ENVIRONMENTAL ASSESSMENT (EA) REPORT

Name of the Sub-project: Multipurpose cum Super Market

Homna Municipality,

Homna, Comilla

Municipal Governance and services Project (MGSP)

Bangladesh Municipal Development Fund (BMDF)

November, 2017

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1.0 Subproject Description

1.1 Subproject Background

This is a proposed subproject relates to the establishment of a Multipurpose cum Super Market under the Municipal Governance and Services Project (MGSP) by Homna Municipality. The Homna Municipality aims to providing the modern facilities and availability of daily necessities under the same roof to its citizens. The name of the subproject is construction of Multipurpose cum Super Market at Homna Municipality. Homna Municipality is a newly created Municipality of Homna Upazila of Comilla District. It was established in 2002. Total area of Homna Municipality is 14.10 sq.km. The total population of the Municipality is 34447 of which 16778 are males and 17669 are females. The literacy rate of the Municipality is 78%. It consists of 9 wards and 13 mahallahs (source: Homna Municipality). There is only one Bazar in Homna Town as well as Homna municipality and there is no super market in the municipality area where the population can get their daily needs under one roof. Most of people of this area go to other place like Comilla or Gouripur Bazar or Dhaka City to buy their needs. Therefore, a well designed super market is needed for the population of the municipality.

The significant features of the subproject are mentioned below:

Name of the subproject	: Multipurpose cum Super Market
District Name	: Comilla
ULB Name	: Homna Municipality
Market side Wards Number	: Ward – 2, 3, 4, 5
Estimating visiting Population	: 2000/day
Wards population	: 34447 (total municipality)
Tribal people	: 3 (Chakma, ward no 3 for job purpose)
Land acquisition	: Owned by Homna Municipality
Estimated cost	: BDT. 200 Million
Subproject duration	: 24 months
Tentative start date	: 1st January 2018
Tentative completion date	: 31st December 2019

Subproject component with floor area and occupancy of the proposed 6 storied Multipurpose cum Super Market is given below.

1. Area of each floor (Appxt.)
   a) Semi Basement Floor = 10059 Sft.
   b) Ground Floor = 10421 Sft.
   c) First Floor = 10292 Sft.
   d) Second Floor = 10339 Sft.
   e) Third Floor = 10245 Sft.
   f) Fourth Floor = 9953 Sft.
   g) Fifth Floor = 9903 Sft.

2. Occupancy of each floor.
   a) Semi Basement Floor:
      1. Under Ground Car Parking
      2. Under Ground Godown
      3. Under Ground Water Reservoir
      4. Electro-Mechanical Room
      5. Two Lift
      6. One Stair
      7. One Ramp
   b) Ground Floor:
      1. 28 Nos. Shop
      2. Under Ground Ramp
      3. Load- Unload Area
      4. Two Lift
      5. Two Stair & Fire Stair
      6. One way Escalator
   c) First Floor:
      1. 26 Nos. Shop
      2. Gents & Ladies Toilet
      3. Two Lift
      4. Two Stair & Fire Stair
      5. One way Escalator

d) Second Floor:
    1. 34 Nos. Shop
    1. Two Lift
    2. Two Stair & Fire Stair
    3. One way Escalator
e) Third Floor:
    1. Food Court Shop, Children Play Area, Café etc.
    2. Two Lift
    3. Two Stair & Fire Stair
    4. Gents & Ladies Toilet
f) Fourth Floor:
    1. Multipurpose Office Space
    2. Two Lift
    3. Two Stair & Fire Stair
    4. Gents & Ladies Toilet
g) Fifth Floor:
    1. Multipurpose Community Hall
    2. Wash Area
    3. Change Area
    4. Two Lift
    5. Two Stair & Fire Stair
    6. Gents & Ladies Toilet
h) Roof Top Floor:
    1. Lift Machine Room
    2. Stair Case
    3. Solar Panel Area
    4. Fire Reservoir
    5. Over Head Water Reservoir
    6. Roof Top Green Space & Gardening
    7. Mobile Tower

Sub structure and superstructure design information of the proposed sub-project is given below:

a) Semi Basement Floor:
    1. Foundation: Earth Work, R.C. C. Pile Foundation, C.C. & R.C.C. Pile Cap, R.C.C. Foundation Beam, Brick Work & etc.
    2. Semi Basement: R.C.C. Column, R.C.C. Floor, R.C.C. Beam, R.C.C. Slab, R.C.C. Retaining Wall, Partition Brick Work, Plaster Work, Tiles Work, Paint Work & etc.

b) Ground Floor:

    R.C.C. Column, R.C.C. Floor, R.C.C. Beam, R.C.C. Slab, Partition Brick Work, Plaster Work, Tiles Work, Paint Work, Glass, Grill, Sutter, Stair Railing & etc.

c) First Floor:

    R.C.C. Column, R.C.C. Floor, R.C.C. Beam, R.C.C. Slab, Partition Brick Work, Plaster Work, Tiles Work, Paint Work, Glass, Grill, Sutter, Stair Railing & etc.

d) Second Floor:

    R.C.C. Column, R.C.C. Floor, R.C.C. Beam, R.C.C. Slab, Partition Brick Work, Plaster Work, Tiles Work, Paint Work, Glass, Grill, Sutter, Stair Railing & etc.

e) Third Floor:

    R.C.C. Column, R.C.C. Floor, R.C.C. Beam, R.C.C. Slab, Partition Brick Work, Plaster Work, Tiles Work, Paint Work, Glass, Grill, Sutter, Stair Railing & etc.

f) Fourth Floor:

    R.C.C. Column, R.C.C. Floor, R.C.C. Beam, R.C.C. Slab, Partition Brick Work, Plaster Work, Tiles Work, Paint Work, Glass, Grill, Sutter, Stair Railing & etc.

g) Fifth Floor:

    R.C.C. Column, R.C.C. Floor, R.C.C. Beam, R.C.C. Slab, Partition Brick Work, Plaster Work, Tiles Work, Paint Work, Glass, Grill, Sutter, Stair Railing & etc.

The proposed subproject building has a setback. For ventilation and entering natural light each floor will have glass window, corridor.

1.2 Location of the subproject

The proposed subproject site is located within the Homna Municipality under Ward no. 4 (figure 1) about 18 km North from Dhaka-Chittagong 4 lane highway and 68 km East from Dhaka City. Geographic co-ordinate of the proposed subproject is 23°40'58.8"N latitude 90°46'56.1"E longitude. An area of approximately 30 Decimals has been identified for the project development. The proposed site is the center point of Homna Municipality near Homna bazar and launch ghat connected with Homna-Gharmora road and Homna Hospital road. The adjacent areas are Ward No. 2 (Baghmara part), 3 (Homna part, Haripur), 4 (Baghmara, Homna part), 5 (Homna part) where about 6300 households are situated around the proposed market (source: Population and Housing Census 2011, Homna Municipality). Map of Homna municipality with indicating wards number is shown in figure 2.

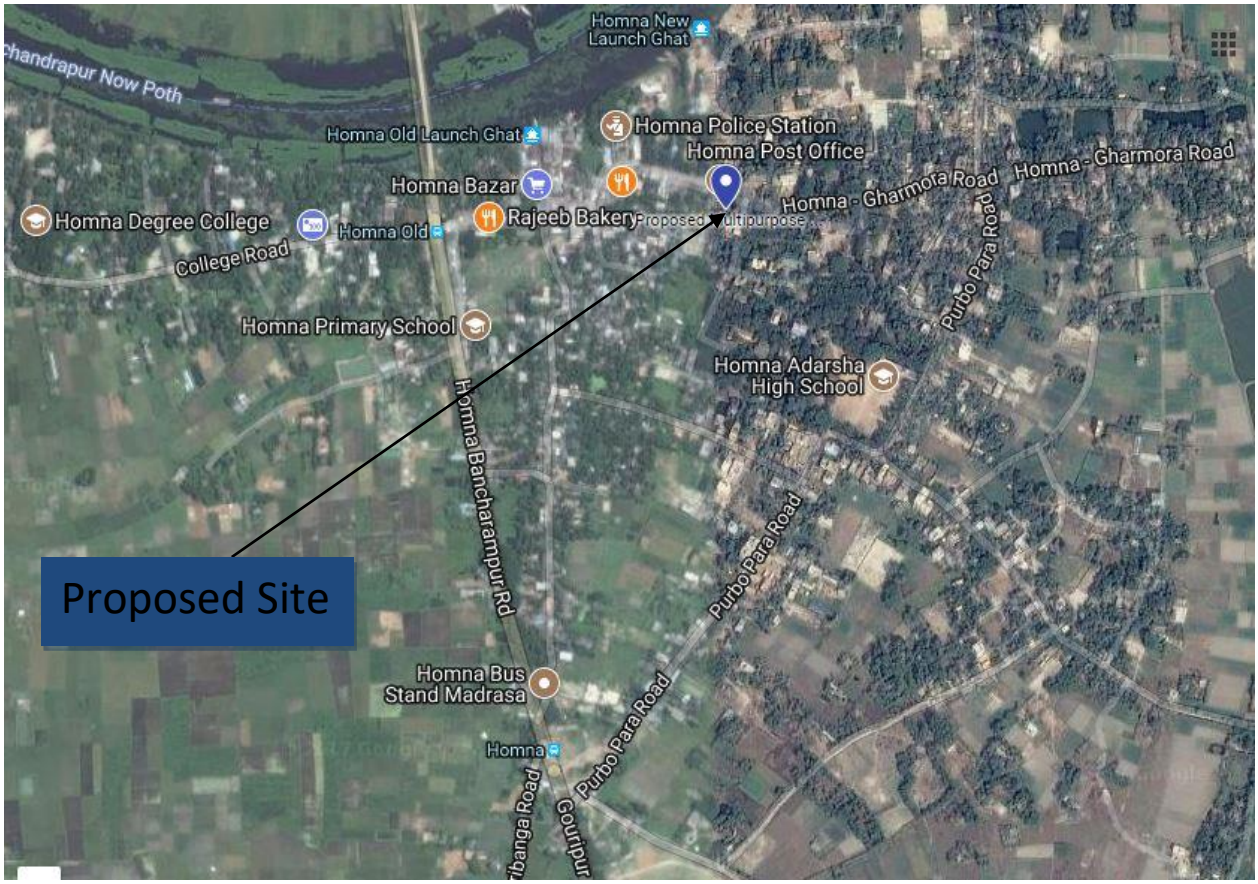


Figure 1: Proposed Subproject Location (source: maps.google.com)

Through the World Bank financial support and overall guidance of BMDF, Homna Municipality 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.

This Environmental Assessment (EA) report presents the screening of potential environmental impacts of the proposed subproject and contains the mitigation measures in order to eliminate or reduce the negative impacts to an acceptable level, describes the institutional requirements and provides an environmental management plan.

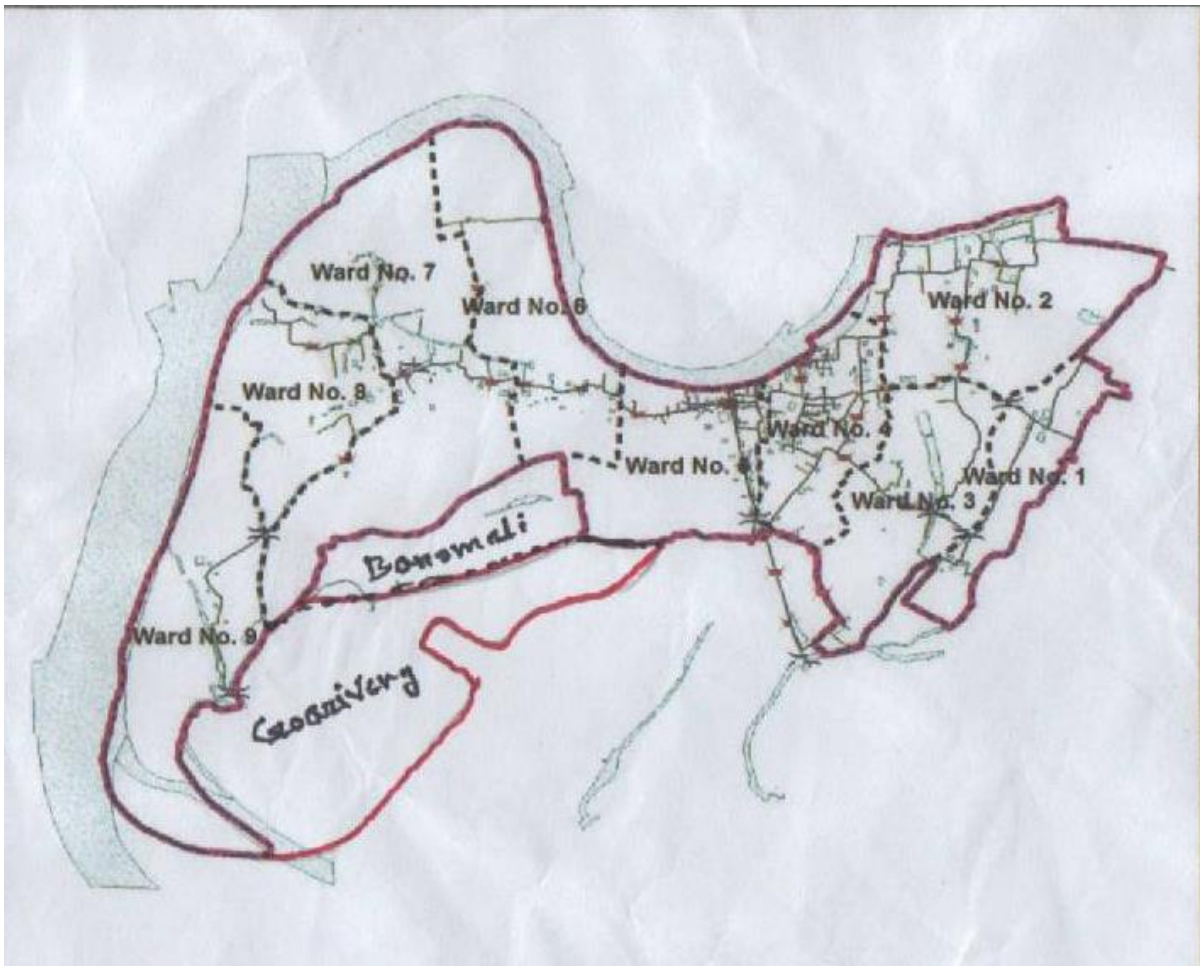


Figure 2: Map showing Homna Municipality with Wards.

1.3 Layout of Subproject

Layout of proposed subproject is shown in figure 3.

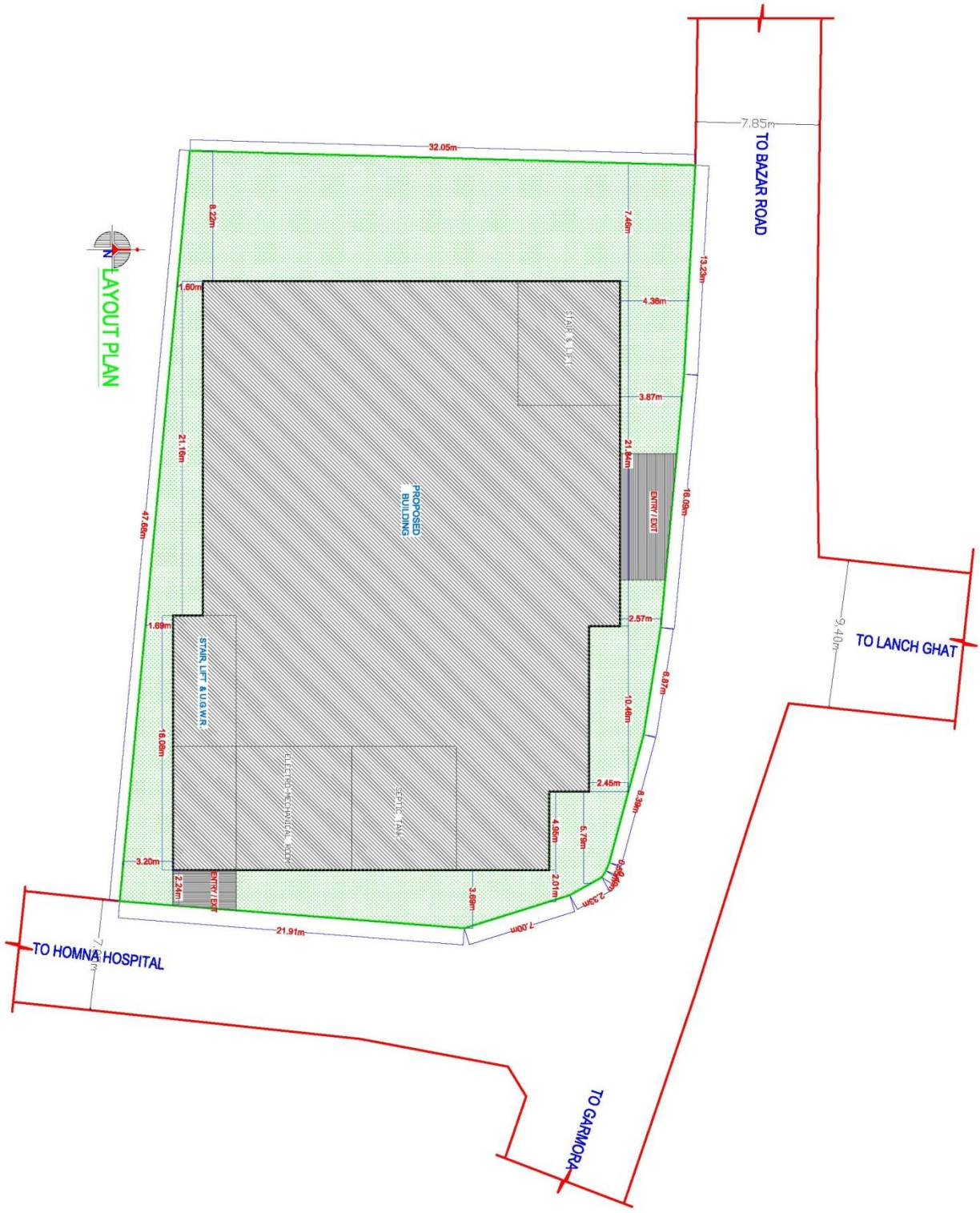


Figure 3: Layout of Proposed Subproject

1.4 Present status of the subproject site

The present status of the proposed subproject site area is vacant. Three very old broken and discarded building, five (5) trees includes one Banyan tree, one Blackberry tree, one Jujube tree and 2 other trees and some small trees and shrubs are in the site area (four side view of proposed subproject site is shown in figure 4-7. The land is owned by the Homna Municipality. This is well

connected with wide roads in two sides with Homna bazaar, launch ghat, other areas of Comilla District and with different Wards under Homna Municipality. The wide road from Homna Launch Ghat and Bazar to Homna Bus Stand and Homna Town, is very suitable for carrying goods from anywhere of the country as well as people can come from their residents on foot, Car, truck, pickup etc. or by Rickshaw through existing roads. There is a covered drain passes in front of the proposed Market site which could be used for discharge the waste water generated from the proposed market.

Figure 4: East side view of the site

Figure 5: South side view of the site

Figure 6: West side view of the site

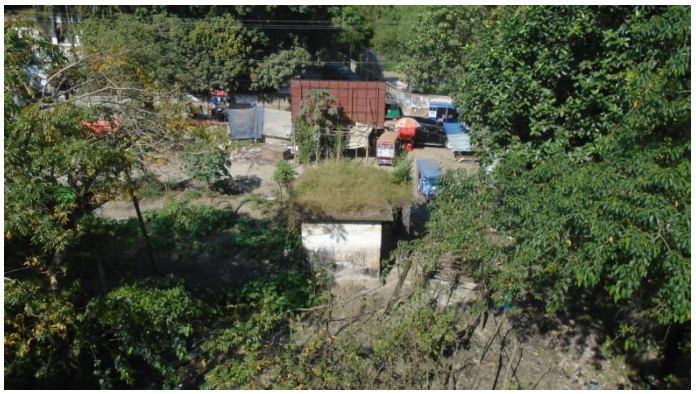


Figure 7: North view of the site

1.5 Objectives and justification of selecting of this subproject

The Capital Investment Plan (CIP) of Homna Municipality lists a number of subprojects. The PMU-MGSP of BMDF along with Homna Municipality has made field visits and

evaluated existing site conditions of the proposed subprojects. Presently there are numbers of broken buildings and trees are inside the area, some street vendor (fruit sellers) sit on road side at the east side of the proposed market. Currently there is no traffic congestion in the site area. Only rickshaw, CNG and small vehicles are moving in the site area. There is no well-designed and multipurpose market complex in Homna Municipality. So, a well-designed and multipurpose market complex is required in the Homna Municipality area.

In fact, after completion of the subproject, it will provide a structural, customer and environment friendly easy shopping facilities for both male and female buyers and sellers in all seasons and it will helps to create employment opportunities for the local people.

Selection Criteria of Subproject

- Existing private markets and their
- poor condition
- Type of commodities being transacted in the area
- Available marketing facilities including condition of access to the market
- Availability of land for the market
- Existing demand for modern market
- Types of structure to be developed
- Loading and unloading provision
- Traffic mobility and parking provision
- Number of population
- Number of population
- **After all revenue income**
- Land position & its value
- Existing demand of market to people
- Construction cost & recovery loan payment & earning

1.6 Key subproject activities and implementation process

The key activities of this proposed Multipurpose cum Super Market subproject will include earth work, brick work, CC and RCC works, reinforcement work; tiles work, plastering work, grill work, glass work, electrical work, plumbing works. The materials to be used for the key activities are soil in earth work, sand, bricks, brick chips, stone chips and reinforcement. Furthermore, kerosene/diesel will be used for vibrator, pilling machine, electric generator. Saline free water will be consumed in two ways for domestic purposes (safe water) and for construction works such as for mixing concrete and curing. Electricity will be used for reinforcement fabrication and domestic purposes. The wood/gas will be used for cooking by the workers at the Labor sheds. The major equipments to be used for the implementing the subproject are diesel machine, brick breaking or stone breaking machine, steel cutter, dump truck, water tanker, excavator and trucks for carrying construction materials. For supplying water in the market a deep tubewell will be established and there will be arrangement of water supply from municipal water supply

line. Storm water and other water from soak pit and septic tank an internal drainage system will be constructed and it will be connected with municipal drainage system.

1.7 Category of subproject

(a) According to ECR 1997 : Green/ Orange A/ **Orange B**/ Red/ Not Listed

(b) According to WB Classification: **Category B**/Category C

1.8 Analysis of Alternatives

The objective of this analysis of alternatives is to identify the suitable location for this proposed subproject of construction of Multipurpose cum Super Market at Homna Municipality that would generate the least adverse impact and maximize the positive impacts. According to capital investment plan (CIP) in 2017 and Homna Municipality Master Plan: 2011-2031 in 2015 ward no 4 is the core area of Municipality and the selected location for the proposed subproject was mentioned in CIP 2017. From the physical observation it was observed that the present location of the subproject is suitable for communication and no other location was found for the proposed subproject. It is near the Homna Bazar, Launch Ghat and Homna Upazila Complex. Map of ward 4 of Homna Municipality is shown in figure 8.

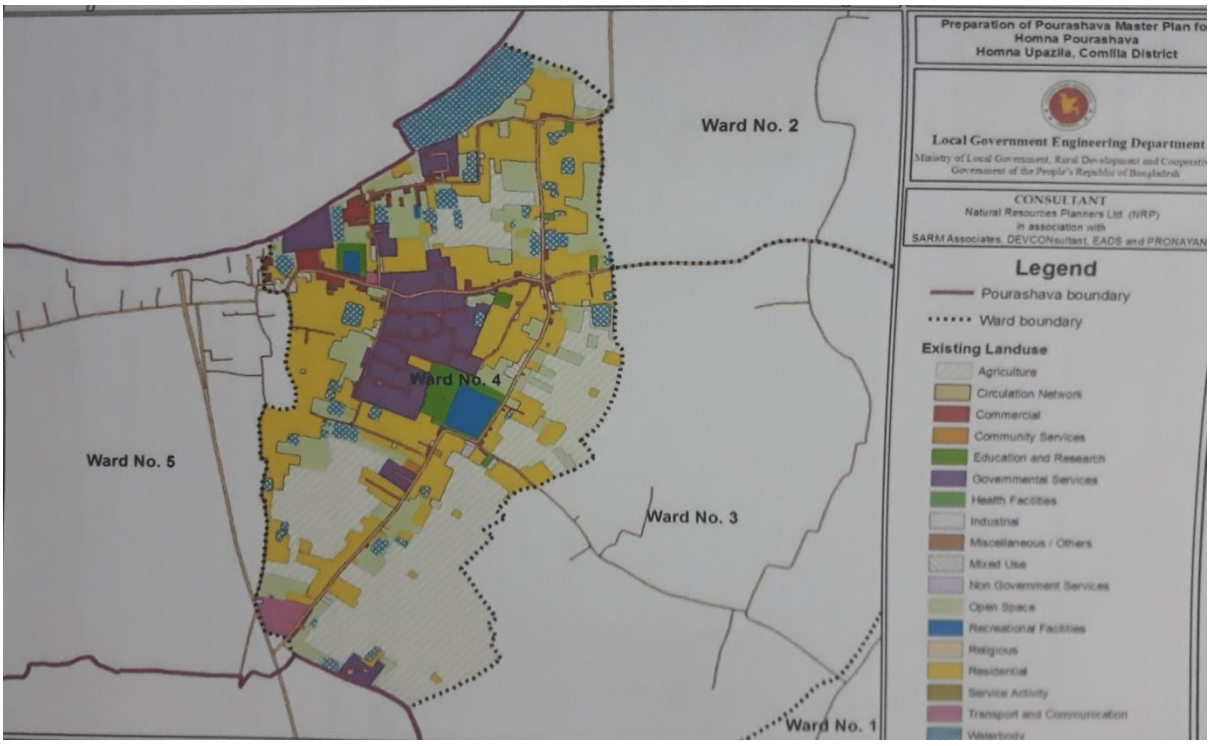


Figure 8: Map of ward 4 of Homna Municipality

2.0 Detailed Environmental and Land use Features

Generally, preparations for these subprojects need a detailed conditional survey to get a clear profile. However, due to immediate requirement for the ULB and the BMDF, the Environmental Consultant prepared this Environmental Assessment (EA) Report by conducting quick field survey. The data collected from the field visits and addressed in the subprojects EA report. Therefore, minor adjustments may be needed at a later stage when the sub-projects will be implemented and in operational stages. Efforts have been given for obtaining environmental features within 100 m at four directions (North, South, East and West) from the center point of the proposed Market .The findings of this effort given in Table 1. Outside view of the proposed subproject site is shown in figure 9.

Table 1: Major Environmental Features around the proposed Market

Sides/Direction	Major Environmental Features
North	Homna-Gharmora Road, Homna-Dulalpur Road, Homna-Post office, Drain, Trees, Electric line, Shilpokola Academy, Homna Girls School, Girls School Market, Homna Launch Ghat
South	Homna Central Hospital, Residential Area, Shops, Open Space, Trees
East	Hospital Road, CNG Stand, Temporary Shops, Open Space, Trees, Upazila Quarter, Market, Homna Upazila Parishad, Homna Municipality and Upazila Land Office
West	Shibaloy Market, Shops, House, Road, Trees, Shib Mandir

Figure 9: Outside view of the site

3.0 Baseline Analysis of Environmental Condition

3.1 Physical environment

Geology, topography and soils

Homna is located on the bank of Titas River and it is a flood plain area. Type of soil of Homna is Non calcareous dark grey and grey floodplain soils.

Non-calcareous Grey Floodplain soils comprise grey topsoil and a cambric B-horizon in the subsoil with a grey matrix or grey gleans. However, there are considerable regional differences in the proportions occupied by individual soil textures. (Source: banglapedia.org).

Climate and meteorology

Homna is situated at south-central zone of Bangladesh. The climate of the subproject area can be described as Tropical Monsoon. It is characterized by warm, humid summers and cool, dry winters. From November to March, it is dry and cool while from April to May it is extremely hot during the pre-monsoon season. From June to October, the monsoon season is warm, cloudy, and wet. The warmest month is April, the coolest is January, the wettest is July and the driest is January.

The average rainfall and temperature of subproject area for last 12 months is given below in table 2. Average rainfall in last 12 months was around 157 mm. The average temperature of subproject area is 27°C for last 12 months.

Table 2: Average temperature and rainfall for last 12 months (2016-2017).

Months Parameter	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Average Temperature °C	25	23	21	24	25	28	30	29	29	30	30	28
Rainfall (mm)	63	0	0	1	107	172	113	257	423	291	209	244

(source: www.accuweather.com)

Hydrology (surface water, ground water, and rainwater)

Homna Municipality has no large water bodies except Titas River. A few numbers of ponds and depressed areas are seen in the Municipality area. In Homna Upazila, 92.2% households depends on tube-well for drinking water purpose, 1.4% from pipe water and the remaining 6.4% household get water from other sources (source: population and housing census 2011). There is only one pump for water supply in Homna Municipality. There is no facility of rain water harvesting in Homna Municipality. The percentage of arsenic in groundwater in Bangladesh, they found 65 percent sample was arsenic contaminated (0.102 mg/L) and level was higher than national standard (0.05 mg/l).
(source: https://www.unicef.org/bangladesh/BNDWQS_2009_web.pdf).

Flooding, water logging, and drainage pattern

According to previous data this area is not affected in severe flood events such as 1988 and 1998. Therefore, this area is temporarily considered as a normal flood prone zone not severe. Due to continuous heavy rain or monsoon season this area goes under water logging. Structured drainage system in this subproject area is basically absent except for a few narrow drains that are not enough to carry storm and domestic waste water. The existing drainage system is not functional because people throw and dispose wastes in the drains. Therefore, the drain is being filled up and the land floods when it rains heavily.

Air quality and dust

Air quality data of the subproject area is not readily available. From physical observation of the proposed project area it can be said that air quality will be same as the average air quality of Comilla town. There is no possibility of air pollution by industries because there is no industries in this area, Air pollution by transportation is very low because a very few number vehicle move in this area that driven by CNG. There as many trees found in this area that helps to balance the air components. A few amount of dust was observed in road due to transportation.

Noise level

Noise is an important factors that obstruction for the quality of the environment in the proposed subproject area. No big vehicles such as Buses, Trucks was found during field visit in the project area. Only Three Wheeler (CNG), Motor Cycles and rickshaws are generally move on the road during day and night. These vehicles generate insignificant noise in the subproject area. No other

perceptible sources of noise generation such as factories or industries were found near the proposed subproject area.

3.2 Biological Environment

Flora and fauna

There are only 4 big trees inside the proposed subproject area which includes Banyan (1), Blackberry (1), Mango (1) and other (1) tree. Some small trees and shrubs were found inside the site area. Local birds such as Wagtail, Shalik, Tailorbird and Orange-bellied Leafbird were found on trees. Wild animals and endangered fauna species were not found as the site areas. As the proposed area is vacant and above flood level, there is no possibility of availability of aquatic species.

Biodiversity status

From physical observation and discussion with local community there is no special or site specific terrestrial and aquatic ecosystems heavily disturbed by this proposed subproject construction.

3.3 Socio-economical environment

Land use

The proposed subproject market construction site is vacant for more than 50 years. The local people viewed that the area was undulated with shrubs and small trees. Gradually the bushes and trees depleted by the human activities such as CNG/rickshaw parking, garbage dumping etc. Presently there is no permanent use of this land.

Beneficiary population

This proposed market is situated in Ward no-4, and other adjacent areas are Homna East part, Horipur, Homna Middle Part, Homna West Part. The adjacent areas are Ward No. 1 (Bahirkhola, Kakarkandi), 2 (Baghmara part), 3 (Homna part, Haripur), 4 (Baghmara, Homna part), 5 (Homna part), 6 (Charergaon, Sreepatir Char part), 7 (Sreepatir Char Part), 8 (Sreepatir Char Part) and 9 (Lathia) where about 6300 households are situated and 34447 people are living around the proposed Market area and will be benefitted from this proposed market directly and indirectly. (Source: Population and Housing Census 2011, Homna Municipality).

Education

In the subproject area, literacy rate among the population is 78%. This is more than the national average (51.8%). Literacy rate among males is still higher than females (Source: Homna Municipality).

Tribal communities

There are no permanent tribal people living around the proposed market area. Only 3 tribal (Chakma) people living in ward no 3 of Homna Municipality for job purpose (Source: Homna Municipality).

Land acquisition and resettlement

The total proposed subproject market area is owned by the Homna Municipality and presently it is vacant, hence there is no need of additional land acquisition and resettlement for the implementation of this subproject.

4.0 Environmental Screening

Environmental Screening (ES) for the subproject has been conducted with the purpose of fulfilling the requirements of DoE and WB. Environmental Screening ensures that environmental issues are properly identified in terms of extent of negative and positive impacts. A field visit for preparing the ES was carried out on November 2017 in the subproject area. Environmental Screening Checklist, as adopted in Appendix C of the Environmental Management Framework (EMF) of MGSP, was followed for identifying the impacts and their extents. The screening data and information for this subproject have been analyzed and are shown in below.

1) Potential environmental impact during construction phase:

(a) Ecological impacts:

- Felling of trees : ☐ Significant ☐ Moderate ☑ Minor (5 trees)
- Clearing of vegetation : ☐ Significant ☐ Moderate ☑ Minor
- Potential impact on species of aquatic (i.e., water) environment
  : ☐ Significant ☐ Moderate ☑ Minor

(b) Physico-chemical 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 wastes
  : ☐ Significant ☐ Moderate ☑ Insignificant
- Water logging : ☐ Significant ☐ Moderate ☑ Insignificant

(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

2) Potential environmental impact during operational phase:

(d) Ecological impacts:

- Potential impact on species of aquatic
  : ☐Significant☐ Moderate ☑Minor

(e) Physico-chemical impacts:

- Potential air quality and noise level
  :☐ Improvement ☐No-improvement ☑Deterioration
- Drainage congestion :☐ Improvement ☑Minor Improvement ☐No Impact
- Risk of Water pollution : ☐Significant ☐Moderate ☑Minor
- Pollution from solid waste :☐ Improvement ☑No-improvement ☐Deterioration

(f) Socio-economic impacts:

- Traffic : ☐ Improvement ☑No-improvement ☐ Adverse
- Safety : ☑Improvement ☐ No-improvement ☐Adverse
- Employment generation :☐ Significant☑Moderate ☐Minor

3) Summary of possible environmental impacts of the subproject

From the above environmental screening it can be said that ecological impacts of construction of subproject is minor. Only five trees and some small trees and shrubs have to cut. No significant physico-chemical impacts of the proposed project construction work. Moderate noise and air pollution may occur during construction time. There are very minimal possibilities of adverse impacts on socio-economic environment of the subproject area, traffic congestion may occur unlikely. The subproject is also expected to produce a large number of positive benefits on the overall community in respect of social and economic strengthening of the area through resource mobilization, employment generation etc. There are some possibilities of producing moderate or minor adverse environmental impacts, which must be mitigated at the earliest by taking mitigation measures. The limiting of noise levels and dust blowing during construction and operation of the project, proper disposal of solid and liquid waste through collection and drainage system development. Maintain air quality by limiting dust and toxic gas emissions from equipment and vehicle exhaust will be monitored and will take necessary steps to control it. Health and safety for workers will be ensured by following prescribed measures of World Bank's Health and Safety guidelines. Finally it can be said that the proposed subproject will help to improve social safety, create employment opportunities and income generating of the Municipality.

5.0 Specific Impact and Mitigation & Enhancement Measures To Safeguard Environment during Construction Period

5.1 Labor Shed Construction

Two (2) separate labor shed are needed to be constructed for both male and female (If any female workers) with separate accommodation and toilet facilities and one site office. There should have safe water supply, light, ventilation and separate cooking places.

Common Mitigation Measures: Two separate (15x30 feet for male, 15x20 feet for male) labors shed will be constructed in the open space at west side of the subproject area. Three separate sanitary latrines will be constructed for site office, male labor and female labor and one tubewell will be installed near the labor shed for adequate sanitary latrine facilities and water facilities. Health and safety of workers will be ensured through providing health and hygiene training to the workers by PIU- Homna Municipality and contractor as mentioned in the Environmental Management Framework (EMF) prepared for MGSP-BMDF. Waste bins/cans will be provided near labor shed and erecting no litter signs at labor shed and site areas. Wastes will be collected in daily by waste collector and dispose the waste about 2 km away from the site at Baghmara waste disposal site under ward no-2 of Homna Municipality.

5.2 Earthwork

The subproject of market construction work consists of earth cutting, earth filling and removal of unsuitable materials. These works lead dust blowing, noise and vibration which disturb the local adjacent people, pedestrians. Excavation and trenching are hazardous construction activities that involve soil removal.

Common Mitigation Measures: Heavy equipment like excavator, truck, tractors will be keep away from trench edges. Trenches will be inspected at the start time of each shift. Work under raised loads will be prohibited. Water will be spraying during day time to stop dust blowing. Adequate safety barriers with clearly visible signs will be given in appropriate place to alert both drivers and pedestrians. Adequate lighting will be provided to the barriers and signs to make them clearly visible at night from a distance sufficient to respond. Temporary arrangement will be facilitate for pedestrian and vehicular traffic. Excavated soil and unsuitable materials will be kept in safe places so that pedestrian can walk smoothly. Cutting soils and unsuitable materials will be used as land fill items near Homna Municipality office compound area about 1.7 km away

from the subproject site (figure 10). For earth filling of the proposed sub-project construction, the required quantity of soil will be collected from Char area of Meghna River (4 km away from the site) and Titas River (2 km away from the site) and it will be ensured to avoid the top soil collection.

Figure 10: Cutting soils and unsuitable materials dumping site

5.3 Construction material sourcing

The construction materials such as sand and bricks are normally obtained from the local vendors. Sand is collected from quarry operations from nearby rivers (Titas, Megna) or from other nearest places like Daudkandi, Comilla. Bricks are produced using clay and firing by coals and somewhere wood. Conscious or unwitting purchase of these materials from unlicensed operators indirectly supports, encourages and promotes environmental degradation at the illegal quarry sites, creates air pollution from using energy inefficient technologies and cause medium to long-term negative impacts at source.

Common Mitigation Measures: Construction materials will be obtained from officially licensed and approved quarries and brick fields. The copies of the relevant licenses will be made available for inspection at the site by the contractor. Stones and course sands will be collected from other places (Sylhet/Sunamganj) of the country. All the materials will be carried, stored by cover and in a safe places and ensure safe transportation and handling by regular monitoring site engineer.

5.4 Air quality and dust

Air polluting substances like dust, smoke, SO_x, NO_x are produced during construction works from land preparation, operation of diesel engines, welding, burning of fossil fuels etc. The construction site generates high levels of dust (typically from concrete, cement, wood, stone, and

sand). Construction dust is classified as PM_{10} / $PM_{2.5}$ - particulate matter less than 10/2.5 microns in diameter, invisible to the naked eye. Oil spillage from engine causes soil pollution.

Common Mitigation Measures: Water will be sprayed regularly during construction works to control dust blowing. During carrying of construction materials like sand, soil, brick, cements will be covered by "terpal" and continually damp down with low levels of water except cement sacks. Cover piles of building materials like cement, sand and other powders, should be regularly inspected for spillages, and located them where they will not be washed into drainage areas. Non-toxic paints, solvents and other non-hazardous materials should be used wherever possible. Spilled oil will be collected by using plastic container to control soil pollution by oil spillage. Catalytic converter system will be used in diesel engine to reduce smoke, SO_x, NO_x from burning of fuel oil in engine.

5.5 Noise and vibration

Construction sites will produce a lot of noise, mainly from generator, pilling machine, iron cutting, brick breaking machines, equipment, and machinery, but also from workers shouting at the project site. Excessive noise is not only annoying and distracting, but can lead to hearing loss, high blood pressure, sleep disturbance, and extreme stress to nearest residential areas. Vibration also occurs during pilling works that is an issue for safety of nearby building and can causes landslides.

Common Mitigation Measures: Noise pollution will be reduced as possible through careful handling of materials; modern, quiet power tools, equipment and generators; low impact technologies; and wall structures as sound shields if possible. Protective measures will be taken to control landslides during pilling works.

5.6 Solid Waste Disposal

From the demolition of old building at the proposed site will generate huge quantity of salvage materials. It will need to carry the salvage items to a safer place for storage/dumping and reuse. Solid waste also causes for clogging of drains. Health safety is an issue for the workers during demolition.

Common Mitigation Measures: The salvage items from the old buildings will be used as landfills of low land near Homna Municipal Office. The better bricks from old building will be used in non-metal link road connected with Municipality. During the demolition time a safety

barrier will be setup around the site to control dust spreading and disturbance of local people. Safety measures will be taken to ensure the health safety of workers by providing safety equipments.

5.7 Workers safety

There is a general risk of accidental injury of workers, especially from working in open trenches of yard excavation. Most of the cases accident is happened due to unconsciousness and for not using personal protective equipment. There is also a potential health risk from contamination at work sites.

Common Mitigation Measures: Health safety training will be given to the workers. Personal protective equipment such as helmet, hand gloves, musk, goggles and gumboot will be provided to the workers and it will make sure that they will used it properly. A first aid box would be kept at work site and some of them will be trained about first aid. Health and safety of workers and work site would be monitored regularly to reduce health risk and negative impacts on workers health and life.

6.0 Specific Impact and Mitigation & Enhancement Measures to Safeguard Environment during Operation Period

6.1 Solid Waste Disposal

It is also anticipating that a considerable volume of organic (Food waste, vegetable waste) and inorganic waste (pieces of iron rods, wood, iron sheet, pet bottle etc.) will be generated from the project site. The lack of suitable methods for proper disposal of this waste will lead to the development of breeding grounds for disease vectors, foul smells from decaying waste and deterioration in the aesthetic value of the entire area. Solid waste also causes for clogging of drains.

Common Mitigation Measures: A number of small bins would be placed inside the market premises where the traders and visitors can put the solid waste within short distance and time. The waste collector will collect the solid waste from the bin in two times in a day. The waste collector will be put it in a secondary solid waste dumping site at market premises. The waste collector of municipality will collect the waste from secondary dumping station and finally dispose it at the waste dumping site of municipality about 2 km away from the site at Baghmara of ward no 2 of Homna Municipality (figure 11). An efficient and effective solid waste management and disposal mechanism will be established and implemented during operational phase of the sub-project.

Figure 11: Solid waste dumping site

6.2 Waste Water Disposal

Waste Water will generate from domestic use, toilets, food shops and floor cleaning activities. This will create environmental hazards on surrounding areas and pollute surface water if not

properly managed. The Titas river is very nearest to the Municipality where may go the waste water along with sewage from toilets.

Common Mitigation Measures: Septic tank would be constructed under the market for discharging sewage from toilets. For discharging storm water and other wastewater like floor cleaning existing drainage system of municipality will be used. A soak pit will be constructed for treatment of waste water before discharging to municipal drain. It will be make sure that the solid waste will not be discharging into the drainage system.

6.3 Traffic Congestion

Huge number of people will come to the market and number of rickshaws and other small vehicle will move for market development. There is ample possibility of traffic congestion in front of proposed market due to conglomeration of people and vehicle at day time.

Common Mitigation Measures: There will be car parking place in basement of the market and there will no need to park in the road. There will be entry and exit gate of the market to entry and exit of vehicles coming to the market. Effective traffic management system would be developed by managing all vehicles in front of the proposed market. Market committee will manage the traffic problem by deploying community police in the market area.

6.4 Rain water harvesting reservoir

There will need large volume of water for drinking purpose, toilets and washing activities. To reduce dependency on ground water, required number of water reservoir would be placed on the roof top and basement of the market to harvest rain water in rainy season following rain water harvesting procedure. There is possibility of generating bacteria in the stored rain water in the long run.

Common Mitigation Measures: An effective rainwater harvesting system would be established in the proposed subproject. Water reservoir would be constructed in basement or roof top of the proposed market to reserve rain water. Quality of reserved water would be monitored regularly and test in laboratory. The water reservoir would be cleaned regularly.

6.5 Solar Energy and Glass Wall

This is a general tendency of shop keepers having additional lights to show their selling items too brighten at day and night time. Including all other electric power demand, there will need huge electric power for the proposed market. This demand can be reduced by using solar energy. On the other hand, if Glass wall use from certain heights at the top, sunlight can be reached where day time electric consumption will reduce.

Common Mitigation Measures: A quality full solar system would be established in the proposed market. Solar panel would be setup at roof top and it will be maintained regularly. For entering sunlight in the market glass wall will be used where possible.

6.6 Fire fighting equipment

The proposed Market will be a place of different shops like food shop, restaurant etc. where may be use of stove. The fire fighting items are very important at the proposed market.

Recommended Mitigation: Fix fire fighting devices at strategic points in all floors. Provide training on device use to the staffs who will be on duties at the Market areas.

6.7 Toilet for Male and Female

It is expected that 2000 (approx.) visitors will visit the market for shopping, selling and other related purposes which will be comprised of male, female, children, and disabled peoples.

Recommended Mitigation: There would be separate toilets in every floor for male and female separately. Special arrangement would be ensured for the disabled people.

7.0 Environmental Management Plan (EMP)

7.1 Access to information

The environmental assessment report will be translated into Bengali and disseminated locally.. The final assessment report will also be uploaded in the BMDF website and the World Bank website.

7.2 Grievance redress mechanism

Subproject specific Grievance Redress Mechanism (GRM) will be set up by the Homna Municipality. This is for timely receive, ground truthing and mitigate the solution of affected person/s as per EMF. This will be transparent, time-bound approach where the affected person (AP) has scope to raise voice without any fear with facts and documents.

7.2.1 Grievance redresses committee (GRC)

For this proposed subproject specific Grievance Redress Committee has been formed by Homna Municipality. The Grievance Redress Committee of Homna Municipality for the proposed subproject is given below.

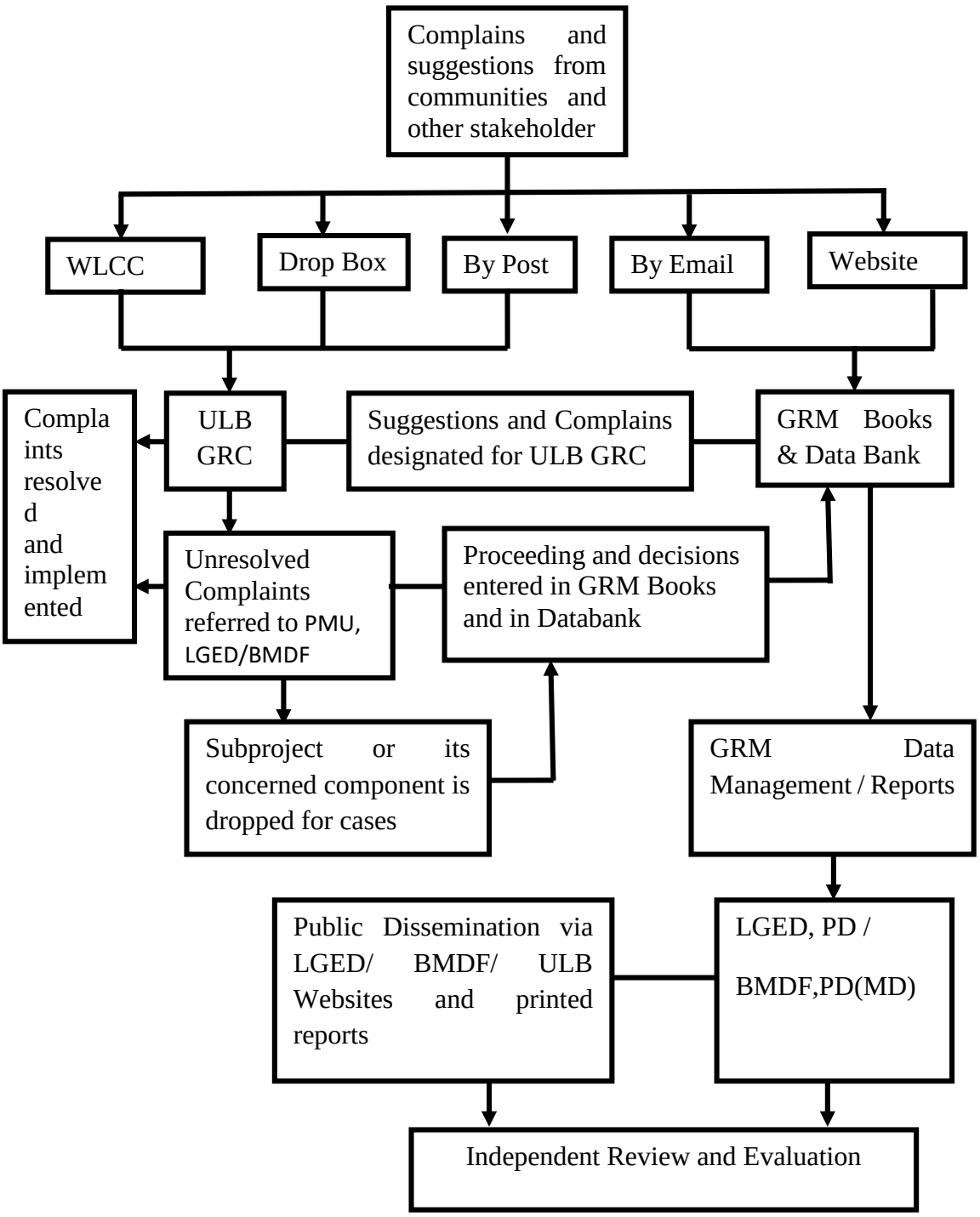
Grievance Redress Committee (GRC)
Sub-Project
Homna Pourashava, Homna, Comilla.

Sl No	Name of Member	Status
1	Md. Nazrul Islam, Mayor, Homna Pourashava.	Chairman
2	Taffazal Hossain, Assistant Engineer, Homna Pourashava.	Member Secretary
3	Agriculture Officer, Homna, Comilla.	Member
4	Mr. Bahar Uddin, English Teacher, Homna Govt. Pilot High School, Homna, Comilla.	Member
5	Manager, CCDA, NGO, Homna, Comilla.	Member
6	Sayed Ismail Hossain, Ex- Head Teacher, Homna Adarsha High School, Homna, Comilla.	Member
7	Mst. Masuda Begum, Ward Councillor, Ward-1,2,3, Homna Pourashava, Comilla.	Member

মোঃ নজরুল ইসলাম
মেয়র
হোমনা পৌরসভা
হোমনা,কুমিল্লা।

7.2.2 Grievance resolution process

Flow chart of Grievance resolution process for this proposed subproject is given below.



7.3 Capacity building

A training program has been developed by the PMU to build the capability of PIU of Homna Municipality. This has been conducted by the PMU-BMDF. The training based 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 will be required to conduct environmental awareness and orientation of the workers and other support staff before deploying to the work sites in order to achieve the expected standards.

7.4 Environmental management action plan (EMP)

Table 3: Environmental management action plan (EMP)

Subproject Activity.	Activity/ Issues	Potential Impact	Proposed Mitigation & Enhancement Measures	Estimated Mitigation Cost	Frequency of monitoring	Responsible for monitoring	
						Implement	Supervision
Pre-Construction Phase							
Construction and operation of labor shed	Construction of labor shed in minimum distance; Local people cannot be disturbed by worker; Establish of sanitary latrine and tubewell	Solid waste and waste water generation; Environmental pollution; Workers health	Labor shed will be constructed at west side of the premises; Sanitary latrine with septic tank/ Ring slab will be constructed beside of labor shed at west side; Keep waste bin; Erection of "no litter" sign	Tentative cost BDT 200000	During Construction	Contractor	Environmental Specialist-PMU, MGSP, PIU/ULB
Construction Phase							
Earth work	Earth cutting; Earth filling; Erosion of slope of the foundation trench.	Slope erosion; Dust blowing	Safety barriers will be provided; Heavy equipments will keep at safer distance; Water will be spraying.	Tentative cost BDT 10000	During Construction	Contractor	Environmental Specialist-PMU, MGSP, PIU/ULB
Construction material sourcing	Construction materials especially Sand, Bricks at the local level collect from local source.	Environmental degradation.	Construction materials will be obtained from officially licensed and approved quarries and brick fields.	N/A	During Construction	Contractor	Environmental Specialist-PMU, MGSP, PIU/ULB

Air, Water Quality and Dust	Air. water quality monitoring; Control air pollution and dust blowing	Air pollution, Water Pollution	Water will be spraying at certain interval to control the dust especially in day time; Air quality will be measured and monitoring. Ground water quality test	Tentative cost BDT 40000	During pre-construction, construction and operation period	Contractor	Environmental Specialist-PMU, MGSP, PIU/ULB
Noise and Vibration	Keep noise level within tolerance level; Measured and monitoring of noise level.	Noise pollution; Vibration at the construction site	Proper scheduling of transportation will be maintained for noise generated work; All vehicles and equipment used in construction would be fitted by exhaust silencers, maintain regularly to minimize noise.	BDT. 20000	During pre-construction, construction and operation period	Contractor	Environmental Specialist-PMU, MGSP, PIU/ULB
Water Logging	Construction materials and construction waste causes drainage congestion and water logging.	Drainage congestion	Construction material will be kept in distance from drain and drain will be cleaning.	Tentative cost BDT 10000	During Construction	Contractor	Environmental Specialist-PMU, MGSP, PIU/ULB

Workers safety	Health risk and Safety issues of workers	Physical illness; Accidental Injury	Healthy environment will be ensured in labor shed; proper use of personal protective equipments (Helmet, Gloves, Eye protecting glass, Boot, Jacket etc.) will be ensured. A first aid box will be placed at work place.	Tentative cost BDT 50000	During Construction	Contractor	Environmental Specialist-PMU, MGSP, PIU/ULB
Operation Phase							
Solid Waste Disposal	Generation of solid waste; Solid waste management system.	Environmental degradation	Small bin will be established in market premises and ensure proper solid waste collection and management.	Cost should include in the regular maintenance cost	During Operation phase	Contractor, Market Management Committee	Environmental Specialist-PMU, MGSP, PIU/ULB
Waste Water Disposal	Waste water generation; pollution of water bodies.	Environmental degradation; Water pollution	Septic tank, soak pit will be constructed for waste water; Ensure use of municipal drain to dispose storm water.	Cost should include in the regular maintenance cost	During Operation phase	Contractor, Market Management Committee	Environmental Specialist-PMU, MGSP, PIU/ULB
Traffic Congestion	Create traffic congestion by both traders and visitors	Traffic congestion; Accident	Proper handling of vehicles by separating area for motorized and non-motorized vehicles will be ensured and deploy community policing.	Cost should include in the regular maintenance cost	During Operation phase	Contractor, Market Management Committee	Environmental Specialist-PMU, MGSP, PIU/ULB

Solar Energy and Glass wall	Saving electricity by using solar energy and day light	Energy consumption and load shading.	Solar panel will be set up at roof top and used of solar energy will increased as possible. Glass wall will be used where possible.	Cost should include in the electrical cost in BoQ	During Operation phase	Contractor	Environmental Specialist-PMU, MGSP, PIU/ULB
Rain water harvesting	Saving ground water by using Rain water	Ground water depletion.	Rain water harvesting will be ensured and rain water reservoir will be constructed at roof top and basement.	Cost should include in the BoQ	During Operation phase	Contractor	Environmental Specialist-PMU, MGSP, PIU/ULB

7.5 Cost of environmental enhancement works in BOQ

Table 4: Cost of environmental enhancement works.

Item No.	Description of Item	Costs (BDT in million)
1	Construction of Labor shed, latrine, safe water supply	.30
2	Labor safety equipment	.05
3	Dust suppression measures like water spraying in and around the site	.02
4	Air, Water, Noise Quality test	.06
5	Water logging	.01
	Total	**0.44**

8.0 Public Consultation and Participation

8.1 Methodology

For carrying out public consultation and participation a focus group discussion (FGD) (Figure 12) and a questionnaire survey (format of questionnaire survey is attached in Annex A) was conducted to identify problems, issues, suggestions from the local people about the proposed subproject. This subproject was selected from the CIP where stakeholder, ULB, Local People, Mayor, Counsellors, NGO and Community people were participated. In the CIP, some subproject was selected and this subproject was taken in priority basis.

Figure 12: Focus Group Discussion

Stakeholders at the subproject were identified under three main groups: (i) beneficiaries in the subproject area; (ii) community leaders and Government officials and (iii) NGOs working at the local and regional levels. Stakeholder participation was completed in two steps: (i) firstly to collect and disseminate information through briefing and discussion meetings; and (ii) secondly to receive feedback for formulating appropriate mitigation measures against the adverse impacts.

In order to ensure appropriate feedback a range of information sharing techniques was used. Techniques used for different stakeholder groups included (i) Discussion with stakeholders (ii)

Semi-structured interviews; (iii) Small group meetings with concerned officials in presence of stakeholder Site visits- stakeholder discussion in the field level .

Special efforts were made to include the elderly, women, and vulnerable groups and to allow them to express their views regarding the subproject implementation. In all cases, the impression of stakeholders & general mass regarding sub-project implementation was positive.

8.2 Issues raised by the participants

- Cutting of Trees inside the subproject site.
- Noise pollution during construction
- Traffic congestion
- Quality maintaining of the construction works
- Environment friendly

8.3 Feedback, suggestions, and recommendations of the participants

Local people are very much interested about the market and they are hopeful that the market will be visible within the time frame. They are informed to plant at least 3times should be planted if one tree need to fell. They suggested to make the market environment friendly. The participants requested the PIU-Homna to maintain the quality of the construction work of the building. Residents of nears the proposed site requested PIU-Homna to reduce noise level and disturbance by construction works as possible.

9.0 Conclusions and Recommendations

The proposed subproject is now a dream project for the municipality because this subproject is taken as priority basis for the enhancement revenue as well as to meet the requirements of Municipal dwellers. This project has some impacts on environment as like other construction activities. 5number of trees will be removed and as a mitigation measures 15 numbers of trees will be planted. Noise level, adverse impact and disturbance by construction work would be reduced as much as possible. Emphasis will be given to make the market environment friendly during design and construction phase. Renewable resource, energy would be used in water supply, energy use. Uses of solar energy and rain water would be ensured during construction and operation time of the market. Environmental quality would be monitored and will make sure that natural environment would not be affected by the sub-project.

Annex A: Format of questionnaire survey

পৌর মার্কেট নির্মাণ সম্পর্কিত জরিপ

বিশ্ব ব্যাংক এর আর্থিক সহযোগিতায় ও হোমনা পৌরসভার তত্ত্বাবধায়নে সি এস দাগ নং ৬৩৩, খতিয়ান নং ১৪৬, মৌজাঃ হোমনা তে একটি ৬তলা বিশিষ্ট পৌর মার্কেট নির্মাণ করা হবে। এই বিষয়ে আপনার অভিযোগ/আপত্তি, গুরুত্বপূর্ণ মতামত/পরামর্শ জানার জন্য নিম্নোক্ত তথ্য গুলো প্রয়োজন।

ক্রমিক নম্বরঃ ..... তারিখঃ .....

১। নামঃ ২। বয়সঃ

৩। পিতার নামঃ

৪। ঠিকানাঃ বাসাঃ রাস্তাঃ ওয়ার্ডঃ

৫। মোবাইল নম্বরঃ

৬। পেশাঃ

৭। প্রকল্প এলাকা থেকে দূরত্বঃ

৮। জমি সম্পর্কিত কোন অভিযোগ/আপত্তিঃ ☐ হ্যাঁ ☐ না

যদি থাকেঃ

৯। মার্কেট নির্মাণ সম্পর্কিত কোন অভিযোগ/আপত্তিঃ ☐ হ্যাঁ ☐ না

যদি থাকেঃ

১০। মার্কেট নির্মাণ সম্পর্কিত কোন মতামত/পরামর্শঃ ☐ হ্যাঁ ☐ না

যদি থাকেঃ

তথ্য দাতার নামঃ জরিপকারীর নামঃ

স্বাক্ষরঃ স্বাক্ষরঃ

তারিখঃ তারিখঃ

ধন্যবাদ