site	• Daily • Reporting: Once in a month
Sanitation & drinking water facility to the workers	Availability of safe drinking water and sanitation to the workers	Subproject site	• Daily • Reporting: Once in a month
Incident record and reporting	Documented record of all incident, accident, its remedial process	Subproject site	• Daily • Reporting: Once in a month
Site security/ Fencing at the site	Isolation of site from general access by fencing, restriction of the un-authorized entry in the site.	Subproject site	• Daily • Reporting: Once in a month
Bulletin/ announcement boards/ prohibition signs	Visible in good condition or not	Subproject site	• Daily • Reporting: Once in a month
Equipment /vehicles	-Switched-off diesel engines when not in use; -Search any possible leakage; -Fuelling.	Subproject site	• Daily • Reporting: Once in a month
Dust	Dust is visible or not	Subproject site	• Daily • Reporting: Once in a month
Oily waste generation and disposal	Quantity of oily waste, storage and disposal	Subproject site	• Daily • Reporting: Once in a week
Solid waste generation	Quantity of solid wastes and disposal	Subproject site	• Daily • Reporting: Once in a month
Gender equity	Direct survey in the field by interviews with the women in order to ensure that there is no any gaps between man and women	Subproject site	• Daily • Reporting: Once in a month
Child labor	No child will be engaged in the activities	Subproject site	• Daily • Reporting: Once in a month
Handling of hazardous materials	Fuelling, storage, operation	Subproject site	• Daily • Reporting: Once in a month

Table 6-3: Monitoring Plan (during construction phase)

Monitored Parameter / Issues	Monitoring Method/Key Aspects	Location of Monitoring	Period & Monitoring Frequency
Air quality	• Visually-black smoke; • Sampling; • Analysis at laboratory; • analysis of merits determination by using quality standards; • Through digital instruments.	Subproject site	• Two times during construction period; • Reporting: Immediately after analysis and once in a month as a regular basis
Noise level	• Through digital noise level meter	Subproject site	• Three times during construction period; • Reporting: Immediately after measurement and once in a month as a regular basis.

Monitoring During Operation

Post construction monitoring is limited to a number of impact parameters to see the actual performance of the project. Some monitoring may be necessary during the operation period of the project. Environmental monitoring requires set of indicators that could be conveniently measured, assessed and evaluated periodically to observe the trends of change in base line environmental quality.Table 6.4 and 6.5 summarizes the potentially significant environmental study needed to be monitored during the operational phase.

Table 6-4: Monitoring plan during operation phase

SL No	Issue	Key aspects	Sampling, No/year
1	✓ Complain from local people	✓ Any significant complain from local people and it's remedial procedure	✓ 4
2	✓ Site drainage	✓ Maintaining proper drainage	✓ 4
3	✓ Solid Waste Management	✓ Proper management of solid wastes	✓ 4

Table 6-5: Environmental parameters need to monitor

Parameter	Location	Sampling No/year
Air quality	Super Market area	2
Water quality	Nearby ground water and Drain water	2
Noise and Vibration	Super Market Area	2

6.8 Environmental Safeguard Cost during Construction Phase

Considering the environmental impacts and their mitigation measures for the subproject, several items are included in the BOQ for the environmental management. ***Table 6.6*** presents the estimated cost for the environmental management.

Table 6-6: Environmental Management Budget

Item No.	Description of the Items	Costs (Tk)
1	Establishment of labor camp (male shed - 15 ft x 30 ft and female shed 12 ft x 15 ft1) with living arrangement, drinking water facilities, cooking arrangement, mosquito net,, waste bin etc.	100,000.00
2	Masonry pucca platform (at least 100 sft size), providing brick soling and net cement finishing for keeping fuel and lubricants for machineries.	15,000.00
3	Dust suppression measures by water spraying throughout the construction period in and around the subproject site, uncovered aggregates and loose materials such as stockpiles of the sands, excavated earth etc.	10,000.00
4	Air quality (SPM, PM_{10}, and PM $_{2.5}$) measurement- it can be measured from the recognized environmental survey company, public institute/ university three times during construction phase and one time at operation	90,000.00
5	Noise level measurement- it can be measured from the recognized environmental survey company, public institute/ university three times during construction phase and one time after construction (total 4 times)	32,000.00
6	Wastes disposal facility during the construction period; collection, transportation, and dumping of the wastes at landfill site and providing sufficient bins; at least 4 bins (400 liter size) to be provided.	30,000.00
7	Water supply facilities (for the labor shed and work site):1 no. of tube well (depending on the site condition the contractor will select the option)	60,000.00
8	Sanitation facilities (at the labor shed): 2 nos. of the toilets preferably portable toilets (1 no. for women and 1 no. for men)	50,000.00
9	Providing PPE like hand gloves, spectacles for eye protection, helmets, masks, visible jacket, ear plug, safety boots for at least 30 person (25 for workers and 5 for visitor) and one first aid box with necessary medicine	100,000.00
10	Tree plantation for beautification work- preferably local fruits, flowers, medicinal and ornamental trees- (including protection and conservation during project defect liability period)- tree plantation detailed as per drawing- 9 nos. of the trees	4500.00
11	Surface water quality test 3 times. 1 time before construction and that result will be compared with the result during construction. 2 times during construction	10200.00
12	Cautionary signs - 8 nos.	15000.00
Total		**516700.00**

Note: The environmental safeguard compliance issues and cost (Like solid waste management, water supply, drain cleaning, test of environment parameter etc.) are to be done by market committee and that is to be supervised by RAMGONJ POURASHAVA.

7 PUBLIC CONSULTATION AND PARTICIPATION

7.1 Methodology

Participation is a process, through which stakeholders influence and share control over development initiatives, the decisions and the resources, which affects them. Participation of stakeholders in the subproject is also a primary requirement in developing an appropriate management plan that addresses subproject requirement and suited to the needs of the stakeholders. Public involvement also vastly increases the probability of successful implementation of management plan. In order to preparing the Environmental Assessment (EA), participatory public consultation was conducted in the subproject site. The Pourashava officials, Engineer, local individuals as well as consultants of Pourashava participants participated.

Public opinion has been collected through Key informant interviews and focus group discussion meetings. For better understanding the socio-economic and environmental condition one focus group discussion has been conducted in the subproject study area. The local communities were informed about the subproject interventions including their benefits. Suggestions made by the participants were listed and incorporated in the EMP accordingly.

Figure 7-1: Consultation Meeting at the Sub-project Site

7.2 Key Issues Raised by the Participants

The key issues discussed were (i) views of the proposed Super market subproject, (ii) impacts on the subproject (if any) during construction and operation phases, (iii) serious environmental issues (if any) and (iv) observations and suggestions on the proposed subproject, (v) quality maintaining of the construction work

7.3 Focus Group Discussion (FGD)

Discussions were held beside the proposed construction site with the local communities and proposed super market side shopkeepers. The participants were presented with feedback, suggestions, and recommendations. The overall outputs of the FGD are given below.

- The local people emphasized that construction work should minimum adverse impact on the environment;
- In the group discussion for the future development of Ramgonj Pourashava and the participants demands (a) Planned and green municipality, (b) Planned hygienic and enhanced municipality, (c) Echo-friendly technology base industrial neighborhood;
- The participants stated that the public water supply facilities, sanitation facilities, drainage congestion and access road is not adequate;
- The FGD results confirmed that an improved communication network, drainage facility, solid waste management, water treatment plant and water supplying system, and sanitation facilities, are needed for future development of Ramgonj Pourashava
- Local people also believed that the importance of the area would be elevated and various economic activities would be started in the area after the subproject implementation;
- Local people also showed strong expectation for the increased opportunities for employment for the local labor in the construction work.
- Participants opined that no small or marginal group will be affected due to this subproject activities.

8 CONCLUTION AND RECOMMENDATION

8.1 Cconcluding Remarks

On the basis of the analysis, it may be concluded that the project stands environmentally sound and sustainable when the recommended mitigation measure and environmental management processes are adopted properly. The adverse environmental impacts from the project will mostly take place during the construction stage. Benefits in the project area will be in significant except some short terms employment and business opportunities during the construction phase There is no significant cumulative adverse impact during operation that are identifiable at this stage. The construction impacts should be very predictable and manageable, and with appropriate mitigation measures. The project is expected to have a small "environmental footprint". No endangered or protected species of flora or fauna are reported at the project site. The proposed project activities have no significant adverse environmental impact so far as a time bound execution program with application of advanced construction technology is ensured. The mitigation measures are well within such codes and practices of construction and operation of the proposed project.

8.2 Recommendations for the subproject

Possible environmental impacts of the proposed subproject have been evaluated and mitigation measures have been suggested, as follows:

- The Ramgonj Pourashava authority will inform the surrounding people about the subproject;
- The construction activities shall follow the structured work schedule;
- The Environmental Management Plan (EMP) shall be placed in the construction site.
- The Contractor shall follow the EMP and that is to be monitored by Ramgonj Pourashava authority.
- All specifications mentioned in the environmental monitoring plan shall be followed.
- mitigation and enhancement measures proposed in this report need to be followed;
- Visual and analytical monitoring should be carried-out as per EMP and with the facilitation of the PMU of BMDF
- Contractor will ensure availability of the PPEs and first-aid box, water supply and sanitation facilities to the workers;
- Contractor will monitor the workers behavioral matter to avoid any undue issues associated to the labor influx.

The Consultants is recommending the sub-project for implementation.

REFERANCE

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ANNEX 1
LIST OF PUBLIC CONSULTATITION

market

Name of Subproject: Construction of five (05) storied Poura Supermarket under Ramganj Pourashava. Laxmipur. (Ward no. 09 and CIP NO-01)

Package: BMDF /RAMGANJ / 2017-2018 / W-1

Name of ULB : **Ramganj** **Upazila: Ramganj**

District : **Laxmipur** **Date: 01/06/2018**

Attendance of Local Participants in the Screening Exercise

Local Stakeholders, Community Members and WLCC/CBO

SL#	Name	Gender	Social Status	Contact Number	Signature/LTI
০১	[illegible]	পুরুষ	ব্যবসায়ী	০১৭২৬৪৬৬০০১	
০২	[illegible]	ঐ	ঐ	01718983983	
০৩	[illegible]	ঐ	ঐ	01876668194	M.M.I.R
০৪	[illegible]	ঐ	ঐ	01757792673	
০৫	[illegible]	ঐ	ঐ	01712597352	
০৬	[illegible]	ঐ	ঐ	01712769896	
০৭	[illegible]	ঐ	ঐ	01818657252	
০৮	[illegible]	,,	[illegible]	০১৭০৮৪০৩৮৯২	
০৯	[illegible]	,,	,,	০১৭১২০২৩৯২	
১০	[illegible]	,,	,,	০১৬৩৫৭৯৩৪৪৩	
১১	[illegible]	,,	[illegible]	০১৮০৬৯৬৭৮২	
১২	[illegible]	,,	[illegible]	০১২৮৬৭৫১১২	
১৩	[illegible]	,,	[illegible]	০১৭১২০২৪৮১২	
১৪	[illegible]	,,	[illegible]	০১৯২২৯৮৭৭৫৭	
১৫	[illegible]	,,	[illegible]	০১৭২৮২৭৫৭০৮	

সহকারী প্রকৌশলী
রামগঞ্জ পৌরসভা
রামগঞ্জ, লক্ষ্মীপুর।

নির্বাহী প্রকৌশলী
রামগঞ্জ পৌরসভা
রামগঞ্জ, লক্ষ্মীপুর।

মোঃ আবুল খায়ের ভূঁইয়া
মেয়র
রামগঞ্জ পৌরসভা
রামগঞ্জ, লক্ষ্মীপুর।

Name of Subproject: Construction of five (05) storied Poura Supermarket under Ramganj Pourashava. Laxmipur. (Ward no. 09 and CIP NO-01)

Package: BMDF /RAMGANJ / 2017-2018 / W-2

Name of ULB : Ramganj **Upazila: Ramganj**

District : Laxmipur **Date: 01/06/2018**

Attendance of Local Participants in the Screening Exercise

Local Stakeholders, Community Members and WLCC/CBO

SL#	Name	Gender	Social Status	Contact Number	Signature/LTI
১৬	মানিক ভাটিক	পুরুষ	ব্যবসায়ী	০১৯০৩৯৩৮২৭৫১	মানিক
১৭	নীলা রানী	মহিলা	গৃহিণী	০১৮৬৭৭৯৪১৮৮	নীলা
১৮	মোঃ হারিছুইয়া	পুরুষ	কৃষক	নাই	মো: হারিছুইয়া
১৯	জাকির হোসেন	,,	ব্যবসায়ী	০১৯২৮৩৯৪৯৭৮	
20	কামাল হোসেন	,,	,,	০১৯২৬৯৫৩৮০৩	
২১	লিটন	,,	ছাত্র	০১৯৩৪২৭৪৯১৫৪	লিটন
22	বাবুল	,,	ব্যবসায়ী	০১৯৫৮৭২৬৮৬৬	বাবুল
২৩	আবুল কাশেম	,,	,,	০১৯১৮২৫৭৯২৫২	মো: কাশেম
24	তমিজ হোসেন	,,	,,	01743171818	তমিজ
২৫	ফরিদ আহম্মদ	,,	,,	০১৯১০৮০৬০৮৪	ফরিদ
২৬	মোকছেদ হোসেন	,,	,,	০১৮৫২৮৫৫২৬	মোকছেদ
29	রিপ্পান হোসেন	,,	,,	০১৯২৩০৫৬৫৮৪৪	রিপ্পান
২৮	জসিম হোসেন	,,	,,	০১৯৬৯৬৮৫৬০০	জসিম
২৯	মিজান খান	,,	,,	০১৯৫৯৮৭৯২৪০৬	
৩০	মু: ইসমাইল	,,	,,	০১৯৪৮৯৫৯৪৯০	ইসমাইল

কাউন্সিলর ২,২৬
রামগঞ্জ পৌরসভা
রামগঞ্জ, লক্ষ্মীপুর।

সহকারী প্রকৌশলী
রামগঞ্জ পৌরসভা
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মোঃ আবুল খায়ের পাটওয়ারী
মেয়র
রামগঞ্জ পৌরসভা
রামগঞ্জ, লক্ষ্মীপুর।