

Final Report

Initial Site Assessment for Seven Economic Zone Sites

*Dhaka Dohar, Bhola Sadar, Kushtia- Bheramara, Nilphamari
Manikganj, Shariatpur-Zajira and Jaliardip-Teknaf*

*Submitted to Bangladesh
Economic Zones Authority
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Bangladesh Economic Zones Authority (BEZA)

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Glossary Table

ASEAN	: Association of South East Asian Nations
BEZA	: Bangladesh Economic Zones Authority
BIWTA	: Bangladesh Inland Water Transport Authority
BOT	: Build-Operate-Transfer
BR	: Bangladesh Railways
BSCIC	: Bangladesh Small and Cottage Industries Corporation
EPZ	: Export Processing Zone
EZ	: Economic Zone
FDI	: Foreign Direct Investment
FMB	: Field Measurement Book
GOB	: Government of Bangladesh
HSIA	: Hazrat Shah Jalal International Airport
IWT	: Inland Water Transport
LGED	: Local Government Engineering Department
M&A	: Mergers & Acquisitions
MLD	: Million Litre Per Day
MMscf	: Million Standard Cubic Feet
MSME	: Micro, Small and Medium Enterprises
MT	: Metric Tonne
MVA	: Mega Volt Amp
MW	: Mega Watt
PPP	: Public Private Partnership
PSDSP	: Private Sector Development Support Project
PwC	: PricewaterhouseCoopers Private Limited
REB	: Rural Electrification Board
RHD	: Roads & Highways Department
SMI	: Survey of Manufacturing Industries
TEU	: Twenty-Foot Equivalent Unit

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Executive Summary

1. Executive Summary

1.1. Introduction

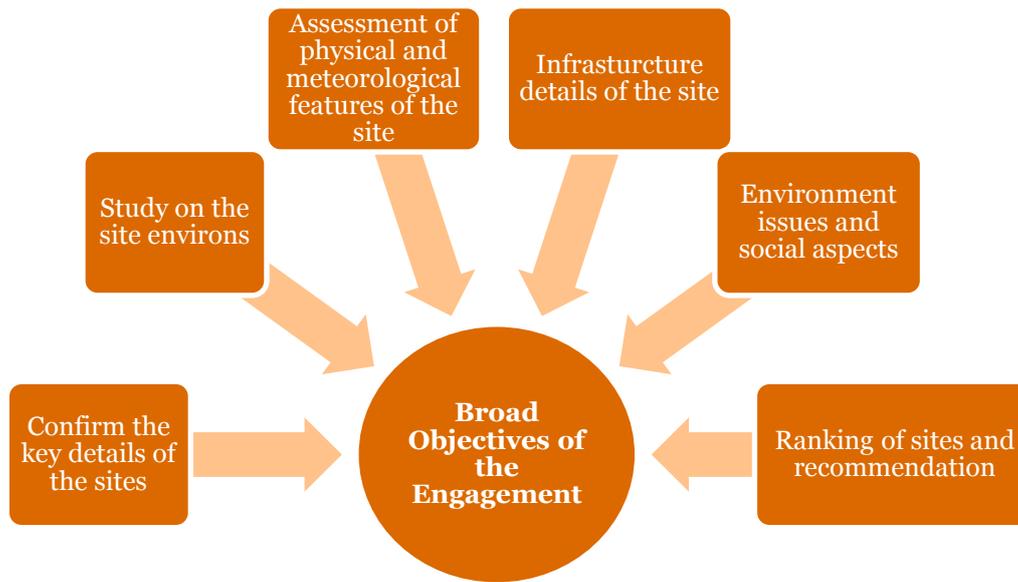
The Government of Bangladesh has launched an effort to develop a new Economic Zone (EZ) paradigm for the country, with the objective of inclusive economic growth and job creation through development of industries.

As part of the Private Sector Development Support Project (PSDSP), supported by the World Bank, PricewaterhouseCoopers Private Limited (PwC) was appointed by Bangladesh Economic Zones Authority (BEZA) to carry out the initial site assessment for the seven Economic Zone sites as outlined below to comprehend the overall adequacy for these sites to evolve as an economic zone site.

Dhaka Dohar	
Bhola Sadar	
Kustia (Bheramara)	
Nilphamari Sadar	
Manikganj (BIWTA Old Aricha Ferry ghat)	
Shariatpur (Zajira)	
Jaliardip (Teknaf)	

1.2. Key Objectives of Initial Site Assessment

The objective of the engagement is to educate BEZA & the World Bank on the preliminary assessment of the seven EZs and to assist BEZA and World Bank in selection of suitable land parcels to be considered for future economic zones development. Figure below shows the principal objectives of this engagement.

Figure 1-1: Principal objectives of Initial Site Assessment

1.3. Approach & Methodology

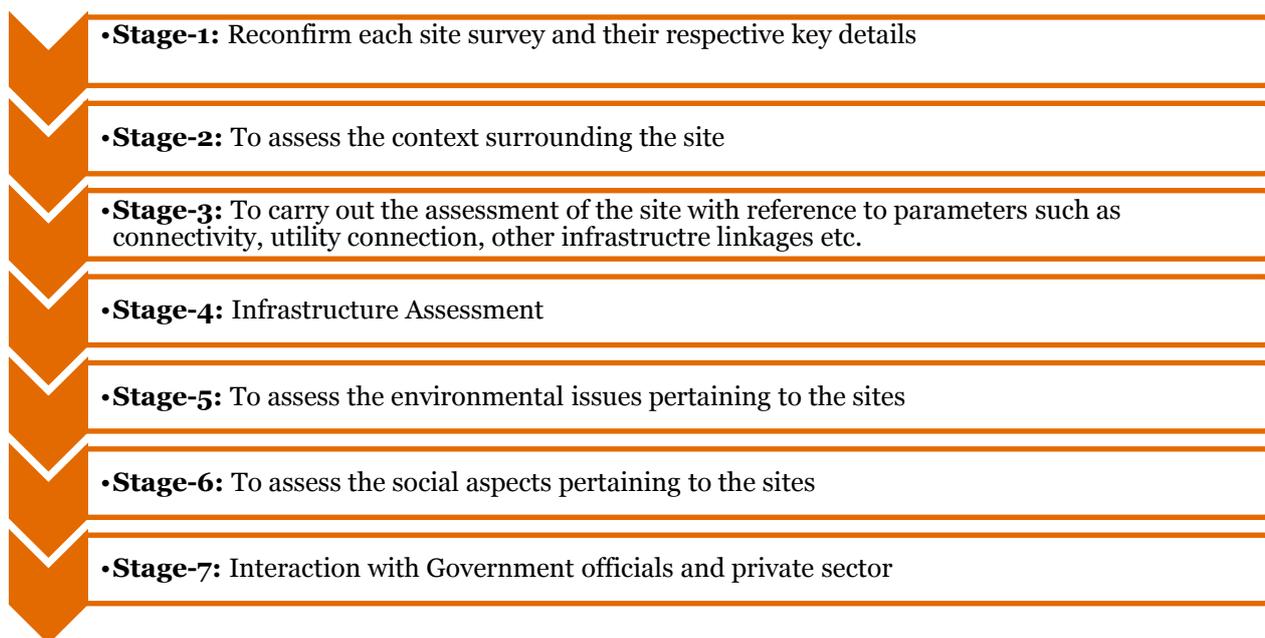
Our approach and methodology to deliver the key objectives of this engagement has been designed to align with the plans and timelines of BEZA and the World Bank. Accordingly, the following sections delve with the overall framework for execution and highlight the key milestones which are aligned towards the requirements of the key stakeholders (i.e. BEZA, World Bank and the Consultants) and our detailed approach and methodology providing a blueprint of our activities and deliverables over the proposed engagement period.

This approach & methodology aims to formulate the Terms of Reference for the proposed engagement and explains the envisaged approach in carrying out the engagement. While formulating this methodology, we have ensured that the final deliverables are oriented towards sustainable development and subsequent operations with innovative and implementable concept. The questionnaire to be utilized during site visit is annexed with this report. We have used a three-pronged approach to carry out this engagement viz. (1) Site visit for initial site assessment; (2) Primary data collection from the UNO office and other respective Govt. organizations and private sector for each of the sites and (3) Secondary data collection/ secondary research.

Some of the major parameters which have been considered while carrying out this engagement is as illustrated below:

- Access to the proposed EZs
- Connectivity of the proposed EZs
- Infrastructure linkages (such as utility connections)
- Neighborhood development (Social infrastructure available in the vicinity) for each of the proposed EZ
- Visibility
- External Infrastructure facilities
- Opportunities in the proposed EZs
- Core offerings of the proposed EZs
- Major constraints and solutions for each of the proposed EZs

The engagement was carried out in various stages as illustrated in the figure below.

Figure: Stages of the Initial Site assessment

1.4. Salient Features of the seven sites

A team comprising of professionals from various backgrounds such as civil engineering, infrastructure specialists, environmental and social specialists and market assessment specialists etc. carried out the site visits for all the seven sites.

The team interacted with Upzilla Nirbahi Officer (UNO) and other government officials at the sites and gathered various information and data regarding the physical, location details, industry details, infrastructure linkages etc. to comprehend about the suitability of each site. The prime objective was to undertake close interactions with various government officials, local UNO team and stakeholders to gather firsthand information and knowledge about the site and its features.

Following figure shows the location of the seven sites.

Figure: Locations of the seven sites



The location details and types of land parcels available for all the seven proposed EZs are presented in the following table. Further details of the same are provided in the main report.

Table 1-1: Location details and type of respective land parcels available

Name of the Proposed EZ	Dhaka Dohar	Bhola Sadar	Kustia (Bheramara)	Nilphamari Sadar	Manikganj	Shariatpur-Zajira	Jaliardip-Teknaf
Date of visit	9 th August 2015	17 th and 18 th August 2015	11 th and 12 th August 2015	15 th , 16 th and 17 th August 2015	10 th and 11 th August 2015	12 th and 13 th August 2015	18 th , 19 th and 20 th August 2015
Location	Dohar upazila, Dhaka district	Bhola sadar upazilla, Bhola district	Bheramara upazila, Kusthia district	Nilphamari Sadar upazilla, Nilphamari district	Shiblaya upazilla, Manikganj district	Zajira upazila, Shariatpur district	Teknaf upzilla, Cox' Bazar district
Co-ordinates of site boundaries	23°36'49.45'' N - 23°37'52.60'' N & 90°03'22.41'' E - 90°04'28.26'' E	22°39'54.65'' N - 22°40'37.87'' N & 90°35'17.50'' E - 90°36'4.03'' E	24°03'51.41'' N - 24°04'43.33'' N & 89°59'56.71'' E - 89°01'00.51'' E	25°48'56.62'' N - 25°50'5.7'' N & 88°51'50.67'' E - 88°52'30.31'' E	23°49'55.78'' N - 23°51'42.61'' N & 89°46'38.37'' E - 89°46'32.58'' E	23°20'52.99'' N - 23°22'7.75'' N & 90°16'54.21'' E - 90°18'5.70'' E	20°54'21.59'' N - 20°55'30.32'' N & 92°16'35.52'' E - 92°16'53.73'' E
Land area as confirmed by UNO (acre)	316.35	304.07	506.77	357.76	303.47	525.27	271.93
Break-up in terms of existing land usage (approximate)	Agriculture - 329 acre Aquaculture-1.4 acre Settlements- 27.5 acre	Residential land- 136.56 acre Agricultural land- 90.8 acre Aquaculture - 52.8 acre	Residential land- 18.685 acre Agricultural land- 469.115 acre	Agriculture - 329 acre Aquaculture-1.4 acre Settlements- 27.5 acre	Water body- 303.87 acre (approx.)	Agriculture- 432.9 acre Aquaculture- 1.4 acre Settlements- 12.6 acre	Aquaculture-265 acre
Break-up in terms of ownership pattern	Government- 219.9 acres Private land- 96.45 acres	Government- 1.35 acres Private land- 302.72 acres	Government- 459.67 acres Private land- 47.10 acres	Government- 103.06 acres Private land- 251.70 acres	Government land- 175.74 acres Private land- 127.78 acres	Government land- 52.5 acres Private land- 472.7 acres	Government land- 273 acres

Indicative Block Cost Estimate for off-site Infrastructure development (Lakh BDT)	34018	13686	18427	27828	28052	16088	67379
Block cost estimate for off-site infrastructure development for unit area (Lakh BDT per acre)	107.53	45.01	36.36	77.78	92.44	30.63	247.78

1.5. Description of seven sites

Dhaka-Dohar

Sl. No.	Parameters	Illustration of the present facilities
A	Connectivity	
1 (A)	<p>Road Connectivity</p> <p>Existing Road Connectivity to Dhaka and other major cities of Bangladesh</p>	<ul style="list-style-type: none"> ➤ R820 (Zinzira-Keraniganj-Nawabganj-Dohar-Srinagar Road) and N8 (Dhaka Mawa highway) connect Dohar with Dhaka and other major cities of Bangladesh. ➤ Dohar-Mawa Road connects the proposed EZ to N8. During site visit, the road conditions in both the stretches (N8 and Dohar-Mawa Road) were observed to be favorable for passage of heavy vehicles. ➤ Preliminary assessment depicts that some maintenance works might be required to improve the road condition in R820. But, road condition of Dhaka-Mawa highway is excellent and it's supposed to be upgraded to four lanes. ➤ Proposed Padma Bridge is located at a distance of around 40 km from the proposed EZ. Once Padma Bridge is operational, proposed EZ in Dohar would have excellent access to the other part of Padma River (Jajira, Bhanga, Mongla etc.)
1 (B)	<p>Road Connectivity</p> <p>Last Mile Connectivity</p>	Existing approach road (1.5 km length) from Kartikpur Bazar to Moinat Ghat is a single lane Kutch road. During site visit, it was observed that widening of this stretch would attract resettlement problem.
2	Rail Connectivity	<p>Preliminary assessment depicts that there are two possibilities for rail connectivity to the proposed EZ.</p> <ul style="list-style-type: none"> ➤ Faridpur Railway station: It is located at 91 km (approx.) from the proposed EZ. Access takes place Dhaka-Faridpur highway and ferry crossing at Paturia Ferry Terminal. ➤ Kamalapur Railway station: it is located at a distance of 50 km (approx.) and could be accessed through Dhaka-Mawa highway. ICD is located in Kamalapur rail station but Cargo storage facility is not available. Last mile connectivity to Kamalapur rail station takes place via Toyenbee Circular Road/ Kamalapur Road. This stretch experiences moderate traffic congestion.

3	Water Connectivity	<p>Location of Moinat ghat inside the project area could be utilized to connect the proposed EZ to waterways network of Bangladesh (such as Mawa ghat, Narayanganj river port and other major ports of Bangladesh etc.). Mawa ghat and Narayanganj riverport could be accessed both by roadways and waterways from the proposed EZ.</p> <p>Proposed EZ is located at the central part of Bangladesh and upon development of Moinat ghat as a cargo terminal, it may envisage seamless movement of cargo via waterways to Mongla Port, Chittagong Port and other major ports/ ferry terminal of the country.</p>
5	Airport Connectivity International airport in the proximity	<ul style="list-style-type: none"> ➤ Proposed EZ is located at a distance of 48 km (approximate) from Hazrat Shah Jalal International airport in Dhaka. Travel time is around 2.5 hours by road. ➤ Dhaka international airport is accessed through Dhaka-Mawa highway. During site visit it was observed that this road alignment is favorable for passage of heavy vehicles. ➤ Govt. of Bangladesh intends to construct a new international airport (Bangabandhu Sheikh Mujib International Airport) with a view to create a hub airport in close proximity to Dhaka and to meet the demand of future growth in aviation sector. Location for the same is yet to be finalized.
B	Utility Connections	
1	Power Availability	<ul style="list-style-type: none"> ➤ Basis discussion with REB officials, existing Dohar substation (20 MVA capacity) has no surplus power available. ➤ REB officials informed us that there is a proposal to setup 33/11kv new substation at Mohabadpur with a capacity of 20 MVA. ➤ One 132 kV grid substation (World Bank funded project) has been proposed in Hashnabad with a capacity of 50 MVA. It is located at a distance of 10 km (approximate) from the proposed EZ.
2	Water Availability	<p>Basis preliminary assessment, the water requirement for the proposed EZ could be met with the intake from either extracting water from the Padma river adjacent to the site boundary or from bore wells which could be developed within the project area.</p>

		<p>Basis interaction with local inhabitants and UNO officials, the ground water is available at a depth of 200 feet approximately from natural ground level.</p> <p>Preliminary assessment suggests that extracting water from river located on the western boundary of the proposed EZ may be considered by providing suitable intake system and water treatment plant. Exact location of water intake needs to be finalized during the master planning stage.</p> <p>Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/ day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Dhaka Dohar EZ is around 2.69 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could be extracted through bore wells.</p>
3	Gas Availability	<ul style="list-style-type: none"> ➤ Gas pipeline is available near BSCIC, Keraniganj which is located at a distance of 40Km (approximate) from the proposed EZ. However basis discussion with industries at BSCIC Keraniganj, gas pressure obtained is not adequate.
C	Suitability for industrial development	
1	Existing industrial ecosystem and Possible Backward linkages for industries	<ul style="list-style-type: none"> ➤ Dohar upzilla hasn't witnessed any significant industrial proliferation. Very few industries (cottage and small scale in nature) are located in and around the proposed EZ. However, proximity to Dhaka may induce industrialization in future. ➤ The land in this area is fertile in nature due to the proximity of Padma River, as a result the land is suitable for cultivation of various crops such as (but not limited to) rice, pulse, jute, seasonal vegetables etc. Sand extracted from Padma River is a major natural resource of this area.¹ ➤ This area is located near to Nawabganj, Munshiganj and Narayanganj. These areas are industrial hubs of the country. Some of the popular industries in these areas are: fabrics, steel, cotton, food processing, light engineering, shipbuilding etc.
2	Proximity to major cities	Dohar EZ is located in close proximity to Dhaka city.

¹ <http://dohar.dhaka.gov.bd/node/1476008/>

D	Challenges in developing the economic zone (<i>Resettlement Issues and social aspects</i>)	
1	Landfilling	Basis preliminary assessment, landfilling of depth 14-17 feet needs to be undertaken.
2	Residential units to be rehabilitated	Basis preliminary assessment, 35 units need to be rehabilitated as a result of the development of this project.
3	Resettlement issues of Moinat ghat, bus terminus and temporary shops located inside the project area	Once the proposed Dohar EZ is functional, the operation of the bus terminus, Moinat Ghat and temporary shops need to be shifted to nearest possible location.
4	Other Resettlement Issues	<ul style="list-style-type: none"> ➤ Basis preliminary assessment and details shared by UNO office, 35 households (approximate) and 15 fishermen families could stand to lose their income/livelihood as a result of the development of the project. ➤ Land filling need to be undertaken for two fish ponds located within the proposed EZ.
E	Availability of Social Infrastructure	
1	Availability of good residential facility in the nearby areas	Dwelling units and residential facilities are available for labours in Karthikpur, latakula and Jaipara.
2	Medical facilities available in the nearby areas	<p>One government hospital (Upzilla Health Complex) is available in Dohar sub district with 50 beds and a private hospital in the Pourashava.</p> <p>For serious medical treatment, patients need to travel to Dhaka.</p>
3	Air and water pollution at the site (prevailing condition)	<p>The site is free from air and water pollution and no significant noise was observed when the site visit was undertaken.</p> <p>The incidence of water and air pollution at the site is insignificant. Also, the incidence of water borne diseases wasn't recorded in the locality.</p>

4	Availability of manpower	<p>Dohar upazilla has 3 government colleges, 40 secondary schools, 56 primary schools and 1 Technical and Vocational education facilities.</p> <p>Dohar being well connected to Dhaka city enjoys the availability of several educational institutions in and near Dhaka city. There are a total of 26 technical and vocational institutions and 44 universities located in Dhaka district, which could cater to the manpower requirements of proposed EZ.</p>
F	Market potential assessment	
	Broad level market potential assessment	<p>Broad level market potential assessment depicts that following industries stand a good chance to be developed within the proposed EZ:</p> <ul style="list-style-type: none"> • Warehousing/ Cold Storage • Ship Repairing/ Ship building/ Shipbreaking • Construction Materials • Agro Processing/ Fish Processing • Light Engineering • Handicrafts • Furniture • Knitwear • Jute Processing

Bhola Sadar

Sl. No.	Parameters	Illustration of the present facilities
A	Connectivity	
1 (A)	Road Connectivity Existing Road Connectivity to major cities of Bangladesh	<ul style="list-style-type: none"> ➤ Waterway is the most convenient mean of accessing the EZ. There is no direct road connectivity from Bhola to other parts of Bangladesh. ➤ Bhola district is approachable only via ferry by crossing the river on both east and west side. ➤ Proposed EZ is connected to capital city Dhaka via Barisal and it is connected to Chittagong via Laxmipur. ➤ Access to Dhaka takes place via Barisal via R890 and N8. This route includes ferry ride.
1 (B)	Road Connectivity Last Mile Connectivity	<ul style="list-style-type: none"> ➤ Zilla Road is abutting the proposed EZ on the northern side boundary. As a result of this, access from the Zilla Road to the proposed EZ can be provided at any location. There is no need for separate approach road for the proposed EZ. ➤ However, connecting the EZ with the trunk road network requires multimodal transport and this renders the last mile connectivity unattractive
2	Rail Connectivity	Proposed EZ is not connected to any rail network.

3	Water Connectivity	<ul style="list-style-type: none"> ➤ Proposed EZ has excellent access to IWT connectivity. ➤ The proposed EZ has access to Bheduria ghat and Kheya ghat at a distance of 5 km and 16 km respectively. ➤ Other major ghats are: Ilisha Ghat and Lalmohan Ghat. ➤ Broad level preliminary assessment indicates that the nearby ferry ghats may be developed as cargo terminals which could provide access to widespread IWT connectivity. ➤ Preliminary assessment also indicates that integration of ports (like Mongla port, Chittagong Port, Payra Port) with the proposed EZ seems possible. Also, there seems to be possibility of cross border trade through the waterways. ➤ Detailed feasibility needs to be undertaken to evaluate the potential of the same.
5	Airport Connectivity International airport in the proximity	<ul style="list-style-type: none"> ➤ Proposed EZ in Bhola Sadar is located at a distance of approximately 65 km from Barisal airport. However, river crossing via ferry/ launch service at Ilisha Ghat needs to be undertaken to reach the proposed EZ. ➤ Dhaka-Barisal Highway (N8) and Barisal-Bhola Highway (N809) connect the proposed EZ to Barisal airport. ➤ Dhaka international airport is located about 237 km from the proposed EZ including ferry crossing.
B	Utility Connections	
1	Power Availability	<ul style="list-style-type: none"> ➤ Existing 33/11 KV substation (of capacity 10 MVA) near Bangla Bazar is located at a distance of around 18 km from the proposed EZ. It would be upgraded to 20 MVA by 2016. After catering to the local demand, 2 MVA surplus power is available from this substation. ➤ One additional 33/11 KV substation of 10 MVA capacity is proposed within one km radius of the proposed EZ. Exact location for the substation is yet to be finalized and it is planned to commission by June 2016. Capacity of this substation is 5 MVA. ➤ There is a 132 KV substation located in Patuakhalia (at a distance of around 65 km from the proposed EZ) and a 230 KV substation is located in Buranuddin (approximate 25 km away from the proposed EZ). ➤ Apart from the above power sources, one 225 MW gas-fired Combined Cycle Power Project is available within approximately 3 km distance from site.
2	Water Availability	Basis interaction with local inhabitants, the ground water is available at a depth of 200 to 300 feet (approximately)

		<p>from natural ground level.</p> <p>Preliminary assessment suggests that the water requirement could be met by extracting water from Tetulia River by providing suitable intake system and water treatment plant.</p> <p>Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Bhola Sadar EZ is around 2.58 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could be extracted through bore wells. Extraction of more water through bore wells might result in depletion of the aquifer level.</p>
3	Gas Availability	<ul style="list-style-type: none"> ➤ Sunderban Gas Company is responsible for supply of gas in this region. ➤ Local gas substation is located at a distance of around 4 km from the proposed EZ and it has a capacity of 45 MMscf per day with surplus of 1 MMscf per day. ➤ Pressure obtained in the substation is also adequate. ➤ In Shahbazpur gas field and in Buranuddin, gas source is available. It could be used for industrial consumption.
C	Suitability for industrial development	
1	Existing industrial ecosystem and Possible Backward linkages for industries	<ul style="list-style-type: none"> ➤ Bhola is rich in natural resources such as rice, jute, potato, chilli, cucumber, watermelon etc. ➤ This region is known as watermelon hub and watermelon from Bhola region is transported to all parts of Bangladesh; Potato from this region is exported to Russia. ➤ Due to the adjacency of Padma River, fishing activities take place in this area. ➤ There is no big industrial set up in this district. Several small and medium scale industries are operating in this region. ➤ Some industries operating in Bhola area are: fish net, garments and textile, plastic, wax, shoes, hatchery, cold storage etc.
2	Proximity to major cities	<p>Bhola Sadar EZ is located in close proximity to Barisal.</p> <p>Other major cities are also accessible from Bhola; however, it involves crossing the ferry and there is no direct road connectivity to other parts of Bangladesh.</p>
D	Challenges in developing the economic zone (Resettlement Issues and	

	social aspects)	
1	Landfilling	Basis preliminary assessment, landfilling of depth 6-9 feet needs to be undertaken.
2	Residential units to be rehabilitated	Basis preliminary assessment, 87 household structures (approximate) need to be rehabilitated as a result of the development of this project.
3	Other Resettlement Issues	<ul style="list-style-type: none"> ➤ Trees existing in the site can be retained and earmarked as green area during the preparation of master plan. ➤ Basis preliminary assessment and details shared by UNO office and local inhabitants, 100-200 numbers of households (approximate) could stand to lose their income/livelihood as a result of the development of the project.
E	Availability of Social Infrastructure	
1	Availability of good residential facility in the nearby areas	Dwelling units and residential facilities are available for labours in Bhola Sadar area. As Bhola is a not easily accessible from other parts of Bangladesh, proliferation of quality residential facilities haven't taken place in this area.
2	Medical facilities available in the nearby areas	One government hospital is available in Bhola with 250 beds and 20 - 30 private hospital with 10 - 15 beds. However for serious medical treatment, local inhabitants need to travel to Dhaka. Travel to Dhaka takes place by road and water mode of transportation and approximate travel time for passengers is around 9-10 hours.
3	Air and water pollution at the site (prevailing condition)	The site is free from air and water pollution and no significant noise was observed when the site visit was undertaken. The incidence of water and air pollution at the site is insignificant. Also, the incidence of water borne diseases wasn't recorded in the locality.
4	Availability of manpower	Bhola district has a total of 12 technical and vocational institutions, 1 agriculture and veterinary college, 35 (government and non-government) colleges, 262 (government and non-government) secondary schools and 241 madrasa. Some of the technical institutes located in the proximity to the proposed EZ are: <ul style="list-style-type: none"> ➤ Bhola Technical School & College ➤ Bhola Polytechnic Institute ➤ Barisal Technical Training Center
F	Availability of Social Infrastructure	
	Broad level market potential	Broad level market potential assessment depicts that following industries stand a good chance to be developed

	assessment	within the proposed EZ: <ul style="list-style-type: none"> • Agro/ Fruit Processing • Food Processing • Dairy based and milk processing • Cattle/ Poultry/ Fish Feed • Pharamceuticals • Chemcials • Textile • Light Engineering
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Kushtia Bheramara

Sl. No.	Parameters	Illustration of the present facilities
A	Connectivity	
1 (A)	Road Connectivity Existing Road Connectivity to Dhaka and other major cities of Bangladesh	<ul style="list-style-type: none"> ➤ Proposed EZ in Bheramara is well-connected to Jessore by N704. Distance by road is 155km (approximate) and travel time is around 3-3.5 hours. During site visit, it was observed that the road condition is smooth and favorable for passage of heavy vehicles. ➤ Jessore is well- connected to Mongla and Khulna region. ➤ Dhaka is also accessible from the proposed EZ. Project site is located adjacent to Lalan Shah Bridge. Lalan Shah Bridge and Jamuna Bridge provide access to Dhaka. Distance between Dhaka and Bheramara is approximately 230 km and travel time is around 5-6 hours. During site visit, it was observed that the road condition is favorable for passage of heavy vehicles.
1 (B)	Road Connectivity Last Mile Connectivity	Two options of approach road exist: <ul style="list-style-type: none"> ➤ Kuthcha road which connects the eastern part of the proposed EZ to Rajashi – Kushtia highway (N704) near the approach to Lalan Shah Bridge. Length of this kutchra road alignment is around 500-700 m. ➤ Bheramara-Allardorga road (LGED road) connects the proposed EZ from West side. Bheramara – Allardorga road is a single lane bituminous road favorable for passage of heavy vehicles. From this LGED road, a paver road (stretch of around 1km) starts which runs inside the proposed EZ. Widening of Bheramara-Allardorga road might attract some resettlement issues as it runs through residential colonies and market places.

2	Rail Connectivity	<ul style="list-style-type: none"> ➤ Bheramara railway station is located at a distance of around 7 km from the proposed EZ. Basis discussion with UNO officials and local inhabitants, cargo facility is available at Bheramara rail station and goods are transported to Khulna and Rajshahi from this region. ➤ Pakshi rail station is connected to the proposed EZ by Lalan Shah Bridge and Kushtia-Jhenaidah Highway (N704). ➤ Approach road to both the rail stations experience moderate traffic congestion. ➤ Both the stations are well connected to other parts of Bangladesh. ➤ Apart from trains to other parts of Bangladesh, trains to Kolkata (India) are also accessible from both the rail stations.
3	Waterways Connectivity	<ul style="list-style-type: none"> ➤ Proposed EZ doesn't have any direct access to cargo terminal/ ferry ghat in the vicinity. However, project site is located adjacent to Padma River. ➤ Broad level initial assessment depicts that Paturia port is located at an approximate distance of 100-110 km from the proposed EZ. Existing cargo facility at Paturia port may be further explored to facilitate seamless movement of cargo via waterways. ➤ Alternate access to waterways seems possible by developing a private jetty in the project area. This in turn would provide access to widespread waterways' network of Bangladesh. Accessing major ports such as Mongla, Chittagong, Payra etc. seems possible. ➤ Mongla port is also accessible by road from the proposed EZ. Proposed EZ is located about 254 km from this port. Mongla port is accessible by either Khulna-Mongla Highway or via Dhaka-Kushtia Highway. ➤ Detailed feasibility analysis needs to be undertaken to ascertain the mentioned possibilities.
4	Airport Connectivity International airport in the proximity	<ul style="list-style-type: none"> ➤ Bheramara EZ is located about 225 km of International Airport at Dhaka and approximate travelling time by road is approximately 5 hours. ➤ Proposed EZ is located at a distance of around 120 km from Jessore airport. Approximate travel time is 3-3.5 hours by road. ➤ Jessore airport is a domestic airport and access to this airport is via N7 and N704. During site visit, traffic stagnation wasn't observed in this stretch and road condition was favorable for passage of heavy vehicles. ➤ Govt. of Bangladesh intends to construct a new international airport (Bangabandhu Sheikh Mujib

		International Airport) with a view to create a hub airport in close proximity to Dhaka and to meet the demand of future growth in aviation sector. Location for the same is yet to be finalized.
B	Utility Connections	
1	Power Availability	<ul style="list-style-type: none"> ➤ Indo Bangla Transmission Centre (500 MW HVDC Back-to-Back power station) is located adjacent to the proposed EZ. ➤ One 360 MW combined cycle power plant (CCPP) is under construction which is located within 2 km from the proposed EZ. ➤ A 33/11 kv substation (under-construction) of capacity 10 MVA is located at 12th Mile (10.4 km from the proposed EZ).
2	Water Availability	<p>Basis interaction with local inhabitants, the ground water is available at a depth of 200 feet (approximately) from natural ground level.</p> <p>Preliminary assessment suggests that the water requirement could be met either by extracting water from the Padma River or from deep tube well (which could be developed within the project area). Further, our preliminary assessment also suggests that extracting water from Padma River located on the eastern boundary of the proposed EZ may be considered by providing suitable intake system and water treatment plant.</p> <p>Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Bheramara EZ is around 4.31 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could be extracted through bore wells. Extraction of more water through bore wells might result in depletion of the aquifer level.</p>
3	Gas Availability	<ul style="list-style-type: none"> ➤ At present there is no gas supply available to the proposed EZ. Difficulty in laying gas transmission pipeline across the Padma Riverbed is holding up gas supply to the south western part of Bangladesh. ➤ CGS Gas substation in Bheramara is located at a distance of approximately 2 km from the proposed EZ and its capacity is 100 MMcfd.
C	Suitability for industrial development	
1	Existing industrial ecosystem and Possible Backward linkages for industries	<ul style="list-style-type: none"> ➤ Kushtia is renowned for various small and medium scale industries pertaining to textile, fabrics, cables, metals, tobacco, sugar etc. ➤ Kushtia district is also rich in natural resources such as rice, sugarcane, jute, maize etc.

		<ul style="list-style-type: none"> ➤ This area is located near to Pabna and Rajshahi district. Pabna is known for pharmaceutical industry and hosiery based industries. Rajshahi district is renowned for agriculture and silk. ➤ Some popular industries in the nearby districts are: jute, bamboo, wood, knitwear, tobacco etc. Major export items from Rajshahi district are: jute, sugarcane, date, pan, mango, lichi, green vegetables, turmeric and silk items. Apart from that, livestock farming (cattle) and fishing are other major activities undertaken by local inhabitants.
2	Proximity to major cities	Bheramara EZ is located in close proximity to Jessore. Dhaka is also accessible from the proposed EZ and travel time is around 5-6 hours.
D	Challenges in developing the economic zone (Resettlement Issues and social aspects)	
1	Landfilling	Basis preliminary assessment, landfilling of depth 6-8 feet needs to be undertaken.
2	Residential units to be rehabilitated	Basis preliminary assessment, 154 units (approximate) need to be rehabilitated as a result of the development of this project.
3	Other Resettlement Issues	<ul style="list-style-type: none"> ➤ During the master planning stage, temporary canals need to be rerouted along the boundary of the proposed EZ in order to increase the utilization of project area. ➤ Trees existing within the proposed EZ can be retained and earmarked as green area during the preparation of master plan.
E	Availability of Social Infrastructure	
1	Availability of good residential facility in the nearby areas	The proposed EZ is located 23 km away from Kusthia town. Dwelling units and residential facilities are available for labours in Kusthia.
2	Medical facilities available in the nearby areas	<p>One government hospital (Upzilla Health Complex) is available in Bheramara sub district with 50 beds.</p> <p>Kushtia Medical College & Hospital is located at a distance of 28 km (approx.) from the proposed EZ.</p> <p>Kushtia General Hospital having 250 bed capacities is located at a distance of 25 km (approx.) from the proposed EZ.</p>
3	Air and water pollution at the site (prevailing	The site is free from air and water pollution and no significant noise was observed when the site visit was

	condition)	undertaken. The incidence of water and air pollution at the site is insignificant. Also, the incidence of water borne diseases wasn't recorded in the locality.
4	Availability of manpower	Proposed EZ is located in Kushtia district. Kushtia district has 1 university, 62 colleges (government and non-government colleges) and 299 secondary schools (government and non-government schools). The district also has 5 engineering colleges, 3 agriculture and veterinary college, 5 medical colleges and 9 technical and vocational institutions. Kushtia polytechnic institute, Pabna Technical Training Center, Banglamotion Institute of Engineering & Technology, Regional Agricultural Research Station etc. are some of the prominent institutes in the vicinity.
F	Market potential assessment	
	Broad level market potential assessment	Broad level market potential assessment depicts that following industries stand a good chance to be developed within the proposed EZ: <ul style="list-style-type: none"> • Warehousing/ Cold Storage • Sugar • Pharmaceuticals • Metals • Textile • Tobacco processing • Agro Processing • Jute based • Hosiery • Pharmaceuticals

Nilphamari Sadar

Sl. No.	Parameters	Illustration of the present facilities
A	Connectivity	
1 (A)	Road Connectivity Existing Road Connectivity to Dhaka and other major cities of Bangladesh	<ul style="list-style-type: none"> ➤ Project site is connected to Saidpur (approximate 20 km away) by Saidpur-Nilphamari Road (R570). It's a single lane bituminous road and widening is proposed. However there are resettlement issues at certain stretches of this road ➤ Proposed EZ in Nilphamari is located at a distance of 350 km (approximate) from Dhaka and travel time is around 7-8 hours.

		<ul style="list-style-type: none"> ➤ R570 and N5 provide access to Dhaka. N5 is a two-lane bituminous road and road condition is favorable for passage of heavy vehicles. ➤ N5 is a part of Asian Highway (AH2). Asian highway 2 runs through 13,177 kilometers from Denpasar (Indonesia) to Merak and Singapore to Khosravi (Iran). ➤ BBIN group of countries (Bangladesh, Bhutan, India and Nepal), signed a sub-regional Motor Vehicles Agreement (MVA) with the objective of enabling movement of cargo across their borders. ➤ MVA would provide access for local products to neighboring markets (India, Bhutan and Nepal).
1 (B)	Road Connectivity Last Mile Connectivity	<p>No separate approach road is required for the northern part of the land.</p> <p>Rail line is located adjacent to the southern boundary of the project area and during master planning stage; a rail over bridge may be proposed to cross the railway line to reach the southern portion of the land to connect to the Saidpur – Niphamari Road (R570)</p>
2	Rail Connectivity	<ul style="list-style-type: none"> ➤ Proposed EZ is located in between two railway stations viz. Saidpur and Nilphamari. R570 connects these two rail stations. ➤ These stations are located at 10 km and 7 km respectively from the proposed site. ➤ Passenger train to Dhaka runs daily from Saidpur station ➤ Saidpur railway station is accessible from the proposed EZ by R570 (up to Saidpur) and then by Station Road. ➤ Station Road (LGED road) is a single lane bituminous road with no scope of widening as it might attract resettlement issues. ➤ Rail siding is available at Saidpur station; however, this rail siding is not used for industrial/commercial purpose. ➤ Bangladesh's biggest rail workshop is located in Saidpur.
3	Water Connectivity	<ul style="list-style-type: none"> ➤ Proposed EZ is located at a road distance of 590 km (approximate) from Chittagong Port.
4	Airport Connectivity International airport in the proximity	<ul style="list-style-type: none"> ➤ Nilphamari EZ is located about 20 km away from Saidpur Airport. Access to Saidpur airport takes place from the proposed EZ via R570. ➤ Saidpur airport is a domestic airport and air travel to Dhaka takes around 1 hour.
5	Land Port Connectivity	<p>Proposed EZ has access to three land ports in India-Bangladesh border:</p> <ul style="list-style-type: none"> ➤ Banglabandha Land Port: It is 114 km north of Nilphamari Sadar and 7 km from Siliguri and Jalpaiguri, in the Indian state of West Bengal.

		<p>Proposed EZ is located at a distance of 125 km (approximate) from Banglabandha land port. . It takes around 2.5-3 hours to reach Banglabandha land port from the proposed EZ.</p> <ul style="list-style-type: none"> ➤ Burimari Land Port: Proposed EZ is located about 80 km from this land port. ➤ Hili Land Port: Hili land port is located at a distance of approximately 85 km from the proposed EZ. It is located in Hakimpur (Dinajpur district) of Bangladesh. On Indian side, it shares the border with South Dinajpur of west-Bengal.
B	Utility Connections	
1	Power Availability	<ul style="list-style-type: none"> ➤ 33/11 KV substation (of capacity 15 MVA) is located at a distance of around 10 km from the proposed EZ. Around 5 MVA of surplus power is available from this substation. ➤ Gas turbine power plant of 20 MW capacity is located in Saidpur at a distance of around 10 km from the proposed EZ. 132/33 KV grid substation with a capacity of 1x20 MVA and 2x25/41 MVA is available at this location. ➤ A new 132/33 KV grid substation of capacity 50 MVA is proposed in Jaldhaka which is located at a distance of 30km (approx.)from the proposed EZ.
2	Water Availability	<ul style="list-style-type: none"> ➤ At the project site, ground water is available at a depth of 500 feet (approximately) from natural ground level. ➤ Around 5-6 bore wells are located within the proposed EZ. However, the utilization of the same could be ascertained during feasibility stage. ➤ Basis the bore well water test reports provided by the UNO Officials, the water quality parameters are well within the limits for drinking water purpose except one report. ➤ According to best practices and working knowledge, average potable water demand of 21 cum/hectare may be considered for arriving at the approximate water requirement. Water requirement in the proposed EZ is estimated to be around 8 MLD. ➤ Basis discussion with local inhabitants and UNO officials, considering maximum yield of 1 MLD per bore well, the water requirement up to 5 MLD may be extracted through bore well for meeting the initial requirement. However, detailed feasibility analysis may be undertaken to assess the exact demand and whether the same amount may be sourced through bore well or not.
3	Gas Availability	<ul style="list-style-type: none"> ➤ Gas supply is not available in this region. ➤ Gas pipeline is laid only till Bogra, which is at a distance of 180 km (approximately) from the proposed EZ.

C	Suitability for industrial development	
1	Existing industrial ecosystem and Possible Backward linkages for industries	<ul style="list-style-type: none"> ➤ About 90% of population of this district is dependent on agricultural activities. Major crops produced in this region are bamboo, rice, paddy, potato, tobacco, maize, onion, peanuts and green vegetables. ➤ Uttara EPZ is located in close proximity (within 5-6 km of distance) to the proposed EZ. Some of the existing industries inside Uttara EPZ are ceramics, sanitary ware, textile, coffin manufacturing etc. ➤ Some other industries (in small and medium scale) present in this area are: rice mill, metal, light engineering, jute mill, cold storage, plastic, food processing etc. ➤ Saidpur upzilla in Nilphamari is renowned for railways workshop. It is the biggest railway workshop in Bangladesh and several small and cottage industrial units related to light engineering, metal etc. are located in this place. ➤ In nearby Panchgarh district, tea cultivation is a predominant industry.
2	Proximity to major cities	<p>Nilphamari EZ is located in proximity to Saidpur.</p> <p>Dhaka is located at a distance of around 350 km from the project site.</p>
D	Challenges in developing the economic zone (Resettlement Issues and social aspects)	
1	Landfilling	Basis preliminary assessment, landfilling of depth 3-4 feet needs to be undertaken.
3	Other Resettlement Issues	<ul style="list-style-type: none"> ➤ Local inhabitants who would stand a chance to lose income are: local farmers, sharecroppers, yearly lease holders, owners of agricultural assets etc. ➤ Basis discussion with local inhabitants and UNO officials, around 180-250 households could stand a chance to lose income as a result of the development of this project. ➤ Trees existing within the project site may be retained and earmarked as green area during the preparation of master plan. ➤ Small nallahs/ canals crossing the project site may be removed or rerouted during master planning stage. ➤ During master planning stage, the bore wells may be retained to the maximum possible extent provided the yield of the bore wells meets the water requirement.

		➤ 11 KV electrical overhead lines need to be rerouted along the project boundary during master planning stage.
E	Availability of Social Infrastructure	
1	Availability of good residential facility in the nearby areas	The proposed EZ is located 20 km away from Saidpur town. Dwelling units and residential facilities are available for labours in Saidur and Nilphamari.
2	Medical facilities available in the nearby areas	Government hospital is available in Nilphamari Sadar upzila and has provision for 120 beds. Some of the major healthcare centers available in the vicinity of the proposed EZ are: <ul style="list-style-type: none"> • Jahurul Islam Medical College, Bajitpur, Kishoreganj • Chest Diseases Hospital, Rangpur • Leprosy Hospital, Nilphamari • Nilphamari Sadar Hospital • Dinajpur sadar Hospital However, for serious medical treatment, local inhabitants travel to Dhaka.
3	Air and water pollution at the site (prevailing condition)	The site is free from air and water pollution and no significant noise was observed when the site visit was undertaken. The incidence of water and air pollution at the site is insignificant. Also, the incidence of water borne diseases wasn't recorded in the locality.
4	Availability of manpower	There are 8 technical and vocational institutions located in Nilphamari Sadar upzila. Some of the Technical institutes located in the radius of 50 km (approx.) from the proposed EZ are: <ul style="list-style-type: none"> • Kishoreganj Polytechnic Institute • Rangpur Polytechnic Institute • Dinajpur Polytechnic Institute
F	Market potential assessment	
	Broad level market potential assessment	Broad level market potential assessment depicts that following industries stand a good chance to be developed within the proposed EZ: <ul style="list-style-type: none"> • Warehousing/ Cold Storage • Agro Processing • Tea • Light Engineering • Metal based

Manikganj

Sl. No.	Parameters	Illustration of the present facilities
A	Connectivity	
1 (A)	Road Connectivity Existing Road Connectivity to Dhaka and other major cities of Bangladesh	<ul style="list-style-type: none"> ➤ Proposed EZ in Manikganj is well-connected to Dhaka by Dhaka-Aricha Highway. Distance by road is 75km (approximate). During site visit, it was observed that the road condition is smooth and favorable for passage of heavy vehicles. ➤ Proposed EZ is connected to Jessore. Road distance is approximately 155 km and travel time is around 4.5-5 hours. This route includes ferry ride at Paturia ferry terminal.
1 (B)	Road Connectivity Last Mile Connectivity	<p>Five options of approach road exist for the proposed EZ and these provide access to Dhaka-Aricha Highway.</p> <p>Broad level initial assessment depicts that Aricha Launch ghat road is a bituminous road of width 20 feet (approximate) and length of this alignment is around 1-1.5 km. It originates from Aricha Launch ghat and ultimately meets Dhaka-Aricha Highway near Shibalaya Police Station. This approach road is the best fit out of the five options.</p>
2	Rail Connectivity	<ul style="list-style-type: none"> ➤ No rail network exists in Shibalaya upzilla. ➤ Goalanda Ghat railway station is about 15 km from proposed EZ, but there is no direct road connectivity to this railway station due to presence of Padma River. Ferry ride is required from Paturia Ferry ghat to Daulatdia Ferry ghat to reach Goalanda Ghat railway station. ➤ Connectivity to Goalanda Ghat rail station is via Dhaka-Faridpur Highway (N7).
3	Waterways Connectivity	<ul style="list-style-type: none"> ➤ Proposed EZ has good access to waterways connectivity. ➤ Project site is located near to Paturia and Aricha river port. <ul style="list-style-type: none"> ○ Paturia – Daulatdia (Faridpur district, Khulna division) Ferry service ○ Paturia – Kazirhat (Pabna district, Rajshahi division) Ferry service ➤ Macro level assessment indicates that upon development of the proposed EZ, old aricha ghat could be developed as a cargo terminal. Decision on the same is subjected to detailed feasibility analysis.

4	Airport Connectivity International airport in the proximity	<ul style="list-style-type: none"> ➤ Manikganj EZ is located about 77 km away from Hazrat Shah Jalal International Airport in Dhaka and approximate travelling time by road is approximately 3.5 hours. ➤ Govt. of Bangladesh intends to construct a new international airport (Bangabandhu Sheikh Mujib International Airport) with a view to create a hub airport in close proximity to Dhaka and to meet the demand of future growth in aviation sector. Location for the same is yet to be finalized.
B	Utility Connections	
1	Power Availability	<ul style="list-style-type: none"> ➤ 5 MVA surplus power is available from 33/11 KV substation located in Uthli (approximately 7-8 km away from the proposed EZ). ➤ 33/11 KV substation of 10 MVA capacity is under construction in Kathersen mouza (located within 5 km from the proposed EZ). It is expected to be commissioned by 2017. ➤ 132/33 KV grid substation of 70 MVA capacity is proposed in Borangal (located at a distance of approximately 10 km from the proposed EZ). Site selection for the same is yet to take place. ➤ 30 MW solar power plant is proposed near the project site. This project is at feasibility stage.
2	Water Availability	<p>Preliminary assessment suggests that the water requirement could be met either by extracting water from the Padma River or from deep tube well. Bore wells could be developed in the char land which is located adjacent to the project area. Further, our preliminary assessment also suggests that extracting water from the river located on the western boundary of the proposed EZ may be considered by providing suitable intake system and water treatment plant.</p> <p>Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Manikganj EZ is around 2.58 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could be extracted through bore wells. Extraction of more water through bore wells might result in depletion of the aquifer level.</p>
3	Gas Availability	<ul style="list-style-type: none"> ➤ Local gas substation of Titas is located at a distance of around 5 km from the proposed EZ.

		<ul style="list-style-type: none"> ➤ Distribution line from the gas substation is available up to Aricha Ghat (around 150 feet from the proposed EZ). It was communicated to us that the gas pressure capacity at the local substation is 150 psi. ➤ However pressure obtained in this region is not adequate and regular fluctuations in gas pressure have been observed. ➤ Basis discussion with Titas officials, another gas distribution line (of capacity 250 psi) from Tongi to Manikganj is proposed.
C	Suitability for industrial development	
1	Existing industrial ecosystem and Possible Backward linkages for industries	<ul style="list-style-type: none"> ➤ Major natural resources in this region are: sand extracted from Padma River, jute, rice, maize, seasonal vegetables and fish. ➤ BSCIC industrial complex in Manikganj has some industrial units pertaining to textile and apparels. ➤ Tangail district is located adjacent to Manikganj and it has experienced proliferation of small and cottage scale industries based on sugar, textile, cold storage, knit wear etc. ➤ Surrounding Sirajganj district is renowned for silk production and related industries, dairy and milk products, rice mill, oil mill etc.
2	Proximity to major cities	<p>Manikganj EZ is located in proximity to Dhaka.</p> <p>Also, the project site has access to Jessore (via Paturia ferry ghat).</p>
D	Challenges in developing the economic zone (<i>Resettlement Issues and social aspects</i>)	
1	Landfilling	Basis preliminary assessment, landfilling of depth 18-22 feet needs to be undertaken.
2	Other Resettlement Issues	<ul style="list-style-type: none"> ➤ As a result of the development of the proposed EZ, old Aricha ghat (non-functional) needs to be relocated to some other location. ➤ Local inhabitants who would stand a chance to lose income are: local fishermen, local boatmen, temporary shop owners, local three wheel drivers etc. Around 120-150 families stand a chance to lose income as a result of the development of the proposed EZ. ➤ All the five options of existing approach road

		involve resettlement issues.
E	Availability of Social Infrastructure	
1	Availability of good residential facility in the nearby areas	The proposed EZ is located 23 km away from Kusthia town. Dwelling units and residential facilities are available for labours in Shibalaya and Manikganj.
2	Medical facilities available in the nearby areas	<p>One government hospital (Upzilla Health Complex) is available in Manikganj district with 50 beds. Manikganj Sadar hospital is located in proximity to the proposed EZ.</p> <p>There is an eye hospital adjacent to the proposed EZ.</p> <p>Monno Medical college & Hospital is located in Manikganj (around 20 km away from the proposed EZ)</p>
3	Air and water pollution at the site (prevailing condition)	<p>The site is free from air and water pollution and no significant noise was observed when the site visit was undertaken.</p> <p>The incidence of water and air pollution at the site is insignificant. Also, the incidence of water borne diseases wasn't recorded in the locality.</p>
4	Availability of manpower	<p>Manikganj district has 28 colleges (government and non-government colleges) and 154 secondary schools (government and non-government schools). The district also has 1 medical college and 2 technical and vocational institutions.</p> <p>Some of the Technical institutes located in the radius of 50 km (approx.) from the proposed EZ are:</p> <ul style="list-style-type: none"> • Manikganj Technical School and College • National Institute of Textile Engineering & Research, Nayarhat • Faridpur Polytechnic Institute
F	Market potential assessment	
	Broad level market potential assessment	<p>Broad level market potential assessment depicts that following industries stand a good chance to be developed within the proposed EZ:</p> <ul style="list-style-type: none"> • Jute Processing • Construction Materials

		<ul style="list-style-type: none"> • Agro Processing • Fish Processing • Hosiery • Knitwear
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Shariatpur- Zajira

Sl. No.	Parameters	Illustration of the present facilities
A	Connectivity	
1 (A)	Road Connectivity Existing Road Connectivity to Dhaka and other major cities of Bangladesh	<ul style="list-style-type: none"> ➤ Proposed EZ is located at a distance of around 80 km from Dhaka. ➤ Access takes place via Dhaka-Mawa Highway. Further, ferry ride has to be taken from Mawa ghat to Shariatpur. ➤ From Shariatpur ghat the zanjira upzila (proposed EZ) can be accessed through Shariatpur - Kathalbari Zilla road (Z8012) at a distance of 13 km. Z8012 is a single lane bituminous road favorable for passage of heavy vehicles. ➤ Land acquisition is ongoing for widening of Z8012. ➤ Proposed EZ is located at a distance of around 3 km from the approach to Padma Bridge. ➤ Once Padma Bridge is operational, proposed EZ would have seamless access to Dhaka. ➤ Construction for Bhanga-Biswa road is ongoing. Once Bhanga-Biswa road is operational, access to Jessore and Khulna would get improved significantly.
1 (B)	Road Connectivity Last Mile Connectivity	<ul style="list-style-type: none"> ➤ Shariatpur-Kathalbari Zilla Road (Z8012) is located at a distance of 2.2 km on the southern portion of the proposed EZ. During site visit, it was observed that it is connected by a kutchra road to the project site. ➤ This kutchra road may be widened to provide better access to the proposed EZ. Basis discussion with UNO officials, around 50 households would be affected due to this development. It was informed to us that the land on both sides of the kutchra road is government land. ➤ Approach road to the site can be provided anywhere from Shariatpur-Majhirghat road. However, during site visit it seems difficult to widen Shariatpur-Majhirghat road due to settlements located on both sides of the road and due to presence of multiple culverts. ➤ Basis preliminary assessment, possibility of constructing another approach road towards the Naruba Rail station/ Padma Bridge could be further explored.

2	Rail Connectivity	<ul style="list-style-type: none"> ➤ Faridpur is the nearest rail station from the project site. It is located at a distance of around 75 km from the proposed EZ. ➤ Dhaka (Kamalapur) rail station is approximately 75 km away (by road) from the proposed EZ and travel time by road is 4.5-5 hours (approximate). Access takes place via Z8012 and Dhaka Mawa Highway. This route includes ferry ride at Mawa ghat. Once Padma Bridge is operational, connectivity between Zajira upzilla and Dhaka would significantly improve. As a result of the same, accessibility of rail facilities in Dhaka would get easier. ➤ Basis discussion with the UNO officials, at the approach of Padma Bridge, Naruba rail station is proposed. This rail line would be connected to Dhaka on one side and Khulna on the other side. It was informed to us that land acquisition for the same is ongoing. ➤ Once Padma Bridge is functional, proposed EZ would have access to rail facility at a distance of around 3 km from the project site.
3	Waterway Connectivity	<ul style="list-style-type: none"> ➤ Proposed EZ has access to three ferry terminals viz. Shariatpur ghat, Kawrakandi ghat and Majhirghat. ➤ These ferry terminals are well connected to Mawa ghat and all major ports of Bangladesh through the widespread waterways network of Bangladesh. ➤ However, using these ghats would result in multiple transshipment in the overall supply chain, thereby increasing the cost and time of transport. This renders the prospects of IWT weak in its current form
4	Airport Connectivity International airport in the proximity	<ul style="list-style-type: none"> ➤ Proposed Shariatpur EZ is located around 82 km from Hazrat Shah Jalal International Airport at Dhaka. The travel time by road to Dhaka International Airport is 4-4.5 hours (approximate). This includes ferry ride from Shariatpur ghat to Mawa ghat. Z8012 and Dhaka-Mawa highway provide access to the airport. ➤ Once Padma Bridge is operational, access to the international airport would be significantly improved and travel time would reduce significantly. ➤ Govt. of Bangladesh intends to construct a new international airport (Bangabandhu Sheikh Mujib International Airport) with a view to create a hub airport in close proximity to Dhaka and to meet the demand of future growth in aviation sector. Location for the same is yet to be finalized.
B	Utility Connections	
1	Power Availability	<ul style="list-style-type: none"> ➤ Zajira substation is the nearest substation to the proposed EZ and it has a total capacity of 10 MVA. It is located at a distance of around 3 km from the project site. Basis interaction with UNO and Rural

		<p>Electrification Board (REB) officials, this substation has surplus capacity of 3 MVA.</p> <ul style="list-style-type: none"> ➤ REB officials informed us that a power plant is proposed in Mazir Ghat, which is at a distance of 4km from the proposed EZ.
2	Water Availability	<ul style="list-style-type: none"> ➤ Basis initial site visit, source of drinking water in the area surrounding the proposed EZ is tube well. ➤ As per our discussion with UNO Officials and local inhabitants, it was communicated to us that the depth of water table is at 40-50 feet from the ground level. ➤ However, detailed feasibility study could be taken up to assess withdrawal of water from Padma River and the ground water potential. Detailed feasibility study needs to be undertaken to estimate the ultimate water demand and decision needs to be taken accordingly. ➤ Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Shariatpur EZ is around 4.46 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could be extracted through bore wells. Extraction of more water through bore wells might result in depletion of the aquifer level.
3	Gas Availability	<ul style="list-style-type: none"> ➤ There is no gas source or gas supply near to the proposed EZ. ➤ Basis discussion with UNO officials, it was informed to us that the nearest gas pipeline is available in Munshiganj (located at road distance of around 50 km from the proposed EZ, on the other side of Padma River). ➤ Once Padma Bridge is operational, gas pipeline will be available near to the proposed EZ. Construction for the approach to the Padma Bridge is ongoing at a location around 3 km away from the project site.
C	Suitability for industrial development	
1	Existing industrial ecosystem and Possible Backward linkages for industries	<ul style="list-style-type: none"> ➤ Zajira upzilla hasn't witnessed any significant industrial proliferation. ➤ However, Zajira is rich in agricultural resources. ➤ In Barisal district, major industries operating are: Pharmaceuticals, saline, cement, food processing etc. ➤ Barisal is one of the major sources for cultivation of food grains and fisheries in the country. ➤ Munshiganj district has maximum number of cold storages in Bangladesh. There are several rice mill, oil mill, pulses mill and maida mill located in this region. Apart from this, other major industries in Munshiganj district are: textile, chemical, garments, fishing net,

		salt and cement.
2	Proximity to major cities	Shariatpur EZ is located at a distance of around 80 km from Dhaka city. Connectivity to Dhaka takes long duration, however once Padma Bridge is operational, connectivity would improve significantly. Further, once Bhanga-Biswa Road is operational, proposed EZ would be well-connected to Khulna region.
D	Challenges in developing the economic zone (<i>Resettlement Issues and social aspects</i>)	
1	Landfilling	Basis preliminary assessment, landfilling of depth 6-7 meter needs to be undertaken.
2	Residential units to be rehabilitated	Basis preliminary assessment, 45-50 units need to be rehabilitated as a result of the development of this project.
3	Other Resettlement Issues	<ul style="list-style-type: none"> ➤ Trees existing in the site can be retained and earmarked as green area during the preparation of master plan. ➤ During the master planning stage, the nallah crossing the project site could be rerouted. ➤ Basis preliminary assessment and interaction with local inhabitants, around 200-300 number of households could stand to lose their income/livelihood as a result of the development of the project. ➤ Basis discussion with UNO officials, around 50 households and some trees would be affected due to construction of approach road. It was informed to us that the land on both sides of the kutchra road (existing approach road) is government land. ➤ A non-functional brick field is located within the project site. As a result of the development of this project, this brick field needs to be relocated and measures need to be formulated accordingly. ➤ Environmental Buffer Zone is being developed at a distance of around 3 km from the proposed EZ. It is located on the northern side of the proposed EZ and on the boundary of the construction yard of Padma Bridge project. During the development of the proposed EZ, precautions need to be taken so that this Environmental Buffer Zone doesn't get affected. ➤ On the eastern side of the project boundary, Jalmahal (aquaculture waterbodies) is located. As a result of the development of the proposed EZ, this surrounding area may get subjected to environmental degradation and care needs to be taken to preserve the existing ecosystem of fisheries in Jalmahal.
E	Availability of Social Infrastructure	

1	Availability of good residential facility in the nearby areas	Dwelling units and residential facilities are available for labours in Zajira and Shariatpur.
2	Medical facilities available in the nearby areas	There is no international standard hospital is present in the vicinity. 1 Government hospital and 14 private clinics are available within 10 km of the proposed EZ.
3	Air and water pollution at the site (prevailing condition)	The site is free from air and water pollution and no significant noise was observed when the site visit was undertaken. The incidence of water and air pollution at the site is insignificant. Also, the incidence of water borne diseases wasn't recorded in the locality.
4	Availability of manpower	There are 4 technical and vocational institutions and 3 polytechnic institutes. Some of the Technical institutes located in the radius of 50 km (approx.) from the proposed EZ are: <ul style="list-style-type: none"> • Shariatpur Polytechnic institute • Technical and vocal Education There are a total of 300 vocational education institutions (48 public and 252 private) in Bangladesh. Basis preliminary assessment, the unskilled/ semi-skilled and skilled/executive level manpower could be sourced from these technical institutes.
F	Market potential assessment	
	Broad level market potential assessment	Broad level market potential assessment depicts that following industries stand a good chance to be developed within the proposed EZ: <ul style="list-style-type: none"> • Agro Processing • Spices • Food Processing • Ship building/ Shipbreaking • Light Engineering

Jaliardip-Teknaf

Sl. No.	Parameters	Illustration of the present facilities
A	Connectivity	
1 (A)	<p>Road Connectivity</p> <p>Existing Road Connectivity to Chittagong and other major cities of Bangladesh</p>	<ul style="list-style-type: none"> ➤ N1 (Dhaka-Chittagong National Highway) known along various stretches as the Dhaka–Chittagong Highway, the Chittagong–Cox's Bazar Highway and the Cox's Bazar–Teknaf Highway connects Teknaf with Chittagong, Dhaka, Comilla, Feni and other major cities of Bangladesh. ➤ However, the road traffic on Dhaka Chittagong Highway is severely hampered because of the lack of capacity of the existing highway and the load restrictions of bridges; with journeys taking around 10 hours due to the congestion of the road. The road also suffers from poor road safety records because of the lack of segregation between local and national traffic and between motorized and non-motorized traffic. ➤ One of the major ongoing projects in Bangladesh of upgrading Dhaka-Chittagong highway to four lanes could ensure fast and smooth conveyance of goods and passengers between Dhaka and Chittagong. These roads can form part of the regional road network, as well as the Trans-Asian Road network facilitating trade between Bangladesh and neighboring countries. ➤ Cox's Bazar-Teknaf Sea beach Road (Z1098) connects Teknaf to Cox's Bazar running in parallel to N1 highway along the Cox's Bazar-Teknaf sea beach. ➤ Z1098 is a single lane road and it takes around 3 hours to reach the Cox's bazaar from the proposed EZ by road.
1 (B)	<p>Road Connectivity</p> <p>Last Mile Connectivity</p>	There is no existing approach road from Dhaka-Chittagong Highway to the proposed EZ. Proposed site is surrounded on all sides by Naf River and is currently accessed by boats.
2	Rail Connectivity	At present there are no railway stations in the Cox's Bazaar. However, Cox's Bazar is located on the Bangladesh Railway's " Dhaka-Chittagong Cox's Bazar- Deep Sea Port Corridor ". Currently this corridor is operational upto Dohazari railway station (located approx. 160 km from the proposed EZ via N1 National Highway) Dhaka-Chittagong Cox's Bazar- Deep Sea Port Corridor is the busiest rail track for passenger and freight transport.
3	Water Connectivity	<p>Teknaf port is located at an aerial distance of 20 m (approx.) from Teknaf port but is accessible through waterways only.</p> <p>Proposed EZ is seems to be strategically located with respect to water connectivity to Chittagong port, proposed Sonadia deep sea port and Mongla port.</p> <p>Teknaf port is currently used only to transport goods and passengers between Bangladesh and Myanmar to cross the river for about 1 km width. Approximately 3-5 trips are being made to & fro from Bangladesh.</p>
4	<p>Airport Connectivity</p> <p>International airport in the</p>	Cox's Bazaar domestic airport is at a distance of 80 km (approx.) from the proposed EZ. The connectivity from airport

	proximity	<p>to the proposed EZ takes around 2-2.5 hours (approx.) of travel time via Cox's Bazar-Teknaf National Highway (N1) road.</p> <p>The Airport is being considered for an upgrade by the Bangladesh Civil Aviation and Tourism Ministry. Prime Minister of Bangladesh has recently inaugurated (Jul' 2015) the commencement of construction works for International Airport in Cox's Bazar.</p> <p>Access via Cox's Bazar-Teknaf National Highway (N1) could provide seamless cargo transfer to/ from the proposed EZ. This could also reduce the cargo traffic at Shah Amanat International airport, Chittagong. However the any such decision would need to be finalized during master planning stage and would require detailed feasibility analysis.</p>
B	Utility Connections	
1	Power Availability	<ul style="list-style-type: none"> ➤ The nearest substation to the proposed EZ is Teknaf substation having capacity of 10 MVA. Basis interaction with UNO and Rural Electrification Board (REB) officials, this substation has excess capacity of 3.5 MVA. ➤ Basis our discussions with UNO officials, tapping may be taken from this line and 33/11 KV substation may be proposed at site. Grid substation 132/33 KV is available at Cox's Bazar which is located at a distance of 80km from the site. ➤ 33 KV line is passing along the road which is located within 500 meters from the proposed EZ.
2	Water Availability	<p>There is no existing water supply system at the proposed site. The local inhabitants are dependent on tube wells for the purpose of drinking water.</p> <p>As per our discussion with UNO officials and local inhabitants, it was communicated to us that the depth of water table is 120 meters – 150 meters from the ground level.</p> <p>Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Teknaf EZ is around 2.31 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could be extracted through bore wells. Extraction of more water through bore wells might result in depletion of the aquifer level.</p>
3	Gas Availability	<p>There is no gas supply point available near the proposed EZ. 24" gas transmission line is available upto Shikalbaha power plant, Chittagong (located at a distance of approx. 190 km from proposed EZ).</p> <p>Basis preliminary assessment, a 16" gas pipe line from this place to Cox's bazar could be proposed to be laid out. However, Cox's bazar is 80 km (approx.) away from the proposed EZ.</p>
C	Suitability for industrial development	
1	Existing industrial ecosystem and Possible Backward linkages for industries	<ul style="list-style-type: none"> ➤ Cox's Bazar district has presence of manufacturing sector (at SME level). There are around 473 rice mills, 38 salt mill, 64 ice factories, 145 flour mills, 31 fish processing industries, 74 saw mills and 18 printing presses. In addition, there are about 27 large scale

		<p>industries in Cox Bazaar Region.</p> <ul style="list-style-type: none"> ➤ Cox's Bazaar is one the most popular tourist centres in the country. Located at the head of the world's longest sea beach, the area is blessed with many tourist attractions. These includes – Aggmeda Khyang – a Buddhist monastery, Himchari picnic spot, Innani beach, Sonadia Island, Saint Martin Island a beautiful coral island and the Teknaf peninsula. ➤ Geographical location and profile of Jaliardip Island is a major challenge in the development of the proposed EZ.
2	Proximity to major cities	<p>Proposed EZ is located in close proximity to Cox's Bazar city and is connected to Chittagong through Dhaka-Chittagong-Cox's bazar-Teknaf Nation Highway (N1).</p> <p>However, Chittagong is located at a distance of (approx.) 190 km from the proposed EZ.</p>
D	Challenges in developing the economic zone (<i>Resettlement Issues and social aspects</i>)	
1	Landfilling	<p>Based on our assumption and discussions with UNO officials, an average depth of 5 meters to 7 meters land filling has been envisaged for the proposed EZ area. This figure is indicative and detailed topography survey needs to be carried out to calculate the exact quantity of land filling at the project area.</p>
2	Residential units to be rehabilitated	<p>There is no loss of homes and structures. However there are 4-5 temporary sheds for fishermen those who are taken the land under lease agreement from government of Bangladesh.</p>
3	Other Resettlement Issues	<ul style="list-style-type: none"> ➤ Basis discussion with local inhabitants, around 200-300 number of trees might be located within the project area. However, during master planning stage this needs to be ascertained. The master plan (during the feasibility stage) can be prepared in a way that maximum number trees could be retained and earmarked as green area. ➤ As a result of loss of aquaculture land, the fishermen who are depended on the ponds for income will be directly affected due to the development of this project. ➤ The surroundings of the EZ have been observed as a rich fishing ground. Project interventions i.e. land filling of the existing water bodies and discharge of waste water along the Naf River might affect the fish spawning & nursing ground and subsequently income source from fishing.
E	Availability of Social Infrastructure	
1	Availability of good residential facility in the nearby areas	<p>There are no Dwelling units and residential facilities are available in the vicinity of the proposed EZ.</p> <p>Good quality residential units are available in Cox's bazaar. However Cox's bazar is located at a distance of 80 km (approx.) from the proposed EZ.</p>
2	Medical facilities available in the nearby areas	<p>Government hospital is available in Teknaf upzila and has provision for 50 beds.</p> <p>However, better Healthcare facilities are available in Cox's Bazar which is far away from the proposed EZ (80 km approx.).</p>

3	Air and water pollution at the site (prevailing condition)	<p>During the field visit, it was observed that the ambient air quality is good in the proposed site.</p> <p>The site is free from air and water pollution.</p>
F	Market potential assessment	
	Broad level market potential assessment	<p>Broad level market potential assessment depicts that following industries stand a good chance to be developed within the proposed EZ:</p> <ul style="list-style-type: none"> • Eco-Tourism • Salt • Fish Processing • Minor Forest Produces • Rubber • Wax • Paan and Areca Nut processing

1.6. Ranking of the sites

The seven sites are ranked relatively to each other. This indicates that if a site is better placed on a particular parameter vis-a-vis the other sites, highest marks (on a scale of 1 to 5, 1 being the lowest and 5 being the highest) are allocated to it. The other sites are ranked relatively to this site. These ratings are qualitative as well as quantitative (where possible) in nature, but as a principal, the assignments of scores are based on a logical rationale.

All such key parameters are clubbed into broad groups of “necessary parameters” and “good to have parameters”. While assigning the weightage to individual parameters it has been kept in mind to broadly assign equal weightage to all parameters falling under similar broad groups. Likewise, any sub parameters (e.g. modes of transportation like roads, rails, ports, airports etc. under parameter Connectivity) are assigned equal weightages. Of course, at a broad level, the necessary parameter group has a higher weightage than good to have parameters.

Following table summarized the relative rankings and weighted scores of the seven sites.

Table: Rankings of the seven proposed Economic Zones

		Parameters	Weightage	Dhaka Dohar		Bhola Sadar		Kustia-Bheramara		Nilphamari Sadar	
				Score	Weightage×Score	Score	Weightage×Score	Score	Weightage×Score	Score	Weightage×Score
		Rank		Rank-1		Rank-6		Rank-2		Rank-5	
			100%		4.172		2.505		3.401		2.510
Necessary Parameters (75%)	Infrastructure Linkages, Connectivity and Access to Market	(1) Connectivity	15.0%		0.53		0.23		0.50		0.45
		Road	5.0%	4	0.20	2.5	0.13	4	0.20	5	0.25
		Rail	2.5%	3	0.08	1	0.03	5	0.13	4	0.10
		Water connectivity	5.0%	5	0.13	2	0.05	4	0.10	1	0.03
		Airport	2.5%	5	0.13	1	0.03	3	0.08	3	0.08
	(2) Utility Connection	15.0%		0.50		0.65		0.48		0.35	
	Power connection	5.0%	2.5	0.13	5	0.25	3.5	0.18	3.5	0.18	
	Gas connection	5.0%	2.5	0.13	5	0.25	2	0.10	1	0.05	
	Water connection	5.0%	5	0.25	3	0.15	4	0.20	2.5	0.13	
	(3) Suitability for industrial development	15.0%	5	0.75	2	0.30	4.5	0.68	3.5	0.53	
Challenges	(4) Off-site Infrastructure Development	15.0%	1.4	0.213618955	3.4	0.51	4.2	0.63	2.0	0.30	
	(5) Social & Resettlement Aspects	15.0%	5	0.75	3	0.45	2.5	0.375	3	0.375	
	(6) Access to quality manpower	8.3%	5	0.42	2	0.17	4	0.33	3	0.25	
Good to Have parameters (25%)	(7) Social Infrastructure	8.3%	5	0.42	2	0.17	4	0.33	3	0.25	
	(9) Cost of land acquisition	8.3%	4.0	0.60	0.2	0.04	0.5	0.08	0.1	0.01	

		Parameters	Weightage	Manikganj		Shariatpur-Zajira		Teknaf-Jaliardip	
				Score	Weightage×Score	Score	Weightage×Score	Score	Weightage×Score
		Rank		Rank-3		Rank-4		Rank-7	
			100%		3.193		2.784		2.334
Necessary Parameters (75%)	Infrastructure Linkages, Connectivity and Access to Market	(1) Connectivity	15.0%		0.48		0.36		0.28
		Road	5.0%	3.5	0.18	3.5	0.18	2	0.10
		Rail	2.5%	2	0.05	2.5	0.06	2	0.05
		Water connectivity	5.0%	5	0.13	3	0.08	4	0.10
		Airport	2.5%	5	0.13	2	0.05	1	0.03
		(2) Utility Connection	15.0%		0.60		0.50		0.38
		Power connection	5.0%	4.5	0.23	3.5	0.18	3	0.15
		Gas connection	5.0%	2.5	0.13	2.5	0.13	1.5	0.08
		Water connection	5.0%	5	0.25	4	0.20	3	0.15
	(3) Suitability for industrial development	15.0%	4.5	0.68	2.5	0.38	1.5	0.23	
Challenges	(4) Off-site Infrastructure Development	15.0%	1.7	0.25	5.0	0.75	0.6	0.09	
	(5) Social & Resettlement Aspects	15.0%	3	0.45	2.5	0.375	3	0.45	
	(6) Access to quality manpower	8.3%	4	0.33	2.5	0.21	1	0.08	
Good to Have parameters (25%)	(7) Social Infrastructure	8.3%	4	0.33	2.5	0.21	1	0.08	
	(9) Cost of land acquisition	8.3%	0.5	0.08	0.0	0.00	5.0	0.75	

The seven sites are ranked relatively to each other. This indicates that if a site is better placed on a particular parameter vis-à-vis the other sites, highest marks (on a scale of 1 to 5, 1 being the lowest and 5 being the highest) are allocated to it. In the following table, a summary behind the rationale used for carrying out the ranking exercise has been elaborated.

Parameter(s)	Rationale	Relative Scoring	
Road Connectivity - Trunk connectivity - Future Potential of Road Connectivity - Last Mile Connectivity	Trunk connectivity and travel time to major cities (such as Dhaka, Jessore) is amenable for Dhaka-Dohar, Bheramara and Manikganj. Ferry crossing is required to reach (from Dhaka) proposed EZs in Shariatpur and Bhola and direct road connectivity is not available. But, if we consider future potential, due to the construction of Padma Bridge, Dhaka-Dohar and Shariatpur are expected to gain significantly as a result of the development. Nilphamari EZ has access to Asian Highway Network and implementation of MVA would enable cross border trade for the proposed EZ. Teknaf EZ seems to have not so good potential for road connectivity. Regarding approach road (last mile connectivity), apart from Bheramara and Nilphamari, all other EZs seem to have resettlement problems.	Dhaka-Dohar	4.00
		Bhola Sadar	2.50
		Kustia-Bheramara	4.00
		Nilphamari Sadar	5.00
		Manikganj	3.50
		Shariatpur-Zajira	3.50
		Teknaf-Jaliardip	2.00
Rail Connectivity	Proposed EZ in Bhola Sadar doesn't have access to rail network. Teknaf-Jaliardip EZ doesn't have any rail network in the vicinity, but Cox's Bazar is located on the Bangladesh Railway's "Dhaka-Chittagong Cox's Bazar- Deep Sea Port Corridor", which is the busiest rail corridor for freight transfer. Proposed EZs in Dohar, Manikganj and Shariatpur have access to Dhaka (Kamalapur) and Faridpur rail station but the time of travel and distance is significant and transport requires multimodal logistics as no direct road access is there at present. Further, there is a ICD in Kamalapur station but cargo storage facility is not available. Dhaka-Faridpur rail corridor is an important rail corridor for freight transfer. Nilphamari EZ has access to Saidpur rail station and rail siding facility is available. However, there seems to be resettlement problem for the last mile connectivity to the rail station. Cross border trade to India (Kolkata) may also be facilitated from Saidpur rail station. For Bheramara EZ, it has good access to Bheramara and pakshi rail stations. It was communicated to us that cargo is transferred to Khulna from Bheramara station.	Dhaka-Dohar	3.00
		Bhola Sadar	1.00
		Kustia-Bheramara	5.00
		Nilphamari Sadar	4.00
		Manikganj	2.00
		Shariatpur-Zajira	2.50
		Teknaf-Jaliardip	2.00
Waterways Connectivity	Proposed EZ in Nilphamari doesn't have access to waterways. Presence of Moinat ghat and Aricha ghat within the project boundaries of Dohar and Manikganj EZs respectively may enable development of private cargo terminals to connect to the waterways. Bheramara EZ is located on the banks of Padma River and hence, private jetty development may be considered further. For Bhola and Shariatpur EZ, there are last mile connectivity problems to the approach to the ferry ghats. Also, development of the ferry ghats as private cargo terminal is dependent on external factors. Moreover, multiple transshipment of goods would increase the cost of goods movement. Teknaf EZ has good access to waterways and proximity to Chittagong port makes it well-connected to waterways however currently there is no terminal at the proposed site and the same may need to be constructed as part of the EZ development.	Dhaka-Dohar	5.00
		Bhola Sadar	2.00
		Kustia-Bheramara	4.00
		Nilphamari Sadar	1.00
		Manikganj	5.00
		Shariatpur-Zajira	3.00
		Teknaf-Jaliardip	4.00
Air	Proposed EZ in Bhola doesn't have good access to	Dhaka-Dohar	5.00

Connectivity	international airport. Dohar and Manikganj EZs are located at around 75-80 km away from Hazrat Shah Jalal International airport in Dhaka and travel takes by road. Road conditions for both the cases are favorable for passage of heavy vehicles. Proposed EZs in Nilphamari and Bheramara are located quite far away from Dhaka airport and nearby airports (Saidpur and Jessore respectively) are domestic. Shariatpur EZ has access to Dhaka airport but river crossing needs to be undertaken which involves multiple transshipment of cargo. Once Padma Bridge is operational, connectivity would be enhanced. For accessing Cox's Bazar airport from Teknaf EZ, Naf river needs to be crossed and road travel needs to be undertaken for around 80 km.	Bhola Sadar	1.00
		Kustia-Bheramara	3.00
		Nilphamari Sadar	3.00
		Manikganj	5.00
		Shariatpur-Zajira	2.00
		Teknaf-Jaliardip	1.00
Power Connection	Access to power substations/ sources has been considered as basis for the ranking exercise. Sites which have access to power substation (having surplus power available) in the vicinity have been given higher marks.	Dhaka-Dohar	2.50
		Bhola Sadar	5.00
		Kustia-Bheramara	3.50
		Nilphamari Sadar	3.50
		Manikganj	4.50
		Shariatpur-Zajira	3.50
Gas Connection	Access to gas has been considered as the basis for gas availability calculation. Sites which have access to gas have been given higher marks and sites which don't have access to gas connection in the vicinity have been given lower marks.	Teknaf-Jaliardip	3.00
		Dhaka-Dohar	2.50
		Bhola Sadar	5.00
		Kustia-Bheramara	2.00
		Nilphamari Sadar	1.00
		Manikganj	2.50
Water Connection	Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha for a typical multiproduct EZ. Considering typical yield of 1-2 MLD (depending on location) per borewell, best practices suggest that around 4-5 MLD of water could be extracted through bore wells, beyond which aquifer would be depleted. Sites which have proximity to river, option of extracting water from the rivers may be further explored. For the EZ sites, which don't have access to rivers in the proximity, option of bore wells needs to be explored. This is subjected to detailed feasibility and master planning. Water table and proximity to river have been considered as basis for the ranking exercise.	Shariatpur-Zajira	2.50
		Teknaf-Jaliardip	1.50
		Dhaka-Dohar	5.00
		Bhola Sadar	3.00
		Kustia-Bheramara	4.00
		Nilphamari Sadar	2.50
Industrial Development	Some of the major factors taken into account as the basis for the scoring: (i) Proximity to major cities; (ii) existing industrial ecosystem in the vicinity; (iii) Potential for access to new market; (iv) Possibility of cross border trade.	Manikganj	5.00
		Shariatpur-Zajira	4.00
		Teknaf-Jaliardip	3.00
		Dhaka-Dohar	5.00
		Bhola Sadar	2.00
		Kustia-Bheramara	4.50
Cost of off-site infrastructure development	Site with the lowest cost of off-site infra per acre has been assigned maximum marks and other sites have been marked on a relative basis, where the marking has been provided on proportionate basis of the cost per unit area.	Nilphamari Sadar	3.50
		Manikganj	4.50
		Shariatpur-Zajira	2.50
		Teknaf-Jaliardip	1.50
		Dhaka-Dohar	5.00
		Bhola Sadar	2.00
		Kustia-Bheramara	4.50
		Nilphamari Sadar	3.50
		Dhaka-Dohar	1.42
		Bhola Sadar	3.40
		Kustia-Bheramara	4.21
		Nilphamari Sadar	1.97

		Manikganj	1.66
		Shariatpur-Zajira	5.00
		Teknaf-Jaliardip	0.62
Social and Resettlement aspects	Major resettlement issues have been considered for this assessment. Site with the major resettlement problem has been given the highest score and relative scoring has been considered.	Dhaka-Dohar	5.00
		Bhola Sadar	3.00
		Kustia-Bheramara	2.50
		Nilphamari Sadar	2.50
		Manikganj	3.00
		Shariatpur-Zajira	2.50
		Teknaf-Jaliardip	3.00
Access to quality manpower	Basis of this analysis is the availability of manpower from local technical institutions and industries. Proximity to major cities has also been considered as a parameter which in turn could provide source of quality manpower for the EZ due to the existing industrial ecosystem.	Dhaka-Dohar	5.00
		Bhola Sadar	2.00
		Kustia-Bheramara	4.00
		Nilphamari Sadar	3.00
		Manikganj	4.00
		Shariatpur-Zajira	2.50
		Teknaf-Jaliardip	1.00
Social Infrastructure	Basis of this analysis is the availability of healthcare and quality residential facilities in the vicinity to the EZ. Proximity to major cities has also been considered as a parameter of the analysis.	Dhaka-Dohar	5.00
		Bhola Sadar	2.00
		Kustia-Bheramara	4.00
		Nilphamari Sadar	3.00
		Manikganj	4.00
		Shariatpur-Zajira	2.50
		Teknaf-Jaliardip	1.00
Cost of land acquisition	Site with the lowest cost of land acquisition (apart from Teknaf, since it has completely government land) has been given the maximum marks. Other sides have been marked on a relative basis.	Dhaka-Dohar	4.00
		Bhola Sadar	0.24
		Kustia-Bheramara	0.519
		Nilphamari Sadar	0.10
		Manikganj	0.522
		Shariatpur-Zajira	0.03
		Teknaf-Jaliardip	5.00

Project Background

2. Project Background

2.1. Background of the Engagement

Bangladesh has been growing at a sustained annual GDP growth of over 6 percent since FY 2010. Growth was underpinned by stable macroeconomic and prudent monetary policies, rising industry, services output and continued high levels of remittances. Going forward, Government of Bangladesh's objective is to develop a growth trajectory that will support an overall increase in real GDP growth to 8 percent per annum and reduce poverty from 40 percent to 15 percent by 2021.

The sustained growth in Bangladesh's labor force of nearly 2 million a year is an asset that nevertheless increases the country's vulnerability. Creating productive employment will largely depend on creating an environment conducive to private sector investment, particularly for labor-intensive manufacturing and services sector.

The Government of Bangladesh has successfully provided tailored infrastructure services and business environment conditions through Export Processing Zones (EPZs). EPZs were used as a strategic instrument for attracting FDI and dealing with the shortcomings of the overall investment climate, business registration, licensing, etc. The Bangladesh Export Processing Zone Authority (BEPZA) was established in 1980, with the first EPZ built in Chittagong in 1983. The EPZ program was the first systematic initiative to provide fully-serviced land and a better business environment for investors, targeting large scale, export-oriented manufacturing. EPZs have triggered impressive growth in exports, mainly in the RMG sector, at an average annual rate of 23 percent since 1993, reaching nearly US\$2.9 billion by FY2010, and employing almost 28,000 people.

Bangladesh's current EPZ model has its limits both in terms of cumulative impact and in terms of spillover to the domestic economy. As an exporting enclave, EPZs have provided little in the way of linkages with the domestic economy, up-stream or down-stream, resulting in low technology and efficiency spillover which accompany foreign investment. Investments in other sectors beyond the low capital investment RMG segment have also not materialized.

The Government's objective is therefore to maximize the potential direct and indirect impacts through a more modern, generalized regime for Economic Zones (EZs). The Government has launched an effort to develop a new EZ paradigm for Bangladesh, drawing from numerous successful examples from around the world as well as Bangladesh's own positive experience with the EPZ model. The expectation is that more spillover will be harnessed by local firms from foreign direct investment, additional investments will be encouraged within value chains, more local produce will be procured and better linkages established between firms and educational institutions. A faster adaption to international environmental and social practices in the private sector should also be encouraged through the new EZ policy.

The new EZ regime provides for a new approach both in management and investment. The policy allows the Government to develop and pilot an approach that is less reliant on Government fiscal subsidies, while leveraging comparative advantages and private sector capability where possible.

The Economic Zone Act was passed in the Bangladesh Parliament in August 2010, providing the overall framework for establishing EZs throughout Bangladesh. Under this Act, the Bangladesh Economic Zone Authority is established under the Prime Minister's Office (PMO) and governed by a Board chaired by the Prime Minister. The law provides the legal coverage for attracting and leveraging private investment in the development of zones as zone developers or operators, and in the provision of tailored infrastructure services, such as private provision of power, effluent treatment, etc.

In the background of the above, the Government of Bangladesh is implementing the Private Sector Development Support Project (PSDSP) with support from the World Bank and United Kingdom – Department for International Development (UK-DFID) to support pilot projects under the new Economic Zone model. The objective is to demonstrate the viability and efficacy of new models to remove key constraints facing the private sector in business investment.

In implementing the PSDSP, Bangladesh Economic Zone Authority (BEZA), the nodal authority for Economic Zone development and World Bank are currently considering the following seven sites for undertaking the initial site assessment.

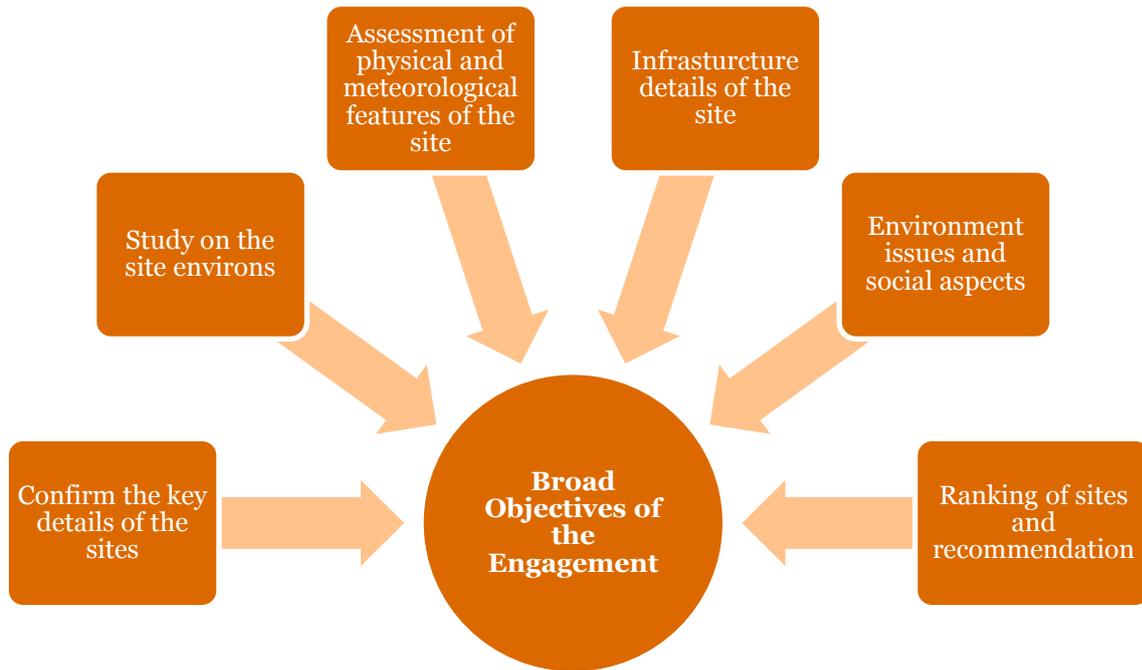
Dhaka Dohar
Manikganj
Shariatpur-Jajira
Bhola Sadar
Kustia-Bheramara
Nilphamari
Teknaf-Jaliardip

This report endeavors to undertake an initial analysis to assess the relative attractiveness of these sites

2.2. Introduction of the Engagement

The objective of the engagement is to educate BEZA & the World Bank on the preliminary assessment of the five identified EZ's and to assist BEZA and the World Bank in selection of suitable land parcels to be considered for future economic zones development. The principal objectives of this engagement are shown in the figure below.

Figure: Principal Objectives of the Engagement



2.3. Earmarking of the Consultant Team

The following team has been earmarked for carrying out the engagement as shown in the figure below.

Figure: Team Composition for the Engagement



The team visited the five economic zone sites to carry out the initial site assessment. The timeline of the visit is shown in the table below.

Table: Field visit to the 7 proposed EZs

Name of the Proposed EZ	Dhaka Dohar	Manikganj	Shariatpur-Jajira	Bhola Sadar	Kustia-Bheramara	Nilphamari	Teknaf-Jaliardip
Date of visit	9 th August 2015	10 th and 11 th August 2015	12 th and 13 th August 2015	17 th and 18 th August 2015	11 th and 12 th August 2015	15 th , 16 th and 17 th August 2015	18 th , 19 th and 20 th August 2015

2.4. Scope of Work for Initial Site Assessment

The consultant shall review the background information provided by BEZA for of seven sites (viz. Dhaka Dohar EZ, Manikganj EZ, Shariatpur-Jajira EZ, Bhola Sadar EZ, Kustia- Bheramara EZ, Nilphamari EZ & Teknaf-Jaliardip EZ), shall visit each site with their team of experts, and shall carry out a site examination. The Consultant’s team shall be evaluating each site based on the following considerations:

It is the Consultant’s responsibility to procure site coordinates, map of the sites etc. from the relevant govt. local departments and related agencies and reconfirm the site locations and the following information.

- Site location, size and area
- Ownership of land i.e. Govt. owned, private (nos. of private owners) etc.
- The context surrounding the site
- On-site and off-site infrastructure
- Environmental and social issues
- Identify any fatal flaws (“deal-breakers” that are impossible or financially prohibitive to mitigate and would eliminate the site from consideration)

The Consultant's main tasks are the following:

Task 1: Conduct each site survey

- Reconfirm the site locations and the following information:
- Reconfirm location (mouza, upzila, district, division)
- Reconfirm coordinates of sites
- Reconfirm the boundaries of the sites
- Reconfirm size of sites (acre and m2)
- Reconfirm ownership of land i.e. whether it is Govt. owned, Govt. agency, private etc. (nos. of private owners, holding size and other pertinent details)
- Reconfirm the land use and conversion constraints, if any

Task 2: The context surrounding each site

- Assess the areas (neighbourhood) around the sites, and identify any issues deemed important to the outcome of the evaluation. In addition, the following must be undertaken:
- Describe the area surrounding the sites
- List nearest urban and rural communities and their distances from the sites (km from the site)
- List the nearest hospitals and schools and their distances from the sites
- List distance in km to key regional infrastructure (airport, rail, seaport, river port, inland waterways, national highways etc.) and the operational condition of the identified infrastructure
- Identify any land uses (residential, commercial etc.) in close proximity to the sites that would be negatively affected by a large scale economic zone
- Identify the possibility of forward and backward linkages to the economy
- Identify if there are any environmental or social problems surrounding the sites that would negatively affect the development of the site
- Identify any fatal flaws in the surrounding areas around the sites

Task 3: Assess each site

- The consultant will assess the individual sites. This will include, but not be limited to:
- The landscape (rolling hills, flood plain, water bodies, trees, rivers etc.)
- Type of soil (no soil testing)
- Is it in an earthquake zone
- Type of climate (rain, monsoon etc.)
- Type and density of vegetation on sites (trees, crops etc.)
- Types of land uses on the sites (commercial, residential, parks, industrial, agricultural etc.)
- Identify if there are any industrial activities on the sites
- Are crops grown on the sites. If so, how often and what kinds
- Identify if any, infrastructure (bridges, dams, retaining walls etc.) or building on sites (houses, mosques, historical structures, graveyards etc.) which currently exists
- Identify any illegal settlements
- Identify any fatal flaws

Task 4: Assess the on-site and off-site infrastructure for each site

Assess the infrastructure both onsite and offsite. This will include, but not be limited to:

- Identify the location, size and type of roads closest or entering into the sites
- Identify the location of off-site key infrastructure and its connections for power, water, gas, water treatment, sewage, telecommunications etc.

- Identify existing quantity and quality of off-site infrastructure (i.e. power voltage existing and can the power be brought to the boundary of the sites etc.)
- List proposed new infrastructure developments around the site which may have an impact on the site
- Identify the location size and type of roads inside the sites
- Identify the location of on-site key infrastructure, if any, and its direct connection i.e. power voltage existing and location of existing connection
- Identify any fatal flaws
- The location of all on-site and off-site connections should be identified by physical site survey

Task 5: Identify the environmental issues for each site

Assess the site's environment and identify any issues or concerns. The following is a brief checklist of issues to be assessed. The issues are:

- Does the site have frequent erosion or flooding
- Are earthquakes frequent; if so what is the magnitudes
- Rivers and lakes-whether they are on-site and where. If so, then what are the implications and impact of that
- What impact will rivers around the areas have on the site (high and low tides)
- Whether raising the level of land (land filling) is required, if so then how high and estimate of the cost
- Whether there are wetlands or any protected areas within the site and/or within 10 km radius. This may include mangrove or other specific areas that is specific to the locality 4 of 5
- Source and type of existing pollution (if any) and the nature of the pollution
- Whether there is clean water available on the site or in the area, and from where and in what quantity? What are the alternative sources
- Is the site contaminated
- Are the lands around the site contaminated
- Can the contamination be mitigated
- Is there wastewater discharge or treatment in the area
- Is there a solid waste disposal in close proximity to the site
- Is it a forest land or will it involve tree cutting
- Identify any fatal flaws
- The consultant is welcome to add any other issues that might be relevant or emerge in the course of performing this exercise.

Task 6: Assess the social aspects of each site and its surrounding area

Assessment of the social issues of the site will also be necessary for the evaluation. The following will need to be looked into:

- Size of urban and rural populations
- Type of housing on site, if any (wood, brick, corrugated iron etc.)
- Whether women and their livelihood will be affected because of the economic zone
- Available community facilities (schools, hospitals, shops, mosques etc.) and services
- List the main livelihood of the inhabitants – fishing, farming, grazing cattle, small business etc.
- Is resettlement required. If so, for approximately how many people, families etc.
- Identify any fatal flaws

Task 7: Meet with government officials

After evaluating the sites, the consultant should meet with government agencies and officials to gather the missing technical information required to undertake the final component of the site prioritization. Land use maps, location and capacity of power, water, gas, telecom etc. will be required to finalize this work.

Task 8: Interaction with private sector

After evaluating the sites, the consultant should meet/discuss over telecom/video conference with private players (at least 3 domestic and 7 international – primarily Japanese, Chinese, Korean etc.) zones developers to gauge their primary interest on the preferred location for the site, attractiveness of the site in terms of marketability as a single product EZ or a multi-product EZ etc.

Task 9: Ranking of sites

The sites must be ranked:

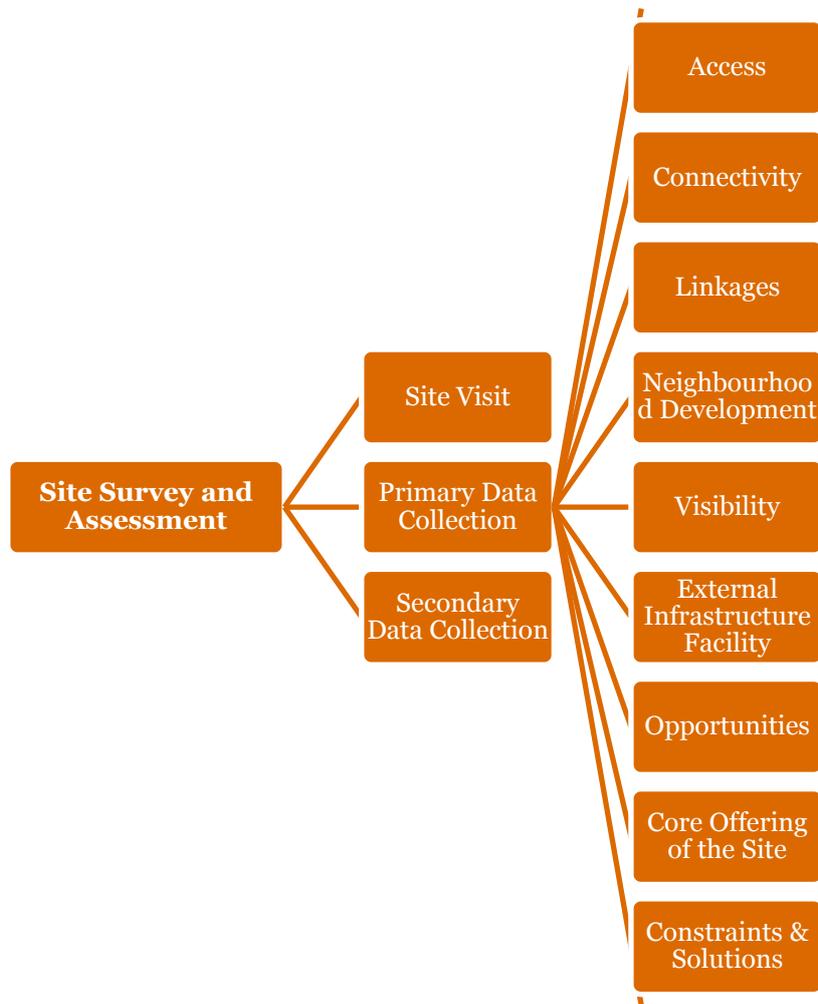
- Against each other to determine the priority sites across the country
- A brief report must be prepared assessing all sites individually with a chapter discussing the ranking process and its outcome
- Arrange a presentation one day session on the draft report potentially attended by BEZA, World Bank, ERD, PMO key officials and selected private sector players, and participate in discussion, take feedback and reflect in the Final Report

2.5. Our Approach and Action Plan

Our approach and methodology to deliver the key objectives of this engagement has been designed to align with the plans and timelines of BEZA and the World Bank. Accordingly, the following sections delves with the overall framework for execution and highlights the key milestones that needs to be achieved understanding and alignment of scope and deliverables between all the key stakeholders (i.e. BEZA, World Bank and the Consultants) and our detailed approach and methodology providing a blueprint of our activities and deliverables over the proposed engagement period.

This approach methodology aims to formulate the Terms of Reference for the proposed engagement and explains the envisaged approach in carrying out the engagement. While formulating this methodology, we have ensured that the final deliverables are oriented towards sustainable development and subsequent operations with innovative and implementable concept. The questionnaire to be utilized during site visit is annexed with this report. The broad approach proposed to be adopted is shown in the figure below.

Figure: Broad Approach for the proposed Engagement



It is proposed to carry out the engagement in following stages as detailed below:

Stage I: Reconfirm each Site Survey and their respective key details

Major activity	Detailed activity proposed during stage
Reconfirm site survey and key details	<ul style="list-style-type: none"> • Based on the information obtained from BEZA, the following specific details of the site would be checked and confirmed to their veracity and accuracy. In case the details are not available with BEZA, the same would be collected from the concerned Government departments and the exercise would be carried out to confirm the correctness of the following details: <ul style="list-style-type: none"> ✓ Location (mouza, upzila, district, division) ✓ Site coordinates ✓ Site boundaries ✓ Area of the site ✓ Land tenure details – Government owned, Government agency, private etc. ✓ Existing land use • Methodology – Site visit, primary data collection, secondary data collection, interaction with various Government departments and agencies etc.

Stage II: The context surrounding each site

Major activity	Detailed activity proposed during stage
Assessment of site environs	<ul style="list-style-type: none"> • As a part of the stage, the site and its environs shall be studied to understand the context surrounding each site. The following aspects would be considered while carrying out this stage of the study. <ul style="list-style-type: none"> ✓ Area description surrounding the sites ✓ Access to the nearest urban and rural settlement to take the advantage of the existing social infrastructure ✓ Proximity to schools and hospitals ✓ Connectivity linkages in terms of road, highways, rail, air, seaport, river port, inland water ways etc. ✓ Existing land use pattern in close proximity to the sites to understand and assess the effect of EZ development on them ✓ Exploring the possibility of backward and forward linkages to the economy in the context of the proposed development ✓ Identification of environmental and social issues of the site that may affect the development of the site ✓ Identification of fatal flaws in the adjoining areas • Methodology – Site visit, primary data collection, secondary data collection, interaction with various Government departments and agencies etc.

Stage III: Site assessment

Major activity	Detailed activity proposed during stage
Assessment of site	<ul style="list-style-type: none"> • As a part of the stage, all the sites would be evaluated considering the following vital aspects: <ul style="list-style-type: none"> ✓ General landscape (hills, water bodies, trees, vegetation, rivers) ✓ Type of soil based on visual inspection ✓ Confirmation on the presence of site in seismic zone or otherwise ✓ Meteorological data on the climate – rainfall, monsoon periods and extent ✓ Type and density of vegetation ✓ Existing land use of the site – residential, commercial, industrial, agricultural ✓ Any industrial development and activities in the identified sites ✓ Presence of agriculture activity – crops grown, cropping pattern ✓ Existing infrastructure and buildings ✓ Illegal settlements ✓ Any fatal flaws • Methodology – Site visit, primary data collection, secondary data collection, interaction with various Government departments and agencies etc.

Stage IV: Infrastructure assessment

Major activity	Detailed activity proposed during stage
Assessment of offsite and onsite infrastructure for the site	<ul style="list-style-type: none"> • As a part of the stage, all the sites would be evaluated considering the following vital aspects: <ul style="list-style-type: none"> ✓ Location, size and type of roads leading to the sites, within the sites and in close proximity to the sites ✓ Location of offsite infrastructure including power source, water source, gas source, water treatment facility, sewage disposal mechanism, telecommunications etc. ✓ Assessment of the existing offsite infrastructure in terms of surplus quantity available and the quantity that can be committed for the proposed development so as to look for alternate sources to supplement the requirement ✓ New infrastructure development around the sites that may have impact on the site ✓ Requirement of Land filling ✓ Identification of any on site infrastructure in the site ✓ Any fatal flaws • Methodology – Site visit, primary data collection, secondary data collection, interaction with various Government departments and agencies etc.

Stage V: Environmental issues

Major activity	Detailed activity proposed during stage
Environmental issues for the sites	<ul style="list-style-type: none"> • As a part of the stage, all the sites would be evaluated on environmental considerations considering the following vital aspects: <ul style="list-style-type: none"> ✓ Possibilities and occurrence of soil erosion and flooding ✓ Occurrence and frequency of earth quakes and their magnitude ✓ Presence of rivers, lakes, waterbodies on the site and the impact of tides on the development ✓ Requirement of site grading – level raising or filling – cost implication of the activity ✓ Presence of environmentally sensitive areas such as wetlands, protected areas, mangroves within the site or within 10 km radius ✓ Type of exiting pollution, nature and sources of pollution ✓ Availability of clean water within the site – Alternative sources for clean water ✓ To check whether the site and areas surrounding the site are contaminated and possible mitigation measures ✓ Availability of waste water discharge and treatment in the area ✓ Availability of solid waste disposal in proximity ✓ To ascertain whether the site is a forest land or the development would involve tree cutting exercise ✓ Any fatal flaws

	<ul style="list-style-type: none"> • Methodology – Site visit, primary data collection, secondary data collection, interaction with various Government departments and agencies etc.
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Stage VI: Social aspects

Major activity	Detailed activity proposed during stage
Social aspects of the sites	<ul style="list-style-type: none"> • As a part of the stage, all the sites would be evaluated on social aspects considering the following vital aspects: <ul style="list-style-type: none"> ✓ Size and distribution of urban and rural population ✓ Presence of residential units on the site – wooden structures, brick structures, corrugated metal structures ✓ Participation of women in the family earning process and the impact of the development on their livelihood ✓ Availability of community facilities – schools, hospitals, shops, mosque ✓ Livelihood nature of the inhabitants ✓ Identification of project affected persons and project affected families – resettlement requirements – quantification on the number of people and families for the resettlement ✓ Any fatal flaws • Methodology – Site visit, primary data collection, secondary data collection, interaction with communities, NGOs, various Government departments and agencies etc.

Stage VII: Interaction with Government officials and private sector

Major activity	Detailed activity proposed during stage
Interaction with Government officials and private sector	<ul style="list-style-type: none"> • As a part of the stage, the following activities would be carried out. <ul style="list-style-type: none"> ✓ On completion of the site evaluation, a meeting would be held with Government officials and agencies to discuss the possible outcomes of the study ✓ Pursuant to the discussion, missing links (if any) or information identified would be gathered and incorporated in the study ✓ Interaction with private players would be undertaken to gauge their interest on the preferred locations and willingness to participate in the development of these EZ's • Methodology – Interaction with various Government departments and agencies, leading private sector players etc.

Post completion of evaluation for each of the sites, a preliminary level demand assessment would be undertaken to gauge the interest of zone developers. This exercise would be carried out through primary research which would be conducted over telecom/ video conference/ one-to-one meeting with both domestic and foreign private players (i.e. unit investors or tenants) and zone developers.

The following aspects would be taken into consideration while carrying out the interaction with the private sector entities to comprehend their interest in the development of the zones:

- Location attractiveness for each of the zone (in terms of connectivity, distance from major cities, proximity to locality/ township etc.)

- Availability of Physical Infrastructure (availability of approach/ access road, gas, energy, water, telecom and internet etc.)
- Availability of Social Infrastructure (healthcare, education and recreational facilities in the vicinity of the proposed project site)
- Ease of availability of local labor
- Ease of availability of raw material for construction
- Marketability of the site as a single product SEZ or a multi-product SEZ
- Support from government (in terms of regulatory and institutional arrangement, incentives etc.)

In addition to the above, prospective investors &/or zone developers would be questioned about requirement of additional infrastructure facilities and government support needed for developing the proposed project site(s). Further, insights from the investors would be sought on the problem areas that they perceive in considering investment for the proposed zone(s).

After assessing each of the proposed EZ with respect to the above mentioned parameters in Stage I to Stage VII, adequacy of each of the proposed EZ would be analysed. The basis of adequacy analysis is qualitative in nature and for each of the parameters, the as-is conditions of the proposed EZ would be compared with the ideal scenario(s) required to develop as an economic zone. Further, a Harvey Ball ideogram would be prepared to indicate the degree to which the proposed EZs are meeting the adequacy criteria.

Further to this, a ranking exercise would be undertaken which would capture the relative comparison of each of the proposed EZ.

Stage VIII: Ranking of the sites

Major activity	Detailed activity proposed during stage
Ranking of the sites	On completion of the site evaluation and adequacy exercise, the ranking of the sites would be determined.

As part of the activity, a detailed exercise would be carried out to ascertain the ranking of the proposed EZs. The ranking exercise endeavours to compare the sites on the basis of the parameters discussed in Stage I to Stage VII. The proposed EZs to be included in the ranking exercise would be multiproduct economic zones in nature. If any of the proposed EZ is industry specific, it would be excluded from the ranking as the industry specific sites are not exactly comparable to the multiproduct zone sites across all the parameters stated above.

For the ranking exercise, broadly two parameters would be taken into account, viz.

- Necessary Parameters (Parameters without which development of an economic zone is not possible)
- Good to Have Parameters (These parameters are also important but not necessary for the development of an economic zone)

Under the “**Necessary Parameters**”, following aspects would be taken into consideration:

- Infrastructure linkages, connectivity and access to market:
 - Connectivity (Road, Rail, Sea/ River Port, Airport)
 - Utility Connection (Power, gas and water connection)
 - Suitability for industrial development
- Challenges:
 - Cost of off-site infrastructure development

- Social and resettlement issues

Under the “**Good to have Parameters**”, following aspects would be taken into consideration:

- Access to quality manpower
- Social Infrastructure
- Cost of private land acquisition

*Snapshots of Infrastructure
Linkages in Bangladesh*

3. Snapshot of Infrastructure Linkages in Bangladesh

3.1. Road Connectivity

The road mode of transportation has significantly evolved in Bangladesh over the past forty years. Prior to independence (1971), there were very few regional or national highways in the country. During that time the extensive network of inland water ways served almost entire country as the main mode of transportation.

The Roads and Highways Department (RHD) is the nodal agency in Bangladesh which is responsible for communication and maintenance of the major roads and bridge network of Bangladesh. RHD was established in 1962 and the road network under RHD has grown from approximately 2,500 km (in 1960s) to approximately 21,000 km (present).²

Table below illustrates the details of RHD road network and bridges/ culverts in Bangladesh:³

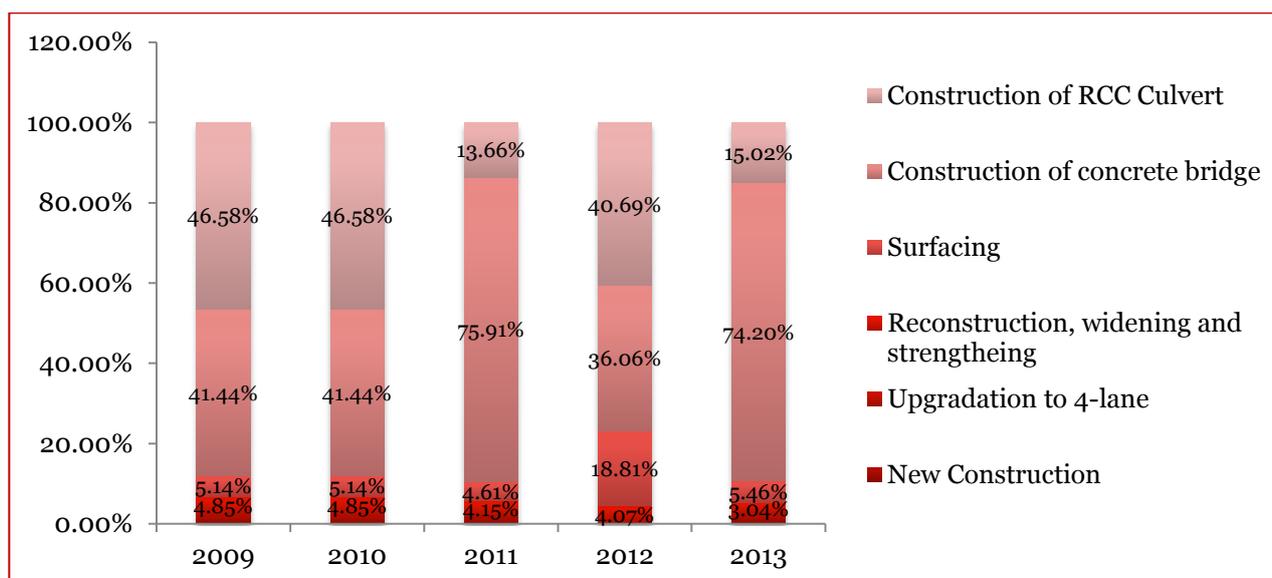
Table: Details of Road network and Bridges/ Culverts in Bangladesh

Details	Number
National Highway	3,812.78 Km
Regional Highway	4,246.97 Km
Zilla Road	13,242.33 Km
Total Road Length	21,302.08 Km
Number of Bridges	4,507
Number of Culverts	13,751

Source: Development Report (2009-2013) of Roads and Highway Department (RHD), Bangladesh

The snapshot of the development activities undertaken from 2009 to 2013 pertaining to road sector is captured in the Figure below.

Figure: Development activities undertaken from 2009 to 2013 in road sector



Source: Development Report (2009-2013) of Roads and Highway Department (RHD), Bangladesh

² <http://www.rhd.gov.bd/newweb.asp>

³ Website of Roads and Highways Department, Bangladesh

The road network (RHD) of Bangladesh is shown in the figure below which indicates the alignment of national highways, regional highways and zilla roads in Bangladesh.

Figure: The road network (RHD) of Bangladesh



Source: Website of Roads and Highways Department, Bangladesh

In order to establish international and regional connectivity, Bangladesh has integrated with the following initiatives to develop the road network.⁴

- Asian Highway Network
- South Asian Sub-regional Economic Cooperation (SASEC) Road Corridors

⁴ Development Report (2009-2013) of RHD, Bangladesh

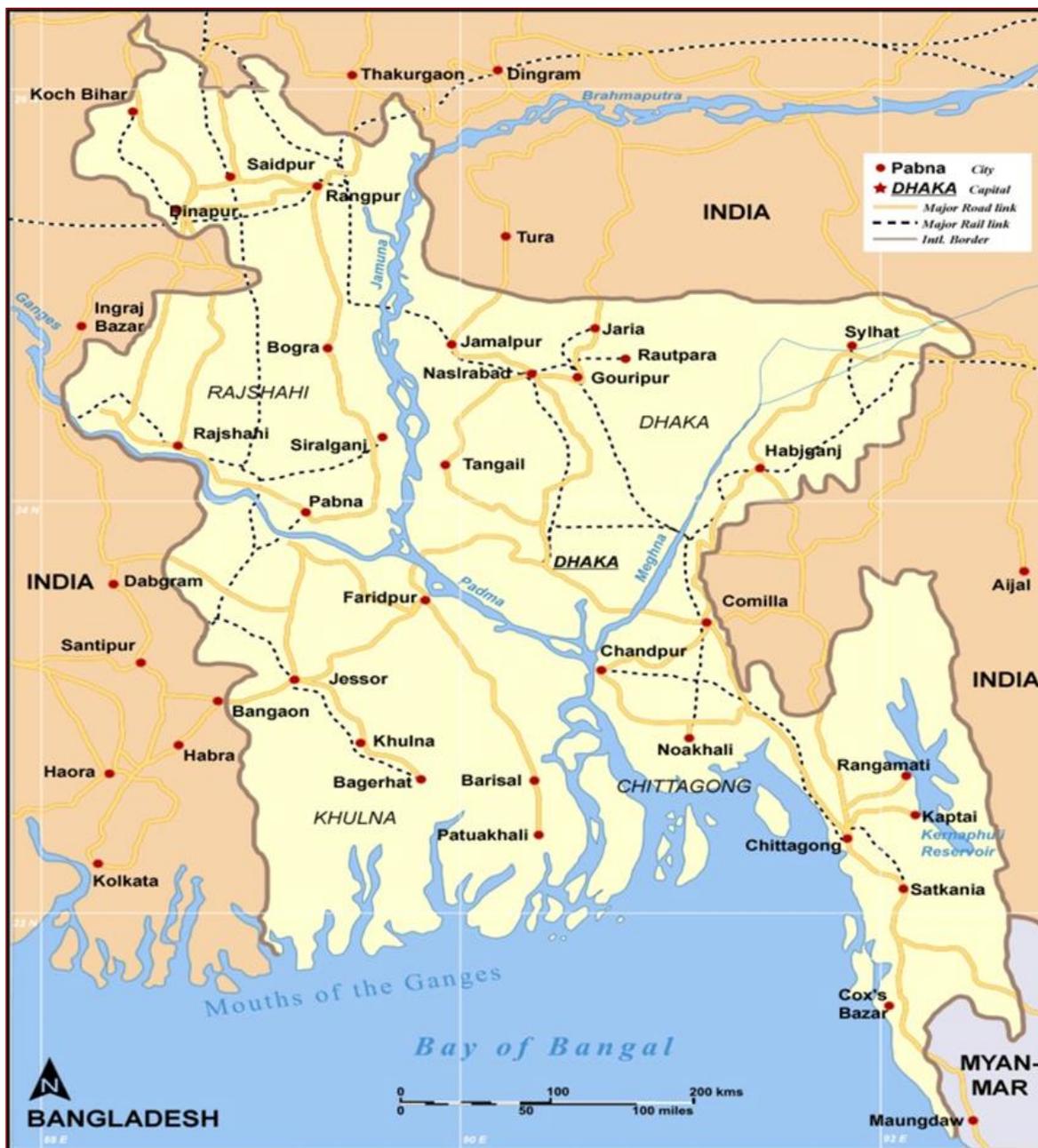
- Bangladesh-China-India-Myanmar (BCIM) Economic Corridors
- Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) Road Corridors
- South Asian Association for Regional Cooperation (SAARC) Highway Corridors

3.2. Rail Connectivity

Bangladesh Railway (BR) is the nodal agency responsible for rail transportation in the country. It is a completely Government owned and Government managed organization. It covers a length of 2,884.67 route kilometers.⁵

The Rail network of Bangladesh is shown in the figure below:

Figure: Rail network of Bangladesh



Source: Bangladesh Railways, < www.railway.gov.bd/>

Geographically, Bangladesh is surrounded almost entirely by India except a small portion on the South-Eastern part where Myanmar is the next door neighbour. **The Southern corridor of the Trans-Asian Railway (TAR) from the East passes through Myanmar, India, Bangladesh and again India and then Pakistan, Iran and Turkey before it joins the European Railway.**

⁵ Bangladesh Railway, <http://railway.portal.gov.bd/site/page/ce7dd6af-c7c8-4811-86b3-ba871e2e406e/BR-in-Short>

Bangladesh Railway is bifurcated into two zones, East & West, under the administrative control of two general managers, who are accountable to the Director General of Bangladesh Railway. The total route length under East Zone is 1390.78 km. Out of total East Zone network, only 119.45 km railway line of Dhaka-Chittagong route is double track, 124.80 km is being doubled, and BR has recently extended Dual Gauge system from Joydevpur to Dhaka. It is to be observed that the East Zone is more dominated by Meter Gauge line.⁶

The details of railway route networks of Bangladesh Railway are shown in Tables below.

Table: Bangladesh Railway Routes Network in kilometer

Item	Meter Gauge	Broad Gauge	Dual Gauge	Total
Route under operation	1784.68	507.10	364.15	2,655.93
Closure of route	53.65	175.09	0	228.74
Total route	1,838.33	682.19	364.15	2,884.67

Source: BR Working Time Table No. 39, GIS Database, TSMR, TSC Wing, Planning Commission

Table: Bangladesh Railways- Number of trains

Train Level	East Zone	West Zone	Total
Intercity	42	44	86
Express mail	32	20	52
Demu / commuter	42	22	64
Shuttle / Local	85	50	135
Inter-country train			2
Total	201	136	337

Source: BR, <http://railway.portal.gov.bd/site/page/e35cebe7-3b39-46be-ae6b-f267d4d1375f/Passenger-Train>

Railway developments in Bangladesh:

The expansion of BR has been blocked since 1947. Only 80km rail line has been constructed over last 50 years. Whereas more than 1,200 km rail lines are under the risk of operation that has resulted due to negligence, privation of maintenances and insufficient fund allocation. One of the major problems is shortage of locomotive routes; the trains need to suffer an excess of traffic caused by the lack of routes.⁷ This results in major delays frequent cancelations and most direly innumerable accidents at the rail crossing point in the busy street areas. The major projects under implementation include 50 short, medium and long term projects worth 18,310 crore BDT. For implementing these projects quickly, government has prepared a draft working plan.⁸

3.3. Airport Connectivity

During the liberation war in 1971, the entire aviation infrastructure of the country was severely damaged. The Department of Civil Aviation (DCA) and the Airports Development Agency (ADA) together reconstructed and repaired the airports at Tejgaon (Dhaka), Chittagong, Sylhet, Jessore, Ishurdi, and Cox's Bazar within amazingly short period of time that facilitated post liberation relief operations.⁹

⁶Ministry of Railways, Bangladesh, <http://mor.portal.gov.bd/sites/default/files/files/mor.portal.gov.bd/page/9a1ba160_209b_4d94_9077_3befdc9e2ef3/2.%20Assessment%20%20of%20Current%20%20Situation.pdf>

⁷ Md. Rakibul Hasan. (2009, August 10). "Problems and Prospects of a railway: A case study in Bangladesh Railway". Journal of Service Marketing. Volume-4, pp. 124-136

⁸ [Online] Available: <http://www.albd.org/index.php/en/resources/special-reports/939-five-yearworking-plan-of-al-government-for-developing-the-railway-sector>

⁹ Civil Aviation Authority, Bangladesh (CAAB); < <http://www.caab.gov.bd/adinfo/airports.html>>

There are three International Airports in the country. All three international airports have direct connections to a number of destinations in the Middle East while Dhaka International Airport has services to the wider Asian region and Europe. The major international airports in the country are:

1. Hazrat Shahjalal International Airport, Dhaka

This is the largest and the principal international airport of the country. It is situated at the capital city Dhaka. Almost all international passengers embark at and disembark from HSIA. More than 90% of aeronautical functions of Civil Aviation Authority, Bangladesh (CAAB) are carried out from it.

2. Shah Amanat International Airport, Chittagong

This airport is situated in the port city of Chittagong. It is the second largest airport and the alternate airport to HSIA.

3. Osmani International Airport, Sylhet

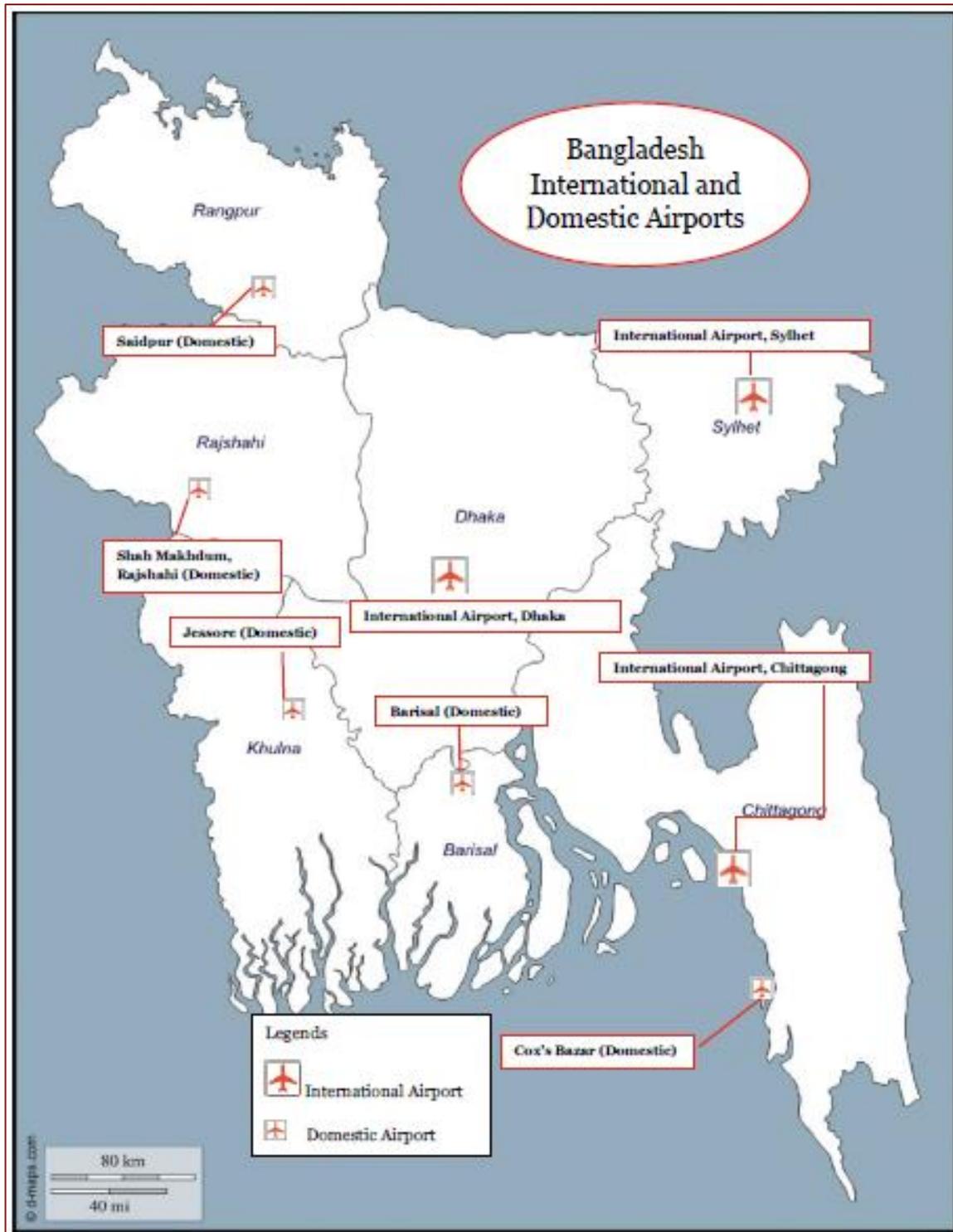
It is situated at the city of Sylhet, a district at the North-East corner of the country. It has been upgraded to an international one in order to facilitate the people of the district which is famous for a large number of residents of United Kingdom.

There are five operational Domestic Airports in the country

1. Cox's Bazar Airport
2. Shah Makhdum Airport, Rajshahi,
3. Jessore Airport
4. Saidpur Airport
5. Barisal Airport

Figure below shows the location of the 3 International and 5 Operational Domestic airports of Bangladesh.

Figure: Airport connectivity of Bangladesh



Source: CAAB Website and PwC analysis

3.4. Ports and harbours Connectivity

3.4.1. Sea Ports

Chittagong port

Chittagong port is the World's only natural sea port and is strategically located acting as the centre of importance for global businesses. Chittagong port has been able to show a marked improvement in handling containers and optimising the utilisation of berths and yards making it easier for the country to become an economic gateway to South Asia, thanks to its computerised management system.¹⁰

The facilities available in Chittagong port is illustrated figure below.

Figure: Chittagong Port facilities

General Cargo Berths	•10 nos.
Container Berths	•6 nos.
Specialised Berths for Bulk handling	<ul style="list-style-type: none"> •Dolphin Oil Jetty (For POL) - 1 no. •Grain Silo Jetty - 1 no. •Cement Clinker Jetty - 1 no. •TSP Jetty - 1 no. •CUFL Jetty - 1 no. •KAFCO Urea Jetty - 1 no. •Ammonia Jetty - 1 no.
Repair Berths	•Dry Dock Jetty - 2 nos.
Mooring Berths	•River Mooring - 9 nos.

Source: Chittagong Port Authority, < <http://cpa.gov.bd/> >

Cargo storage spaces available in Chittagong Port are detailed in tables below.

(i) For general break bulk cargoes

Table: Open space available for general bulk cargoes

Open space for storage	
R.C.C pavement	173,763 sq. m
Brick pavement	5,639 sq. m
Total	179,402 sq. m

Source: Chittagong Port Authority, < <http://cpa.gov.bd/> >

Table: Storage space available outside protected area for general bulk cargoes

Outside protected area	
Ware houses (16nos)	35,839 sq. m
Open dump	200,000 sq. m

Source: Chittagong Port Authority, < <http://cpa.gov.bd/> >

¹⁰ Chittagong Port Authority, < <http://cpa.gov.bd/> >

(ii) For containers

Table: Storage space available for Containers at general cargo berth area

At general cargo berth area	
Holding-capacity	4885 TEUs*
Open yard	110,443 sq. m
C.F.S. (Transit shed 6 nos. & ware house & nos.)	70,234 sq. m
Railway container terminal	123 meter.
Reefer points	90 (440 volts) 18 (220 volts)

*TEUs: Twenty-foot equivalent unit

Source: Chittagong Port Authority, < <http://cpa.gov.bd/> >

Table: Storage space available for Containers at container terminal

At container terminal (MPB)	
Container storage yard	150,000 sq. m
C.F.S	12,732 sq. m
Railway container siding	550 meter
Reefer plugs	210 (415volts)
Container holding capacity	4,062 TEUs
Stand by Generator	2 nos
Water reservoir	140,000 gallons
Fire brigade	1 unit

Source: Chittagong Port Authority, < <http://cpa.gov.bd/> >

Mongla Port

Mongla Port is the second sea port of Bangladesh and is reportedly the most eco-friendly port of the country. It is situated in the Bagerhat District of the south-western part of the country at the confluence of Pussur River and Mongla Nulla. Keeping pace with the rapid economic growth of the country the port is drawing attraction of the government, businessman and all other stake holders of the country. Furthermore, the construction of Padma Bridge by 2018 is likely to multiply the importance and activities of the port to a large extent. In such circumstances, the port is going to carry out a major role in the trade and commerce activities of the country, particularly in the south and south west part of the country.¹¹

The facilities available in Mongla port is presented in the figure below:

Figure: Mongla Port facilities

One Stop Service	<ul style="list-style-type: none"> • Being operational in the Jetty area, all departments who are directly involved in the Operation are being located in one room.
Storage and Yard facilities	<ul style="list-style-type: none"> • 3 Container yards, 4 Transit sheds, 2 Warehouses, 2000 car capacity of car parking yards and open dumps each
Handling Equipments	<ul style="list-style-type: none"> • Mobile Crane of 10-100 ton capacity • Dock side crane • Heavy duty Fork Lift Trucks of 16-35 ton capacity • Fork lift trucks of 2-5 ton capacity • Straddle carrier of 35-40 ton capacity • Terminal tractor of 40/50 ton capacity
Sweet water supply	<ul style="list-style-type: none"> • Operated by numbers of Production Tubewells situated at Failerhat (22 Km from Mongla) under RampalUpazilla, Bagerhat. • Current production tube wells is about 4,75,000.00 gallon/day

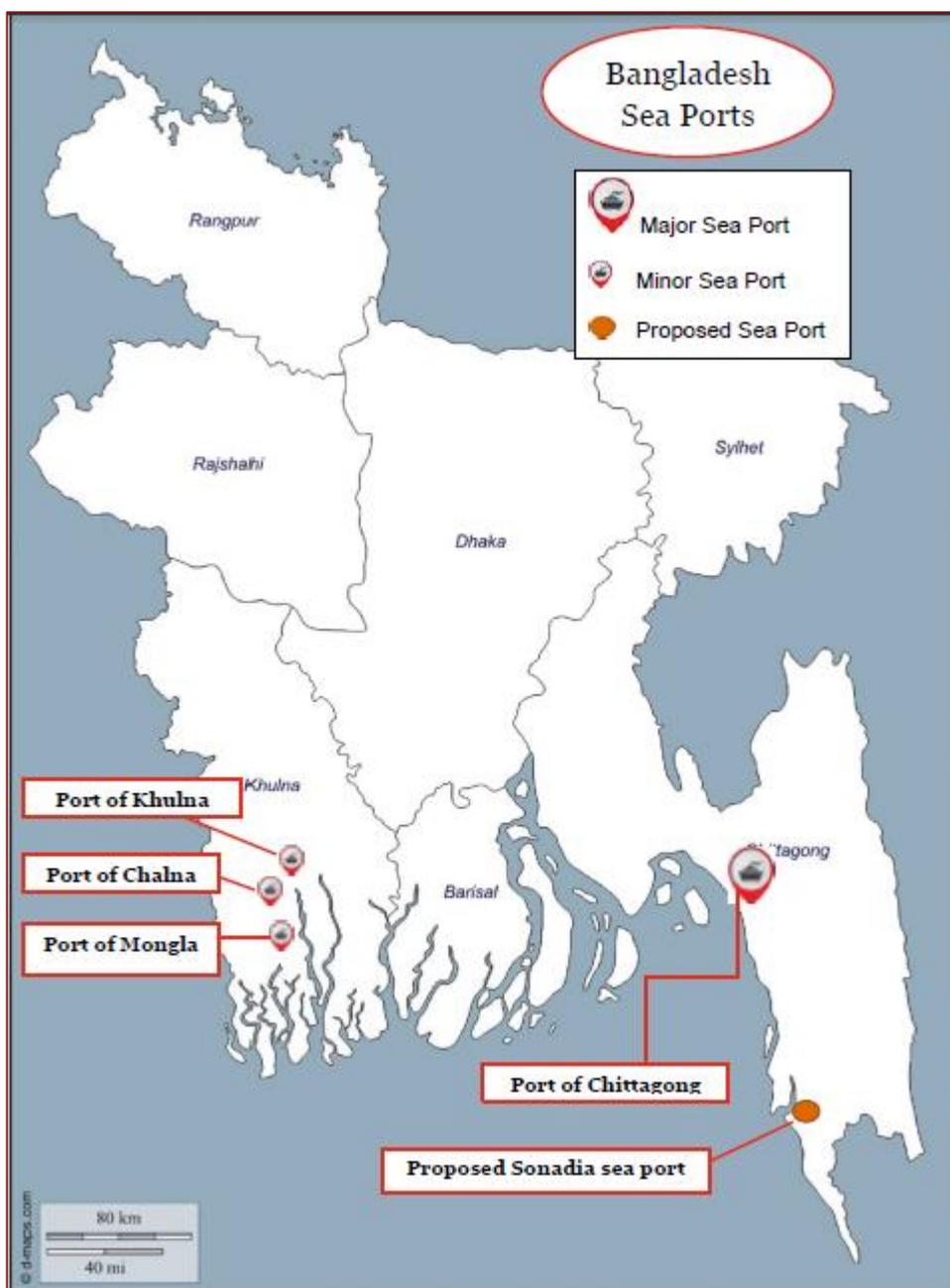
Source: Mongla Port Authority, <http://www.mpa.gov.bd/index.php>

Apart from Chittagong and Mongla sea ports, a sea port has been proposed at Sonadia dip, Maheshkhali offshore of the Cox's Bazaar coast. The area has been identified and is under study. It is seen as a potential deep water port lying on the Bay of Bengal that could serve the landlocked parts of India, Myanmar and China.

Figure below shows the location of seaports in Bangladesh.

¹¹ <http://www.mpa.gov.bd/index.php>

Figure: Bangladesh Sea Ports



Source: PwC analysis

3.4.2. River Ports

Bangladesh is crisscrossed by rivers, river ports and river ways have been playing a significant role to the transportation of goods here and there. Almost all big cities and commercial centers of Bangladesh have been established by the river-ports.

Two organizations viz. Bangladesh Inland Water Transportation Authority (BIWTA) and Bangladesh Inland Water Transportation Corporation (BIWTC) control the marine vessels ply in the inland river-ways and the river ports of Bangladesh. According to the statistics of BIWTA, there are twenty two complete river-ports are in Bangladesh. These are: Dhaka, Narayanganj, Barisal, Chandpur, Khulna, Baghabari, Patuakhali, Narsingdi, Aricha, Nagarbari, Daulotdia, Tongi, Maa, Char-Jannat, Ashugonj-

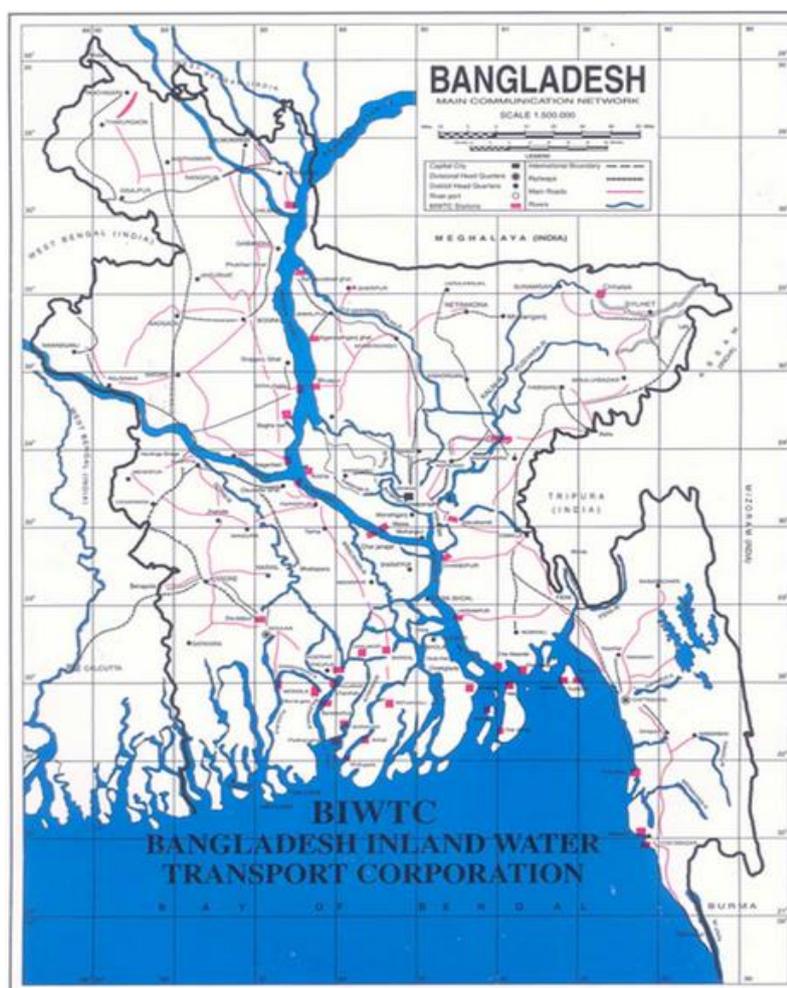
Bhairab Bazar, Bhola, Barguna, Noapara, Munshigonj, Chatak, Meghnaghat and Cox's Bazaar. These river-ports have necessary arrangements to load and unload passengers and goods and to land motorized marine vessels. Apart from these, with the initiative of BIWTA, another 448 small-medium ports have so far been improved or set up, which are called 'Secondary Riverine Port'. According to BIWTA, there are 374 places have so far been identified where BIWTA does not have any establishments. Those ports are used to load and upload the goods and passengers. In addition, there are eight ferry jetties which are used for the transportation of motor vehicles carrying goods and passengers.

The BIWTC has set up pilot stations in 24 river ports all over the country. These are: Chittagong, Ramgoti, Barisal, Narayanganj, Chandpur, Natuapara, Madaripur, Kawkhali, Mongla, Angtiara, Maoa, Aricha, Kaulia, Sirajgonj, Kazipur, Bahadurabad, Chilmari, Doi-Khaoa, Patuakhali, Bhairab Bazaar, Lipsa, Paturia and Boidder Bazaar.¹²

3.4.3. Inland Waterways

The primary transportation system of Bangladesh is its extensive inland waterways. Bangladesh Inland Water Transport Authority (BIWTA) and Bangladesh Inland Water Transportation Corporation (BIWTC) are responsible for development, maintenance and control of inland water transport and of certain inland navigable waterways. Figure below shows the Bangladesh Inland water transport network.

Figure: Bangladesh Inland water transport network



Source: BIWTC, <http://www.biwtc.gov.bd/img/site/BangladeshMap.jpg>

¹² http://en.banglapedia.org/index.php?title=River_Port

3.4.4. Land Ports

According to Bangladesh Land Port Authority, initially 12 land custom stations were declared as land ports in 2002. Since 2009 more eight new land ports have been declared. Presently the number of land ports is 20 of which 5 ports are in operation under BOT excepting Birol. On the other hand, Benapole, Burimari, Akhaura and Bhomra land ports are being operated under Bangladesh land port Authority directly. Considering 2007-2008 as base year, import-export through land routes has been increased by 55% & 67% respectively in 2012-13.¹³

Figure below shows the major land custom station of Bangladesh and India.

Figure: Land Custom station of Bangladesh and India



Source: http://www.hcidhaka.gov.in/pdf/Map_of_major_LCS%20_in_Bangladesh.pdf

¹³ http://www.bsbk.gov.bd/index.php?option=com_content&task=view&id=242&Itemid=1

3.5. Infrastructure Linkages- Intermodal Cargo Transfer

Intermodal cargo transfer involves transportation of cargo in an intermodal container using multiple modes of transportation (such as rail, road, port and airport etc.) with efficient transfer of cargo from one mode of transportation to another. This method reduces cargo handling, improves security, reduces damage or loss and allows faster transportation of cargo. This is the most efficient way of connecting to markets through multiple modes of transportation.

Broadly two major aspects are to be considered in order to facilitate effective intermodal cargo transfer:

- Possibility of integration of multiple modes of transportation
- Last mile connectivity to the proposed EZ

In the report, for each of the multiproduct economic zones, connectivity aspects pertaining to road, rail, port and airport etc. are considered separately and major challenges are accordingly highlighted. A two pronged approach has been undertaken where Bangladesh country scenario is taken into consideration and then the respective EZ specific analysis has been carried out. Both the existing and future potential of the same has been considered to assess connectivity potential of each of the proposed EZ.

3.6. Utility connection- Gas

Gas connection is the prerequisite to any manufacturing based industry. In 2014, Bangladesh produced 4,800 Barrels per day of petroleum and other liquids. The production figure is very less as compared to India (978,000 Barrels per day) and also with respect to USA (13,973,000 Barrels per day).¹⁴

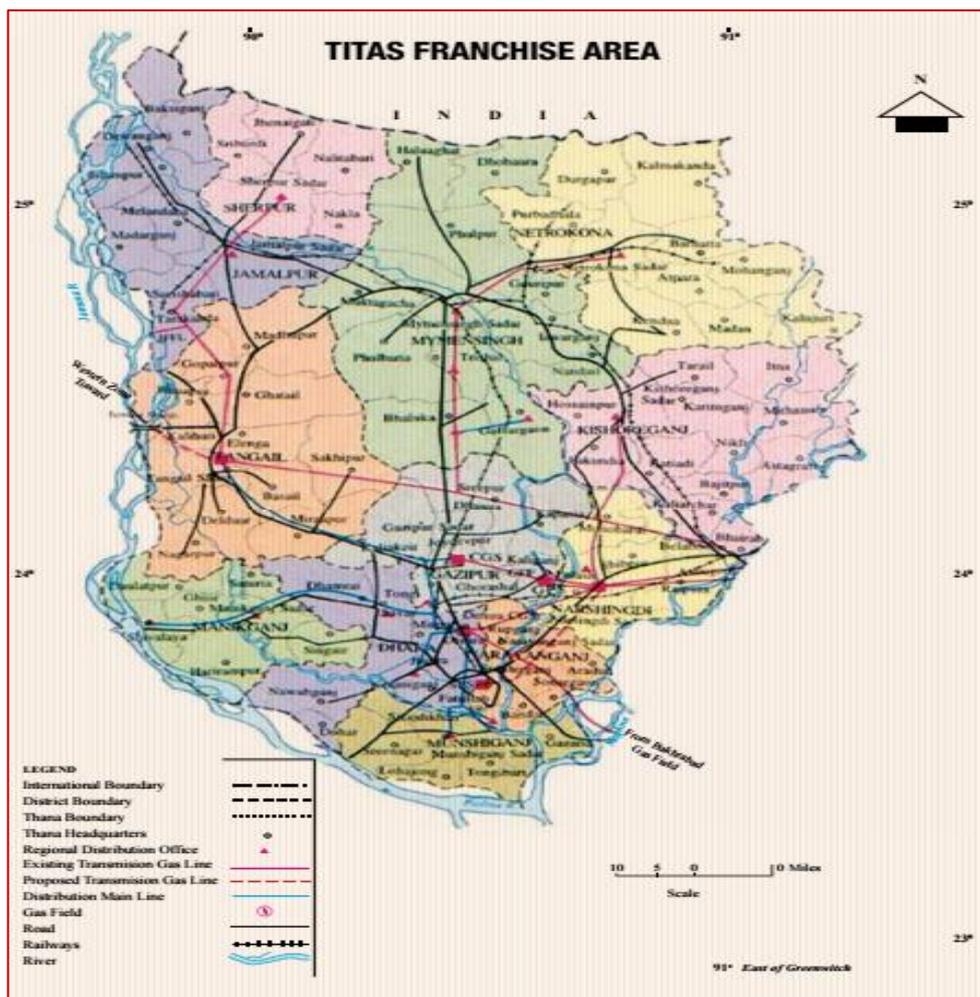
Petrobangla is the nodal company for energy in Bangladesh. Its subsidiary company Bangladesh Petroleum Exploration Company (BAPEX) is responsible for gas exploration activities. There are some gas distributions companies in Bangladesh such as Titas Gas Transmission and Distribution Company Ltd., Karnaphuli Gas Distribution Company limited (KGDCL) etc. which are responsible for gas distribution catering to the industrial and domestic demand depending on the location of the unit inside the country.

TITAS GAS is the premier gas distribution company of Bangladesh. It is responsible for transmission and distribution of natural gas from the gas fields to different areas. Titas Gas is the franchisee holder for transmission and distribution of gas to areas such as Greater Dhaka & Mymensingh districts and Brahmanbaria district. It caters to the requirement of several industries such as power, fertilizer, industrial, captive power, commercial etc.

Titas gas transmits and distributes around 74% of country's total consumption. Presently, it procures gas from Titas, Habiganj, Narsingdi & Bakhrabad Gas Fields under Bangladesh Gas Fields Co. Ltd. and from Rashidpur, Kailashtila, Beanibazar Gas Fields under Sylhet Gas Fields Co. Ltd. and Jalalabad Gas Field of Oxydental/Unicol. Figure below shows the franchisee area of Titas Gas.

¹⁴ <http://www.eia.gov/beta/international/rankings/#?product=53-1&cy=2014>

Figure: Titas Gas franchise area



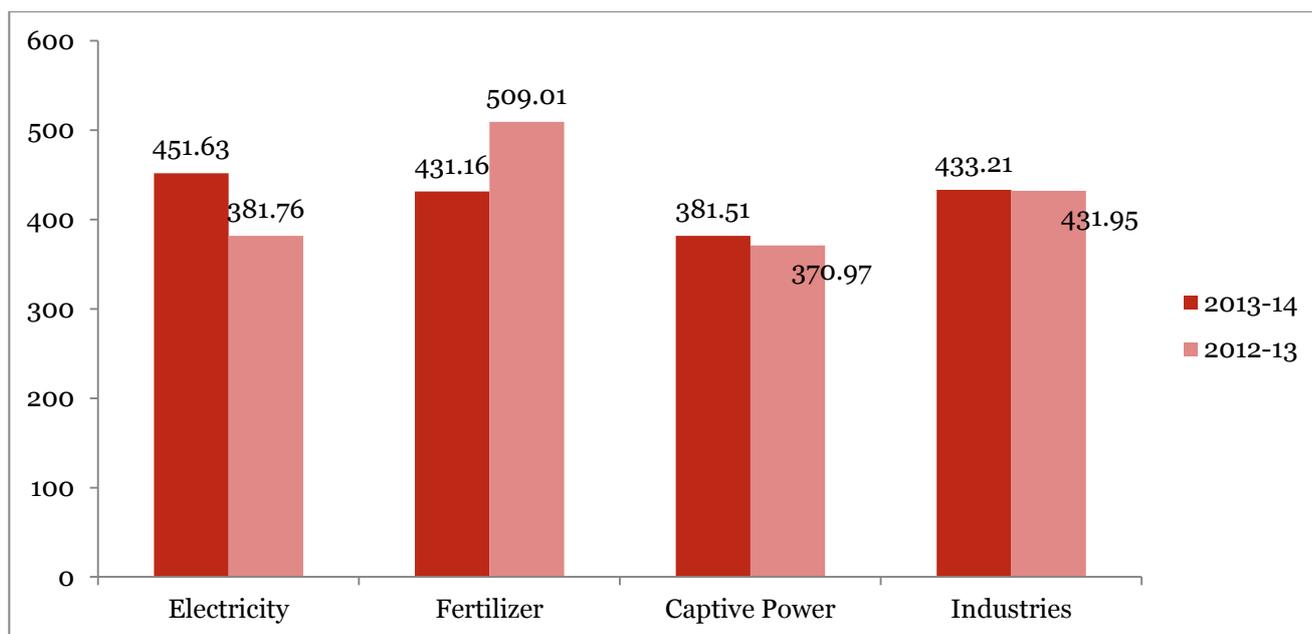
Source: Annual Report of Titas Gas (2013-14)

Karnaphuli Gas Distribution Company Ltd. (KGDCL) is the nodal agency for gas transmission in Chittagong and Chittagong Hill tract area. It was registered in Feb'2010 and as on FY 2013-14, total volume of gas consumed in KGDCL franchisee area was 2331.18 mmcm. KGDCL has provided more than 4.7 lakh gas connection to industrial, commercial and residential projects in the Chittagong area.¹⁵

Table below captures a snapshot of gas supply by KGDCL to various sectors (for FY 13-14 and 12-13).

¹⁵ KGDCL Annual Report 2013-14

Table: KGDCL gas supply for 2012-13 and 2013-14 (million cubic meters)



Source: Annual Report of KGDCL (2013-14)

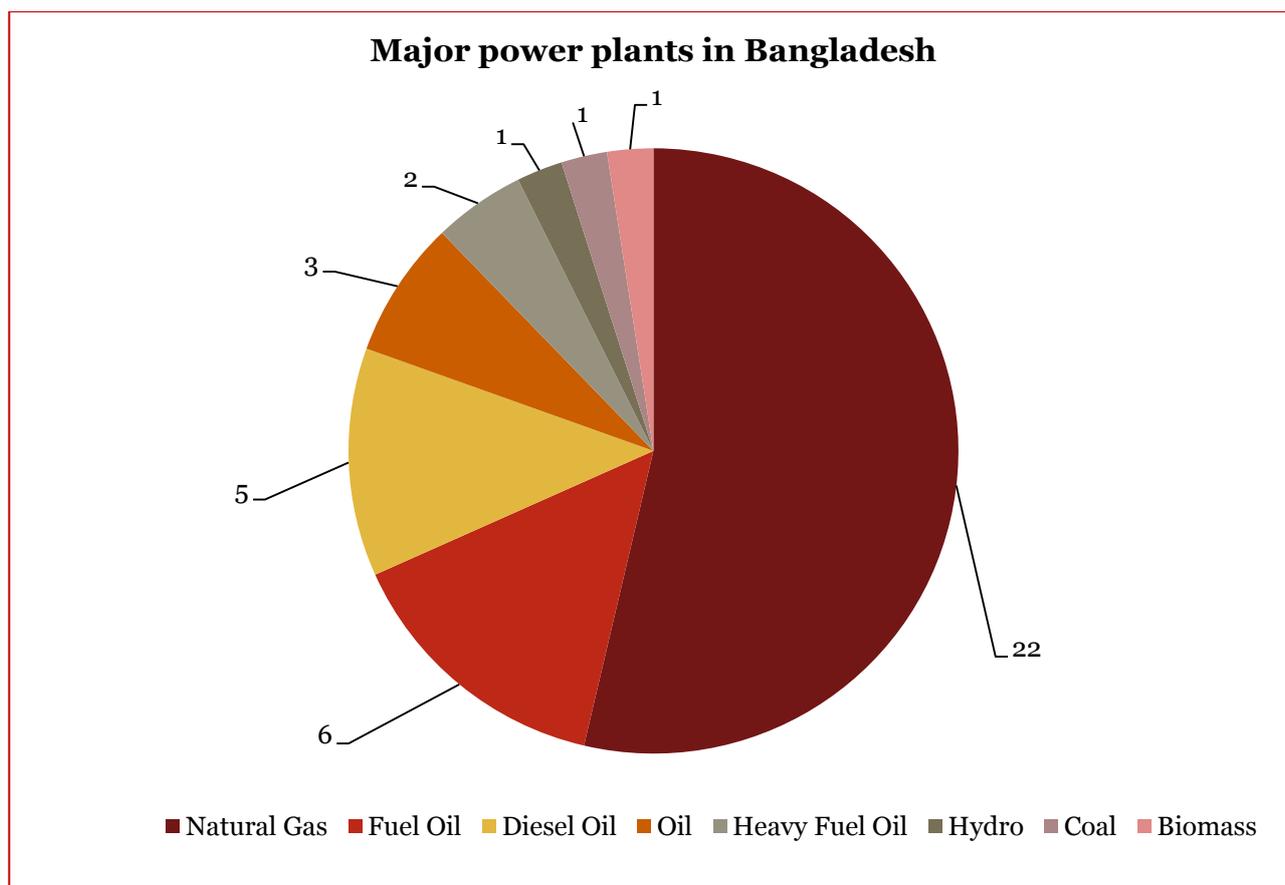
3.7. Utility connection- Power

Bangladesh has small reserves of oil and coal, but potentially very large natural gas resources. Commercial energy consumption is around 75% natural gas, with the remainder almost entirely oil (plus limited amounts of hydropower and coal). Presently about 60% of the total population has access to electricity including renewable energy.

Power Grid Company of Bangladesh Ltd. (PGCB) is responsible for operation, maintenance and development of transmission system all over the country. Presently power generated in various power plants in Bangladesh is transmitted to the national grid through 230 kV and 132 kV transmission lines. Electricity distribution system in Bangladesh is controlled by national grid. Total electric power, generated from the power plants is first supplied to the national grid then to the whole country through national grid. The Padma-Jamuna-Meghna River divides power distribution system into two zones, East and West. The East contains nearly all of the country's electric generating capacity, while the West, with almost no natural resources, must import power from the East

Bangladesh's installed electric generation capacity was 10289 MW in January, 2014 only 62% of the population has access to electricity with a per capita availability of 321 kWh per annum. Problems in the Bangladesh's electric power sector include corruption in administration, high system losses and delay in completion of new plants, low plant efficiencies, erratic power supply, electricity theft, blackouts, and shortages of funds for power plant maintenance. Major power plants in Bangladesh are presented in figure below.

Figure: Major power plants in Bangladesh



Source: PwC Analysis

List of companies involved in power production in Bangladesh is shown in figure below.

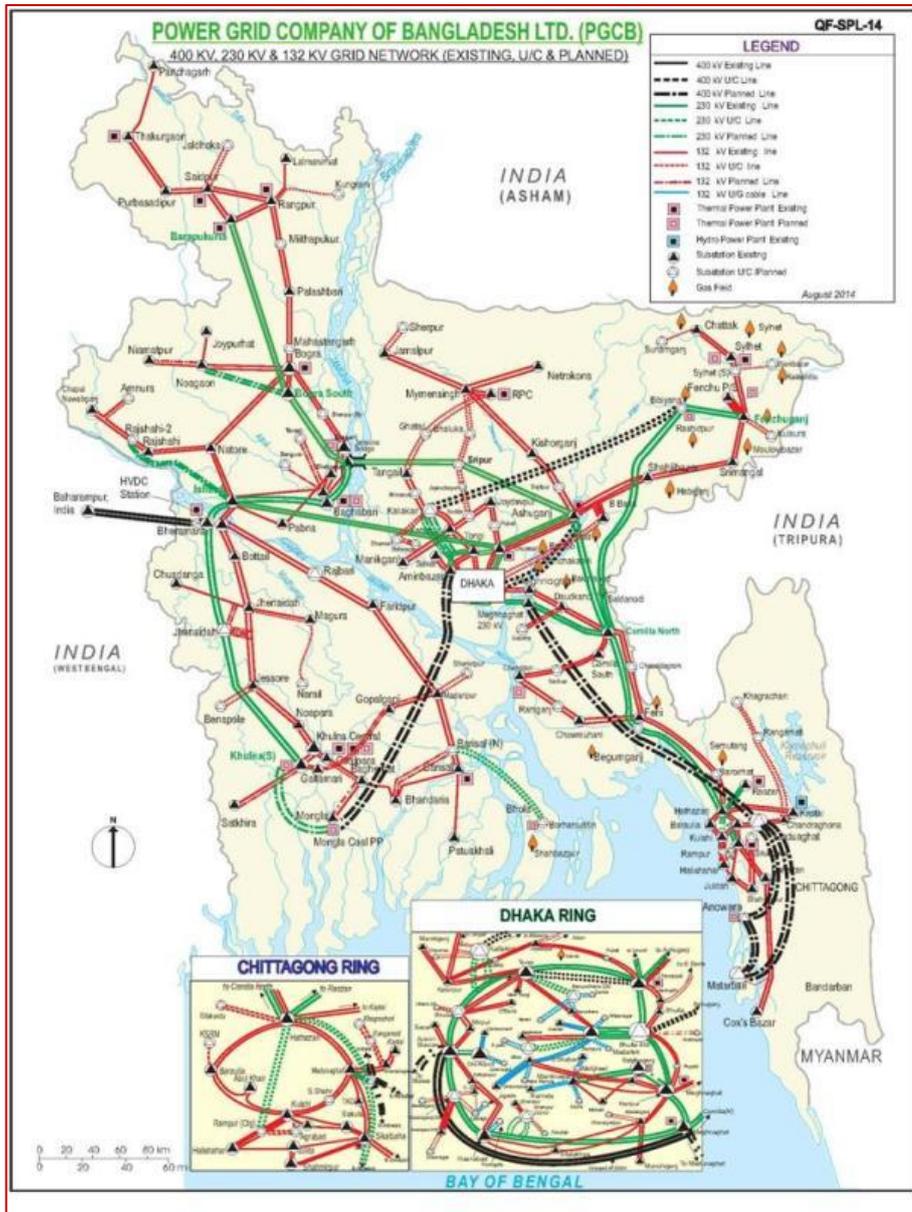
Figure: Companies involved in power production in Bangladesh

Bangladesh Power Dev Board	Pendekar Energy	Pendekar Energy Holdings	Bangladesh Chemical Industries
Rural Power Co Ltd	Covanta Holding Corp	Shahjibazar Power Co Ltd	Westmont Power Bangladesh
Khulna Power Co Ltd	Barakathullah Electro Dynamics	United Group	Summit Power Co Ltd
	Doreen Power House & Tech Ltd	Others	

Source: PwC analysis

The power grid network of Bangladesh is represented in figure below.

Figure: Power grid network of Bangladesh



Source: PGCB Website

3.8. Utility connection- IT/ Telecom

Bangladesh's landline telecommunications system is owned by the state. The Bangladesh Telecommunications Company Limited (BTCL) is the organization that controls telecommunications in the country. Besides BTCL, which operates in all urban areas, there are two private operators. Bangladesh Rural Telecom Authority and Sheba Telecommunications provide telephone services to rural areas. Digital telephone systems are being introduced into Bangladesh.

BTCL is spread across 11 telecom regions in Bangladesh viz. Dhaka (North/South/East/West/Central), Sylhet, Chittagong, Barisal, Khulna, Rajshahi and Rangpur. As on May'2015, the optical fiber network is spread over 7,800 km in Bangladesh and it covers 64 districts, 126 upzillas and 108 union parishads.¹⁶

VSAT technology is used to connect to the Internet in Bangladesh. Around 54 Internet Service Providers operate in the country. Satellite Internet in Bangladesh enables individuals to access the internet in remote areas through terrestrial means.

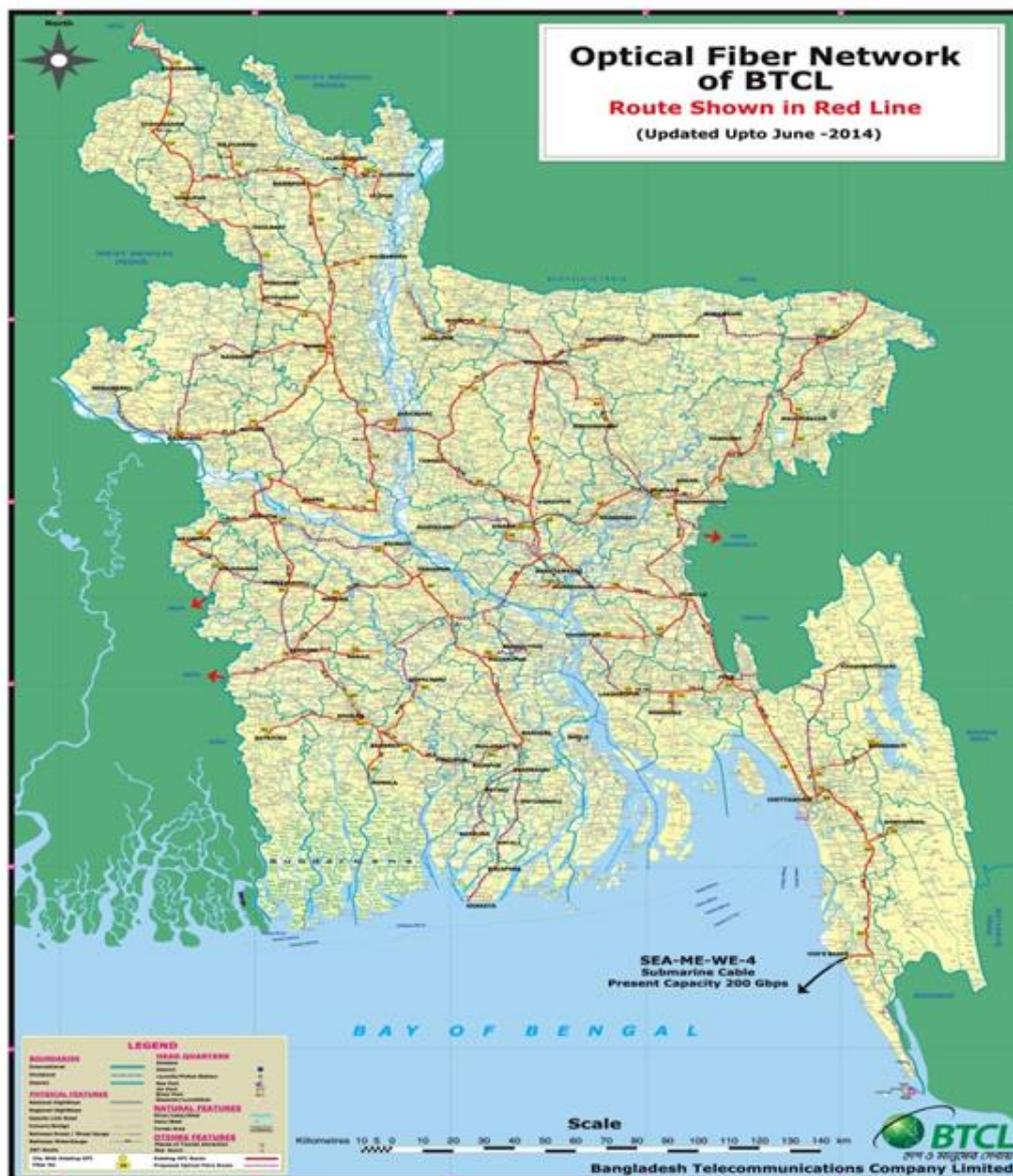
In 2014, Bangladesh Submarine Cable Company Limited (BSCCL) had 200Gbps (88MIU-km) bandwidth available and Bangladesh was using only 32Gbps or 16% of it.¹⁷ Thus, Bangladesh Govt. had approved a proposal for exporting around half of the country's internet bandwidth to the North Eastern states of India as Bangladesh was utilizing only 16% of its total bandwidth. Bangladesh has a total of 82 MIU-km of unused bandwidth and Govt. has given approval to BSCCL for renting or leasing of internet bandwidth. Hence, it can be concluded that the supply of internet bandwidth is far larger than the demand for this.

Figure below shows the optical fiber network (June' 2014) of BTCL.

¹⁶ <http://www.btcl.gov.bd/statistics/statistics.htm>

¹⁷ Dhaka Tribune Article (<http://www.dhakatribune.com/sci-amp-tech/2014/feb/15/govt-approves-export-half-internet-bandwidth>)

Figure: Optical Fiber Network (June' 2014) of BTCL



Source: BTCL Website

Bangladesh Government Wide Network (BanglaGovNet Project) is a dedicated government intranet which connects all the government entities in Bangladesh under a single network. This program has been implemented all over the country to ensure basic infrastructure for e-government and to ensure secured connectivity among all the government entities.¹⁸

The following government entities are covered under BanglaGovNet Project:

- BCC (Bangladesh Computer Council)
- All Ministries and Divisions in Dhaka
- Major Departments and Agency under Ministries and Divisions in Dhaka
- 64 Deputy Commissioner's Offices
- Selected 64 UNO Offices

¹⁸ <http://www.bcc.gov.bd/site/page/a05da8a7-89d5-4191-bc26-c179f9e33456/%E0%A6%AC%E0%A6%BE%E0%A6%82%E0%A6%B2%E0%A6%BE%E0%A6%97%E0%A6%AD%E0%A6%A8%E0%A7%87%E0%A6%9F-%E0%A6%AA%E0%A7%8D%E0%A6%B0%E0%A6%95%E0%A6%B2%E0%A7%8D%E0%A6%AA>

Multi-Product Economic Zones

4. Multi-Product Economic Zone

4.1 About Multi-Product Economic Zone

4.1.1. Concept

Economic Zone (EZ) is a demarcated industrial complex where business and trade laws are different than that of the rest of the country. EZ concept itself basically intends to attract private sector investment with preferential treatment and attractive fiscal/ non-fiscal incentives. The major objectives to develop EZs are to increase the export, generate employment, promote FDI inflow in the country and upgrade managerial and technical skills.

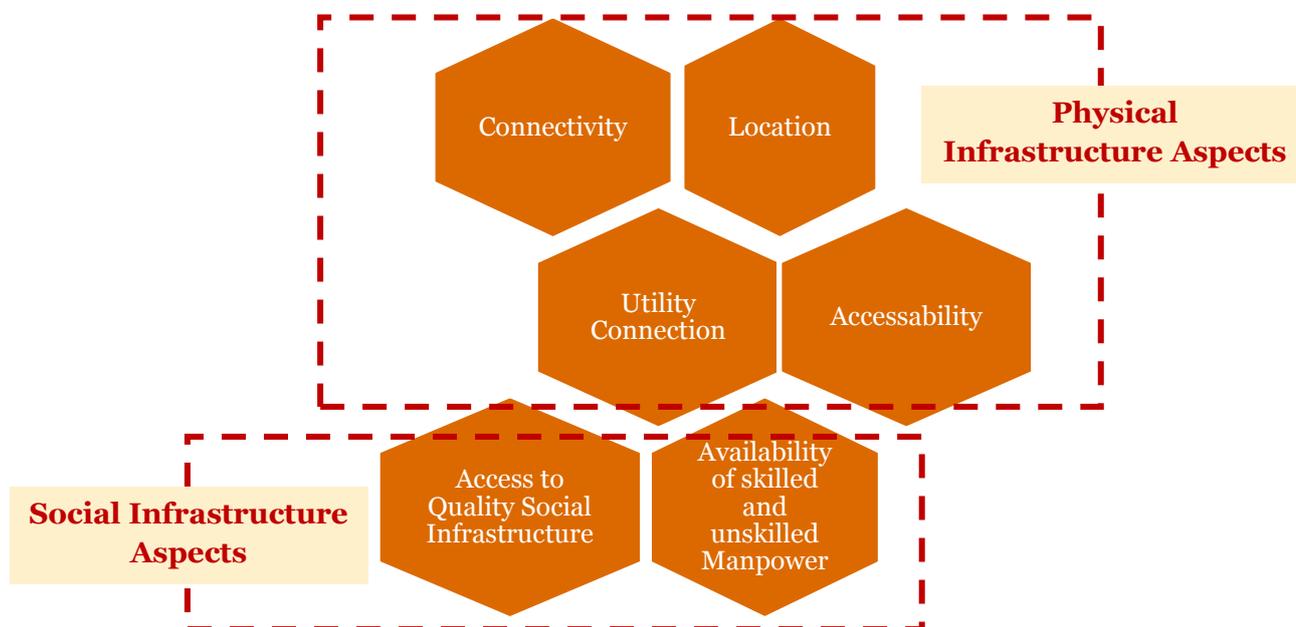
Achievement of the above objectives through EZs is typically facilitated through the following -

- Income tax Holidays
- Hassle Free Environment
- Exemption from Indirect duties and taxes
- No currency restrictions
- Relaxed foreign investment norms
- Excellent infrastructure facilities

EZs can be of two types, viz. sector specific and multi-product EZ. In a multi-product economic zone, industrial units may be set up for manufacturing/rendering of two or more goods/services in a sector or goods/services falling in two or more sectors.

4.1.2. Major Infrastructure facilities required to develop a Multi-Product EZ

Physical and Social Infrastructure facilities are essential to develop a multi-product Economic Zone:



4.1.2.1. Connectivity and transportation linkages

External connectivity for EZs is extremely critical to the success of the EZ. Governments should evolve a development plan and create adequate external infrastructure for the EZs on a time bound basis.

To develop smooth logistics network and to sustain the supply chain, access to efficient transportation network is vital for any EZ. This may be undertaken via road, rail, water and air mode of transportation.

Ideally, any economic zone should not only have better transportation linkages, but also, if these linkages are via different modes of transport it helps in optimizing the logistics cost. As an illustration, rail and water modes are preferred for longer distance movement of bulk commodities at lower transportation cost. On the other hand, road is preferred means of transport for relatively shorter distances (less than 500 km).

When the goods to be transported are perishable in nature &/or timeliness of delivery is the most important aspect over the point-to-point delivery, air cargo mode of transportation is used. Air transportation is also the most expensive option.

In a multi-product economic zone, there shall be various end products and for that different modes of transportation to be utilized. Accordingly, any industrial or economic zone with access to as many modes of transport improves the viability of the project.

4.1.2.2. Strategic Location-Proximity to the major city

Key aspects to be kept in mind with respect to strategic location of the EZ include:

- Close proximity to major city
- Close proximity to highway, expressway, sea port, airport and railway
- Easy access to strategic markets
- Easy access to cargo and logistics warehousing facilities

4.1.2.3. Accessibility

In addition to transportation linkages, the location's accessibility (internal as well as external) is of paramount interest. This include last mile connectivity from the trunk route (rail as well as road network), access to port / jetty/wharf, smooth connection with airport etc. In addition to the external connectivity, frequency of public transport facilities (bus, train and ferry service) should be adequate to cater to the requirements of the workforce employed in the EZ.

Further, the site should not be affected by flood and should have adequate embankments for protection.

4.1.2.4. Utility Connection

The following utility connections are essential to develop a multi-product economic zone:

- Availability of uninterrupted 24×7 power supply
- Constant availability of potable and good quality water
- Adequacy to set-up water and waste water treatment facilities
- Availability of gas at adequate pressure essential to set up relevant industries
- Internet/ Telecom connectivity

For manufacturing based industries, utility connection is the most important parameter.

4.1.2.5. Quality Social Infrastructure

Access to quality social infrastructure is equally important for the success of any EZ. The following aspects are to be considered while considering a location proposed for economic zone.

- Access to quality healthcare facilities near to the proposed EZ
- Access to quality education facilities in the vicinity of the proposed EZ
- Good quality residential facilities in the vicinity of the EZ
- Source of entertainment and quality lifestyle in the nearby locality

In acquiring the land for the proposed economic zone and in constructing the approach road to the proposed EZ, the impact due to resettlement should be minimal so that the project inception activities are smooth. Also the master plan shall be prepared such that there is very less impact on the existing habitation and livelihood and natural resources in and around the proposed EZ of any EZ.

4.1.2.6. Availability of Quality Manpower

Availability of Quality manpower is a key impediment for any EZ. The developer may be responsible for setting up technical education facilities on need basis in the non-processing area which could include Polytechnics, courses for higher education as well as facilities for evening classes for the nearby areas of each Zone to provide qualified manpower in the units coming up in the Zone.

A case study on success story of Dahej SEZ Ltd, a multi-product special economic zone located in India is illustrated in Annexure.

Next sections endeavours to assess the attractiveness of each of the sites on these critical parameters

Dhaka Dohar EZ

5. Dhaka Dohar Economic Zone

5.1. Location Details and Salient Features

5.1.1. General Profile of Dhaka District

Geographical Location

Dhaka district is located at the median of the country. Dhaka, the capital city stands on the bank of the river Buriganga.

Dhaka district is surrounded by:

- North- Gazipur and Tangail districts,
- East- Narayanganj district,
- South- Munshiganj and Faridpur districts
- West- Manikganj district

It lies between 23°53' and 24°06' North latitudes and between 90°01' and 90°37' East longitudes. The district spreads over an area of about 1463.60 sq. km.¹⁹

The district consists of 6 upazilas:

- Dhaka metropolitan
- Dhamrai
- Dohar
- Keraniganj
- Nawabganj
- Savar

Proposed EZ is located in Dohar upzila and in close proximity to Nawabganj upzila.



Source: Dhaka District Website

Demographics

As per Housing and Population Census 2011, Dhaka district has overall population of 1,20,43,977. Upzila wise population details as per census 2011 are presented in following table.

Table: Upzila wise population details of Dhaka District

Name	Status	Population census			
		1981	1991	2001	2011
Dhaka	District	4153000	5840000	8511000	12044000
Dhaka metropolitan	Sub district (Upazila)	2835000	4174000	6483000	8906000
Dhamrai		275000	313000	350000	413000
Dohar		149000	176000	191000	226000
Keraniganj		374000	530000	603000	794000
Nawabganj		250000	269000	297000	319000
Savar		270000	378000	587000	1386000

Climate Condition

¹⁹ Population and Housing Census 2011- Dhaka District

The annual average temperature of Dhaka district varies from maximum 23.4°C to a minimum of 12.2°C. Average annual rain fall and humidity of this district are 1777 mm and 68.2% respectively.²⁰

Main rivers flowing through this district are:

- Padma
- Kaliganga
- Dhaleshwari
- Ichamati
- Shitalakshya
- Buriganga

Agriculture

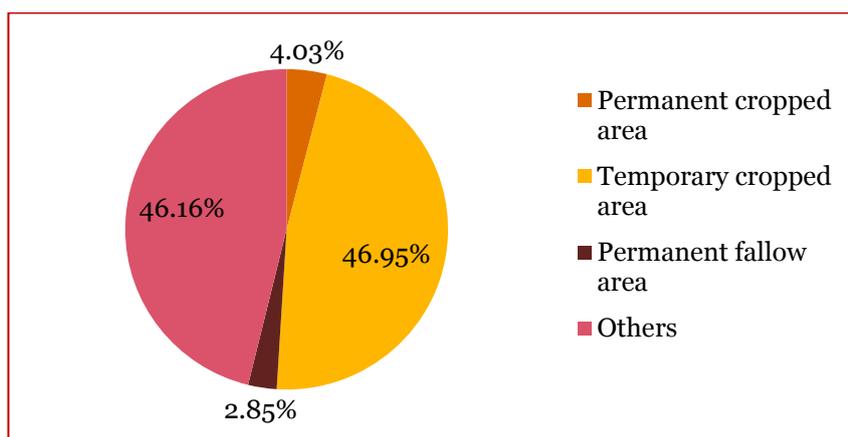
Total agriculture land in Dhaka district is 839.36 sq. km., which amounts to approximately 57% of the total area of the district.²¹

Major agriculture crops cultivated in the district are paddy, wheat, jute, sugarcane, oil seeds, potato, peanut, garlic, chilly, ginger, pulses and different type of vegetables.

Major horticulture crops in this district are Mango, banana, jackfruit, papaya, coconut, olive, star apple, guava, Indian palm and other fruits.

Major portion of the agriculture land is utilized as temporary cropped area in this district. The land use pattern of the agriculture land for the year 2008 is presented in the following figure.

Figure: Land use pattern (2008)



Source: District Statistics 2011, Dhaka, published by Bangladesh Bureau of Statistics (BBS)

Irrigation

Irrigated area classifications fall into two categories:

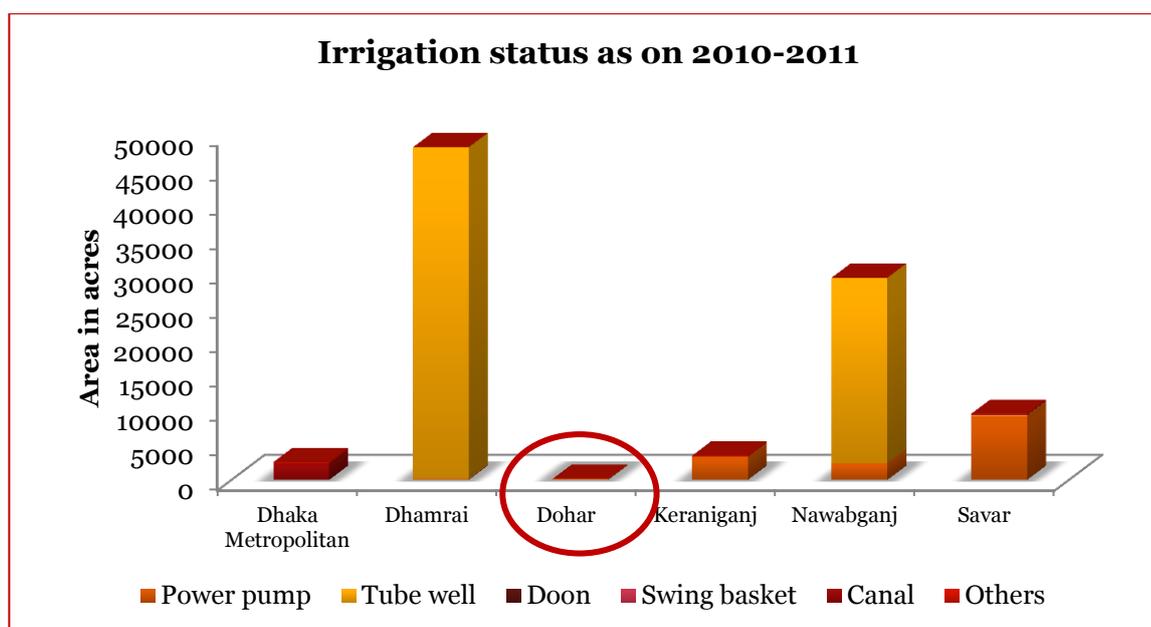
- Surface water irrigation with main water sources being rivers, canals, ponds, and other water bodies;
- Underground water irrigation with water lifted by shallow tube-wells, deep tube wells, and country traditional devices.

Currently, 45.01% of total area is under irrigation in this district. However, the percentage of total area under irrigation in Dohar upzila is only 0.95%. Upzila wise the method of irrigation during the year 2010-11 is presented in the following figure.

²⁰ District Statistics, BBS 2011

²¹ District Statistics, BBS 2011

Figure: Irrigation Status (2010-11)



Source: District Statistics 2011, published by Bangladesh Bureau of Statistics (BBS)

Industrial Landscape

Since its establishment as the capital of Bangladesh, the population, area, and social and economic diversity of Dhaka have grown tremendously. Dhaka now is one of the most densely industrialized regions in the country. Traditional products include *jamdani* (fine-quality muslin), embroidery, silk, and jewelry. Among the district's major industries are jute processing and the manufacture of chemicals, pharmaceuticals, textiles, leather goods, ceramics, and electronics products. A strong export-oriented garment industry emerged in the late 20th century.²²

With the emergence of the city into the capital, Dhaka became the trade center for international businesses from around the world, such as Iran, Turkey, Arabia, the Netherlands, Denmark, France and England.²³ Industrial Snapshot of Dhaka district is captured in the following table.

Table: Distribution of Industries of Dhaka district

Company type	Number
Garments Factory	1483
Textile Mills	32
Rice Mills	492
Match Factory	8
Steel and engineering	24
Aluminum	41
Jute Mills	8
Others	516

Source: Dhaka District Statistics, BBS 2011

On the other side, Dohar upzilla hasn't witnessed any significant industrial proliferation. Very few industries (cottage and small scale in nature) are located in and around the proposed EZ. These industries include innerwear, lungi, hand-made containers made of wood and jute etc.

²² <http://www.britannica.com/place/Dhaka>

²³ <http://www.dhaka.gov.bd/node/449217-%E0%A6%AC%E0%A7%8D%E0%A6%AF%E0%A6%AC%E0%A6%B8%E0%A6%BE-%E0%A6%AC%E0%A6%BE%E0%A6%A3%E0%A6%BF%E0%A6%9C%E0%A7%8D%E0%A6%AF>

5.2. Dhaka, the hub of economic wheel of Bangladesh

Being the capital city, Dhaka is also the commercial centre of Bangladesh. Cheap labor has been an important factor for the growth of industries, especially factories of readymade garments in and around Dhaka city. As a capital city with its strategic geographical location in the middle of the national territory, it offers a good communication and transportation network with all important places of the country including the sea ports of Chittagong and Mongla. Besides, being the capital city of the nation, it has the favorable factors for encouraging growth and development in the capital region.

The capital city and its region offer the largest employment in industries, commerce and services sector. It enjoys the highest concentration of labor, financial institutions and business services. The city also enjoys a concentration of infrastructures in administration, health, education, and professional services. The knowledge-based business services have potential for growth as the city houses a large number of universities producing technical and business graduates.²⁴

Since its establishment as the capital city, the population, area, and social and economic diversity of Dhaka have grown tremendously. Together with its river port of Narayanganj, 10 miles (16 km) to the south, Dhaka now is one of the most densely industrialized regions in the country. Among the city's major industries are jute processing and the manufacture of chemicals, pharmaceuticals, textiles, leather goods, ceramics, and electronics products.

5.2.1. Bangladesh Vision 2021- Role of Dhaka

The country has set itself a goal of becoming a poverty-free middle-income country and a globally integrated regional economic and commercial hub by 2021. To this effect, the nation has prepared a blue print called the Bangladesh Vision 2021²⁵. This blueprint proposes the following milestones with respect to Dhaka (to realize nation's overall Vision):

Development of competitive investment climate

To facilitate investment and movement of goods, the options of constructing a second Dhaka-Chittagong Highway and/or establishment of a modernised rail link between the two cities has been proposed. In all these areas new and modernising investments have been proposed, which in turn, would be backed up by a transformation in the quality of governance to ensure a globally competitive standard of services.

Universal access to basic healthcare and quality services

For Bangladesh to achieve equity in health outcomes, equity in terms of access to health services needs to be ensured first as per Vision 2021. A basic set of essential quality healthcare services will be made accessible to the entire population. Dhaka would need to cater to wide use of telemedicine and e-medicine, especially in the case of complex diseases, whereby a person in a remote village will be able to access via the internet the best medical advice from either a doctor in Dhaka or a specialist sitting in Singapore or Thailand.

Promote the deepening and broadening of capital markets

To develop into a regional trading hub, the Vision 2021 aspires the government to provide support to the trading companies with a wide range of financial and capital market instruments. Smaller trading companies commonly experience difficulties in securing traditional bank financing due to their weak business asset structure. Easy access to sources of capital (e.g. debt and equity capital) to help them develop their companies and anchor them in Bangladesh would also be provided.

A deepened and broadened capital market (the Dhaka and Chittagong Stock Exchanges) and a relatively larger size of capital (i.e. if Bangladesh becomes a middle-income country) would help make Bangladesh the preferred location to raise funds by these trading companies for business development.

²⁴ KALAM, AKM Abul. Planning Dhaka as a Global City: A Critical Discourse. Journal of Bangladesh Institute of Planners, [S.l.], v. 2, p. 1-12, Jan. 2012. ISSN 2408-8587. Available at: <<http://www.banglajol.info/index.php/JBIP/article/view/9552>>

²⁵ Bangladesh Vision 2021, Centre for Policy Dialogue, <http://cpd.org.bd/index.php/bangladesh-vision-2021/>

Effective urban planning

By 2021, Bangladesh's urban population is expected to double in size, thereby increasing the population density in the cities, especially in Dhaka, to unprecedented levels. To counter the arising challenges in terms of urban planning and the environment, Vision 2021 proposes a two-pronged strategy.

- To develop and implement a plan on the development prospects of Dhaka over the next ten years. This plan is envisaged to be based on participatory planning with a clear understanding of the roles of the politicians, the government, corporations, NGOs and last but not the least, the citizens of Dhaka in implementing the plan.
- Creation of urban centres or "compact towns" in the vicinity of the specialized commercial zones across the country to ease the pressures on Dhaka via effective urban planning outside Dhaka city.

5.2.2. Major projects supporting industrial development, undertaken by Government of Bangladesh (with special focus on Dhaka)

Keeping in view the Vision 2021, some of the projects undertaken by Government of Bangladesh²⁶ (with special focus on Dhaka) include:

1) CBI IT Outsourcing Export Coaching Program 2008-2014 (CBI ITO ECP)

Centre for the promotion of Imports from developing countries (CBI) and organization of the Netherlands Government has launched 'CBI ITO Export Coaching Program 2008-14'. The objectives of CBI ITO ECP is the institutional development of the Business Support Organization (BSOs) of the target countries and promotion of export of IT related products of the participating companies to the EU market.

2) Automation and Modernization of Dhaka Customs House

To reduce cost of doing business and ensuring hassle-free business transactions in Bangladesh, Dhaka Chamber of Commerce and industry (DCCI) has successfully implemented Dhaka Customs House Automation Project as Public Private Partnership (PPP) initiative. The commercial operation of the project was started on 01 June, 2011. Full commercial operation of the project would help in reducing customs related hassles of the private sector.

3) Upgrading Dhaka-Chittagong highway to four lanes & doubling of railway lines

Dhaka-Chittagong Highway is being upgraded to 4 lanes to ensure fast and smooth conveyance of goods and passengers between Dhaka and Chittagong. These roads can form part of the regional road network, as well as the Trans-Asian Road network facilitating trade between Bangladesh and neighbouring countries.²⁷

Further, there are plans for doubling of rail track between Dhaka and Chittagong.

4) Padma Multipurpose Bridge Project

To ensure balanced development across the country, an adequate number of east-west connections could be one of the most important challenges in Bangladesh. The 6.15 km long and 22 m wide Padma Bridge would serve southwest part of Bangladesh and improve the connection between Mongla Port and Dhaka. The construction of this bridge is expected to be over by 2018-19 and this could reduce the travel time from Dhaka to Mongla to 3.5 hrs (from current 8-10 hrs)

²⁶ Source: http://www.dhakachamber.com/home/ongoing_projects

²⁷ <http://www.plancomm.gov.bd/wp-content/uploads/2013/09/Perspective-Plan-of-Bangladesh.pdf>

5) NTF III Bangladesh Project

The NTF III Project would continue to strengthen institutional marketing capacities, including the B2B capacity of the Dhaka Chamber of Commerce & Industry (DCCI) and Bangladesh Association of Software & Information Services (BASIS). NTF III Project Bangladesh has already recruited 40 companies in selected growth segments of the IT & ITES industry, such as mobile, web and image processing among other areas. The NTF III Bangladesh project aims to increase the income of Bangladeshi IT & ITES exporters by enhancing the competitiveness of the sector.

6) Business Initiatives Leading Development (BUILD)

The present government's Vision 2021 calls for Bangladesh to become a middle income country (MIC) by the year 2021 has inspired private sector to work in collaboration with the government to set several priorities so that targets of the Vision 2021 can be achieved. BUILD is a joint initiative of the Dhaka Chamber of Commerce and Industry (DCCI), the Metropolitan Chamber of Commerce and Industry (MCCI) and the Small & Medium Enterprise Foundation (SME Foundation) to assist in the development of Bangladesh's private sector and thus unlock Bangladesh's true development potential.

7) SWITCH Asia Re-Tie Bangladesh

"Reduction of environmental threats and increase of exportability (Re-Tie) of Bangladeshi leather products" is a project jointly undertaken by SEQUA, gGmbH, Germany, United Nations Industrial Development Organization (UNIDO), Bavarian Employer Association (bfz, gGmbH), DCCI, Bangladesh Finished Leather Goods and Footwear Exporters Association (BFLLEA) and Bangladesh Tanners Association (BTA). The project is supporting business entrepreneurs dealing with leather.

8) Technology Information Services Centre (TISC) in the Chamber in cooperation with WIPO

Dhaka Chamber of Commerce & Industry (DCCI) in corporation with World Intellectual Property Organization (WIPO) and Ministry of Industries would be establishing a Technical Information Services Centre (TISC) in the Chamber to create awareness about IP issues in Bangladesh.

Coordinated development of infrastructure development, capacity development and manpower development around Dhaka makes the city as most receptive place for the successful implementation of an Economic Zone (EZ). With this background, the next sections discuss more on the proposed EZ in Dohar region of Dhaka.

5.3. Broad level market potential assessment of the proposed EZ

Proposed EZ in Dohar falls in Dhaka division. This area is well connected to Dhaka and other major cities of Bangladesh by road/water mode of transportation. Proposed EZ is accessible from Dhaka by Dhaka-Mawa highway and by DNK road (Dhaka-Nababganj-Keraniganj road). Distance between Dohar upzilla and capital city is 60 km (approx.) and travel time is around 2-2.5 hours. Project site is located adjacent to river Padma and has access to Mawa Ghat (approximately 45 km away from the proposed EZ).

Padma multipurpose project, the path-breaking infrastructure project in Bangladesh, is under construction. It shall connect Mawa to Zajira and the estimated future (in 2025) traffic demand in Mawa/Zajira route is 41,550 vehicles/ day²⁸. Once operational, it would facilitate quick access for the cargo and passengers from Dhaka to Mongla, Jessore and Benapole route. Construction work for widening Dhaka Mawa expressway to 4-lane is expected to commence from December 2015.²⁹ Once, the Padma Bridge is functional, rail connectivity and gas could be available near to the proposed EZ.

²⁸ <http://bba-beta.dayspringltd.com/wp-content/uploads/2015/01/Padma-Bridge-Feasibility-Study-Report-Executive-Summary.pdf>

²⁹ <http://newagebd.net/139954/expanding-dhaka-mawa-highway-to-4-lane-to-begin-in-december/#sthash.mHfIekuZ.dpbs>

Dohar upzila hasn't witnessed any significant industrial proliferation. Basis discussion with UNO officials, very few industries (cottage and small scale in nature) are located in and around the proposed EZ. These industries include innerwear, lungi, hand-made containers made of wood and jute etc. The land in Dohar upzila is fertile in nature due to the proximity of Padma River, as a result the land is suitable for cultivation of various crops such as (but not limited to) rice, pulse, jute, seasonal vegetables etc. Sand extracted from Padma River is a major natural resource of this area.³⁰

Dohar upzila is surrounded by Nababganj upzila on north, Munshiganj district on east and Manikganj district on west. Some of the popular industries located in Manikganj district are:

- Fabrics (such as Munnu Fabrics Ltd.), Knitwear and Apparel (located in BSCIC complex)
- Construction materials (such as Akiz Particles Ltd.)
- Steel (such as Basundhara Steel Complex etc.)
- Cotton (such as Kalam Cotton Enterprise etc.)
- Food Processing (Such as Dhaka Food Products, Tasty Food Products etc.)
- Light Engineering (such as Brothers Engineering Works etc.)
- Metal based downstream (such as Alumina Pvt. Ltd., Reliable Metal Industries etc.)

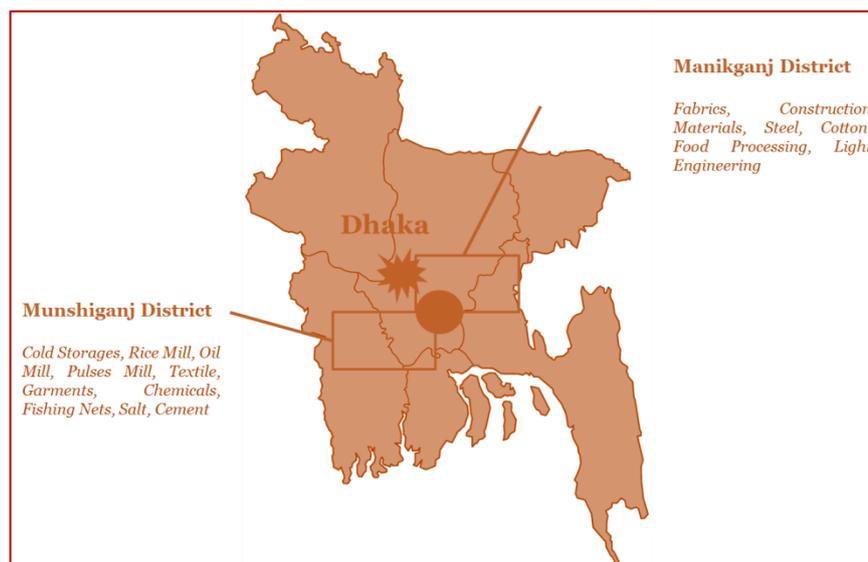
Munshiganj district is industrial powerhouse of Bangladesh. This district has maximum number of cold storages in all over Bangladesh. There are several rice mill, oil mill, pulses mill and maida mill located in this region. Other major industries in Munshiganj district are: textile, chemical, garments, fishing net, salt and cement.

Snapshot of industrial landscape in Munshiganj is captured below:

- Cold Storage: 67 in number
- Cement: 6 in number
- Salt Factory: 2 in number
- Paper Factory: 2 in number
- Shipbuilding Industry: 3 in number

Following figure depicts the industrial landscape and natural resources in and around Dohar Upzila.

Figure: Industrial landscape and natural resources in and around Dohar upzila



Proposed EZ is poised to leverage on various aspects such as its location, proximity to Dhaka, adjacency of Padma River and future prospect of enhanced connectivity to other parts of Bangladesh. Dohar upzila doesn't have a prevailing industrial ecosystem; however the industries in the proposed EZ could benefit

³⁰<http://dohar.dhaka.gov.bd/node/1476008/%E0%A6%AA%E0%A7%8D%E0%A6%B0%E0%A6%BE%E0%A6%95%E0%A7%83%E0%A6%A4%E0%A6%BF%E0%A6%95-%E0%A6%B8%E0%A6%AE%E0%A7%8D%E0%A6%AA%E0%A6%A6>

from the developed industrial ecosystem in the surrounding districts. Further the proximity to Dhaka city could facilitate the industries in the proposed EZ for smooth cargo transport and sourcing of qualified manpower.

Basis preliminary assessment, proposed EZ seems to have good connectivity to other parts of Bangladesh and especially to Dhaka. This region is located in the central part of Bangladesh and has access to river and road connectivity to other areas of Bangladesh. Basis broad level assessment, there seems an untapped potential for development of warehousing and cold storage facilities in this location.

Development of ship repairing/ shipbuilding/ shipbreaking industries may also be considered for this location due to its adjacency to Padma River and seamless access to Mawa ghat and Narayanganj port.

Availability of sand in this area also evokes a possibility of setting up units related to Construction Materials in the proposed EZ. Good connectivity to other parts of Bangladesh could facilitate smooth transport of finished goods.

Soil condition in this area is fertile and prone for agriculture. Land is suitable for cultivation of various crops such as rice, jute, pulses and other vegetables. Needless to say proximity to river also facilitates fishing activities in this area. It seems that industries based on agro processing/ fish processing etc. stand a good chance for development in the proposed EZ.

Further, to cater to the requirements of machineries and equipment for the operation and process of agro processing, shipbuilding, construction materials etc. light engineering industry may also be conceived. The access to transportation network could also cater to the logistics' requirements for the functioning of the industries.

In Dohar area, industries (small and cottage scale) based on handicrafts made of wood & jute and innerwear items already exist. This existing infrastructure may be leveraged to set up handicrafts, furniture manufacturing, knitwear and jute processing industries in this region.

Above analysis has been carried out from a high level market potential assessment. Any further decision on the same needs detailed demand/ market assessment study and feasibility analysis.

5.4. Reconfirmation of the proposed EZ

5.4.1. Location of the proposed EZ

The proposed Economic Zone falls in Dohar upazila, Dhaka district. It is located on the bank of Padma River, the south most part of the district and along the Karithickpur to Dohar road.

Reconfirmation of site details is presented in following table.

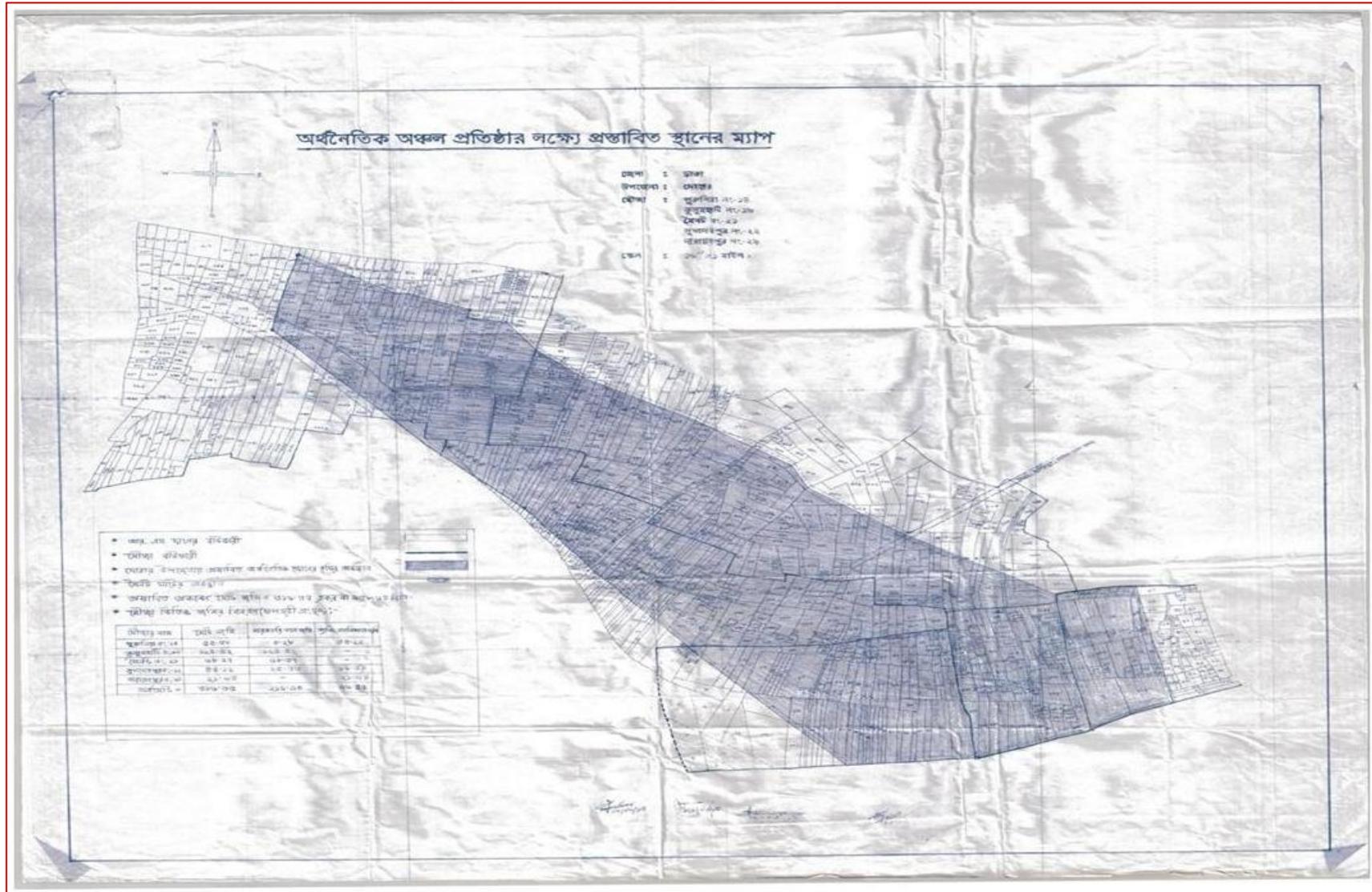
Table: Reconfirmation of site details

Parameters	Details
Site co-ordinates	23°36'49.45'' N - 23°37'52.60'' N & 90°03'22.41'' E - 90°04'28.26'' E
Site boundaries on East	Residential colonies & agriculture land
Site boundaries on West	Padma River, Abasan to Purulia road(UNDP), Embankment
Site boundaries on North	Mahmudpur Abasan project and Resettlement colonies
Site boundaries on South	Padma river, Moinat ghat
Total area of the site	316.35 Acres
Land tenure details	Government owned & private land
Government land	219.9 Acres
Private land	96.45 Acres
Others	Nil
Expansion potential	<p>Basis preliminary assessment, proposed EZ is surrounded by the following:</p> <ul style="list-style-type: none"> • Padma river- South • Resettlement colonies- North • Road and embankment- West • Private land and agricultural land- East <p>Basis discussion with local inhabitants, it was understood that expanding the proposed EZ could be possible on North-East and North-West side. Land parcels on north east and north west side of the proposed EZ belong to private landowners. However, this is subjected to land survey and detailed feasibility analysis.</p>
Existing land use	Agriculture, fishing
Land cost (per acre)	1.9 Lakh BDT

Source: PwC Initial Site Assessment (Data collected from UNO office)

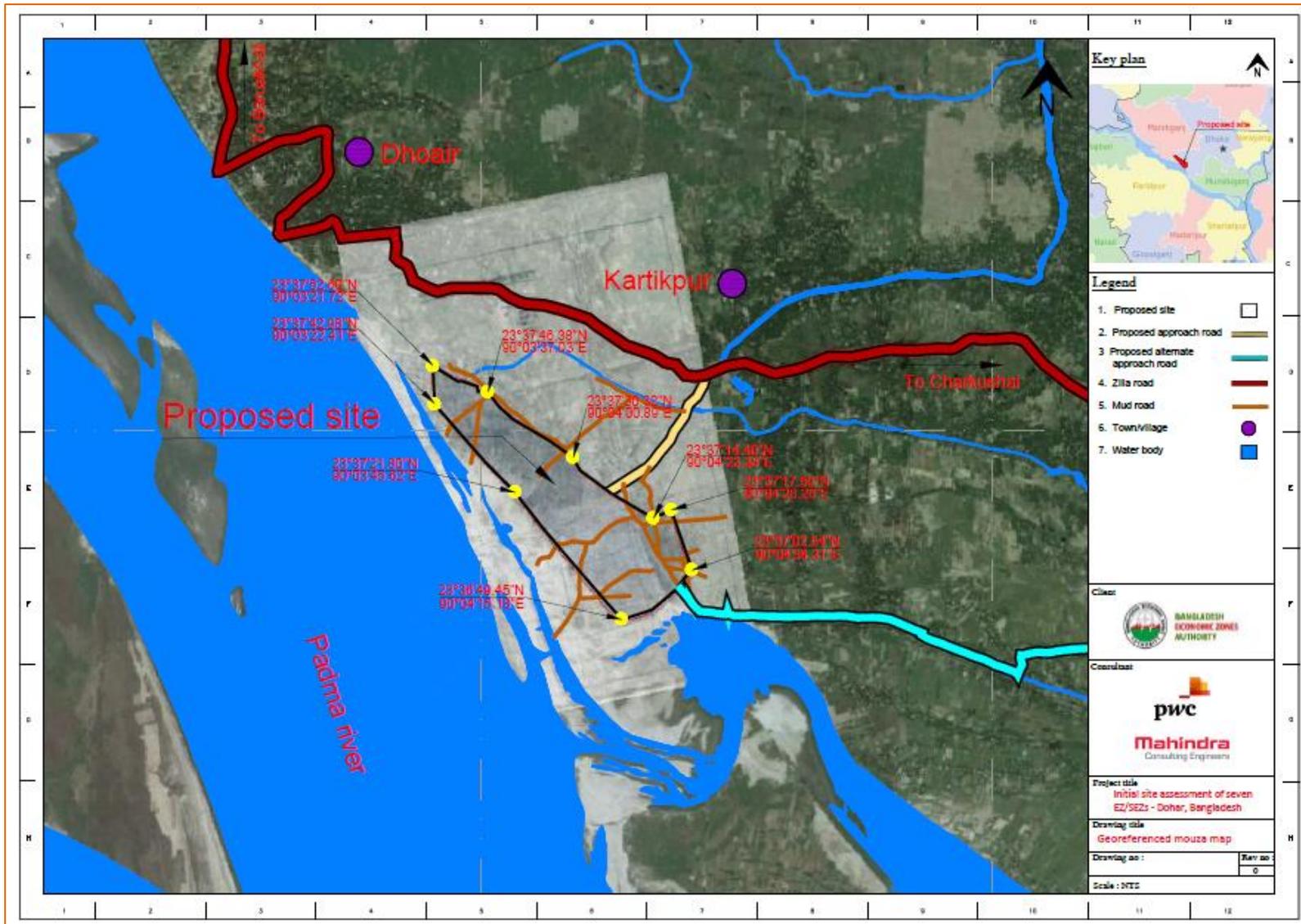
Mouza map of proposed site as provided by Upazila Nirbahi Officer (UNO) and Mouza map superimposed on Google map are presented in following figures (on subsequent pages)

Figure: Mouza Map of proposed Dhaka Dohar EZ



Source: Map Collected from UNO office

Figure: Mouza map superimposed on google map (Dhaka Dohar)



Following figure shows the location of the proposed EZ and popular regions nearby. Proposed EZ is located very near to Narayanganj and Munshiganj which are industrial hubs of the country and various small to big industrial units pertaining to textile, jute, cement, shipbuilding etc. are located in these areas. However, in Dohar upzilla, industrial proliferation hasn't yet taken place.

Figure: Location of the proposed EZ



Source: Google Map and PwC Analysis

GIS maps comprising of the major features in the vicinity of the proposed EZ is illustrated in subsequent figure.

Figure: Surrounding features in the vicinity of proposed EZ

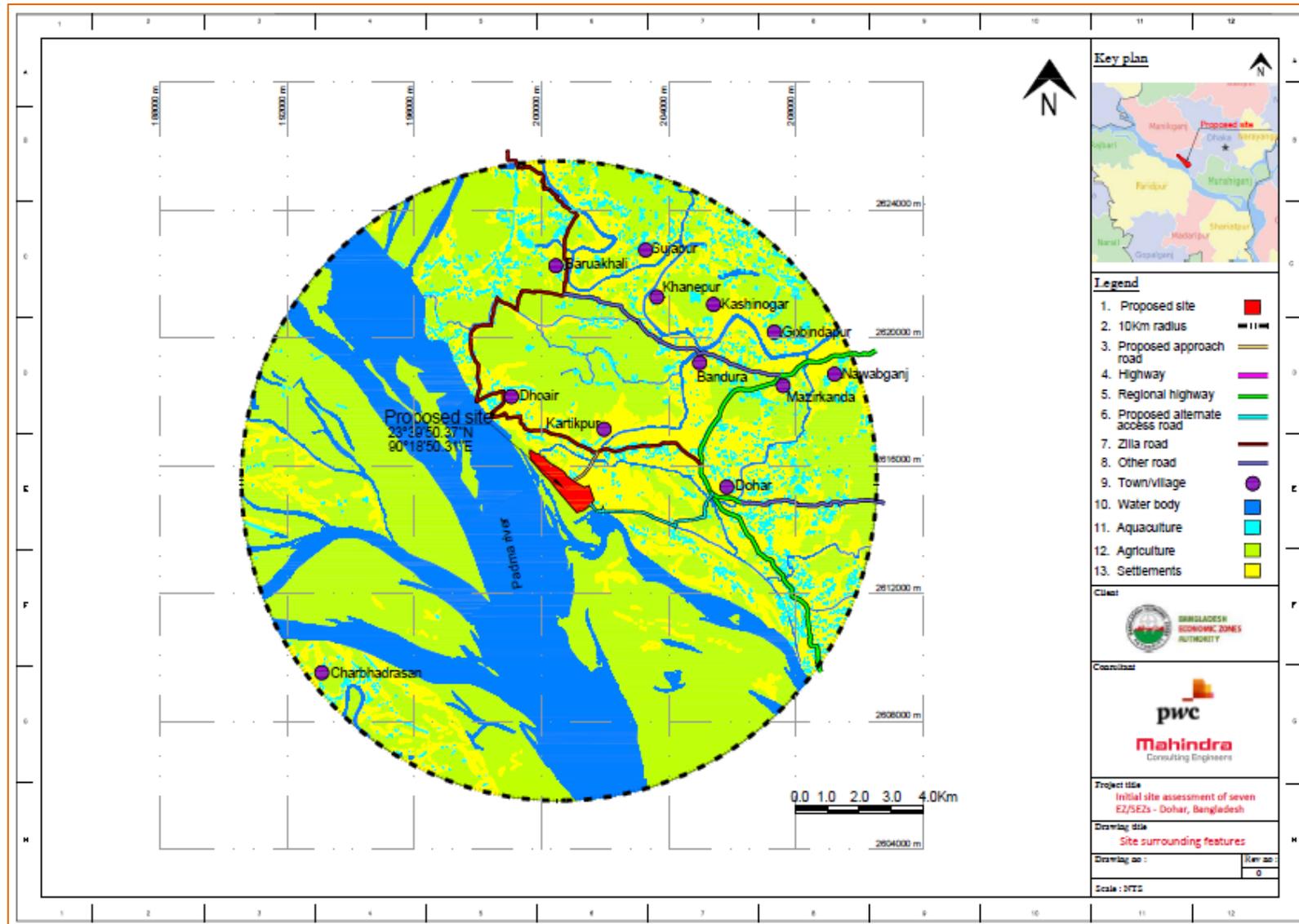
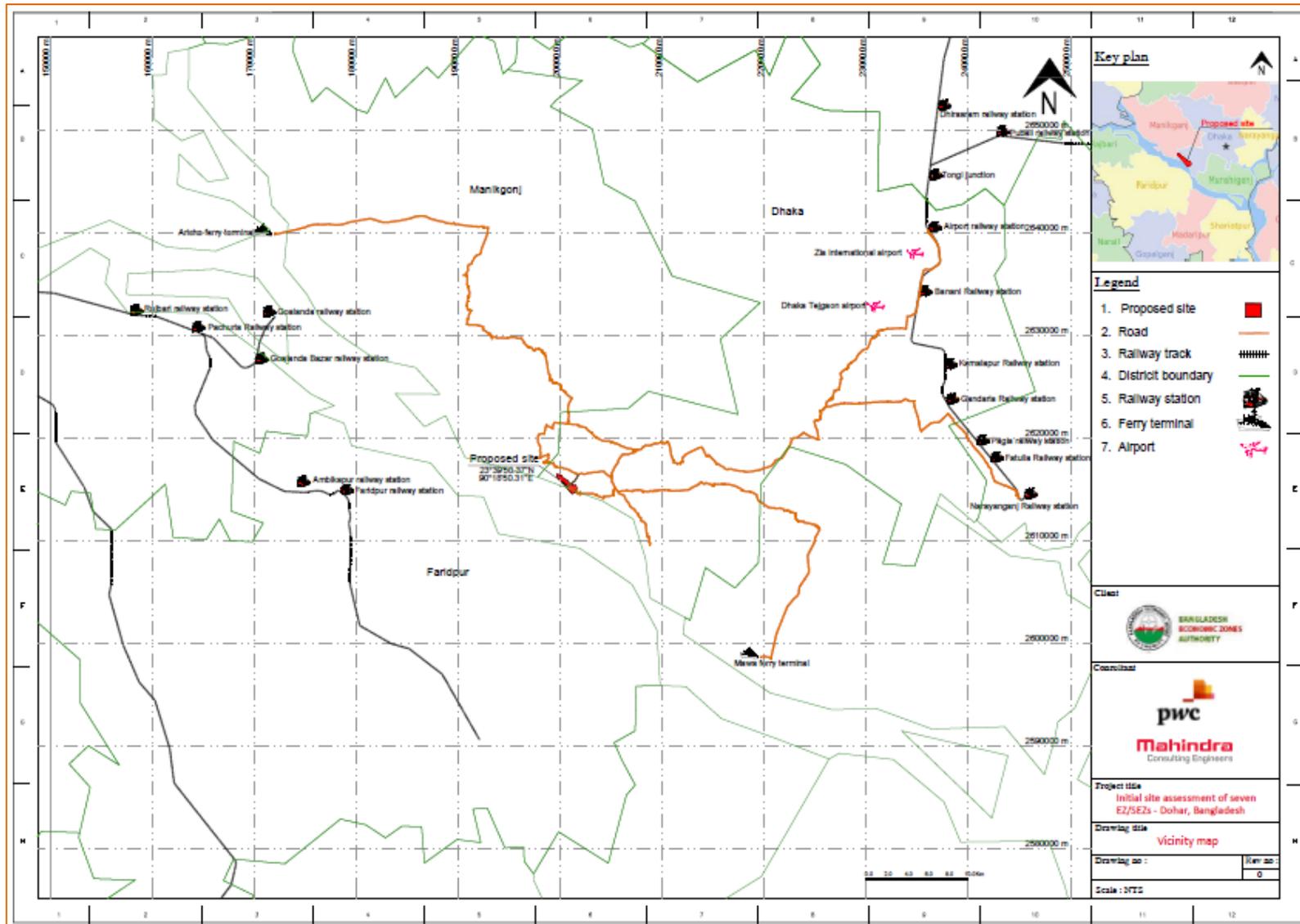


Figure: Proposed EZ and its vicinity



5.4.2. Land use / land cover

The land use pattern of the proposed EZ area falls under agriculture and aquaculture zone of Dohar upzilla. It was observed during our site visit that single crop is being cultivated at some land parcels throughout the year. Existing land use pattern for 10 km radius are shown in figures on subsequent pages.

Figure 5-1: Agriculture and fishing activities within the project area



5.4.3. Topography

Basis initial assessment, it was observed that the proposed EZ has a level difference of 6 to 7 m (approximately) with a gentle slope towards North East to South west direction towards Padma River with minor undulations. The entire site is located below the Maximum flood level. As per the contour variation, the depth of landfilling across the project area shall vary. The natural slope of ground is advantageous for gravity network of water supply, sewer and storm water drains.

Contour maps of the proposed EZ for 5 km and 10 km radius are presented in following figures(on subsequent pages).

5.4.4. Physiography

The physiography of the region surrounding the proposed EZ falls in Ganges river floodplain which exhibits morphology composed of low ridges and depression. The Ganges channel is constantly shifting within its active floodplain, eroding and depositing large areas of new char land each flood season, but it is less braided than that of the Brahmaputra-Jamuna. Ganges alluvium is calcareous when deposited, but most basin clays and some older ridge soils have been decalcified and acidified in their upper layers; lime is found only in the subsoil or substratum of such soils. Clay soils predominate in basins and on the middle parts of most ridges, with loamy soils (and occasionally sands) occurring mainly on ridge crests.

The Bangladesh physiography map is presented in Annexure.

According to the history of physiography of this region, the area around the proposed EZ is prone to high flood (depth of waterlogging is generally more than one metre) during the monsoon season.

Figure: Existing Land Use Pattern of the proposed EZ for 10 km radius (Closer View)

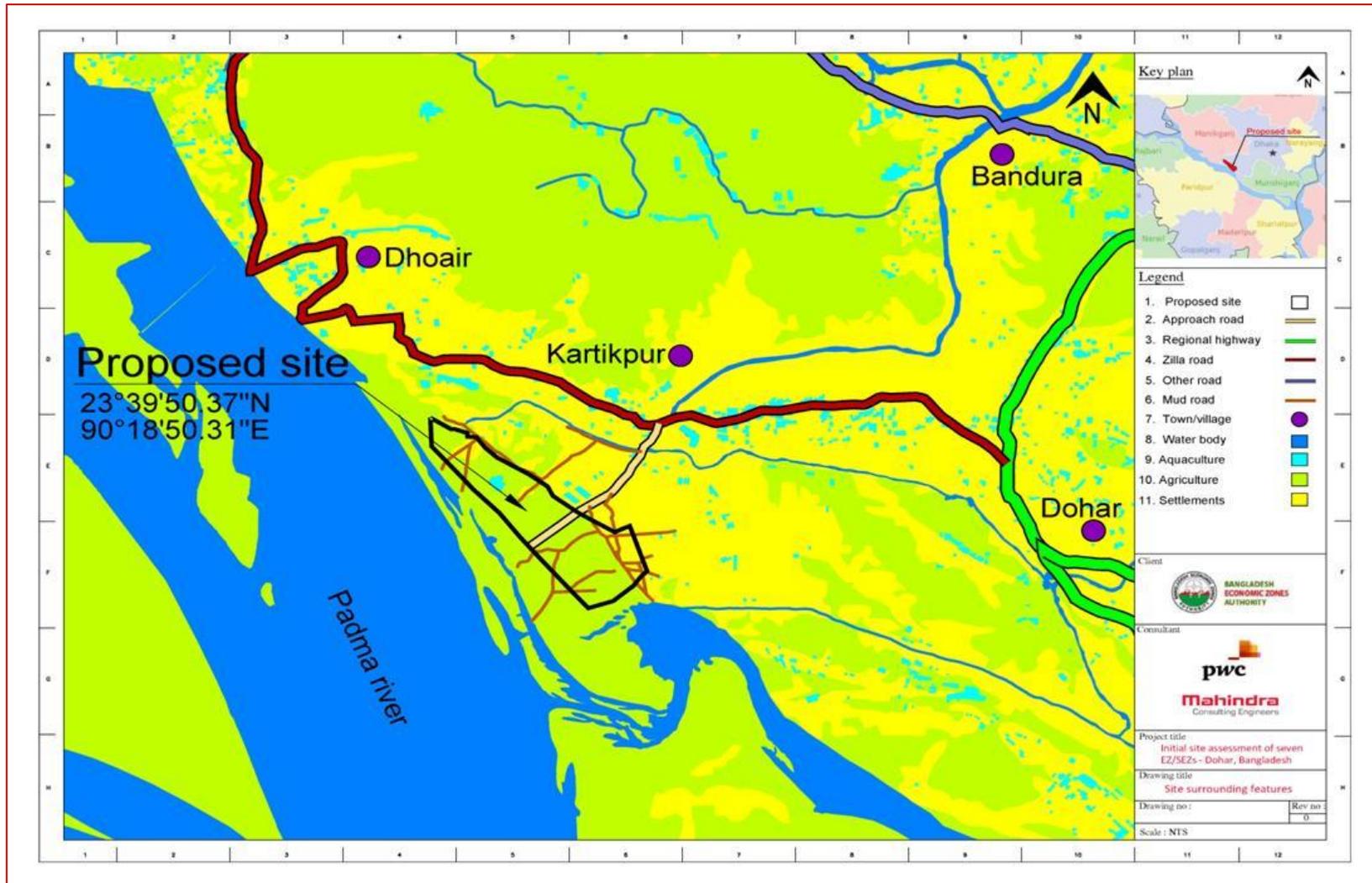


Figure: Contour map of the proposed EZ for 5 km radius (Dhaka Dohar)

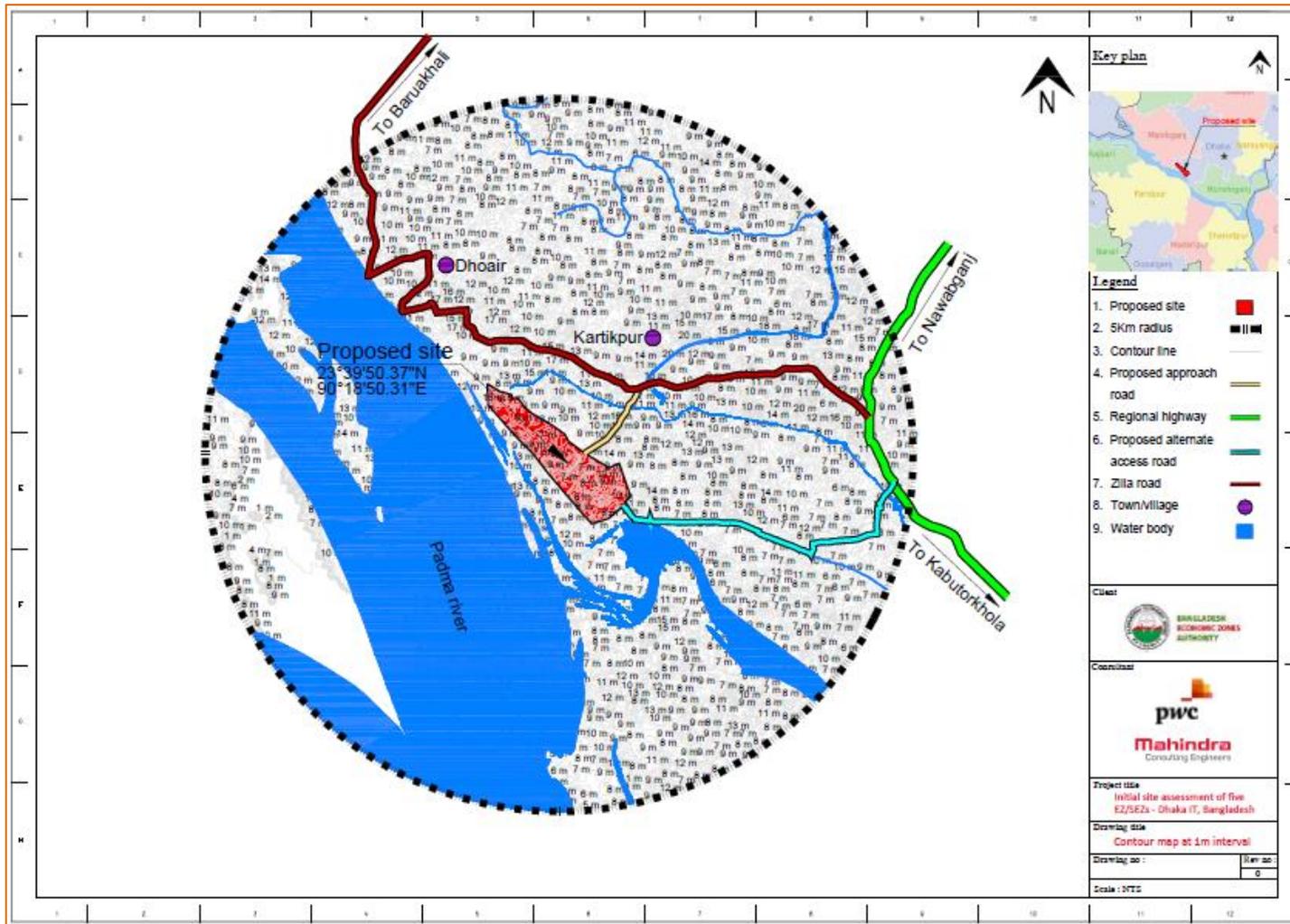
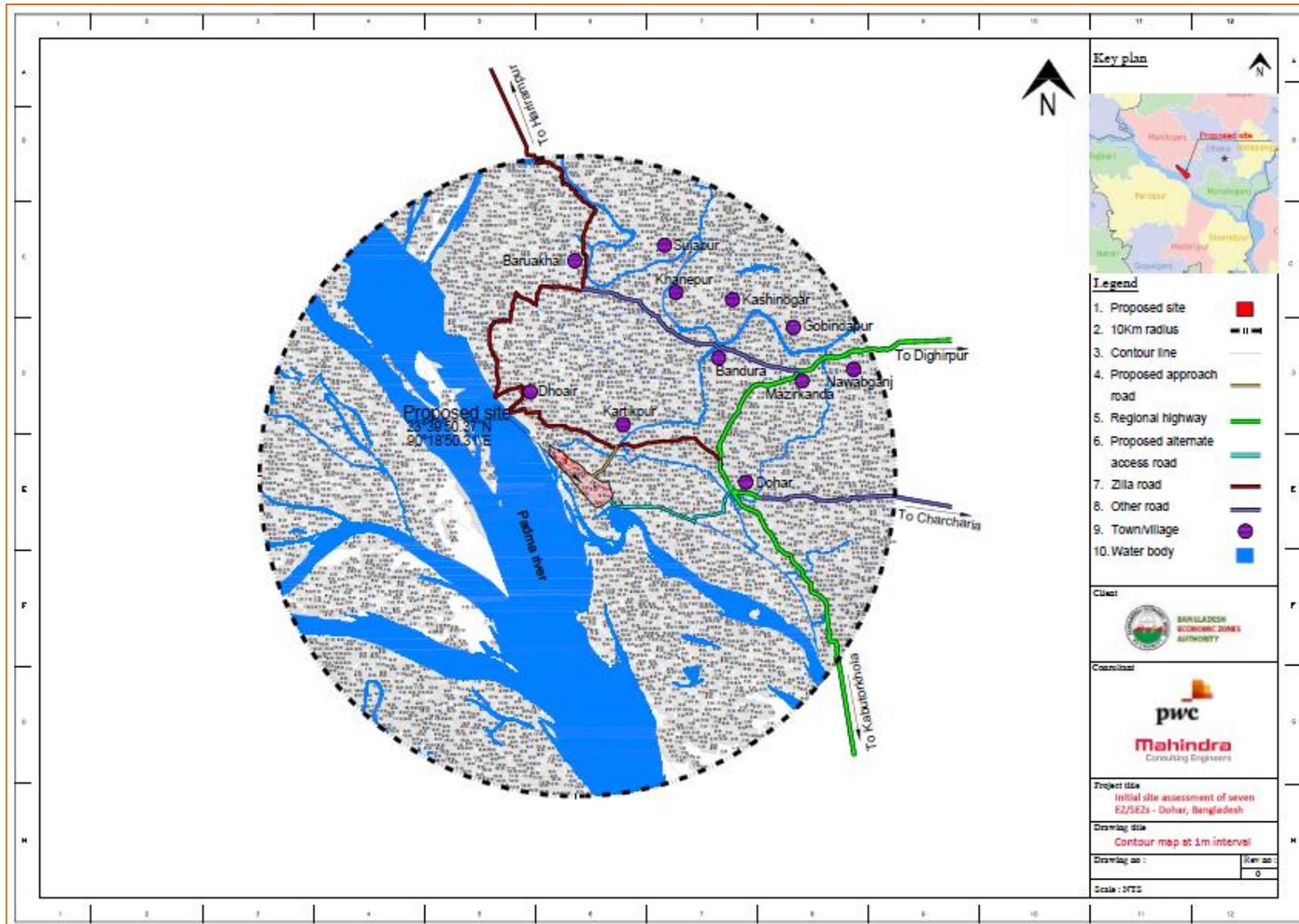


Figure: Contour map of the proposed EZ for 10 km radius (Dhaka Dohar)



5.4.5. Soil

Basis site visit, the top soil layer was found to be mixture of clayey and black cotton soil which needs to be replaced for road construction. This soil is not suitable for laying foundation for any structure. The dominant soil texture is sandy loam. The soil layer is acidic in character and the pH ranges from 5.5 to 6.8. The soil layer is naturally fertile and is recharged every year by fresh deposition by the floodwater.

Figure: Soil Type in proposed EZ



5.4.6. Geology

Proposed EZ is located in the Ganges river floodplain. The geological map of Bangladesh is shown in Annexure.

The type of soil strata in this type of geological area is Gangeyo pal land it has a clay loam to light sandy loam; this soil strata is not suitable for laying foundation for structure. Detailed soil investigation needs to be carried out during the structural design stage.

5.4.7. Earthquake data

Dohar area falls in the Seismic Zone 2 and the earthquake coefficient is 0.15 for this zone. The area under the proposed EZ falls under the medium seismic range zone; this factor needs to be taken into account while designing the structure of the proposed EZ.

Seismic zoning map of Bangladesh is presented in Annexure.

5.4.8. Wind speed

During winter, the northern and central areas in Bangladesh witness gentle winds blowing at relatively low speeds of 1-3 Km/hr. from the north & northwest. The detailed wind speeds need to be obtained for designing the high rise structures in the proposed EZ.

The wind speed map for Bangladesh is presented in Annexure.

5.4.9. Cyclones and storms

Dohar has not witnessed any significant cyclone or storms in the past.

5.5. Environment section

5.5.1. Air quality

Ambient air quality measurements are essential:

- to provide a description of the existing conditions,
- to provide a baseline against which changes can be measured and
- to assist in the determination of potential impacts of the proposed EZ construction on air quality conditions

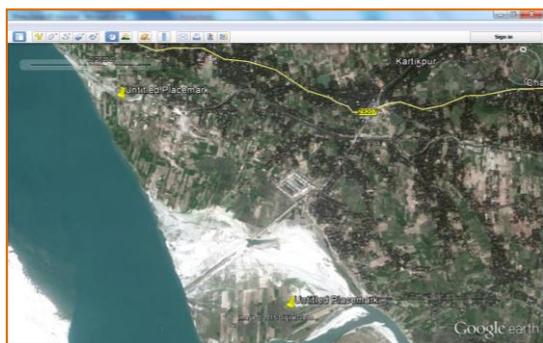
During the field visit, it was observed that the ambient air quality is good in the vicinity of the proposed EZ. This is due to the fact that not much industrial development has taken place in the surrounding area.

5.5.2. Floods and Water Logging

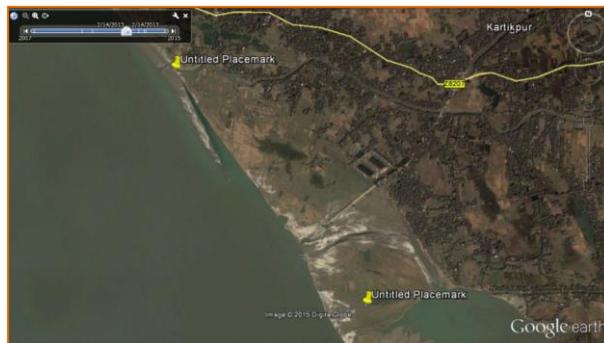
Basis the interaction with the UNO Officials and local inhabitants, it was communicated to us that the flood level during monsoon season varies from 12 feet to 15 feet within the area of the proposed EZ.

It is believed that the Ganges-Padma River is a meandering river. But lately the Ganges-Padma becomes braided river for high sediment transportation by Jamuna and deposition of Ganges-Padma river bed. Due to Padma River's changing trend, the site is prone to erosion. The google image for various periods is depicted below which clearly indicates the possibility of erosion. Necessary flood protection and erosion protection measures need to be taken for the development of EZ.

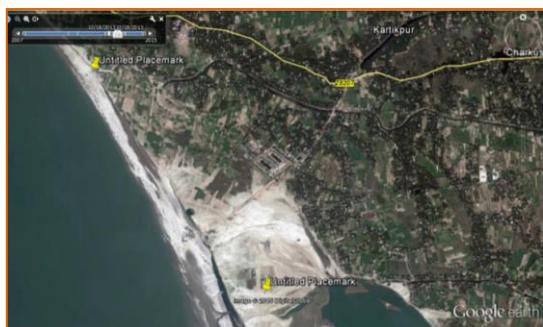
Figure: Google Images for various periods indicating possibility of erosion



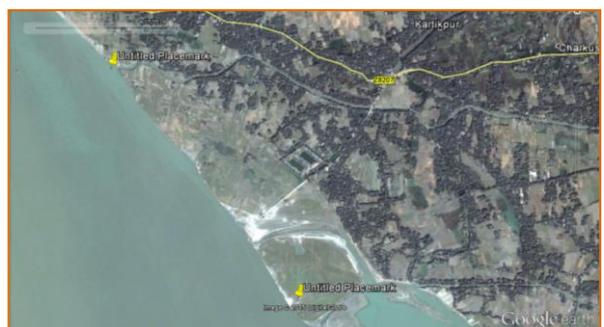
Google image during October 2010



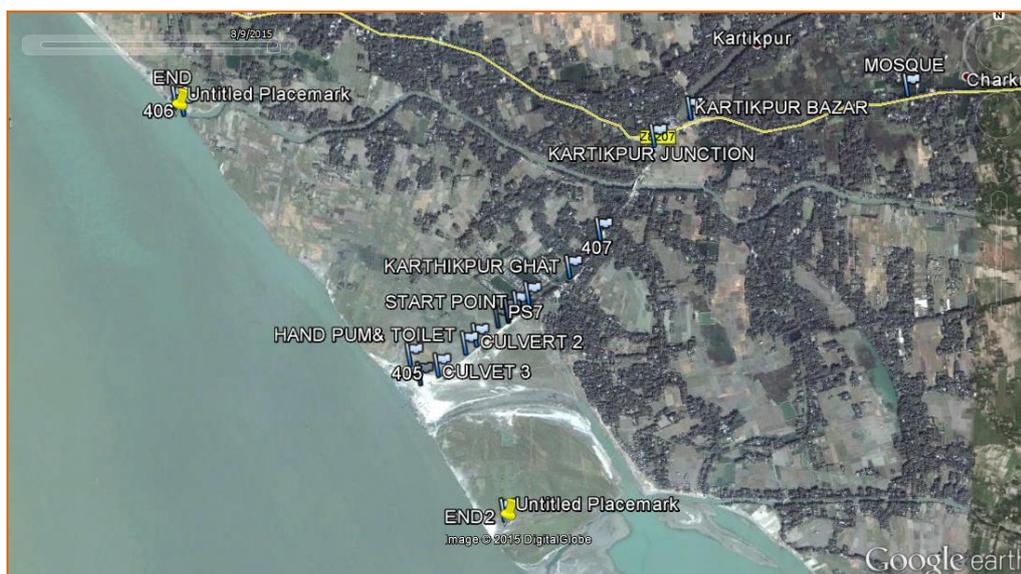
Google image during December 2012



Google image during October 2013



Google image during April 2014



Google image during August 2015

5.5.3. Noise

During the field visit, no apparent problem of noise was observed. On the north-western side of the proposed EZ, temporary bus terminal is located; as a result of this noise due to bus movement is observed.

5.5.4. Land filling

Basis the interaction with the UNO officials and local inhabitants, flood level during monsoon season varies from 12 feet to 15 feet depth inside the proposed EZ area.

To avoid inundation during monsoon season, minimum land filling of 0.6 m above the flood level is considered.

Based on the assumption, an average depth of 14 feet to 17 feet of land filling has been envisaged for the proposed EZ area. This figure is indicative and detailed topography survey needs to be carried out to calculate the exact quantity of land filling at the project area.

5.6. Infrastructure Linkages to the Proposed Site

5.6.1. Physical Infrastructure- Availability of Utility Connection

5.6.1.1. Power Availability for the proposed EZ

Dohar substation is the nearest substation to the proposed EZ and it has a total capacity of 20 MVA. Basis interaction with UNO and Rural Electrification Board (REB) officials, this substation has no excess capacity.

However REB officials informed that there is a proposal to setup 33/11kv new substation at Mohabadpur with a capacity of 20 MVA. It was informed by the officials that 11 KV feeder line is already planned up to the proposed EZ from this proposed substation. The land for the proposed substation in Mohabadpur has been acquired by the REB for the construction and expected to complete by 2020.

Figure: Existing Dohar Substation and Project site of proposed 33/11 KV substation in Mohabbadpur



One 132 kV grid substation (World Bank funded project) has been proposed in Hashnabad with a capacity of 50 MVA.

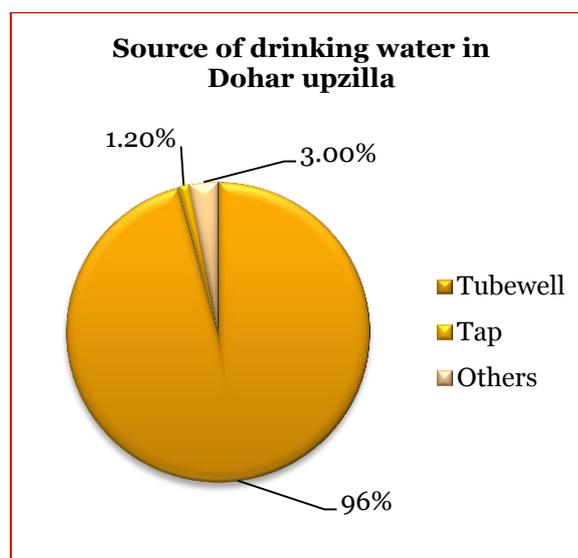
Basis working knowledge and best practices followed, power requirement in a typical EZ could be transmitted by a dedicated 33 KV line for demand up to 25 MW. If the demand is more than 25 MW, then the option of 132 KV transmission lines needs to be further explored. Proximity to 33 KV power connection and surplus power availability in the vicinity of the proposed EZ are the crucial factors to decide on the potential of power availability to the proposed EZ.

Locations of the substations and power connections to the proposed EZ are captured in the utility map illustrated at the end of section.

5.6.1.2. Water Availability for the proposed EZ

There is no existing water supply system at the proposed site. The local inhabitants are dependent on tube wells for the purpose of drinking water. The sources of drinking water in Dohar upzilla are captured in following figures.

Figure: Sources of drinking water in Dohar upzilla



Source: District Statistics, BBS 2011

Figure: Tube well(s) located at the proposed EZ



Basis interaction with local inhabitants and UNO officials, the ground water is available at a depth of 200 feet approximately from natural ground level.

Basis initial site assessment, water requirement at the proposed EZ could be met with intake from either extracting water from the Padma River or from bore wells which could be developed within the project area.

Preliminary assessment suggests that extracting water from river located on the western boundary of the proposed EZ may be considered by providing suitable intake system and water treatment plant. Exact location of water intake needs to be finalized during the master planning stage.

Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/ day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Dhaka Dohar EZ is around 2.69 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could be extracted through bore wells. Extraction of more water through bore wells might result in depletion of the aquifer level. Proposed site has proximity to Padma River, thus the option of extracting water from Padma River may be further explored. Decision regarding extraction of water from bore well/ Padma River needs to be taken after detailed feasibility analysis.

Tentative location of the water intake is captured is in the Utility Map at the end of section.

5.6.1.3. Gas supply to the proposed EZ

There is no gas source or gas supply near to the proposed EZ.

Gas supply is available near BSCIC industrial estate at Keraniganj upzilla which is located at a distance of 40 km from the proposed EZ. Basis discussion with the representative from BSCIC industrial estate at Keraniganj upzilla, gas supply is not adequate to cater to the requirements of 133 units in the industrial estate.

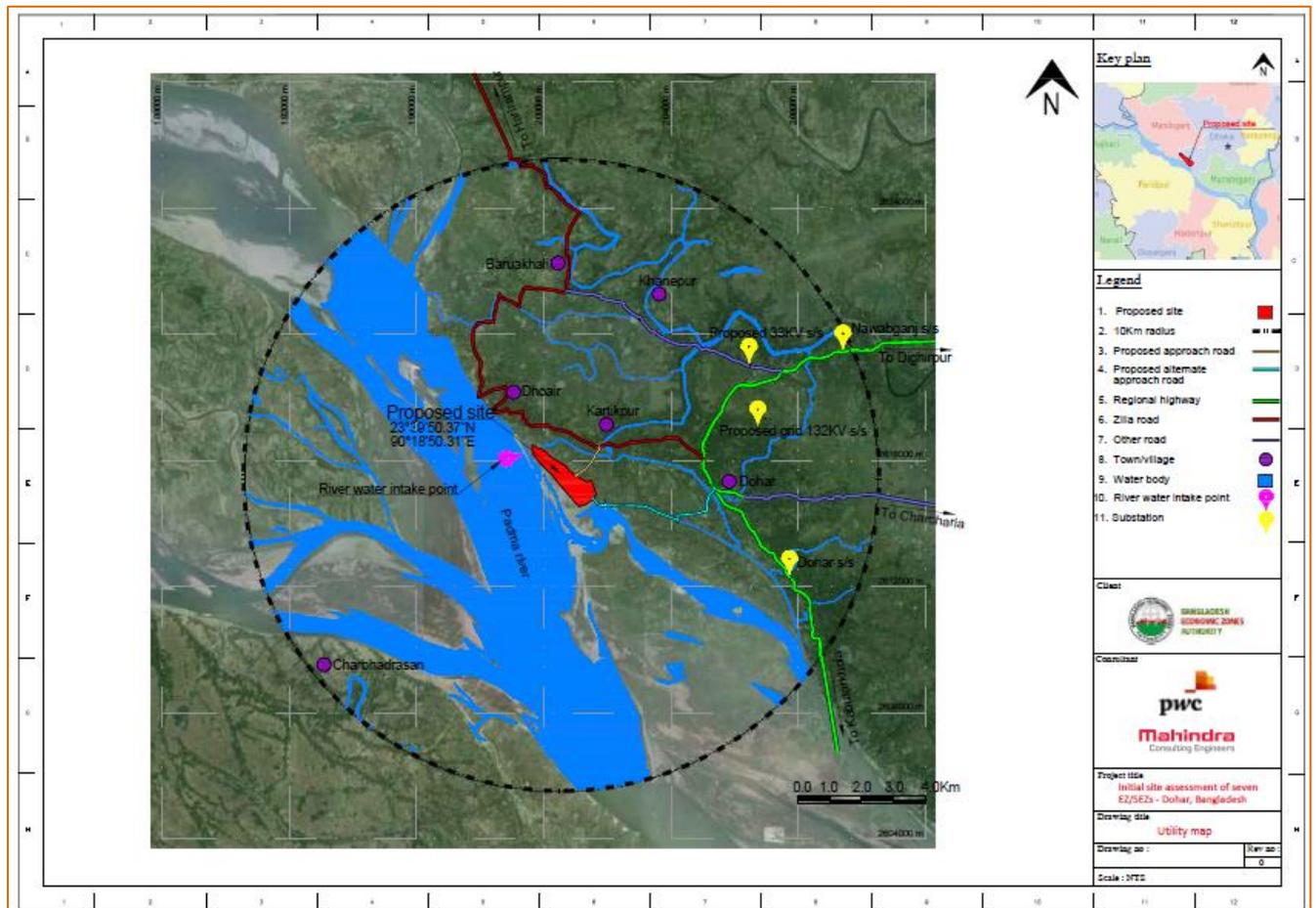
Work is undergoing for establishment of gas connection from Ginjira DRS to BSCIC industrial complex (13.5 km gas line- 8 inch dia. and 140 psig distribution line). Government to Government (G2G) letter for the same was issued on 8th March 2006 and the gas requirement for BSCIC industrial complex has been calculated as 5,35,000 cubic feet per hour.

5.6.1.4. Telecom/ Internet connectivity to the proposed EZ

Optical fiber cables are laid till Dohar UNO and the bandwidth available is around 2 mbps. At present, the internet and telecom services are provided by private telecom subscribers such as Grameen Phone, Bharti Airtel, Banglalink, Teletalk in this region. Service by private operators has significantly improved the telecom connectivity in the region.

Utility map for the proposed EZ is illustrated in following figure.

Figure: Utility Map for the proposed EZ



5.6.2. Social Infrastructure

5.6.2.1. Institutional

Dohar upazilla has 3 government colleges, 40 secondary schools, 56 primary schools and 1 Technical and Vocational education facilities.

A broader view suggests that the proposed EZ being located in Dhaka district has an advantageous position in terms of availability of educational institutions. There are a total of 26 technical and vocational institutions and 44 universities located in Dhaka district.³¹

Some of the major educational institutions located in Dhaka are:

- Bangladesh University of Engineering and Technology (BUET)
- Dhaka University of Engineering and Technology (DUET)
- Jahangirnagar University etc.

Some of the Technical Training centers located in the radius of 50 km (approx.) from the proposed EZ are:

- Bangladesh-Korea Technical Training Center (located 50 km (approx.) away)
- Bangladesh-German Technical Training Center (located 50 km (approx.) away)
- SFM Mohila Technical Training Center (located 50 km (approx.) away)
- Keraniganj Technical Training Center (located 80 km (approx.) away)

5.6.2.2. Healthcare Facilities

There is no international standard hospital located in the vicinity. Dohar general hospital is located at around 8 km from the proposed EZ.

However the region is well-connected to Dhaka city by road and world-class medical facilities are available in Dhaka city.

Available healthcare facilities in Dohar upzilla are captured in the following table.

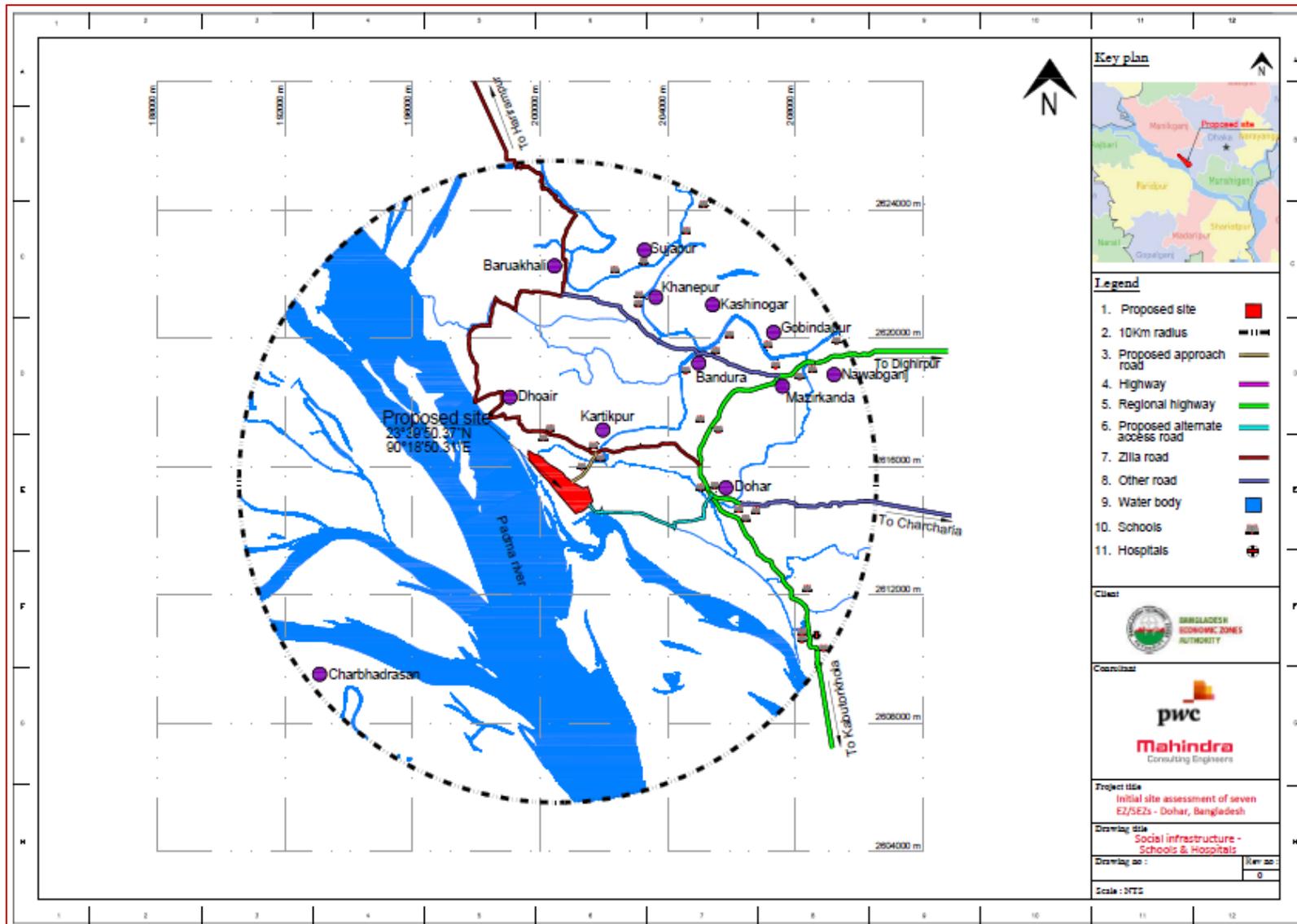
Table: Available Healthcare Facilities in Dhaka Dohar

Facility Type(s)	Total (No.)	No. of beds
No. of Upazila Health Complex	1	50
No. of Union Sub-Centers	2	N/A
No. of Union Health and Family Welfare Centers	6	N/A
No. of Community Clinics	10	N/A
No. of Private Clinics/Facilities	11	82

Source: Dohar Upazila Health Complex | Health Bulletin 2014

³¹ Dhaka District statistics, 2011

Figure: Schools and Hospitals in the vicinity of proposed EZ



5.6.3. Connectivity

Roadways and waterways are the major convenient means of accessing the EZ. The distance between Dhaka city and the proposed EZ by Dhaka-Dohar Road is 52 km (approximate) and by Dhaka-Mawa Road is 63 km (approximate). Dohar is well-connected to Dhaka city.

5.6.3.1. Road

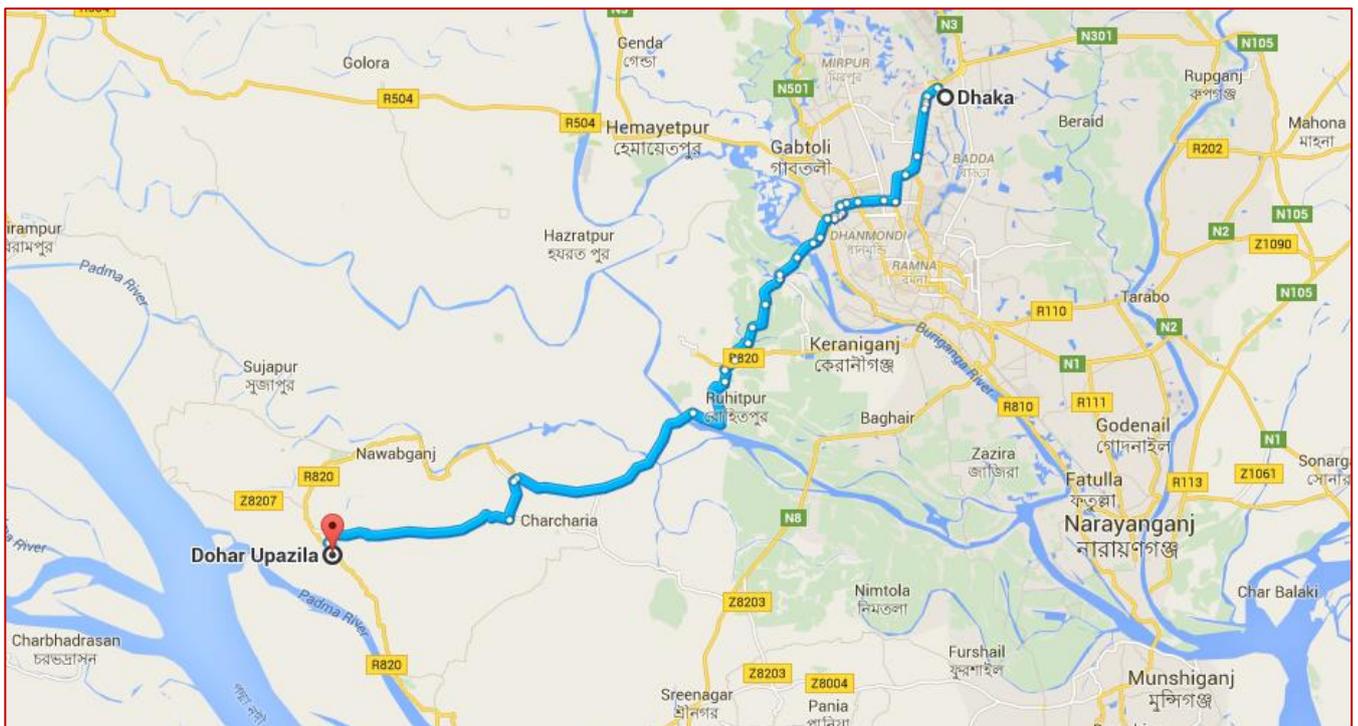
Proposed EZ is accessible from Dhaka city. Dohar upzila and the proposed EZ can be accessed from Dhaka by the following roads:

- 1. Zinzira-Keraniganj-Nawabganj-Dohar-Srinagar Road (R820):** The distance between Dhaka and the proposed EZ is approximately 52 km. During site visit, it was observed that traffic stagnation in this road was low and travel time is around 2 hours. This road is favorable for passage of heavy vehicles. However, preliminary assessment depicts that some widening and maintenance works are required in the road stretch connecting Keraniganj to Nawabganj and near Kartikbazar area to improve the road condition.
- 2. Dhaka-Mawa Highway:** Distance between Dhaka and the proposed EZ by this route is around 63 km and travel time is around 2 hours. Dhaka-Mawa highway is a two lane bituminous road and upgradation of this highway to four lane highway has been proposed.³² Road condition is excellent and favorable for passage of heavy vehicles. This highway connects the Mawa Ferry ghat to Dhaka and Dohar. 30 km (approximate) long Dohar-Mawa road connects the proposed EZ (and Dohar upzila) to the Dhaka-Mawa expressway. Preliminary assessment suggests that this highway may be used as the main access to the proposed Dohar EZ.

Construction of the Padma Multipurpose project is ongoing and Dohar-Mawa Road provides access to the Padma Bridge.

Following figure depicts the connectivity of the proposed EZ from Dhaka city.

Figure: Connectivity between Dhaka and Dohar Upzila (proposed EZ)



Source: Google map and PwC analysis

³² <http://newagebd.net/139954/expanding-dhaka-mawa-highway-to-4-lane-to-begin-in-december/>

Padma Multipurpose Bridge Project

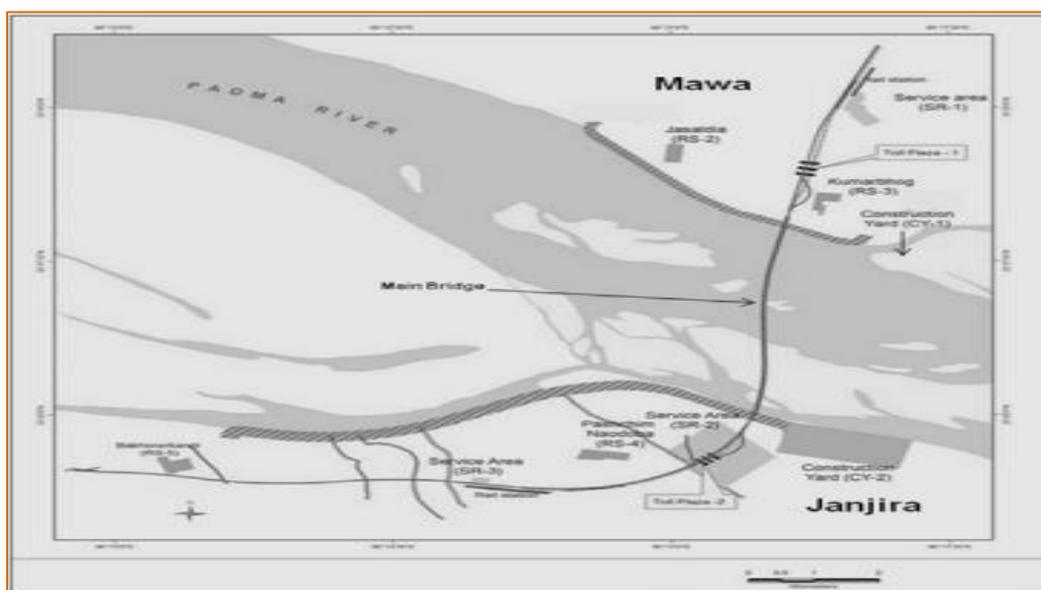
The Padma Multipurpose Bridge Design Project comprises a new fixed crossing of the Padma River in Bangladesh, which will consist of a new bridge approximately 6.15km long across the Padma River, approach viaducts, major river training works and approximately 13.6 km of approach roads and bridge end facilities, including toll plazas, service areas and offices. The bridge – the longest in South Asia – will connect the southwest of the country with the capital Dhaka, boosting business and the movement of goods between the country's second seaport, Mongla, and the rest of the country.³³

The Padma River separates the south-west region from the capital city and requires time-consuming ferry crossings to major destinations.

The proposed Padma Bridge is expected to make cross-Padma transport more reliable and drastically reduce the travel time and cost to cross the river. The Padma Bridge is a multipurpose bridge designed to carry four lanes of highway traffic, a single freight rail track, a high pressure gas main and various communication facilities.

The Padma Bridge is on the Asian Highway Route A-1 and Trans-Asian Railway Route. When the railway will be effectively connected, the Padma Bridge will contribute to the multimodal international transport network for the Eastern Region of the Indian sub-continent and ensure substantial bi-lateral cargo movement between India and Bangladesh.

Figure: Layout of the Padma Multipurpose Bridge Project



Source: Detailed design of the Padma Multipurpose Bridge, Bangladesh – An overview (2010), <http://www.iabse-bd.org/old/90.pdf>

Funding arrangement:

Financing plan and loan signing have been finalized with the development partners³⁴

- World Bank (WB) – 1200 Million USD
- Asian Development Bank (ADB) – 615 Million USD
- Japan International Co-operation Agency (JICA) – 415 Million USD
- Islamic Development Bank (IDB) – 140 Million USD
- Government of Bangladesh (GoB) – 600 Million USD

³³ Detailed design of the Padma Multipurpose Bridge, Bangladesh – An overview (2010), <<http://www.iabse-bd.org/old/90.pdf>>
³⁴ BBA, <http://www.bba.gov.bd/padma-multipurpose-bridge-3/>

Present Status of the project:

Following table illustrates the present status of the project.

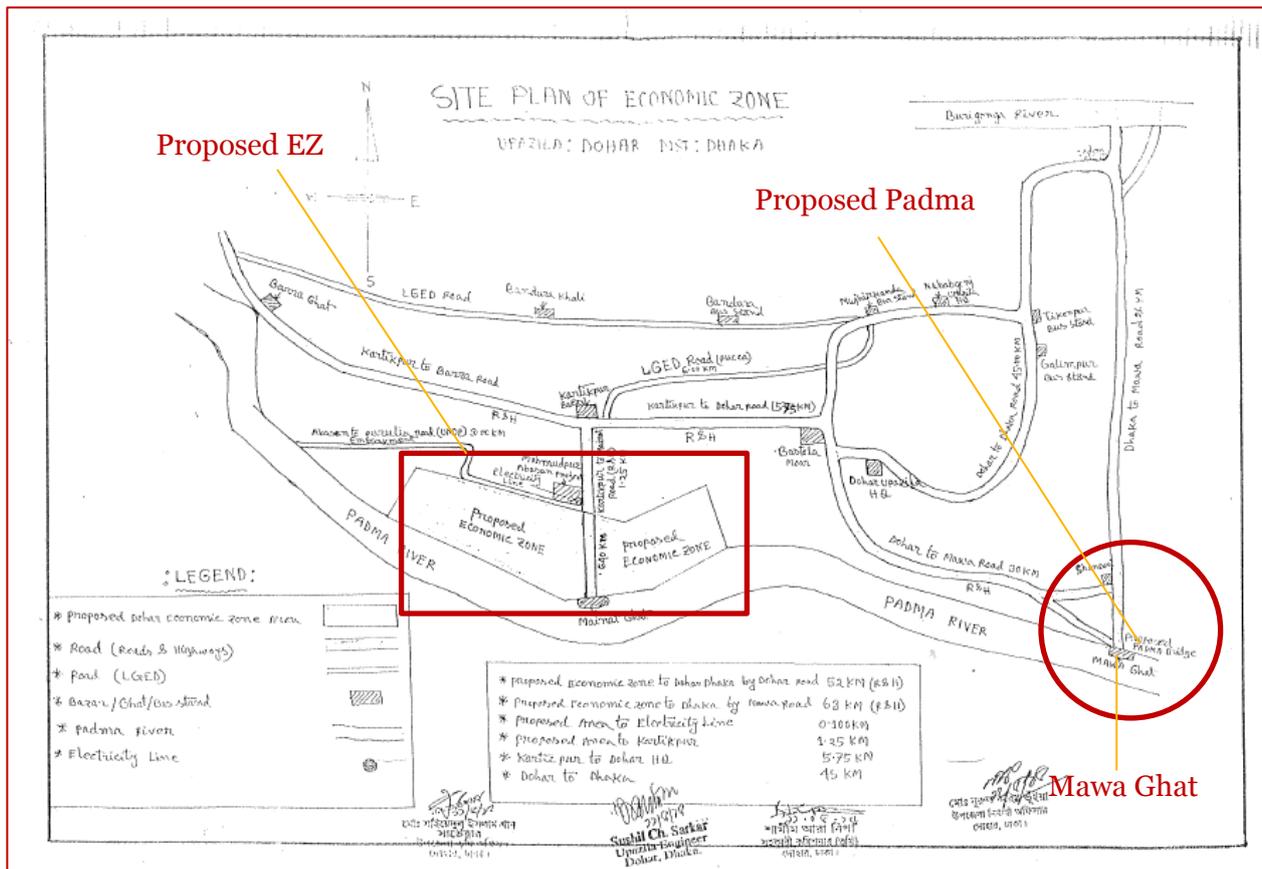
Table: Present status of components of Padma Multipurpose Bridge Project

Si. No	Component of Project	Status
1	Main Bridge	Prequalification completed and concurrence given by the development partners (DPS)
2	RIVER TRAINING WORKS (RTW)	Prequalification completed and concurrence required from the development partners (DPS)
3	Janjira Approach Road and Selected Bridge End Facilities	Tender (Contractor Selection) completed and concurrence required from IDB
4	Mawa Approach Road and Selected Bridge End Facilities	Prequalification completed and concurrence required from DPS
5	Service Area-2	Prequalification completed and concurrence required from DPS

Source: Bangladesh Bridge Authority, <http://www.bba.gov.bd/padma-multipurpose-bridge-3/>

Once Padma Bridge is operational, it would provide seamless access to locations such as Jajira, Khulna region, Mongla (other side of Padma River) etc.

Following figure captures the location of the proposed EZ and road connectivity to the surroundings (including Padma Bridge and Dhaka-Mawa Road).



Last Mile Connectivity (Approach Road)

Basis discussion with UNO officials and preliminary site visit, existing approach road (R&H road) connects the Moinat Ghat (proposed EZ) to Kartikpur Bazar. From Kartikpur Bazar, DNK road and Dohar-Mawa Road are accessible.

It's a single lane kutcha road of length 1.25 km. Preliminary assessment depicts that widening is difficult for this stretch as it would attract resettlement issues. The following figure illustrates the photographs of the existing approach road.

Photograph of the approach road (1.25 km)



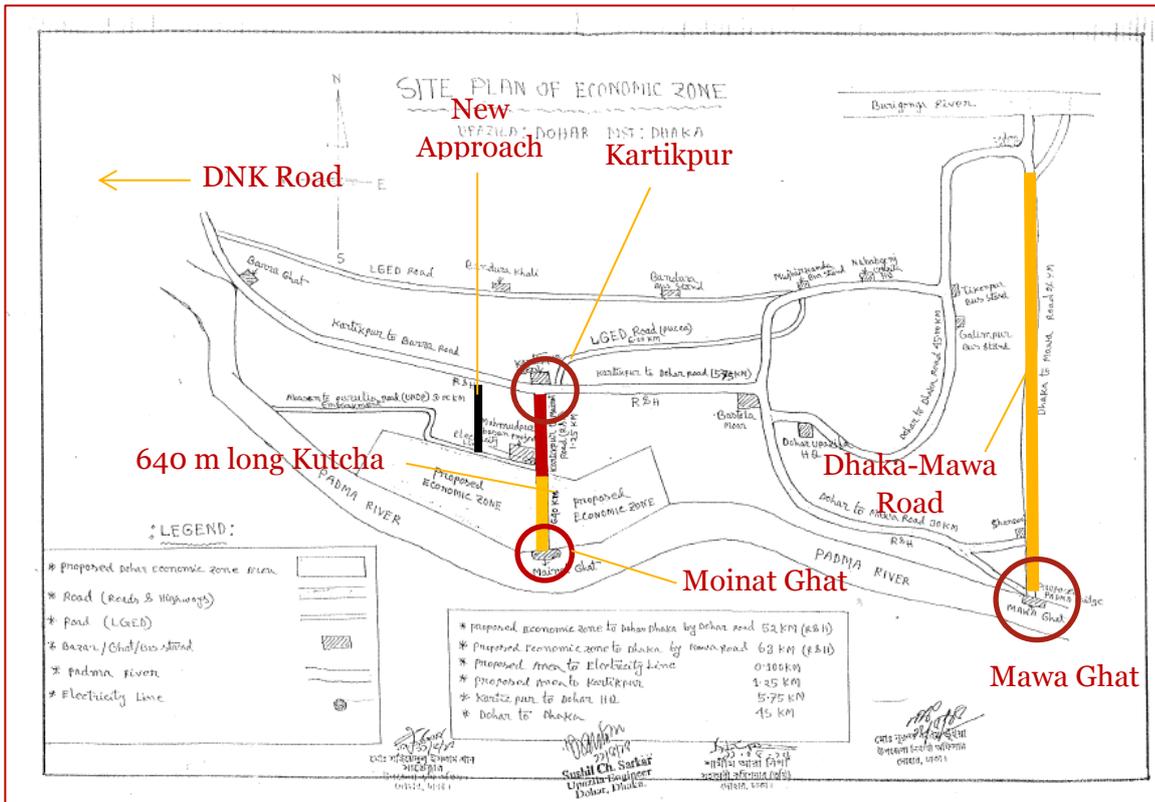
After the 1.25 km stretch, 640 m stretch of kutcha road runs up to Moinat ghat and the bus terminus. Proposed EZ lies on both sides of the kutcha road of 640 m length. It's a single lane road and once the EZ is developed, it may be widened based on the master planning.

Photograph of 640 m stretch of kutcha road up to Moinat Ghat



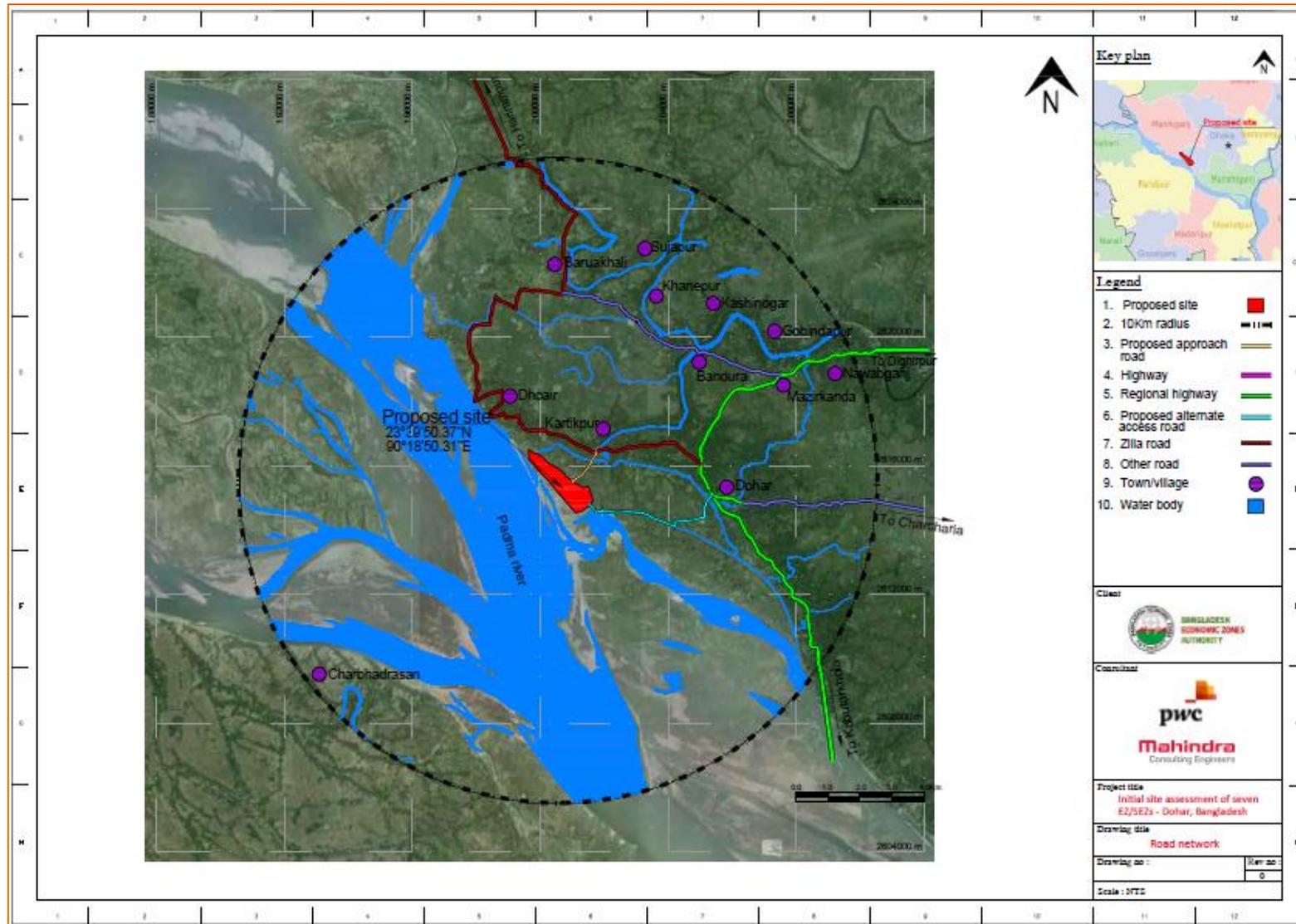
A broad level initial assessment suggests that during the development of the proposed EZ, possibility of developing a new approach road from Kartikpur Bazar to North West land parcel of the proposed EZ may be explored. However, this is subjected to topography survey and detailed feasibility analysis.

The following figure illustrates the connectivity of the approach road to the proposed EZ.



Following figure illustrates the road network for 10 km radius of the proposed EZ.

Figure: Road Network for 10 km radius (Dhaka Dohar)



5.6.3.2. Rail

There are no railway stations in the Dohar upzilla. As per discussion held with UNO officials, rail line would be established in Dohar upon construction of Padma Multipurpose Bridge.

Faridpur and Dhaka railway station are the nearby rail station to the proposed EZ. The following figure illustrates the location of Faridpur and Dhaka railway station to the proposed EZ.

Faridpur is located on the other side of the river bank at an aerial distance of 25 km from the proposed EZ. By road, Faridpur station has to be accessed via Dhaka-Faridpur Highway and travel time (distance) is around 3.5 hours (91 km).

Figure: Locations of Faridpur rail station and Dohar upzilla



Source: PwC Analysis and Google Map

Dhaka (Kamalapur) Rail Station

Dhaka rail station is approximately 50 km away (by road) from the proposed EZ and travel time by road is 1.5 hours (approximate). Dhaka railway station could be accessed through R820 road (Zinzira-Keraniganj-Nawabganj-Dohar-Srinagar Road).

Cargo Handling Facilities:

There is an inland container depot (ICD) near Kamalapur railway station, Dhaka. The facilities available at ICD are tabulated below³⁵:

³⁵ (<http://www.irfca.org/~shankie/brly/inland.htm>),
(<http://www.oocl.com/bangladesh/eng/localinformation/terminalsandfacilities/Pages/default.aspx>)

Details	Specifications
Area Capacity	1473225 sq feet
Handling capacity	90,000 TEUs ³⁶ annually
Equipment	2 No. Forklift of 36 Tons Capacity. 1 No. Forklift of 28 Tons Capacity. 1 No. Forklift of 8 Tons Capacity. 1 No. Forklift of 5 Tons Capacity. 1 No. Forklift of 3 Tons Capacity.

Basis preliminary assessment Bangladesh Railways is procuring a rail mounted gantry crane for faster wagon loading and unloading operation works at the ICD at Kamalpur Rail station, Dhaka. Cargo storage facilities are not available at the ICD.

Connectivity of Dhaka rail Station

Dhaka is connected with the rail network to other parts of the country. The Dhaka railway station is located at a distance of 20km (approximate) from proposed EZ. The total railway line exists in Dhaka district is presented in following table.

Table: Length of existing railway line in Dhaka district

Upzilla	Length of railway line in km	No. of railway stations
Dhaka Metropolitan	356	8
Dhamrai	0	0
Dohar	0	0
Keraniganj	0	0
Nawabganj	0	0
Savar	0	0
Total	356	8

Source: Bangladesh Railways, Dhaka District statistics

At present around 329 trains per day stops at Dhaka railway station for transporting passengers to Chittagong and Kolkata. The details of train running from Dhaka are presented in following table.

Table: Details of Trains running from Dhaka district

Train Class	Number of trains
Intercity	82
Mail, Express & Commuter	78
DEMU Commuter	32
Shuttle / Local	137
Total	329

Source: Dhaka District website

³⁶ TEU; Twenty Foot Equivalent Unit

Travel time from Dhaka to major locations of Bangladesh is summarized in the following table.

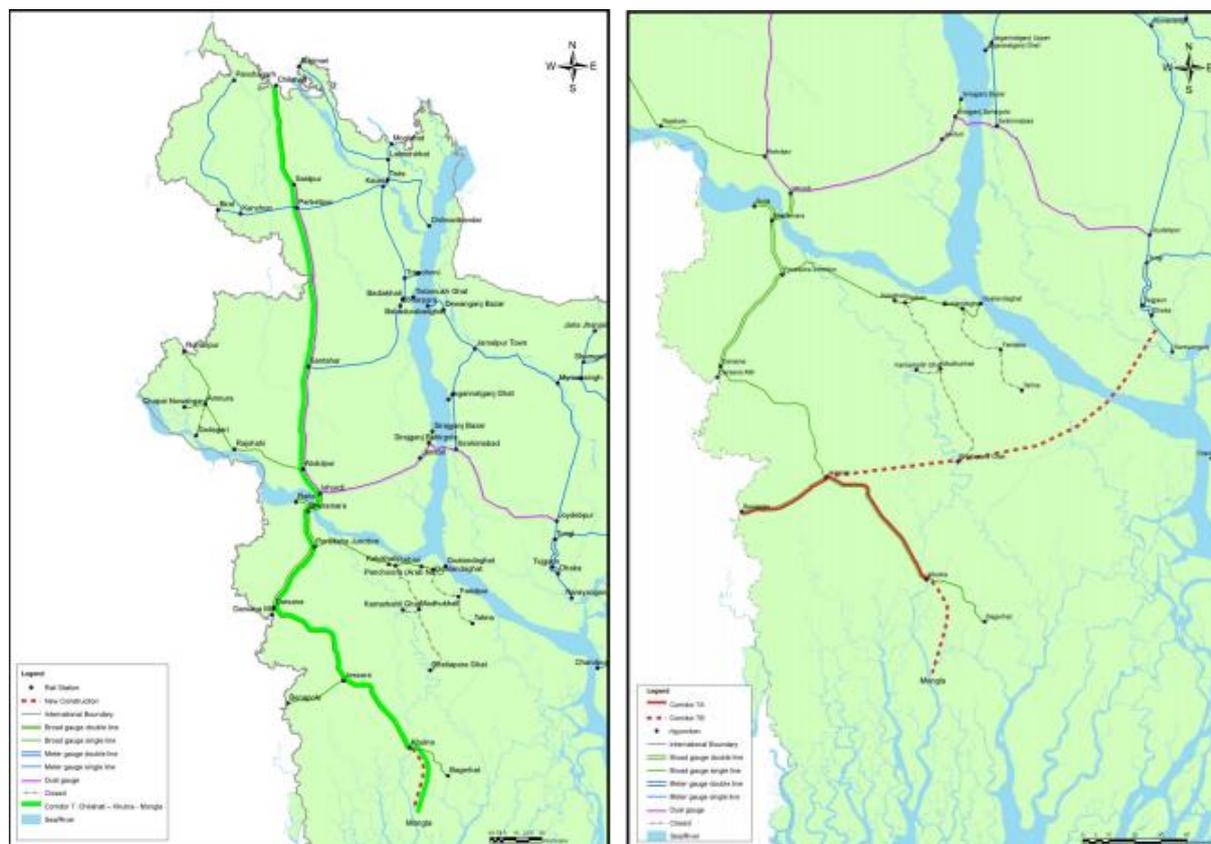
Table: Approximate travel time to major locations from Dhaka station

Location	Approximate Travel Time
Chittagong	5-6 hours
Jagannathganj Ghat	5 hours 30 minutes
Dinajpur	14 hours
Sylhet	6 hours 30 minutes
Noakhali	6 hours
Mymensingh	6 hours
Brahmman Baria	3 hours
Mohanganj	10 hours
Jamalpur	4 hours

Prominence of Faridpur and Dhaka railway station

Faridpur has connectivity to “Chilahati- Ishurdi- Khulna- Mongla corridor” which connects Khulna River Port (with a road link to Mongla seaport in the south to Chilahati border point in the north of the Bangladesh railways. This corridor is the busiest Broad Gauge section in the west zone of Bangladesh for passenger and freight transport of Bangladesh railway.

Figure: Chilahati- Ishurdi- Khulna- Mongla and Dhaka-Mawa-Jajira-Bhanga-Jessore-Khulna-Mongla rail corridors of Bangladesh railway



Source: Bangladesh Railway master plan, http://railway.portal.gov.bd/sites/default/files/files/railway.portal.gov.bd/page/67cd2529_587a_45b9_84e0_cd12c8d8c9bd/8.%20Formulation%20of%20BR%20Masterplan.pdf

The construction of Padma Bridge at Mawa – Jajira will open up new opportunities for Bangladesh Railway for linking Dhaka directly with Jessore and Mongla Port as well as southern part of Bangladesh. The whole Faridpur area is expected to fall in the catchment area of rail transport for passenger as well as freight traffic.

The new line (Dhaka-Jessore) will reduce the distance both for corridors 7A (Dhaka-Mawa-Jajira-Bhanga-Jessore-Khulna-Mongla) and 7B (Dhaka-Mawa-Jajira- Bhanga-Jessore-Benapole) and will become the shorter route for traffic originating from Faridpur areas and there as well as Rajshahi areas, because BG trains from that area will have no load restriction over proposed Padma Bridge as on Bangabandhu Bridge. There also is an ongoing work on “Re-opening of Pachuria – Faridpur – Pukuria section and construction of Pukuria – Bhanga railway line (GOB)” on Dhaka-Jessore corridor to carry new/additional traffic from Faridpur.³⁷

Dhaka railway station is the central railway station in Dhaka. Dhaka-Chittagong Cox’s Bazar- Deep Sea Port Corridor is the busiest rail track for passenger and freight transport. The line carried about 14 crore tonne-km freight in the year 2007 and of them, petroleum (diesel, kerosene and petrol), wheat, rice, marble and stone, fertiliser, sugar, iron and steel, and other grains were the prominent ones.³⁸

Figure: Dhaka-Chittagong Cox’s Bazar- Deep Sea Port Corridor of Bangladesh railway



Source: Bangladesh Railway master plan,
http://railway.portal.gov.bd/sites/default/files/files/railway.portal.gov.bd/page/67cd2529_587a_45b9_84e0_cd12c8d8c9bd/8.%20Formulation%20of%20BR%20Masterplan.pdf

³⁷ Bangladesh Railway (Formulation of Master Plan),
http://railway.portal.gov.bd/sites/default/files/files/railway.portal.gov.bd/page/67cd2529_587a_45b9_84e0_cd12c8d8c9bd/8.%20Formulation%20of%20BR%20Masterplan.pdf

³⁸ Bangladesh Railway (Formulation of Master Plan),
http://railway.portal.gov.bd/sites/default/files/files/railway.portal.gov.bd/page/67cd2529_587a_45b9_84e0_cd12c8d8c9bd/8.%20Formulation%20of%20BR%20Masterplan.pdf

5.6.3.3. Airport

Proposed Dohar EZ is located around 48 km from Hazrat Shah Jalal International Airport at Dhaka. The travel time by road to Dhaka International Airport is 2.5-3 hours (approximate). Dhaka international airport is accessible from the proposed EZ either by R820 or by Dhaka-Mawa highway. During site visit, it was observed that the road condition in Dhaka-Mawa highway is favorable for passage of heavy vehicles. However, the alignment of R820 needs repair and maintenance works for the stretch connecting Nawabganj to Keraniganj and near Kartikpur Bazar.

Basis secondary research, over 4 million international and 1 million domestic passengers as well as 150,000 MT of freight and mail exchange use Dhaka International airport. This airport has a freight village (warehouse), terminal buildings, hangers and other modern equipments for aircraft handling.³⁹

For ease in transportation of construction materials, rail station (airport rail station) is operation near the Dhaka International airport.

Govt. of Bangladesh intends to construct a new international airport (Bangabandhu Sheikh Mujib International Airport) with a view to create a hub airport in close proximity to Dhaka and to meet the demand of future growth in aviation sector. The Civil Aviation and Tourism Ministry is in the process to finalise the location of the proposed international airport. Some of the locations which are being considered as prospective locations for the development of new airport are: (1) Char Janajat under Shibchar Upazila in Madaripur district, (2) Keyain and Latobdi under Shirajdikhan Upazila in Munshiganj district and (3) Char Bilashpur under Dohar Upazila of Dhaka district.

5.6.3.4. Water Connectivity

Bangladesh, as a riverine country with 24,000 km waterways, has a navigable network varying from 5968 km during the monsoon to 3865 km during the dry season. Inland water transport (IWT) is an important mode of transport not only in the inland movement of freight and passengers but also in the transportation of import and export items through the ports of Chittagong and Mongla.⁴⁰ Inland waterways map of Bangladesh is illustrated in Annexure.

Moinat Ghat

Proposed EZ in Dhaka-Dohar is located on the bank of Padma River. Moinat Ghat is situated within the project boundary. During site visit, it was observed that primarily passenger conveying speed boats and motorized boats operate from Moinat ghat.

Naryanganj river port and Mawa ghat are located on Meghna River and Padma River respectively and are accessible from the proposed EZ by road and water modes of transportation. Basis discussion with local inhabitants, the stretch of Padma River passing through Moinat ghat and running through Narayanganj Port on north and Mawa ghat on south are navigable throughout the year. UNO official couldn't provide us exact information on available draft in this area. However, local boatmen informed us that average river draft around Dohar upzilla is around 2-2.5 m. Moinat ghat is utilized for passenger conveyance. However, it may be developed as a cargo terminal to transport goods to/ from the proposed EZ to all major ports of Bangladesh using the widespread inland waterways network. Any decision on the same needs detailed feasibility analysis.

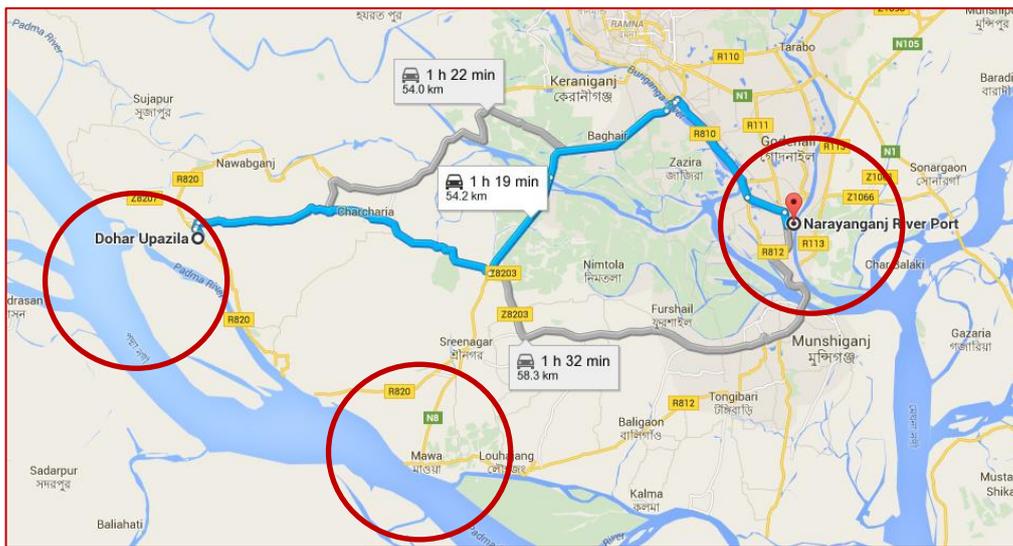
³⁹ <http://www.shahjalalairport.com/>

⁴⁰ BIWTA: Waterways Assessment Report

Figure : Photographs of Moinat Ghat



Figure: Locations of Narayanganj river port, Mawa ghat and Moinat ghat



Mawa Ghat

Following figure displays photographs of the Mawa ferry ghat.

Figure: Photographs of Mawa ghat



During site visit moderate traffic congestion was observed on the approach road linking Dhaka-Mawa highway to Mawa ghat. Following figure illustrates the same. Road condition appears to be favorable for passage of heavy vehicles.

Figure: Photographs of approach to Mawa Ghat



Basis discussions with BIWTA officials, it was informed to us that there are total 18 ferries (for both cargo and passengers) providing 24x7 services from Mawa ghat to Kawrandi ghat and average frequency is 25 -35 ferries per day.

Two types of ferries (both for passenger and cargo) are being operated from Mawa ghat:

- **Big Ferry:** Capacity: 12 Trucks or 18 Buses or 50 Cars
- **Utility Ferry:** Capacity: 6 Trucks or 9 Buses or 25 Cars

Mawa ghat is connected to Kawrakandi ghat on the other part of the river. Kawrakandi ghat provides access to places such as Zajira, Shariatpur, Khulna, Jessore etc. Both Mongla port and Chandpur port are accessible from Kawrakandi ghat.

Following figure shows the connectivity from Kawrakandi ghat.

Figure: Connectivity from Kawrakandi ghat



Narayanganj River Port

Cargo handling capacity of Narayanganj river port is outlined in the following table.

Table: Cargo handling capacity of Narayanganj river port

Capacity	Bulk	Container	General Cargo
	MT/month	MT/month	MT/month
Total handling capacity of the port	55.500	-	12.500
Monthly activity of the port	46.585	-	11.750
Current monthly use by WFP	Nil	Nil	Nil
Potential monthly use by WFP	500	Nil	Nil
Monthly use if augmented	600	Nil	500

Most of the bulk cargo discharged at this port consist of sand, stones, cement clinker and fly ash whereas food grains are discharged in bagged form. Almost 62% of bulk cargo discharged into this port constitutes fly ash. Narayanganj river port also has a fuel depot at Godnail. Capacity of this fuel depot is 75.000 MT and Monthly activity is 68.000 MT.

Narayanganj river port has four warehouses of 700 square metres each. The port also has an area of 5.067,28 square metres which is available for open storage.

Following table indicates the vessel specification at Narayanganj port.

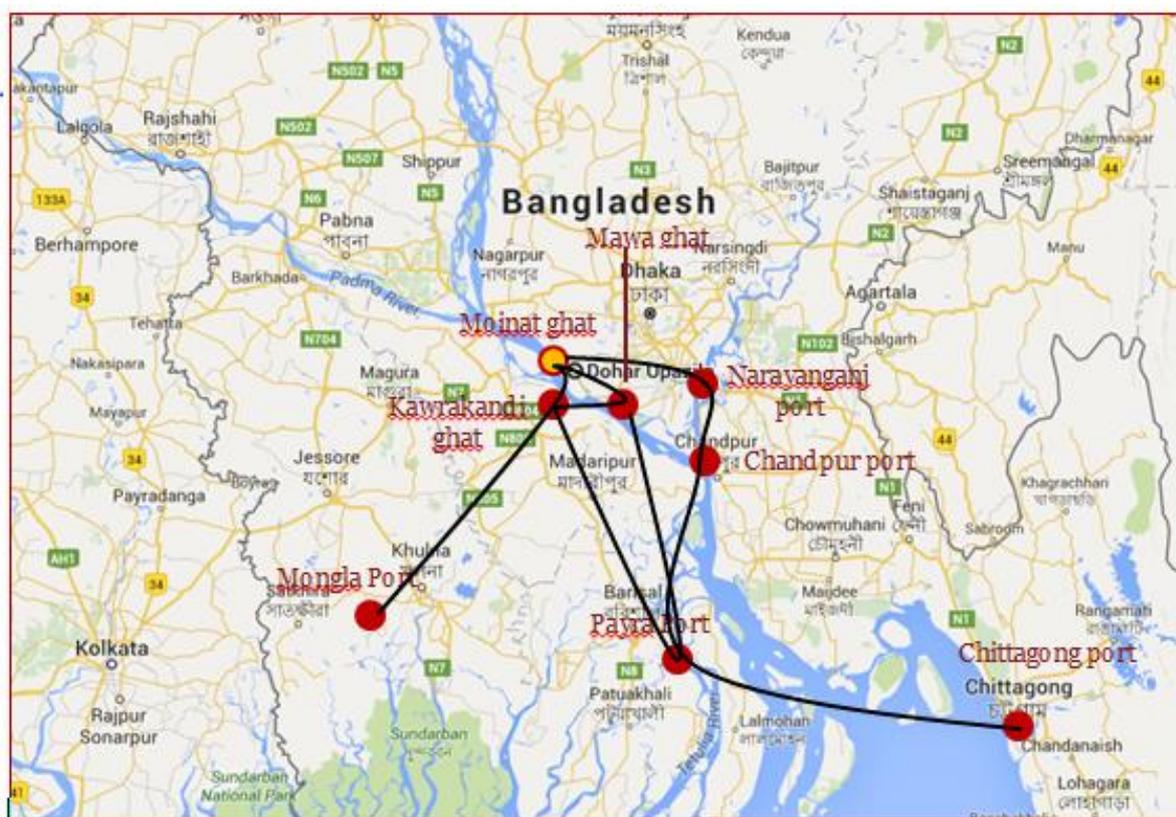
Table: Vessel specification of Narayanganj river port

Specification	Nb	Bulk		Conventional	
		Min (m)	Max (m)	Min (m)	Max (m)
Berths	05	-	-	-	-
Anchorage	08	-	-	-	-
Draught at anchor	metres	3,66	3,66	3,66	3,66
Draught at Berth	metres	3,66	3,66	3,66	3,66
Length Over All	metres	180	220	180	220
Beam (maximum)	metres	-	-	-	-

From preliminary assessment, it seems that the proposed EZ has good access to waterways. It is connected to Mawa ghat and Narayanganj river port, which in turn are connected to major ports of Bangladesh.

Broad level preliminary assessment indicates that the proposed EZ seems to be fit for waterways connectivity. Following figure depicts the waterways connectivity potential of the proposed EZ

Figure: Waterways connectivity potential of the project site



Major river ports/ ports which could be connected from the proposed EZ as depicted in the above figure are:

- Mongla Port
- Chandpur Port
- Payra Port
- Chittagong Port

Please refer chapter on “Snapshot of Infrastructure Linkages in Bangladesh” for further information on cargo handling and capacity etc. for Mongla Port, Chittagong Port.

Potential for Cross-Border Trade

Connectivity to Mongla Port and Chittagong port could enable cross-border trade with countries like India, Myanmar, Singapore etc.

In June 2015, India and Bangladesh renewed a bilateral trade agreement and inked two separate pacts on coastal shipping the use of Bangladesh’s Chittagong and Mongla ports. Indian merchant vessels can now use the two ports to directly ship cargo to Bangladesh, instead of routing goods through ports such as Singapore. This will bring shipping time down to a week or less.⁴¹

Also, India and Bangladesh have agreed on the extension of Protocol on Inland Water Transit and Trade (PIWTT) with the provision of automatic renewal in line with the proposed amendment to Bangladesh-India trade agreement.⁴² As per PIWTT, Narayanganj, Mongla, Khulna and two more ports are “Ports of Call” to provide facilities to the vessels of the India.

Broad level assessment reveals that if the Moinat ghat could be developed as cargo terminal, it has the potential for cross-border trade as well. However, any further decision on the same involves detailed feasibility analysis and master planning.

⁴¹ <http://www.hindustantimes.com/india-news/modi-visit-all-you-need-to-know-about-india-bangladesh-pacts-on-boundary-and-trade-/article1-1355921.aspx>

⁴² http://articles.economicstimes.indiatimes.com/2015-04-21/news/61379041_1_inland-water-transit-bangladesh-delegation-bangladesh-side

5.6.3.5. Assessment of Intermodal Cargo Transfer

This section attempts to carry out a broad level assessment of the possibilities of linking the proposed EZ through different modes of transportation. All the other modes of transportation (other than road) require multimodal transport. Attempt has been made to evaluate the potential of integrating different modes of transportation with the proposed EZ. It is envisaged that integration of rail, water and air mode of transportation via road accessibility need to be assessed. However, this assessment is carried out at a broad level on the basis of the preliminary assessment. Any further decision on the same needs to be taken after detailed feasibility analysis.

Rail Connectivity: Faridpur rail station is located on other side of the river and it has to be accessed via Dhaka-Faridpur Highway and river crossing at Paturia ferry terminal. Travel time (distance) is around 3.5 hours (91 km). Requirement of a bridge over Padma river is essential for connecting the proposed EZ with this railway station.

Kamalapur rail station in Dhaka is approximately 50 km away (by road) from the proposed EZ and travel time by road is 1.5 hours (approximate). Dhaka railway station could be accessed through R820 road (Zinzira-Keraniganj-Nawabganj-Dohar-Srinagar Road) or by Dhaka-Mawa highway. There is an inland container depot (ICD) near Kamalapur railway station. Cargo handling capacity of the ICD is 90,000 TEUs annually, but cargo storage facility is not available at the ICD. Kamalapur railway station is the central railway station in Dhaka. Dhaka-Chittagong Cox's Bazar- Deep Sea Port Corridor is the busiest rail track for passenger and freight transport. The line carried about 14 crore tonne-km freight in the year 2007 and of them, petroleum (diesel, kerosene and petrol), wheat, rice, marble and stone, fertiliser, sugar, iron and steel, and other grains were the prominent ones. Dhaka-Mawa highway also provides seamless access from the proposed EZ to the rail station.

Preliminary assessment indicates that linking the proposed EZ with rail mode of transport is a possibility; however this is subjected to detailed feasibility assessment. Broad level assessment depicts that proposed EZ may be integrated with Kamalapur rail station.

Water Connectivity: Location of Moinat ghat inside the project area could be utilized to connect the proposed EZ to Mawa ghat, Narayanganj river port and other major ports of Bangladesh. Mawa ghat and Narayanganj riverport could be accessed both by roadways and waterways as detailed in previous section.

From Mawa ghat, several other locations such as Jessore, Khulna, Zajira etc. are accessible. Narayanganj river port is an important port in Bangladesh and various cargos are transported from this river port. Prominence of Mawa ghat and Narayanganj river port is detailed in previous section on waterways connectivity of the proposed EZ.

Proposed EZ is located at the central part of Bangladesh and upon development of Moinat ghat as a cargo terminal, it may envisage seamless movement of cargo via waterways to Mongla Port, Chittagong Port and other major ports/ ferry terminal of the country.

Broad level assessment depicts that there is a good possibility to integrate the proposed EZ with major ports of Bangladesh via waterways.

Airport Connectivity: Proposed Dohar EZ is located around 48 km from Hazrat Shah Jalal International Airport at Dhaka. The travel time by road to Dhaka International Airport is 2.5-3 hours (approximate). Dhaka international airport is accessible from the proposed EZ either by R820 or by Dhaka-Mawa highway. During site visit, it was observed that the road condition in Dhaka-Mawa highway is favorable for passage of heavy vehicles. However, the alignment of R820 needs repair and maintenance works for the stretch connecting Nawabganj to Keraniganj and near Kartikpur Bazar.

Access via Dhaka-Mawa highway would provide seamless cargo transfer to/ from the proposed EZ. Proximity to Dhaka international airport would also enable ease in transfer of cargo.

5.7. Resettlement issues

5.7.1. Social impacts

The impacts have been assessed on the following parameters:

- (i) Loss of land (for existing land owners),
- (ii) Loss of homes/structures,
- (iii) Loss of Trees
- (iv) Loss of livelihood systems/ income opportunity
- (v) Loss of water bodies.
- (vi) Resettlement issue pertaining to approach road
- (vii) Resettlement issue pertaining to Moinat Ghat and existing temporary shops

The expected types of losses are described in the following sub-sections.

5.7.1.1. Loss of land

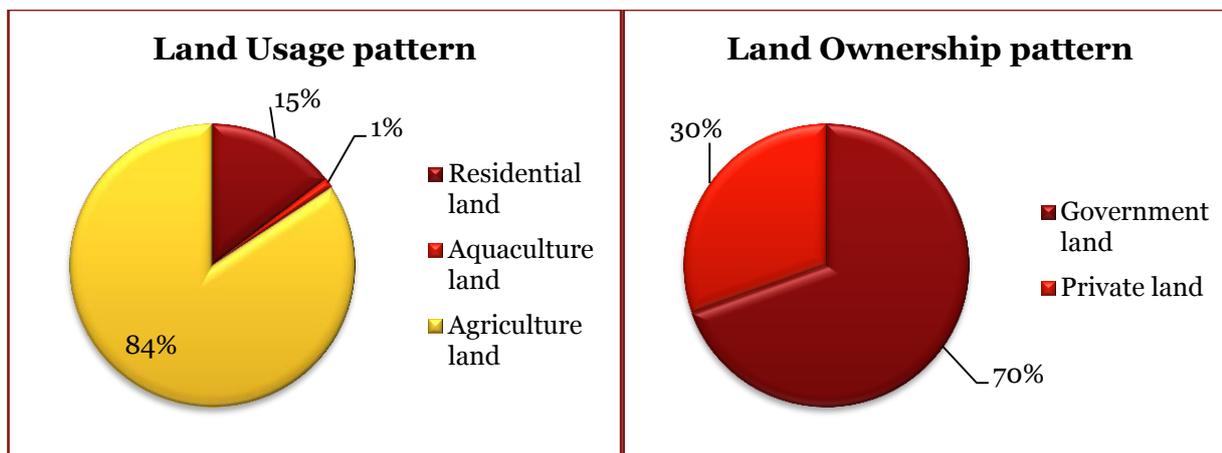
To establish the Dohar EZ project, a total of 316.35 acres of land has been demarcated by the authority. As per Field Measurement Book (FMB) superimposed on google map the total area works out to approximately 316.65 acres. The land usage pattern for this area is as under:

- Residential land- 45.00 acre (approx.)
- Aquaculture- 3.51 acre (approx.)
- Agricultural land- 260.00 acres (approx.)

Ownership pattern of the land is as follows:

- Government- 219.90 acres of land under vested property
- Private land - 96.45 acres

Figure: Land Ownership and Usage pattern



Source: Data collected from Dohar UNO Office

As a result of the development of the project, residential land owners and agricultural land owners will lose entire land holding.

5.7.1.2. Loss of homes/structures

As informed us by the UNO officials, due to the development of this project, 35 household structures will be directly affected. This includes dwellings and associated infrastructures are to be re-located. All

affected structures are 'kutchha' structures and the average size of the structures is 200 sq. ft. with a minimum size of 140 sq. ft. and a maximum of 300 sq. ft.



5.7.1.3. *Loss of trees*

Loss of trees in the project area is less. Basis discussion with local inhabitants, around 200-350 number of trees might be located within the project area. However, during master planning stage this needs to be ascertained. The master plan (during the feasibility stage) can be prepared in a way that maximum number trees could be retained and earmarked as green area.



5.7.1.4. *Loss of income/livelihood*

As a result of loss of agricultural land, the following would be directly affected:

- Local farmers,
- Sharecroppers,
- Yearly lease holders (agricultural land)
- Owners of agricultural assets (deep tube-wells and shallow tube-wells etc.)

Indirectly, seasonal agriculture labours, fishermen and crop traders will be affected. Basis preliminary assessment and details shared by UNO office, Resettlement Action Plan (RAP) would need to be formulated for 35 numbers of households and 15 fishermen (approx.). These households could stand to lose their income/livelihood as a result of the development of the project.



5.7.1.5. Loss of water bodies

There are two major fishponds located within the proposed EZ. The surroundings of the EZ have been observed as a rich fishing ground. Project interventions i.e. land filling of the existing water bodies and discharge of waste water along the river might affect the fish spawning & nursing ground and subsequently income source from cage culture & pen culture (katha fishing). Therefore, significant environmental and social impacts are anticipated. Basis information obtained from the UNO officials, around 15 families are undertaking finshing activities within the project area.

Figure: Fish pond located inside the project area



5.7.1.6. Resettlement Issue due to the construction of approach road

As discussed in section on road connectivity of the proposed EZ, widening of the existing approach road (Kartikpur-Moinat Ghat road) connecting the proposed EZ is restricted owing to the presence of resettlements along the approach road.

Preliminary assessment suggests that the option of providing a new approach road to the proposed EZ could be further explored. A high level initial assessment suggests that a new approach road to North-West land parcel of the proposed EZ may be undertaken. However, it is subjected to topography survey and detailed feasibility analysis.

5.7.1.7. Resettlement Issue due to Moinat ghat and temporary shops

One non-functional ferry ghat (Moinat Ghat) is located inside the area of the proposed EZ. There is a bus terminus from where buses depart for Dhaka and some temporary shops located adjacent to Moinat Ghat. Basis discussion with UNO officials, these temporary shops are illegal and resettlement won't be a concern. UNO official informed us that there are around 20-30 temporary shops located in this area.

Figure: Bus Terminus and temporary shops inside the project area



Once the proposed Dohar EZ is functional, the operation of the bus terminus, Moinat Ghat and these temporary shops need to be shifted to nearest possible location.

5.7.2. Summary of the constraints and suggested mitigation

The major constraints and suggested mitigation are presented in in the following table.

Table: Major Constraints and Mitigation measures

Sl. No.	Constraints	Mitigation measures
1	Low lying land	Basis preliminary assessment, landfilling of depth 14-17 feet needs to be undertaken.
2	Residential units	35 units need to be rehabilitated as a result of the development of this project.
3	Loss of trees	Trees existing in the site can be retained and earmarked as green area during the preparation of master plan.
4	Loss of water bodies	Land filling need to be undertaken for two fish ponds located within the proposed EZ.
5	Loss of income/livelihood	Basis preliminary assessment and details shared by UNO office, Resettlement Action Plan (RAP) would need to be formulated for 35 numbers of households (approximate) and 15 fishermen families. These households could stand to lose their income/livelihood as a result of the development of the project.
6	Resettlement Issues due to construction of approach road	The widening of existing approach road connecting the proposed EZ is restricted owing to the presence

		of settlements located on both sides of the road. Preliminary assessment suggests that construction of a new approach road to the proposed EZ could be further explored. Detailed topographical survey and feasibility analysis need to be carried out for the same.
7	Resettlement issues of Moinat ghat, bus terminus and temporary shops located inside the project area	Once the proposed Dohar EZ is functional, the operation of the bus terminus, Moinat Ghat and temporary shops need to be shifted to nearest possible location.

5.7.3. Block Cost Estimation for development of Offsite Infrastructure

Based on preliminary assessment and available information (the schedule of rates published by the competent public authorities, prevailing market prices, in-house data bank and experience gained over similar / comparable development), the Block Cost estimate for the proposed offsite infrastructure components required for developing EZ has been calculated.

Wherever applicable, we have considered all the possible options to arrive at the cost of development and the option of maximum development cost is considered to arrive at the total cost of the proposed offsite infrastructure development. This exercise has been carried out to indicate the approximate cost to be incurred for the development of EZ and it may vary to any extent during implementation stage depending upon the detailed technical information and new developments which may affect / contribute to this EZ. The techno-commercial viability of these options needs to be explored during feasibility stage.

Following table depicts the broad level Block Cost estimates for development of Offsite infrastructure for Dohar EZ. The figures provided are indicative and may vary depending on the master planning, feasibility analysis and the timeline of development activities.

The broad Block Cost estimate for off-site infrastructure development for proposed Dohar EZ is calculated as BDT 34,018 Lakh (approx.)

Table: Block Cost Estimation for proposed Dhaka Dohar EZ

S.No	Description	Option -1			Option -2			Considered cost option		
		Qty	Unit	Amount in Lakh BDT	Qty	Unit	Amount in Lakh BDT	Qty	Unit	Amount in Lakh BDT
1	Site filling	Lumpsum		21893	Lumpsum		21893	Lumpsum		21893
2	Compound wall	6003	Mtr	570	6003	Mtr	570	6003	Mtr	570
3	Diaphragm wall	2800	Mtr	1120	2800	Mtr	1120	2800	Mtr	1120
4	Approach Road (10.50 mtr Carriage way)	6.5	Km	4687	10	Km	7210	10	Km	7210
5	Electrical (External connectivity- 33 kv LINE with 33/11 KV substation)	12	KM	1520	12	Km	1520	12	Km	1520
6	Water supply - Water Intake from River - 6.64 MLD	1.5	KM	1705				1.50	Km	1705
7	Water supply (Water from Bore well- bore well 4 Nos - 6.64 MLD				5	Km	556			
	Total			31494			32869			34018

5.8. Voice on the Ground

5.8.1. Stakeholder consultation

Following table lists the details of stakeholders consulted at UNO office to obtain first-hand information from about the proposed EZ.

Table: Stakeholders consulted

Name	Description	Phone number
Mr. Saidar Islam	Engineer	+8801712069614
Mr. Habibur Rahman	Surveyor	+8801711666711
Mr. Khader Mastitur Rahaman	AC land	
Mr. Nurul Karim Bhuiya	UNO	+8801713081353
Mr. Lathif		+8801769400138

5.8.2. Consultation with Private Sector

Further to the site visit for the initial assessment, private sector consultation was also carried out to understand the preliminary level demand assessment of the proposed EZ to gauge the interest of unit investors from various sectors. Some of the major aspects which were discussed with the private investors to understand their interest are as below:

- Location attractiveness
- Availability of physical infrastructure
- Availability of social infrastructure
- Ease of availability of quality manpower
- Marketability of the site
- Support required from the Government

We discussed the salient features of the proposed EZ with various investors in Bangladesh to understand how attractive this project is for them. Also, we tried to understand the macro level infrastructure requirements that any investor looks upon before making an investment decision. The results of the Private Sector consultation are summarized in the following table.

Table: Summary of the results of the Private Sector consultation

Sl. No.	Parameters	Discussions	Excerpts from the interaction (if any)
Infrastructure aspects that investors take into consideration while making investment decisions:			
1	Connectivity of the site	According to the investors, the EZ site should be located in the proximity of any industrial center &/or city. The connectivity by road, rail and airport should be excellent and also the access to port is important as this will ease the conveyance of the finished goods to	<p><i>“In my opinion, connectivity is the prerequisite in the investment decisions for any economic zone site.”</i></p> <p>- Abdul Monem Limited, Bangladesh</p>

		<p>customers.</p> <p>The proposed site in Dohar is located near to Dhaka city and it is located in the northern region of Dhaka division which is prone to industrial development. Proposed EZ could stand a chance to gain significantly from the proximity to the industrial hub such as Narayanganj, Munshiganj etc.</p>	<p><i>“Domestic investors might get interested in economic zones coming up in this region of the country.”</i> - Orion Group, Bangladesh</p> <p><i>“Dohar EZ can easily access Dhaka airport by Bypass Road”</i> - AK Khan & Company Limited., Bangladesh</p>
2	Proximity to Port	<p>Access to port is very important for development of multi-product EZs as it will facilitate easy transportation of raw materials and finished goods.</p> <p>However, sea ports in Mongla and Chittagong are situated at a distance of more than 250 km from the Dohar EZ.</p>	<p><i>“The proximity to river port is very important for any textile industry to develop.”</i> - NASSA Group, Bangladesh</p> <p><i>“We look for proximity to port while selecting a site.”</i> - AK Khan & Company Limited., Bangladesh</p>
3	Utility Connection	<p>For a multi-product EZ to function and for manufacturing units to effectively continue production, access to power supply, water availability and gas supply is very important.</p> <p>Proposed EZ has good access to power and water, however, gas availability is a concern. Investors expressed that it would be difficult for heavy industries to operate in this economic zone.</p>	<p><i>“Availability of Gas, Power and Water is the prerequisite to set up any manufacturing based industry.”</i> - Orion Group, Bangladesh</p>
Marketability of proposed Dohar EZ:			
4	Location of the site	<p>The proposed EZ is located near to Dhaka city and it has access to various nearby industrial hubs of Bangladesh.</p> <p>Investors communicated to us that due to easy access to the capital city, domestic investors might get attracted in Dohar EZ.</p>	<p><i>“Dohar has access to the industrial belt of Bangladesh and it is nearby Dhaka city. We feel that this EZ has good prospect.”</i> - A K Khan & Company Limited, Bangladesh</p>
5	Demand among local unit investors	<p>Investors felt that the demand of the proposed EZ would be high among the domestic investors. They also felt that industries such as textile (RMG based),</p>	<p><i>“Demand among local investor should be quite high.”</i> - Orion Group, Bangladesh</p>

		food processing etc. stand a chance to flourish in the proposed EZ.	
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5.9. Overall Adequacy of the EZ Site in Dohar

Evaluation of the proposed EZs with respect to key parameters required to establish multi product economic zones are presented in following table.

Table2: Overall Adequacy of the Dohar EZ Site

Sl. No.	Parameters	Illustration of the present facilities	Remarks/ Analysis
A	Connectivity		
1 (A)	Road Connectivity Existing Road Connectivity to Dhaka and other major cities of Bangladesh	<ul style="list-style-type: none"> ➤ R820 (Zinzira-Keraniganj-Nawabganj-Dohar-Srinagar Road) and N8 (Dhaka Mawa highway) connect Dohar with Dhaka and other major cities of Bangladesh. ➤ Dohar-Mawa Road connects the proposed EZ to N8. During site visit, the road conditions in both the stretches (N8 and Dohar-Mawa Road) were observed to be favorable for passage of heavy vehicles. ➤ Preliminary assessment depicts that some maintenance works might be required to improve the road condition in R820. But, road condition of Dhaka-Mawa highway is excellent and it's supposed to be upgraded to four lanes. ➤ Proposed Padma Bridge is located at a distance of around 40 km from the proposed EZ. Once Padma Bridge is operational, proposed EZ in Dohar would have excellent access to the other part of Padma River (Jajira, Bhanga, Mongla etc.) 	<p>For any Multiproduct EZ to develop the site must be near to the main city and the connectivity via road should be excellent.</p> <ul style="list-style-type: none"> ➤ The proposed EZ in Dohar has good road connectivity to Dhaka and other major cities of Bangladesh. ➤ Dhaka-Mawa highway provides excellent access to the proposed EZ from Dhaka city ➤ Padma Bridge, once operational would enable seamless movement of cargo vehicles to the other side of Padma River, which in turn would facilitate easy sourcing of raw materials and transport of finished goods to/ from various locations of Bangladesh.

<p>1 (B)</p>	<p>Road Connectivity Last Mile Connectivity</p>	<p>Existing approach road (1.5 km length) from Kartikpur Bazar to Moinat Ghat is a single lane Kutcha road. During site visit, it was observed that widening of this stretch would attract resettlement problem.</p>	<p>The alignment for an approach road is essential for developing a multiproduct EZ as it shall enable the access for the manpower and heavy commercial vehicles to national highways and expressways.</p> <p>A broad level initial assessment indicates that a new approach road may be proposed which would connect Kartikbazar area to the North-West land parcel of the proposed EZ. However, it is subjected to topography survey and detailed feasibility analysis.</p>	
<p>2</p>	<p>Rail Connectivity</p>	<p>Preliminary assessment depicts that there are two possibilities for rail connectivity to the proposed EZ.</p> <ul style="list-style-type: none"> ➤ Faridpur Railway station: It is located at 91 km (approx.) from the proposed EZ. Access takes place Dhaka-Faridpur highway and ferry crossing at Paturia Ferry Terminal. ➤ Kamalapur Railway station: it is located at a distance of 50 km (approx.) and could be accessed through Dhaka-Mawa highway. ICD is located in Kamalapur rail station but Cargo storage facility is not available. Last mile connectivity to Kamalapur rail station takes place via Toyenbee Circular Road/ Kamalapur Road. This stretch experiences moderate traffic congestion. 	<p>Rail mode of transportation is vital for goods with high volume and timeliness of delivery.</p> <p>At present there is no rail connectivity in the vicinity of Dohar upzila.</p> <p>Due to lack of direct connectivity, access to Faridpur rail stations seems difficult, until the construction of Padma bridge.</p> <p>Preliminary assessment highlights possibility of access to Kamalapur rail station.</p> <p>After the construction of Padma bridge, rail connectivity would be available near to Mawa Ghat. Access to Padma bridge would take place by Dohar-Mawa Road.</p> <p>For last mile connectivity to the proposed EZ, existing approach road seems to be inadequate for widening for larger volume transportation (for rail transportation)</p>	

3	Water Connectivity	<p>Location of Moinat ghat inside the project area could be utilized to connect the proposed EZ to waterways network of Bangladesh (such as Mawa ghat, Narayanganj river port and other major ports of Bangladesh etc.). Mawa ghat and Narayanganj riverport could be accessed both by roadways and waterways from the proposed EZ.</p> <p>Proposed EZ is located at the central part of Bangladesh and upon development of Moinat ghat as a cargo terminal, it may envisage seamless movement of cargo via waterways to Mongla Port, Chittagong Port and other major ports/ ferry terminal of the country.</p>	<p>Broad level assessment depicts that there is a possibility to integrate the proposed EZ with major ports of Bangladesh via waterways.</p> <p>However this is subjected to development of Moinat ghat as a cargo terminal. For any such decision, detailed feasibility analysis needs to be undertaken.</p>	
5	Airport Connectivity International airport in the proximity	<ul style="list-style-type: none"> ➤ Proposed EZ is located at a distance of 48 km (approximate) from Hazrat Shah Jalal International airport in Dhaka. Travel time is around 2.5 hours by road. ➤ Dhaka international airport is accessed through Dhaka-Mawa highway. During site visit it was observed that this road alignment is favorable for passage of heavy vehicles. ➤ Govt. of Bangladesh intends to construct a new international airport (Bangabandhu Sheikh Mujib International Airport) with a view to create a hub airport in close proximity to Dhaka and to meet the demand of future growth in aviation sector. Location for the same is yet to be finalized. 	<p>For movement of goods by air cargo, proximity to airport is essential. Dhaka Airport is only 48 km (approx.) from the proposed EZ.</p>	
B	Utility Connections			
1	Power Availability	<ul style="list-style-type: none"> ➤ Basis discussion with REB officials, existing Dohar substation (20 MVA capacity) has no surplus power available. ➤ REB officials informed us that there is a proposal to setup 33/11kv new substation at Mohabadpur with a capacity of 20 MVA. ➤ One 132 kV grid substation (World Bank 	<p>24×7 uninterrupted electricity supply is a prerequisite for development of any manufacturing facility.</p> <p>Possibility of 24×7 uninterrupted electricity supply could be sourced from the proposed grid substation (10 km from the site).</p>	

		<p>funded project) has been proposed in Hashnabad with a capacity of 50 MVA. It is located at a distance of 10 km (approximate) from the proposed EZ.</p>	<p>Basis working knowledge and best practices followed, power requirement in a typical EZ could be transmitted by a dedicated 33 KV line for demand up to 25 MW. If the demand is more than 25 MW, then the option of 132 KV transmission lines needs to be further explored. Proximity to 33 KV power connection and surplus power availability in the vicinity of the proposed EZ are the crucial factors to decide on the potential of power availability to the proposed EZ.</p>	
2	Water Availability	<p>Basis preliminary assessment, the water requirement for the proposed EZ could be met with the intake from either extracting water from the Padma river adjacent to the site boundary or from bore wells which could be developed within the project area.</p> <p>Basis interaction with local inhabitants and UNO officials, the ground water is available at a depth of 200 feet approximately from natural ground level.</p> <p>Preliminary assessment suggests that extracting water from river located on the western boundary of the proposed EZ may be considered by providing suitable intake system and water treatment plant. Exact location of water intake needs to be finalized during the master planning stage.</p> <p>Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/ day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Dhaka Dohar EZ is around 2.69 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could be extracted through bore wells.</p>	<p>It is very important to have adequate and sustainable source of potable water for the development of multiproduct EZ so that the labours don't face any scarcity of drinking water. The industrial units need uninterrupted supply of good quality water for industrial consumption.</p> <p>Extraction of more water through bore wells might result in depletion of the aquifer level. Proposed site has proximity to Padma River, thus the option of extracting water from Padma River may be further explored. Decision regarding extraction of water from bore well/ Padma River needs to be taken after detailed feasibility analysis.</p>	
3	Gas Availability	<ul style="list-style-type: none"> ➤ Gas pipeline is available near BSCIC, Keraniganj which is located at a distance of 	<p>Gas supply is a prerequisite for development of any manufacturing</p>	



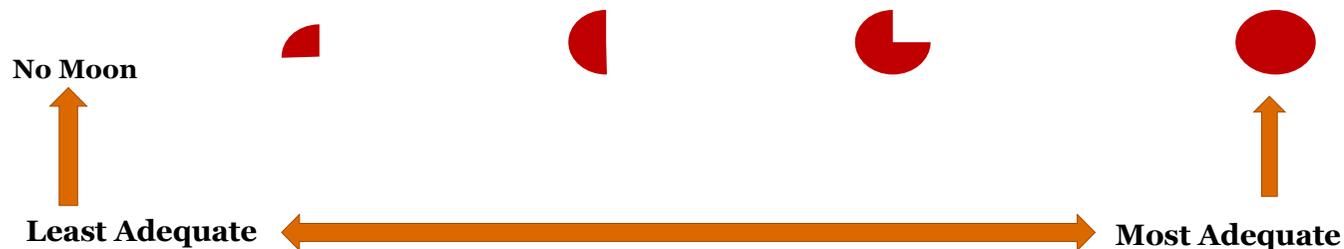
		40Km (approximate) from the proposed EZ. However basis discussion with industries at BSCIC Keraniganj, gas pressure obtained is not adequate.	facility. Non-availability of gas would discourage various industries (textile, cement, heavy engineering, electronics, leather etc.) from establishing their units in the proposed EZ.	
C	Suitability for industrial development			
1	Existing industrial ecosystem and Possible Backward linkages for industries	<ul style="list-style-type: none"> ➤ Dohar upzilla hasn't witnessed any significant industrial proliferation. Very few industries (cottage and small scale in nature) are located in and around the proposed EZ. However, proximity to Dhaka may induce industrialization in future. ➤ The land in this area is fertile in nature due to the proximity of Padma River, as a result the land is suitable for cultivation of various crops such as (but not limited to) rice, pulse, jute, seasonal vegetables etc. Sand extracted from Padma River is a major natural resource of this area.⁴³ ➤ This area is located near to Nawabganj, Munshiganj and Narayanganj. These areas are industrial hubs of the country. Some of the popular industries in these areas are: fabrics, steel, cotton, food processing, light engineering, shipbuilding etc. 	<p>Existing industrial ecosystem facilitates easy development of industries in the economic zone based on backward linkages and ease in raw material sourcing.</p> <p>Proximity to Nawabganj, Munshiganj and Narayanganj would enable industries (based on backward and forward integration of existing industries) to develop in the proposed EZ.</p>	
2	Proximity to major cities	Dohar EZ is located in close proximity to Dhaka city.	Proximity to major cities facilitates the proliferation of industrial development. Existing industrial ecosystem provides access to raw material sourcing and skilled manpower.	
D	Challenges in developing the economic zone			

⁴³ <http://dohar.dhaka.gov.bd/node/1476008/>

	(Resettlement Issues and social aspects)			
1	Landfilling	Basis preliminary assessment, landfilling of depth 14-17 feet needs to be undertaken.	Landfilling has to be done for the entire site, which means some initial cost has to be borne before the commencement of the development works. Depth of landfilling is approximately equal to the average depth of landfilling throughout the other six sites.	
2	Residential units to be rehabilitated	Basis preliminary assessment, 35 units need to be rehabilitated as a result of the development of this project.	Rehabilitation and resettlement issues expected	
3	Resettlement issues of Moinat ghat, bus terminus and temporary shops located inside the project area	Once the proposed Dohar EZ is functional, the operation of the bus terminus, Moinat Ghat and temporary shops need to be shifted to nearest possible location.	Rehabilitation and resettlement issues expected	
4	Other Resettlement Issues	<ul style="list-style-type: none"> ➤ Basis preliminary assessment and details shared by UNO office, 35 households (approximate) and 15 fishermen families could stand to lose their income/livelihood as a result of the development of the project. ➤ Land filling need to be undertaken for two fish ponds located within the proposed EZ. 	Mentioned resettlement aspects need to be considered before the development of the economic zone project.	
E	Availability of Social Infrastructure			
1	Availability of good residential facility in the nearby areas	Dwelling units and residential facilities are available for labours in Karthikpur, latakula and Jaipara.	The labours working in the proposed EZ shall have access to the dwelling units and residential areas within 5-10 km radius of the proposed EZ. For residential requirements for executives working in the economic zone, good quality residential facilities may need to be developed within the	

			EZ.	
2	Medical facilities available in the nearby areas	<p>One government hospital (Upzilla Health Complex) is available in Dohar sub district with 50 beds and a private hospital in the Pourashava.</p> <p>For serious medical treatment, patients need to travel to Dhaka.</p>	<p>There are few medical facilities available within 10 km radius of the proposed EZ to cater to the healthcare requirements of the workforce.</p> <p>Major healthcare facilities are available in Dhaka city (50 km away from proposed EZ).</p>	
3	Air and water pollution at the site (prevailing condition)	<p>The site is free from air and water pollution and no significant noise was observed when the site visit was undertaken.</p> <p>The incidence of water and air pollution at the site is insignificant. Also, the incidence of water borne diseases wasn't recorded in the locality.</p>	<p>The location of any multi product EZ should ideally be free from air and water pollution. Pollution would lead to health hazards and non-conducive working environment for the workforce. From the initial site assessment, it appears that the site is free from all such pollution problems.</p>	
4	Availability of manpower	<p>Dohar upazilla has 3 government colleges, 40 secondary schools, 56 primary schools and 1 Technical and Vocational education facilities.</p> <p>Dohar being well connected to Dhaka city enjoys the availability of several educational institutions in and near Dhaka city. There are a total of 26 technical and vocational institutions and 44 universities located in Dhaka district, which could cater to the manpower requirements of proposed EZ.</p>	<p>Availability of manpower is a prerequisite in development of multiproduct economic zones.</p> <p>Dhaka is in close proximity to the proposed EZ. Quality manpower could be sourced from the educational institutions around Dhaka.</p>	

Legend:



5.10. SWOT Analysis of Dhaka-Dohar Economic Zone

Based on the detailed analysis carried out, a SWOT analysis is developed as depicted below:

Parameters	Strengths	Weaknesses
Last mile connectivity	Basis preliminary assessment, another approach may be proposed to connect the North-East part of the land parcel from Kartikpur Bazar.	Widening of existing approach road (1.5 km length) from Kartikpur Bazar to Moinat Ghat seems difficult as it may attract resettlement problems.
Water availability inside the proposed EZ	<ul style="list-style-type: none"> Proposed EZ is located adjacent to Padma River. Preliminary assessment suggests that extracting water from river located on the western boundary of the proposed EZ may be considered by providing suitable intake system and water treatment plant. Exact location of water intake needs to be finalized during the master planning stage. 	Basis discussion with UNO officials, ground water is available at a depth of 200 feet (approx.) from natural ground level.
Block cost of off-site infrastructure development		Block cost estimate for off-site infrastructure development is BDT 34,018 lakh. Block cost estimate for off-site infrastructure development for unit area is calculated at 107.53 BDT lakh per acre, which is second highest.
Social and resettlement aspects		<ul style="list-style-type: none"> Landfilling of around 14-17 feet is envisaged Basis preliminary assessment and details shared by UNO office, 35 households (approximate) and 15 fishermen families could stand to lose their income/livelihood as a result of the development of the project. Basis preliminary assessment, 35 residential units need to be rehabilitated as a result of the development of this project. Land filling need to be undertaken for two fish ponds located within the proposed EZ. Relocation of Moinat ghat, bus stand and temporary shops needs to be carried out as a result of the development of the project.
Cost of private land acquisition		Around 96.45 acre of private land need to be acquired which would result in a cost of BDT 183.26 lakh. Proposed EZ stands at second lowest figure for cost of land acquisition.
Parameters	Opportunities	Threats
Road connectivity	<ul style="list-style-type: none"> Proposed EZ is well connected to Dhaka by Dhaka-Mawa highway 	

	<p>and by DNK Road.</p> <ul style="list-style-type: none"> • Road condition of Dhaka-Mawa highway is excellent and it's supposed to be upgraded to four lanes. • Proposed Padma Bridge is located at a distance of around 40 km from the proposed EZ and access takes place via Dohar-Mawa Road. Once Padma Bridge is operational, proposed EZ in Dohar would have access to the other part of Padma River (Jajira, Bhanga, Mongla etc.) 	
Rail connectivity	<ul style="list-style-type: none"> • Kamalapur Railway station is located at a distance of 50 km (approx.) and could be accessed through Dhaka-Mawa highway. • Upon completion of Padma Bridge, proposed EZ would have access to rail connectivity via Padma Bridge. 	
Waterways connectivity	<ul style="list-style-type: none"> • Location of Moinat ghat inside the project area could be utilized to connect the proposed EZ to Mawa ghat, Narayanganj river port and other major ports of Bangladesh. Mawa ghat and Narayanganj riverport could be accessed both by roadways and waterways from the proposed EZ. • Proposed EZ is located at the central part of Bangladesh and upon development of Moinat ghat as a cargo terminal, it may envisage seamless movement of cargo via waterways to Mongla Port, Chittagong Port and other major ports/ ferry terminal of the country. 	
Air connectivity	<ul style="list-style-type: none"> • Proposed EZ is located at a distance of 48 km (approximate) from Hazrat Shah Jalal International airport in Dhaka. Travel time is around 2.5 hours by road. • Govt. of Bangladesh intends to construct a new international airport (Bangabandhu Sheikh Mujib International Airport) with a view to create a hub airport in close proximity to Dhaka and to meet the demand of future growth in aviation sector. Location for the same is yet to be finalized. 	
Power connection	<p>Proposed EZ has access to the following:</p> <ul style="list-style-type: none"> • There is a proposal to setup 33/11kv new substation at Mohabadpur with a capacity of 20 MVA. • One 132 kV grid substation (World Bank funded project) has been 	<p>Basis discussion with REB officials, existing Dohar substation (20 MVA capacity) has no surplus power available.</p>

	proposed in Hashnabad with a capacity of 50 MVA. It is located at a distance of 10 km (approximate) from the proposed EZ.	
Gas connection		Gas pipeline is available near BSCIC, Keraniganj which is located at a distance of 40Km (approximate) from the proposed EZ. However basis discussion with industries at BSCIC Keraniganj, gas pressure obtained is not adequate.
Existing industrial ecosystem and Possible Backward linkages for industries	<ul style="list-style-type: none"> The land in this area is fertile in nature due to the proximity of Padma River, as a result the land is suitable for cultivation of various crops such as (but not limited to) rice, pulse, jute, seasonal vegetables etc. Sand extracted from Padma River is a major natural resource of this area. Proposed EZ is located near to Nawabganj, Munshiganj and Narayanganj. These areas are industrial hubs of the country. Some of the popular industries in these areas are: fabrics, steel, cotton, food processing, light engineering, shipbuilding etc. 	Dohar upzilla hasn't witnessed any significant industrial proliferation. Very few industries (cottage and small scale in nature) are located in and around the proposed EZ.
Proximity to major cities	Dohar EZ is located in proximity to Dhaka city.	
Access to quality manpower	Dohar upazilla has 3 government colleges, 40 secondary schools, 56 primary schools and 1 Technical and Vocational education facilities. Dohar being well connected to Dhaka city enjoys the availability of several educational institutions in and near Dhaka city. There are a total of 26 technical and vocational institutions and 44 universities located in Dhaka district, which could cater to the manpower requirements of proposed EZ. Proposed EZ in Dohar is in proximity to Dhaka city.	
Availability of medical facilities	One government hospital (Upzilla Health Complex) is available in Dohar sub district with 50 beds and a private hospital in the Pourashava.	For serious medical treatment, patients need to travel to Dhaka.
Availability of residential facilities	Dwelling units and residential facilities are available for labours in Karthikpur, Latakula and Jaipara.	No international standard residential facilities are available in the vicinity to the proposed EZ.

Bhola Sadar EZ

6. Bhola Sadar Economic Zone

6.1. Location Details and Salient Features

6.1.1. General Profile of Bhola District

Geographical Location

Bhola is a district in the Barisal division (on southern side) of Bangladesh.

Bhola district is surrounded by:

- North- Lakshmipur district and Barisal district,
- East- Lakshmipur district and Noakhali district,
- South- Bay of Bengal
- West- Barisal district and Patuakhali district

It lies between 21°54' and 22°52' North latitudes and between 90°34' and 91°01' East longitudes. The district spreads over an area of about 3403.48 sq. km of which 1456.87 sq. km is under forest.⁴⁴

Bhola district consists of 7 upzillas.

- Bhola Sadar,
- Daulatkhan,
- Burhanuddin,
- Tazumuddin,
- Manpura,
- Lalmohan
- Char Fasson

Proposed EZ is located in Bhola Sadar upzilla.



Source: Bhola District website

Demographics

Bhola district has overall population of 17,76,795 as per Housing and Population census 2011. Upzilla wise population details as per census are presented in following table.

Table: Upzilla wise population details of Bhola District

Name	Status	Population census		
		2001	2011	Growth (%)
Bhola	District (Zila)	17,03,117	17,76,795	4.33
Bhola Sadar	Upzila (Upazila)	4,08,094	4,30,520	5.50
Daulatkhan		1,73,253	1,68,567	-2.70
Burhanuddin		2,44,137	2,33,860	-4.21
Tazumuddin		1,20,189	1,26,940	5.62
Manpura		67,304	76,582	13.78
Lalmohan		2,76,547	2,83,889	2.65
Char Fasson		4,13,593	4,56,437	10.36

⁴⁴ Population and Housing census 2011, Bhola District

Climate Condition

The annual average temperature of the Bhola district varies from maximum 32.7°C to a minimum of 11.6°C. Average annual rain fall of the district is 2960 mm and 82.7% humidity.⁴⁵

Main rivers flowing through this district are: Kalabador, Lower Meghna, Tetulia and Ilisha.

Agriculture

Total agriculture land in Bhola district is 1092.69 sq. km., which amounts to approximately 32.1% of the total area of the district.⁴⁶

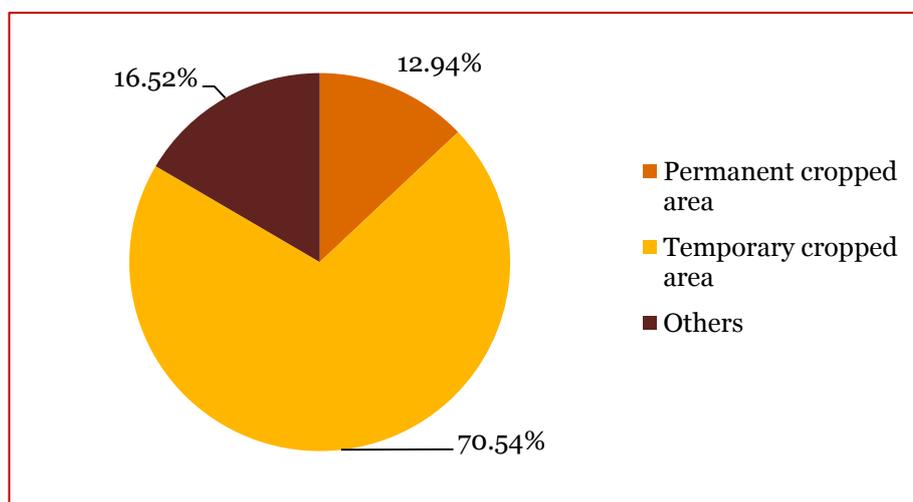
Major agriculture crops cultivated in the district are aman, boro, aus and wheat. Other crops include khesari, mung, masur, gram, potato, sugarcane, onion and garlic. Betel leaf, betel nut and chilies are the main cash crops.

Major horticulture crops in this district are mango, black berries, watermelon, amra, jackfruits, coconut, guava, palm, date palm and jambura.

Major portion of the agriculture land is utilized as temporary cropped area in this district.

The land use pattern of the agriculture land for the year 2008 is presented in the following figure.

Figure: Agriculture Land use pattern (2008)



Source: District Statistics 2011, Bhola, published by Bangladesh Bureau of Statistics (BBS)

Irrigation

Irrigated area classifications fall into two categories:

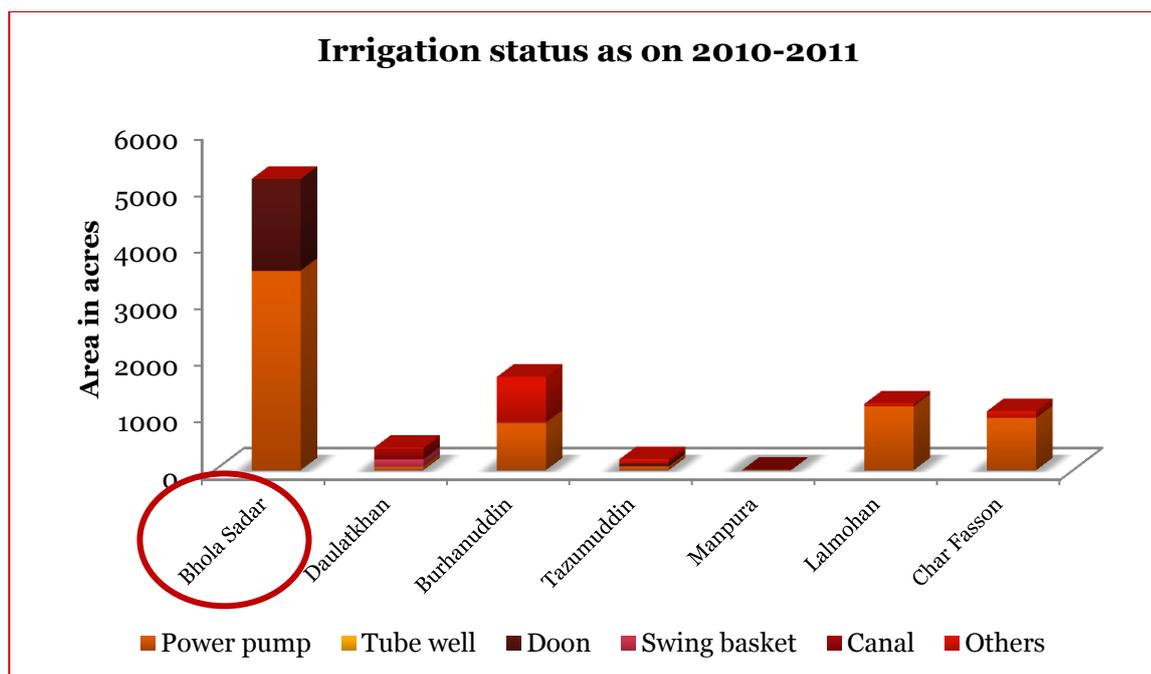
- Surface water irrigation with main water sources being rivers, canals, ponds, and other water bodies;
- Underground water irrigation with water lifted by shallow tube-wells, deep tube wells, and country traditional devices.

As per Bhola district statistics, 3.56% of total agriculture area is under irrigation. The percentage of total area under irrigation in Bhola sadar upzila is only 8.85%. Upzila wise method of irrigation during the year 2010-11 is presented in the following figure.

⁴⁵ District Statistics, BBS 2011

⁴⁶ District Statistics, BBS 2011

Figure: Irrigation Status (2010-11)



Source: District Statistics 2011, published by Bangladesh Bureau of Statistics (BBS)

Industrial Landscape

Bhola district is geographically different from other districts of Bangladesh, as a result of this; industrial growth is yet to start in this region. The major constraints of industrial growth in this area are lack of connectivity and lack of adequate infrastructure.

However, Bhola is rich in natural resources and agricultural resources. Plenty of fishing activities take place in this region as it is adjacent to Bay of Bengal. According to local inhabitants, around 30% hilsa fish of Bangladesh is produced in Bhola. Dairy industry is predominant in this district and milk based products (such as ghee, paneer, curd etc.) are supplied to other parts of Bangladesh.

There is no big industrial set up in this district. Several small and medium scale industries are operating in this region. Some industries operating in this area are: rice mill, fish net, garments and textile, plastic, wax, shoes, hatchery, cold storage etc.

Industry Snapshot of Bhola district is captured in the following table.

Table: Distribution of Industries of Bhola district

Company type	Number
Rice Mills	535
Others	516

Source: Bhola District Statistics, BBS 2011

6.2. Broad level market potential assessment of the proposed EZ

Bhola Sadar upzila is one of the biggest deltas in Bangladesh. It is located in the southern part of the country and three sides of the delta are surrounded by water. Bhola Sadar (Barisal division) is located in close vicinity of two rivers viz. Meghna and Tetulia and on its southern side Bay of Bengal is located.

Proposed EZ is mainly accessible by water mode of transportation from other parts of Bangladesh. Proposed EZ is located at a distance of approximately 120 km from Barisal Airport and travel time is around 4-4.5 hours. Basis discussion with UNO officials, after the construction of Padma Bridge, Dhaka to Barisal can be travelled in around 3-4 hours. Currently, Bhola is to be accessed from Barisal by road (partial) and water (partial) modes of transportation. Passengers (and cargo) from other parts of Bangladesh commute to Bhola Sadar by ferry through Meghna River and Tetulia River. Bhola is connected to other parts of the country by several ghats such as Ilisha Ghat, Lalmohan, Kheyaghat, Bheduria Ghat etc. All these ghats are easily accessible from the proposed EZ. Following figure indicates the location of Bhola Sadar.

Figure: Location of Bhola sadar upzila



Bhola district is geographically different from other districts of Bangladesh. As a result of this, industrial growth is yet to develop in this region. The major constraints of industrial growth in this area are lack of connectivity and lack of adequate infrastructure.⁴⁷ This region is rich in agricultural production such as rice, jute, potato, chili, cucumber, watermelon etc. This region is known as watermelon hub and watermelon from Bhola region is transported to all parts of Bangladesh; Potato from this region is exported to Russia. Due to the adjacency of rivers, plenty of fishing activities take place in this region. According to the local inhabitants, around 30% hilsa fish of Bangladesh is produced in Bhola. This region is well known for live stocking (buffalo) and products based on buffalo milk such as curd, paneer, ghee etc. are produced in abundance. After catering to local requirement, surplus milk based products are transported to other parts of Bangladesh.

⁴⁷

<http://www.bhola.gov.bd/node/112991/%E0%A6%AC%E0%A7%8D%E0%A6%AF%E0%A6%AC%E0%A6%B8%E0%A6%BE-%E0%A6%AC%E0%A6%BE%E0%A6%A3%E0%A6%BF%E0%A6%9C%E0%A7%8D%E0%A6%AF>

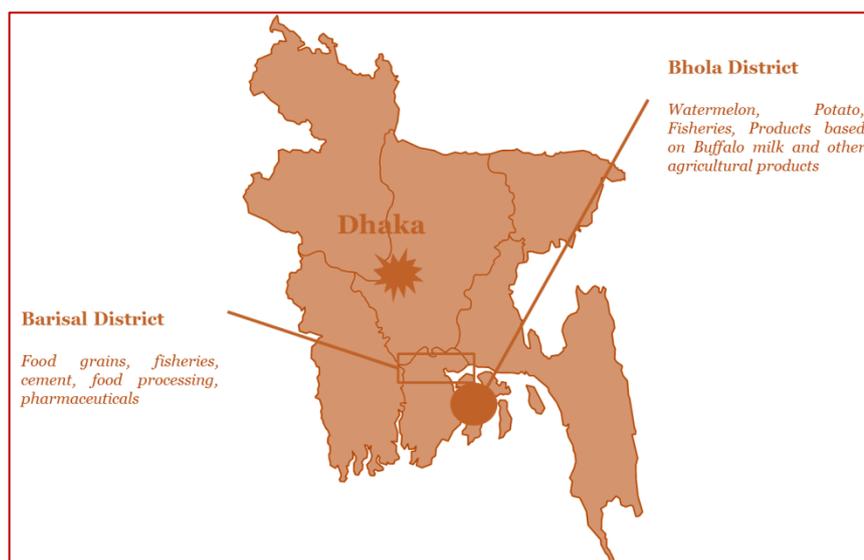
There is no big industrial set up in this district. Several small and medium scale industries are operating in this region. Some industries operating in this area are: fish net, garments and textile, plastic, wax, shoes, hatchery, cold storage etc.

In Barisal district, several big industries are operating. A snapshot of the same is provided below:

- Pharamceuticals (such as Opso Pharma etc.)
- Saline (such as Opso Saline etc.)
- Cement (such as Anchor cement etc.)
- Biscuit and Food Processing (such as Bengal Biscuit etc.)

Barisal is one of the major sources for cultivation of food grains and fisheries in the country. It is known as “Venice of Bengal”; some of the major crops cultivated in this area are: rice, paddy, seasonal vegetables etc. Fishery and live stocking takes place in abundance in this region. Barisal river port is a very important river port in Bangladesh.

Following figure depicts the landscape of industry and natural resources in and around Bhola.



Various upstream and downstream industries based on agricultural products, food processing, fisheries, live stocking, milk products are the best fit for the proposed EZ in Bhola. Proximity to river and Bay of Bengal also evokes the possibility of industries based on marine activities (such as ship building, ship breaking etc.). Raw materials for the same could be easily sourced from the nearby region. However, the main hindrance of industrial proliferation of this area is the lack of rail and road connectivity. Though Barisal airport is accessible from the proposed EZ, but it is not an international airport and cargo facilities are not available. However, adjacency to Bay of Bengal would enable the prospective industries in the proposed EZ to undertake export and import of raw materials and finished goods.

From the above discussion, Food processing industry has emerged as one of the key industries to be focused on, based on parameters such as – Global trade trends, Global FDI trends, Global M&A trends, Productivity indices, and Employment indices.

As discussed earlier, Bhola is rich in agricultural and natural resources. Industries based on the agricultural, livestock and fishery production in this region, Agro/ Fruit and Food Processing industries stand a good chance to be set up in the proposed EZ. Also, dairy based and milk processing industries can easily source the raw materials from nearby and hence stand as a good fit.

Proposed EZ has proximity to river and hence small scale industries based on fish nets manufacturing are also placed to gain significantly from the development of the proposed EZ. Since livestock and fishing activities take place in plenty, hence industries related to production of cattle/ poultry/ fish feeds are also appears to be potential for the proposed EZ.

Nearby Barisal district has various industrial units related to Pharmaceuticals and Chemicals. Based on the parameters such as – global trade trends, global FDI trends, global M&A trends, domestic output index, domestic employment index, and domestic investment index; and as per the perspective plan 2021, pharmaceuticals and chemical industries are considered fit for this proposed EZ. Existing industries in Barisal would act as feeder for the same.

Textile is the top priority industry as per the Perspective Plan 2021, output indices and FDI trends. Given the availability of local skills for the industry and facility to transport by water mode of transportation, textile is another industry which may be considered as potential for the proposed EZ.

Also, it seems possible to develop light engineering industries in the vicinity to cater to the requirements of machineries and equipment for the agro and food processing, textile and chemical industries.

6.3. Reconfirmation of the proposed EZ

6.3.1. Location of the proposed EZ

The proposed Economic Zone site falls in Bhola Sadar upzila. . It is located between Tetulia River on its west and Megna River on its east and northwest part of the district and southwest of the country.

Reconfirmation of site details is presented in following table.

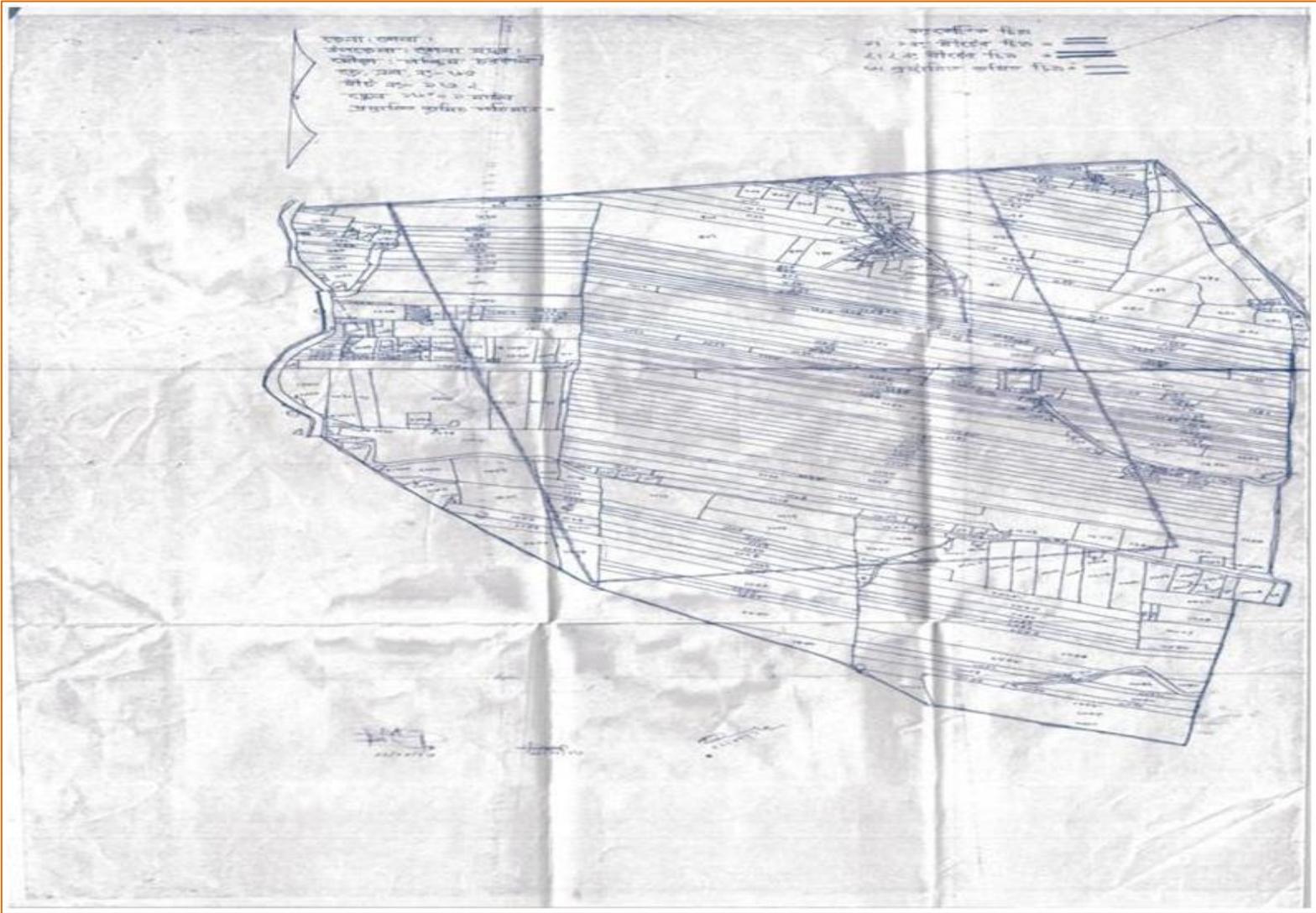
Table: Reconfirmation of site details

Parameters	Details
Site co-ordinates	22°39'54.65'' N - 22°40'37.87'' N & 90°35'17.50'' E - 90°36'4.03'' E
Site boundaries on East	Agricultural land, residential colonies, Kheya ghat bridge, Local Mosque
Site boundaries on West	Banker Hat market, aquaculture and agriculture
Site boundaries on North	Agricultural land, Zilla road connecting Banker Hat to Bhola-Charfashion road
Site boundaries on South	Agricultural land
Total area of the site	304.07 Acres
Land tenure details	Government owned & private land
Government land	1.35 Acres
Private land	302.72 Acres
Others	Nil
Expansion potential	Basis initial site assessment, expansion of the proposed land parcel is not possible. However UNO identified another land parcel near Char area (low-land) to the extent of 3000 acres out of which around 30% is submerged under water.
Existing land use	Agriculture
Land cost (per acre)	10 Lakh BDT

Source: PwC Initial Site Assessment (Data collected from UNO office)

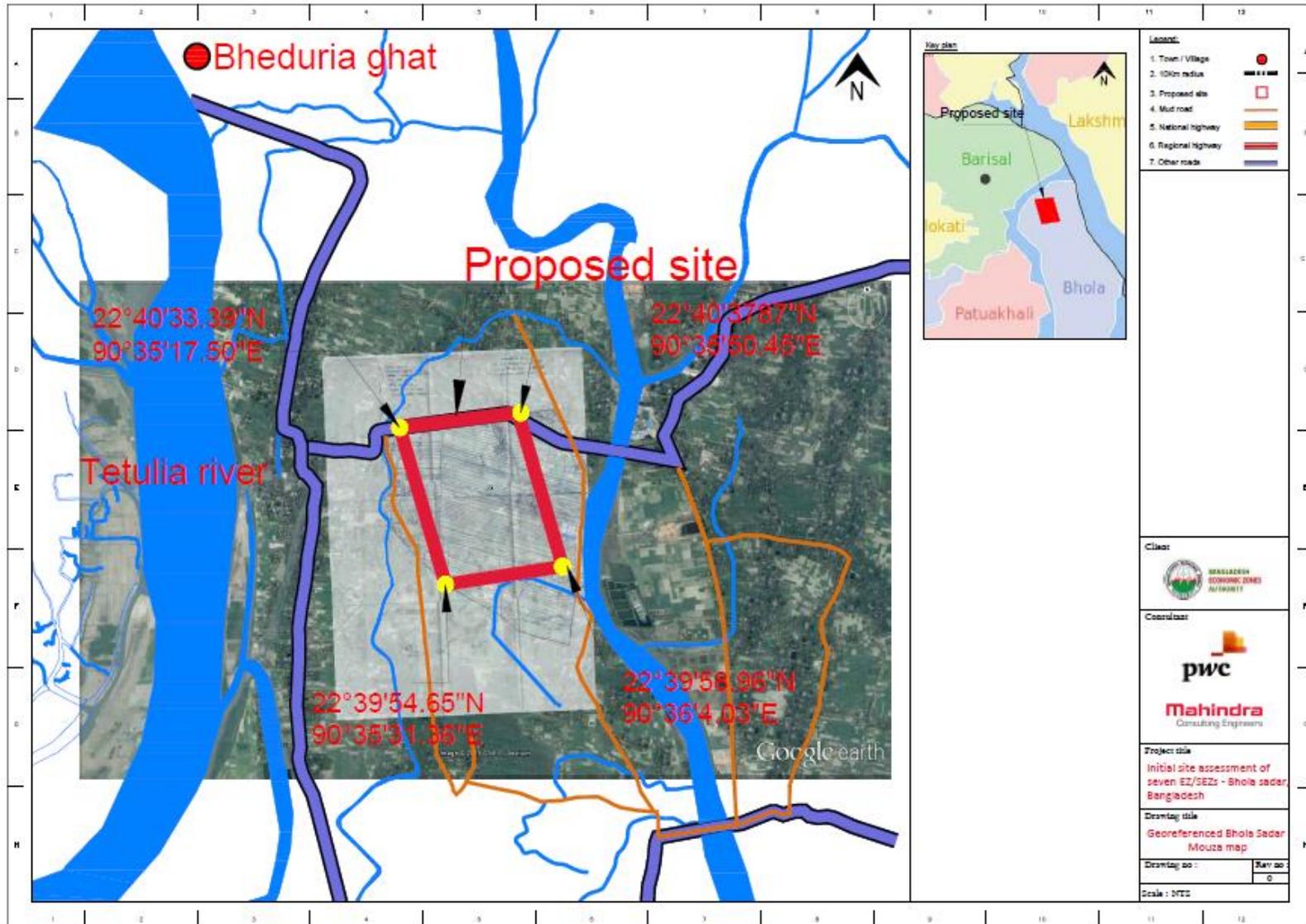
Mouza map of proposed site as provided by Upazila Nirbahi Officer (UNO) and Mouza map superimposed on Google map are presented in following figures (on subsequent pages).

Figure: Mouza Map of proposed Bhola Sadar EZ



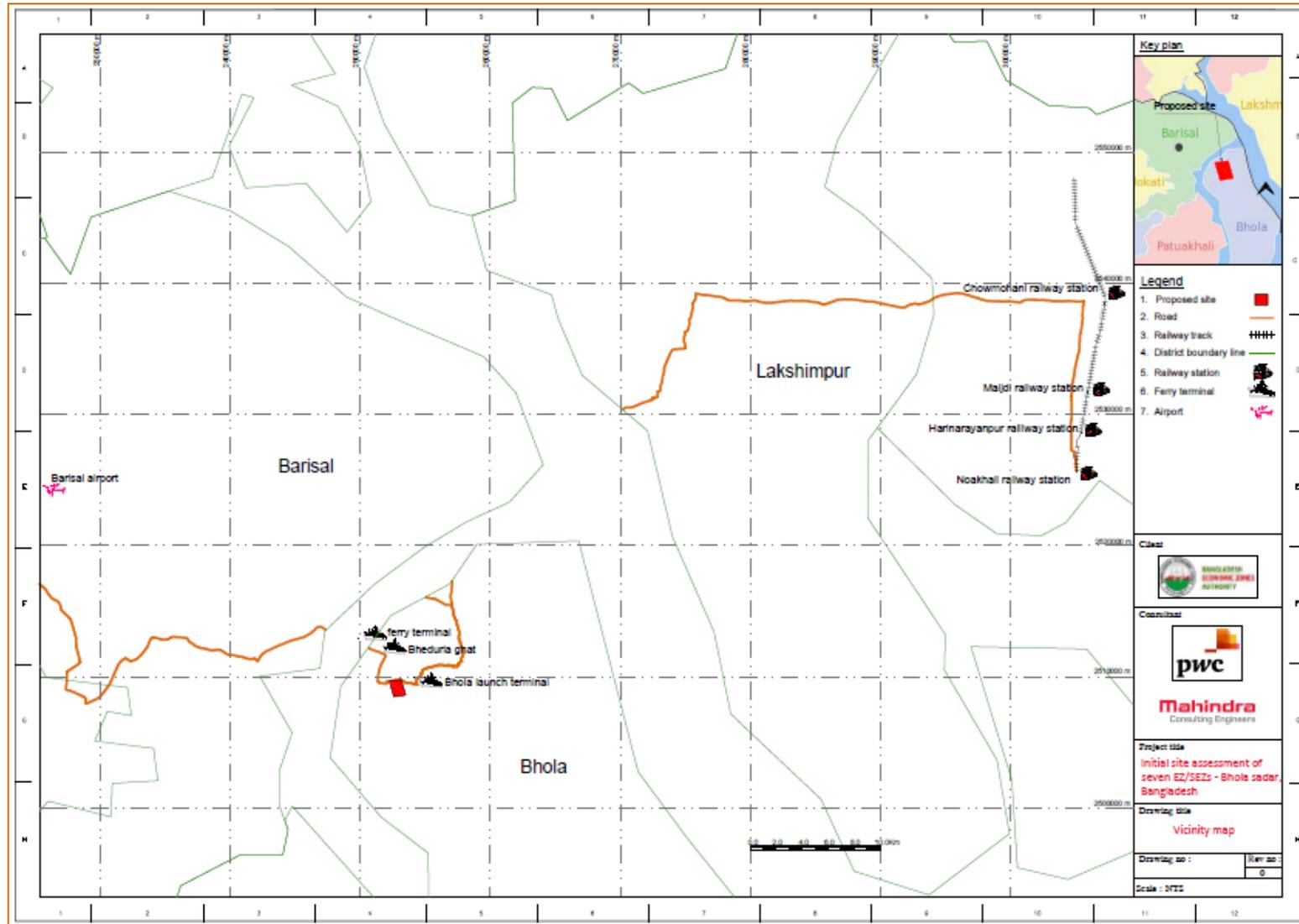
Source: UNO office

Figure: Mouza map superimposed on google map (Bhola Sadar)



Following figure shows the location of the proposed EZ and its vicinity.

Figure: Location of the proposed EZ and its vicinity (Bhola Sadar)



6.3.2. Land use / land cover

The land use pattern of the proposed EZ area falls under agriculture Zone. At present 2 and 3 crops are being cultivated at some parts of the project area. Major holdings are farms that produce varieties of crops such as jute, rice, wheat, vegetables etc. Existing land use pattern for 10 km radius is shown in figure on subsequent pages.

Figure: Photograph of agricultural activities inside the project area



6.3.3. Topography

Basis initial site assessment, it was observed that the proposed EZ has a level difference of 3 to 4 m with a gentle slope from North East towards South West direction with minor undulations. According to the contour variation, the depth of landfilling across the project area shall vary.

Contour maps of the proposed EZ for 5 km and 10 km radius are presented in figures on subsequent pages.

Figure: Existing land use pattern for 10 km radius (Bhola Sadar)

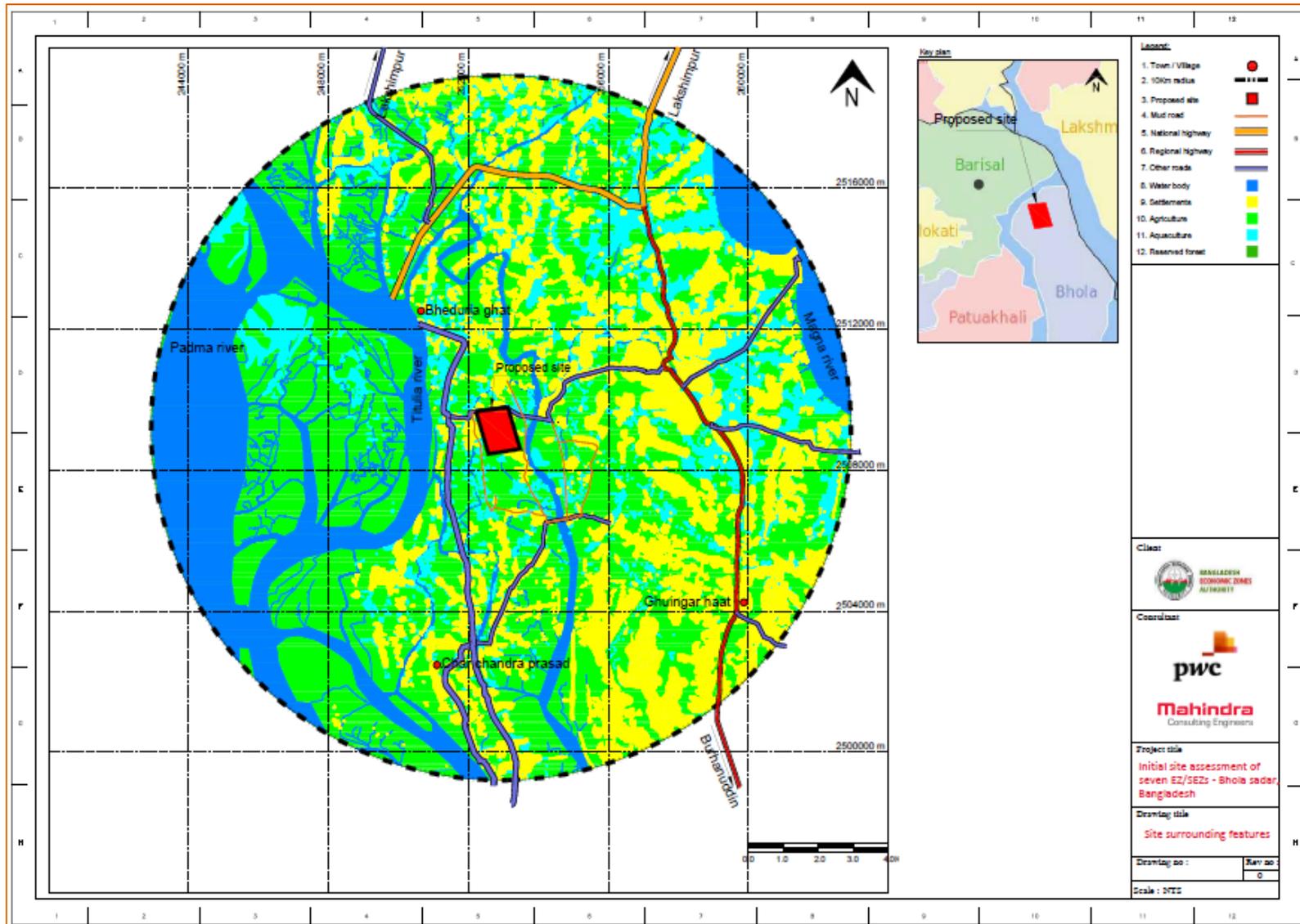


Figure: Existing land use pattern for 5 km radius (Bhola Sadar)-Closer View

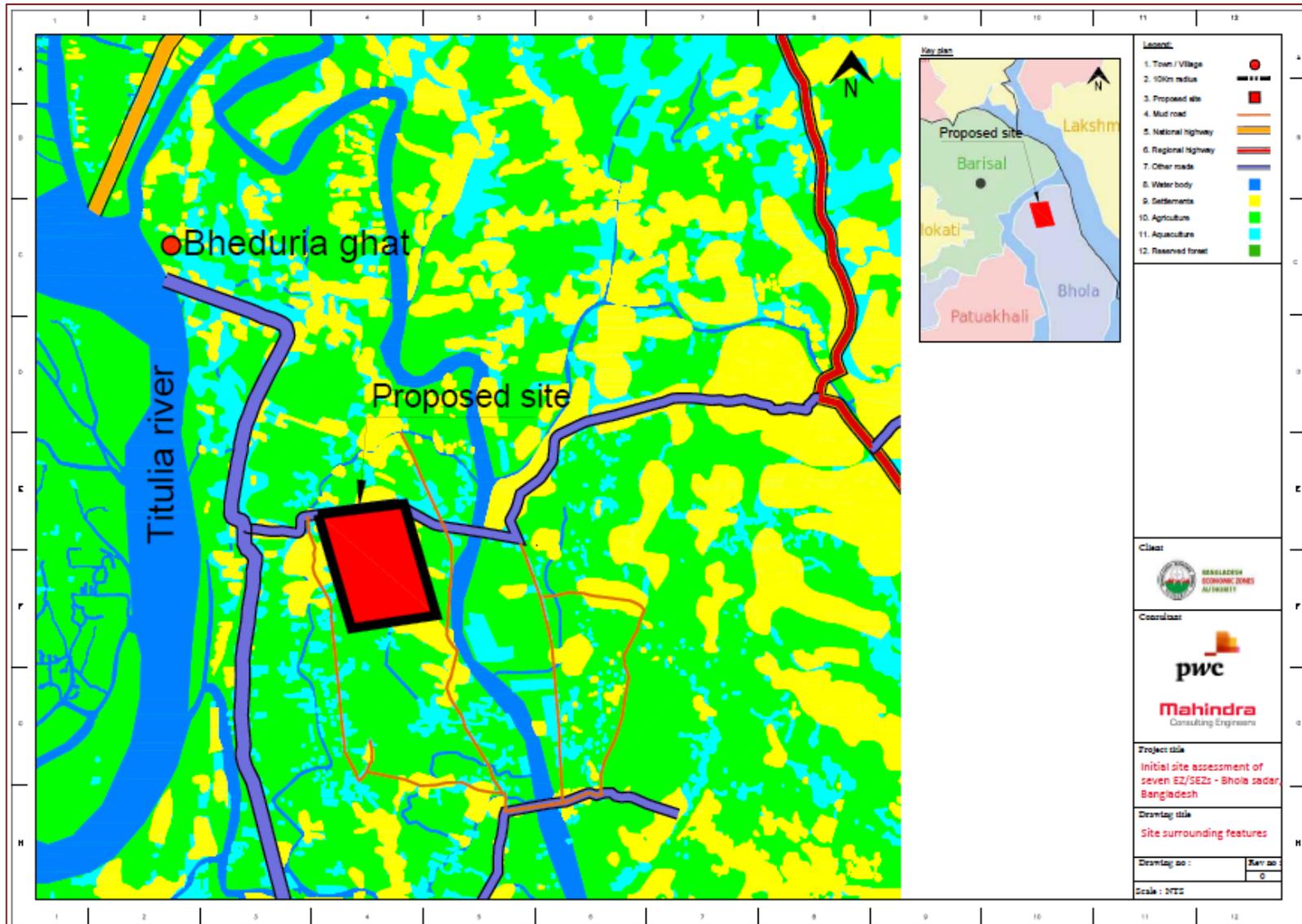
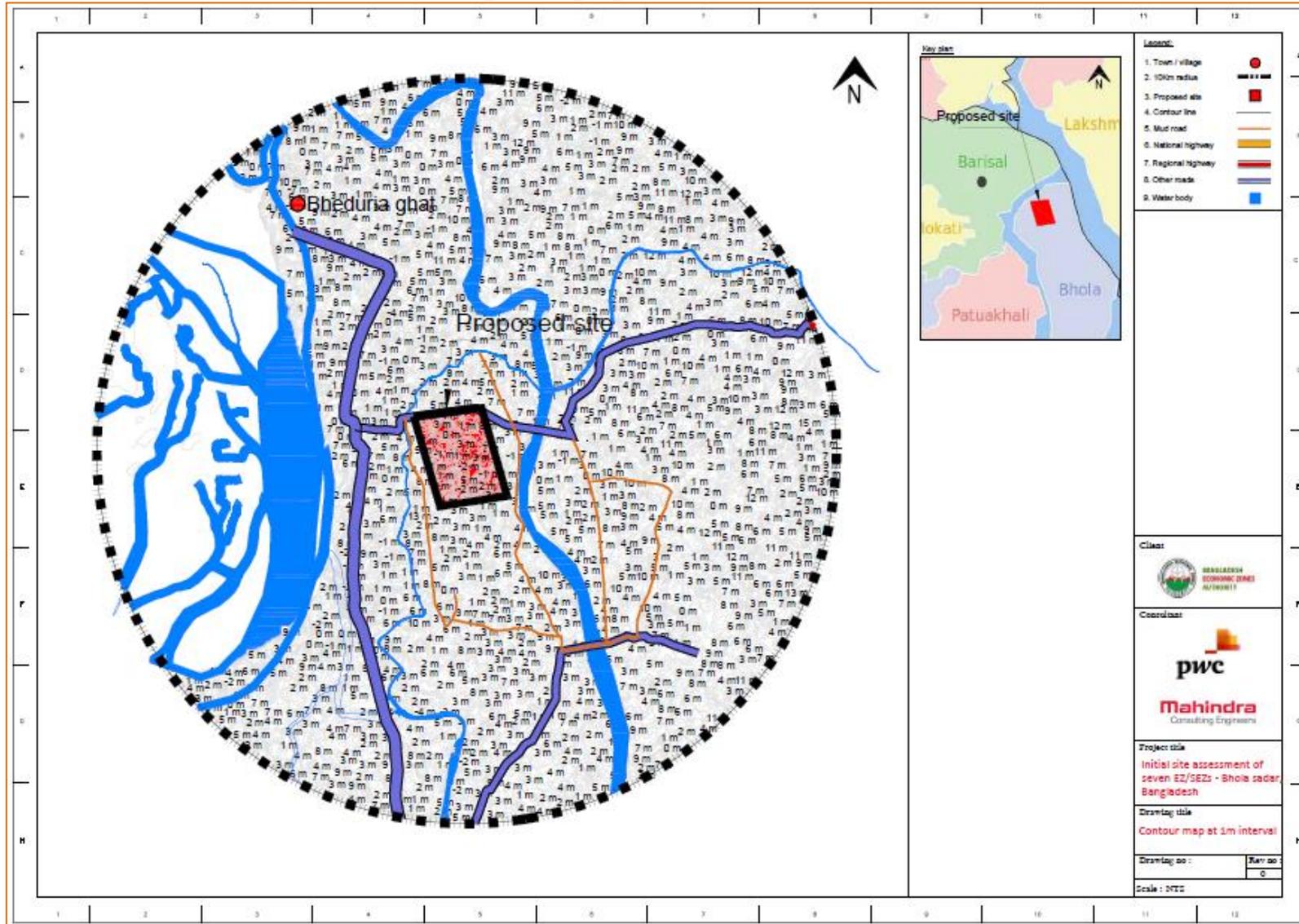


Figure: Contour map of the proposed EZ for 5 km radius (Bhola Sadar)



6.3.4. Physiography

The physiography of the region surrounding proposed EZ falls in Ganges tidal flood plain. Morphology of the tidal landscape exhibits a low ridge and a basin relief crossed by innumerable tidal rivers and creeks. Local differences in elevation generally are less than 1m (compared with 2-3m on the Ganges floodplain).

The sediments are mainly non-calcareous clays, but they are silty and slightly calcareous on riverbanks and in a transitional zone in the east adjoining the lower Meghna.

This tidal flood plain covers most of Satkhira, Khulna, Bagerhat, Pirojpur, Barisal, Patuakhali, Bhola and the entire Jhalokati and Barguna districts but excludes the sundarbans in the southwest.

In the northeast, there is moderately deep flooding in the monsoon season, mainly by rainwater ponded on the land when the Ganges distributaries and the lower Meghna are at high flood levels. Elsewhere, there is mainly shallow flooding at high tides, either throughout the year, or only in the monsoon, except in the extensive areas where tidal flooding is prevented by embankments. Within embankments, there is seasonal flooding with accumulated rainwater. The soils are non-saline throughout the year over substantial areas in the north and the east, but they become saline to varying degrees in the dry season in the southwest. The Bangladesh physiography map is presented in Annexure.

6.3.5. Soil

Basis site visit, the top soil layer was found to be silt which needs to be replaced for road construction. This soil is not suitable for laying foundation for any structure. The dominant soil texture is sandy loam.

Figure: Soil type in the proposed Bhola Sadar EZ



6.3.6. Geology

Prevailing soil strata in this geological region is coastal saline tract. It represents the flat low-laying areas along the coastal belt and the estuarine islands. The soil is saline and the pH values are neutral to slightly alkaline. The soil is enriched with potassium and phosphorus. The geological map of Bangladesh is shown in Annexure.

6.3.7. Earthquake data

Bhola Sadar area falls in the Seismic Zone 1 and the earthquake coefficient is 0.10 for this zone. The area under the proposed EZ falls under the low seismic range zone; this factor needs to be taken into account while designing the structure of the proposed EZ.

Seismic zoning map of Bangladesh is presented in Annexure.

6.3.8. Wind speed

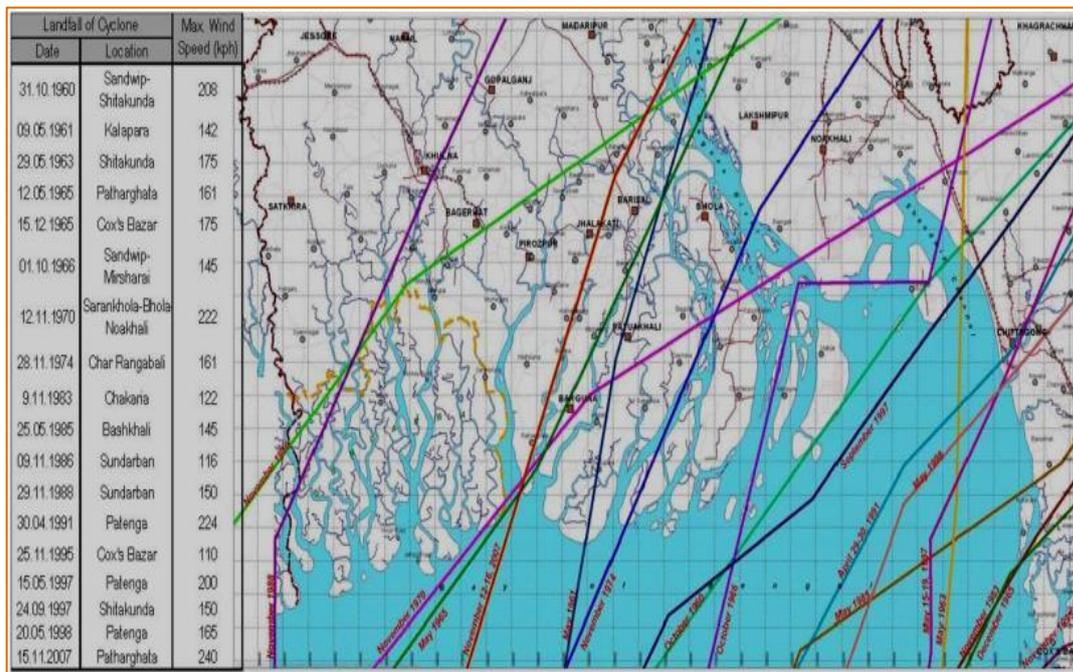
The wind speed in the coastal areas could go up to 3-6 km per hour. From March to May, violent thunderstorms, called northwesterers, are observed with a wind speed up to 60 km per hour. The early summer and late monsoon seasons are characterized by intense storms. During this season, southerly wind blow at a speed of more than 160 km per hour and it induce around 6 meter high waves in the Bay of Bengal. This is a prime cause for most of the flooding witnessed each year in the coastal areas. The wind speed map for Bangladesh is presented in Annexure.

6.3.9. Cyclones and storms

Bhola sadar area witnesses cyclone or storms which generally occur in early summer (April-May) or late rainy season (October-November).

The great Bhola cyclone (category 4 cyclone) of 1970 brought a storm surge of up to 27 feet and killed 350,000-550,000 people. During the master planning stage, cyclone structures and multipurpose cyclone shelters may be taken into consideration as a part of the disaster mitigation plan.

Figure: Major cyclones that had hit Bangladesh



Source: Bangladesh Meterological Department

Refer Annexure for the cyclone affected areas in Bangladesh and Disaster prone areas in Bangladesh.

6.4. Environment section

6.4.1. Air quality

Ambient air quality measurements are essential:

- to provide a description of the existing conditions,
- to provide a baseline against which changes can be measured and
- to assist in the determination of potential impacts of the proposed EZ construction on air quality conditions

During the field visit, it was observed that the ambient air quality in this area is good (in terms of Suspended Particulate Matter) and free from pollution. This may be due to the fact that the project area is located in a rural area with limited industrial proliferation and the traffic was relatively less.

6.4.2. Floods and Water Logging

Basis interaction with UNO officials and local inhabitants, it was communicated to us that the flood level in the proposed EZ is 1-2 meters. According to the local inhabitants, area surrounding the proposed EZ is not affected to flood during monsoon season, but due to tidal surge, sometimes this regions gets flooded.

6.4.3. Noise

During the field visit, no apparent problem of noise was observed in and around the proposed EZ.

6.4.4. Land filling

Basis the interaction with the UNO officials and local inhabitants, flood level varies from 1 to 2 metres depth inside the proposed EZ area. To avoid inundation during monsoon season, minimum land filling of 0.6 m above the flood level is considered.

Based on the assumption, an average depth of 6 feet to 9 feet of land filling has been envisaged for the proposed EZ area. This figure is indicative and detailed topography survey needs to be carried out to calculate the exact quantity of land filling at the project area.

6.5. Infrastructure Linkages to the Proposed Site

6.5.1. Physical Infrastructure- Availability of Utility Connection

6.5.1.1. Power Availability for the proposed EZ

Existing 33/11 KV substation (of capacity 10 MVA) near Bangla Bazar is located at a distance of around 18 km from the proposed EZ. Basis discussion with Rural Electrification Board (REB) officials, it would be upgraded to 20 MVA by 2016. After catering to the local demand, 2 MVA surplus power is available from this substation.

Figure: Existing 33/11 KV substation



Basis interaction with REB officials, one additional 33/11 KV substation of 10 MVA capacities is proposed within one km radius of the proposed EZ. Exact location for the substation is yet to be finalized and it is planned to commission by June 2016. It was communicated to us that JICA funded substation in Paranganj (around 15 km from the proposed EZ) is under construction and it is expected to be operational in the later part of the year 2015. Capacity of this substation is 5 MVA.

Bhola Rental Power Plant (with 34.5 MW gas turbine and 20 MW gas engine capacities) is located at a distance of around 3.5 km from the proposed EZ. This is operated and maintained by Venture energy power plant. Out of 54.5 MW generated power, 6 MW is being transmitted to national grid through 33 KV line and the remaining power caters to the local requirements. A 230/ 132 KV substation is already established within the rental power plant but it is not utilized due to non-availability of 132 KV grid network. At present an excess capacity of 14 MW is available in the rental power plant.

Basis discussion with UNO officials, there is a 132 KV substation located in Patuakhalia (at a distance of around 65 km from the proposed EZ) and a 230 KV substation is located in Buranuddin (approximate 25 km away from the proposed EZ).

Basis working knowledge and best practices followed, power requirement in a typical EZ could be transmitted by a dedicated 33 KV line for demand up to 25 MW. If the demand is more than 25 MW, then the option of 132 KV transmission lines needs to be further explored. Proximity to 33 KV power connection and surplus power availability in the vicinity of the proposed EZ are the crucial factors to decide on the potential of power availability to the proposed EZ.

Figure: Bhola Rental Power Plant



Apart from the above power sources, one 225 MW gas-fired Combined Cycle Power Project is available within approximately 3 km distance from site.

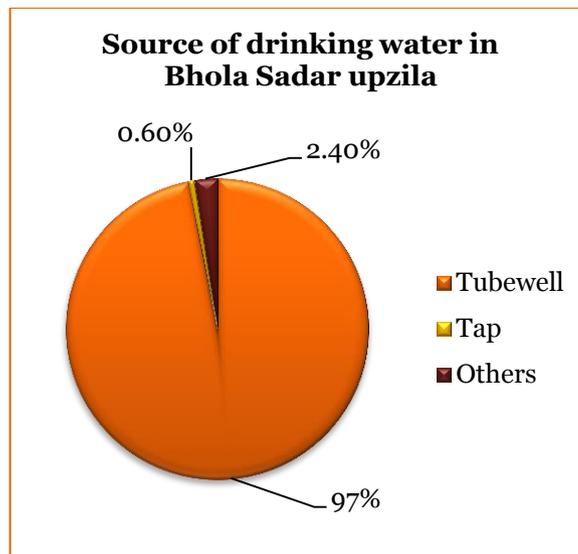
Basis interaction with REB officials, selling price of electricity in this region is 7.32 BDT/ unit for industrial purpose.

Utility Map shown in figure at the end of the section illustrates the electricity availability in and around the proposed EZ.

6.5.1.2. Water Availability for the proposed EZ

There is no existing water supply system at the proposed site. The local inhabitants are dependent on tube wells for the purpose of drinking water. The sources of drinking water in Bhola upzila is captured in following figure.

Figure: Sources of drinking water in Bhola upzila



Source: population and Housing census, BBS 2011

Basis interaction with local inhabitants, the ground water is available at a depth of 200 to 300 feet (approximately) from natural ground level. Preliminary assessment suggests that the water requirement could be met by extracting water from Tetulia River by providing suitable intake system and water treatment plant.

Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Bhola Sadar EZ is around 2.58 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could be extracted through bore wells. Extraction of more water through bore wells might result in depletion of the aquifer level. Proposed site has proximity to Tetulia River, thus the option of extracting water from Tetulia River may be further explored. Decision regarding extraction of water from bore well/ Tetulia River needs to be taken after detailed feasibility analysis.

6.5.1.3. Gas supply to the proposed EZ

Sundarban Gas Company is the nodal agency responsible for supply of gas in this region.

Basis interaction with representative of the local distribution office of Sundarban Gas Company, local gas substation has a capacity of 45 MMscf per day with surplus of 1 MMscf per day. Pressure available in this substation is 520 psi. Gas consumption pattern from the gas substation is as following:

- 250 MVA Bhola Power Plant: 35 MMscf per day
- 34.5 MVA Bhola Rental Power Plant: 7 MMscf per day
- Domestic consumption: 2 MMscf per day

At present, no industrial gas connection has been set up in this region; however, one local industrial unit (Sagarika Feed) is setting up the gas connection for its internal usage. Basis interaction with Sundarban Gas Company officials, tariff for industrial gas supply is BDT 9.52/ cubic feet.

Figure: Sundarban Gas Distribution Office



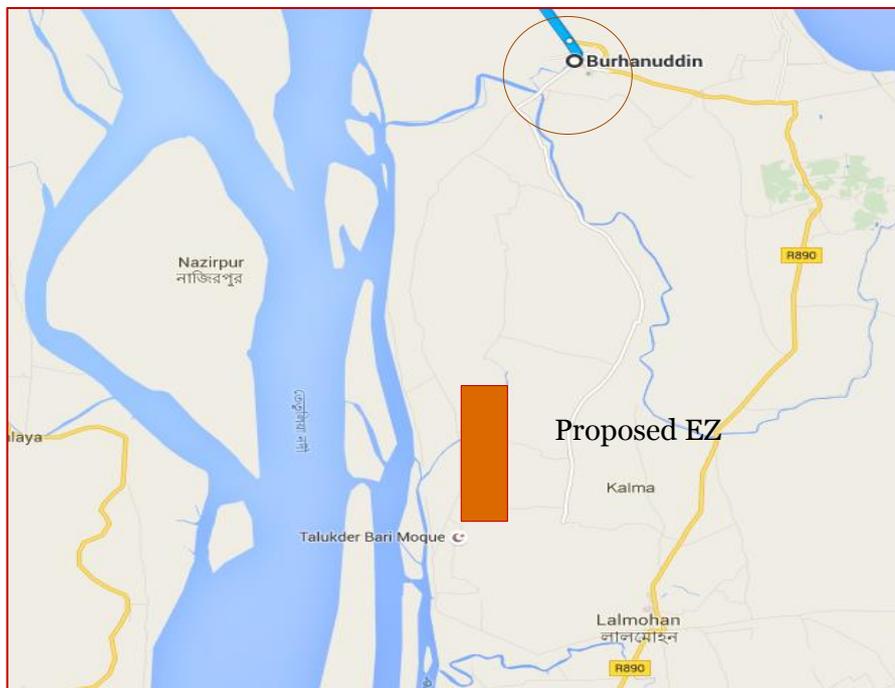
10” Gas pipes is available near the Bhola rental power plant and it is located within 2km radius of the proposed EZ. However, representatives of Sundarban Gas Company informed us that upgradation of this pipeline to 12” is possible. Option of tapping of Gas supply from this point to the proposed EZ could be further explored.

Figure: Possible gas tapping point near Bhola Rental Power Plant



Gas is available in abundance in Bhola area. Bangladesh Petroleum Exploration and Production Company Limited (BAPEX) is the controlling authority which controls gas production in Bangladesh. At Shahbazpur gas field, 1 trillion cubic feet gas reserve is available; after catering to the local demand, surplus gas is available. The gas available at Shahbazpur (approximately 44 km away from proposed EZ) and Buranuddin (approximately 25-30 km away from proposed EZ) can easily be used for industrial consumption.

Figure: Location of Buranuddin (Gas Source)



6.5.1.4. Telecom/ Internet connectivity to the proposed EZ

Basis interaction with UNO officials, optic fiber cables are not available to the proposed EZ. At present, the internet and telecom services in this region are provided by private telecom operators such as Grameen Phone, Bharti Airtel, Banglalink, Teletalk.

Following figure illustrates the utility connection to the proposed EZ.

6.5.2. Social Infrastructure

6.5.2.1. Institutional

Bhola district has a total of 12 technical and vocational institutions, 1 agriculture and veterinary college, 35 (government and non-government) colleges, 262 (government and non-government) secondary schools and 241 madrasa.⁴⁸

Basis interaction with the UNO officials a vocational textile institute has been proposed and will be functional by 2017. Location of the vocational textile institute is yet to be selected but UNO officials informed us that it would be located in close proximity to the proposed EZ.

Some of the technical institutes located in the proximity to the proposed EZ are:

- Bhola Technical School & College (located 10 km (approx.) from proposed EZ)
- Bhola Polytechnic Institute (located 30 km (approx.) from proposed EZ)
- Barisal Technical Training Center (located 50 km (approx.) from proposed EZ).

6.5.2.2. Healthcare Facilities

Major categories of health centers in this region are outlined in following table. No international quality healthcare facility is available in the vicinity. Basis interaction with UNO officials and local population, it was comprehended that for serious medical treatments, local inhabitants need to travel to Dhaka city.

Table: Healthcare Facilities in Bhola Sadar area

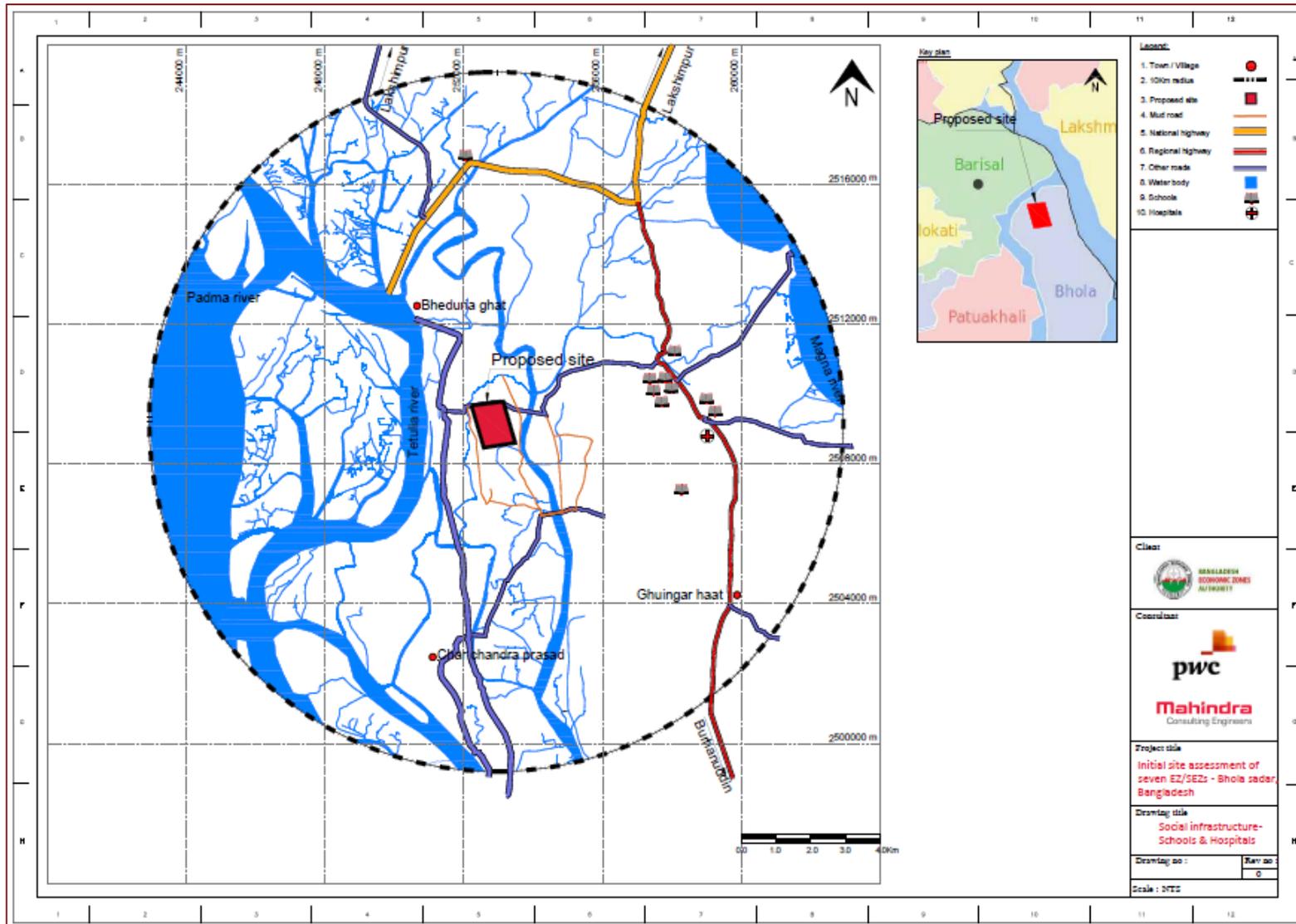
Details	Number
Union Health and Family Welfare Centres	13
Community Clinics	43
MCWC	1
Chest Disease Clinic (TB clinic)	1
Private Clinics	7

Source: Data collected from UNO Office

Following figure illustrates the location of schools and hospitals in the vicinity of proposed EZ.

⁴⁸ Bhola District statistics, 2011

Figure: Schools and Hospitals in the vicinity of proposed EZ (Bhola sadar)



6.5.3. Connectivity

Waterway is the most convenient mean of accessing the EZ. There is no direct road connectivity from Bhola to other parts of Bangladesh. Bhola district is approachable only via ferry by crossing the river on both east and west side.

6.5.3.1. Road

Proposed EZ is connected to capital city Dhaka via Barisal and it is connected to Chittagong via Laxmipur. Bhola Sadar is connected to other parts of Bangladesh by ferry and IWT. Direct road connectivity to other parts of Bangladesh is not available from this upzilla.

Northern side boundary of the proposed EZ is abutting the Zilla Road (LGED Road). The alignment of the Zilla Road (adjacent to the proposed EZ) is connected up to Kheya Ghat on the North East side and Bheduria Ghat (via Banker Haat market) on the west side. It's a single lane bituminous road and during site visit, it was observed that the road condition is favorable for passage of heavy vehicles. Distance between the proposed EZ and Bheduria ghat is around 5 km. Zilla road also provides access to Bhola Sadar which is located at a distance of approximately 3 km from the proposed EZ.

Figure: Zilla Road abutting the proposed EZ



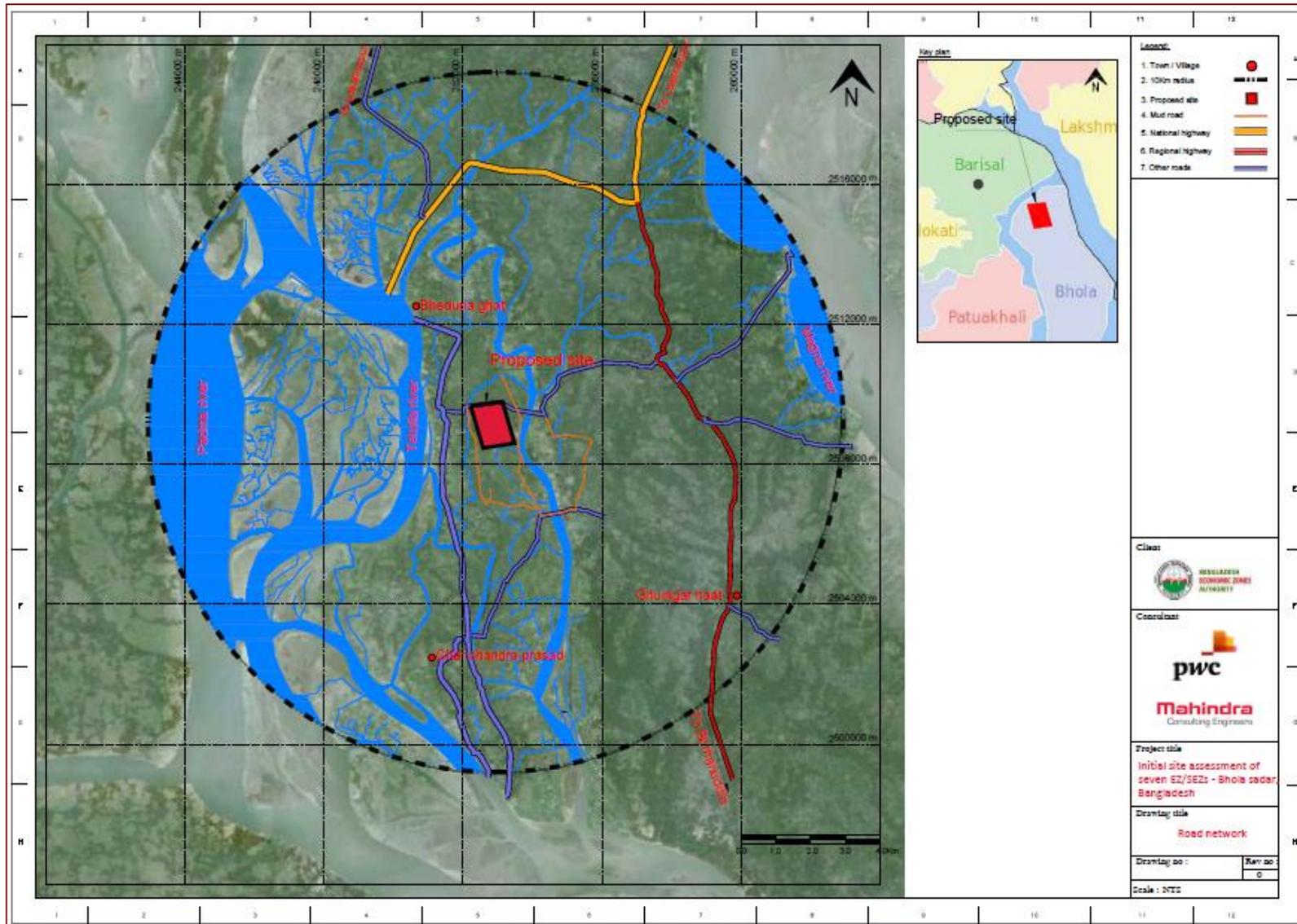
On the eastern side of the proposed EZ, this zilla road is connected to Bhola (Paran Talukderhat)-Burhanuddin-Lalmohon-Char Fassion-Char Manika Road (R 890) at a distance of around 5 km from the proposed EZ.

Further, R890 is connected to the Dhaka-Barisal Highway (N8) which provides access to Dhaka via Barisal. Connectivity from R890 to N8 takes place by ferry ride from Ilisha ferry terminal. Bhola Sadar is connected to other parts of Bangladesh by several ferry terminals such as Ilisha Ghat, Lalmohan, Kheya ghat, Bheduria ghat etc. Basis discussion with UNO officials, R890 is a single lane bituminous road and road condition is favorable for passage of heavy vehicles.

Following figure captures the road connectivity in and around the proposed EZ.

Road network for 10 km radius is shown in figure on subsequent pages.

Figure: Road Network for 10 km radius (Bhola Sadar)



6.5.3.2. Rail

Bhola district is accessible by road and water mode of transportation and there is no rail network present in the vicinity to the proposed EZ.

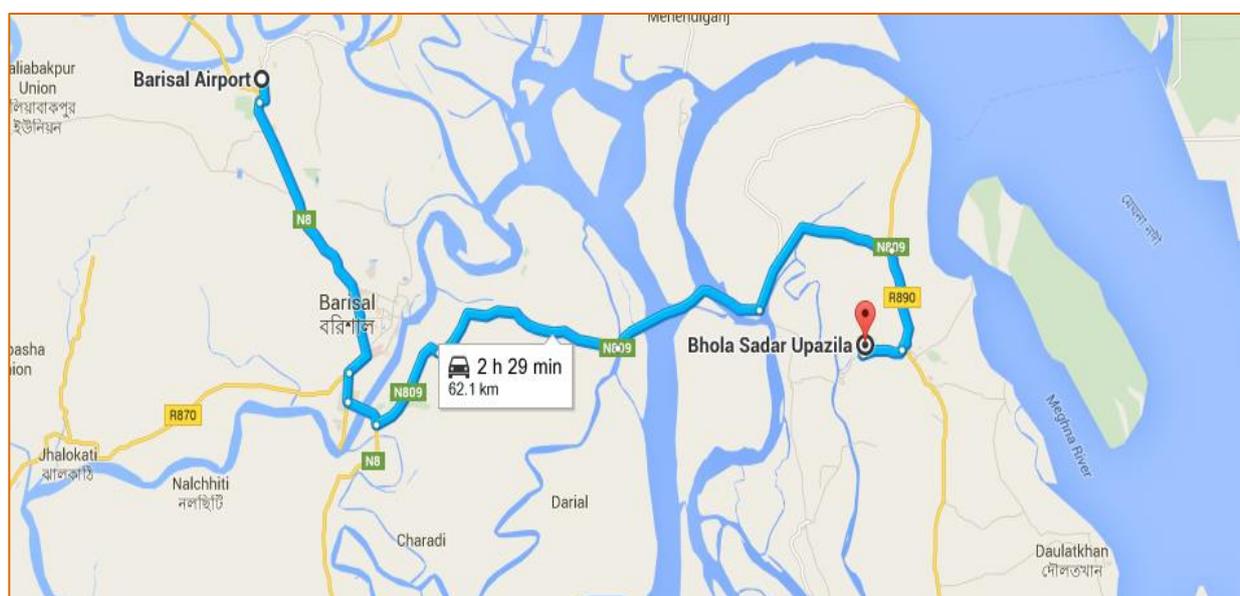
6.5.3.3. Airport

Proposed EZ in Bhola Sadar is located at a distance of approximately 65 km from Barisal airport. However, river crossing via ferry/ launch service at Ilisha Ghat needs to be undertaken to reach the proposed EZ. Dhaka-Barisal Highway (N8) and Barisal-Bhola Highway (N809) connect the proposed EZ to Barisal airport. This route includes ferry ride from Laharhat ferry terminal to Ilisha ghat ferry terminal. Approximate distance of the ferry ride is 9 km. These are two-lane bituminous highway roads and are favorable for passage of heavy vehicles. Travel time from Barisal airport to proposed EZ is around 2.5-3 hours.

Barisal airport is a domestic airport and Biman-Bangladesh airlines and US-Bangla airlines operate flights to Dhaka from Barisal airport.

Dhaka international airport is located about 237 km from the proposed EZ including ferry crossing.

Figure: Connectivity between Barisal airport and Bhola Sadar



Source: Google map and PwC analysis

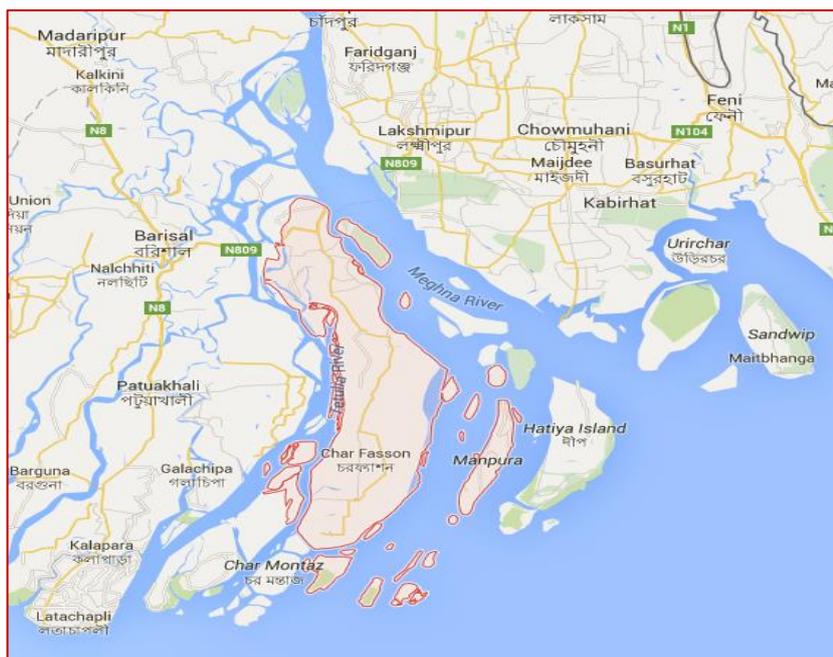
6.5.3.4. Water Connectivity

The primary transportation system of Bangladesh is its extensive inland waterways. Bangladesh Inland Water Transport Authority (BIWTA) is responsible for development, maintenance and control of inland water transport and of certain inland navigable waterways. Inland waterway network of Bangladesh is depicted in Annexure.

Bhola district is geographically different from all other regions of Bangladesh. This district is surrounded by water on three sides. Meghna River and Tetulia River flow through the district and on southern side of the district Bay of Bengal is located.

The proposed EZ has access to Bheduria ghat and Kheya ghat at an approximate distance of 5 km and 16 km respectively. Other major ghats are: Ilisha Ghat and Lalmohan Ghat. Following figure depicts the location of Bhola district.

Figure: Location of Bhola District



Bheduria Ferry Ghat

Northern side boundary of the proposed EZ is abutting the Zilla Road (LGED Road). The alignment of the Zilla Road (adjacent to the proposed EZ) is connected up to Bheduria Ghat (via Banker Haat market) on the west side. It’s a single lane bituminous road and during site visit, it was observed that the road condition is favorable for passage of heavy vehicles. Distance between the proposed EZ and Bheduria ghat is around 5 km.

Basis discussion with UNO officials, this ferry ghat is used for passenger transfer. Speed boats and motorized boats are available to transfer passengers to Lahar Hat ferry terminal from where Ilisha Ghat-Barisal highway is accessible. Following figure illustrates the location of Bheduria Ferry ghat.

Figure: Location of Bheduria Ghat



Information about the draught level near this ferry ghat was not available with the UNO office. Basis discussion with local boatmen, it was communicated to us that Tetulia River in this area is navigable throughout the year. Detailed feasibility needs to be undertaken to understand the potential of developing Bheduria ghat as a cargo terminal.

Following figure shows the photograph of Bheduria ghat and its approach.

Figure: Photograph of Bheduria Ghat



Kheya Ferry Ghat

Northern side boundary of the proposed EZ is abutting the Zilla Road (LGED Road). The alignment of the Zilla Road (adjacent to the proposed EZ) is connected up to Kheya Ghat on the east side. It's a single lane bituminous road and during site visit, it was observed that the road condition is favorable for passage of heavy vehicles. Distance between the proposed EZ and Kheya ghat is around 16 km.

Basis discussion with UNO officials, motorized passenger boats and speed boats operate from this ghat. Exact information about the draught level was not available at the UNO office. Local boatmen communicated to us that average level of draught in this area is more than 2.5 m; however, detailed information about the same needs to be ascertained during the feasibility stage. This part of Tetulia River is navigable throughout the year.

Ilisha Ferry Ghat

It's a major ferry terminal in Bhola district. Passenger and cargo transport takes place from Ilisha Ghat. Basis discussion with local inhabitants, ferries from Ilisha ghat commute towards Lakshmipur on the eastern side and towards Laharghat on the western side.

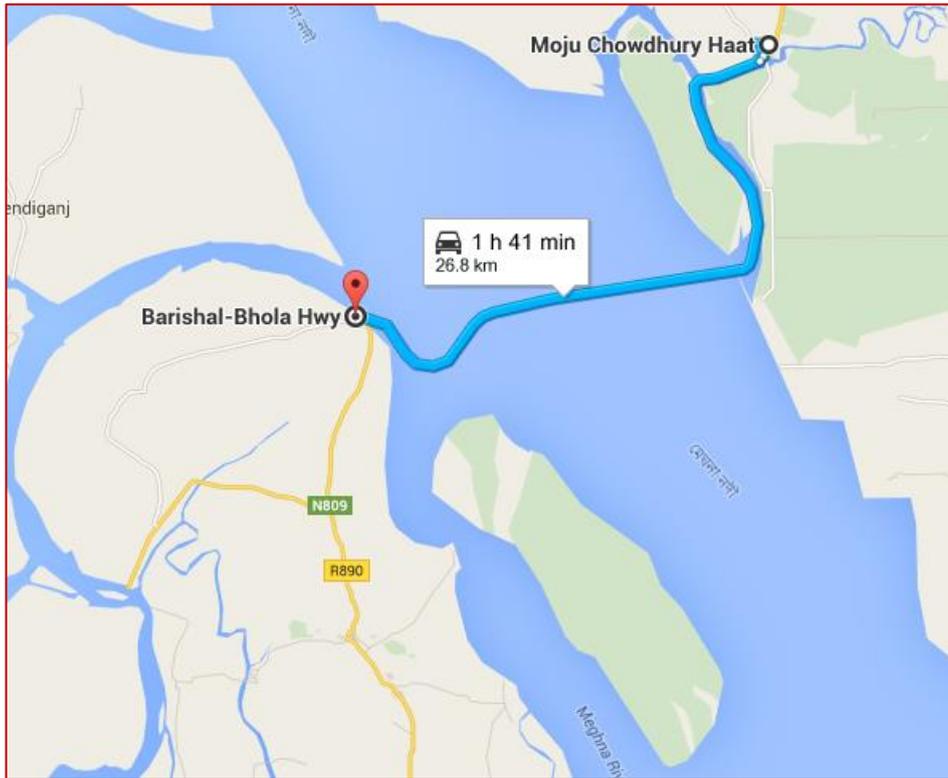
Following figure depicts the location of Ilisha ghat.

Figure: Location of Ilisha Ghat



Bhola-Laxmipur ferry service leaves from Ilisha ghat (located at a distance of 18 km (approx.) from Proposed EZ) to Moju Chowdhury Haat (located in Laxmipur). Following figure illustrates the Bhola-Laxmipur ferry service route.

Figure: Bhola-Lakshmipur Ferry Service



Proposed EZ is connected to Ilisha Ghat by Zilla road (LGED road) and R890. For detailed information about the same, please refer to the section on road connectivity.

Information about the draught level available in Meghna River near Ilisha ghat wasn't available at the UNO office. Basis discussion with local boatmen, this part of the river is navigable throughout the year. Following figure captures the photograph of Ilisha ghat.

Figure: Photograph of Ilisha Ghat



Proposed EZ has access to multiple ferry terminals as outlined above. These ferry terminals are connected to major ports of Bangladesh such as Mongla Port, Payra Port, Chittagong Port etc. Please

refer to Chapter Snapshot of Infrastructure Linkages Potential for detailed description of Mongla Port and Chittagong Port.

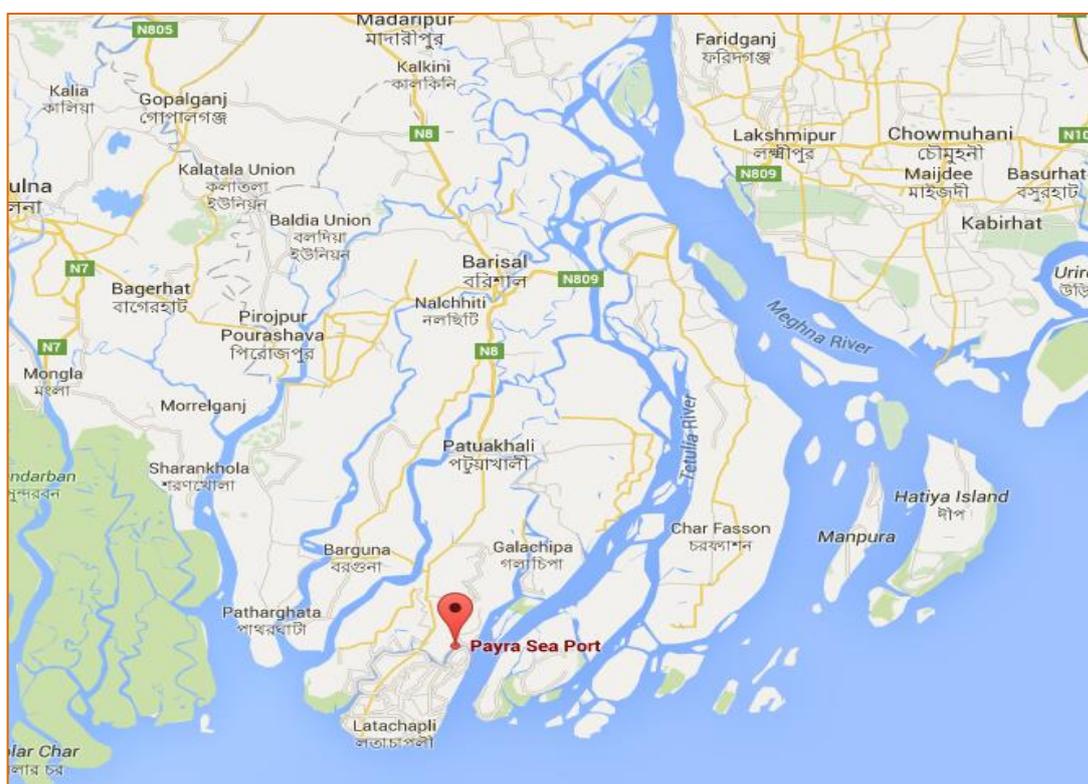
Payra Port: Payra port at Patuakhali's Payra River is the third seaport of Bangladesh. Payra Port Authority has stated that around BDT 15,000 Crores will be required to complete the infrastructural part of the construction process. The entire project will take 5 to 7 years for completion.⁴⁹

Chittagong Port Authority (CPA) has provided interest free loan for the feasibility study, land acquisition and other preparatory activities for the project. Hon'ble prime minister of Bangladesh officially inaugurated this port in 2013.⁵⁰ Once the port is fully operational mother vessels with eight to ten metre drafts will be able to anchor helping loading and unloading of goods more quickly than Chittagong port, which now handles 92% of the country's export and import cargoes.⁵¹

Distance between Bhola Sadar upzilla and Payra port is 135 km (approximate) and travel time is around 4.5 hours by road. Access takes via Barishal-Bhola highway or via Barishal-Subidkhali Sadak. Payra port is also accessible by Meghna River.

Following figure illustrates the location of Payra port.

Figure: Location of Payra Port



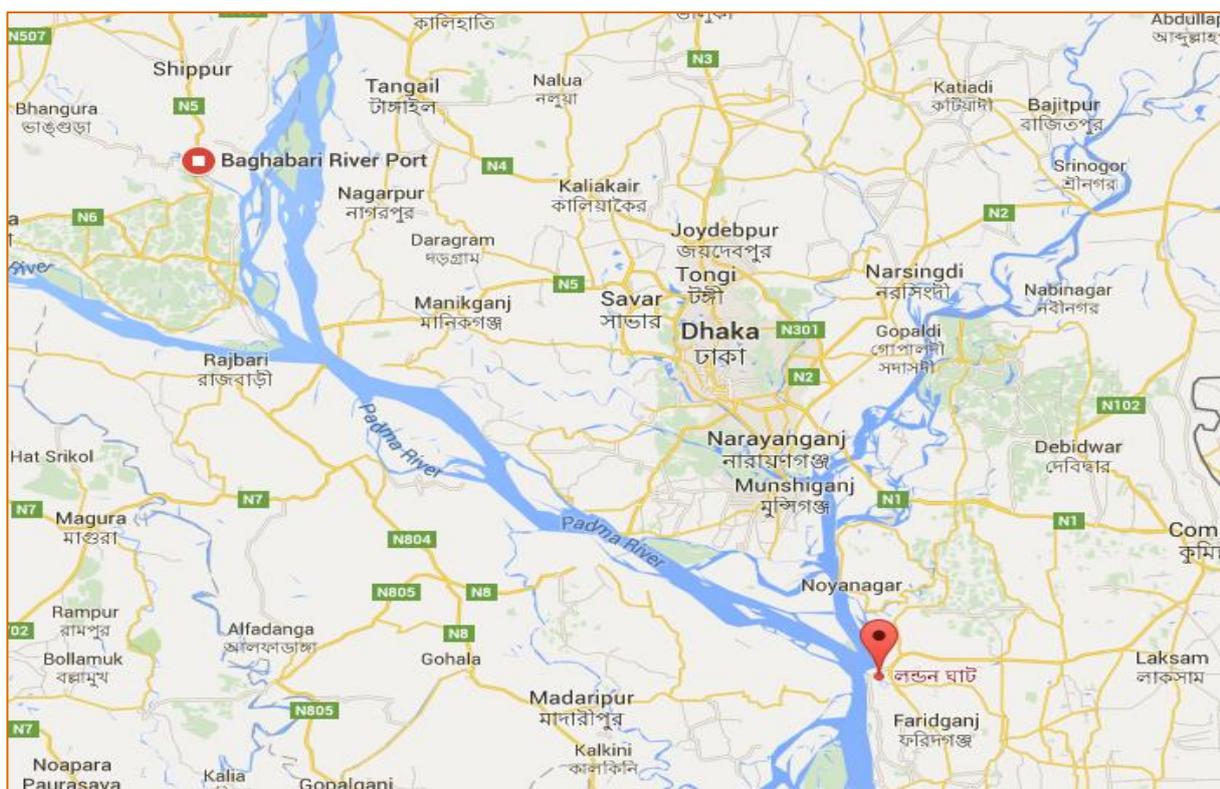
Chandpur Port: Chandpur port (also known as London ghat) is located on the bank of Padma River. It is located in close proximity to Narayanganj river port and Mawa ghat. Baghabari River port is also accessible from Chandpur port.

⁴⁹ <https://www.albd.org/index.php/en/updates/news/1100-construction-to-begin-of-3rd-seaport-at-patuakhali-s-payra-river>

⁵⁰ <http://www.bloomberg.com/news/articles/2015-06-23/japan-beating-china-in-race-for-bangladesh-s-first-deep-sea-port>

⁵¹ <http://www.dhakatribune.com/development/2013/nov/20/paira-bandar-starts-operation>

Figure: Location of Chandpur Port



Cargo handling capacity of Chandpur Port is tabulated below:

Table: Cargo handling capacity of Chandpur Port⁵²

Capacity	Bulk	Container	General Cargo
	MT/month	MT/month	MT/month
Total handling capacity of the port	6.500	-	6.500
Monthly activity of the port	5.520	-	5.800
Current monthly use by WFP	Nil	Nil	Nil
Potential monthly use by WFP	400	Nil	300
Monthly use if augmented	500	Nil	400

Details about draught available at Chandpur Port are illustrated in the following table:

⁵² BIWTA- Waterways Assessment

Table: Draught available at Chandpur Port⁵³

Specifications	Nb	Bulk		Conventional	
		Min (m)	Max (m)	Min (m)	Max (m)
Berths	03	-	-	-	-
Anchorage	05	-	-	-	-
Draught at anchor	metres	3,66	3,66	3,66	3,66
Draught at Berth	metres	3,66	3,66	3,66	3,66
Length Over All	metres	110	120	110	120
Beam (maximum)	metres	-	-	-	-

Proposed EZ has good access to ferry terminals such as Bheduria ghat, Kheya ghat and Ilisha ghat. In turn, these ferry terminals are connected to major ports of Bangladesh by its widespread IWT network. Some of the major ports which could be accessible from the proposed EZ are:

- Mongla Port
- Chittagong Port
- Chandpur Port
- Payra Port

Integration of the waterways is possible by developing any of the ferry terminals to a cargo terminal. Preliminary assessment indicates that there seems to be a possibility for the same, however this development activity is subjected to detailed feasibility analysis.

Potential for Cross-Border Trade

Connectivity to Mongla Port and Chittagong port could enable cross-border trade with countries like India, Myanmar, Singapore etc.

In June 2015, India and Bangladesh renewed a bilateral trade agreement and inked two separate pacts on coastal shipping the use of Bangladesh’s Chittagong and Mongla ports. Indian merchant vessels can now use the two ports to directly ship cargo to Bangladesh, instead of routing goods through ports such as Singapore. This will bring shipping time down to a week or less.

Also, India and Bangladesh have agreed on the extension of Protocol on Inland Water Transit and Trade (PIWTT) with the provision of automatic renewal in line with the proposed amendment to Bangladesh-India trade agreement. As per PIWTT, Narayanganj, Mongla, Khulna and two more ports are “Ports of Call” to provide facilities to the vessels of the India.

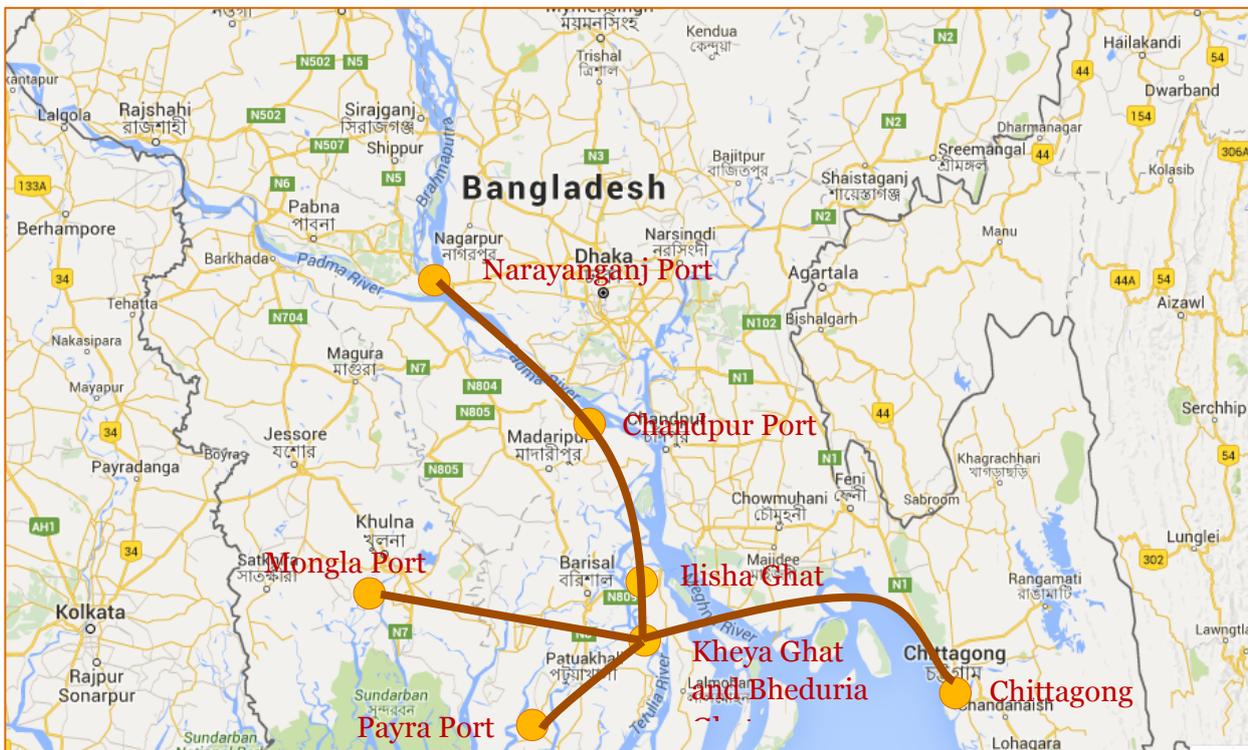
Broad level assessment reveals that if the any such ghats (Bheduria ghat or Kheya ghat) could be developed as cargo terminal, it has the potential for cargo transfer by waterways and cross-border trade as well. For transshipment, last mile connectivity could take place via zilla road. Widening of the zilla road seems not possible as it may attract resettlement issues. Moreover, proposed EZ site doesn’t have any direct access to waterways. Hence, considering the possibilities, it seems difficult for the proposed EZ to have amenable access to waterways; but the potential of waterways connectivity is significant for this economic zone.

However, any further decision on the same involves detailed feasibility analysis and master planning.

⁵³ BIWTA-Waterways Assessment

Following figures attempts to capture the potential access seems possible through waterways network for the proposed EZ.

Figure: Integration possibility from waterways for the proposed EZ



6.5.3.5. Intermodal Cargo Transfer

This section attempts to carry out a broad level assessment of the possibilities of linking the proposed EZ through different modes of transportation. All the other modes of transportation (other than road) require multimodal transport. Attempt has been made to evaluate the potential of integrating different modes of transportation with the proposed EZ. It is envisaged that integration of rail, water and air mode of transportation via road accessibility need to be assessed. However, this assessment is carried out at a broad level on the basis of the preliminary assessment. Any further decision on the same needs to be taken after detailed feasibility analysis

Rail Connectivity: There is no rail connectivity in the vicinity to the proposed EZ.

Airport Connectivity: Proposed EZ in Bhola Sadar is located at a distance of approximately 65 km from Barisal airport. However, river crossing via ferry/ launch service at Ilisha Ghat needs to be undertaken to reach the proposed EZ. Dhaka-Barisal Highway (N8) and Barisal-Bhola Highway (N809) connect the proposed EZ to Barisal airport. This route includes ferry ride from Laharhat ferry terminal to Ilisha ghat ferry terminal. Approximate distance of the ferry ride is 9 km. These are two-lane bituminous highway roads and are favorable for passage of heavy vehicles. Travel time from Barisal airport to proposed EZ is around 2.5-3 hours.

Barisal airport is a domestic airport and Biman-Bangladesh airlines and US-Bangla airlines operate flights to Dhaka from Barisal airport.

Preliminary assessment indicates that integration is possible with Barisal Airport. However, it's a domestic airport and the travel time to the proposed EZ is around 3 hours, which indicate that the efficacy of integration of air mode of transportation may not suffice. However, any decision on the same needs detailed feasibility analysis.

Waterways Connectivity: Proximity to ferry terminals such as Bheduria ghat, Ilisha ghat and Kheya ghat could be utilized to connect the proposed EZ to widespread waterways network of Bangladesh. Various major ports such as Mongla port, Chittagong port, Payra Port, Narayanganj port etc. could be accessed both by roadways and waterways as detailed in previous section. Proposed EZ is located near to Bay of Bengal and this location may be utilized to evoke the scenario of cross border trade with neighboring countries like India, Myanmar, Singapore etc. However, detailed feasibility needs to be undertaken to ascertain the possibility of developing the ferry terminals as cargo terminals.

Preliminary assessment indicates that there is a good possibility to integrate the proposed EZ with major ports of Bangladesh via waterways. However, proposed EZ doesn't have any direct access to waterways. Transshipment could take place via Zilla Road, but last mile connectivity seems to be an issue for the cargo movement. Further, development of Bheduria ghat or Kheya ghat as cargo terminals is subjected to external factors. Considering all the major factors, integration of the proposed EZ to waterways would require considering the transshipment issue.

6.6. Resettlement issues

6.6.1. Social impacts

The impacts have been assessed on the following parameters:

- (viii) Loss of land (for existing land owners),
- (ix) Loss of homes/structures,
- (x) Loss of Trees
- (xi) Loss of livelihood systems/ income opportunity
- (xii) Loss of water bodies.

The expected types of losses are described in the following sub-sections.

6.6.1.1. Loss of land

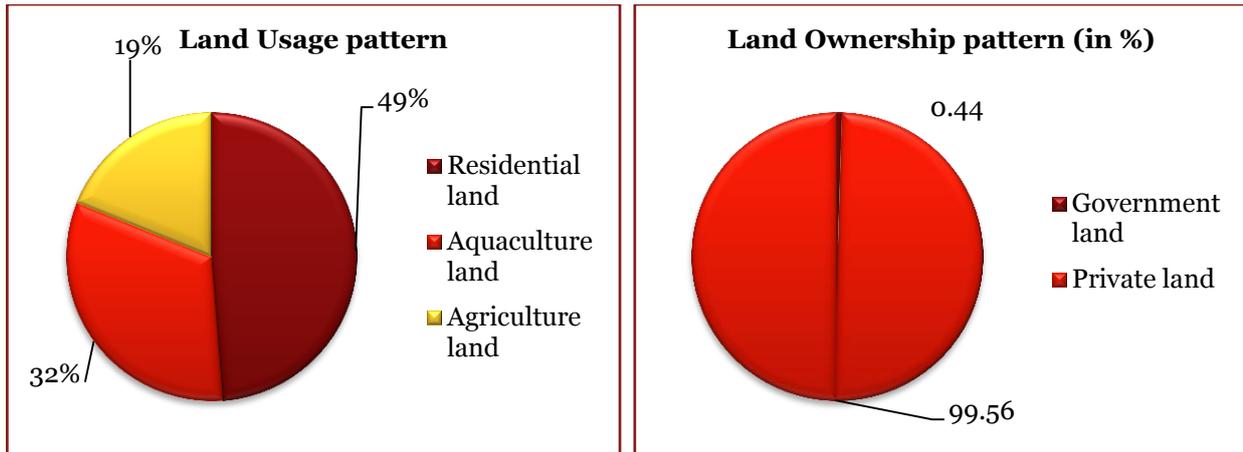
To establish the proposed Bhola sadar EZ, a total of 304.07 acres of land has been demarcated by the authority. As per Field Measurement Book (FMB) superimposed on Google map the total area works out to approximately 280.12 acres. The land usage pattern for this area is as under:

- Residential land- 136.56 acre
- Agricultural land- 90.8 acre
- Aquaculture – 52.8 acre

Ownership pattern of the land is as follows:

- Government- 1.35 acres
- Private land – 302.72 acres

Figure: Land Ownership and Usage pattern



Source: Data collected from Bhola sadar UNO Office

As a result of the development of the project, residential colonies, and agricultural land owners will lose entire land holding.

6.6.1.2. Loss of homes/structures

As a result of the development of this project, around 425 families (viz. 87 houses) would be directly affected. All affected structures are 'kutchha' structures and the average size of the structures is 200 sq. ft approximately with a minimum and maximum size of 140 sq. ft. - 300 sq. ft.

Figure: Affected households



6.6.1.3. Loss of trees

There are plenty of trees present in the project area. The master plan (during the feasibility stage) can be prepared in a way that maximum number trees could be retained and earmarked as green area. Basis discussion with local inhabitants, approximately 1500-2000 trees are located within the project boundary. However, topographical survey needs to be undertaken to ascertain this.

Figure: Trees located inside the project area



6.6.1.4. *Loss of income/livelihood*

As a result of loss of agricultural land, the following would be directly affected:

- Local farmers,
- Sharecroppers,
- Yearly lease holders (agricultural land)
- Owners of agricultural assets (deep tube-wells and shallow tube-wells etc.)

Indirectly, seasonal agriculture labours and crop traders will be affected. Basis preliminary assessment and details shared by UNO office and local inhabitants, 100-200 numbers of households (approximate) could stand to lose their income/livelihood as a result of the development of the project.

6.6.1.5. *Loss of water bodies*

At present there are no notable water bodies inside the project area.

6.6.2. *Constraints and its mitigation*

The major constraints and its mitigation are presented in following table.

Table: Major Constraints and Mitigation measures

Sl. No.	Constraints	Mitigation measures
1	Low lying land	Basis preliminary assessment, landfilling of depth 6-9 feet needs to be undertaken.
2	Residential units	87 household structures (425 families) need to be resettled as a result of the development of the proposed EZ.
3	Loss of trees	Trees existing in the site can be retained and earmarked as green area during the preparation of master plan.
4	Loss of income/livelihood	Basis preliminary assessment and details shared by UNO office and local inhabitants, 100-200 numbers of households (approximate) could stand to lose their income/livelihood as a result of the development of the project.

6.6.3. Block Cost Estimation for development of Offsite Infrastructure

Based on preliminary assessment and available information (the schedule of rates published by the competent public authorities, prevailing market prices, in-house data bank and experience gained over similar / comparable development), the Block Cost estimate for the proposed offsite infrastructure components required for developing EZ has been calculated.

Wherever applicable, we have considered all the possible options to arrive at the cost of development and the option of maximum development cost is considered to arrive at the total cost of the proposed offsite infrastructure development. This exercise has been carried out to indicate the approximate cost to be incurred for the development of EZ and it may vary to any extent during implementation stage depending upon the detailed technical information and new developments which may affect / contribute to this EZ. The techno-commercial viability of these options needs to be explored during feasibility stage.

Following table depicts the broad level Block Cost estimates for development of Offsite infrastructure for Bhola Sadar EZ. The figures provided are indicative and may vary depending on the master planning, feasibility analysis and the timeline of development activities.

The broad Block Cost estimate for off-site infrastructure development for proposed Bhola Sadar EZ is calculated as BDT 13,686 Lakh (approx.)

Table: Block Cost Estimation (Bhola Sadar)

Bhola sadar – EZ										
S.No	Description	Option -1			Option -2			Considered cost option		
		Qty	Unit	Amount in Lakh BDT	Qty	Unit	Amount in Lakh BDT	Qty	Unit	Amount in Lakh BDT
1	Site filling	Lumpsum		9723	Lumpsum		9723	Lumpsum		9723
2	Compound wall	4350	Mtr	413	4350	Mtr	413	4350	Mtr	413
3	Electrical (External connectivity- 33 kv LINE with 33/11 KV substation)	18	km	1880	18	Km	1880	18	Km	1880
4	Water supply - Water Intake from River - 5.90 MLD	1	km	1670				1.00	Km	1670
5	Water supply (Water from Bore well- bore well 4 Nos -5.90 MLD				3	Km	416			
Total				13686			12432			13686

6.7. Voice on the Ground

6.7.1. Stakeholder consultation

Following table lists the details of stakeholders consulted at UNO office to obtain first-hand information from about the proposed EZ.

Table: Stakeholders consulted

Name	Description	Phone number
Mr. Salim Reza	Deputy commissioner	+8801715211899
Mr. Md Rahman	Additional Deputy commissioner	+8801719765469
Mr. Shabeer Reza Fanazy	DGM, Bhola palli bidyut samaty	+8801769402117
Mr. Abdul Hakim	Executive engineer, Bhola O&M division-1	+8801741377506

6.7.2. Consultation with Private Sector

Further to the site visit for the initial assessment, private sector consultation was also carried out to understand the preliminary level demand assessment of the proposed EZ to gauge the interest of unit investors from various sectors. Some of the major aspects which were discussed with the private investors to understand their interest are as below:

- Location attractiveness
- Availability of physical infrastructure
- Availability of social infrastructure
- Ease of availability of quality manpower
- Marketability of the site
- Support required from the Government

We discussed the salient features of the proposed EZ of the proposed EZ with various investors in Bangladesh to understand how attractive this project is for them. Also, we tried to understand the macro level infrastructure requirements that any investor looks upon before making an investment decision. The results of the Private Sector consultation are summarized in the following table.

Table: Summary of the results of the Private Sector consultation

Sl. No.	Parameters	Discussions	Excerpts from the interaction (if any)
<i>Infrastructure aspects that investors take into consideration while making investment decisions:</i>			
1	Connectivity of the site	According to the investors, the EZ site should be located in the proximity of any industrial center &/or city. The connectivity by road and rail should be excellent and also the access to port is important as this will ease the conveyance of the finished goods to customers. Bhola Sadar region is surrounded by water on three sides and road	“Bhola area has connectivity problem.” -Orion Group, Bangladesh

		connectivity to Barishal on the other side. There is no rail connectivity in this region. Also, access to other parts of Bangladesh takes place via IWT. Investors expressed concern that due to the connectivity constraint, it might be difficult for industries to proliferate in this area.	
2	Proximity to Port	<p>Access to port is very important for development of multi-product EZs as it will facilitate easy transportation of raw materials and finished goods.</p> <p>Payra Port is the nearest port for the proposed site in Bhola Sadar. This port is poised to become the hub of export/import for the country. Investors opined that this site has excellent potential for import/export based industrial units and foreign investors.</p>	<p><i>“Proximity to port is very important for textile industry to develop.”</i></p> <p>- NASSA Group, Bangladesh</p> <p><i>“Bhola Sadar EZ should utilize the proximity to Payra Port.”</i></p> <p>- A K Khan & Company Limited, Bangladesh</p>
3	Utility Connection	<p>For a multi-product EZ to function and for manufacturing units to effectively continue production, utility connection is crucial.</p> <p>Investors expressed opinion that this site has access to gas which would facilitate heavy industries to function. Further to this, connectivity via water would also enable transport of goods in bulk volume.</p>	<p><i>“Availability of Gas, Power and Water is the prerequisite to set up any manufacturing based industry.”</i></p> <p>- Orion Group, Bangladesh</p> <p><i>“Proposed EZ has good potential for heavy industries.”</i></p> <p>- NASSA Group, Bangladesh</p>
Marketability of proposed Bhola Sadar EZ:			
4	Location of the site	<p>Proposed EZ in Bhola Sadar area should effectively utilize the access to gas and water mode of transportation.</p> <p>According to unit investors, raw materials are not available in abundance in this area. Also, due to the geographical constraints, it might get difficult for domestic investors and small/ medium scale industrial units to locally source raw materials and to transport the</p>	<p><i>“Location constraint might be disadvantageous for domestic investors”</i></p> <p>- Orion Group, Bangladesh</p> <p><i>“Bhola Sadar is located at a remote place and access is difficult.”</i></p> <p>- A K Khan & Company Limited, Bangladesh</p>

		finished goods to other parts of Bangladesh.	
5	Demand among domestic and foreign unit investors	Investors opined that the proposed EZ might be best fit for export oriented units and foreign investors who need to transport finished goods outside Bangladesh. They felt that proposed site is not so attractive for domestic investors	<p><i>“Proposed site has good potential for foreign investors.”</i></p> <p>- Orion Group, Bangladesh</p>

6.8. Overall Adequacy of the EZ Site in Bhola Sadar

Evaluation of the proposed EZs with respect to key parameters required to establish multi product economic zones are presented in following table.

Table: Overall Adequacy of the Bhola Sadar EZ Site

Sl. No.	Parameters	Illustration of the present facilities	Remarks/ Analysis
A	Connectivity		
1 (A)	Road Connectivity Existing Road Connectivity to major cities of Bangladesh	<ul style="list-style-type: none"> ➤ Waterway is the most convenient mean of accessing the EZ. There is no direct road connectivity from Bhola to other parts of Bangladesh. ➤ Bhola district is approachable only via ferry by crossing the river on both east and west side. ➤ Proposed EZ is connected to capital city Dhaka via Barisal and it is connected to Chittagong via Laxmipur. ➤ Access to Dhaka takes place via Barisal via R890 and N8. This route includes ferry ride. 	<p>For any Multiproduct EZ to develop the site must be near to the main city and the connectivity via road should be excellent.</p> <p>Proposed EZ doesn't have any direct road connectivity to Dhaka and Barisal.</p>
1 (B)	Road Connectivity Last Mile Connectivity	<ul style="list-style-type: none"> ➤ Zilla Road is abutting the proposed EZ on the northern side boundary. As a result of this, access from the Zilla Road to the proposed EZ can be provided at any location. There is no need for separate approach road for the proposed EZ. ➤ However, connecting the EZ with the trunk road network requires multimodal transport and this renders the last mile connectivity unattractive 	<p>The alignment for an approach road is essential for developing a multiproduct EZ as it shall enable the access for the manpower and heavy commercial vehicles to national highways and expressways.</p> <p>A broad level initial assessment indicates that access can be provided at any location of the proposed EZ. Nevertheless, the last mile connectivity to the trunk road network requires construction of a bridge or multimodal transport.</p>
2	Rail Connectivity	Proposed EZ is not connected to any rail network.	Rail mode of transportation is vital for

			<p>goods with high volume and timeliness of delivery.</p> <p>The existing railway stations are far away and requires multimodal transport to connect with the trunk rail network, thereby rendering the whole supply chain costly and time consuming</p>	
3	Water Connectivity	<ul style="list-style-type: none"> ➤ Proposed EZ has excellent access to IWT connectivity. ➤ The proposed EZ has access to Bheduria ghat and Kheya ghat at a distance of 5 km and 16 km respectively. ➤ Other major ghats are: Ilisha Ghat and Lalmohan Ghat. ➤ Broad level preliminary assessment indicates that the nearby ferry ghats may be developed as cargo terminals which could provide access to widespread IWT connectivity. ➤ Preliminary assessment also indicates that integration of ports (like Mongla port, Chittagong Port, Payra Port) with the proposed EZ seems possible. Also, there seems to be possibility of cross border trade through the waterways. ➤ Detailed feasibility needs to be undertaken to evaluate the potential of the same. 	<p>Connectivity to IWT is essential for easy transfer of labor, raw material from local sourcing and for transfer of finished goods to nearby areas to cater to the local demand.</p> <p>Proposed EZ is connected to major ports of Bangladesh by rivers such as Meghna, Tetulia, Padma etc. There seems to be possibility of integration of the waterways to the proposed EZ.</p> <p>Further, access to Bay of Bengal could facilitate cross border trade with neighboring countries such as India, Myanmar, Singapore etc. However, this decision is subjected to detailed feasibility analysis.</p> <p>However, last mile connectivity aspect needs improvement and also development of Bheduria ghat or Kheya ghat falls under the purview of external agencies. At present, there is no plans for development of such ports/ghats into full fledged terminal and lot of inter government coordination is required to initiate such massive infrastructure development in the vicinity of the EZ.</p>	

5	Airport Connectivity International airport in the proximity	<ul style="list-style-type: none"> ➤ Proposed EZ in Bhola Sadar is located at a distance of approximately 65 km from Barisal airport. However, river crossing via ferry/ launch service at Ilisha Ghat needs to be undertaken to reach the proposed EZ. ➤ Dhaka-Barisal Highway (N8) and Barisal-Bhola Highway (N809) connect the proposed EZ to Barisal airport. ➤ Dhaka international airport is located about 237 km from the proposed EZ including ferry crossing. 	For movement of goods by air cargo, proximity to airport is essential. Dhaka Airport is 237 km (approximate) from the proposed EZ. Long distance, involvement of multimodal transport renders the supply chain costly and time consuming	
B	Utility Connections			
1	Power Availability	<ul style="list-style-type: none"> ➤ Existing 33/11 KV substation (of capacity 10 MVA) near Bangla Bazar is located at a distance of around 18 km from the proposed EZ. It would be upgraded to 20 MVA by 2016. After catering to the local demand, 2 MVA surplus power is available from this substation. ➤ One additional 33/11 KV substation of 10 MVA capacity is proposed within one km radius of the proposed EZ. Exact location for the substation is yet to be finalized and it is planned to commission by June 2016. Capacity of this substation is 5 MVA. ➤ There is a 132 KV substation located in Patuakhalia (at a distance of around 65 km from the proposed EZ) and a 230 KV substation is located in Buranuddin (approximate 25 km away from the proposed EZ). ➤ Apart from the above power sources, one 225 MW gas-fired Combined Cycle Power Project is available within approximately 3 km distance from site. 	24×7 uninterrupted electricity supply is a prerequisite for development of any manufacturing facility. Basis working knowledge and best practices followed, power requirement in a typical EZ could be transmitted by a dedicated 33 KV line for demand up to 25 MW. If the demand is more than 25 MW, then the option of 132 KV transmission lines needs to be further explored. Proximity to 33 KV power connection and surplus power availability in the vicinity of the proposed EZ are the crucial factors to decide on the potential of power availability to the proposed EZ.	
2	Water Availability	Basis interaction with local inhabitants, the ground water is available at a depth of 200 to 300 feet (approximately) from natural ground level.	It is very important to have adequate and sustainable source of potable water for the development of multiproduct EZ	

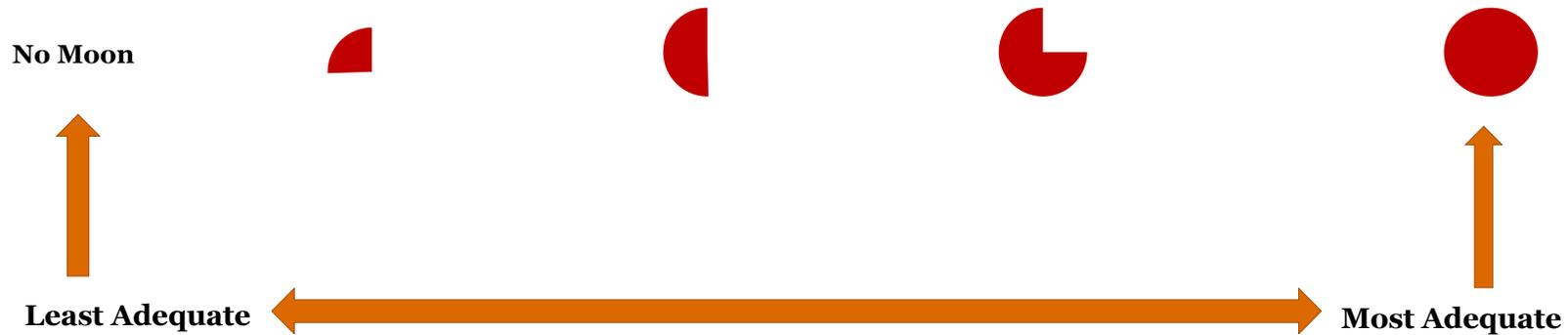
		<p>Preliminary assessment suggests that the water requirement could be met by extracting water from Tetulia River by providing suitable intake system and water treatment plant.</p> <p>Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Bhola Sadar EZ is around 2.58 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could be extracted through bore wells. Extraction of more water through bore wells might result in depletion of the aquifer level.</p>	<p>so that the labours don't face any scarcity of drinking water. The industrial units need uninterrupted supply of good quality water for industrial consumption.</p> <p>Proposed site has proximity to Tetulia River, thus the option of extracting water from Tetulia River may be further explored. Decision regarding extraction of water from bore well/ Tetulia River needs to be taken after detailed feasibility analysis</p>	
3	Gas Availability	<ul style="list-style-type: none"> ➤ Sunderban Gas Company is responsible for supply of gas in this region. ➤ Local gas substation is located at a distance of around 4 km from the proposed EZ and it has a capacity of 45 MMscf per day with surplus of 1 MMscf per day. ➤ Pressure obtained in the substation is also adequate. ➤ In Shahbazpur gas field and in Buranuddin, gas source is available. It could be used for industrial consumption. 	<p>Gas supply is a prerequisite for development of any manufacturing facility.</p> <p>10" Gas pipes is available near the Bhola rental power plant and it is located within 2km radius of the proposed EZ. Upgradation of this pipeline to 12" is possible. Option of tapping of Gas supply from this point to the proposed EZ could be further explored.</p>	
C	Suitability for industrial development			
1	Existing industrial ecosystem and Possible Backward linkages for industries	<ul style="list-style-type: none"> ➤ Bhola is rich in natural resources such as rice, jute, potato, chilli, cucumber, watermelon etc. ➤ This region is known as watermelon hub and watermelon from Bhola region is transported to all parts of Bangladesh; Potato from this region is exported to Russia. 	<p>Existing industrial ecosystem facilitates easy development of industries in the economic zone based on backward linkages and ease in raw material sourcing.</p> <p>Bhola Sadar hasn't witnessed any</p>	

		<ul style="list-style-type: none"> ➤ Due to the adjacency of Padma River, fishing activities take place in this area. ➤ There is no big industrial set up in this district. Several small and medium scale industries are operating in this region. ➤ Some industries operating in Bhola area are: fish net, garments and textile, plastic, wax, shoes, hatchery, cold storage etc. 	significant industrial proliferation; however, natural resources are available in this region. However, there is a lack of backward and forward linkages in the region.	
2	Proximity to major cities	Bhola Sadar EZ is located in close proximity to Barisal. Other major cities are also accessible from Bhola; however, it involves crossing the ferry and there is no direct road connectivity to other parts of Bangladesh.	Proximity to major cities facilitates the proliferation of industrial development. Existing industrial ecosystem provides access to raw material sourcing and skilled manpower.	
D	Challenges in developing the economic zone (Resettlement Issues and social aspects)			
1	Landfilling	Basis preliminary assessment, landfilling of depth 6-9 feet needs to be undertaken.	Landfilling has to be done for the entire site, which means some initial cost has to be borne before the commencement of the development works. Depth of landfilling is less than the average depth of landfilling for the six sites.	
2	Residential units to be rehabilitated	Basis preliminary assessment, 87 household structures (approximate) need to be rehabilitated as a result of the development of this project.	Rehabilitation of household structures involves challenge in developing this economic zone.	
3	Other Resettlement Issues	<ul style="list-style-type: none"> ➤ Trees existing in the site can be retained and earmarked as green area during the preparation of master plan. ➤ Basis preliminary assessment and details shared by UNO office and local inhabitants, 100-200 numbers of households (approximate) could stand to lose their income/livelihood as a result 	Mentioned resettlement aspects need to be considered before the development of the economic zone project.	

E	Availability of Social Infrastructure	of the development of the project.		
1	Availability of good residential facility in the nearby areas	<p>Dwelling units and residential facilities are available for labours in Bhola Sadar area.</p> <p>As Bhola is a not easily accessible from other parts of Bangladesh, proliferation of quality residential facilities haven't taken place in this area.</p>	<p>The labours working in the proposed EZ shall have access to the dwelling units and residential areas within close proximity to the proposed EZ.</p> <p>However for executives, lack of social infrastructure and connectivity issues with other major regions of the country may pose a challenge</p>	
2	Medical facilities available in the nearby areas	<p>One government hospital is available in Bhola with 250 beds and 20 - 30 private hospital with 10 - 15 beds.</p> <p>However for serious medical treatment, local inhabitants need to travel to Dhaka. Travel to Dhaka takes place by road and water mode of transportation and approximate travel time for passengers is around 9-10 hours.</p>	<p>There are few medical facilities available within 10 km radius of the proposed EZ to cater to the healthcare requirements of the workforce.</p> <p>Major healthcare facilities are available in Dhaka.</p>	
3	Air and water pollution at the site (prevailing condition)	<p>The site is free from air and water pollution and no significant noise was observed when the site visit was undertaken.</p> <p>The incidence of water and air pollution at the site is insignificant. Also, the incidence of water borne diseases wasn't recorded in the locality.</p>	<p>The location of any multi product EZ should ideally be free from air and water pollution. Pollution would lead to health hazards and non-conducive working environment for the workforce. From the initial site assessment, it appears that the site is free from all such pollution problems.</p>	
4	Availability of manpower	<p>Bhola district has a total of 12 technical and vocational institutions, 1 agriculture and veterinary college, 35 (government and non-government) colleges, 262 (government and non-government) secondary schools and 241 madrasa.</p> <p>Some of the technical institutes located in the proximity to the proposed EZ are:</p>	<p>Availability of manpower is a prerequisite in development of multiproduct economic zones.</p> <p>Basis preliminary assessment, quality manpower requirement could be sourced from the institutes located in</p>	

		<ul style="list-style-type: none"> ➤ Bholā Technical School & College ➤ Bholā Polytechnic Institute ➤ Barisal Technical Training Center 	<p>the proximity of the site. However, this would partially meet the manpower requirements.</p> <p>Sourcing of additional manpower may be considered from Dhaka or other prominent places of Bangladesh and this may pose come constraints, given the location and connectivity challenges pertaining to the site.</p>	
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Legend:



6.9. SWOT Analysis of Bhola Sadar Economic Zone

Based on the detailed analysis carried out, SWOT analysis of the economic zone is outlined as below:

Parameters	Strengths	Weaknesses
Last mile connectivity	There is no need for separate approach road for the proposed EZ. Zilla Road (LGED road) is abutting the proposed EZ on the northern side boundary. As a result of this, access from the Zilla Road to the proposed EZ can be provided at any location.	
Water availability inside the proposed EZ		Basis discussion with UNO officials, ground water is available at a depth of 200-300 feet (approx.) from natural ground level.
Block cost of off-site infrastructure development		Block cost estimate for off-site infrastructure development is BDT 13,686 lakh. Block cost estimate for off-site infrastructure development for unit area is calculated at 45.01 BDT lakh per acre, which is third lowest.
Social and resettlement aspects		<ul style="list-style-type: none"> Landfilling of around 6-9 feet is envisaged Basis preliminary assessment and details shared by UNO office and local inhabitants, 100-200 numbers of households (approximate) could stand to lose their income/livelihood as a result of the development of the project. Basis preliminary assessment, 87 residential units need to be rehabilitated as a result of the development of this project. Trees existing in the site can be retained and earmarked as green area during the preparation of master plan.
Cost of private land acquisition		Around 302.72 acre of private land need to be acquired which would result in a cost of BDT 3027.72 lakh. Proposed EZ stands at third lowest figure for cost of land acquisition.
Parameters	Opportunities	Threats
Road connectivity		<ul style="list-style-type: none"> Direct road connectivity is not available from Bhola to other parts of Bangladesh. Waterways need to be accessed for the same. Bhola district is approachable only via ferry by crossing the river on both east and west side. After crossing the waterways, access to Dhaka takes place via Barisal by R890 and N8.

<p>Rail connectivity</p>		<p>Proposed EZ doesn't have access to any rail network as Bhola district is surrounded by water.</p>
<p>Waterways connectivity</p>	<ul style="list-style-type: none"> • Bhola Sadar upzilla has excellent access to IWT connectivity. • The proposed EZ has access to Bheduria ghat and Kheya ghat at a distance of 5 km and 16 km respectively. • Other major ghats are: Ilisha Ghat and Lalmohan Ghat. • Broad level preliminary assessment indicates that the nearby ferry ghats may be developed as cargo terminals which could provide access to widespread IWT connectivity. • Preliminary assessment also indicates that integration of ports (like Mongla port, Chittagong Port, Payra Port) with the proposed EZ seems possible. Also, there seems to be possibility of cross border trade through the waterways. However the development of Bheduria ghat/ Kheya ghat as cargo terminals is subjected to external factors. Also, the last mile connectivity from the ghats to the proposed EZs has resettlement issues and widening seems to be a problem. 	
<p>Air connectivity</p>		<ul style="list-style-type: none"> • Proposed EZ in Bhola Sadar is located at a distance of approximately 65 km from Barisal airport. However, river crossing via ferry/ launch service at Ilisha Ghat needs to be undertaken to reach the proposed EZ. • Dhaka international airport is located about 237 km from the proposed EZ including ferry crossing.
<p>Power connection</p>	<p>Following power connections are available in the proximity of the proposed EZ:</p> <ul style="list-style-type: none"> • Existing 33/11 KV substation (of capacity 10 MVA) near Bangla Bazar is located at a distance of around 18 km from the proposed EZ. It would be upgraded to 20 MVA by 2016. After catering to the local demand, 2 MVA surplus power is available from this substation. • One additional 33/11 KV substation of 10 MVA capacity is proposed within one km radius of the proposed EZ. Exact location for the substation is yet to be 	

	<p>finalized and it is planned to commission by June 2016. Capacity of this substation is 5 MVA.</p> <ul style="list-style-type: none"> • There is a 132 KV substation located in Patuakhalia (at a distance of around 65 km from the proposed EZ) and a 230 KV substation is located in Buranuddin (approximate 25 km away from the proposed EZ). • Apart from the above power sources, one 225 MW gas-fired Combined Cycle Power Project is available within approximately 3 km distance from site. 	
Gas connection	<ul style="list-style-type: none"> • Local gas substation is located at a distance of around 4 km from the proposed EZ and it has a capacity of 45 MMscf per day with surplus of 1 MMscf per day. • As informed to us by the UNO officials, pressure obtained in the substation is also adequate. • In Shahbazzpur gas field and in Buranuddin, gas source is available. It could be used for industrial consumption. 	
Water connection		Proposed EZ is located at a distance of around 5 km from Tetulia River. Preliminary assessment suggests that the water requirement could be met by extracting water from Tetulia River by providing suitable intake system and water treatment plant.
Existing industrial ecosystem and Possible Backward linkages for industries	<ul style="list-style-type: none"> • Bhola is rich in natural resources such as rice, jute, potato, chilli, cucumber, watermelon etc. • This region is known as watermelon hub and watermelon from Bhola region is transported to all parts of Bangladesh; Potato from this region is exported to Russia. • Due to the adjacency of Padma River, fishing activities take place in this area. 	There is no big industrial set up in this district. Several small and medium scale industries are operating in this region.
Proximity to major cities	Bhola Sadar EZ is located in close proximity to Barisal.	Other major cities are also accessible from Bhola; however, it involves crossing the ferry and there is no direct road connectivity to other parts of Bangladesh.
Access to quality manpower	Bhola district has a total of 12 technical and vocational institutions, 1 agriculture and veterinary college, 35 (government and non-government) colleges, 262 (government and non-government) secondary schools and 241 madrasa.	Sourcing of additional manpower may be considered from Dhaka or other prominent places of Bangladesh and this may pose some constraints, given the location and connectivity challenges pertaining to the site.
Availability of medical	One government hospital is available in Bhola with 250 beds and 20 - 30 private	However for serious medical treatment, local inhabitants need to

facilities	hospital with 10 - 15 beds.	travel to Dhaka. Travel to Dhaka takes place by road and water mode of transportation and approximate travel time for passengers is around 9-10 hours.
Availability of residential facilities	Dwelling units and residential facilities are available for labours in Bhola Sadar area.	As Bhola is a not easily accessible from other parts of Bangladesh, proliferation of quality residential facilities haven't taken place in this area. No international standard residential facilities are available in the vicinity to the proposed EZ.

Bheramara (Kushtia) EZ

7. Bheramara Economic Zone

7.1. Location Details and Salient Features

7.1.1. General Profile of the District

Geographic Location

Kushtia is a district in the Khulna division located in western part of Bangladesh and at a distance of 240 km (approx.) the capital city Dhaka. There are total of 10 districts under Khulna division.

Kushtia is surrounded by:

- North-River Padma; Rajshahi , Natore and Pabna districts;
- East- Rajbari district;
- South- Jhenaidaha and Chaudanga districts;
- West- Meherpur district and west Bengal state of India.

It lies between 23°42' and 24° 12' north latitudes and between 88°42' and 89°22' east longitudes. The total area of the zila is 1608.80 sq. km. (621.16 sq. miles).⁵⁴

Kushtia district has 6 upzillas:

- Bheramara
- Daulatpur
- Khoksa
- Kumarkhali
- Kushtia Sadar
- Mirpur

The proposed EZ is located in Bheramara upzilla. Daulatpur and Mirpur upzilla are in close proximity to the proposed EZ.

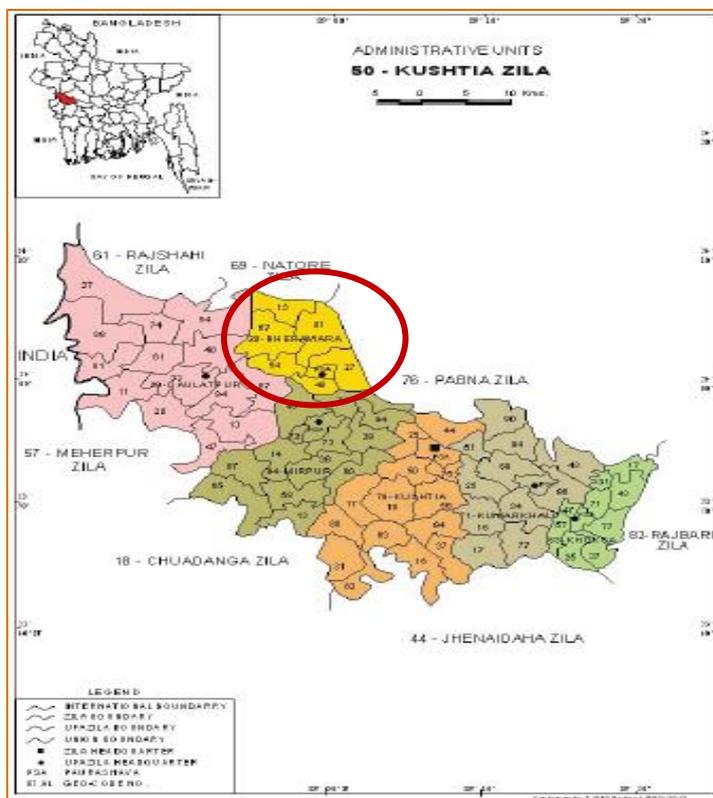
Demographics

The district has overall population of 1,946,838 as per Population and Housing census 2011. The gender ratio in 2011 was 1000 (no. of female per 1000 males). Total numbers of households were 477289 and the literacy rate was 46.3%.⁵⁵

Upzila wise population details as per census are presented in the Table 5-1.

Table 7-1: Upzila wise population details of Manikganj District

Name	Status	Population census		Growth
		2001	2011	
Kushtia	District (Zila)	17,40,155	19,46,838	11.9 %
Bheramara	Sub district (Upazila)	1,75,677	2,00,084	3.9%
Daulatpur		4,43,655	4,56,372	2.9%
Khoksa		1,14,188	1,29,555	13.5%
Kumarkhali		2,97,728	3,28,457	10.3%
Mirpur		1,14,188	1,29,555	13.5%



Source: Population and Housing Census, Kushtia, BBS 2011

⁵⁴ Population and Housing Census Kushtia District, BBS 2011

⁵⁵ Population and Housing Census Kushtia District, BBS 2011

Kushtia Sadar		4,23,818	5,02,255	18.5%
Mirpur		2,85,089	3,30,115	15.8%

Population and Housing Census Kushtia District, BBS 2011

Climate Condition

The annual average temperature of the Kushtia district varies from maximum 37.8°C to a minimum of 11.2°C. Average annual rain fall and humidity of this district are 1467 mm and 78% respectively. ⁵⁶

Main rivers flowing through this district are:

- Padma
- Garai
- Mathabhanga
- Kaliganga
- Kumar

Agriculture

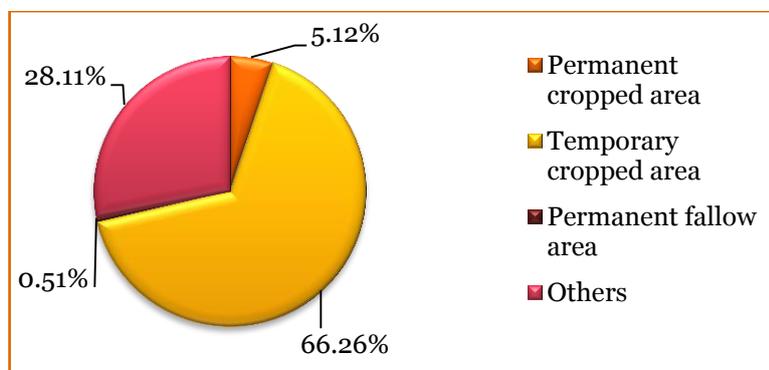
Total agriculture land in Dhaka district is 1129.02 sq. km, which amounts to 71% (approx.) of the total area of the district.⁵⁷

Major agriculture crops cultivated in the district are Paddy, tobacco, jute, sugarcane, pulses oil seed and different type of vegetables.

Major horticulture crops in this district are Mango, banana, jackfruit, lichi and other fruits.

Major portion of the agriculture land is utilized as temporary cropped area in this district. The land use pattern of the agriculture land for the year 2008 is presented in the following figure.

Figure: Land use pattern (2008)



Source: District Statistics, BBS 2011

Irrigation

Irrigated area classifications fall into two categories:

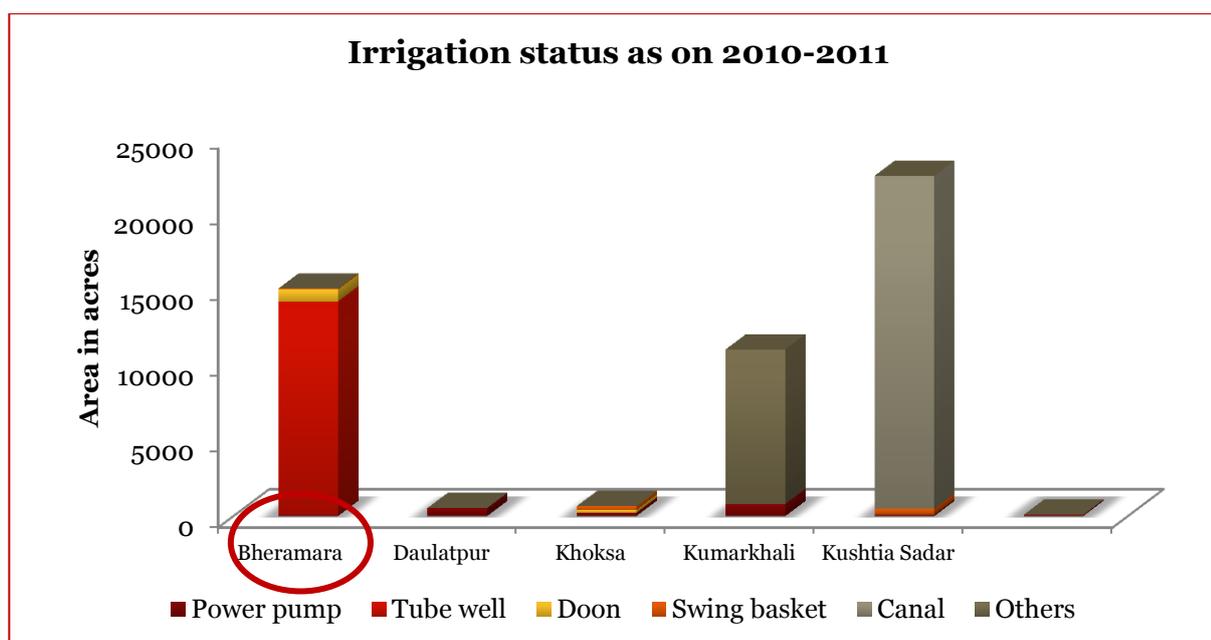
- Surface water irrigation with main water sources being rivers, canals, ponds, and other water bodies;
- Underground water irrigation with water lifted by shallow tube-wells, deep tube wells, and country traditional devices.

Currently, 18.26% of total agriculture land is under irrigation in this district. However, Bheramara upzila is well covered under irrigation with total agriculture land under irrigation in the upzila being 73.35%. Upzila wise method of irrigation during the year 2010-11 is presented in following figure.

⁵⁶ Districts statistics, BBS 2011

⁵⁷ District Statistics, BBS 2011

Figure: Irrigation Status (2010-11)



Source: District Statistics 2011, published by Bangladesh Bureau of Statistics (BBS)

Industrial Landscape

Kushtia is renowned for various cottage, small, medium and large industries. Basis data obtained from district website, the industrial landscape in Kushtia district is presented below:

- Large Industries: 15 no.
- Medium Industries: 38 no.
- Small Industries: 5212 no.
- Cottage Industries: 21837 no.

Major industrial sectors existing in Kushtia are: Textile, Fabrics, Cables, Metals, Tobacco, Sugar etc. BSCIC industrial complex is also located in Kushtia; basis information obtained from the district website, industries operating in this industrial complex are profit making.

Industrial Snapshot of Kushtia district is captured in the following table.

Table: Distribution of Industries of Kushtia district

Company type	Number
Textile Mills	8
Garments Factory	21
Rice Mills	1343
Match Factory	2
Steel and engineering	107
Aluminum	3
Jute Mills	2
Sugar Mills	1
Others	8

Source: Dhaka District Statistics, BBS 2011

Due to the presence of various industries and BSCIC industrial complex in Kushtia, skilled manpower is available within 30 km radius of the proposed EZ in Bheramara. Approximately 4.5% of population in Kushtia is daily labour, 2.05% is transportation labour, and 1.41% is construction worker. 58 Majority of the population (approximately 55%) in this region are farmers.

⁵⁸ <http://www.kushtia.gov.bd/node/697490/%E0%A6%AA%E0%A7%87%E0%A6%B6%E0%A6%BE>

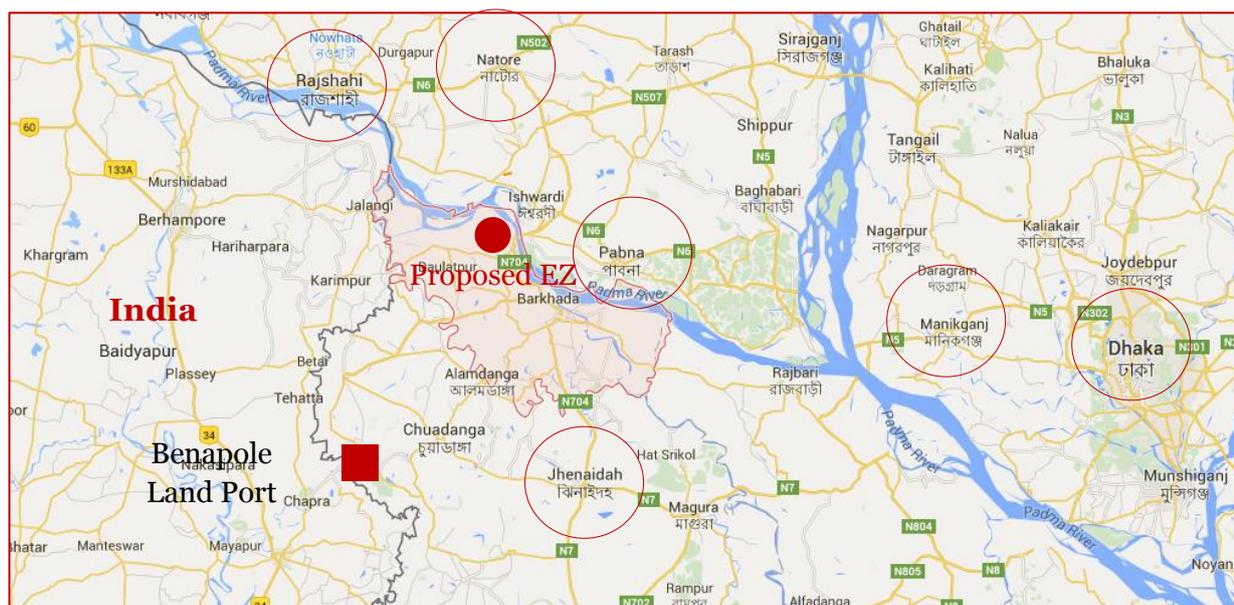
7.2. Broad level market potential assessment of the proposed EZ

Bheramara Upzilla is located near to Jessore. Proposed EZ is located approximately 130 km away from Jessore and travel time is around 3-3.5 hours. The distance between Dhaka and proposed EZ is around 240 km and it is accessible by Jamuna Bridge and Lalan Shah Bridge. Proposed EZ is located adjacent to Lalan Shah Bridge. Kushtia district is located near to India and it is approximately 160 km away from Benapole border.

Proposed EZ is located on the banks of Padma River and adjacent to Hardinge Bridge (Rail Bridge) and Lalan Shah Bridge (Road connecting Dhaka). Following figure illustrates the location of the proposed EZ. It has good access to various major locations of Bangladesh such as Jessore, Rajshahi, Pabna, Natore, Dhaka etc.

Apart from road connectivity (as illustrated above), proposed EZ has access to rail facility. There is a railway station at Bheramara and apart from passenger trains to other parts of Bangladesh (such as Rajshahi, Dhaka, Khulna, Saidpur and Kolkata); cargo facility (up to Khulna) is also available at the station.

Figure: Location of the proposed EZ



Mongla port is located at a distance of around 250 km from proposed EZ and it can be accessed by either Dhaka-Kushtia highway or Khulna-Mongla highway.

Benapole Land Port is located at around 160 km away from Bheramara and it has a storage capacity of 40,000 MT and handling capacity of 2 million MT yearly.⁵⁹ Major import and export via Benapole Land Port is illustrated in the table below:

Major Imports	Cotton, chemical, motor car, motor cycle, tyre-tube, machinery & spare parts, food grains, fish, spices, sugar, egg, aluminium, refrigerator, paper etc.
Major Exports	Jute & jute goods, fish, soap, plastic goods, battery, construction materials etc.

⁵⁹ http://114.130.54.109/blpa/index.php?option=com_content&task=view&id=800&Itemid=229

Kushtia is renowned for various cottage, small, medium and large industries. Basis data obtained from district website, the industrial landscape in Kushtia district is presented below:

- Large Industries: 15 no.
- Medium Industries: 38 no.
- Small Industries: 5212 no.
- Cottage Industries: 21837 no.

Major industrial sectors existing in Kushtia are: Textile, Fabrics, Cables, Metals, Tobacco, Sugar etc. Bangladesh Small & Cottage Industries Corporation (BSCIC) industrial complex is also functional in Kushtia.

Kushtia district is rich in agricultural resources. Some of the major crops produced in this area are: rice, sugarcane, tobacco, jute, maize, mustard, pulse etc. In Bheramara sub district, major crops produced are banana, rice, tamarind etc.

Due to the presence of various industries and BSCIC industrial complex in Kushtia, skilled manpower is available within 30 km radius of the proposed EZ in Bheramara. Approximately 4.5% of population in Kushtia is daily labour, 2.05% is transportation labour, and 1.41% is construction worker.⁶⁰ Majority of the population (approximately 55%) in this region are farmers.

Rajshahi district is approximately 85 km away from Bheramara and travel time is around 2 hours. This district is well known for agriculture and silk. Some popular cottage industries are: jute, bamboo, wood, knitwear, tobacco etc. Major export items from Rajshahi district are: jute, sugarcane, date, pan, mango, lichi, green vegetables, turmeric and silk items. Apart from that, livestock farming (cattle) and fishing are other major activities undertaken by local inhabitants in this area.

Pabna district is popular for industrial proliferation. Textile industry in this district is very popular in Bangladesh. Several small scale and cottage scale textile units are located in places such as Sadulanapur, Sujanagar, Dogachi, Shibpur, Selimpur etc. Mustard is produced in abundance in Pabna district, as a result of which several oil mills are established in this district.

Pabna district is also renowned for Hosiery industries. There are a total of around 500 hosiery units in this district. Innerwear, vests and other hosiery items produced from Pabna district are being exported to Nepal, India, Bhutan, Malaysia and Singapore.

Tant industry has developed extensively in Pabna district. Saree, thin towel, inner wear (lungi) etc. products are exported from Pabna. A snapshot of the number of tants in Pabna is illustrated below:⁶¹

- Power Loom: 24 no.
- Image Tants: 1418 no.
- Hand operated Tants: 3781 no.
- Thread based: 20 no.
- Embroidery: 27 no.

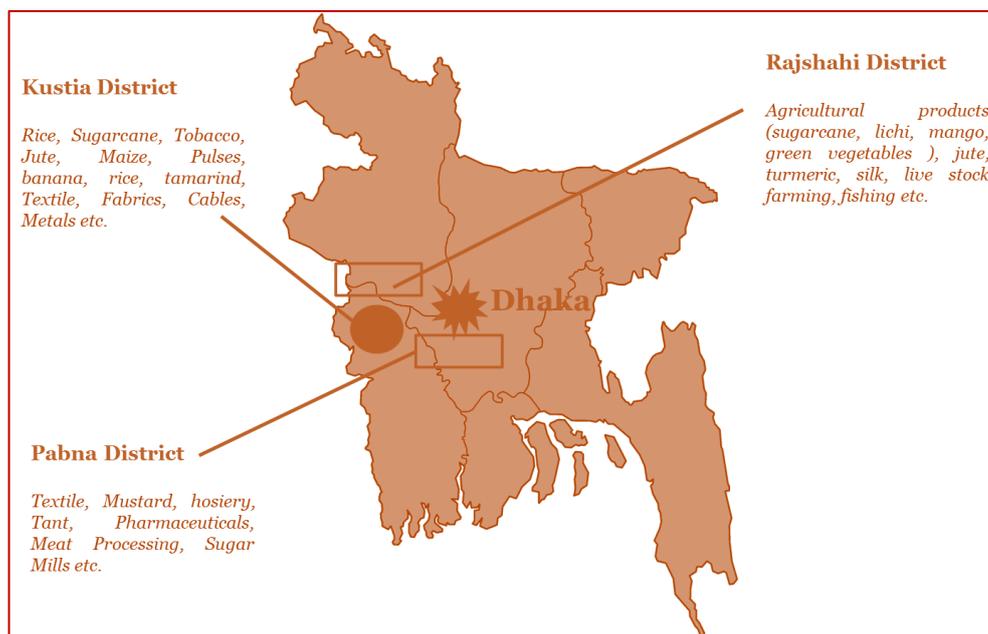
Pabna is also known for proliferation of pharmaceutical industry. Some of the major pharmaceutical companies in this district are: Square Pharmaceuticals, Edrug Limited and Universal Pharamaceuticals etc. Square Pharmaceuticals is renowned for export of several pharmaceutical products to abroad. Bengal Meat in Pabna is a meat packaging and processing unit. It is into packaging and processing of beef and goat meat and the same is exported abroad. Based on the livestock farming potential of the district, this industry has grown significantly. Average daily production from Bengal Meat is around 2,500 kg. Sugar mills have been set up in this district; sugarcane produced in this district is used as raw material for the same.

⁶⁰ <http://www.kushtia.gov.bd/node/697490/%E0%A6%AA%E0%A7%87%E0%A6%B6%E0%A6%BE>

⁶¹ <http://www.pabna.gov.bd/node/98560/%E0%A6%B6%E0%A6%BF%E0%A6%B2%E0%A7%8D%E0%A6%AA-%E0%A6%AC%E0%A6%BE%E0%A6%A8%E0%A6%BF%E0%A6%9C%E0%A7%8D%E0%A6%AF>

Following figure depicts the landscape of industry and natural resources in and around Bheramara.

Figure: Landscape of industry and natural resources in and around Bheramara



Proposed EZ in Bheramara is connected to other parts of Bangladesh. Access to Benapole Land Port evokes the possibility for import/ export to India. The location advantage of this area shall inculcate into the logistics aspects of the proposed industries. Raw materials and finished goods could easily be transported from/ to any part of Bangladesh and abroad.

Kushtia district has witnessed significant industrial proliferation which has enabled the propensity of development of various industries based on the existing industrial ecosystem. Analysis of industrial landscape scenario in adjacent districts reveals that this region is rich in agricultural, fishing and live stocks. Also, industries such as sugar, pharmaceuticals, metals, food processing, textile, hosiery etc. are already present in this region.

Proposed EZ may use its location advantage to promote export oriented industries. Further, various downstream and upstream industries based on the already existing industries in this region stand a chance for being established in the proposed EZ. Rich agricultural resources of this region could be harnessed for development of food/ agro/ fish/ meat processing industries.

Kushtia district has significant industrial proliferation which enables the propensity of development of various industries based on the existing industrial ecosystem. Analysis of industrial landscape scenario in adjacent districts reveals that this region is rich in agricultural, fishing and live stocks. Also, industries such as sugar, pharmaceuticals, metals, food processing, textile, hosiery etc. are already present in this region. Based on the existing industrial ecosystem of sugar, pharmaceuticals, metals and textile industries, related downstream/ upstream industries could easily be set up in the proposed EZ.

Crops such as sugarcane, tobacco, jute, maize, mustard etc. are produced in abundance in this area. Tobacco processing industries stand a good chance for the proposed EZ. Further, agro processing industries are supposed to gain significantly from the proposed EZ. Also, jute production in this area can be leveraged to set up small scale jute based industries.

At present Bangladesh is the second largest exporter of garments in the world after China with a market share of 4.8%. China which is the market leader is facing rapidly increasing labor cost and investors are looking for new locations outside China. Textiles and related industries are 3rd in Bangladesh in terms of FDI investment. Nearby Pabna district is known for hosiery and related textile industries. Henceforth, similar industries also stand a good chance for the proposed EZ. Due to the excellent connectivity

features, raw materials and finished goods can easily be transported to/ from the proposed EZ by all modes of transportation.

Pharmaceutical is the top priority industry as per the Perspective Plan 2021, output indices and FDI trends. Given the availability of local skills for the industry and facility to transport by water mode of transportation, Pharmaceuticals is another industry which can be considered. Existing industrial ecosystem of pharmaceutical industry in nearby Pabna district may act as backbone for the development of the same.

7.3. Reconfirmation of the proposed EZ

7.3.1. Location of the proposed EZ

The proposed Economic Zone site falls in Bheramara upazilla of Kusthia district. It is located on the bank of Padma River and in close proximity to Bheramara-Daulatpur Road (Z7411). Proposed EZ is located very near to Lalan-Shah Bridge, adjacent to Pakshi Railway Bridge at North East part of the site and Indo-Bangladesh power transmission centre on west part of the proposed EZ.

Reconfirmation of site details is presented in following table.

Table: Reconfirmation of site details

Parameters	Details
Site co-ordinates	24°03'51.41'' N - 24°04'43.33'' N & 89°59'56.71'' E - 89°01'00.51'' E
Site boundaries on East	Padma river
Site boundaries on West	Private agriculture land
Site boundaries on North	Residential colonies
Site boundaries on South	Government land & Old railway line
Total area of the site	506.77 Acres
Land tenure details	Government owned & private land
Government land	459.67 Acres
Private land	47.10 Acres
Others	Nil
Expansion potential	Basis preliminary assessment, following settlements are located on the surroundings of the proposed EZ: <ul style="list-style-type: none"> • Hardinge Bridge and rail line- South part • Indo Bangla Power transmission center- West Part • Residential colonies- North part • Padma River- East part Hence, it is difficult to expand the proposed EZ.
Existing land use	Agriculture
Land cost (per acre)	30 Lakh BDT

Source: PwC Initial Site Assessment (Data collected from UNO office)

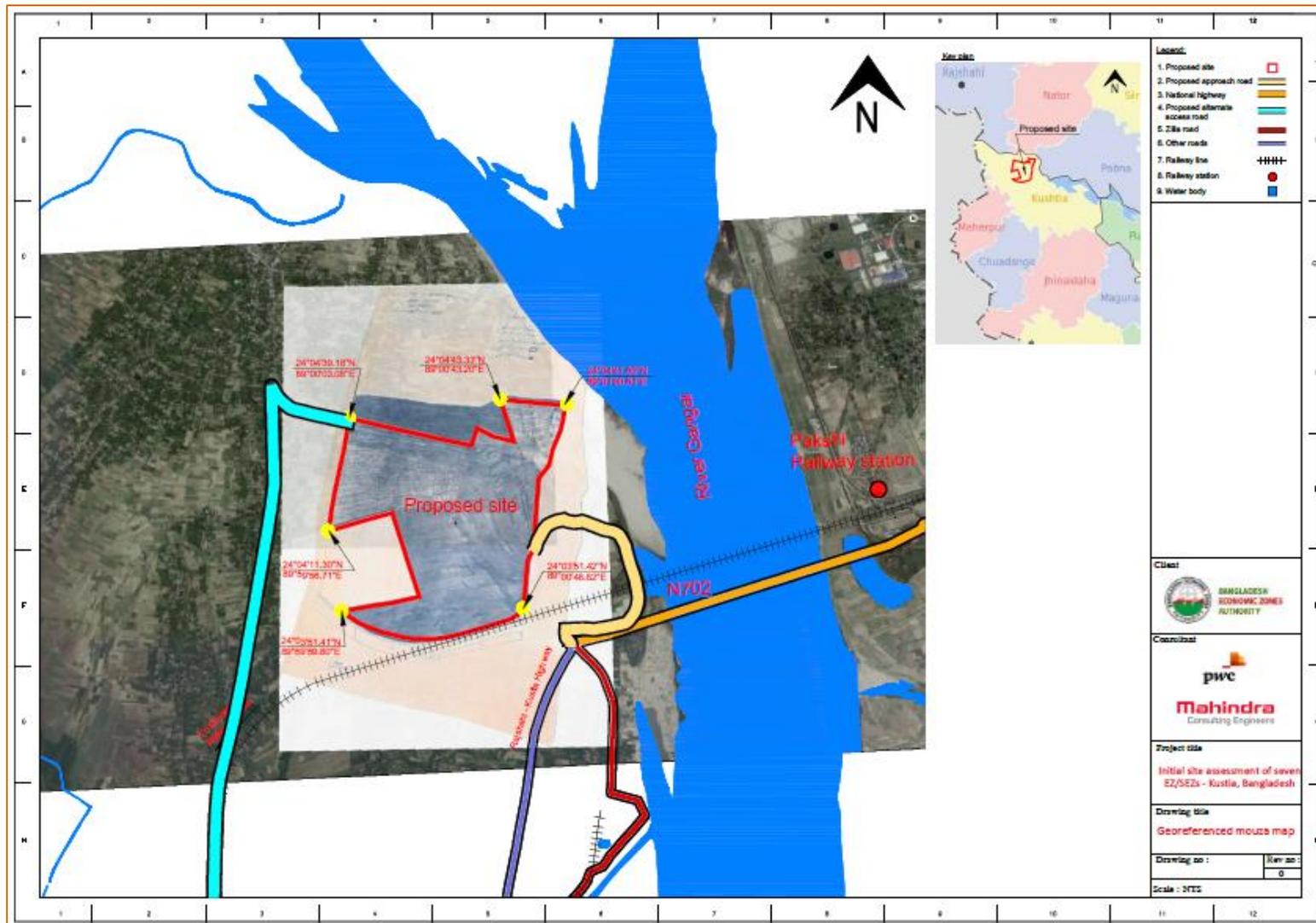
Mouza map of proposed site as provided by Upazila Nirbahi Officer (UNO) and Mouza map superimposed on Google map are presented figures on (subsequent pages).

Figure: Mouza Map of proposed Bheramara EZ



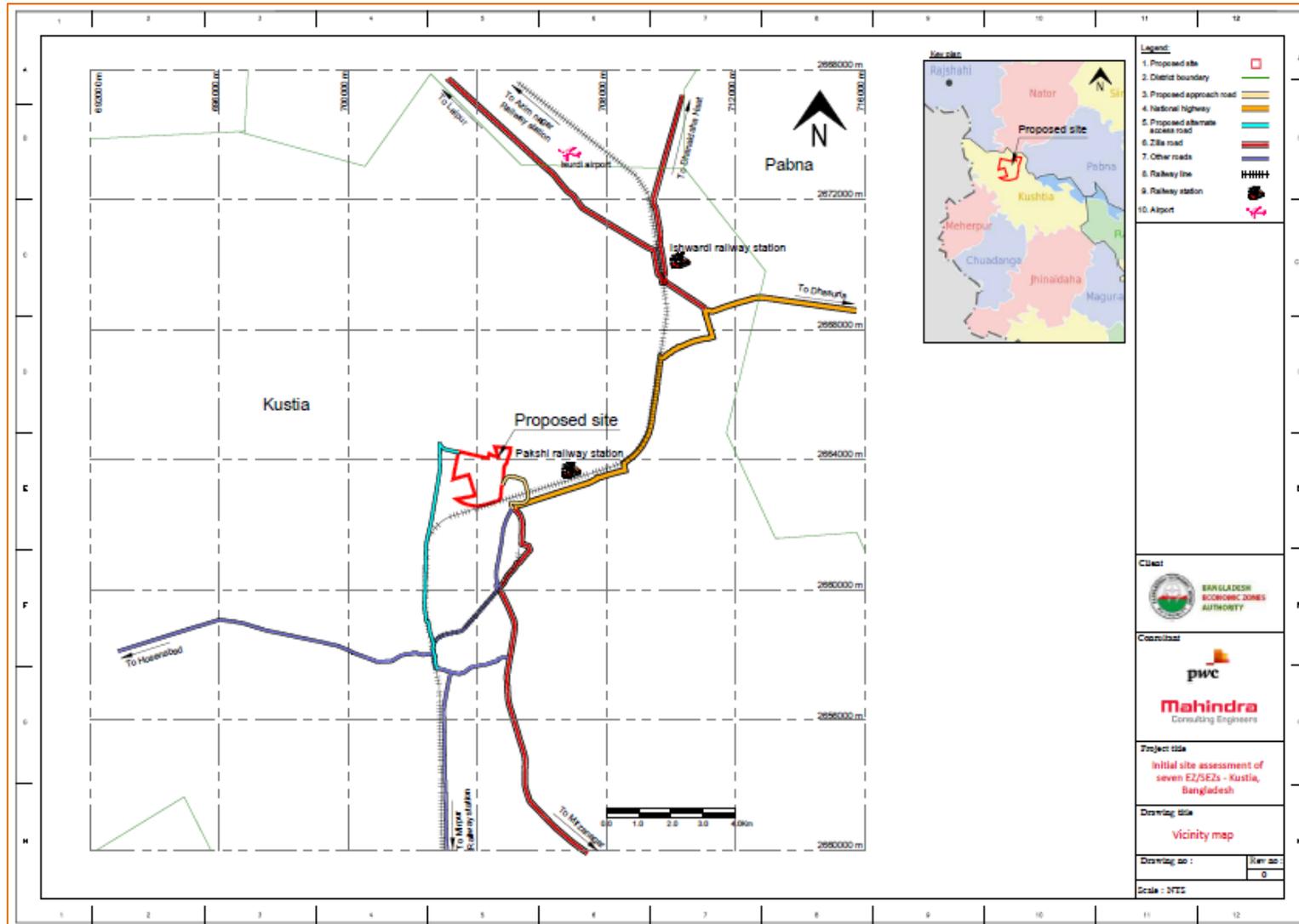
Source: UNO office

Figure: Mouza map superimposed on google map (Bheramara)



Following figure shows the location of the proposed EZ and its vicinity.

Figure: Location of the proposed EZ



7.3.2. Land use / land cover

The land use pattern of the proposed EZ area falls under agriculture zone. Two and three crops are being cultivated at some part of the proposed EZ throughout the year. Major holdings are farms that produce varieties of crops, such as: Paddy, jute, sugarcane and pulses oil seed and Banana plantation.

Almost all kinds of vegetables are cultivated particularly potato, brinjal, raddish, arum, lady's finger, cauliflower, cabbage, bean, tomato, patal, gourd, cucumber, pumpkin, knollkal-turnip, dhundal, barbati, khirai, chichinga, carrot, kakrol and sak are abundantly grown. The main spices include turmeric, ginger, chillies, onion, garlic, corriander, black cumin and aniseed. Existing land use pattern for 10 km radius is shown in figures on subsequent pages.

Figure: Thick vegetation and agricultural activities inside the project area (Bheramara)



7.3.3. Topography

Basis initial site assessment, it was observed that the proposed EZ has a level difference of 2 to 3 m with a gentle slope towards North to South & West to East direction with minor undulations. According to the contour variation, the depth of landfilling across the project area shall vary.

Contour maps of the proposed EZ for 5 km and 10 km radius are presented in figures on subsequent pages.

Figure: Existing land use pattern for 10 km radius (Bheramara)

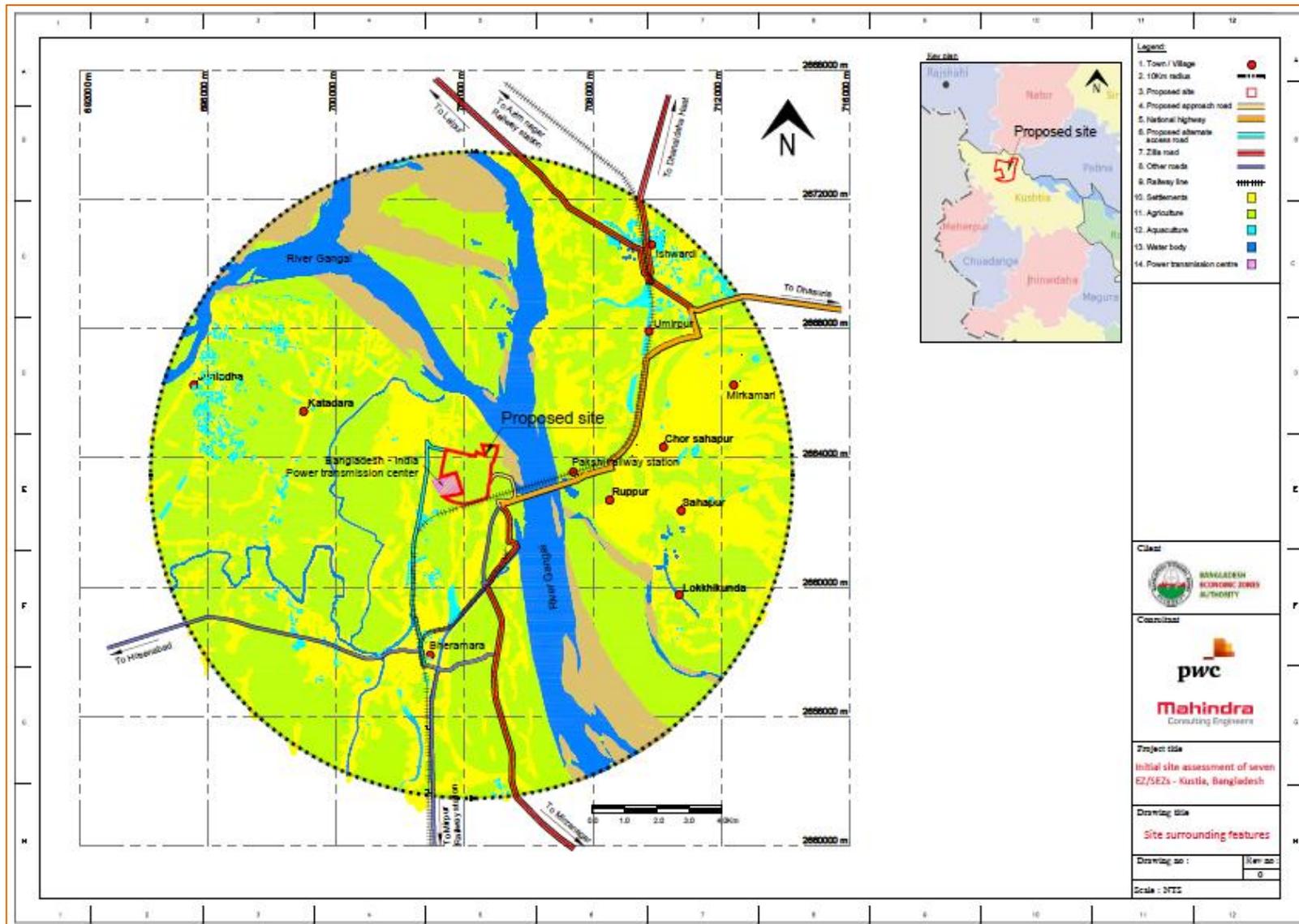


Figure: Existing land use pattern for 5 km radius (Bheramara)-Closer View

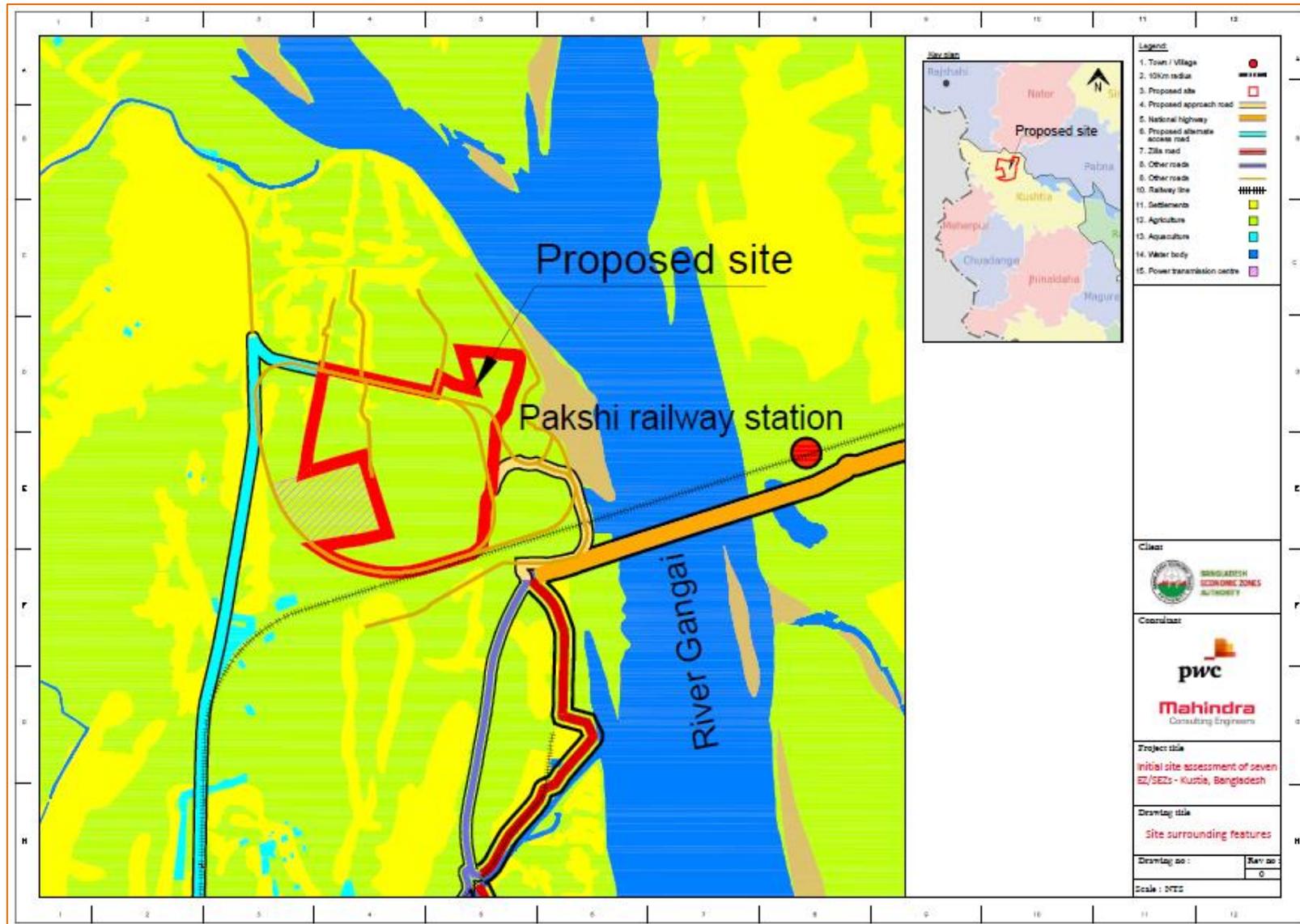
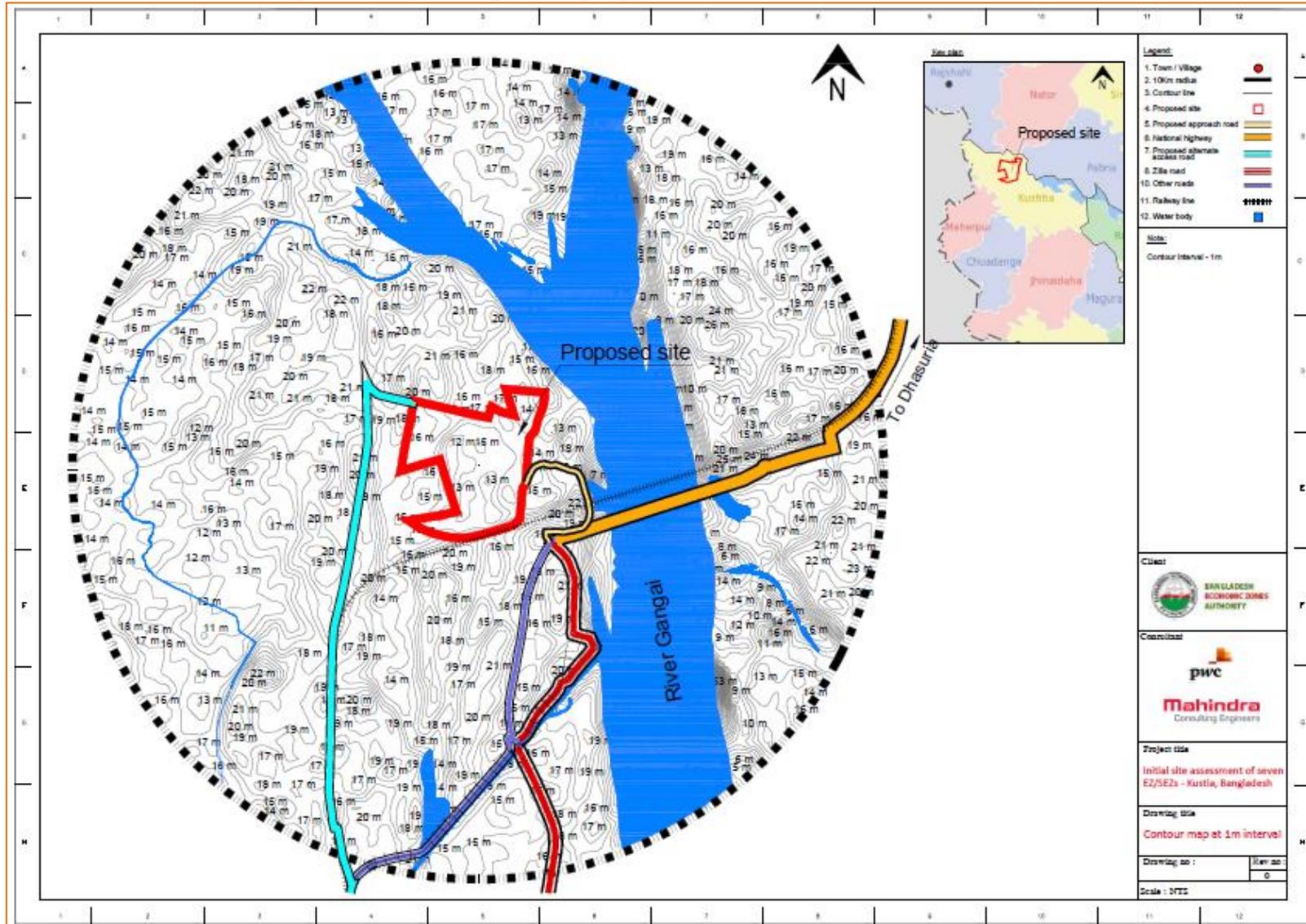


Figure: Contour map of the proposed EZ for 5 km radius (Bheramara)



7.3.4. Physiography

The physiography of the region surrounding proposed EZ falls in Ganges river flood plain which comprises the active floodplain of the Ganges and the adjoining meander floodplain. The latter mainly comprises smooth landscape of ridges, basins and old channels. The relief is locally irregular alongside the present and former river courses, especially in the west. It comprises rapidly alternating series of linear low ridges and depressions.

Ganges channel is constantly shifting within its active floodplain by eroding and depositing large areas of new char land each flood season. However, it is less braided than that of the Brahmaputra-Jamuna. Ganges alluvium is calcareous when deposited, but most basin clays and some older ridge soils have been decalcified and acidified in their upper layers; lime is found only in the subsoil or substratum of such soils. Clay soils predominate in basins and on the middle parts of most ridges, with loamy soils (and occasionally sands) occurring mainly on ridge crests.

The Bangladesh physiography map is presented in Annexure.

According to the history of physiography of this region, Seasonal flooding is mainly shallow in the west and north, with the highest ridge crests remaining above normal flood levels. However according to the trend, flood depths increase towards the east and the south.

7.3.5. Soil

Basis visual observation, the top soil layer was found to be black cotton soil which needs to be replaced for laying roads and is also not suitable for foundation of any structure. The dominant soil texture is sandy loam. The soils are acidic in character and the pH ranges from 5.5 to 6.8. The soils are naturally fertile and are recharged every year by fresh deposition by the floodwaters.

Figure: Soil type in the proposed Bheramara EZ



7.3.6. Geology

Proposed EZ is located in the Ganges river floodplain. Type of soil strata in this geological region is Gangeyo palal land and it has a clay loam to light sandy loam texture. Detailed soil investigation needs to be carried out during the structural design stage.

Geological map of Bangladesh is shown in Annexure.

7.3.7. Earthquake data

Bhola Sadar area falls in the Seismic Zone 1 and the earthquake coefficient is 0.10 for this zone. The area under the proposed EZ falls under the low seismic range zone; this factor needs to be taken into account while designing the structure of the proposed EZ.

Seismic zoning map of Bangladesh is presented in Annexure.

7.3.8. Wind speed

During winter, the northern and central areas in Bangladesh witness gentle winds blowing at relatively low speeds of 1-3 Km/hr. from the north & northwest. The detailed wind speeds need to be obtained for designing the high rise structures in the proposed EZ.

The wind speed map for Bangladesh is presented in Annexure.

7.3.9. Cyclones and storms

Bheramara has not witnessed any significant cyclone or storms. However, Kushtia district has witnessed storms in the past and the details of the occurrence during the year 2008-11 are presented in following table.

Table: Occurrence of storms during 2008-2011

Upazila	2008	2009	2010	2011
Kushtia Sadar	Yes	Yes	No	No
Bheramara	No	No	No	No
Daulatpur	No	No	No	No
Khoksa	Yes	Yes	No	No
Kumarkhali	No	No	No	No
Mirpur	No	No	No	No

From the above table, it can be seen that Bheramara upazilla has no record of storms which is conducive for the proposed development.

7.4. Environment section

7.4.1. Air quality

Ambient air quality measurements are essential:

- to provide a description of the existing conditions,
- to provide a baseline against which changes can be measured and
- to assist in the determination of potential impacts of the proposed EZ construction on air quality conditions

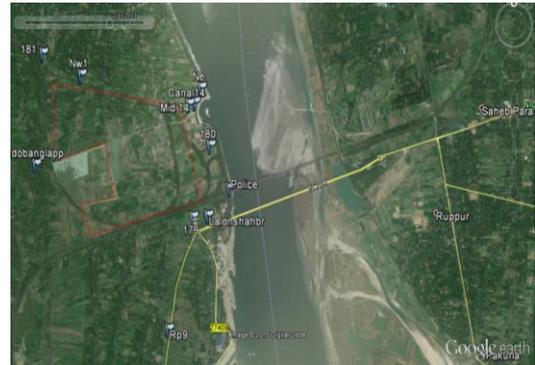
During the field visit, no apparent problem with air quality was noticed. This may be due to the fact that the project area is located in a rural area with very few industries in the surrounding area and the traffic was relatively less. The ambient air quality measured by nearby power plant was also studied and found no significant impact was observed.

7.4.2. Floods and Water Logging

Basis interaction with local inhabitants and site visit, the proposed EZ is not affected to a great extent by floods during monsoon season.

Google images for various periods clearly indicate that there is no erosion happening at this proposed EZ. However necessary flood protection and erosion protection measures need to be taken for the development of EZ.

Figure: Google images for various periods at the proposed Bheramara EZ

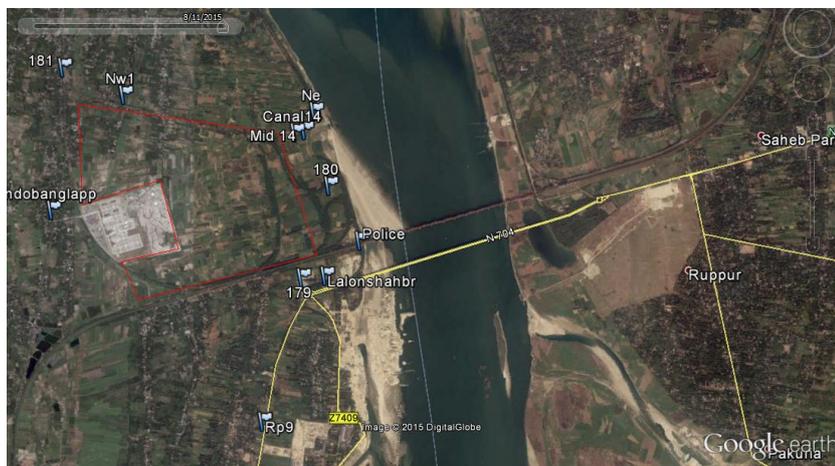


Google image during November 2007

Google image during February 2011

Google image during February 2014

Google image during May 2014



Google image during August 2015

7.4.3. Noise

During the field visit, no apparent problem of noise was observed in and around the proposed EZ.

7.4.4. Land filling

Basis the interaction with the UNO officials and local inhabitants, proposed EZ area is free from flood. To avoid inundation during monsoon season, minimum land filling of 0.6 m above the flood level is considered.

Based on the assumption, an average depth of 6 feet to 8 feet of land filling has been envisaged for the proposed EZ area. This figure is indicative and detailed topography survey needs to be carried out to calculate the exact quantity of land filling at the project area.

7.5. Infrastructure Linkages to the Proposed Site

7.5.1. Physical Infrastructure- Availability of Utility Connection

7.5.1.1. Power Availability for the proposed EZ

Indo Bangla Transmission Centre (500 MW HVDC Back-to-Back power station) is located adjacent to the proposed EZ. Power Grid Company of Bangladesh (PGCB) is the nodal government agency for operation of Indo Bangla Transmission Centre and Siemens AG, Germany was the developer. Commissioning of this project commenced from 2014.

Figure: Indo-Bangla Transmission Centre



One 360 MW combined cycle power plant (CCPP) is under construction which is located within 2 km from the proposed EZ. L&T India is the developer for the project and basis discussion with UNO officials, this 360 MW CCPP is expected to commission from Mid-2016.

Figure: 360 MW combined cycle power plant (CCPP)



A 33/11 kv substation (under-construction) of capacity 10 MVA is located at 12th Mile (10.4 km from the proposed EZ).

Figure: 33/11 kv substation at 12th Mile



Power for the proposed EZ can be tapped from any of the three sources mentioned above.

2000 MW Ruppur Nuclear Power Plant (RNPP) project is under construction stage which is located near to Lalan Shah Bridge (within 20 km radius from the proposed EZ).

Figure: Ruppur Nuclear Power Plant



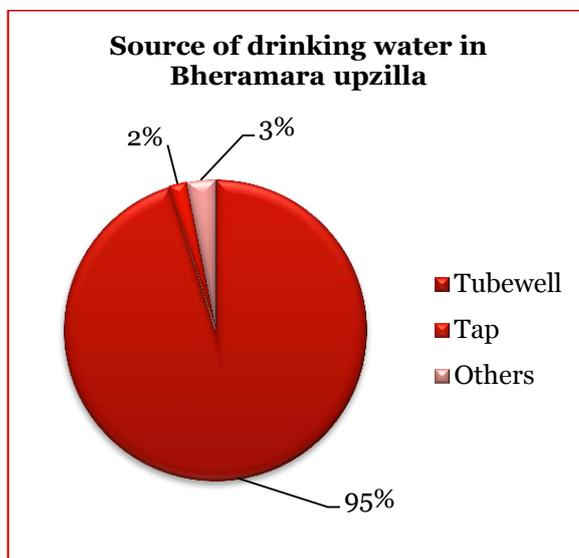
Basis working knowledge and best practices followed, power requirement in a typical EZ could be transmitted by a dedicated 33 KV line for demand up to 25 MW. If the demand is more than 25 MW, then the option of 132 KV transmission lines needs to be further explored. Proximity to 33 KV power connection and surplus power availability in the vicinity of the proposed EZ are the crucial factors to decide on the potential of power availability to the proposed EZ.

Utility Map shown in figure at the end of the section illustrates the electricity availability in and around the proposed EZ.

7.5.1.2. Water Availability for the proposed EZ

There is no existing water supply system at the proposed site. The local inhabitants are dependent on tube wells for the purpose of drinking water. The sources of drinking water in Bheramara upzila is captured in following figure.

Figure: Sources of drinking water in Bheramara upzila



Source: District Statistics, BBS 2011

Basis interaction with local inhabitants, the ground water is available at a depth of 200 feet (approximately) from natural ground level. Preliminary assessment suggests that the water requirement could be met either by extracting water from the Padma River or from bore well (which could be developed within the project area). Further, our preliminary assessment also suggests that extracting water from Padma River located on the eastern boundary of the proposed EZ may be considered by providing suitable intake system and water treatment plant.

Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Bheramara EZ is around 4.31 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could be extracted through bore wells. Extraction of more water through bore wells might result in depletion of the aquifer level. Proposed site has proximity to Padma River, thus the option of extracting water from Padma River may be further explored. Decision regarding extraction of water from bore well/ Padma River needs to be taken after detailed feasibility analysis.

7.5.1.3. Gas supply to the proposed EZ

Gas Transmission Company Limited (a company of PetroBangla) is the nodal agency responsible for supply of gas in this region. At present there is no gas supply available to the proposed EZ. Difficulty in laying gas transmission pipeline across the Padma Riverbed is holding up gas supply to the southwestern part of Bangladesh.

CGS Gas substation in Bheramara is located at a distance of approximately 2 km from the proposed EZ and its capacity is 100 MMcfd.

Figure: Gas pipeline laid inside the project area



7.5.1.4. Telecom/ Internet connectivity to the proposed EZ

Optic fiber cables are laid within the project area and up to UNO office of Bheramara. Basis discussion with the UNO officials, all government offices in Kushtia district would be connected through intranet by December 2015. At present, the internet and telecom services in this region are provided by private telecom operators such as Grameen Phone, Bharti Airtel, Banglalink, Teletalk.

Figure: Optical Fiber line within the project area



The following figure summarizes the utilities provision on a map:

7.5.2. Social Infrastructure

7.5.2.1. Institutional

Kushtia district has 1 university, 62 colleges (government and non-government colleges) and 299 secondary schools (government and non-government schools). The district also has 5 engineering colleges, 3 agriculture and veterinary college, 5 medical colleges and 9 technical and vocational institutions.

Some of the major educational institutions located in Kushtia are:

- Islamic University, Kushtia
- Kushtia Government College
- Kumarkhali Degree College
- Kushtia Medical College
- Khalisakundi Degree College
- Khoksa College, Khoksa

The technical and vocational institutions are located in Kushtia Sadar and Mirpur upzila. Some of the Technical institutes located in the radius of 50 km (approx.) from the proposed EZ are:

- Kushtia polytechnic institute (located 25 km (approx.) from the proposed EZ)
- Pabna Technical Training Center (located 30 km (approx.) from the proposed EZ)
- Banglamotion Institute of Engineering & Technology, Pabna
- Regional Agricultural Research Station, BARI, Ishwardi (Pabna)

7.5.2.2. Healthcare Facilities

Government hospital is available in Bheramara upzila and has provision for 50 beds. Different categories of health centers are shown below.

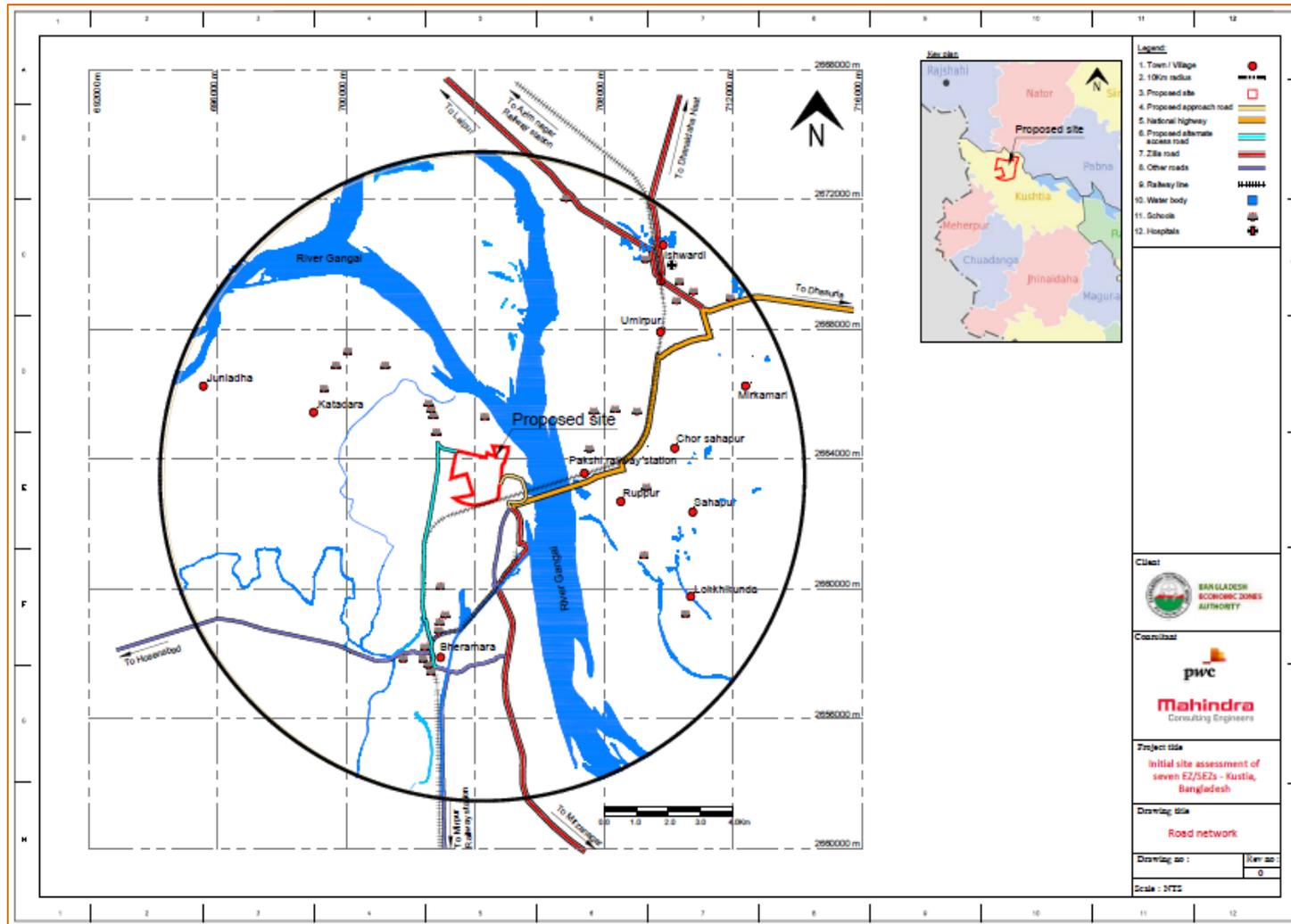
Table: Details of healthcare facilities in and around Bheramara upzila

Details	Numbers
Government health complex	1
Private hospital/ Clinic	7
Union health center	6
Missionary hospital	1
Diagnostic center	8

However, healthcare facilities available in Bheramara upzila are of substandard quality. Basis discussion with local inhabitants, for serious medical problems the local people need to travel to Jessore or Dhaka for treatment. Travel time from Bheramara to Jessore and Dhaka takes around 3 hours and 6 hours respectively.

Kushtia Medical College & Hospital is located at a distance of 28 km (approx.) from the proposed EZ. Kushtia General Hospital having 250 bed capacities is located at a distance of 25 km (approx.) from the proposed EZ.

Figure: Schools and Hospitals in the vicinity of proposed EZ (Bheramara – Kushtia EZ)



7.5.3. Connectivity

Roadway and railway are the most convenient means of accessing the proposed EZ. Proposed EZ is well connected with Jessore, Khulna, Mongla and the capital city of Bangladesh.

7.5.3.1. Road

Road Connectivity to Jessore: Proposed EZ is well-connected to Jessore. Road distance is around 155 km and travel time is 3-3.5 hours. The main access from Jessore to Bheramara is illustrated below:

1. Jhenaidah-Magura-Dhaka Highway (N7 and N702): It's a two-lane bituminous road and during site visit, it was observed that the road condition is good and favorable for passage of heavy vehicles.
2. Kushtia-Jhenaidah Highway (N704): It's a two-lane bituminous road and during site visit, it was observed that the road condition is good and favorable for passage of heavy vehicles.

In the following figure, access is shown in blue color.

Figure: Access to Bheramara from Jessore

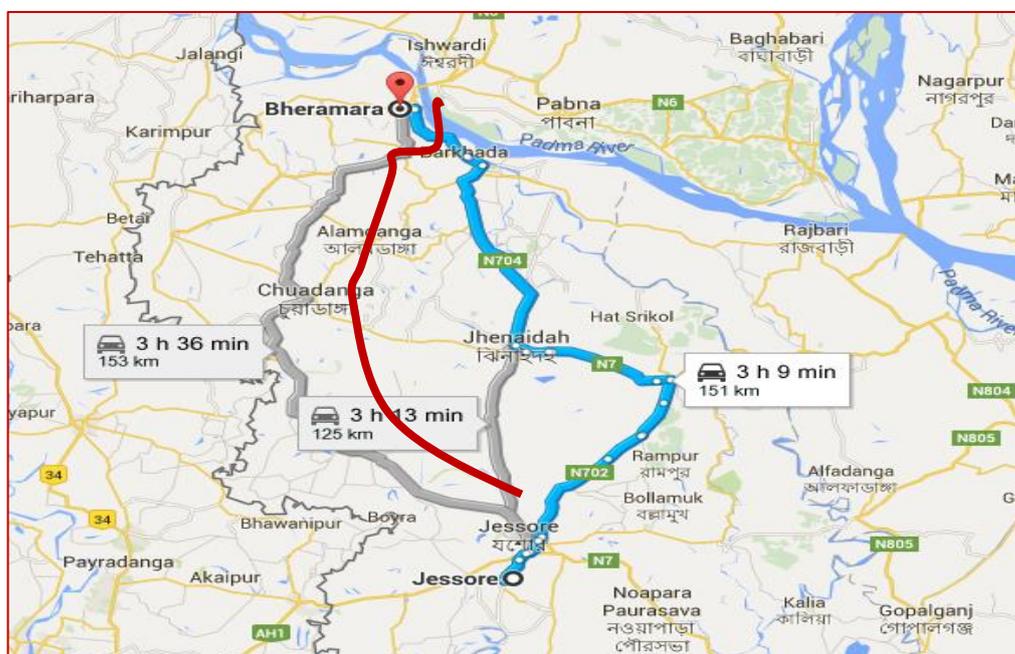


Figure: Photograph of N7 and N704



Alternate access to Bheramara would be via Kushtia-Meherpur highway (R745) and one LGED road (Z7463). Basis discussion with UNO officials, the LGED road is a single lane bituminous road and in normal time traffic stagnation is not observed. In subsequent figures showing access from Bheramara to Dhaka, alternate access is shown in red color.

Road Connectivity to Dhaka: Proposed EZ is well-connected to Dhaka city. Road distance is around 230 km and travel time is 5-6 hours. The main access from the proposed EZ to Dhaka is illustrated below:

1. Around 500 m through Kushtia-Jhenaidah Highway (N704) up to Lalan Shah Bridge (Pakshey Bridge). It's a two lane bituminous road and road condition is favorable for passage of heavy vehicles. Refer subsequent figure for photograph of the same.
2. Around 2 km of journey crossing Padama River through Lalan Shah Bridge (N704). It's a two lane bituminous road and road condition is favorable for passage of heavy vehicles. subsequent figure for photograph of the same.
3. Rajshahi-Pabna Highway (N6). It's a two lane bituminous road and road condition is favorable for passage of heavy vehicles.
4. Dhaka-Rajshahi Highway (N507). It's a two lane bituminous road and road condition is favorable for passage of heavy vehicles.
5. Elenga-Nalka-Hatikamrul Road (N405) up to Jamuna Bridge. It's a two lane bituminous road and road condition is favorable for passage of heavy vehicles.
6. Around 5 km journey crossing Jamuna River through Jamuna Bridge (N405) and afterwards N 405. During site visit, two lane bituminous road and favorable road condition (for passage of heavy vehicles) was observed throughout.

Figure: Access from Bheramara to Dhaka

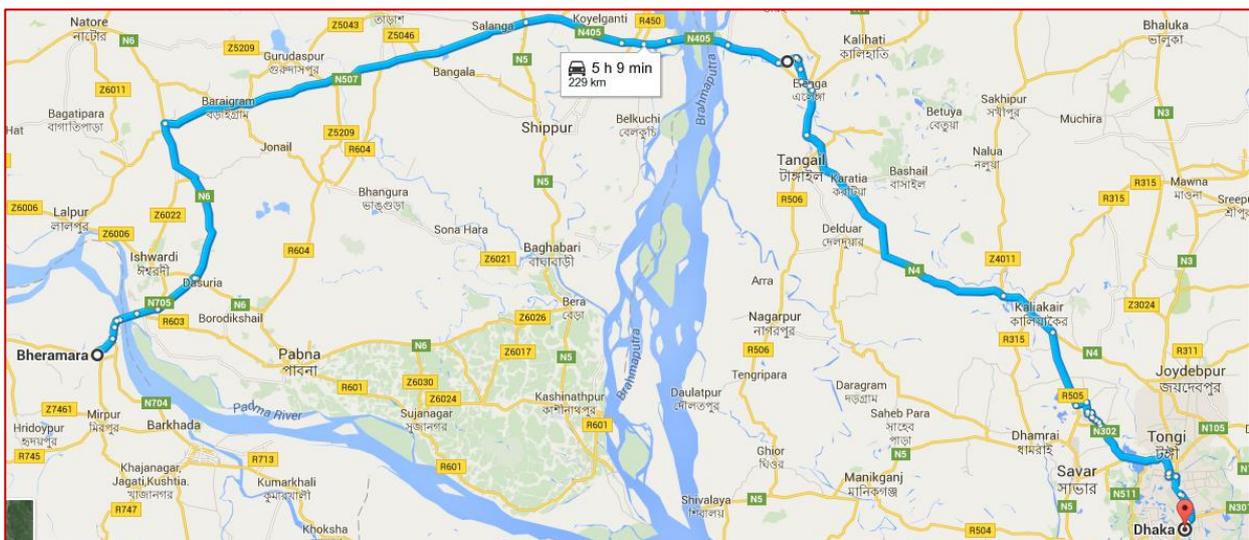
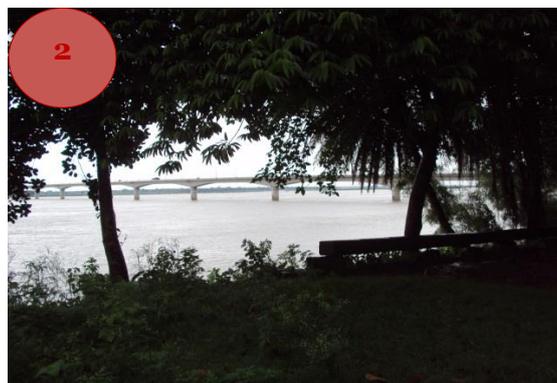


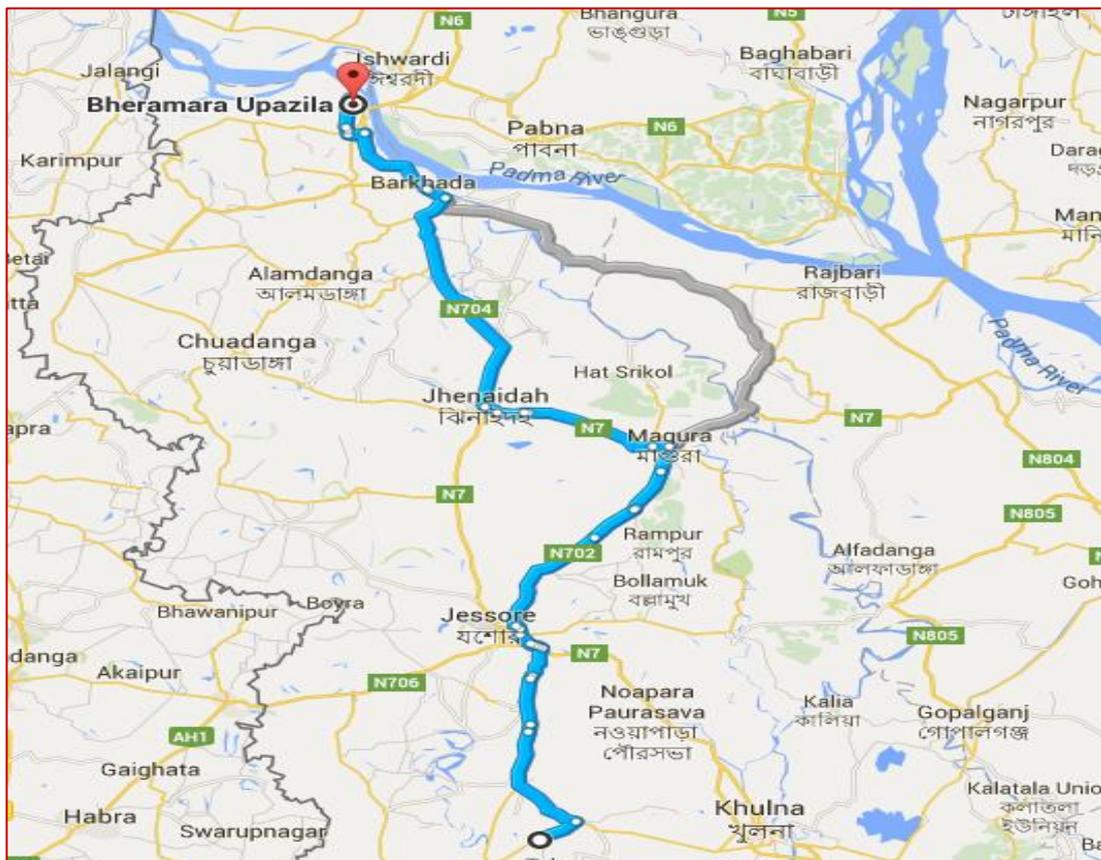
Figure: Access from Bheramara to Dhaka- Photographs



Access from Khulna

Proposed EZ is also easily accessible from Khulna via N7 and N704. Distance between Bheramara and Khulna is around 190 km and travel time is around 4 hours. During site visit, we travelled through N7 and N704; road condition appeared to be favorable for passage of heavy vehicles.

Figure: Connectivity between Khulna and Bheramara upzilla



Bheramara is also easily accessible from other places of Bangladesh such as Rangpur division, Bagura, Rajshahi division etc. The access to Bheramara is through Jamuna Bridge and Lalan Shah Bridge.

Road network for 10 km radius is shown in figure on subsequent pages.

Last Mile Connectivity (Approach Road)

At present two approach roads are existing for the proposed EZ. Last mile connectivity aspect of the proposed EZ is depicted below:

1. **Approach Road 1:** Kutchcha road which connects the proposed EZ to Rajshahi – Kushtia highway (N704) near the approach to Lalan Shah Bridge. Length of this kutchcha road alignment is around 500-700 m and it runs up to Hardinge Bridge (adjacent to the starting point of the proposed EZ). This approach road connects the eastern part of the proposed EZ. Widening is possible for this approach road as no significant resettlement issues were observed during site visit and discussion with UNO officials. However, detailed land survey needs to be undertaken for further exploration of this issue.
2. **Approach Road 2:** Bheramara-Allardorga road (LGED road) connects the proposed EZ from West side. This LGED road is connected to Bheramara Railway station by Station Road (another LGED road). Bheramara – Allardorga road is a single lane bituminous road favorable for passage of heavy vehicles. From this LGED road, a paver road (stretch of around 1km) starts which runs inside the proposed EZ. Widening of Bheramara-Allardorga road might attract some resettlement issues as it runs through residential colonies and market places.

Preliminary assessment depicts that the first option of approach road could be explored further as no significant resettlement issues were observed during site visit and this approach road converges near the starting point of Lalan Shah Bridge. This would provide easy access to N704 which in turn would facilitate easy passage of vehicles towards Dhaka and Jessore.

Following figures depicts the last mile connectivity aspect for proposed EZ in Bheramara.

Figure: Last Mile Connectivity for the proposed EZ (Part-1)

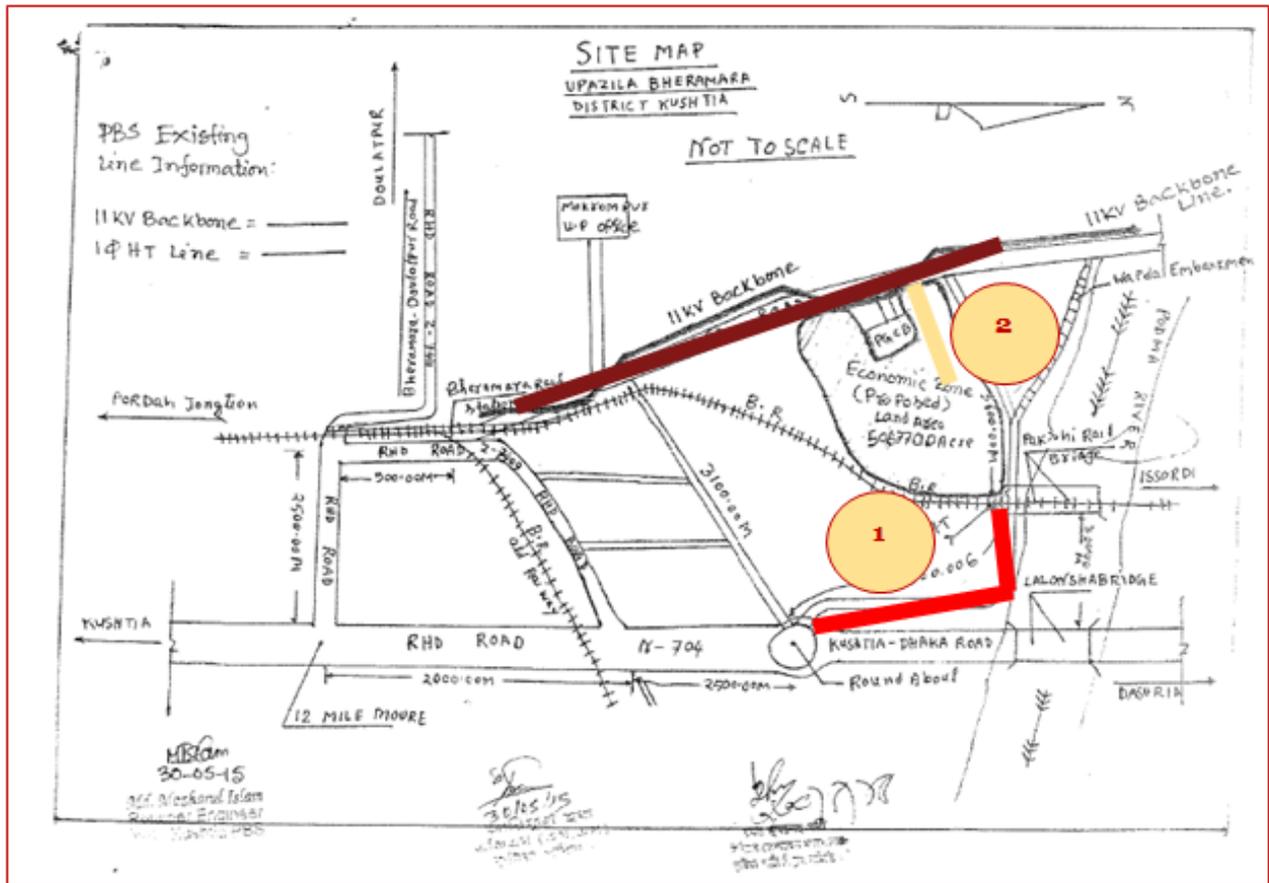
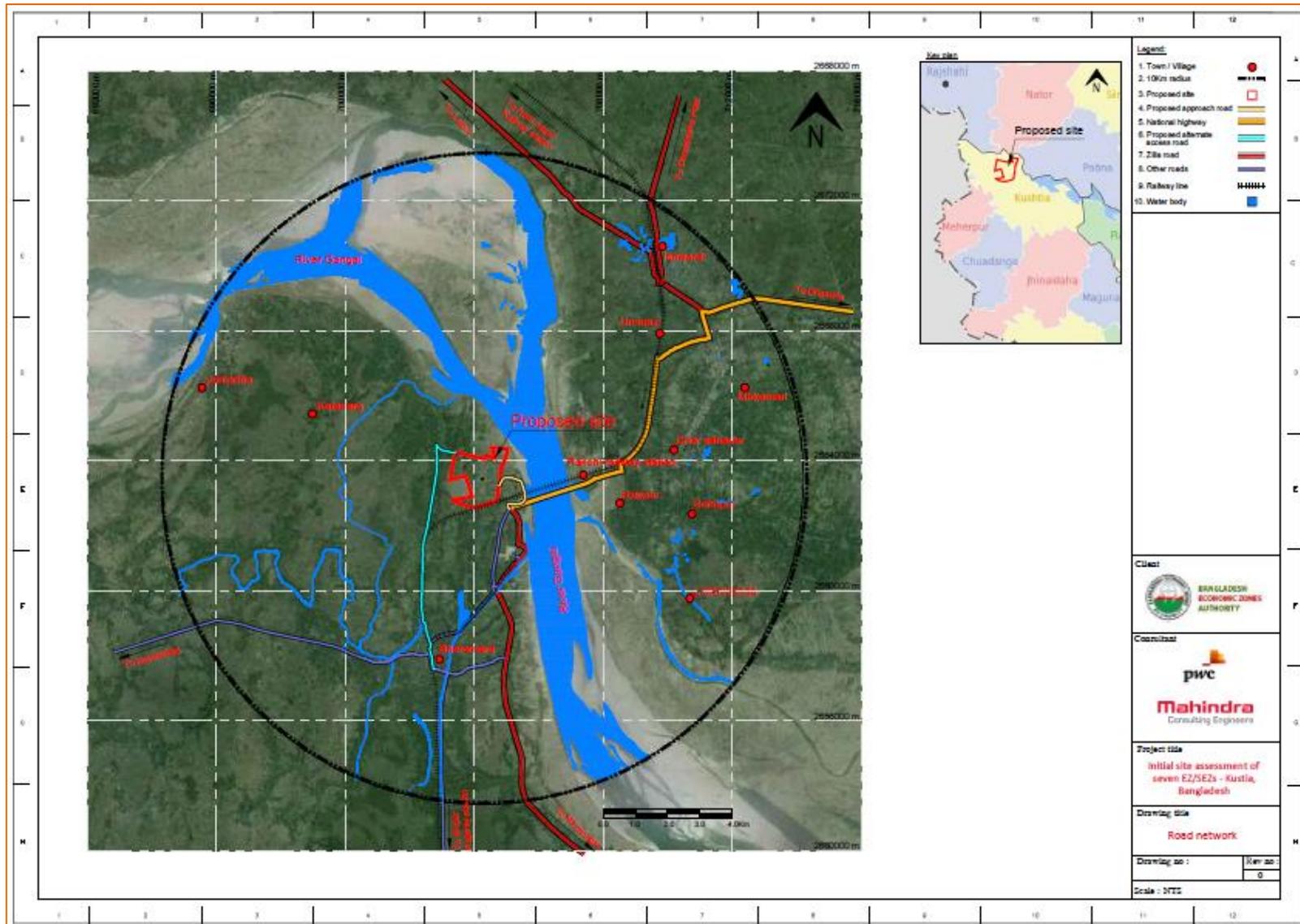


Figure: Last Mile Connectivity for the proposed EZ (Part-2)



Figure: Road Network for 10 km radius (Bheramara – Kushtia EZ)

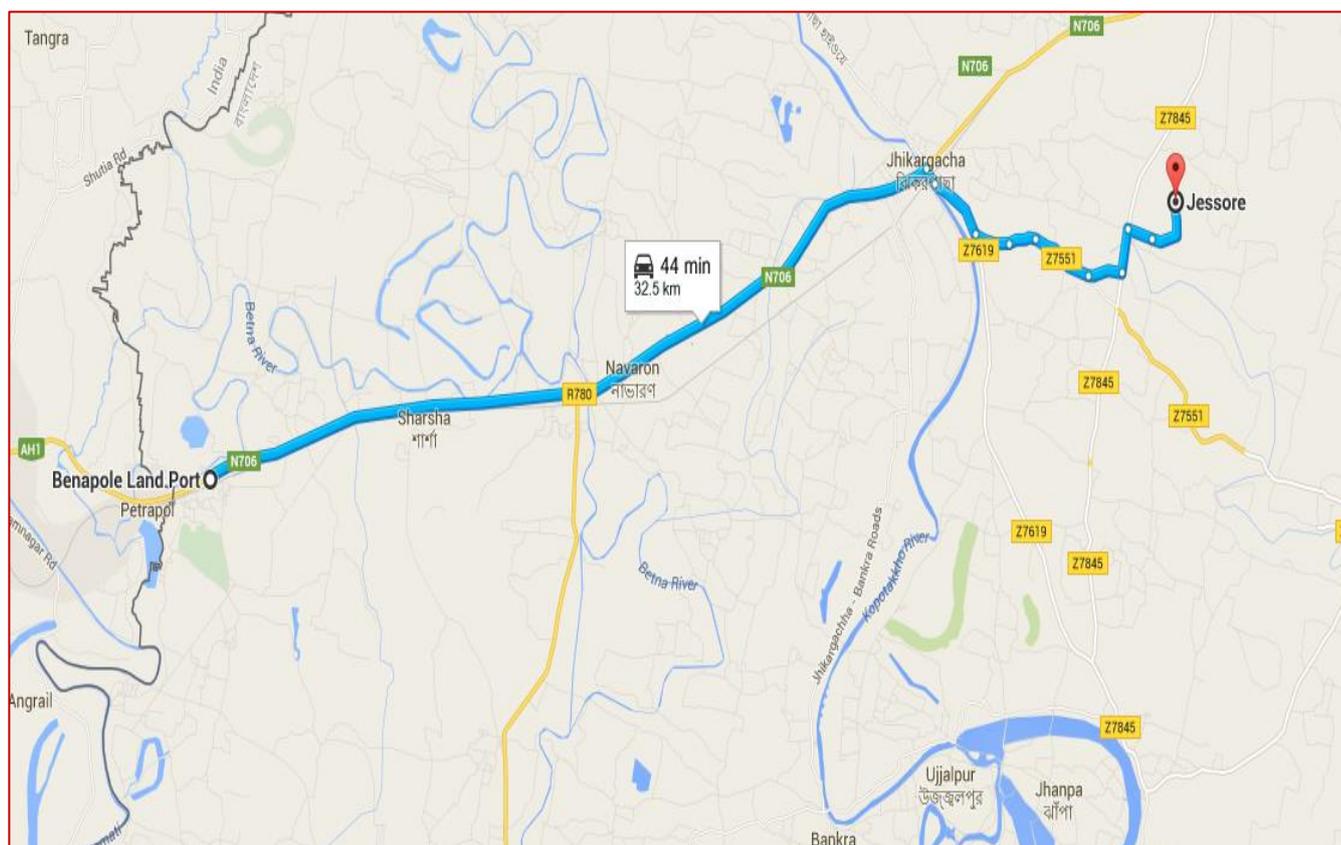


7.5.3.2. Access to Land Port

Bheramara upzilla has access to Benapole Land port situated in India-Bangladesh border. Bheramara is located between the rail route to Kolkata and it is in proximity to Jessore. Distance between Benapole land port and the proposed EZ is approximately 185 km and travel time by road is around 4 hours.

Benapole land port is located at a distance of around 35 km from Jessore. Proposed EZ is very well connected to Jessore by roadway. Jessore-Benapole Highway (N706) connects Jessore to Benapole and time of travel is approximately 1 hour.

Figure: Connectivity between Jessore and Benapole Land Port



Following table provides a glimpse of the major import and export commodities to/from Benapole land port, which indicates the market potential for cross-border trade from proposed Bheramara EZ.

Table: Major import and export to/ from Benapole land port⁶²

Major imports	Cotton, chemical, motor car, motor cycle, tyre-tube, machinery & spare parts, food grains, fish, spices, sugar, egg, aluminium, refrigerator, paper etc.
Major exports	Jute & jute goods, fish, soap, plastic goods, battery, construction materials etc.

Salient features of Benapole land port is outlined in the following table.

⁶² http://114.130.54.109/blpa/index.php?option=com_content&task=view&id=800&Itemid=229

Table: Salient features of Benapole land port⁶³

Parameters	Details
Bangladesh side	Benapole, Sharsha, Jessore
Indian side	Petrapole, Bongaon, 24-Parganas, West Bengal
Commencement of work	February 01, 2002
Storage capacity	40,000 MT
Total land area	60.782 Acre
Infrastructure	Warehouse-36, Warehouse-cum-yard-5, Open stack yard-2, Transshipment yard-1, Truck Terminal (import & export)-2, Weighbridge scale-2 (100 MT), International Passenger Terminal, International Bus Terminal, Administrative and residential building, fire brigade, standby power generator, Observation towers, Lighting, water supply & sewerage system in operational areas, Security posts, Boundary wall
Handling capacity	2.00 mln MT (yearly) out of which 1.20 mln MT (yearly) manually
Goods handled (2011-12)	Import- 1.22 mln MT Export - 0.46 mln MT

7.5.3.3. Rail

Bheramara upzilla is well-connected by rail network to other parts of Bangladesh. Following are the nearest rail stations from the proposed EZ:

- Bheramara rail station (around 7 km from the western part of the proposed EZ)
- Pakshi rail station (around 3 km from the eastern part of the proposed EZ)

Following table indicates the total railway line existing in Kusthia district.

Table: Total railway lines existing in Kusthia district

Upzilla	Length of railway lines (in km)
Kusthia Sadar	8
Bhermara	10
Daulatpur	0
Khoksa	4
Kumarkhali	22
Mirpur	18
Total	62

Bheramra Rail station can easily be accessed by Z7409 (LGED road) from the proposed EZ. This road converges with station road (another LGED road) near the rail station. Basis discussion with UNO officials and local inhabitants, cargo facility is also available in Bheramara rail station and goods are transported to Khulna and Rajshahi from this region. These LGED roads are single lane bituminous roads with moderate traffic stagnation. During site visit, it was observed that due to settlements on both sides of the roads, widening is not possible.

⁶³ http://114.130.54.109/blpa/index.php?option=com_content&task=view&id=800&Itemid=229

Figure: Connectivity between Proposed EZ and Bheramara Railway station



Figure: Bheramara Railway station (photographs)



Bheramara rail station



Approach road to the rail station

Following table depicts major trains which connects Bheramara to other parts of Bangladesh. Places such as Khulna, Noapara, Jessore, Darshanahalt, Chuadanga, Poradaha, Ishurdi, Natore, Shanatahar, Jaypurhat, Biarampur, Phulbari, Dhaka, Parbotipur, Saidpur etc. are well-connected from Bheramara.

Table: Rail connectivity of Bheramara to other parts of Bangladesh⁶⁴

Trains and frequency	Destination	Approximate travel time (hour)
Shundarban Express (Daily apart from Tuesday)	Dhaka and Khulna	5.5
Shimanta Express (Daily)	Khulna and Dhaka	5.0
Rocket Express (Daily)	Parbotipur and Khulna	4.5

⁶⁴ <http://sumonmadpur.yolasite.com/train-schedule.php>

Rupsha Express (Daily)	Saidpur and Khulna	5
Kapotakkha Express (Daily except Wednesday)	Rajshahi and Khulna	4
Mohananda Express (Daily)	Champai Nawabganj and Khulna	6
Modhumoti Express (Daily except Monday)	Goalanda Ghat and Rajshahi	3

Pakshi rail station is connected to the proposed EZ by Lalan Shah Bridge and Kushtia-Jhenaidah Highway (N704). Station road provides last mile connectivity to the station. Basis discussion with local inhabitants, station road is a single lane bituminous road with moderate traffic congestion. Following figure indicates the connectivity of the proposed EZ with Pakshi rail station.

Figure: Connectivity between Proposed EZ and Pakshi Railway station



The Maitree Express or Dhaka-Kolkata express running on Dhaka-Kolkata route is only train connecting India and Bangladesh through railway line. Bheramara and Pakshi, both the railway stations are located on this route. Hardinge Bridge connects Bheramara railway station with Pakshi railway station. Following figure depicts the photograph of Hardinge Bridge.

Figure: Photograph of Hardinge Bridge

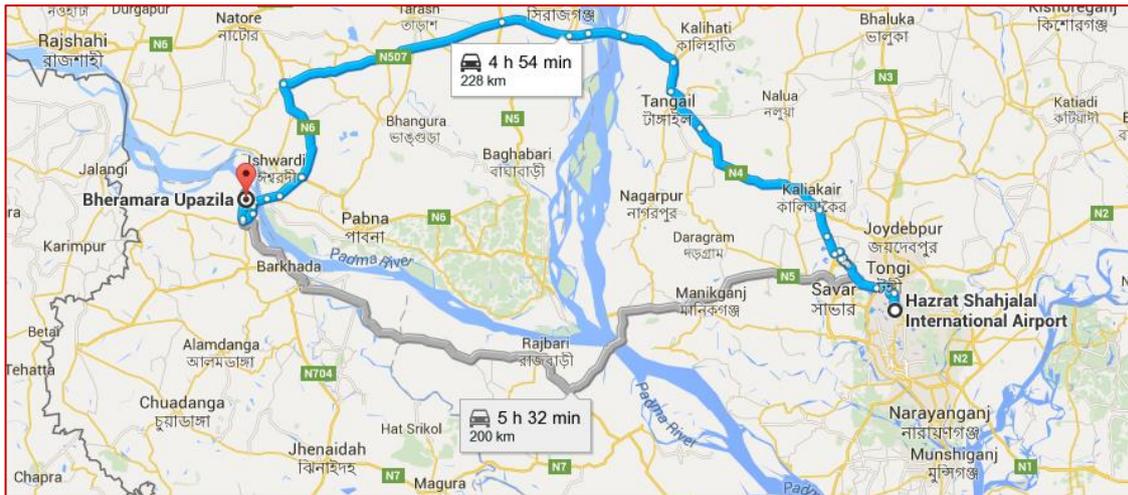


7.5.3.4. Airport

Bheramara EZ is located about 225 km of International Airport at Dhaka and approximate travelling time by road is approximately 5 hours.

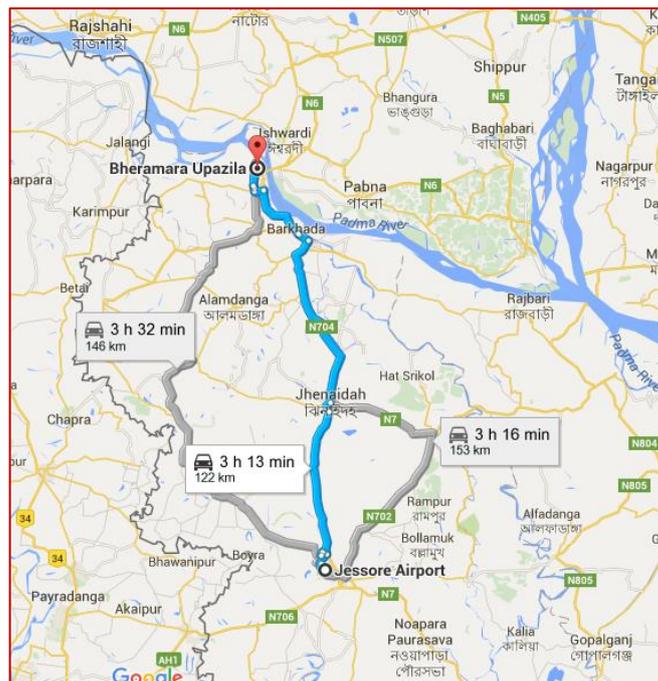
Basis secondary research, over 4 million international and 1 million domestic passengers as well as 150,000 MT of freight and mail exchange use Dhaka International airport. This airport has a freight village (warehouse), terminal buildings, hangers and other modern equipments for aircraft handling. For ease in transportation of construction materials, rail station (airport rail station) is operation near the Dhaka International airport.

Figure: Connectivity between Dhaka airport and Bheramara (proposed EZ)



Proposed EZ is located at a distance of around 120 km from Jessore airport. Approximate travel time is 3-3.5 hours by road. Jessore airport is a domestic airport and access to this airport is via N7 and N704. During site visit, traffic stagnation wasn't observed in this stretch and road condition was favorable for passage of heavy vehicles.

Figure: Connectivity between Jessore airport and Bheramara (proposed EZ)



7.5.3.5. Water Connectivity

Bangladesh, as a riverine country with 24,000 km waterways, has a navigable network varying from 5968 km during the monsoon to 3865 km during the dry season. Inland water transport (IWT) is an important mode of transport not only in the inland movement of freight and passengers but also in the transportation of import and export items through the ports of Chittagong and Mongla. Inland waterways map of Bangladesh is illustrated in Annexure.

Proposed EZ in Bheramara doesn't have any direct access to riverine port or ferry terminal, but it is located adjacent to Padma River.

Figure: Location of the proposed EZ



This Padma River flows from West-Bengal (India) on the upstream (west side of the proposed EZ) and converges with the streams on the downstream (south-east side of the proposed EZ): Brahmaputra flowing (from North-East India), Shitalakhya River and Meghna River. Confluence of three rivers (viz. Meghna, Shitalakhya and Dhaleswari) takes place near Narayanganj and then the stream flows further south up to Bay of Bengal. Some of the major ports which are located on this stream are:

- Narayanganj port
- Paturia port
- Chandpur port
- Payra port

Mongla port and Chittagong port are also accessible from this stream. Figures below attempts to capture the flow of the perennial streams up to Bay of Bengal which indicates the possibility of integration of various ports with the proposed EZ for seamless cargo transfer.

Detailed description about Mongla port and Chittagong port is provided in the section “Snapshot of Infrastructure Linkages in Bangladesh.” Apart from waterways connectivity, Mongla port can also be accessed from Jessore/ Khulna from the proposed EZ. Bheramara EZ is well-connected to Jessore and during site visit; road condition appears to be fit for passage of heavy vehicles. Mongla Port is situated on the south-western part of the country at the confluence of Pussur River and Mongla Nulla. Proposed EZ is located about 254 km from this port. Mongla port is accessible by either Khulna-Mongla Highway or via Dhaka-Kushtia Highway. Figures below indicates the connectivity between Bheramara upzilla and Mongla Port.

Nearest port from the proposed EZ is Paturia. It is located at a distance of around 100-110 km from the proposed EZ. From the Paturia port, both cargo and passenger transfer takes place. Basis discussion with the UNO Officials in Shibalaya, river near paturia port is navigable throughout the year. However, exact information about draft wasn't available from the UNO officials. Ferry service from Paturia ferry terminal runs up to Kazirhat and Daulatia.

Figure: Location of the proposed EZ and access to waterways

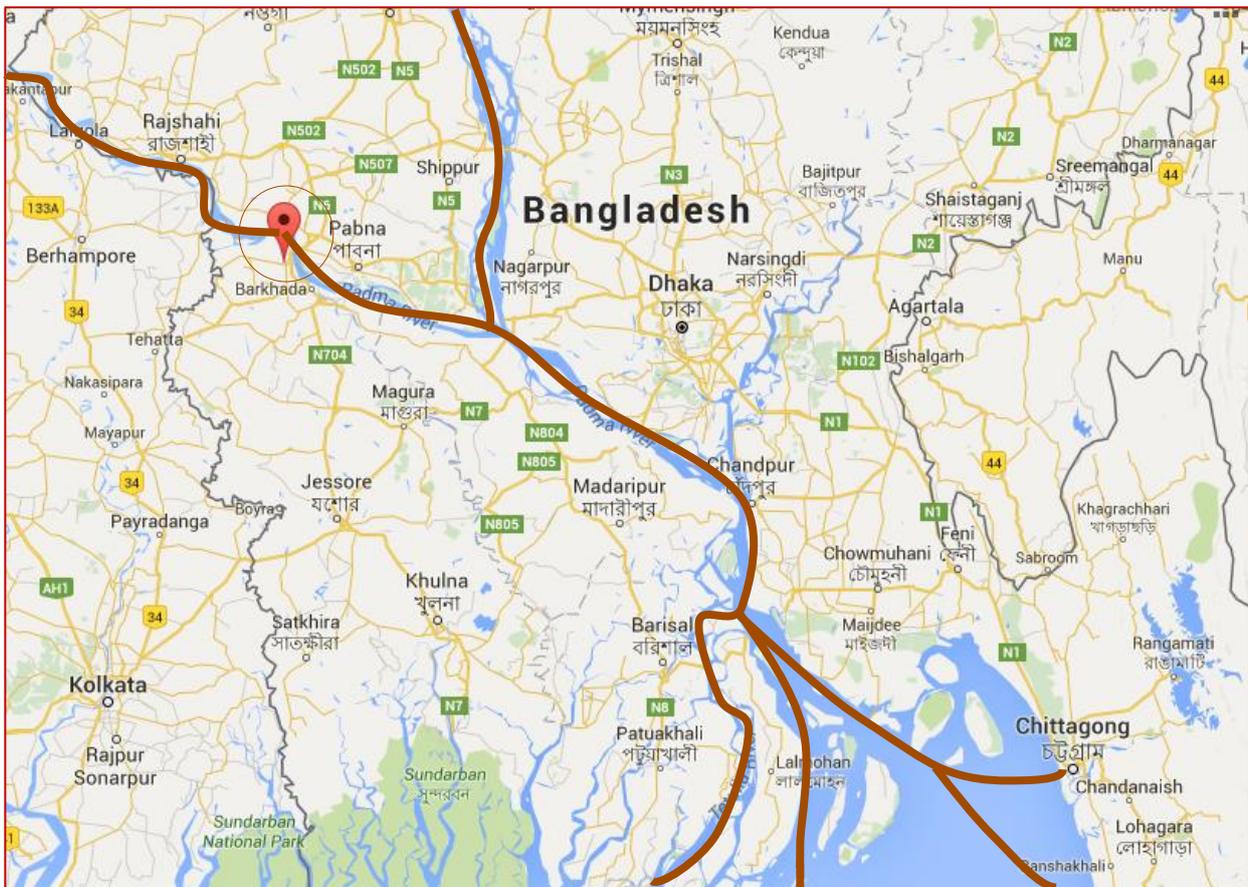
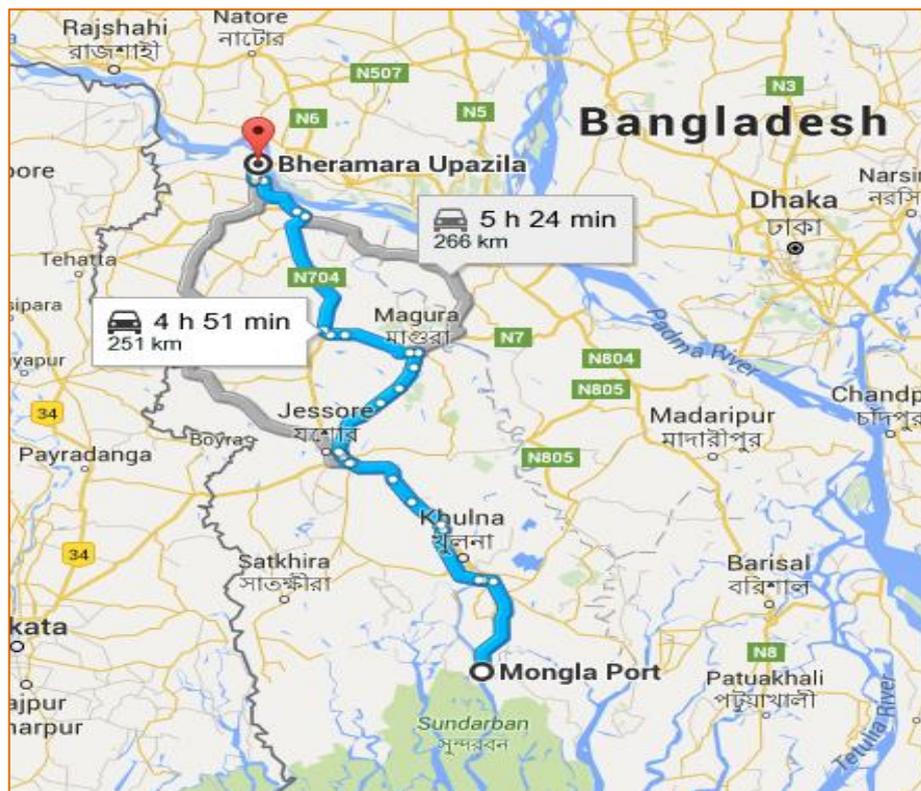
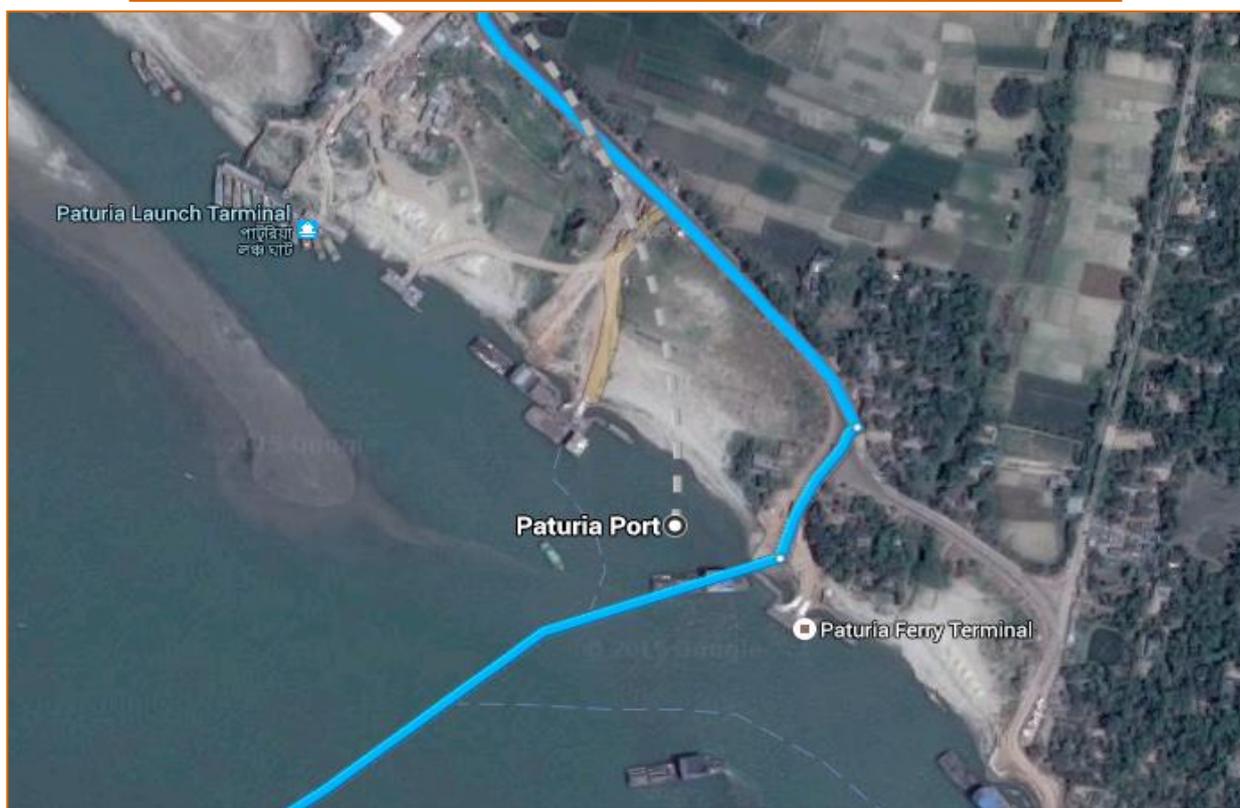
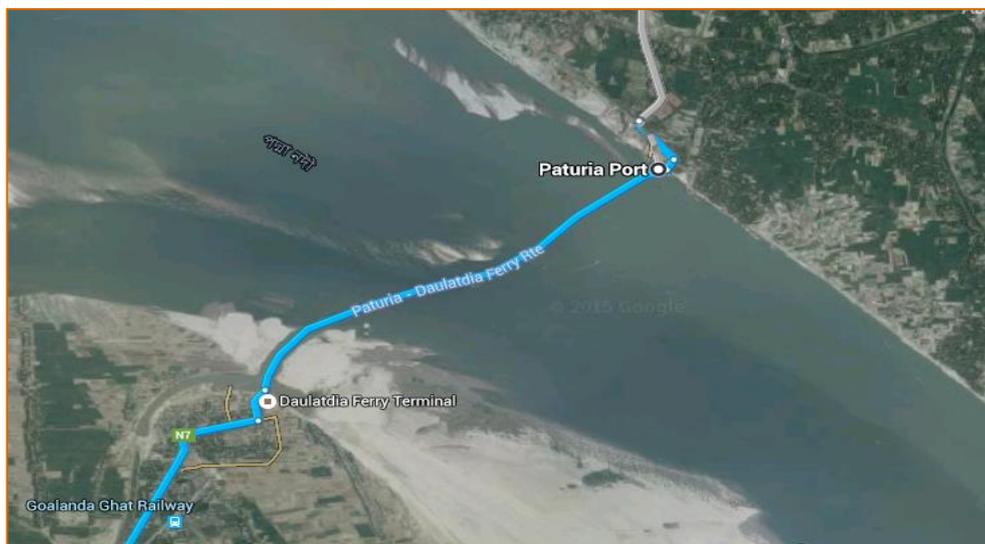


Figure: Connectivity between the proposed EZ and Mongla Port by road



Following figure indicates the ferry connectivity from Paturia ferry terminal.

Figure: Ferry connectivity from Paturia



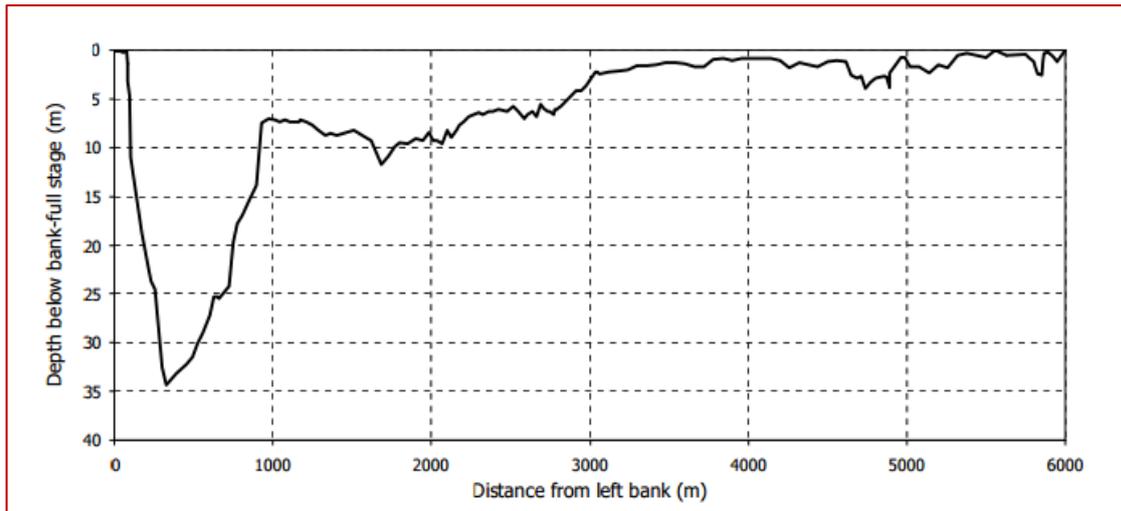
Basis discussions with BIWTA officials, it was informed to us that there are total 18 ferries (for both cargo and passengers) providing 24x7 services from Paturia ghat to Daulatdia ghat and average frequency is 25 -35 ferries per day.

Two types of ferries (both for passenger and cargo) are being operated from Paturia ghat:

- **Big Ferry:** Capacity: 12 Trucks or 18 Buses or 50 Cars
- **Utility Ferry:** Capacity: 6 Trucks or 9 Buses or 25 Cars

Information about available draught in Padma River couldn't be obtained during our site visit. Basis secondary research, following figure captures the draught availability in Padma River.

Figure: Draught Availability in Padma River

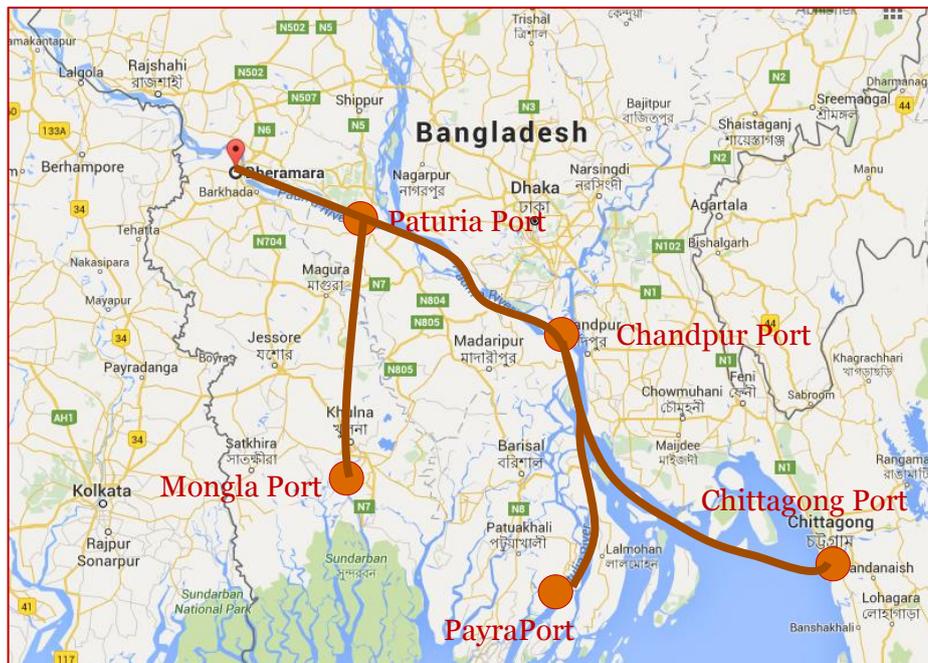


Basis secondary research, in August 2015, the water depth at Daulatia-Paturia ferry route was below 9 feet⁶⁵ and in September 2013 also, the water depth at Daulatia-Paturia channel was below 7 feet⁶⁶.

Preliminary assessment indicates that to integrate the potential of the widespread waterways connectivity of Bangladesh with the proposed EZ, Paturia port may be utilized for cargo transfer. Alternative to this, the option of developing a private jetty in the project area may also be further explored. If a private jetty be constructed within the project site, it would provide easy access to waterways for amenable transfer of cargo. However, any decision pertaining to the same is subjected to detailed feasibility analysis.

Following figure attempts to highlight the major ports and connectivity potential of the proposed EZ via waterways.

Figure: Connectivity potential of the proposed EZ



⁶⁵ <http://www.daily-industry.com/?p=15216>

⁶⁶ <http://www.dhakatribune.com/bangladesh/2013/sep/02/bus-movement-daulatdia-paturia-ferry-ghats-halted-72-hours>

7.5.3.6. *Intermodal Cargo Transfer*

This section attempts to carry out a broad level assessment of the possibilities of linking the proposed EZ through different modes of transportation. All the other modes of transportation (other than road) require multimodal transport. Attempt has been made to evaluate the potential of integrating different modes of transportation with the proposed EZ. It is envisaged that integration of rail, water and air mode of transportation via road accessibility need to be assessed. However, this assessment is carried out at a broad level on the basis of the preliminary assessment. Any further decision on the same needs to be taken after detailed feasibility analysis.

Airport Connectivity: Proposed EZ is located at a distance of around 225 km from Dhaka Airport (Hazrat Shah Jalal International Airport) and travel time is around 5 hours. Cargo facility is available at Dhaka Airport. Access to Dhaka airport takes place by Lalan Shah Bridge, Jamuna Bridge and during site visit, traffic stagnation wasn't observed on this stretch.

Proposed EZ is located at a distance of around 120 km from Jessore airport and travel time is around 3-3.5 hours. It's a domestic airport; basis macro level preliminary assessment, adequate cargo handling infrastructure is not available in this airport. Jessore airport is accessible from the proposed EZ by N7 and N704; during site visit, it was observed that the road condition is favorable for passage of heavy vehicles.

Basis broad level preliminary assessment, it may be stated that integration of airport seems a possibility for the proposed EZ. However, the same involves significant travel time (of around 5 hours to Dhaka airport) from the proposed EZ. As a result of the same, cost of cargo transfer might get impacted. Due diligence is recommended to ascertain the possibility of integration of air mode of transportation in intermodal cargo transfer.

Rail Connectivity: Proposed EZ is well-connected to Bheramara Rail Station (around 7 km from the proposed EZ) and Pakshi Rail Station (around 3 km from the proposed EZ). Basis preliminary assessment, last mile connectivity to these rail stations take place by Z7409/ Station Road and N704/ Station Road respectively. Moderate traffic stagnation has been observed in both these stretches. Both Bheramara and Pakshi rail station is located on the route to Kolkata (India) and are well connected to Khulna and Dhaka rail stations. Cargo facility is available at Bheramara station and Khulna station. Regular cargo transfer takes place from Bheramara to Khulna. Further information on the same couldn't be obtained from the UNO office. Detailed analysis on the same needs to be carried out to ascertain the integration potential of railways for intermodal cargo transfer.

Basis broad level preliminary assessment, it may be stated that integration of railways seems a possibility for the proposed EZ.

Waterways Connectivity: Though there is no cargo terminal or ferry terminal is located in close proximity to the proposed EZ, but it is located on the bank of Padma River and it is well connected to the widespread waterways network of Bangladesh. Please refer to the previous section for further details on how the major ports of Bangladesh are connected to the proposed EZ.

Preliminary assessment indicates that to integrate the potential of the widespread waterways connectivity of Bangladesh with the proposed EZ, Paturia port may be utilized for cargo transfer. Alternative to this, the option of developing a private jetty in the project area may also be further explored. If a private jetty be constructed within the project site, it would provide easy access to waterways for amenable transfer of cargo. However, any decision pertaining to the same is subjected to detailed feasibility analysis.

Macro level assessment of the possibility of intermodal cargo transfer pertaining to waterways seems to be a possibility for the proposed EZ.

7.6. Resettlement issues

7.6.1. Social impacts

The impacts have been assessed on the following parameters:

- (xiii) Loss of land (for existing land owners),
- (xiv) Loss of homes/structures,
- (xv) Loss of Trees
- (xvi) Loss of livelihood systems/ income opportunity
- (xvii) Loss of water bodies.
- (xviii) Resettlement issues pertaining to approach road

The expected types of losses are described in the following sub-sections.

7.6.1.1. Loss of land

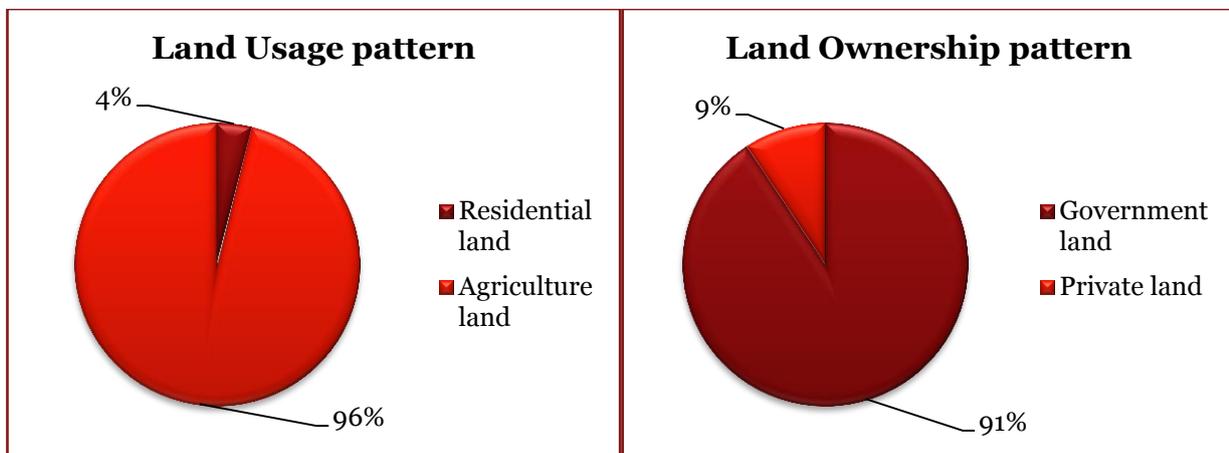
To establish the proposed EZ project, a total of 506.77 acres of land has been demarcated by the authority. As per Field Measurement Book (FMB) superimposed on google map the total area works out to approximately 490 acres. The land usage pattern for this area is as under:

- Residential land- 18.685 acre (approx.)
- Agricultural land- 469.115 acre (approx.)

Ownership pattern of the land is as follows:

- Government- 459.67 acres
- Private land – 47.10 acres

Figure: Land Ownership and Usage pattern



Source: Data collected from Bheramara UNO Office

As a result of the development of the project, residential land owners, and agricultural land owners will lose entire land holding.

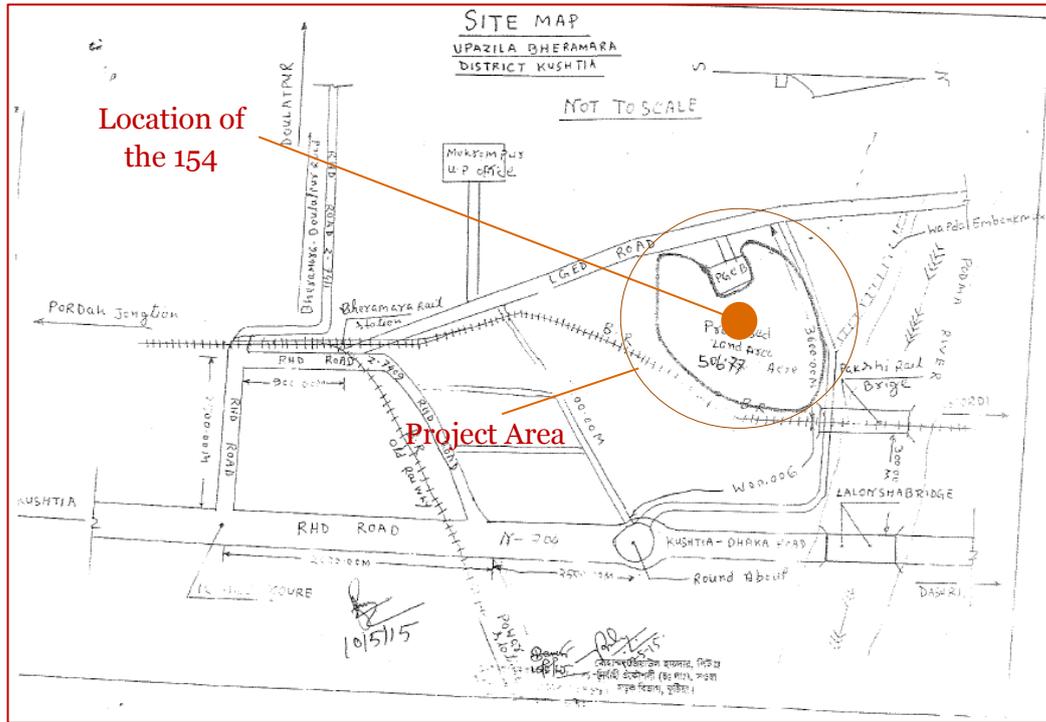
7.6.1.2. Loss of homes/structures

Basis discussion with UNO officials, as a result of the development of this project, approximate 154 families will be directly affected. This includes dwellings and associated infrastructures, which are to be re-located. All affected structures are 'kutcha' structures and the average size of the structures is 200 sq. ft. approximately with a minimum and maximum size of 140 sq. ft. - 300 sq. ft. Since the house hold area

is located on one side of the project area, the same can be excluded from the project area during feasibility stage.

UNO officials informed us that all these families are encroachers and resettlement won't be a concern in the development of the proposed EZ.

Figure: Tentative location of the encroachers within the project area



7.6.1.3. Loss of trees

During site visit, it was observed that thick vegetation is spreaded all over the project area. As a result of the development of the project, loss of trees in this area is huge. The master plan (during the feasibility stage) can be prepared in a way that maximum number trees could be retained and earmarked as green area. Information regarding number of trees wasn't available at the UNO Office. Preliminary assessment indicates that 3,000-5,000 trees are located within the project area. However, during the master planning stage, this assessment needs to be validated.

Figure: Thick vegetation within the project area



7.6.1.4. *Loss of income/livelihood*

Due to loss of shelter and agricultural lands, surrounding villagers will lose source of income.

As a result of the development of the proposed EZ, following local inhabitants would be directly affected and would stand a chance to lose sources of income:

- Sharecroppers
- Yearly lease holders of agricultural land
- Owners of agricultural assets (deep tube-wells and shallow tube wells etc.)

Following local inhabitants would be indirectly affected as a result of the development of this project:

- Seasonal agricultural labors
- Crop traders

Our preliminary assessment indicates that around 250 families would be impacted. However, the same could not be confirmed from UNO. Further due diligence may therefore be conducted at the feasibility stage to assess the exact number of families that would be impacted.

7.6.1.5. *Loss of water bodies*

During site visit, no notable water bodies were observed within the proposed EZ except some temporary canal for irrigation purpose within the project area.

During the master planning stage, such temporary canals need to be rerouted along the boundary of the proposed EZ in order to increase the utilization of project area.

7.6.1.6. *Resettlement issues due to the construction of approach road*

As discussed in Section on road connectivity of the proposed EZ, the option of approach road through Bheramara-Allardorga road (LGED road) is restricted owing to resettlement issues along the approach road.

Preliminary assessment suggests that the other option of approach road (Kuthcha road which connects the proposed EZ to Rajashi – Kushtia highway (N704) near the approach to Lalan Shah Bridge) to the proposed EZ may be considered.

7.6.2. *Constraints and its mitigation*

The major constraints and its mitigation are presented in following table.

Table: Major Constraints and Mitigation measures

Sl. No.	Constraints	Mitigation measures
1	Low lying land	Basis preliminary assessment, landfilling of depth 6-8 feet needs to be undertaken.
2	Existing irrigation canals	During the master planning stage, temporary canals need to be rerouted along the boundary of the proposed EZ in order to increase the utilization of project area.
3	Loss of trees	Trees existing within the proposed EZ can be retained and earmarked as green area during the preparation of master plan.
4	Loss of households	Basis details shared by UNO office, approximate 154 numbers of households are located within the project boundary. As a result of the development of this project, these households could stand a chance of resettlement.
5	Loss of income/ livelihood	As a result of the development of the proposed EZ, following local inhabitants would be directly affected and would stand a chance to lose sources

		<p>of income:</p> <ul style="list-style-type: none"> ➤ Sharecroppers ➤ Yearly lease holders of agricultural land ➤ Owners of agricultural assets (deep tube-wells and shallow tube wells etc.) <p>Following local inhabitants would be indirectly affected as a result of the development of this project:</p> <ul style="list-style-type: none"> ➤ Seasonal agricultural labors ➤ Crop traders <p>Our preliminary assessment indicates that around 250 families would be impacted. This could not be confirmed by the UNO and accordingly further due diligence may be required at the feasibility stage to ascertain the number of impacted families.</p>
6	Resettlement issues due to the construction of approach road	<p>Widening of approach road through Bheramara-Allardorga road (LGED road) connecting the proposed EZ is restricted owing to the presence of settlements located on both sides of the road.</p> <p>Preliminary assessment suggests that the second option of approach road (kutchra road connecting the proposed EZ to N704) may be considered. (refer section on road connectivity for the proposed EZ)</p>

7.6.3. Block Cost Estimation for development of Offsite Infrastructure

Based on preliminary assessment and available information (the schedule of rates published by the competent public authorities, prevailing market prices, in-house data bank and experience gained over similar / comparable development), the Block Cost estimate for the proposed offsite infrastructure components required for developing EZ has been calculated.

Wherever applicable, we have considered all the possible options to arrive at the cost of development and the option of maximum development cost is considered to arrive at the total cost of the proposed offsite infrastructure development. This exercise has been carried out to indicate the approximate cost to be incurred for the development of EZ and it may vary to any extent during implementation stage depending upon the detailed technical information and new developments which may affect / contribute to this EZ. The techno-commercial viability of these options needs to be explored during feasibility stage.

Following table depicts the broad level Block Cost estimates for development of Offsite infrastructure for Manikganj EZ. The figures provided are indicative and may vary depending on the master planning, feasibility analysis and the timeline of development activities.

The broad Block Cost estimate for off-site infrastructure development for proposed Bheramara EZ is calculated as BDT 18,427 Lakh (approx.)

Table: Block cost estimation for proposed EZ

Bheramara-Kushtia – EZ										
S.No	Description	Option -1			Option -2			Considered cost option		
		Qty	Unit	Amount in Lakh BDT	Qty	Unit	Amount in Lakh BDT	Qty	Unit	Amount in Lakh BDT
1	Site filling	Lumpsum		8767	Lumpsum		8767	Lumpsum		8767
2	Compound wall	7900	Mtr	751	7900	Mtr	751	7900	Mtr	751
3	Approach Road (10.50 mtr Carriage way)	2.2	Km	1586	7.75	Km	5588	8	Km	5588
4	Electrical (External connectivity- 33 kv LINE with 33/11 KV substation)	11	Km	1460	11	Km	1460	11	Km	1460
5	Water supply - Water Intake from River - 10.65 MLD	3	Km	1863				3.00	Km	1863
6	Water supply (Water from Bore well- bore well 6 Nos - 10.65 MLD				5	Km	697			
Total				14426			17261			18427

7.7. Voice on the Ground

7.7.1. Stakeholder consultation

Table lists the details of stakeholders consulted at UNO office to obtain first-hand information from about the proposed EZ.

Table: Stakeholders consulted

Name	Description	Phone number
Mr. Shanti Moni Chakma	UNO	+8801715544564
Mr. Wahib Rahman	Engineer, DPHE	+8801925700355
Mr. G.Ranganath	Mechanical Engineer, L&T	+8801777745216
Mr. Kumar Dhas	REB	+8801769402028

7.7.2. Consultation with Private Sector

Further to the site visit for the initial assessment, private sector consultation was also carried out to understand the preliminary level demand assessment of the proposed EZ to gauge the interest of unit investors from various sectors. Some of the major aspects which were discussed with the private investors to understand their interest are as below:

- Location attractiveness
- Availability of physical infrastructure
- Availability of social infrastructure
- Ease of availability of quality manpower
- Marketability of the site
- Support required from the Government

We discussed the salient features of the proposed EZ of the proposed EZ with various investors in Bangladesh to understand how attractive this project is for them. Also, we tried to understand the macro level infrastructure requirements that any investor looks upon before making an investment decision. The results of the Private Sector consultation are summarized in the following table.

Table: Summary of the results of the Private Sector consultation

Sl. No.	Parameters	Discussions	Excerpts from the interaction (if any)
Infrastructure aspects that investors take into consideration while making investment decisions:			
1	Location and Connectivity of the site	According to the investors, the EZ site should be located in the proximity of any industrial center &/or city. The connectivity by road and rail should be excellent and also the access to port is important as this will ease the conveyance of the finished goods to customers. The proposed site in Bheramara is	<p>“Connectivity is the major KPI in evaluating the potential of any economic zone site.”</p> <p>- Hamid Group, Bangladesh</p> <p>“Kushtia and Jessore area has excellent potential for small and medium scale</p>

		located in proximity to the industrial belt of Jessore and Kushtia. This region is renowned for several cottage, small and medium scale industries such as textile, fabrics, metals, tobacco, sugar etc. Further, this region is agriculturally rich. Industries based on the agricultural potential of this region and depending on the backward/ forward linkages of the existing industrial ecosystem would be the best suited industries for this EZ.	<i>industries. Khulna region is also accessible from the proposed EZ in Bheramara.</i> -Orion Group, Bangladesh
2	Proximity to Port	Access to port is very important for development of multi-product EZs as it will facilitate easy transportation of raw materials and finished goods. The proposed site in Bheramara is located at a distance of around 246 km from Mongla Port. According to private sector investors/ developers, proposed EZ in Bheramara is not located adjacent to any port and hence for heavy industries it might be difficult to flourish.	<i>“The proximity to port is very important for industries to develop.”</i> - A K Khan & Company Limited, Bangladesh
3	Utility Connection	For a multi-product EZ to function and for manufacturing units to effectively continue production, access to power, gas and water is very crucial. According to investors, non-availability of gas supply at the project site is a major disadvantage for manufacturing industries to be developed in this EZ.	<i>“Availability of Gas, Power and Water is the prerequisite to set up any manufacturing based industry.”</i> - Orion Group, Bangladesh
Marketability of proposed Bheramara EZ:			
4	Location of the site	According to private sector developers, proposed EZ is well-connected to Jessore and Dhaka. However, distance from Mongla Port is a negative aspect for Bheramara EZ. They felt that industries based on local agricultural resources and existing industrial ecosystem are the best fit for this EZ.	<i>“Location of the project site is attractive; it has easy access to Dhaka and Jessore.”</i> - Hamid Group, Bangladesh
5	Potential for Import/ Export facilitation	According to private sector investors, proposed EZ is located near to India and it has access to Benapole land port. It is expected to gain significantly from the export/ import potential to/ from India through the land port.	<i>“This EZ has good potential to develop as an Indian EZ as it has the advantage to import/ export with India.”</i> -A K Khan & Company Limited, Bangladesh

		Investors also felt that Bheramara EZ has an excellent potential to develop as an Indian Economic Zone.	
6	Demand among local and foreign unit investors	<p>As a result of the proximity to India and access to Benapole land port, investors felt that Bheramara EZ has a good potential for India investors and local investors might not get attracted in this EZ.</p> <p>They also opined that this EZ is best suited for small and medium scale domestic investors who would prefer to locally source the raw materials from agricultural resources and</p>	<p><i>“In my opinion, domestic investors might not get interested in this EZ.”</i></p> <p>-Orion Group, Bangladesh</p>
Support required from Government:			
7	Support in Investment Facilitation	<p>According to the investors, BEZA should focus on investment facilitation so that both foreign and domestic investors enjoy hassle-free process of investment in Bangladesh.</p> <p>They seem to be interested in the implementation of One-Stop-Service and expressed positive opinion about the same.</p>	<p><i>“We think the conceptualization of One-Stop-Service is an excellent initiative from BEZA and it would act as an important parameter for investment facilitation</i></p> <p>-Orion Group, Bangladesh</p>

7.8. Overall Adequacy of the EZ Site in Bheramara

Evaluation of the proposed EZs with respect to key parameters required to establish multi product economic zones are presented in following table.

Table: Overall Adequacy of the Bheramara EZ Site

Sl. No.	Parameters	Illustration of the present facilities	Remarks/ Analysis
A	Connectivity		
1 (A)	Road Connectivity Existing Road Connectivity to Dhaka and other major cities of Bangladesh	<ul style="list-style-type: none"> ➤ Proposed EZ in Bheramara is well-connected to Jessore by N704. Distance by road is 155km (approximate) and travel time is around 3-3.5 hours. During site visit, it was observed that the road condition is smooth and favorable for passage of heavy vehicles. ➤ Jessore is well- connected to Mongla and Khulna region. ➤ Dhaka is also accessible from the proposed EZ. Project site is located adjacent to Lalan Shah Bridge. Lalan Shah Bridge and Jamuna Bridge provide access to Dhaka. Distance between Dhaka and Bheramara is approximately 230 km and travel time is around 5-6 hours. During site visit, it was observed that the road condition is favorable for passage of heavy vehicles. 	<p>For any Multiproduct EZ to develop the site must be near to the main city and the connectivity via road should be excellent.</p> <ul style="list-style-type: none"> ➤ The proposed EZ in Bheramara has good road connectivity to Dhaka and Jessore and some other locations of Bangladesh. ➤ During site visit, it was observed that the road conditions (for both towards Dhaka and Jessore) are favorable for passage of heavy vehicles
1 (B)	Road Connectivity Last Mile Connectivity	<p>Two options of approach road exist:</p> <ul style="list-style-type: none"> ➤ Kutchcha road which connects the eastern part of the proposed EZ to Rajashi – Kushtia highway (N704) near the approach to Lalan Shah Bridge. Length of this kutchcha road alignment is around 500-700 m. ➤ Bheramara-Allardorga road (LGED road) connects the proposed EZ from West side. Bheramara – Allardorga road is a single lane 	<p>The alignment for an approach road is essential for developing a multiproduct EZ as it shall enable the access for the manpower and heavy commercial vehicles to national highways and expressways.</p> <p>A broad level initial assessment indicates that the first option of approach road could be explored further as there seems</p>

		<p>bituminous road favorable for passage of heavy vehicles. From this LGED road, a paver road (stretch of around 1km) starts which runs inside the proposed EZ. Widening of Bheramara-Allardorga road might attract some resettlement issues as it runs through residential colonies and market places.</p>	<p>to be negligible resettlement problem. Further, this approach road connects the proposed EZ to the highway, thus enabling smooth access. However, it is subjected to topography survey and detailed feasibility analysis.</p>	
2	Rail Connectivity	<ul style="list-style-type: none"> ➤ Bheramara railway station is located at a distance of around 7 km from the proposed EZ. Basis discussion with UNO officials and local inhabitants, cargo facility is available at Bheramara rail station and goods are transported to Khulna and Rajshahi from this region. ➤ Pakshi rail station is connected to the proposed EZ by Lalan Shah Bridge and Kushtia-Jhenaidah Highway (N704). ➤ Approach road to both the rail stations experience moderate traffic congestion. ➤ Both the stations are well connected to other parts of Bangladesh. ➤ Apart from trains to other parts of Bangladesh, trains to Kolkata (India) are also accessible from both the rail stations. 	<p>Rail mode of transportation is vital for goods with high volume and timeliness of delivery.</p> <p>Proposed EZ has good access to two rail stations as mentioned. These stations are well-connected to Dhaka and other parts of Bangladesh.</p> <p>Further to this, access to N704 and Lalan Shah Bridge facilitates seamless movement of cargo and passengers from the rail stations to Dhaka, Jessore and other parts of Bangladesh.</p>	
3	Waterways Connectivity	<ul style="list-style-type: none"> ➤ Proposed EZ doesn't have any direct access to cargo terminal/ ferry ghat in the vicinity. However, project site is located adjacent to Padma River. ➤ Broad level initial assessment depicts that Paturia port is located at an approximate distance of 100-110 km from the proposed EZ. Existing cargo facility at Paturia port may be further explored to facilitate seamless movement of cargo via waterways. ➤ Alternate access to waterways seems possible by developing a private jetty in the project area. 	<p>Connectivity to IWT is essential for easy transfer of labor, raw material from local sourcing and for transfer of finished goods to nearby areas to cater to the local demand.</p> <p>Macro level initial assessment depicts that the connecting to widespread waterways is a possibility for the proposed EZ. Further to this, Mongla port can also be accessed by road. Last mile connectivity aspect of the proposed EZ needs to be improved by widening of</p>	

		<p>This in turn would provide access to widespread waterways' network of Bangladesh. Accessing major ports such as Mongla, Chittagong, Payra etc. seems possible.</p> <ul style="list-style-type: none"> ➤ Mongla port is also accessible by road from the proposed EZ. Proposed EZ is located about 254 km from this port. Mongla port is accessible by either Khulna-Mongla Highway or via Dhaka-Kushtia Highway. ➤ Detailed feasibility analysis needs to be undertaken to ascertain the mentioned possibilities. 	<p>the kutchra road which provides access to the project site adjacent to Lalan Shah Bridge.</p>	
4	<p>Airport Connectivity International airport in the proximity</p>	<ul style="list-style-type: none"> ➤ Bheramara EZ is located about 225 km of International Airport at Dhaka and approximate travelling time by road is approximately 5 hours. ➤ Proposed EZ is located at a distance of around 120 km from Jessore airport. Approximate travel time is 3-3.5 hours by road. ➤ Jessore airport is a domestic airport and access to this airport is via N7 and N704. During site visit, traffic stagnation wasn't observed in this stretch and road condition was favorable for passage of heavy vehicles. ➤ Govt. of Bangladesh intends to construct a new international airport (Bangabandhu Sheikh Mujib International Airport) with a view to create a hub airport in close proximity to Dhaka and to meet the demand of future growth in aviation sector. Location for the same is yet to be finalized. 	<p>For movement of goods by air cargo, proximity to airport is essential.</p> <p>Dhaka Airport is 225 km (approximate) from the proposed EZ and travel time is around 5 hours. Jessore airport is also located at a distance of around 120 km from the proposed EZ. As a result of the same, cost of cargo transfer might get impacted.</p>	
B	<p>Utility Connections</p>			

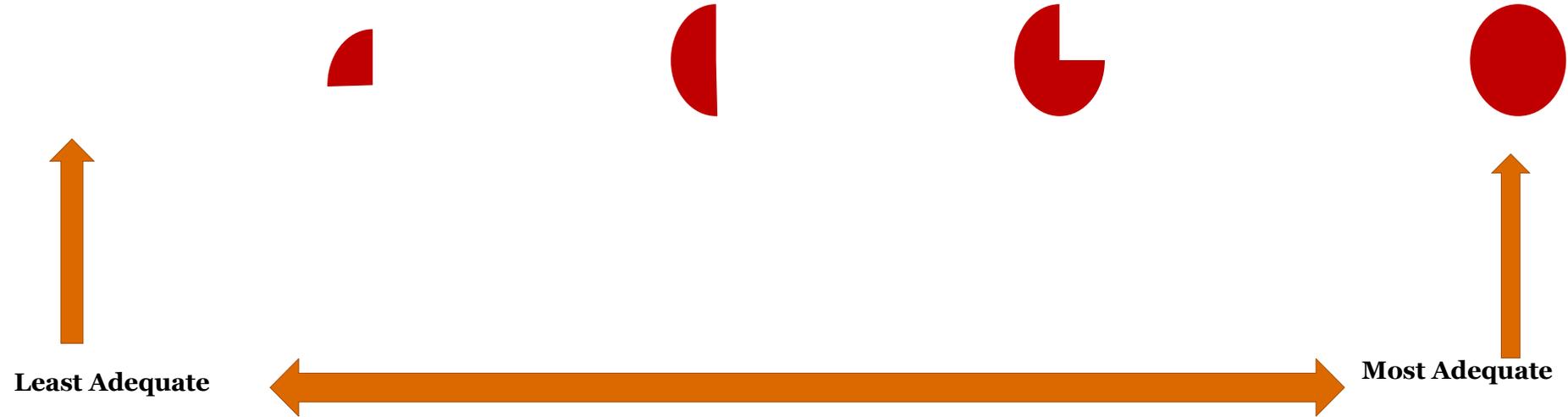
1	Power Availability	<ul style="list-style-type: none"> ➤ Indo Bangla Transmission Centre (500 MW HVDC Back-to-Back power station) is located adjacent to the proposed EZ. ➤ One 360 MW combined cycle power plant (CCPP) is under construction which is located within 2 km from the proposed EZ. ➤ A 33/11 kv substation (under-construction) of capacity 10 MVA is located at 12th Mile (10.4 km from the proposed EZ). 	<p>24×7 uninterrupted electricity supply is a prerequisite for development of any manufacturing facility.</p> <p>Basis working knowledge and best practices followed, power requirement in a typical EZ could be transmitted by a dedicated 33 KV line for demand up to 25 MW. If the demand is more than 25 MW, then the option of 132 KV transmission lines needs to be further explored. Proximity to 33 KV power connection and surplus power availability in the vicinity of the proposed EZ are the crucial factors to decide on the potential of power availability to the proposed EZ.</p>	
2	Water Availability	<p>Basis interaction with local inhabitants, the ground water is available at a depth of 200 feet (approximately) from natural ground level.</p> <p>Preliminary assessment suggests that the water requirement could be met either by extracting water from the Padma River or from deep tube well (which could be developed within the project area). Further, our preliminary assessment also suggests that extracting water from Padma River located on the eastern boundary of the proposed EZ may be considered by providing suitable intake system and water treatment plant.</p> <p>Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Bheramara EZ is around 4.31 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could</p>	<p>It is very important to have adequate and sustainable source of potable water for the development of multiproduct EZ so that the labours don't face any scarcity of drinking water. The industrial units need uninterrupted supply of good quality water for industrial consumption.</p> <p>Proposed site has proximity to Padma River, thus the option of extracting water from Padma River may be further explored. Decision regarding extraction of water from bore well/ Padma River needs to be taken after detailed feasibility analysis</p>	

		be extracted through bore wells. Extraction of more water through bore wells might result in depletion of the aquifer level.		
3	Gas Availability	<ul style="list-style-type: none"> ➤ At present there is no gas supply available to the proposed EZ. Difficulty in laying gas transmission pipeline across the Padma Riverbed is holding up gas supply to the south western part of Bangladesh. ➤ CGS Gas substation in Bheramara is located at a distance of approximately 2 km from the proposed EZ and its capacity is 100 MMcfd. 	<p>Gas supply is a prerequisite for development of any manufacturing facility.</p> <p>Non-availability of gas would discourage various industries (textile, cement, heavy engineering, electronics, leather etc.) from establishing their units in the proposed EZ.</p>	
C	Suitability for industrial development			
1	Existing industrial ecosystem and Possible Backward linkages for industries	<ul style="list-style-type: none"> ➤ Kushtia is renowned for various small and medium scale industries pertaining to textile, fabrics, cables, metals, tobacco, sugar etc. ➤ Kushtia district is also rich in natural resources such as rice, sugarcane, jute, maize etc. ➤ This area is located near to Pabna and Rajshahi district. Pabna is known for pharmaceutical industry and hosiery based industries. Rajshahi district is renowned for agriculture and silk. ➤ Some popular industries in the nearby districts are: jute, bamboo, wood, knitwear, tobacco etc. Major export items from Rajshahi district are: jute, sugarcane, date, pan, mango, lichi, green vegetables, turmeric and silk items. Apart from that, livestock farming (cattle) and fishing are other major activities undertaken by local inhabitants. 	<p>Existing industrial ecosystem facilitates easy development of industries in the economic zone based on backward linkages and ease in raw material sourcing.</p> <p>Proximity to Pabna, Rajshahi and Kushtia would enable industries (based on backward and forward integration of existing industries) to develop in the proposed EZ.</p>	
2	Proximity to major cities	Bheramara EZ is located in close proximity to Jessore. Dhaka is also accessible from the proposed EZ and	Proximity to major cities facilitates the proliferation of industrial development. Existing industrial ecosystem provides	

		travel time is around 5-6 hours.	access to raw material sourcing and skilled manpower.	
D	Challenges in developing the economic zone (Resettlement Issues and social aspects)			
1	Landfilling	Basis preliminary assessment, landfilling of depth 6-8 feet needs to be undertaken.	Landfilling has to be done for the entire site, which means some initial cost has to be borne before the commencement of the development works. Depth of landfilling is less than the average depth of landfilling for the other six sites.	
2	Residential units to be rehabilitated	Basis preliminary assessment, 154 units (approximate) need to be rehabilitated as a result of the development of this project.	Rehabilitation of household structures involves challenge in developing this economic zone.	
3	Other Resettlement Issues	<ul style="list-style-type: none"> ➤ During the master planning stage, temporary canals need to be rerouted along the boundary of the proposed EZ in order to increase the utilization of project area. ➤ Trees existing within the proposed EZ can be retained and earmarked as green area during the preparation of master plan. 	Mentioned resettlement aspects need to be considered before the development of the economic zone project.	
E	Availability of Social Infrastructure			
1	Availability of good residential facility in the nearby areas	The proposed EZ is located 23 km away from Kusthia town. Dwelling units and residential facilities are available for labours in Kusthia.	The labours working in the proposed EZ shall have access to the dwelling units and residential areas within close proximity to the proposed EZ. Executives working in the economic zone may take up accommodation in Kushtia town. The option of developing residential facilities within the EZ needs	

			to be explored further during the master planning stage.	
2	Medical facilities available in the nearby areas	<p>One government hospital (Upzilla Health Complex) is available in Bheramara sub district with 50 beds.</p> <p>Kushtia Medical College & Hospital is located at a distance of 28 km (approx.) from the proposed EZ.</p> <p>Kushtia General Hospital having 250 bed capacities is located at a distance of 25 km (approx.) from the proposed EZ.</p>	<p>There are few medical facilities available within 10 km radius of the proposed EZ to cater to the healthcare requirements of the workforce. Better Healthcare facilities are available in Kushtia at a distance of 25-30 km (approx.)</p> <p>Major healthcare facilities are available in Jessore and Dhaka.</p>	
3	Air and water pollution at the site (prevailing condition)	<p>The site is free from air and water pollution and no significant noise was observed when the site visit was undertaken.</p> <p>The incidence of water and air pollution at the site is insignificant. Also, the incidence of water borne diseases wasn't recorded in the locality.</p>	The location of any multi product EZ should ideally be free from air and water pollution. Pollution would lead to health hazards and non-conducive working environment for the workforce. From the initial site assessment, it appears that the site is free from all such pollution problems.	
4	Availability of manpower	<p>Proposed EZ is located in Kushtia district.</p> <p>Kushtia district has 1 university, 62 colleges (government and non-government colleges) and 299 secondary schools (government and non-government schools). The district also has 5 engineering colleges, 3 agriculture and veterinary college, 5 medical colleges and 9 technical and vocational institutions.</p> <p>Kushtia polytechnic institute, Pabna Technical Training Center, Banglamotion Institute of Engineering & Technology, Regional Agricultural Research Station etc. are some of the prominent institutes in the vicinity.</p>	<p>Availability of manpower is a prerequisite in development of multiproduct economic zones.</p> <p>Quality manpower could be sourced from the prominent technical institutes located in Kushtia and Pabna districts. Jessore located at 120 km (approx.) could also act as source of manpower requirements. Existing industrial ecosystem in Jessore and Kushtia may be beneficial for sourcing of quality manpower at affordable cost.</p>	

Legend:



7.9. SWOT Analysis of Kustia- Bheramara Economic Zone

Based on the detailed analysis carried out, SWOT analysis of the proposed EZ is depicted below:

Parameters	Strengths	Weaknesses
Last mile connectivity	Two approach roads are possible for the proposed EZ. The best-fit is the Kutchcha road which connects the eastern part of the proposed EZ to Rajashi – Kushtia highway (N704) near the approach to Lalan Shah Bridge. Length of this kutchcha road alignment is around 500-700 m.	
Water availability inside the proposed EZ	Proposed EZ is located adjacent to Padma River. Preliminary assessment suggests that the water requirement could be met either by extracting water from the Padma River or from deep tube well (which could be developed within the project area). Further, our preliminary assessment also suggests that extracting water from Padma River located on the eastern boundary of the proposed EZ may be considered by providing suitable intake system and water treatment plant.	Basis discussion with UNO officials, ground water is available at a depth of 200 feet (approx.) from natural ground level.
Block cost of off-site infrastructure development		Block cost estimate for off-site infrastructure development is BDT 18,427 lakh. Block cost estimate for off-site infrastructure development for unit area is calculated at 36.36 BDT lakh per acre, which is second lowest.
Social and resettlement aspects		<ul style="list-style-type: none"> • Landfilling of around 6-8 feet is envisaged • Basis preliminary assessment and details shared by UNO office and local inhabitants, 250 numbers of households (approximate) could stand to lose their income/livelihood as a result of the development of the project. • Basis preliminary assessment, 154 residential units need to be rehabilitated as a result of the development of this project. • Trees existing in the site can be retained and earmarked as green area during the preparation of master plan. • During the master planning stage, temporary canals need to be rerouted along the boundary of the proposed EZ in order to increase the utilization of project area.
Cost of private land		Around 47.10 acre of private land need to be acquired which would result in a

acquisition		cost of BDT 1413.00 lakh. Proposed EZ stands at fourth lowest figure for cost of land acquisition.
Parameters	Opportunities	Threats
Road connectivity	<ul style="list-style-type: none"> Proposed EZ in Bheramara is well-connected to Jessore by N704. Distance by road is 155km (approximate) and travel time is around 3-3.5 hours. During site visit, it was observed that the road condition is smooth and favorable for passage of heavy vehicles. Dhaka is also accessible from the proposed EZ. Project site is located adjacent to Lalan Shah Bridge. Lalan Shah Bridge and Jamuna Bridge provide access to Dhaka. Distance between Dhaka and Bheramara is approximately 230 km and travel time is around 5-6 hours. During site visit, it was observed that the road condition is favorable for passage of heavy vehicles. 	
Rail connectivity	<ul style="list-style-type: none"> Bheramara railway station is located at a distance of around 7 km from the proposed EZ. Basis discussion with UNO officials and local inhabitants, cargo facility is available at Bheramara rail station and goods are transported to Khulna and Rajshahi from this region. Pakshi rail station is connected to the proposed EZ by Lalan Shah Bridge and Kushtia-Jhenaidah Highway (N704). Apart from trains to other parts of Bangladesh, trains to Kolkata (India) are also accessible from both the rail stations. 	Approach road to both the rail stations experience moderate traffic congestion.
Waterways connectivity	<ul style="list-style-type: none"> Alternate access to waterways seems possible by developing a private jetty/ cargo terminal in the project area. This in turn would provide access to widespread waterways' network of Bangladesh. Accessing major ports such as Mongla, Chittagong, Payra etc. seems possible. 	<ul style="list-style-type: none"> Proposed EZ doesn't have any direct access to cargo terminal/ ferry ghat in the vicinity. However, project site is located adjacent to Padma River.
Air connectivity	Proposed EZ is located at a distance of around 120 km from Jessore airport. Approximate travel time is 3-3.5 hours by road.	<ul style="list-style-type: none"> Bheramara EZ is located about 225 km of International Airport at Dhaka and approximate travelling time by road is approximately 5 hours.
Power connection	Following power connections are available in the proximity of the proposed EZ: <ul style="list-style-type: none"> Indo Bangla Transmission Centre (500 MW HVDC Back-to-Back power station) is located adjacent 	

	<p>to the proposed EZ.</p> <ul style="list-style-type: none"> • One 360 MW combined cycle power plant (CCPP) is under construction which is located within 2 km from the proposed EZ. It is expected to be functional by Mid-2016. • A 33/11 kv substation (under-construction) of capacity 10 MVA is located at 12th Mile (10.4 km from the proposed EZ). 	
Gas connection		At present there is no gas supply available to the proposed EZ. Difficulty in laying gas transmission pipeline across the Padma Riverbed is holding up gas supply to the south western part of Bangladesh.
Existing industrial ecosystem and Possible Backward linkages for industries	<ul style="list-style-type: none"> • Kushtia is renowned for various small and medium scale industries pertaining to textile, fabrics, cables, metals, tobacco, sugar etc. • Kushtia district is also rich in natural resources such as rice, sugarcane, jute, maize etc. • This area is located near to Pabna and Rajshahi district. Pabna is known for pharmaceutical industry and hosiery based industries. Rajshahi district is renowned for agriculture and silk. 	
Proximity to major cities	<p>Bheramara EZ is located in close proximity to Jessore.</p> <p>Dhaka is also accessible from the proposed EZ and travel time is around 5-6 hours.</p>	
Other facilitator for the industrial proliferation	Proposed EZ has access to Benapole land port which could facilitate in cross border trade to India	
Access to quality manpower	<ul style="list-style-type: none"> • Kushtia district has 1 university, 62 colleges (government and non-government colleges) and 299 secondary schools (government and non-government schools). The district also has 5 engineering colleges, 3 agriculture and veterinary college, 5 medical colleges and 9 technical and vocational institutions. • Quality manpower could be sourced from the prominent technical institutes located in Kushtia and Pabna districts. • Jessore located at 120 km (approx.) could also act as source of manpower requirements. Existing industrial ecosystem in Jessore and Kushtia may be beneficial for sourcing of quality manpower at affordable cost. 	
Availability of	<ul style="list-style-type: none"> • One government hospital (Upzilla 	However for serious medical

medical facilities	Health Complex) is available in Bheramara sub district with 50 beds. <ul style="list-style-type: none">• Kushtia Medical College & Hospital is located at a distance of 28 km (approx.) from the proposed EZ.	treatment, local inhabitants need to travel to Dhaka/ Jessore.
Availability of residential facilities	The proposed EZ is located 23 km away from Kusthia town. Dwelling units and residential facilities are available for labours in Kusthia.	No international standard residential facilities are available in the vicinity to the proposed EZ.

Nilphamari EZ

8. Nilphamari Economic Zone

8.1. Location Details and Salient Features

8.1.1. General Profile of the District

Geographic Location

Nilphamari is a district in the Rangpur division located in located at the extreme northern part of the country on the India-Bangladesh border. There are total of 8 districts under Dhaka division.

Nilphamari is surrounded by:

- North- West Bengal state of India;
- East- Lalmonirhat and Rangpur District;
- South- Rangpur and Dinajpur districts;
- West- Panchagarh and Dinajpur districts.

It lies between 25°44' and 26° 19' North latitudes and between 88°44' and 89°12' East longitudes. The district spreads over total area of about 1546.59 sq. km. of which 33.54 sq. km. is riverine and 6.26 sq. km is under forest.⁶⁷

Nilphamari has 6 upzilas:

- Dimla
- Domar
- Jaldhaka
- Kishoreganj
- Nilphamari Sadar
- Saidpur

The proposed EZ is located in Nilphamari Sadar upzila. Saidpur upzila is in close proximity to the proposed EZ.

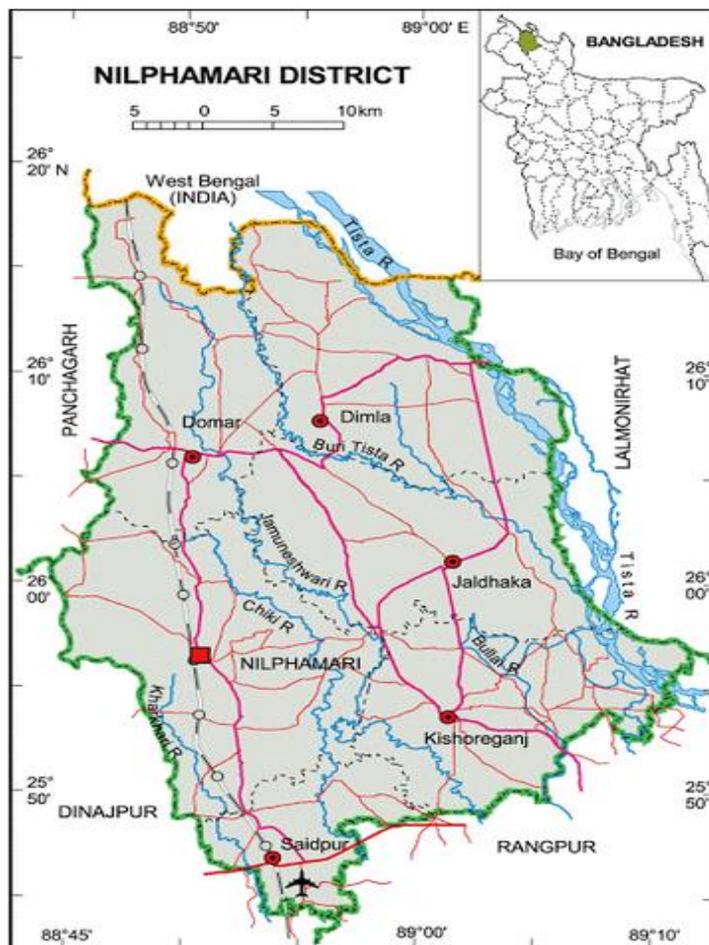
Demographics

The district has overall population of 18,34,231 as per Population and Housing census 2011. The gender ratio in 2011 was 101 (no. of males per 100 males). Total numbers of households were 4,21,572 (average household size was 4.34 persons per household), and the literacy rate was 44.4%

Upzila wise population details as per census 2011 are presented in the following table.

Table: Upzila wise population details of Manikganj District

Name	Status	Population census		Growth
		2001	2011	
Nilphamari	District (Zila)	15,71,690	18,34,231	16.7%
Dimla	Sub district (Upazila)	2,23,975	2,83,438	26.5%
Domar		2,15,699	2,49,429	15.6%
Jaldhaka		1,41,715	1,71,466	24%
Kishoreganj		2,53,192	2,61,069	3.1%



Source: Districts Website Nilphamari

⁶⁷ Population and Housing Census Manik ganj District, BBS 2011

Nilphamari Sadar		1,91,336	2,19,080	17%
Saidpur		2,32,209	2,64,461	13.9%

Source: Population and Housing Census Nilphamari district, BBS 2011

Climate Condition

The annual average temperature of Nilphamari district varies from maximum 32.3°C to a minimum of 11.2°C. Average annual rain fall and average relative humidity recorded in this district were 2931 mm and 77.4% respectively in 2011.⁶⁸

Agriculture

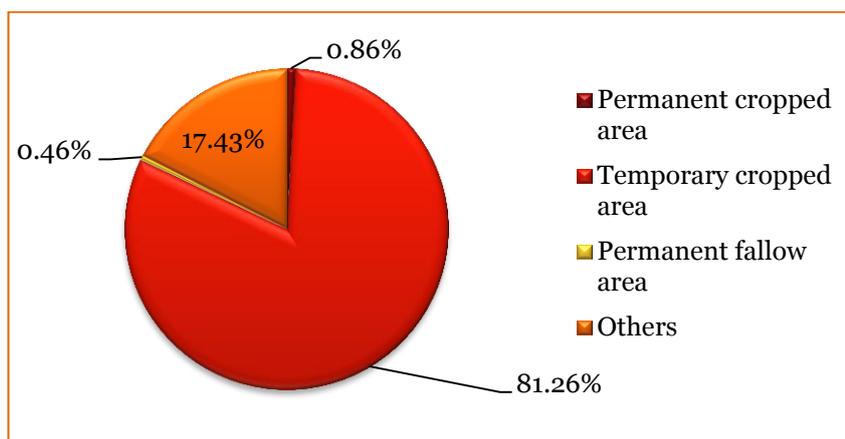
Total agriculture land in Manikganj district is 1124.39 sq. km., which amounts to 72.7% (approx.) of the total area of the district.⁶⁹

Major agriculture crops cultivated in the district are rice, wheat, jute, pulse, oilseed, vegetable, spice, sugarcane, tobacco, etc. Among rice crops aman occupies the largest area followed by aus and boro.

Major horticulture crops in this district are Banana, coconut (*Cocos nucifera*), date palm (*Phoenix sylvestris*), betel nut (*Areca catechu*) and palmyra etc. Betel nut is very commonly grown and is very special of this district.

Major portion of the agriculture land is utilized as temporary cropped area in this district. The land use pattern of the agriculture land for the year 2008 is presented in the following figure.

Figure: Land use pattern (2008)



Source: District Statistics 2011, Manikganj, published by Bangladesh Bureau of Statistics (BBS)

Irrigation

Irrigated area classifications fall into two categories:

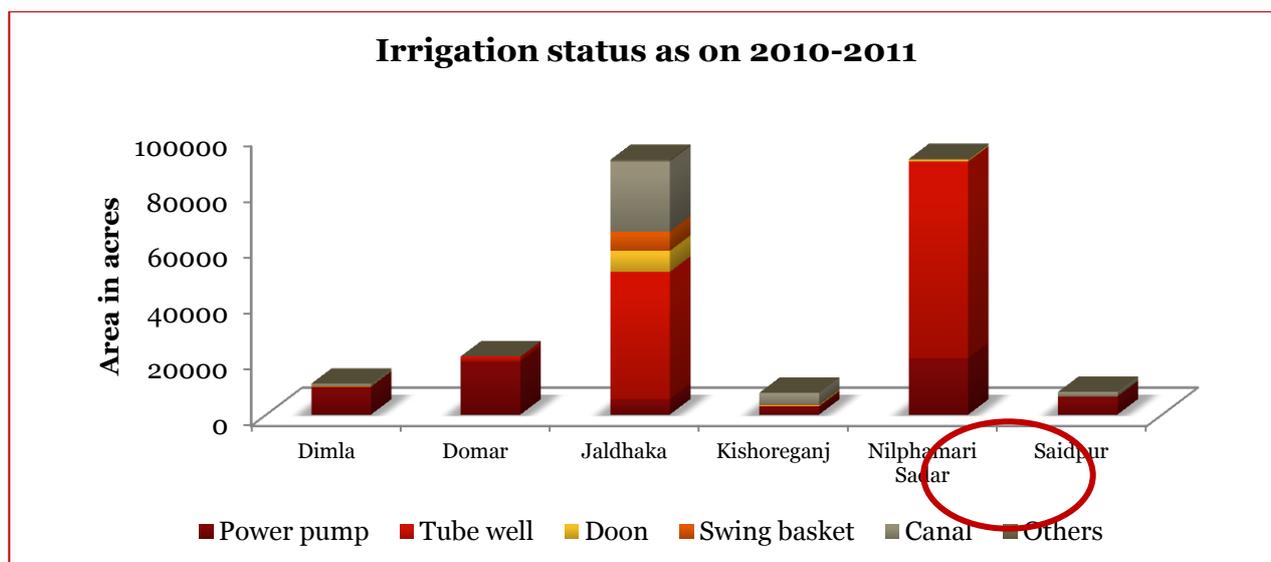
- Surface water irrigation with main water sources being rivers, canals, ponds, and other water bodies;
- Underground water irrigation with water lifted by shallow tube-wells, deep tube wells, and country traditional devices.

Currently, 60.86% (approx.) of total agriculture area is under irrigation in this district. However, the percentage of total area under irrigation in Nilphamari Sadar upzila is 83.7%, significantly better than the district figure. Upzila wise the method of irrigation during the year 2010-11 is presented in the following figure.

⁶⁸ Districts statistics, BBS 2011

⁶⁹ District Statistics, BBS 2011

Figure: Irrigation Status (2010-11)



Source: District Statistics 2011, published by Bangladesh Bureau of Statistics (BBS)

8.2. Broad level market potential assessment for the proposed EZ

Proposed EZ in Nilphamari is located in Rangpur division of Bangladesh and it is approximately 400 km away (travel time by road is around 8-9 hours) from Dhaka. Nilphamari is located near to Saidpur town (approximately 25 km away) and is accessible by Saidpur-Nilphamari Road. Nilphamari is located at extreme northern part of Bangladesh and near to India-Bangladesh border. India's Siliguri district is located on the northern side of Nilphamari district.

Proposed EZ is located at a distance of approximately 20 km from Saidpur Airport. It is a domestic airport and a few flights (moderate frequency) are available from Saidpur to Dhaka. Biggest railway workshop in Bangladesh is located in Saidpur town. Railway station in Saidpur has railway siding for cargo conveyance however at present no cargo is conveyed by using this facility. Both Broad Gauge (BG) and Meter gauge (MG) lines are operational in this station. Basis discussion with Railways Department, Saidpur it was revealed that Nilsagar Express runs from Dhaka to Saidpur (six pairs of trains weekly). Apart from that, trains to Khulna and Rajshahi are available from Saidpur Railway station. Daily trains to Dhaka are available from Parvatipur (Distance between Parvatipur Railway station and Saidpur Railway station is approximately 18 km).

Multiple infrastructure projects are proposed in this region. Once implemented, connectivity of this region to other parts of Bangladesh and also with neighboring countries shall improve significantly. Asian Highway (four-lane highway) is proposed between Dhaka and Banglabandha Land Port. It is a cooperative project among countries in Asia and Europe and the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), to improve the highway systems in Asia.

There is a Land Custom Station – Banglabandha located at approximately 120 kms from Nilphamari district. The LCS is situated at only 7km from New Jalpaiguri and Shillguri on the Indian site, which are the major towns in the northern part of the state of West Bengal and which are crucial junctions for connectivity to India's north east and beyond to Bhutan and Nepal. Banglabandha road leading to the LCS provides an important trade link with Bhutan, Nepal and India. Phulbari is the corresponding LCS on the Indian side. At present different goods such as fertilizer, jute, medical equipment, plastic material, readymade garments, electrical goods, textile, computer and parts, machinery, chemicals, tea, pulses, rice, onion, apple, marble, slab, live animals and miscellaneous are exported and imported through this

LCS. Trade through the LCS has increased from 112,081 metric tons in 2010-11, to 530,213 metric tons in 2013-14.

Burimari Land port is located at a distance of approximately 76 km from proposed EZ. Burimari Land Port is located near Chengrabanda Border in India.

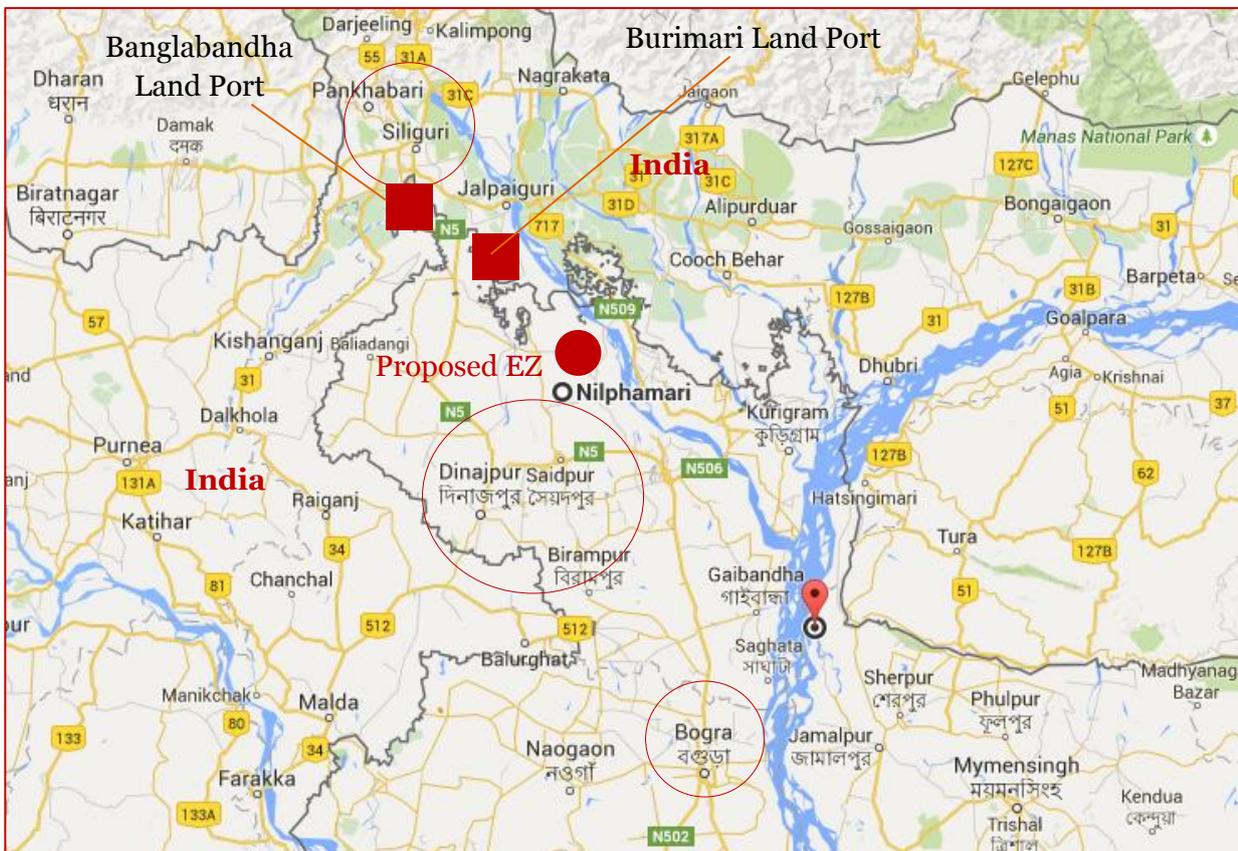
Hili Land port is situated at Hakimpur Upazilla in Dinajpur district and is the 2nd largest land port in Bangladesh. In 1985-86, the Hili customs station was established for export-import business between Bangladesh and India. Later in 1996, government declared it as a full-fledged customs station. In 2005, the government handed over the port for private management. Hili Land port is located at a distance of approximately 120 km away from the proposed EZ.

Moreover, on 15th June, 2015, BBIN (Bangladesh, Bhutan, India and Nepal) group of countries signed a sub-regional Motor Vehicles Agreement (MVA) with the objective of enabling a seamless and easy movement of cargo across their borders. The MVA will enable Bangladeshi products to access not only the Indian markets but also markets in Bhutan and Nepal.

The presence of well-functioning LCS will further facilitate the trade among the countries. Once Asian Highway is developed it will enable seamless movement of goods from Panchagarh to major markets in Bangladesh such as Dhaka and also to markets to India and beyond to Bhutan and Nepal. Owing to the recent MVA among BBIN countries, upcoming Asian highway 2 and the presence of Banglabandha LCS which is 7 km away from major Indian towns, an economic zone in Nilphamari Sadar stands to gain significantly.

Following figure illustrates the location of the proposed EZ and the existing/ proposed connectivity aspect in the vicinity.

Figure: Location of the proposed EZ



About 90% of population of this district is dependent on agricultural activities. Major crops produced in this region are bamboo, rice, paddy, potato, tobacco, maize, onion, peanuts and green vegetables.⁷⁰ Industrial development hasn't taken place in this district; however Uttara EPZ is located in close proximity (within 5-6 km of distance) to the proposed EZ. Some of the existing industries inside Uttara EPZ are ceramics, sanitary ware, textile, coffin manufacturing etc.

Other industries (in small and medium scale) present in this region are:

- Auto rice mill
- Metal and light engineering
- Jute Mills
- Wooden furnitures and accessories
- Cold Storage
- Food Processing
- Plastic and packaging

Industry Snapshot of Nilphamari district is captured in the following table.

Table: Distribution of Industries of Nilphamari district

Company type	Number
Textile Mills	1
Garments Factory	151
Rice Mills	224
Steel and engineering	11
Aluminum	1
Jute Mills	3
Others	12

Source: District statistics, BBS 2011

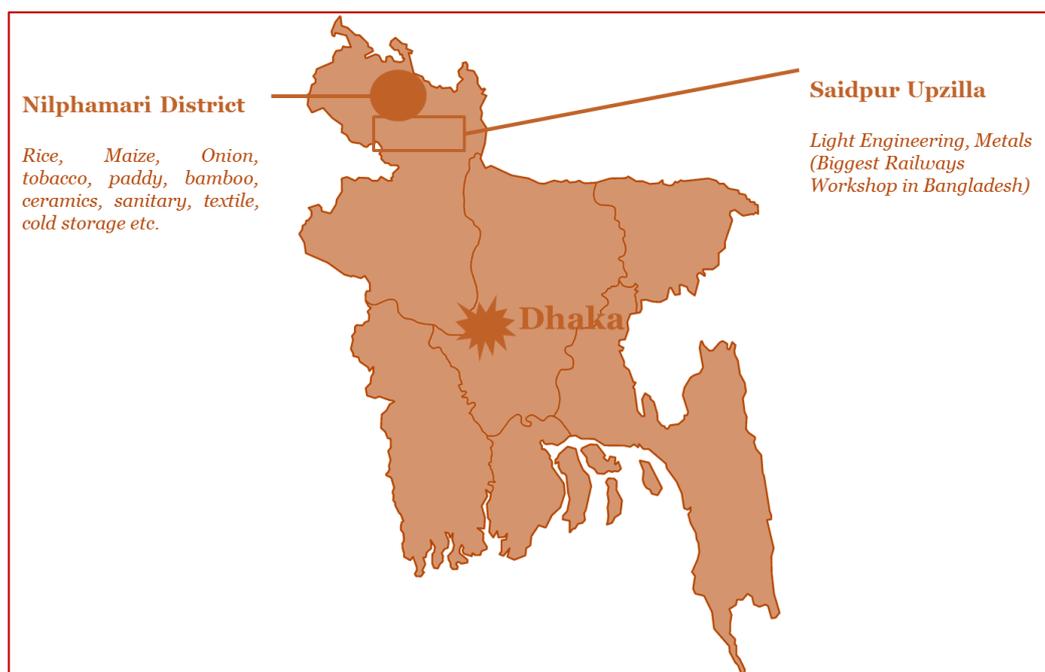
Saidpur upzilla in Nilphamari is renowned for railways workshop. It is the biggest railway workshop in Bangladesh and several skilled and semi-skilled workers are employed there. Basis discussion with local inhabitants and UNO officials, Saidpur has several small and cottage units related to light engineering, metal etc. Spin offs from the rail workshop have started these units at their households.

Further north of Nilphamari Sadar, in Panchgarh district tea cultivation is a predominant industry. Currently total land under tea cultivation in Panchgarh is 2255.54 acre. There are a total of 246 tea gardens, including 18 big estates, 13 medium-size and 215 small-scale gardens set up on over 1,815 acres (7.35 sq. km) of land in Tetulia and its surrounding areas. The tea cultivation provides employment to approximately 3,000 to 4,000 local people. Some of the major tea gardens in this area are: Aga Tea Estate, Kartoa Tea Garden, Kazi & Kazi Tea Garden, Dahuk Tea Garden, Mainaguri Tea Garden etc. Currently there are a total of three tea processing units in this district viz. (1) Organic factory of Kazi & Kazi Tea Estate, Tetulia; (2) Tetulia Tea Company Limited and (3) Factory of Kartoa Tea Garden. Kazi & Kazi Tea Estate (KKTE) at Tetulia has earned reputation in both national and international markets by producing, processing and marketing the famous and most popular Kazi & Kazi Organic Tea.

Following figure depicts the landscape of industry and natural resources in and around Nilphamari.

⁷⁰ <http://www.nilphamari.gov.bd/node/689306/%E0%A6%8F%E0%A6%95-%E0%A6%A8%E0%A6%9C%E0%A6%B0%E0%A7%87-%E0%A6%9C%E0%A7%87%E0%A6%B2%E0%A6%BE%E0%A6%B0-%E0%A6%95%E0%A7%83%E0%A6%B7%E0%A6%BF>

Figure: Landscape of industrial and natural resources in and around Nilphamari



Access to several Land Ports and LCS such as Banglabandha, Burimari, Hili etc. makes the proposed EZ fit for import/ export to India and other neighboring countries such as Nepal, Bhutan etc. Proposed EZ stands to gain significantly from the cross border trade potential and it has prospect for setting up of export oriented and warehousing/ storage based industries.

Using the agricultural resources (such as bamboo, tobacco, potato etc.) produced in this region; various pertinent industries are also fit for development in the proposed EZ. Nilphamari and Saidpur have some industrial clusters in light engineering, metal, ceramics, textile, rice mill and food processing sectors. The existing ecosystem of industries can be utilized to develop various upstream and downstream industries in the proposed EZ.

Nilphamari Sadar is predominantly based on agricultural resources. Major crops produced in this area are: bamboo, rice, paddy, potato, maize, onion, peanuts and green vegetables. Potential of rich agricultural resources in this area can be tapped by setting up related industries. Agro Processing industries can leverage the existing potential of rich agricultural resources in this region.

Cultivation of tea takes place in abundance in Panchgarh district. There are a total of 246 tea gardens, including 18 big estates, 13 medium-size and 215 small-scale gardens set up on over 1,815 acres (7.35 sq. km) of land in Tetulia and its surrounding areas. Tea Industries stand a good chance of setting up in the proposed EZ.

Basis discussion with local inhabitants and UNO officials, Saidpur has several small and cottage units related to light engineering, metal etc. Spin offs from the rail workshop have started these units at their households. By utilizing existing industrial ecosystem, light engineering and metal based industries may be beneficial for setting up in the proposed EZ.

8.3. Reconfirmation of the proposed EZ

8.3.1. Location of the proposed EZ

The proposed Economic Zone site falls in Nilphamari Sadar upazilla of Nilphamari district. It is located in between Nilphamari and Saidpur. The proposed EZ is divided into two parts by Saidpur - Nilphamari road (R570) and dual gauge railway line from Saidpur to Jalpaiguri (India). Ultra EPZ is located at a distance of around 5 km towards North from the proposed EZ.

Reconfirmation of site details is presented in following table.

Table: Reconfirmation of site details

Parameters	Details
Site co-ordinates	25°48'56.62'' N - 25°50'5.7'' N & 88°51'50.67'' E - 88°52'30.31'' E
Site boundaries on East	Subarna Khuli Mouza agricultural land
Site boundaries on West	Subarna Khuli Mouza agricultural land
Site boundaries on North	Kadikhul Mouza, Subarnokhuli Mouza agricultural land
Site boundaries on South	Bothakadi Mouza, Uttara abbasan settlement
Total area of the site	357.76 Acres
Land tenure details	Government and private owned
Government land	103.06 acres
Private land	251.7 acres
Others	The land is not contiguous and divided into two parts by agricultural land
Expansion potential	Basis preliminary assessment, proposed EZ is expandable on all the four sides except south side due to the presence of settlements. The extent of area (to be expanded) need to be ascertained during feasibility stage.
Existing land use	Agriculture
Land cost (per acre)	30 Lakh BDT

Source: PwC Initial Site Assessment (Data collected from UNO office)

Mouza map of proposed site as provided by Upazila Nirbahi Officer (UNO) and Mouza map superimposed on Google map are presented in the subsequent figures.

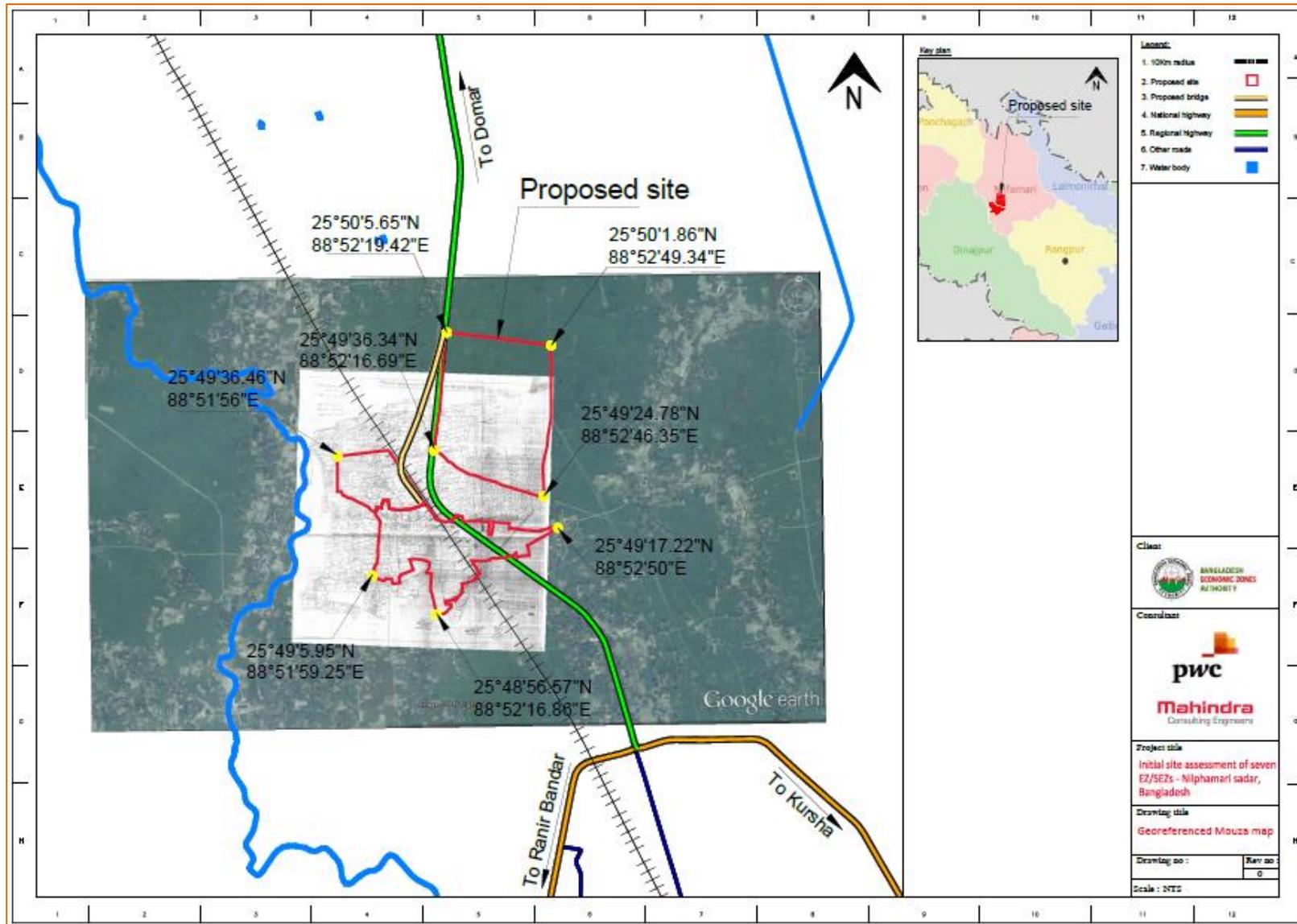
Figure showing the proposed EZ and its vicinity on GIS map is also illustrated in the subsequent pages.

Figure: Mouza Map of proposed Nilphamari EZ



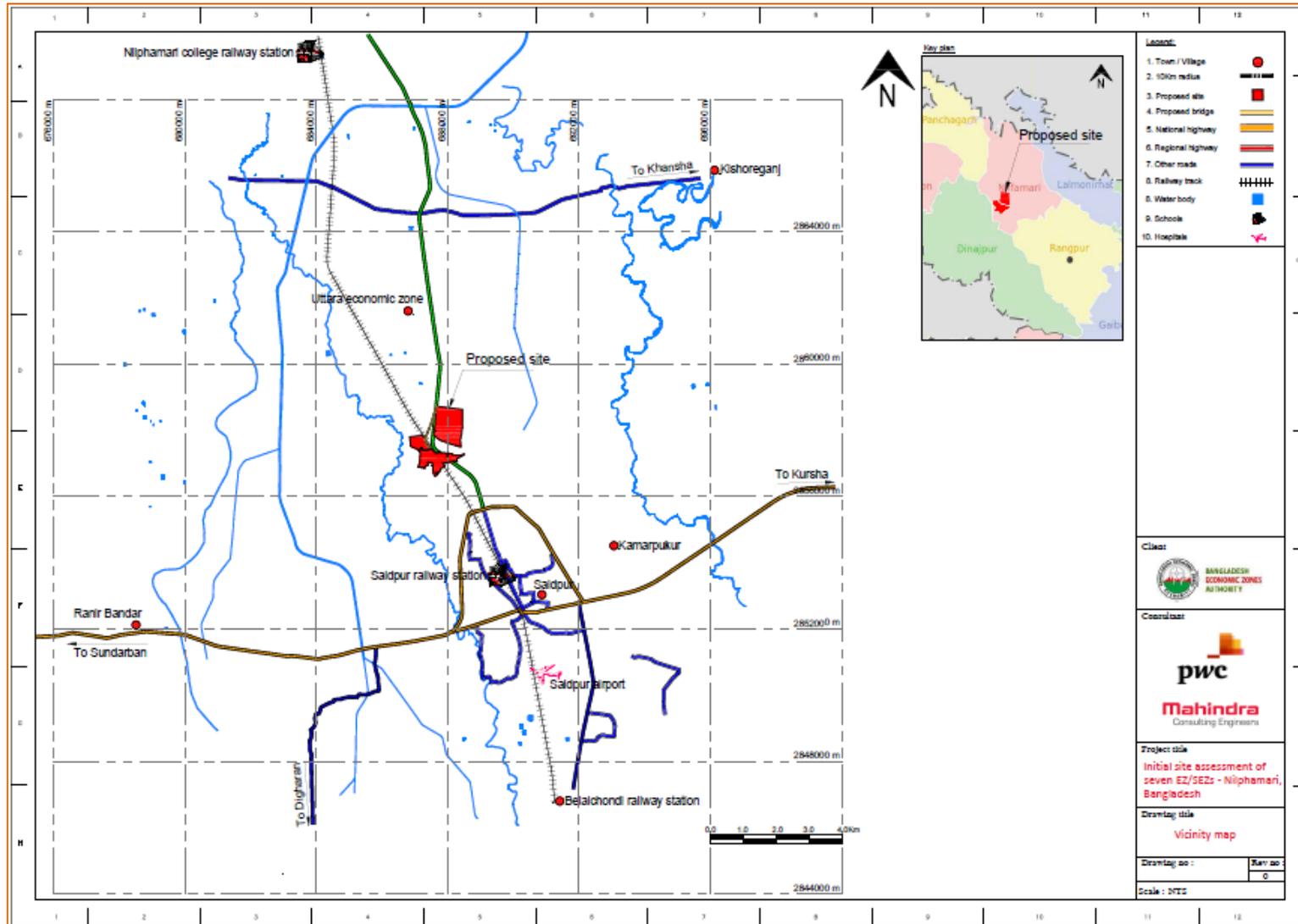
Source: UNO office

Figure: Mouza map superimposed on google map (Nilphamari)



Following figure shows the location of the proposed EZ and its vicinity.

Figure: Location of the proposed EZ



8.3.2. Land use / land cover

The land use pattern of the proposed EZ area falls under agriculture zone of Nilphamari Sadar upzilla. It was observed during site visit that maximum of 2 crops is being cultivated on the proposed EZ land. The types of crops shall include rice, garlic and vegetables. Existing land use pattern for 10 km radius is shown in subsequent figures.

Figure: Agricultural Landscape



8.3.3. Topography

Basis initial site assessment, it was observed that the Northern side of the land parcel of proposed EZ has a level difference of 4m with a gentle slope from North West to South East direction with minor undulations. Southern side of the land parcel of proposed EZ has a gentle slope from South East to North West with minor undulation. According to the contour variation, the depth of landfilling across the project area shall vary.

Contour maps of the proposed EZ for 5 km and 10 km radius are presented in subsequent figures.

8.3.4. Physiography

The physiography of the region surrounding proposed EZ falls in Tista river flood plain. This region stretches between the Old Himalaya Piedmont plain in the west and the right bank of Brahmaputra River (N-S flowing) in the east. An elongated outlier representing the floodplain of the ancient Tista extends up to Sherpur (Bogra district) in the south. Most of the land is shallowly flooded during monsoons. There is a shallow depression along the ghaghat river, where flooding is of medium depth. The big river courses of Tista, dharla and dudhkumar cut through the plain.

The Bangladesh physiography map is presented in Annexure C.

Figure: Existing land use pattern for 10 km radius (Nilphamari)

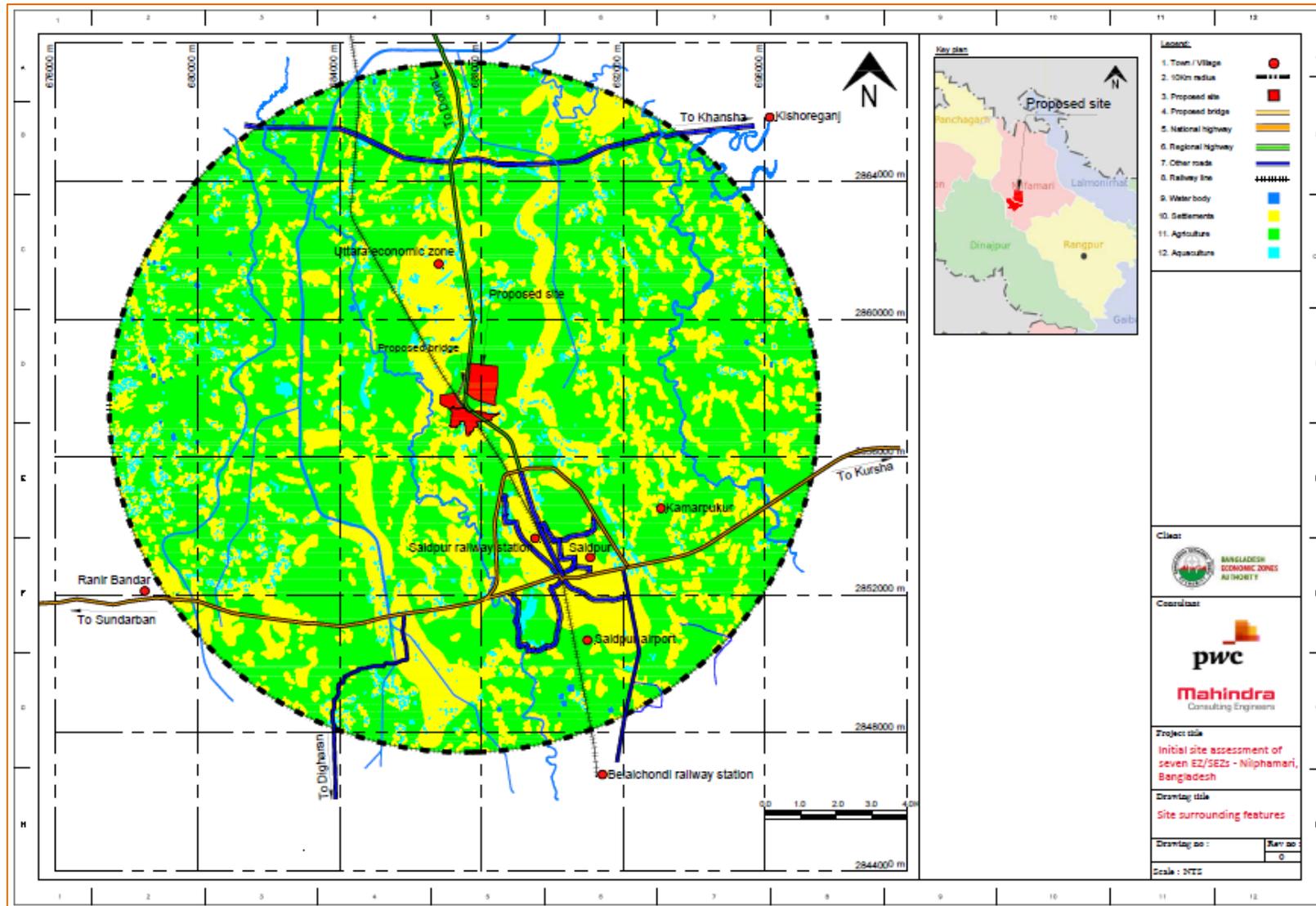


Figure: Existing land use pattern for 10 km radius (Nilphamari)-Closer View

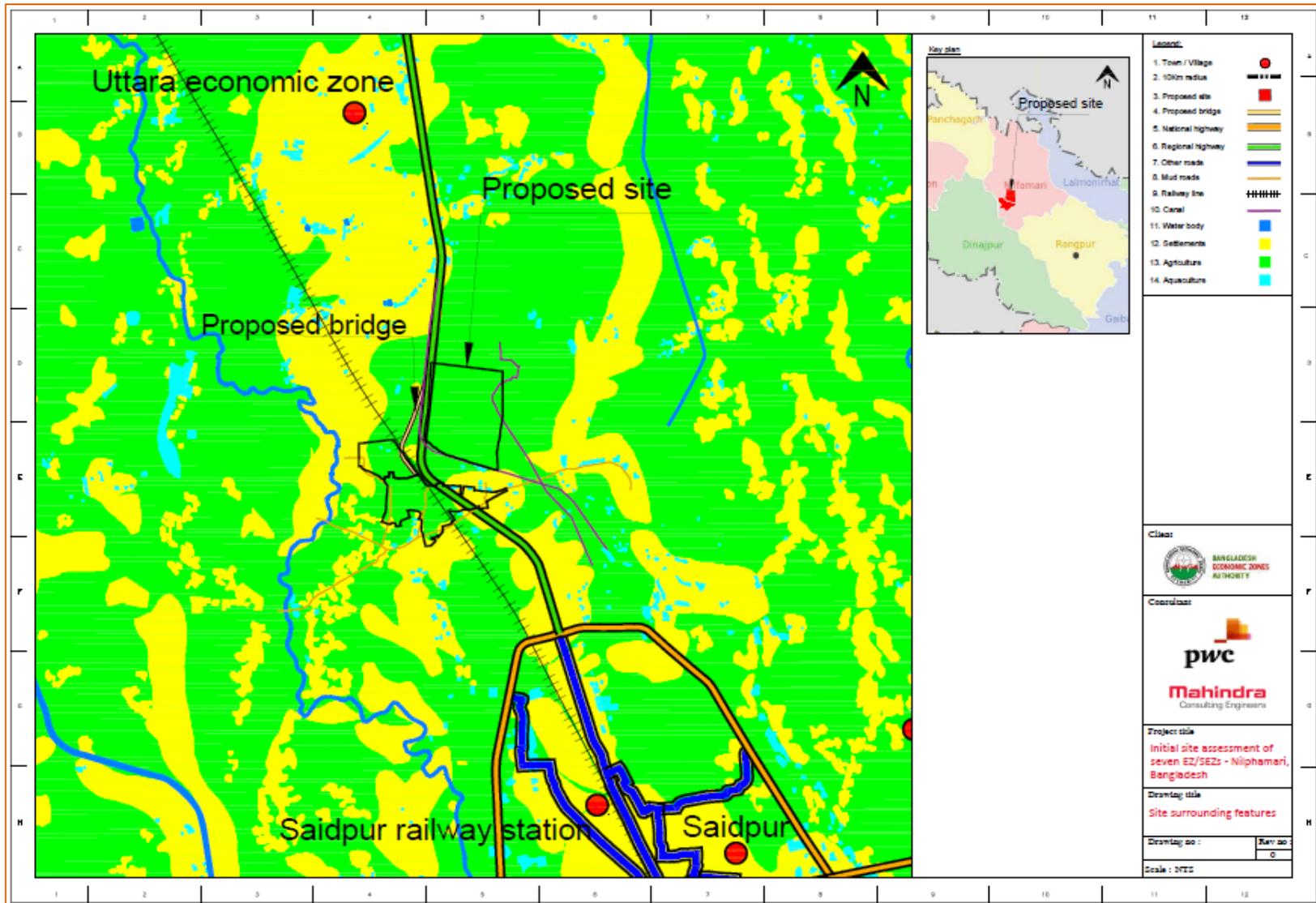


Figure: Contour map of the proposed EZ for 5 km radius (Nilphamari)

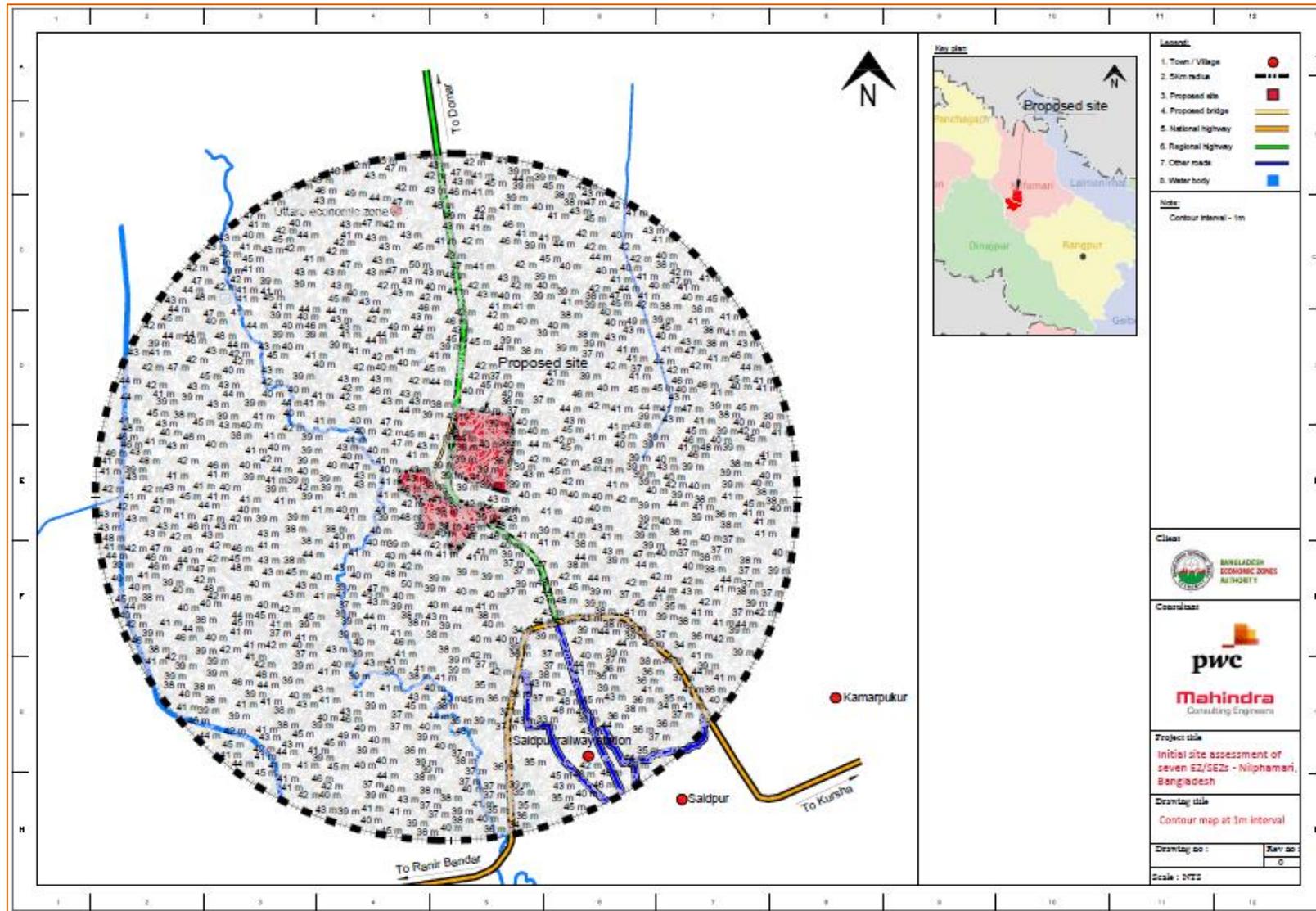
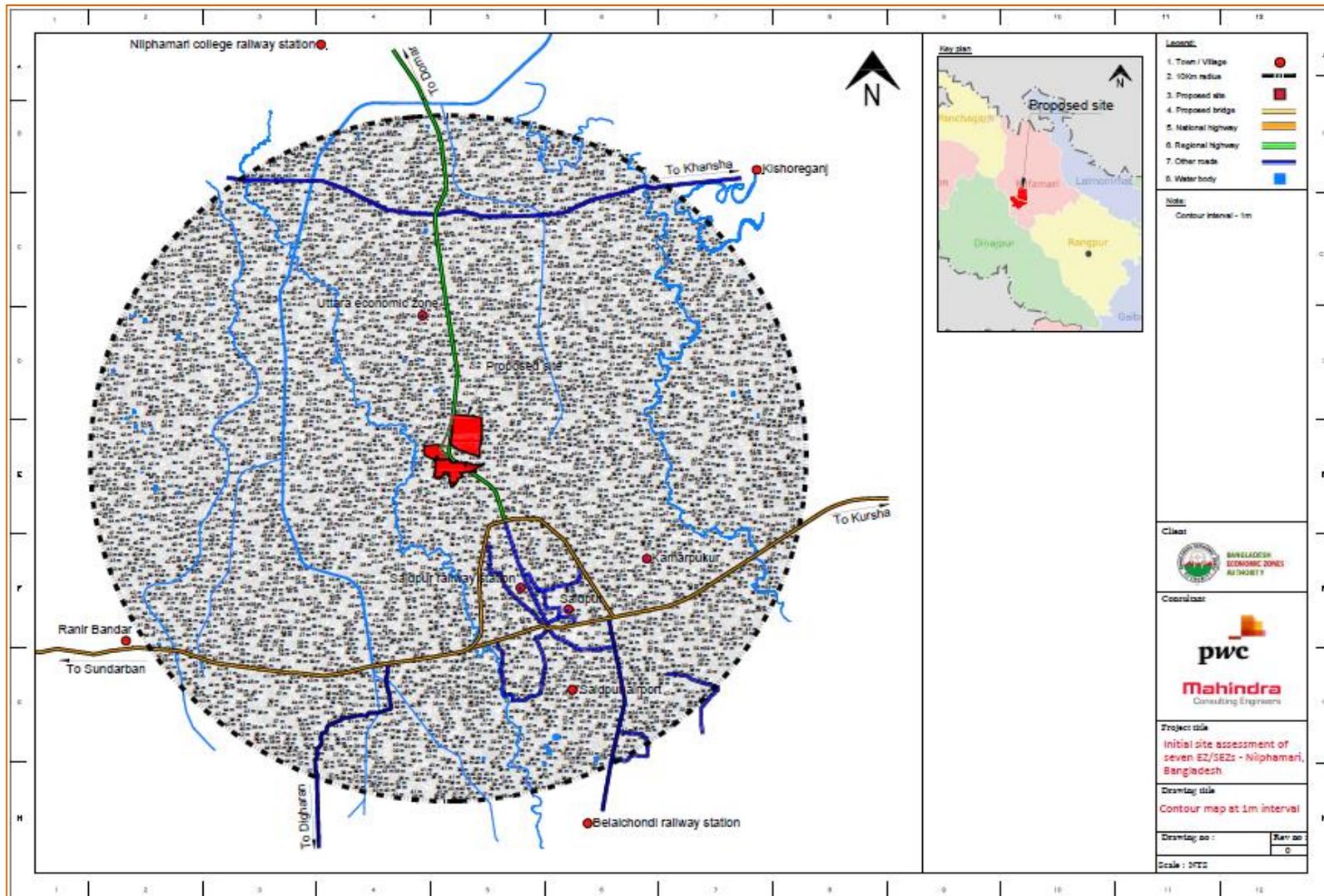


Figure: Contour map of the proposed EZ for 10 km radius (Nilphamari)



8.3.5. Soil

Basis site visit, the top soil layer was found to be mixture of clayey and black cotton soil which needs to be replaced for road construction. This soil is not suitable for laying foundation for any structure. The soil layer is acidic in character and the pH ranges from 5.0 to 6.5. The soil layer is naturally fertile and responds to the application of nitrogen and phosphatic fertilizers. Paddy, tobacco and sugar cane are the main crops which can be cultivated.

Figure: Soil type in the proposed Nilphamari EZ



8.3.6. Geology

Proposed EZ is located in the Tista River floodplain. The type of soil strata in this type of geological area is Teesta silt. It represents a sandy loam texture similar to the ordinary silt soil of Bangladesh. The soil is fertile and is well supplied with potash and phosphate though rather poor in lime. Detailed soil investigation needs to be carried out during the structural design stage.

Geological map of Bangladesh is shown in Annexure D.

8.3.7. Earthquake data

Nilphamari area falls in the Seismic Zone 2 and the earthquake coefficient is 0.15 for this zone. The area under the proposed EZ falls under the medium seismic range zone; this factor needs to be taken into account while designing the structure of the proposed EZ.

Seismic zoning map of Bangladesh is presented in Annexure E.

8.3.8. Wind speed

During winter, the northern and central areas in Bangladesh witness gentle winds blowing at relatively low speeds of 1-3 Km/hr. from the north & northwest. The detailed wind speeds need to be obtained for designing the high rise structures in the proposed EZ.

The wind speed map for Bangladesh is presented in Annexure F.

8.3.9. Cyclones and storms

Nilphamari has not witnessed any significant cyclone or storms.

8.4. Environment section

8.4.1. Air quality

Ambient air quality measurements are essential:

- to provide a description of the existing conditions,
- to provide a baseline against which changes can be measured and
- to assist in the determination of potential impacts of the proposed EZ construction on air quality conditions

During the field visit, no apparent problem with air quality was noticed. This may be due to the fact that the project area is located in a rural area and the traffic was relatively less.

8.4.2. Floods and Water Logging

Basis interaction with local inhabitants, low lying areas of Nilphamari district experience moderate flash flood during monsoon season. Preliminary site assessment reveals that the proposed EZ area is prone to water logging of 1 to 2 feet due to insufficient downstream storm drain discharge structures. Necessary filling need to be carried out for the development of proposed EZ.

8.4.3. Noise

During the field visit, no apparent problem of noise was observed in and around the proposed EZ.

8.4.4. Land filling

Basis the interaction with the UNO officials and local inhabitants, water logging varies from 1 to 2 feet depth inside the proposed EZ area. To avoid inundation during monsoon season, minimum land filling of 0.6 m above the flood level is considered.

Based on the assumption, an average depth of 3 feet to 4 feet of land filling has been envisaged for the proposed EZ area. This figure is indicative and detailed topography survey needs to be carried out to calculate the exact quantity of land filling at the project area.

8.5. Infrastructure Linkages to the Proposed Site

8.5.1. Physical Infrastructure- Availability of Utility Connection

8.5.1.1. Power Availability for the proposed EZ

33/11 KV substation (of capacity 15 MVA) is located at a distance of around 10 km from the proposed EZ. Basis discussion with Rural Electrification Board (REB) officials, around 5 MVA of surplus power is available from this substation.

Figure: 33/11 KV substation in Nilphamari



Basis discussion with REB officials, a gas turbine power plant of 20 MW capacity is located in Saidpur at a distance of around 10 km from the proposed EZ. 132/33 KV grid substation with a capacity of 1x20 MVA and 2x25/41 MVA is also available at this location.

It was also communicated to us that a new 132/33 KV grid substation of capacity 50 MVA is proposed in Jaldhaka which is located at a distance of 30km (approx.) from the proposed EZ.

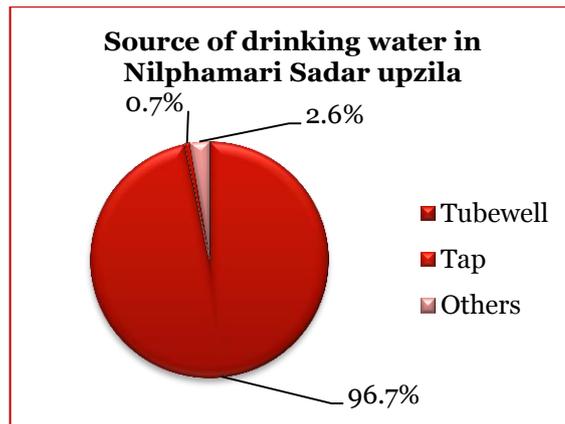
Basis working knowledge and best practices followed, power requirement in a typical EZ could be transmitted by a dedicated 33 KV line for demand up to 25 MW. If the demand is more than 25 MW, then the option of 132 KV transmission lines needs to be further explored. Proximity to 33 KV power connection and surplus power availability in the vicinity of the proposed EZ are the crucial factors to decide on the potential of power availability to the proposed EZ.

Utility Map shown at the end of section illustrates the electricity availability in and around the proposed EZ.

8.5.1.2. Water Availability for the proposed EZ

There is no existing water supply system at the proposed site. The local inhabitants are dependent on tube wells for the purpose of drinking water. The sources of drinking water in Nilphamari Sadar upzila is captured in following figure.

Figure: Sources of drinking water in Nilphamari Sadar upzila



Source: District Statistics, BBS 2011

Basis interaction with local inhabitants, the ground water is available at a depth of 500 feet (approximately) from natural ground level. Basis interaction with UNO officials, water supply system in this region is only available in Nilphamari and Saidpur (both the places are within the radius of around 10 Km of the proposed EZ). Around 5-6 bore wells are located within the proposed EZ. However, the utilization of the same could be ascertained during feasibility stage. Basis the bore well water test reports provided by the UNO Officials, the water quality parameters are well within the limits for drinking water purpose except one report.

Figure: Bore wells located within the proposed EZ



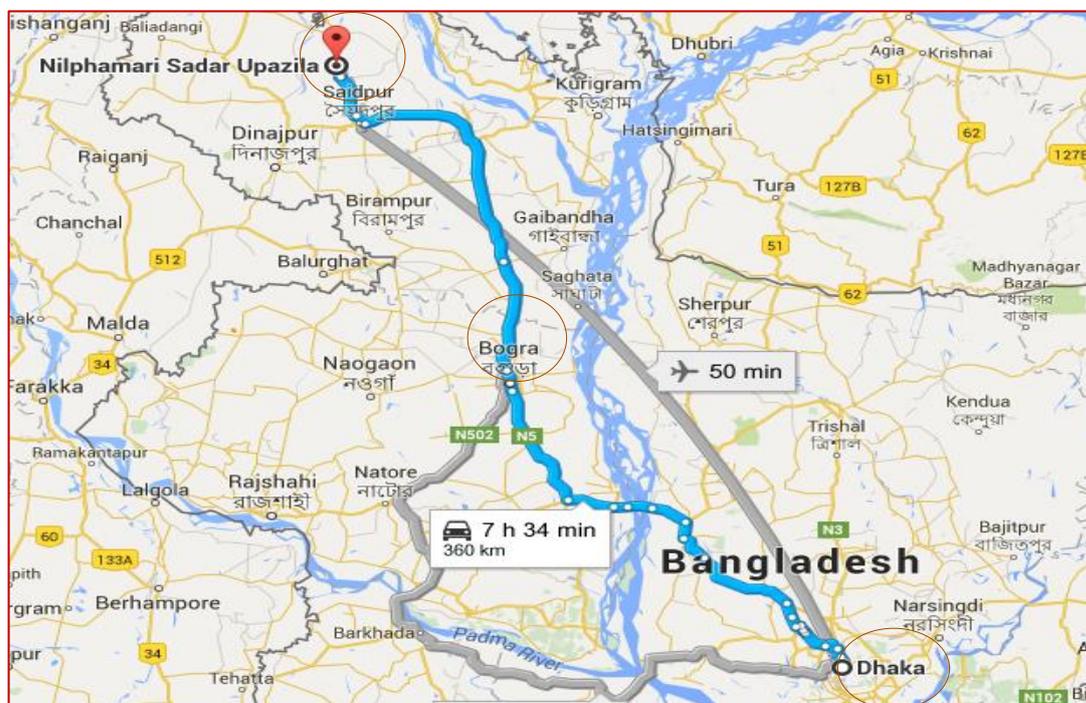
Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Nilphamari Sadar EZ is around 3.04 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could be extracted through bore wells. Extraction of more water through bore wells might result in depletion of the aquifer level. During the feasibility stage, option of extracting water from river(s) and bore well needs to be further explored.

8.5.1.3. Gas supply to the proposed EZ

Basis interaction with UNO officials, gas supply is not available in this region.

It was informed to us that Gas pipeline is laid only till Bogra, which is at a distance of 180 km (approximately) from the proposed EZ.

Figure: Location of Bogra and Nilphamari



8.5.1.4. Telecom/ Internet connectivity to the proposed EZ

Basis interaction with UNO officials, optic fiber cables are laid up to UNO Office. At present, the internet and telecom services in this region are provided by private telecom operators such as Grameen Phone, Bharti Airtel, Banglalink, Teletalk.

Industries operating in Uttra EPZ (located at a distance of around 5 km from the proposed EZ) use optical fiber cables at the speed of 2mbps. Internet connection to Uttara EPZ is provided by M/s Broad Band Telecom Service limited.

Figure: Office of M/s Broad Band Telecom Services Limited inside Uttara EPZ



Following figure illustrates the utility connections to the proposed EZ.

8.5.2. Social Infrastructure

8.5.2.1. Institutional

Nilphamari district has 50 colleges (government and non-government colleges) and 306 secondary schools (government and non-government schools). The district also has 21 technical and vocational institutions, 1 medical college and 4 agriculture and veterinary college.⁷¹

Some of the major colleges located in Nilphamari are:

- Rahman Degree College
- Mizanur Rahman Chowdhury, Agriculture College

Availability of manpower

There are 8 technical and vocational institutions located in Nilphamari Sadar upzila. Some of the Technical institutes located in the radius of 50 km (approx.) from the proposed EZ are:

- Kishoreganj Polytechnic Institute
- Rangpur Polytechnic Institute
- Dinajpur Polytechnic Institute

There are a total of 300 vocational education institutions (48 public and 252 private) in Bangladesh. Basis preliminary assessment, the unskilled/ semi-skilled and skilled/executive level manpower could be sourced from these technical institutes.

Besides, Bangladesh's biggest railway workshop is located in Saidpur and as a result of this, skilled and semi-skilled labors could be available in this region. Once the proposed EZ is developed, migration of skilled labors could take place of Saidpur. Hence, the availability of manpower for the proposed EZ could be sourced from the existing institutional ecosystem in this area.

8.5.2.2. Healthcare Facilities

Government hospital is available in Nilphamari Sadar upzila and has provision for 120 beds. Different categories of health centers are shown below.

Table: Details of healthcare facilities in Nilphamari Sadar upzila

Details	Numbers
Government health complex	1
Private hospital/ Clinic	4
Diagnostic center	5
Missionary Hospital	1

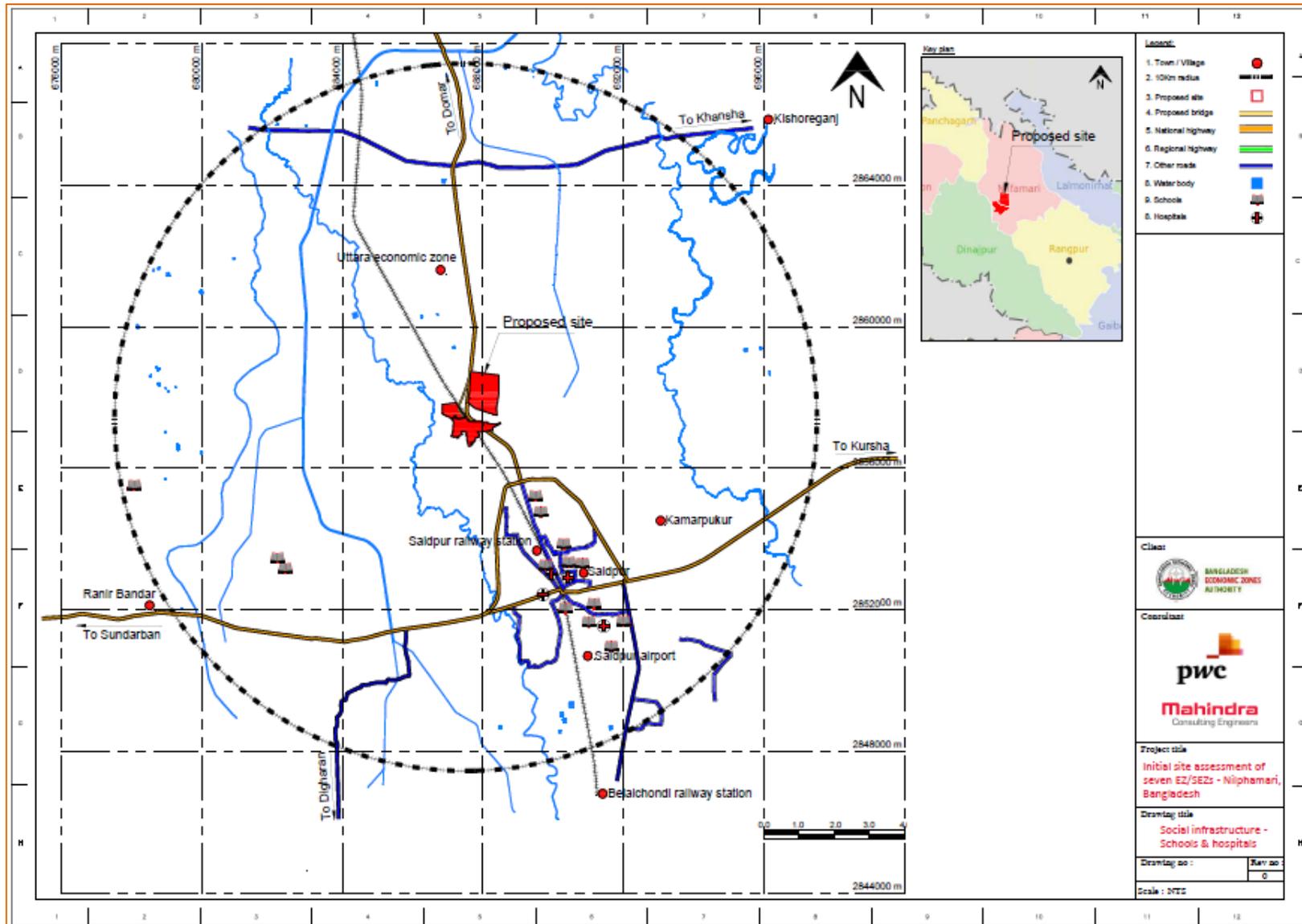
Source: District Statistics, BBS 2011

Some of the major healthcare centers available in the vicinity of the proposed EZ are:

- Jahurul Islam Medical College, Bajitpur, Kishoreganj
- Chest Diseases Hospital, Rangpur
- Leprosy Hospital, Nilphamari
- Nilphamari Sadar Hospital
- Labour Hospital, Saidpur
- Dinajpur sadar Hospital
- Northern Medical College, Rangpur etc.

⁷¹ District Statistics, 2011

Figure: Schools and Hospital located in the vicinity of the proposed Nilphamari EZ



8.5.3. Connectivity

Proposed EZ is accessible by roadway and railway from other parts of Bangladesh. Nilphamari is located at a distance of 350 km (approx.) from Dhaka and travel time is around 7-8 hours.

8.5.3.1. Road

Road Connectivity to Saidpur: Proposed EZ is abutting the regional highway Saipur-Nilphamari road (R570). It's a single lane bituminous road. Basis discussion with UNO officials, widening of this road to double lane is proposed and land acquisition is in progress. Proposed EZ is located at a distance of approximately 12 km from Nilphamari and approximately 8 km from Saidpur.

Figure: Nilphamari-Saidpur Road (R570)



Road Connectivity to Dhaka: To access the proposed EZ from Dhaka, following route needs to be taken:

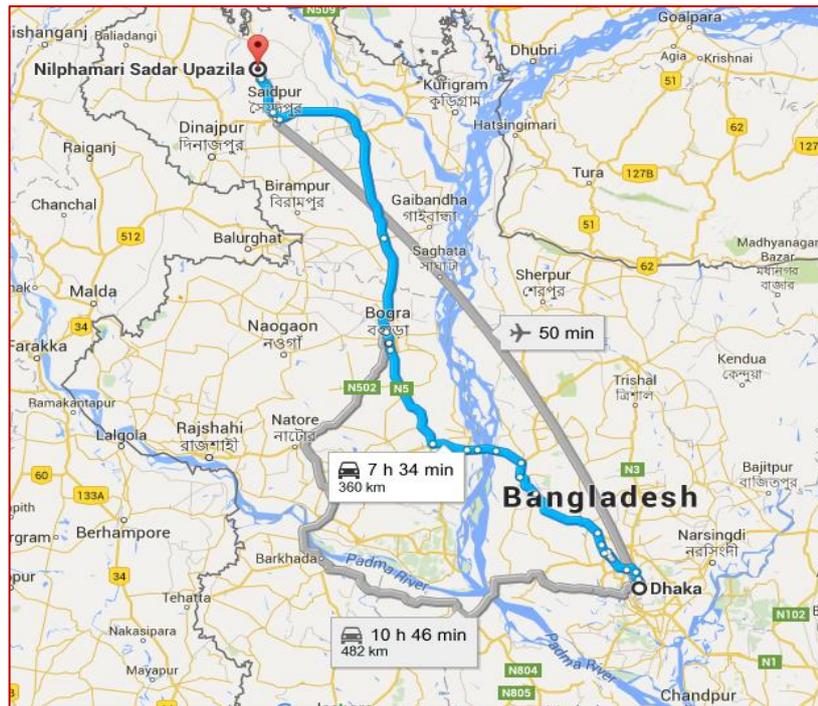
1. Dhaka to Saidpur by N5. It's a two lane bituminous road connecting Dhaka to Banglabandha on the India-Bangladesh border. National Highway 5 (N5) is a part of Asian Highway (AH2). Asian highway 2 runs through 13,177 kilometers from Denpasar (Indonesia) to Merak and Singapore to Khosravi (Iran). Following figure depicts the connectivity feature of AH2.

AH2 integrates the following countries:

- Indonesia
- Singapore
- Malaysia
- Thailand
- Myanmar
- India
- Bangladesh
- Nepal
- Pakistan
- Iran

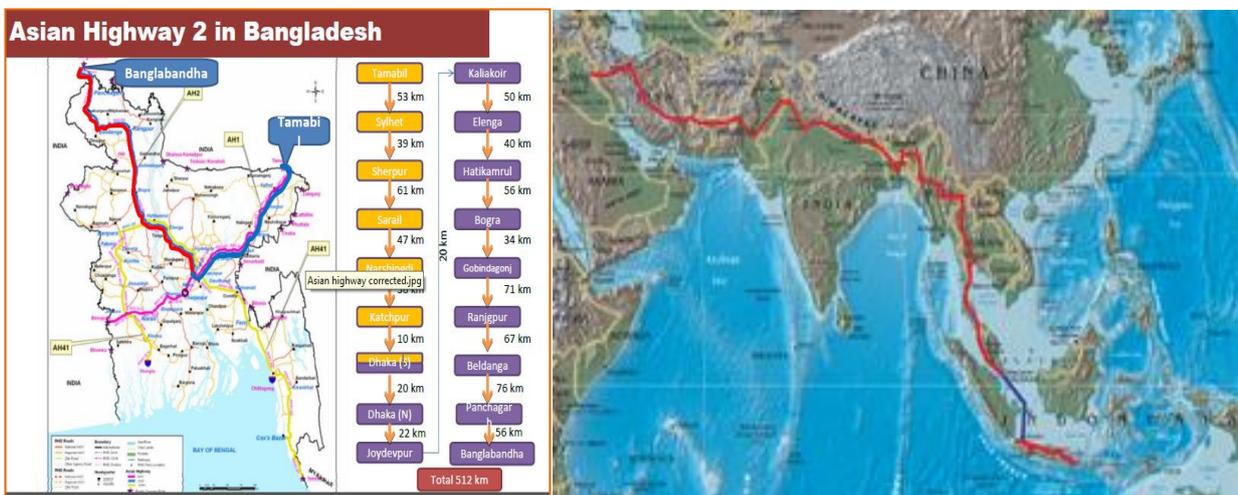
2. Saidpur to proposed EZ by Saidpur-Nilphamari Road (R570).

Figure: Access to the proposed EZ from Dhaka



Access to Asian Highway 2 facilitates cross border trade from the proposed EZ. Nine other countries are accessible from Bangladesh by AH2, which in turn would provide seamless movement of cargo to/ from the proposed EZ in Nilphamari Sadar.

Figure: Route Map of Asian Highway 2

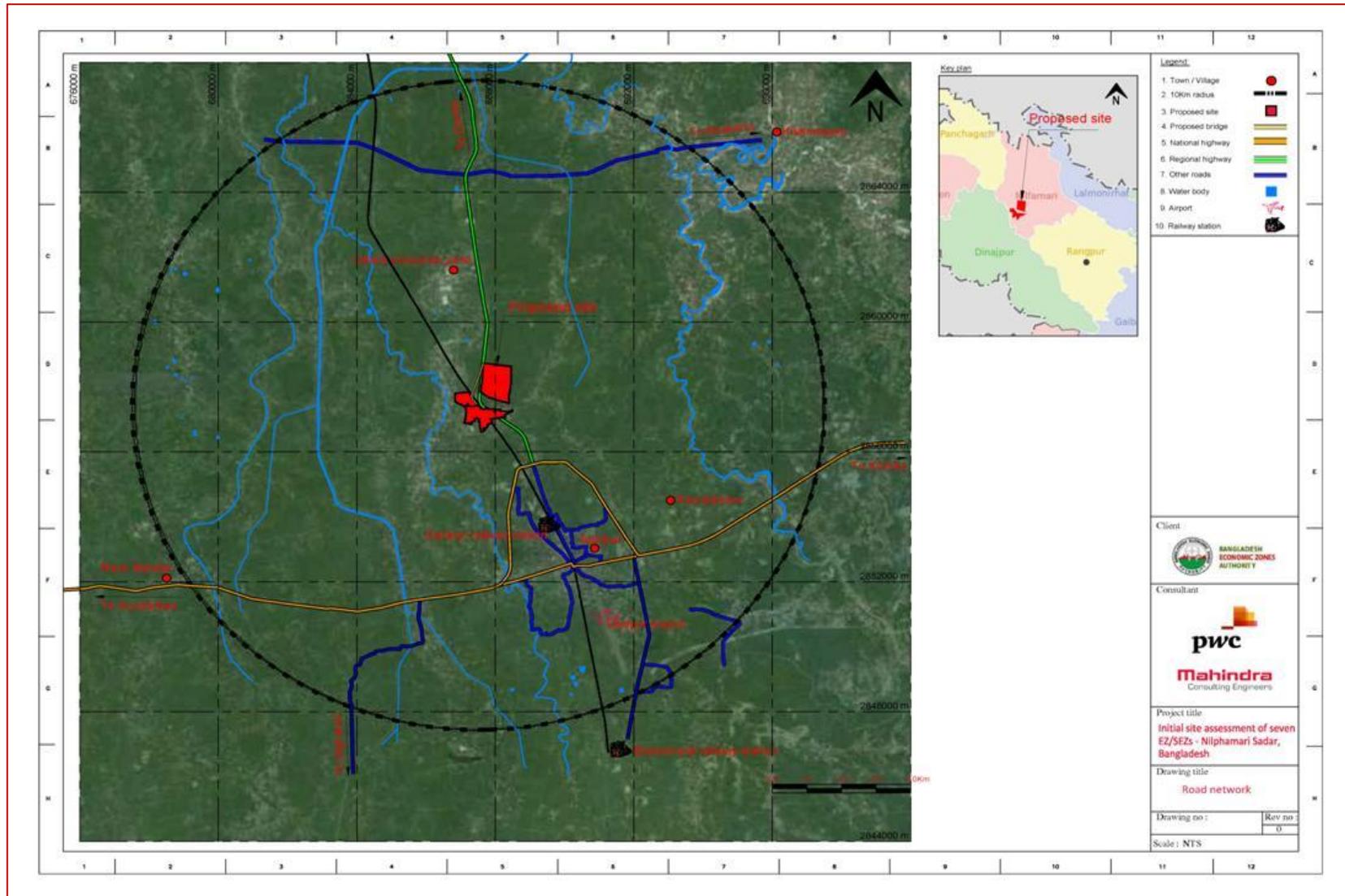


Approach Road

The Northern portion of the land is abutting R570 (Saidpur - Nilphamari road). Basis preliminary assessment, approach to this part of the land parcel could be made at suitable location based on the master planning of the proposed EZ.

Southern portion of the land parcel is abutting the railway network. Preliminary assessment suggests that the option of proposing an over bridge to connect the regional highway (R570) and southern portion of the land could be further explored.

Figure: Road Network for 10 km radius (Nilphamari)



8.6.1.1. Land Port

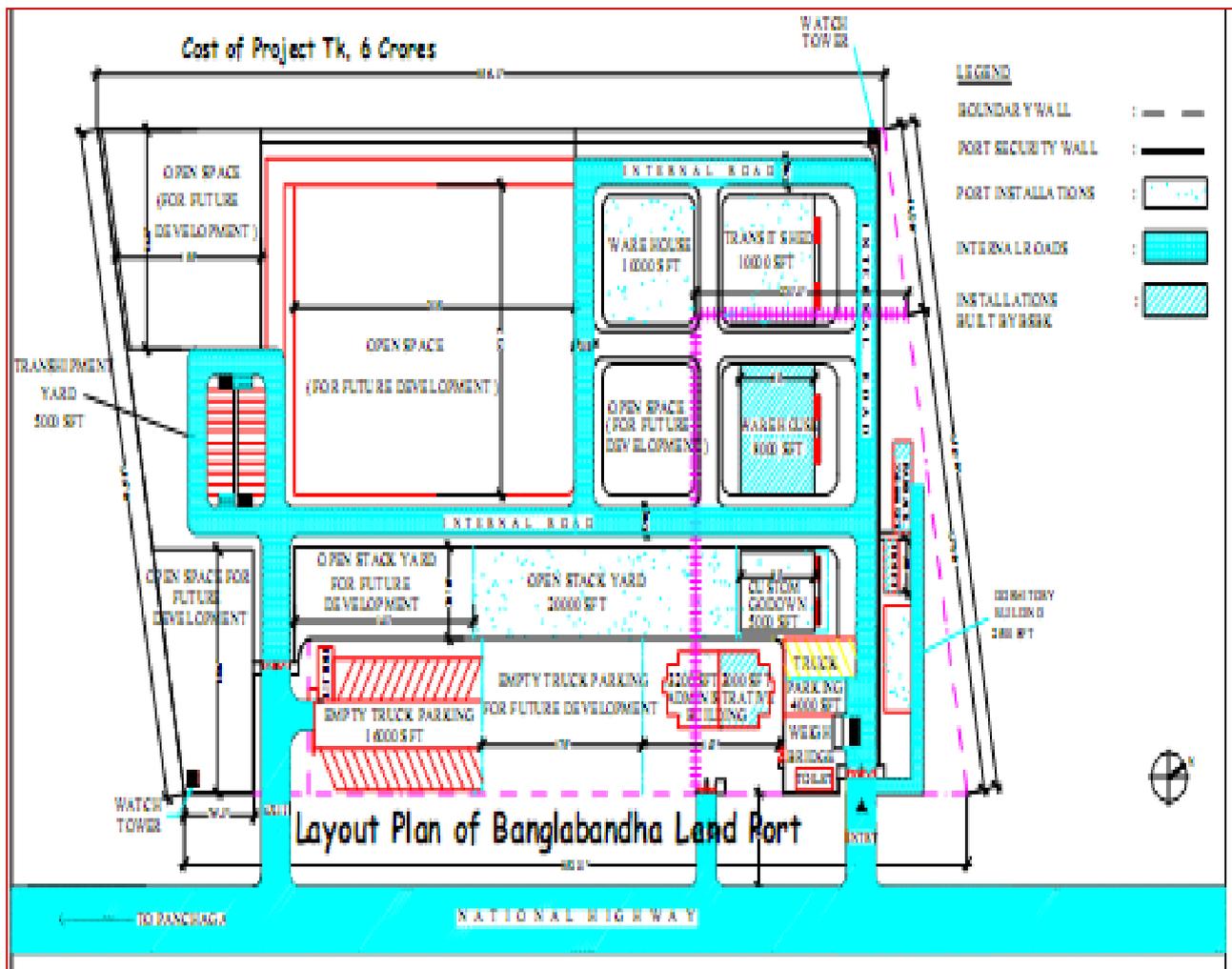
Banglabandha land port

Banglabandha land port is located at the tip of north-western Bangladesh at latitude of 26°37'46"N and longitude of 88°24'45"E. It is 114 km north of Nilphamari Sadar and 7 km from Siliguri and Jalpaiguri, in the Indian state of West Bengal.

This land port was inaugurated in May 2004 but has not been fully operational owing to the absence of a transit agreement for the use of Indian Territory as a transport route for Bangladeshi, Nepalese and Bhutanese trade cargos. In 2010, it was decided vide a joint communique issued by India and Bangladesh that both the countries would cooperate to provide Nepalese and Bhutanese cargo access to the Bangladeshi ports. The commerce secretaries of Nepal and Bangladesh also held high-level talks to form an agreement to resolve the transit issues between the two countries.

Proposed EZ is located at a distance of 125 km (approximate) from Banglabandha land port. The layout of Banglabandha land port is presented in the following figure.

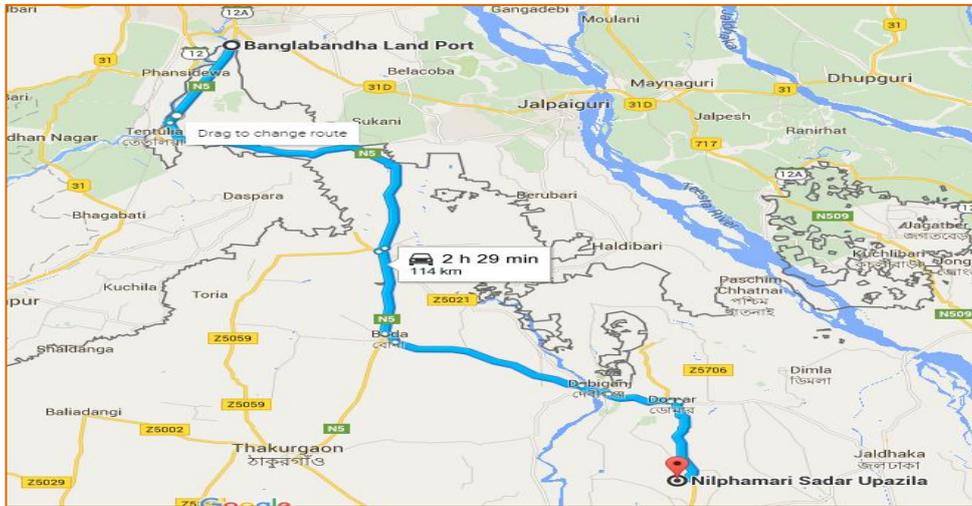
Figure: Layout of Banglabandha Port



Source: Banglabandha Port-Website

In the following figure, the location of Banglabandha Land port and Nilphamari Sadar upzilla is indicated. It takes around 2.5-3 hours to reach Banglabandha land port from the proposed EZ.

Figure: Banglabandha Land Port and Nilphamari Sadar upzilla



Source: Google map and PwC analysis

Burimari land port

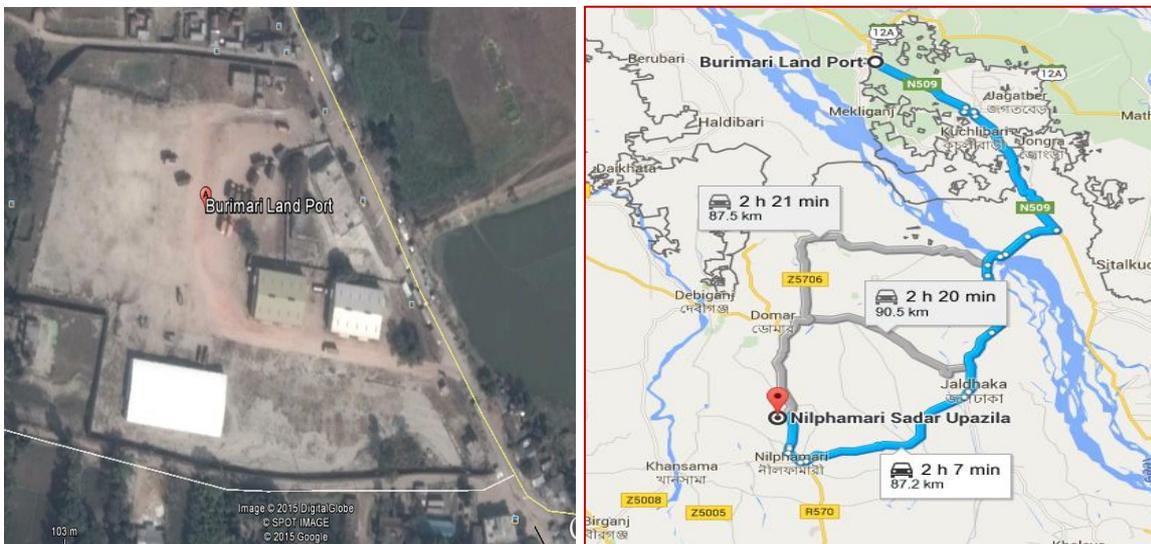
Burimari Land Port is located near Chengrabanda Border in India. Nearby Saidpur Town, Siliguri and Joypurhat Dist Town Latitude and Longitude of this port are 26°24'30"N and 88°55'21"E respectively. Proposed EZ is located about 80 km from this land port.

Some of the salient features of Burimara land port are outlined below:

- Warehouse-2 nos,
- Open stack yard-2nos,
- Transshipment yard-1no, storage capacity 2000MT,
- Weigh bridge scale-1no
- Administrative building,
- Labor shed,
- Standby power generator and
- Observation towers facilities

Following figure shows the google image of Burimari land port.

Figure: Burimari Land port google image



Hili land port

Hili land port is located at a distance of approximately 85 km from the proposed EZ. It is located in Hakimpur (Dinajpur district) of Bangladesh. On Indian side, it shares the border with South Dinajpur of west-Bengal. Salient features of Hili Land port is depicted in following table.

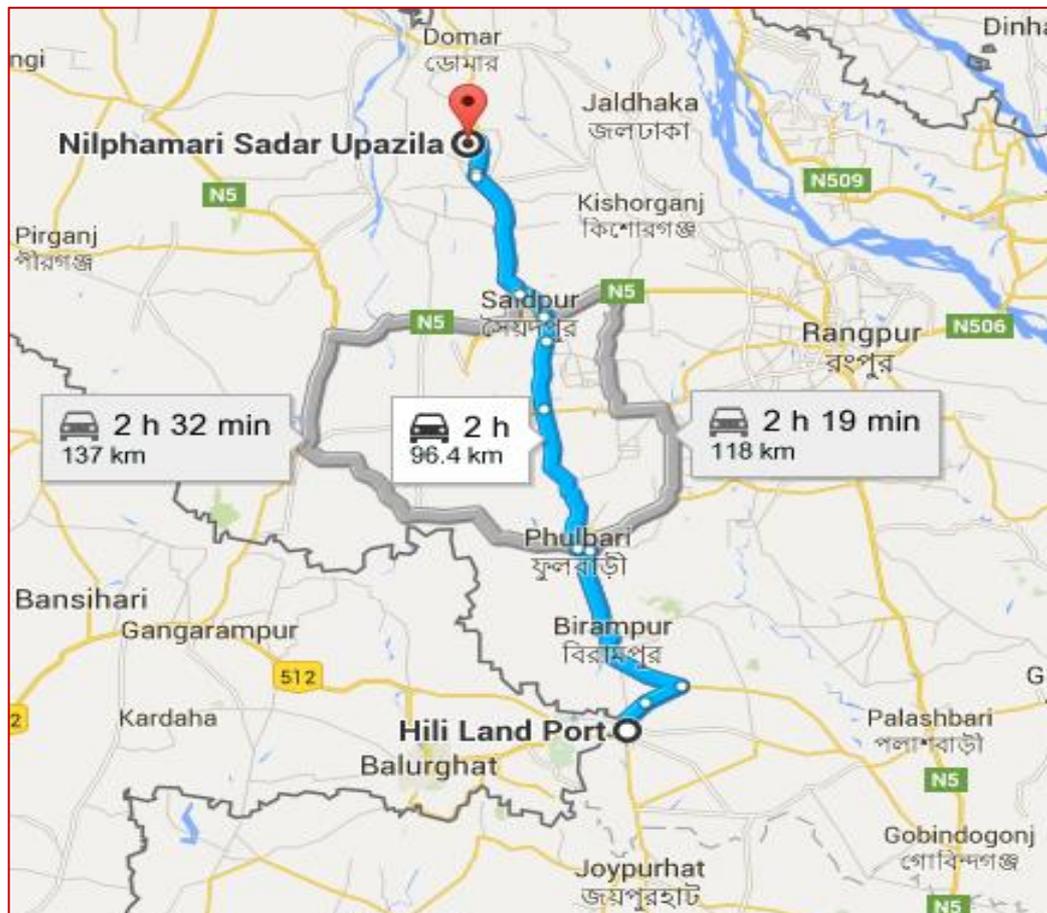
Table: Salient features of Hili Land Port

Particulars	Details
Commercial Operation Date (COD)	January 2012
Storage Capacity	2,000 MT
Land Area	10 acre
Infrastructure	Warehouse-4, Open stack yard-1, Transshipment yard-1, Truck terminal-1, Weigh bridge-1, Standby power generator, Administrative building, Standby power generator, Lighting, Security posts, Observation tower, Boundary wall etc.
Handling Capacity	1 mln MT (manual-yearly)
Goods handled	Import- 603,000 MT Export- 11,000 MT

Major commodities imported and exported from Hili land port is captured below, which indicates the market potential of commodities pertaining to cross-border trade facilitation between India and Bangladesh.

Major Imports	Rice, Wheat, Onion, Fruits, Fish, Maize etc.
Major Exports	Molases, Cement, Battery, etc.

Figure: Location of Hili land port and Nilphamari Sadar upzilla

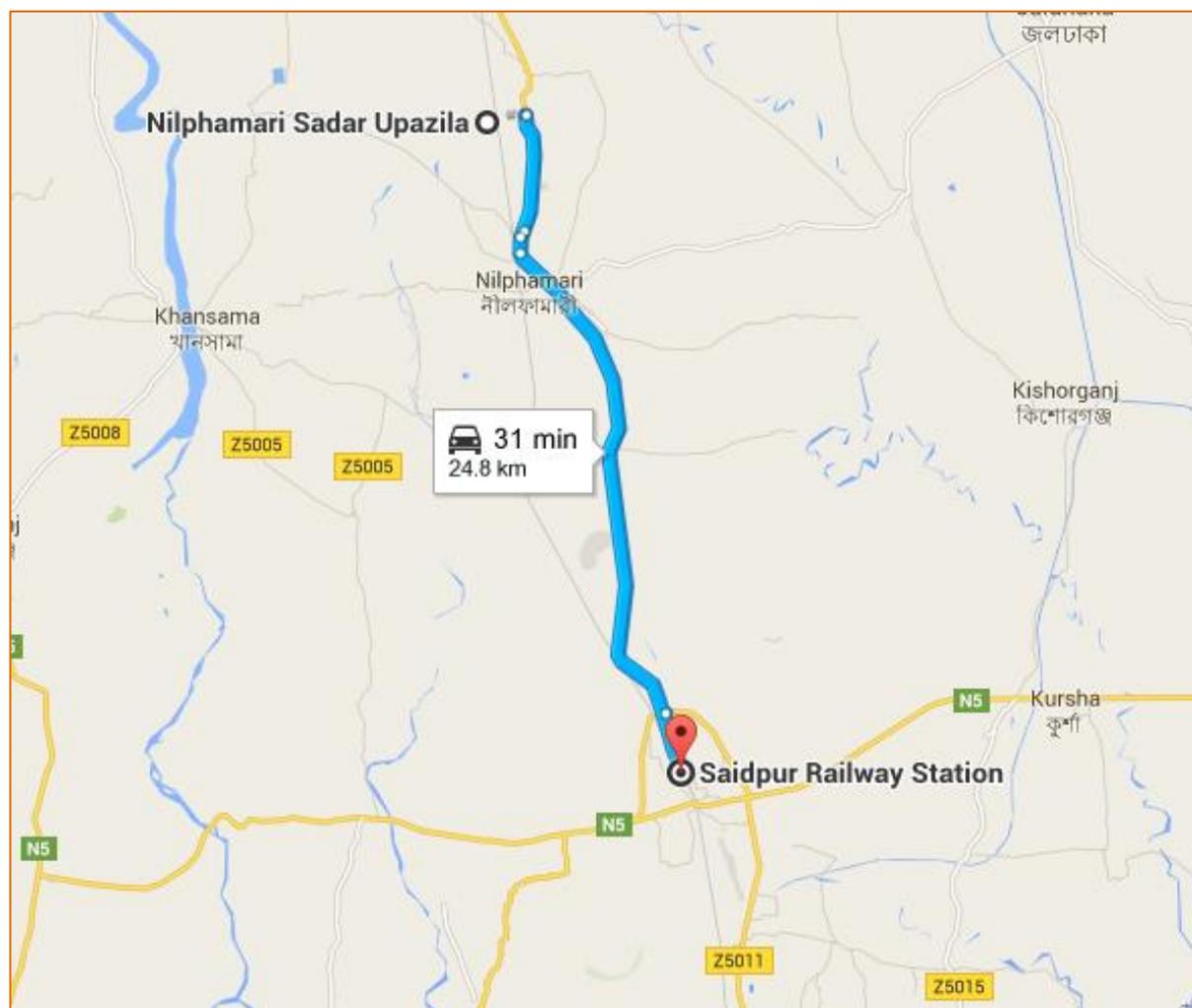


8.6.1.2. Rail

Proposed EZ is located in between two railway stations viz. Saidpur and Nilphamari. R570 connects these two rail stations. These stations are located at 10 km and 7 km respectively from the proposed site.

This section of the rail network has dual gauge from santahar junction in Bogra district to Jalpaiguri in India. Basis discussion with UNO officials, it was communicated to us that at present only one train is aiding in transportation of goods transportation from Saidpur to Dhaka. Saidpur has the biggest railway work shop at a distance of 5 km (approximate) from the proposed EZ.

Figure: Connectivity between Nilphamrai Sadar and Saidpur Railway station



During site visit, it was observed that there is a railway siding located in the Saidpur railway station. It was informed to us by the rail officials that this railway siding is not used for storage of goods.

Saidpur railway station is accessible from the proposed EZ by R570 (up to Saidpur) and then by Station Road. Following figure depicts the photograph of the last mile connectivity of the rail station. Station Road (LGED road) is a single lane bituminous road with no scope of widening as it might attract resettlement issues.

Figure: Photograph of Saidpur Rail Station

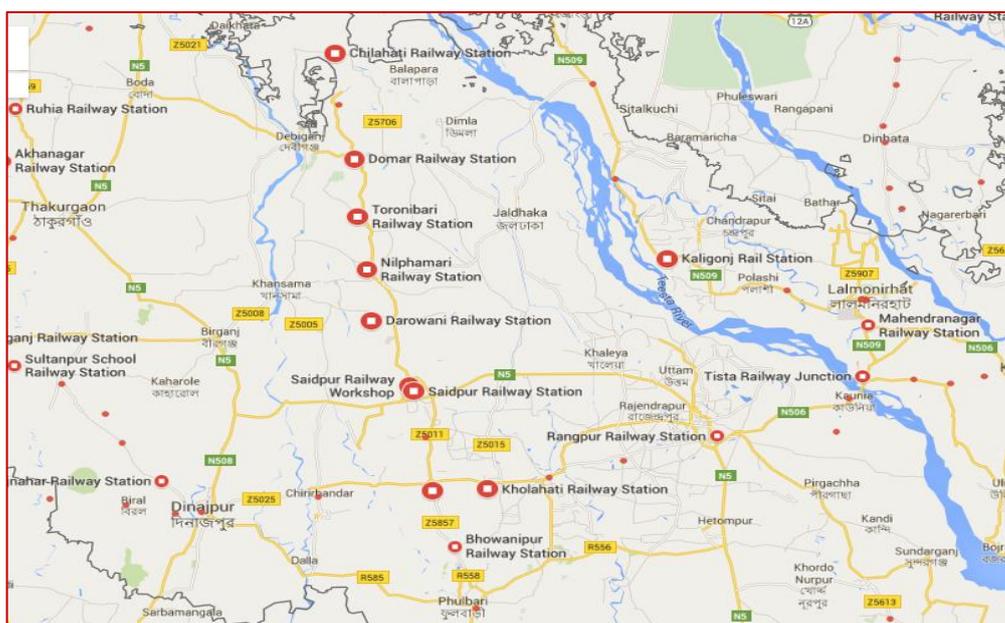


Figure: Photograph of approach to Saidpur Rail Station



Following figure depicts the major inter-station rail connectivity to Nilphamari through Saidpur station which in turn connects different places throughout Bangladesh.

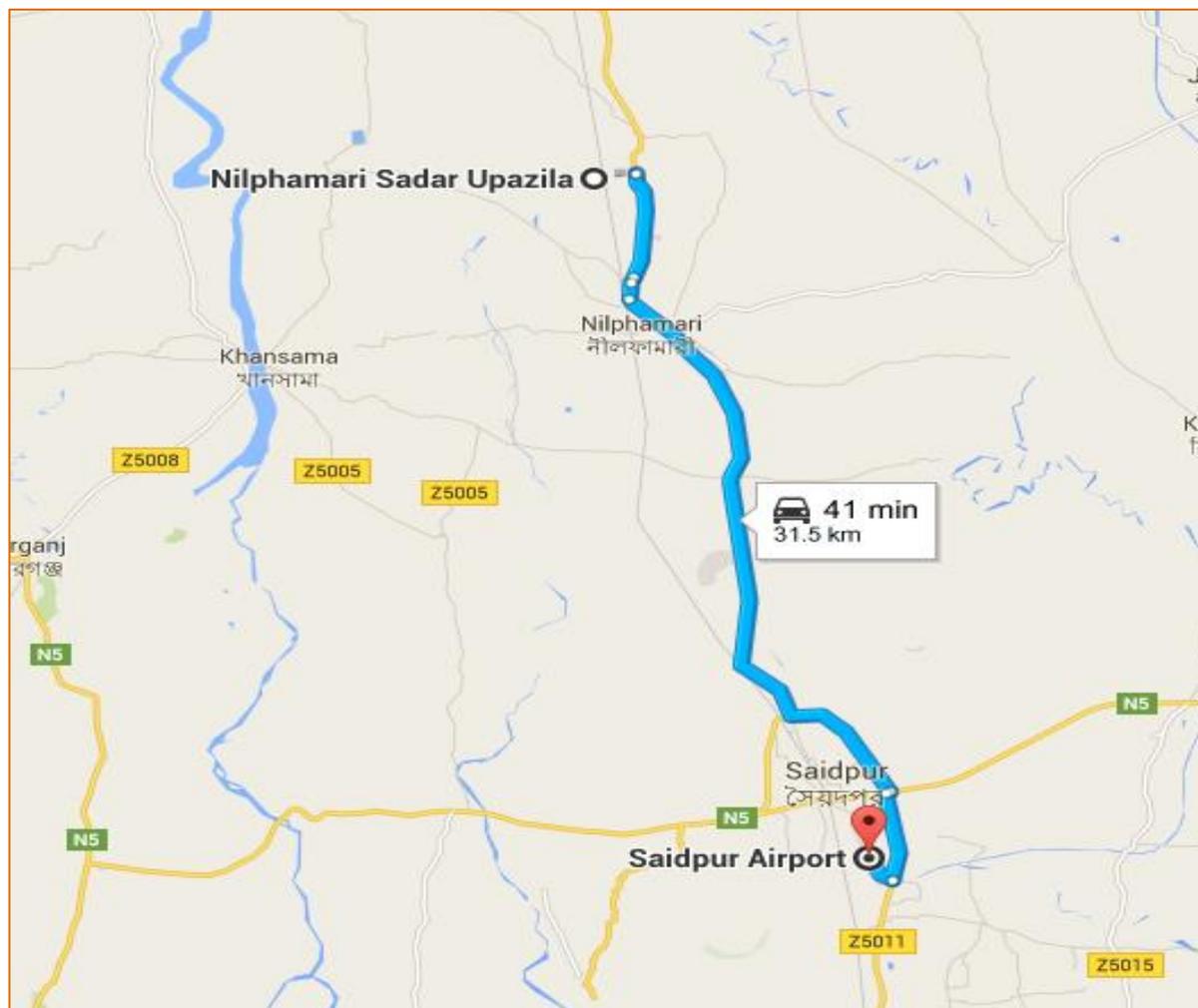
Figure: Rail Connectivity (inter station)



8.6.1.3. Airport

The proposed EZ is located about 20 km from Saidpur Domestic Airport. The travel time by road to Saidpur Airport is 0.5 hours (approximate). Access to Saidpur airport takes place from the proposed EZ via R570.

Figure: Connectivity between Saidpur airport and Nilphamari Sadar upzilla (proposed EZ)



Major airlines operating through Saidpur airport are:

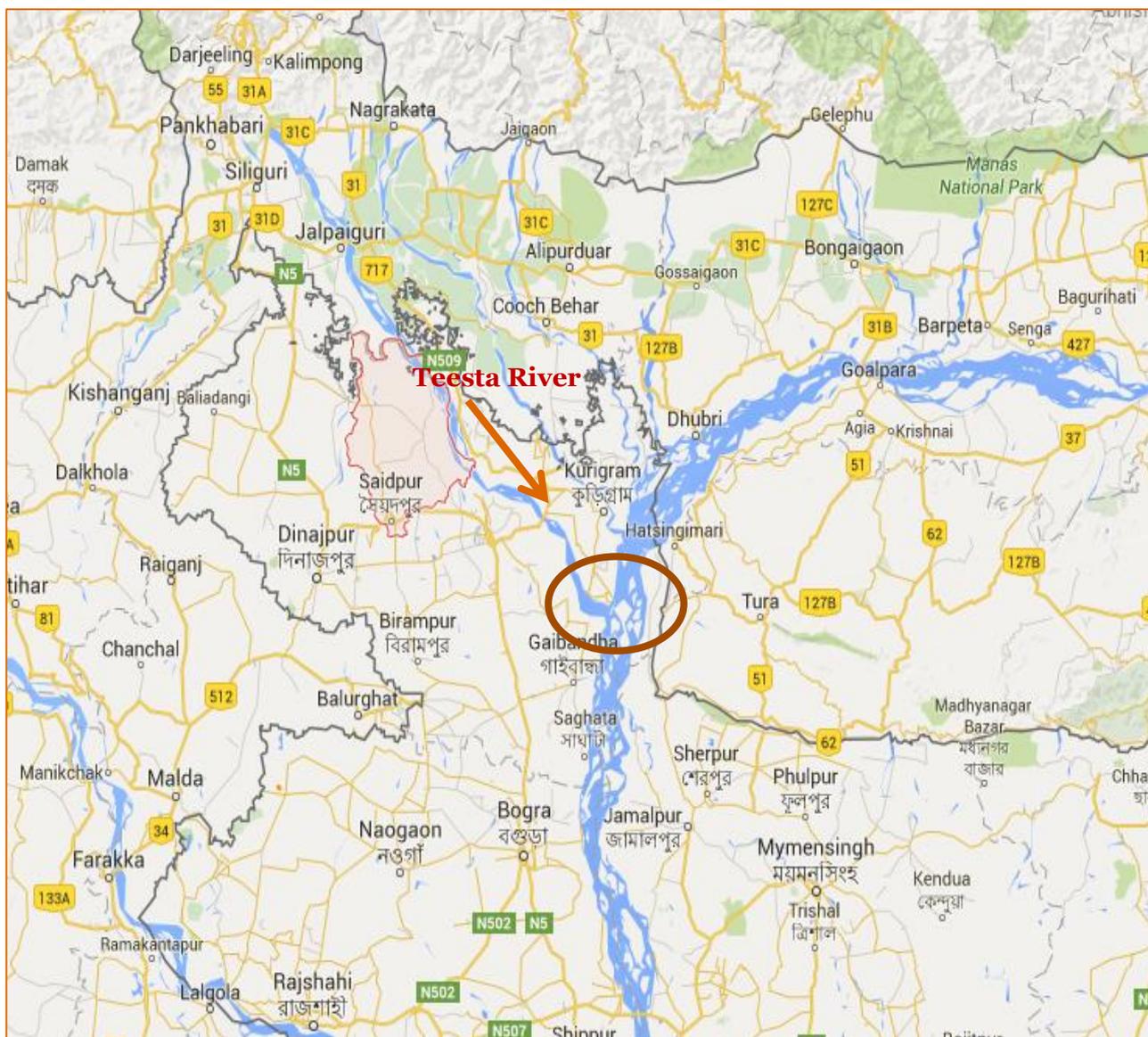
- Biman Bangladesh Airlines
- US Bangla Airlines
- United Airways (Bangladesh)

8.6.1.4. Water ways Connectivity

Proposed EZ in Nilphamari is located on the northern part of Bangladesh and it doesn't have any direct access to waterways. It is connected to other parts of Bangladesh mostly by road and rail modes of transportation. However, Nilphamari sadar upzilla is located in proximity to Teesta River, which flows from India and meets Brahmaputra River and Padma River on the downstream side.

Broad level assessment indicates that if the proposed EZ could be linked to Teesta River then cargo transfer could get access to the widespread waterways network of Bangladesh.

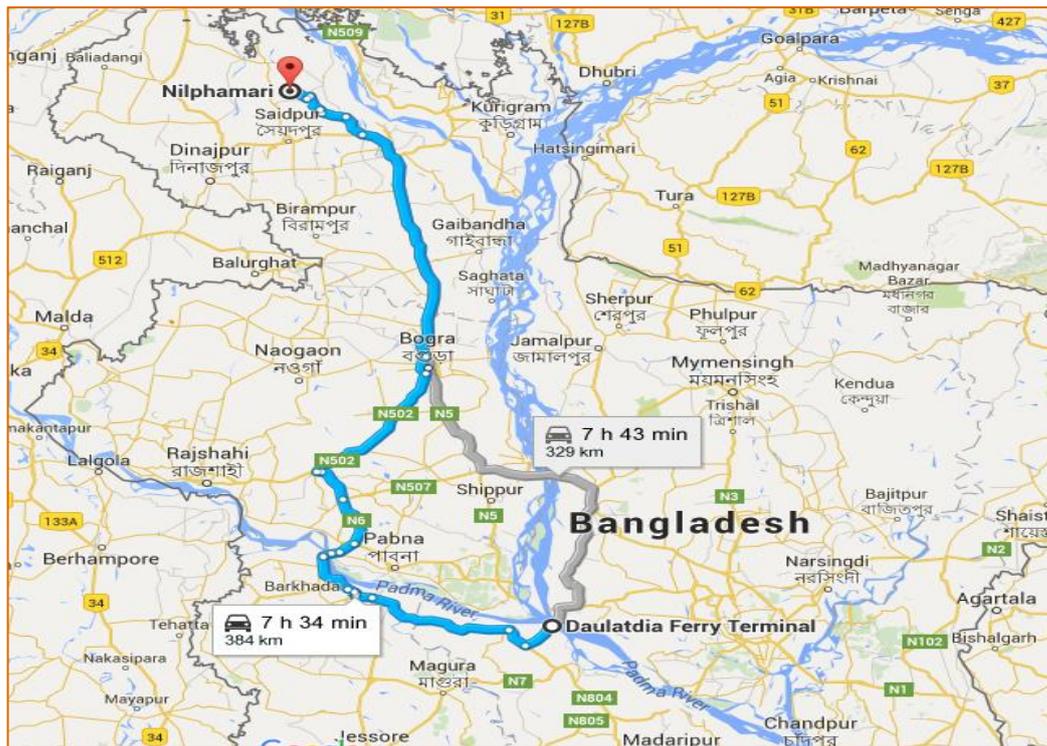
Figure: Teesta River and Brahmaputra River



However, it may be highlighted that the last mile connectivity aspect for access to Teesta River is not clear in this preliminary assessment. The road distance between Nilphamari to Teesta River is more than 50-60 km and access would take place by Zilla roads. Moreover, this access is subjected to setting up of cargo terminal in Teesta River. This decision is subjected to various key performance indicators such as draught level in the river, cargo handling capacity, storage space etc.

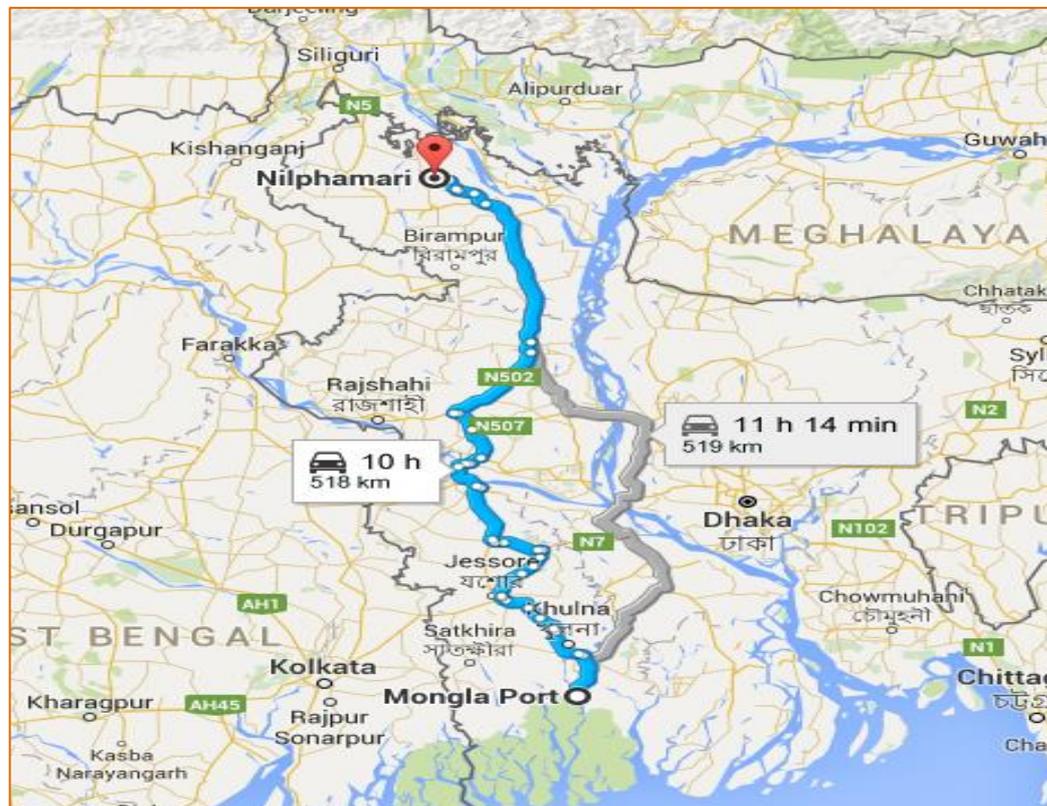
Alternate access to the waterways network of Bangladesh may also take place by road travel up to Daulatia ghat near Manikganj district. Approximate distance by road is around 380 km and travel time is 7.5-8 hours. Broad level assessment indicates that the cost of goods transport would be significantly higher and lead time would also be high.

Figure: Nilphamari to Daulatdia Ferry Terminal



Distance between Mongla port and the proposed EZ is around 520 km and travel time is around 10 hours.

Figure: Nilphamari to Mongla Port



To summarize, broad level preliminary assessment indicates that proposed EZ in Nilphamari doesn't have good access to waterways mode of transportation and thus, linking the proposed EZ by road and rail mode of transportation seems to be the best fit.

8.6.1.5. Intermodal Cargo Transfer

Basis preliminary assessment, rail and air transport offers the possibility of multimodal transport of cargo in case of this proposed EZ.

Saidpur rail station has rail siding and it has access to rail network up to Kolkata (India), and Dhaka. Saidpur rail station is located at a distance of around 10 km from the proposed EZ.

However, the last mile connectivity aspect of the rail mode of cargo transfer needs to be further evaluated as the widening of station road might attract resettlement problems.

Accordingly, from a macro level assessment, integration of rail mode of transport seems a possibility, however it is subjected to further development of cargo handling infrastructure and last mile connectivity development. Detailed feasibility analysis needs to be undertaken for the same.

Similarly, though the EZ is connected to the Saidpur airport via R570 and the travel time is only 0.5 hrs, the airport itself is domestic airport with limited infrastructure to cater cargo freight. Investment in infrastructure development and upgradation of the airport to international airport would be paramount for multi modal logistics via air mode.

8.6. Resettlement issues

8.6.1. Social impacts

The impacts have been assessed on the following parameters:

- (xix) Loss of land (for existing land owners),
- (xx) Loss of homes/structures,
- (xxi) Loss of Trees
- (xxii) Loss of livelihood systems/ income opportunity
- (xxiii) Loss of water bodies
- (xxiv) Existing bore wells within the project site
- (xxv) Electric lines crossing the project site
- (xxvi) Provision of access to the project site

The expected types of losses are described in the following sub-sections.

8.6.1.1. Loss of land

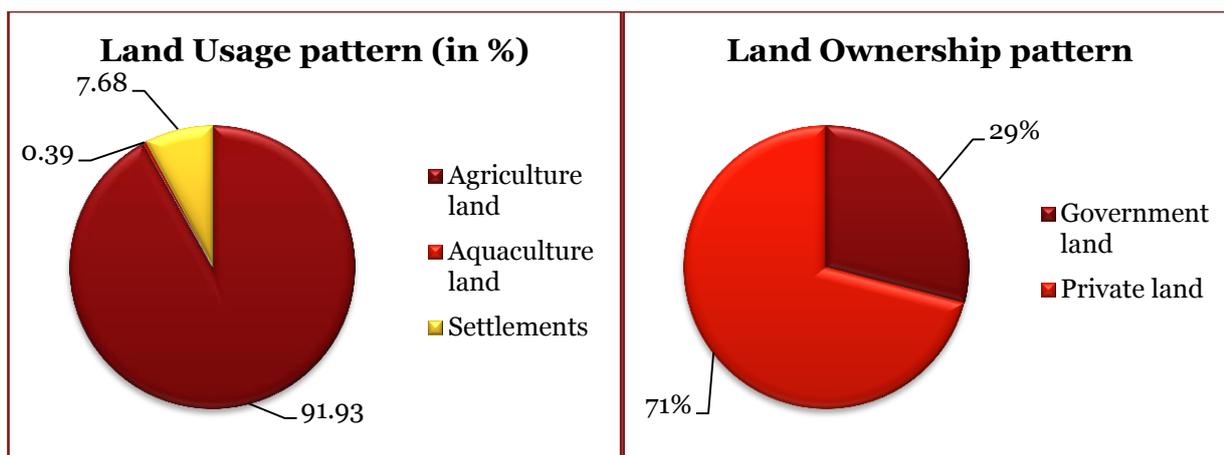
To establish the proposed EZ project, a total of 357.70 acres of land has been demarcated by the authority. It is comprised of two Mouza namely Subarnokhuli and Kadikhol which is of 62.15 acres and 295.51 acres. As per Field Measurement Book (FMB) superimposed on Google map the total area works out to approximately 380 acres. The land usage pattern for this area is as under:

- Agriculture - 329 acre
- Aquaculture-1.4 acre
- Settlements- 27.5 acre

Ownership pattern of the land is as follows:

- Government land- 103.06 acres
- Private land – 251.70 acres

Figure: Land Ownership and Usage pattern



Source: Data collected from Nilphamari Sadar UNO Office

8.6.1.2. Loss of homes/structures

Basis discussion with UNO officials, as a result of the development of this project, 150 houses and 36 Kutcha shops (approximate) will be directly affected. All affected structures are 'kutcha' structures and the average size of the structures is 200 sq. ft. approximately with a minimum and maximum size of 150 sq. ft. - 250 sq. ft. However during master planning stage, the settlement area may be excluded from the development.

Figure: Photograph of the settlements within the project area



8.6.1.3. Loss of trees

Basis initial site visit, as a result of the development of the proposed EZ, loss of trees would occur inside the project area. The master plan (during the feasibility stage) can be prepared in a way that maximum number trees could be retained and earmarked as green area. By visual observation during site visit, around 700-1000 trees are located within the project area. However, topography survey needs to be undertaken to validate this number.

Figure: Photograph of the project site



8.6.1.4. Loss of income/livelihood

As a result of the development of the proposed EZ, following local inhabitants would directly be affected and would stand a chance to lose their existing source of income:

- Local farmers
- Sharecroppers
- Yearly lease holders (of agricultural land)
- Owners of agricultural assets (deep tube-wells and shallow tube-wells etc.)

Following inhabitants would be indirectly affected as a result of the development of the project:

- Seasonal agriculture labor
- Crop traders

Figure: Agricultural activities within the project area



Basis discussion with UNO officials and local inhabitants, around 180-250 numbers of households could stand a chance to lose income as a result of the development of this project.

8.6.1.5. Loss of water bodies

Basis initial site visit, no notable water bodies exist within the project area. However, small nallahs passing through the site are located at two or three locations within the project area. During master planning stage, these small nallahs could be rerouted along the project boundary.

Figure: Canals within the project area



8.6.1.6. Existing bore wells within the project site

During site visit, it was observed that some bore wells are located within the project site. During the master planning stage, these bore wells may be retained to the maximum possible extent provided the yield of the bore wells is meeting the water requirement of the project area.

Figure: Bore wells within the project area



8.6.1.7. Electric Lines crossing the project site

During site visit, it was observed that 11 KV electrical overhead lines are crossing the project site. During master planning stage, these electric lines are to be rerouted along the project boundary.

Figure: Electric lines crossing the project site



8.6.2. Constraints and its mitigation- Resettlement aspect

The major constraints and its mitigation are presented in the following table.

Table: Major Constraints and Mitigation measures

Sl. No.	Constraints	Mitigation measures
1	Low lying land	Basis preliminary assessment, landfilling of depth 3-4 feet needs to be undertaken.
2	Loss of income/ livelihood	As a result of the development of the proposed EZ, following local inhabitants would stand a chance to lose their income. <ul style="list-style-type: none"> ➤ Local farmers ➤ Sharecroppers ➤ Yearly lease holders (of agricultural land) ➤ Owners of agricultural assets (deep tube-wells and shallow tube-wells etc.) Basis discussion with local inhabitants and UNO officials, around 180-250 households could stand a chance to lose income as a result of the development of this project.
3	Loss of trees	Trees existing within the project site may be retained and earmarked as green area during the preparation of master plan.
4	Loss of water bodies	Small nallahs/ canals crossing the project site may be removed or rerouted during master planning stage.
5	Existing bore wells	During master planning stage, the bore wells may be retained to the maximum possible extent provided the yield of the bore wells meets the water requirement.
6	Electric line crossing the project site	11 KV electrical overhead lines need to be rerouted along the project boundary during master planning stage.

8.6.3. Block Cost Estimation for development of Offsite Infrastructure

Based on preliminary assessment and available information (the schedule of rates published by the competent public authorities, prevailing market prices, in-house data bank and experience gained over similar / comparable development), the Block Cost estimate for the proposed offsite infrastructure components required for developing EZ has been calculated.

Wherever applicable, we have considered all the possible options to arrive at the cost of development and the option of maximum development cost is considered to arrive at the total cost of the proposed offsite infrastructure development. This exercise has been carried out to indicate the approximate cost to be incurred for the development of EZ and it may vary to any extent during implementation stage depending upon the detailed technical information and new developments which may affect / contribute to this EZ. The techno-commercial viability of these options needs to be explored during feasibility stage.

Following table depicts the broad level Block Cost estimates for development of Offsite infrastructure for Nilphamari EZ. The figures provided are indicative and may vary depending on the master planning, feasibility analysis and the timeline of development activities.

The broad Block Cost estimate for off-site infrastructure development for proposed Nilphamari EZ is calculated as BDT 27,828 Lakh (approx.). The rationale behind the block cost estimation is incorporated in Annexure.

Table: Block cost estimation for proposed Nilphamari EZ

Nilphamari - EZ										
S.No	Description	Option -1			Option -2			Considered cost option		
		Qty	Unit	Amount in Lakh BDT	Qty	Unit	Amount in Lakh BDT	Qty	Unit	Amount in Lakh BDT
1	Site filling	lump sum		6730	lump sum		6730	lump sum		6730
2	Compound wall	10850	Mtr	1031	10810	Mtr	1031	10810	Mtr	1031
3	Electrical (External connectivity- 33 KV LINE with 33/11 KV substation)	2.5	Km	950	2.5	Km	950	2.5	Km	950
4	RCC Bridge	1500	Mtr	18675	1500	Mtr	18675	1500	Mtr	18675
5	Water supply (Water from Bore well – 5 Nos. 8.17 MLD)				3	Km	443	3	Km	443
Total				27386			27828			27828

8.7. Voice on the Ground

8.7.1. Stakeholder consultation

Following table lists the details of stakeholders consulted at UNO office to obtain first-hand information from about the proposed EZ.

Table: Stakeholders consulted

Name	Description	Phone number
Mr. Fokrul Hasan	AC land	+8801761876810
Mr. Khordoker Md. Nahid hasan	Senior Assistant Commissioner	+8801712744094
Mr. Md. Arifuzzaman Sha	Rice business	+8801744952906
Mr. Jujid	Homeopathy medical shop	+8801737141759
Mr. Jossim		+8801797613394

8.7.2. Consultation with Private Sector

Further to the site visit for the initial assessment, private sector consultation was also carried out to understand the preliminary level demand assessment of the proposed EZ to gauge the interest of unit investors from various sectors. Some of the major aspects which were discussed with the private investors to understand their interest are as below:

- Location attractiveness
- Availability of physical infrastructure
- Availability of social infrastructure
- Ease of availability of quality manpower
- Marketability of the site
- Support required from the Government

We discussed the salient features of the proposed EZ of the proposed EZ with various investors in Bangladesh to understand how attractive this project is for them. Also, we tried to understand the macro level infrastructure requirements that any investor looks upon before making an investment decision. The results of the Private Sector consultation are summarized in the following table.

Table: Summary of the results of the Private Sector consultation

Sl. No.	Parameters	Discussions	Excerpts from the interaction (if any)
<i>Infrastructure aspects that investors take into consideration while making investment decisions:</i>			
1	Connectivity of the site	According to the investors, the EZ site should be located in the proximity of any industrial center &/or city. The connectivity by road and rail should be excellent and also the access to port is important as this will ease the conveyance of the finished goods to customers.	<i>“Nilphamari is a remote location and not easily accessible from Dhaka.”</i> -Orion Group, Bangladesh

		<p>According to the private sector investors, Nilphamari region is located in the northern part of Bangladesh and at a remote location. The connectivity of the region from Dhaka and other major cities of Bangladesh are poor and as a result of the same, industrial development haven't taken place in this area.</p>	
2	Proximity to Port	<p>Access to port is very important for development of multi-product EZs as it will facilitate easy transportation of raw materials and finished goods.</p> <p>The proposed site in Nilphamari doesn't have access to sea/ river port.</p>	<p><i>"Nilphamari site is not located in close proximity to any sea port."</i></p> <p>-A K Khan & Company Limited, Bangladesh</p>
3	Utility Connection	<p>For a multi-product EZ to function and for manufacturing units to effectively continue production, uninterrupted power supply is very important.</p> <p>Gas connection is not available in this region. According to the investors, heavy industries (which are largely dependent on the gas supply) might not be feasible for set up in this area. Also, access to gas is very important for functioning of power plants to ensure adequate power supply to the proposed EZ.</p>	<p><i>"This region doesn't have access to gas and as a result of the same heavy industries might find it difficult to set up in this EZ."</i></p> <p>-Orion Group, Bangladesh</p>
Marketability of proposed Nilphamari EZ:			
4	Location of the site	<p>According to the investors, this geographical region hasn't witnessed any industrial proliferation and it is located far away from Dhaka.</p> <p>Investors also expressed opinion that the proposed EZ doesn't have easy access to sea/ river ports. However, this EZ is located near to India-Bangladesh border and it would facilitate seamless import/export to/ from India.</p>	<p><i>"This area is located close to India and cross border trade is a good possibility."</i></p> <p>-A K Khan & Company Limited, Bangladesh</p> <p><i>"It's not a very attractive location for textile industries as there is no ecosystem in place."</i></p> <p>-NASSA Group Bangladesh</p>
5	Demand among local and foreign investors	<p>Investors and developers expressed concern that this location is near to</p>	<p><i>"Foreign investors might get interested for this</i></p>

		<p>India-Bangladesh border and as a result of same, cross-border trade to India seems a possibility. However, due to the remoteness and lack of adequate infrastructure, investors have opined that local unit investors might not be interested in the proposed EZ.</p>	<p><i>location.”</i> -Orion Group, Bangladesh</p> <p><i>“Local investors prefer areas close to Dhaka and Chittagong.”</i> -A K Khan and Company Limited, Bangladesh</p>
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8.8. Overall Adequacy of the EZ Site in Nilphamari

Evaluation of the proposed EZs with respect to key parameters required to establish multi product economic zones are presented in the following table.

Table: Overall Adequacy of the Nilphamari EZ Site

Sl. No.	Parameters	Illustration of the present facilities	Remarks/ Analysis
A	Connectivity		
1 (A)	Road Connectivity Existing Road Connectivity to Dhaka and other major cities of Bangladesh	<ul style="list-style-type: none"> ➤ Project site is connected to Saidpur (approximate 20 km away) by Saidpur-Nilphamari Road (R570). It's a single lane bituminous road and widening is proposed. However there are resettlement issues at certain stretches of this road ➤ Proposed EZ in Nilphamari is located at a distance of 350 km (approximate) from Dhaka and travel time is around 7-8 hours. ➤ R570 and N5 provide access to Dhaka. N5 is a two-lane bituminous road and road condition is favorable for passage of heavy vehicles. ➤ N5 is a part of Asian Highway (AH2). Asian highway 2 runs through 13,177 kilometers from Denpasar (Indonesia) to Merak and Singapore to Khosravi (Iran). ➤ BBIN group of countries (Bangladesh, Bhutan, India and Nepal), signed a sub-regional Motor Vehicles Agreement (MVA) with the objective of enabling movement of cargo across their borders. ➤ MVA would provide access for local products to neighboring markets (India, Bhutan and Nepal). 	<p>For any Multiproduct EZ to develop the site must be near to the main city and the connectivity via road should be excellent.</p> <p>Proposed EZ in Nilphamari is connected to Asian Highway-2 and Dhaka city. This would enable seamless movement of cargo to/ from industrial hubs located in and around Dhaka division.</p> <p>Access to AH-2 and implementation of MVA would also facilitate cross border trade and movement of cargo to the north-eastern part of India.</p>

1 (B)	Road Connectivity Last Mile Connectivity	No separate approach road is required for the northern part of the land. Rail line is located adjacent to the southern boundary of the project area and during master planning stage; a rail over bridge may be proposed to cross the railway line to reach the southern portion of the land to connect to the Saidpur – Niphamari Road (R570)	The alignment for an approach road is essential for developing a multiproduct EZ as it shall enable the access for the manpower and heavy commercial vehicles to national highways and expressways. The length of the approach road is expected to be only 40-50 m with no apparent resettlement issues.	
2	Rail Connectivity	<ul style="list-style-type: none"> ➤ Proposed EZ is located in between two railway stations viz. Saidpur and Nilphamari. R570 connects these two rail stations. ➤ These stations are located at 10 km and 7 km respectively from the proposed site. ➤ Passenger train to Dhaka runs daily from Saidpur station ➤ Saidpur railway station is accessible from the proposed EZ by R570 (up to Saidpur) and then by Station Road. ➤ Station Road (LGED road) is a single lane bituminous road with no scope of widening as it might attract resettlement issues. ➤ Rail siding is available at Saidpur station; however, this rail siding is not used for industrial/ commercial purpose. ➤ Bangladesh’s biggest rail workshop is located in Saidpur. 	Rail mode of transportation is vital for goods with high volume and timeliness of delivery. Proposed EZ has access to rail station and rail siding facility is also available. However, during site visit it was observed that widening of the approach road towards the rail station seems difficult as it might attract resettlement issues.	
3	Water Connectivity	<ul style="list-style-type: none"> ➤ Proposed EZ is located at a road distance of 590 km (approximate) from Chittagong Port. 	Proposed EZ doesn’t have access to any IWT terminal and secondary transport by road takes long time.	

4	Airport Connectivity International airport in the proximity	<ul style="list-style-type: none"> ➤ Nilphamari EZ is located about 20 km away from Saidpur Airport. Access to Saidpur airport takes place from the proposed EZ via R570. ➤ Saidpur airport is a domestic airport and air travel to Dhaka takes around 1 hour. 	For movement of goods by air cargo, proximity to airport is essential. For seamless movement of cargo by air mode of transportation, cargo handling facilities need to be developed in Saidpur airport and the airport need to be transformed to international airport	
5	Land Port Connectivity	Proposed EZ has access to three land ports in India-Bangladesh border: <ul style="list-style-type: none"> ➤ Banglabandha Land Port: It is 114 km north of Nilphamari Sadar and 7 km from Siliguri and Jalpaiguri, in the Indian state of West Bengal. Proposed EZ is located at a distance of 125 km (approximate) from Banglabandha land port. . It takes around 2.5-3 hours to reach Banglabandha land port from the proposed EZ. ➤ Burimari Land Port: Proposed EZ is located about 80 km from this land port. ➤ Hili Land Port: Hili land port is located at a distance of approximately 85 km from the proposed EZ. It is located in Hakimpur (Dinajpur district) of Bangladesh. On Indian side, it shares the border with South Dinajpur of west-Bengal. 	Access to land port is important for cross border trade facilitation. Proposed EZ in Nilphamari is connected to three land ports; this indicates the market potential for cross border trade between India and Bangladesh. However, travel to the mentioned land ports take around 3 hours of time.	
B	Utility Connections			
1	Power Availability	<ul style="list-style-type: none"> ➤ 33/11 KV substation (of capacity 15 MVA) is located at a distance of around 10 km from the proposed EZ. Around 5 MVA of surplus power is available from this substation. ➤ Gas turbine power plant of 20 MW capacity is located in Saidpur at a distance of around 10 km from the proposed EZ. 132/33 KV grid substation with a capacity of 1x20 MVA and 	24x7 uninterrupted electricity supply is a prerequisite for development of any manufacturing facility. Basis working knowledge and best practices followed, power requirement in a typical EZ could be transmitted by a dedicated 33 KV line for demand up to 25	

		<p>2x25/41 MVA is available at this location.</p> <ul style="list-style-type: none"> ➤ A new 132/33 KV grid substation of capacity 50 MVA is proposed in Jaldhaka which is located at a distance of 30km (approx.) from the proposed EZ. 	<p>MW. If the demand is more than 25 MW, then the option of 132 KV transmission lines needs to be further explored. Proximity to 33 KV power connection and surplus power availability in the vicinity of the proposed EZ are the crucial factors to decide on the potential of power availability to the proposed EZ.</p>	
2	Water Availability	<ul style="list-style-type: none"> ➤ At the project site, ground water is available at a depth of 500 feet (approximately) from natural ground level. ➤ Around 5-6 bore wells are located within the proposed EZ. However, the utilization of the same could be ascertained during feasibility stage. ➤ Basis the bore well water test reports provided by the UNO Officials, the water quality parameters are well within the limits for drinking water purpose except one report. ➤ According to best practices and working knowledge, average potable water demand of 21 cum/hectare may be considered for arriving at the approximate water requirement. Water requirement in the proposed EZ is estimated to be around 8 MLD. ➤ Basis discussion with local inhabitants and UNO officials, considering maximum yield of 1 MLD per bore well, the water requirement up to 5 MLD may be extracted through bore well for meeting the initial requirement. However, detailed feasibility analysis may be undertaken to assess the exact demand and whether the same amount may be sourced through bore well or not. 	<p>Basis preliminary assessment, certain portion of the estimated water requirement for the proposed EZ may be met from deep tube well which could be developed within the project area.</p> <p>Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Nilphamari Sadar EZ is around 3.04 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could be extracted through bore wells. Extraction of more water through bore wells might result in depletion of the aquifer level. During the feasibility stage, option of extracting water from river(s) and bore well needs to be further explored.</p>	
3	Gas Availability	<ul style="list-style-type: none"> ➤ Gas supply is not available in this region. ➤ Gas pipeline is laid only till Bogra, which is at a 	<p>Gas supply is a prerequisite for development of any manufacturing</p>	

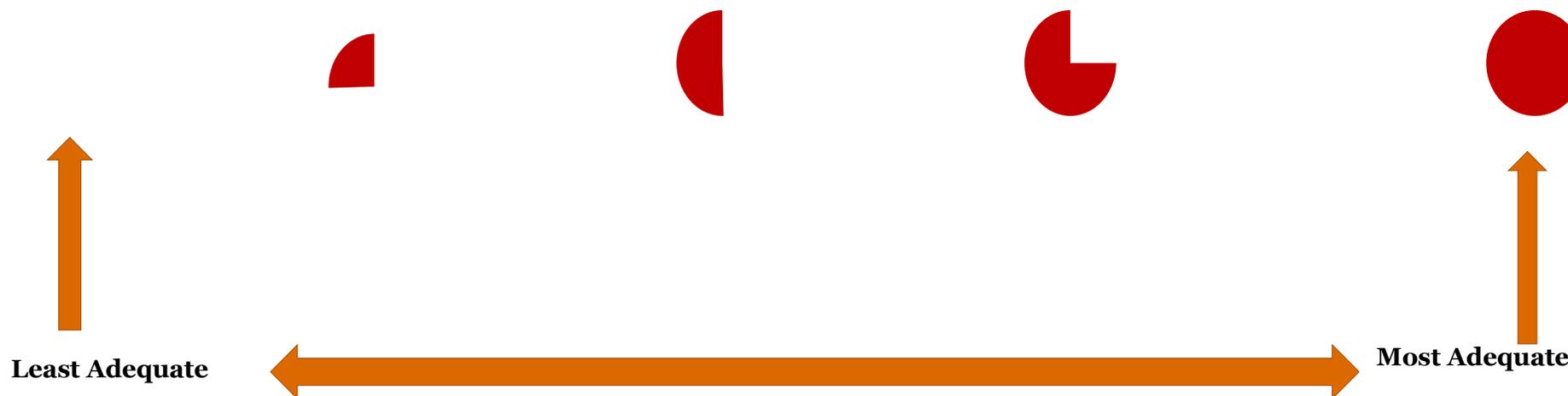
		distance of 180 km (approximately) from the proposed EZ.	facility. Lack of gas connection would discourage heavy industries from setting up facilities in the proposed EZ.	
C	Suitability for industrial development			
1	Existing industrial ecosystem and Possible Backward linkages for industries	<ul style="list-style-type: none"> ➤ About 90% of population of this district is dependent on agricultural activities. Major crops produced in this region are bamboo, rice, paddy, potato, tobacco, maize, onion, peanuts and green vegetables. ➤ Uttara EPZ is located in close proximity (within 5-6 km of distance) to the proposed EZ. Some of the existing industries inside Uttara EPZ are ceramics, sanitary ware, textile, coffin manufacturing etc. ➤ Some other industries (in small and medium scale) present in this area are: rice mill, metal, light engineering, jute mill, cold storage, plastic, food processing etc. ➤ Saidpur upzilla in Nilphamari is renowned for railways workshop. It is the biggest railway workshop in Bangladesh and several small and cottage industrial units related to light engineering, metal etc. are located in this place. ➤ In nearby Panchgarh district, tea cultivation is a predominant industry. 	Existing industrial ecosystem facilitates easy development of industries in the economic zone based on backward linkages and ease in raw material sourcing. Proximity to Saidpur and Sirajganj would enable industries (based on backward and forward integration of existing industries) to develop in the proposed EZ.	
2	Proximity to major cities	Nilphamari EZ is located in proximity to Saidpur. Dhaka is located at a distance of around 350 km from the project site.	Proximity to major cities facilitates the proliferation of industrial development. Existing industrial ecosystem provides access to raw material sourcing and skilled manpower.	
D	Challenges in developing the economic zone (Resettlement Issues and			

social aspects)				
1	Landfilling	Basis preliminary assessment, landfilling of depth 3-4 feet needs to be undertaken.	Landfilling has to be done for the entire site, which means some initial cost has to be borne before the commencement of the development works. Depth of land filling as compared to other six economic zone sites appears to be less.	
3	Other Resettlement Issues	<ul style="list-style-type: none"> ➤ Local inhabitants who would stand a chance to lose income are: local farmers, sharecroppers, yearly lease holders, owners of agricultural assets etc. ➤ Basis discussion with local inhabitants and UNO officials, around 180-250 households could stand a chance to lose income as a result of the development of this project. ➤ Trees existing within the project site may be retained and earmarked as green area during the preparation of master plan. ➤ Small nallahs/ canals crossing the project site may be removed or rerouted during master planning stage. ➤ During master planning stage, the bore wells may be retained to the maximum possible extent provided the yield of the bore wells meets the water requirement. ➤ 11 KV electrical overhead lines need to be rerouted along the project boundary during master planning stage. 	Mentioned resettlement aspects need to be considered before the development of the economic zone project.	
E	Availability of Social Infrastructure			
1	Availability of good residential facility in the nearby areas	The proposed EZ is located 20 km away from Saidpur town. Dwelling units and residential facilities are available for labours in Saidur and Nilphamari.	The labours working in the proposed EZ shall have access to the dwelling units and residential areas within close proximity to the proposed EZ.	

			To cater to the residential requirements of executive level employees in the proposed EZ, residential facilities within the EZ may be proposed during the master planning stage.	
2	Medical facilities available in the nearby areas	<p>Government hospital is available in Nilphamari Sadar upzila and has provision for 120 beds. Some of the major healthcare centers available in the vicinity of the proposed EZ are:</p> <ul style="list-style-type: none"> • Jahurul Islam Medical College, Bajitpur, Kishoreganj • Chest Diseases Hospital, Rangpur • Leprosy Hospital, Nilphamari • Nilphamari Sadar Hospital • Dinajpur sadar Hospital <p>However, for serious medical treatment, local inhabitants travel to Dhaka.</p>	There are few medical facilities available within 20 km radius of the proposed EZ to cater to the healthcare requirements of the workforce.	
3	Air and water pollution at the site (prevailing condition)	<p>The site is free from air and water pollution and no significant noise was observed when the site visit was undertaken.</p> <p>The incidence of water and air pollution at the site is insignificant. Also, the incidence of water borne diseases wasn't recorded in the locality.</p>	The location of any multi product EZ should ideally be free from air and water pollution. Pollution would lead to health hazards and non-conducive working environment for the workforce. From the initial site assessment, it appears that the site is free from all such pollution problems.	

4	Availability of manpower	<p>There are 8 technical and vocational institutions located in Nilphamari Sadar upzila. Some of the Technical institutes located in the radius of 50 km (approx.) from the proposed EZ are:</p> <ul style="list-style-type: none"> • Kishoreganj Polytechnic Institute • Rangpur Polytechnic Institute • Dinajpur Polytechnic Institute 	<p>Availability of manpower is a prerequisite in development of multiproduct economic zones.</p> <p>There are a total of 300 vocational education institutions (48 public and 252 private) in Bangladesh. Basis preliminary assessment, the unskilled/ semi-skilled and skilled/executive level manpower could be sourced from these technical institutes. Once the proposed EZ is developed, migration of skilled labors could take place of Saidpur.</p>	
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Legend:



8.9. SWOT Analysis of Nilphamari Sadar Economic Zone

Based on the detailed analysis carried out in above, SWOT analysis of the proposed EZ is depicted below:

Parameters	Strengths	Weaknesses
Last mile connectivity	No separate approach road is required for the northern part of the land.	Rail line is located adjacent to the southern boundary of the project area and during master planning stage; a rail over bridge may be proposed to cross the railway line to reach the southern portion of the land.
Water availability inside the proposed EZ	<ul style="list-style-type: none"> • Around 5-6 bore wells are located within the proposed EZ. However, the utilization of the same could be ascertained during feasibility stage. • Basis the bore well water test reports provided by the UNO Officials, the water quality parameters are well within the limits for drinking water purpose except one report. 	At the project site, ground water is available at a depth of 500 feet (approximately) from natural ground level.
Block cost of off-site infrastructure development		Block cost estimate for off-site infrastructure development is BDT 27,828 lakh. Block cost estimate for off-site infrastructure development for unit area is calculated at 77.78 BDT lakh per acre, which is fourth lowest.
Social and resettlement aspects		<ul style="list-style-type: none"> • Landfilling of around 3-4 feet is envisaged • Basis discussion with local inhabitants and UNO officials, around 180-250 households could stand a chance to lose income as a result of the development of this project. • Basis discussion with UNO officials, as a result of the development of this project, 150 houses and 36 Kutcha shops (approximate) will be directly affected. • Trees existing in the site can be retained and earmarked as green area during the preparation of master plan. • Small nallahs/ canals crossing the project site may be removed or rerouted during master planning stage. • During master planning stage, the bore wells may be retained to the maximum possible extent provided the yield of the bore wells meets the water requirement. • 11 KV electrical overhead lines

		need to be rerouted along the project boundary during master planning stage.
Cost of private land acquisition		Around 251.70 acre of private land need to be acquired which would result in a cost of BDT 7551.00 lakh. Proposed EZ stands at second highest figure for cost of land acquisition.
Parameters	Opportunities	Threats
Road connectivity	<ul style="list-style-type: none"> Project site is connected to Saidpur (approximate 20 km away) by Saidpur-Nilphamari Road (R570). It's a single lane bituminous road and widening is proposed. Proposed EZ has access to Asian Highway 2 (AH-2). Asian highway 2 runs through 13,177 kilometers from Denpasar (Indonesia) to Merak and Singapore to Khosravi (Iran). 	Proposed EZ in Nilphamari is located at a distance of 350 km (approximate) from Dhaka and travel time is around 7-8 hours.
Other facilitator for road connectivity	<ul style="list-style-type: none"> BBIN group of countries (Bangladesh, Bhutan, India and Nepal), signed a sub-regional Motor Vehicles Agreement (MVA) with the objective of enabling movement of cargo across their borders. MVA would provide access for local products to neighboring markets (India, Bhutan and Nepal). 	
Rail connectivity	<ul style="list-style-type: none"> Proposed EZ is located in between two railway stations viz. Saidpur and Nilphamari. These stations are located at 10 km and 7 km respectively from the proposed site. Saidpur railway station is accessible from the proposed EZ by R570 (up to Saidpur) and then by Station Road. Rail siding is available at Saidpur station; however, this rail siding is not used for industrial/commercial purpose. Bangladesh's biggest rail workshop is located in Saidpur. 	Station Road (LGED road) is a single lane bituminous road with no scope of widening as it might attract resettlement issues.
Waterways connectivity		Proposed EZ in Nilphamari doesn't have any direct access to waterways network. It is connected to other parts of Bangladesh by road and rail modes of transportation.
Air connectivity	Nilphamari EZ is located about 20 km away from Saidpur Airport.	Saidpur airport is a domestic airport.
Power connection	<p>Following power connections are available in the proximity of the proposed EZ:</p> <ul style="list-style-type: none"> 33/11 KV substation (of capacity 15 MVA) is located at a distance of around 10 km from the proposed EZ. Around 5 MVA of surplus 	

	<p>power is available from this substation.</p> <ul style="list-style-type: none"> Gas turbine power plant of 20 MW capacity is located in Saidpur at a distance of around 10 km from the proposed EZ. 132/33 KV grid substation with a capacity of 1x20 MVA and 2x25/41 MVA is available at this location. A new 132/33 KV grid substation of capacity 50 MVA is proposed in Jaldhaka which is located at a distance of 30km (approx.)from the proposed EZ. 	
Gas connection		<ul style="list-style-type: none"> Gas supply is not available in this region. Gas pipeline is laid only till Bogra, which is at a distance of 180 km (approximately) from the proposed EZ.
Existing industrial ecosystem and Possible Backward linkages for industries	<ul style="list-style-type: none"> This district is dependent on agricultural activities. Major crops produced in this region are bamboo, rice, paddy, potato, tobacco, maize, onion, peanuts and green vegetables. Uttara EPZ is located in close proximity (within 5-6 km of distance) to the proposed EZ. Some of the existing industries inside Uttara EPZ are ceramics, sanitary ware, textile, coffin manufacturing etc. Some other industries (in small and medium scale) present in this area are: rice mill, metal, light engineering, jute mill, cold storage, plastic, food processing etc. Saidpur upzilla in Nilphamari is renowned for railways workshop. It is the biggest railway workshop in Bangladesh and several small and cottage industrial units related to light engineering, metal etc. are located in this place. In nearby Panchgarh district, tea cultivation is a predominant industry. 	Industrial proliferation hasn't grown in Nilphamari and it is located at a remote place.
Proximity to major cities	Nilphamari EZ is located in proximity to Saidpur.	Dhaka is located at a distance of around 350 km from the project site.
Other facilitator for the industrial proliferation	<ul style="list-style-type: none"> Proposed EZ has access to Banglabandha, Burimari and Hili land port which could facilitate cross border trade with India. Proposed EZ has access to Asian Highway network, which may facilitate in seamless cargo transfer to neighboring countries Once MVA is implemented, it would facilitate transfer of cargo to 	

	neighboring countries like India, Bhutan, Nepal etc.	
Access to quality manpower	<ul style="list-style-type: none"> • There are 8 technical and vocational institutions located in Nilphamari Sadar upzila. Around 3 technical training centres are located within 50 km radius from the proposed EZ. • Proximity to Saidpur may also act as another source of quality manpower. 	
Availability of medical facilities	Government hospital is available in Nilphamari Sadar upzila and has provision for 120 beds.	However for serious medical treatment, local inhabitants need to travel to Dhaka/ Jessore.
Availability of residential facilities	The proposed EZ is located 20 km away from Saidpur town. Dwelling units and residential facilities are available for labours in Saidur and Nilphamari.	No international standard residential facilities are available in the vicinity to the proposed EZ.

Manikganj EZ

9. Manikganj Economic Zone

9.1. Location Details and Salient Features

9.1.1. General Profile of the District

Geographic Location

Manikganj is a district in the Dhaka division located in central Bangladesh and near to (approximately 80 km away) the capital city Dhaka. There are total of 17 districts under Dhaka division.

Manikganj is surrounded by:

- North- Sirajganj and Tangail Districts;
- East- Dhaka District;
- South- River Padma, Faridpur and Dhaka districts;
- West- River Jamuna, Pabna and Rajbari districts.

It lies between 23°38' and 24° 03' North latitudes and between 89°41' and 90°08' East longitudes. The district spreads over an area of about 1383.66 sq. km.⁷²

Manikganj has 7 upzilas:

- Daulatpur
- Ghior
- Harirampur
- Manikganj Sadar
- Saturaia
- Shibalaya
- Singair

The proposed EZ is located in Shibalaya upzila. Daulatpur, Ghior and Harirampur upzila are in close proximity to the proposed EZ.

Demographics

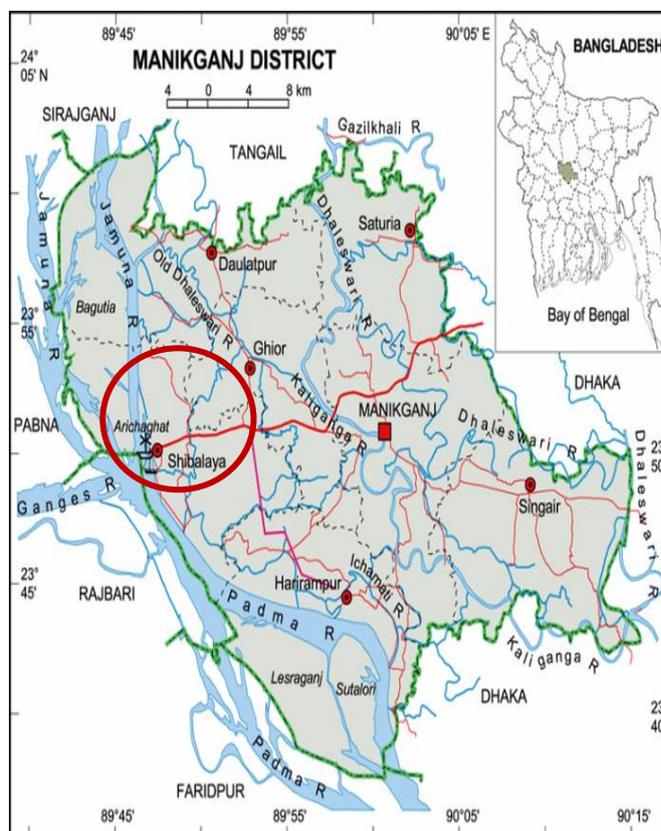
The district has overall population of 13,92,867 as per Population and Housing census 2011. The gender ratio in 2011 was 94 (no. of males per 100 females). Total numbers of households were 3,24,794 (average household size was 4.26 persons per household), and the literacy rate was 49.2%

Upzila wise population details as per census 2011 are presented in the following table.

Table: Upzila wise population details of Manikganj District

Name	Status	Population census		Growth
		2001	2011	
Manikganj	District (Zila)	1,285,080	1,392,867	8.39%
Daulatpur	Sub district (Upazila)	155,674	167,026	7.29%
Ghior		138,479	146,292	5.64%
Harirampur		171,274	139,318	-18.66%

⁷² Population and Housing Census Manik ganj District, BBS 2011



Source: Districts Website, Manikganj

Manikganj Sadar		261,662	309,413	18.25%
Saturia		155,137	171,494	10.54%
Shibalaya		154,239	171,837	11.41%
Singair		248,615	287,415	15.61%

Source: www.manikganj.gov.bd

Climate Condition

The annual average temperature of Manikganj district varies from maximum 36°C to a minimum of 12.7°C. Average annual rain fall and average relative humidity recorded in this district were 2376 mm and 74% respectively in 2011.⁷³

Agriculture

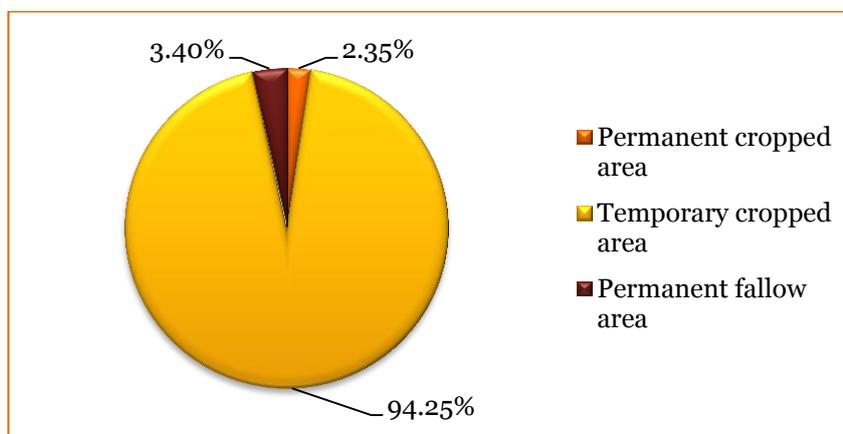
Total agriculture land in Manikganj district is 774.36 sq. km., which amounts to 56% (approx.) of the total area of the district.⁷⁴

Major agriculture crops cultivated in the district are Paddy, jute, sugarcane, wheat, tobacco, mustard, sesame, potato, ground nut, onion, chili, garlic, khesari, lentil, leguminous pulse and different type of vegetables.

Major horticulture crops in this district are Mango, jackfruit, safeda, banana, papaya, guava, coconut, palm, kamranga etc.

Major portion of the agriculture land is utilized as temporary cropped area in this district. The land use pattern of the agriculture land for the year 2008 is presented in the following figure.

Figure: Land use pattern (2008)



Source: District Statistics 2011, Manikganj, published by Bangladesh Bureau of Statistics (BBS)

Irrigation

Irrigated area classifications fall into two categories:

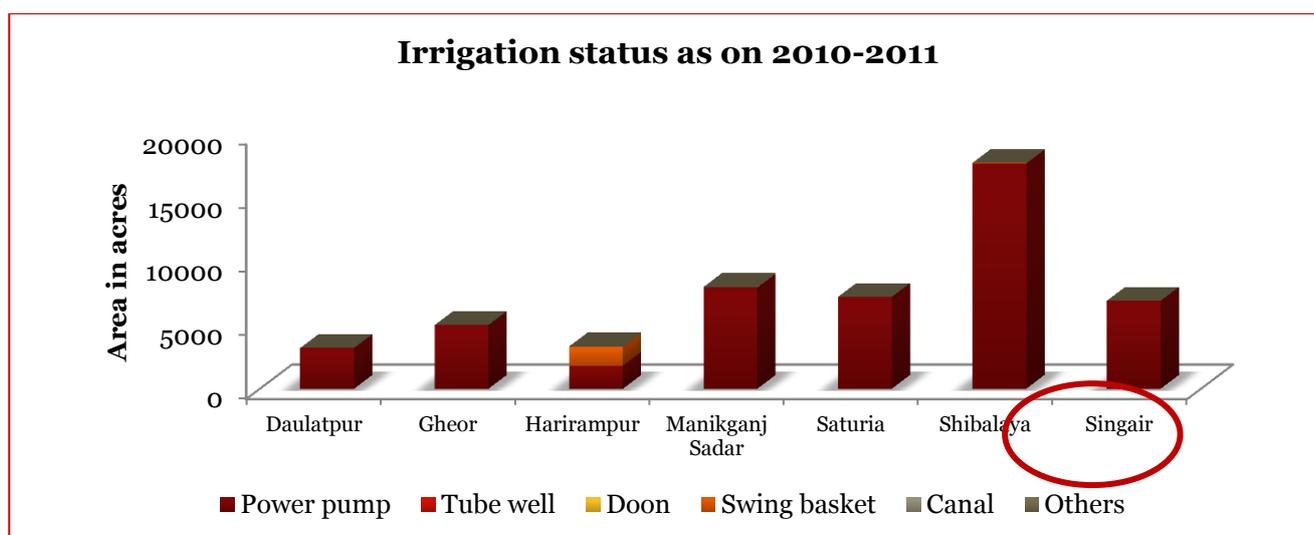
- Surface water irrigation with main water sources being rivers, canals, ponds, and other water bodies;
- Underground water irrigation with water lifted by shallow tube-wells, deep tube wells, and country traditional devices.

Currently, 26.83% (approx.) of total agriculture area is under irrigation in this district. However, the percentage of total area under irrigation in Shibalaya upzila is 66.4%, significantly better than the district figure. Upzila wise the method of irrigation during the year 2010-11 is presented in the following figure.

⁷³ Districts statistics, BBS 2011

⁷⁴ District Statistics, BBS 2011

Figure: Irrigation Status (2010-11)



Source: District Statistics 2011, published by Bangladesh Bureau of Statistics (BBS)

Industrial Landscape

The economy of Manikganj is predominantly agricultural. Out of total 293,977 holdings of the District, 58.19% holdings are farms that produce varieties of agriculture and horticulture crops.⁷⁵

This geographical region doesn't have many natural resources, other than, sand extracted from Padma River. This is the major natural resource and engages significant number of persons involved. In Manikganj, good quality jute is produced in abundance.

Major industries in this region are⁷⁶:

- Textile (Big Scale)
- Fabrics (like Munnu Fabrics etc.)
- Construction Materials (like Akiz Particles etc.)
- Bashundhara Steel Complex
- Cotton
- Knitting (medium scale)
- Chemical products (medium scale)
- PVC (medium scale)
- Food products (like Dhaka Food Products, Tasty Food products etc.)
- Light Engineering and Metals

There is a Bangladesh Small and College Industries Corporation (BSCIC) Industrial Complex located in Manikganj spread over around 70 acre of land. Some of the major tenants are: Akiz Textile (37 acre), Rising Knit Textile (17 acre) and Tarasima Apparels (12 acre).

Mega Feed, a local factory unit producing fish, poultry and cattle feed is located in close proximity to the proposed EZ. Finished goods from Mega Feed are transported to all over Bangladesh via Dhaka city.

Industry Snapshot of Manikganj district is captured in the following table.

Table: Distribution of Industries of Manikganj district:

Company type	Number
Textile Mills	7
Garments Factory	4
Rice Mills	229

⁷⁵ District Statistics, BBS 2011

⁷⁶ <http://www.manikganj.gov.bd/>

Steel and engineering	3
Aluminum	2
Jute Mills	1
Others	29

Source: District statistics, BBS 2011

9.2. Broad level market potential assessment of the proposed EZ

Proposed EZ is located near to Old Aricha Ghat and Paturia Ferryghat in Shivalaya upzilla (Manikganj district). This district is surrounded by Sirajganj and Tangail district in north, Faridpur, Rajbari, Dhaka district in south, Dhaka district in east and Pabna and Rajbari district in west.

Proposed EZ is located at a distance of approximately 80 km away from Dhaka city and travel time is around 2.5-3 hours. It is located adjacent to River Padma. This region is well connected to Dhaka city by road. Nearest Rail station is Golanda Ghat Railway station, but it is on the other side of the river.

Jessore is also connected from the proposed EZ. Distance between proposed EZ and Jessore is approximately 170 km. N-5 provides access to Jessore and travel time is approximately 3 hours. This route includes ferry crossing at paturia ferry terminal. Travel time to Khulna is approximately 4-5 hours.

Proposed EZ is connected to some other parts of Bangladesh by water mode of transportation. Ferry services are available from Paturia Ferry Ghat to Daulatdia. From Daulatdia, Kushtia district is easily accessible.

Basis interaction with Mega Feed (local industrial unit producing fish, poultry and cattle feed), local industries mostly transport finished goods and raw materials via Dhaka. In very few cases, Chittagong Port is used for export or import of specialized items.

Following figure illustrates the location of the proposed EZ and surrounding districts.



According to the above analyses, it may be stated that the proposed EZ is well-connected to Dhaka city and some other parts of Bangladesh. Adjacency to River Padma enables the access to water mode of transportation for industries in the proposed EZ.

This geographical region doesn't have natural resources, however in Shivalaya and in Sirajganj district, sand extracted from Padma River is a major natural resource and a significant source of employment. In Manikganj, good quality jute is produced in abundance. Apart from that, other crops are rice, maize, seasonal vegetables etc. Fishing (hilsa, prawn and small fishes) is a major profession for local inhabitants in Shivalalay.⁷⁷

Major industries in this region are⁷⁸:

- Textile (Big Scale)
- Fabrics (like Munnu Fabrics etc.)
- Construction Materials (like Akiz Particles etc.)
- Bashundhara Steel Complex
- Cotton
- Knitting (medium scale)
- Chemical products (medium scale)
- PVC (medium scale)
- Food products (like Dhaka Food Products, Tasty Food products etc.)
- Light Engineering and Metals

There is a BSCIC Industrial Complex located in Manikganj. It is spreaded over around 70 acre of land and some of the major tenants are: Akiz Textile (37 acre), Rising Knit Textile (17 acre) and Tarasima Apparels (12 acre) etc.

Tangail district (surrounding district) is famous for Tangail Saree (special handmade sarees). According to Bangladesh Bureau of Statistics, in Tangail district, a total of 34,678 tants (saree making machines) and manpower of around 76,000 is involved in saree making. Apart from Tangail saree, several small scale industries and cottage industries are located all over this district which produces innerwear, knitwear, hosiery items etc. Some other major industries in Tangail district are presented below:

- Utensils and accessories made of brass metal (small and cottage level industrial units)
- Handicrafts, toys and utensils made of clay (small and cottage level industrial units)
- Handicrafts, containers etc. made of bamboo (small and cottage level industrial units)
- Table, chair and other furniture items made of wood (small and cottage level industrial units)
- Tobacco (biri) industry (small and medium level industrial units)
- Oil Mills
- Dairy units
- Polutry units

Apart from extensive proliferation of small and cottage industries in this district, seasonal vegetables, cabbage, potato etc. are cultivated in abundance. Tangail district is known for pineapple production. However, due to lack of cold storages the wastage of the agricultural resources is significant.⁷⁹

In Faridpur district, industrial development has prospered. An abridged snapshot of the same is given below:⁸⁰

- Big Scale Industries: Sugar Mill, Pipe Manufacturing units, Textile Mill, Jute Mill etc.
- Medium Scale Industries: Cold Storage, Jute Fiber, Textile etc.
- Small/ Cottage Scale Industries: Clay Products, Wooden Furnitures, Handicrafts made of wood, knit wear, fishing nets etc.

⁷⁷ <http://www.manikganj.gov.bd/node/>

⁷⁸ <http://www.manikganj.gov.bd/>

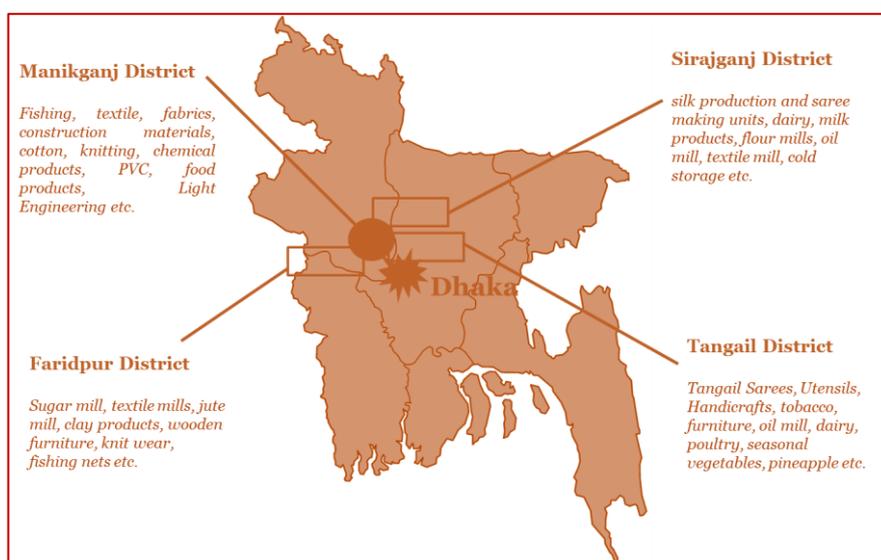
⁷⁹ <http://www.tangail.gov.bd/node/316746/>

⁸⁰ <http://www.faridpur.gov.bd/node/448181/>

Surrounding Sirajganj district is renowned for silk production and related industrial development. A total of around 15,000 families and around 135,000 tants (machines for apparel manufacturing) are associated with the silk industry in this district. Annual manufacturing of clothes in Sirajganj district is 23 crore meter. Apart from Silk industry, other major industries in this district are:⁸¹

- Dairy and Milk based products such as Ghee, Butter, Curd etc. Bangladesh's largest manufacturing unit of Milk Vita- Trade Mark of Bangladesh Milk Producers Co-operative Union Limited (BMPCUL) is located in this district.
- Medium and small scale industries on construction materials, cement etc.
- Flour Mill
- Rice Mill
- Oil Mill
- Textile Mill
- Cold Storage

Following figure depicts the landscape of industry and natural resources in and around Manikganj.



Proposed EZ in Manikganj is connected to Dhaka city and some other parts of Bangladesh such as Jessore, Kushtia etc. Proximity to Ferry Ghat and adjacency to Padma River would provide easy access for the industries in the proposed EZ to transfer goods via water.

Manikganj district is under developing in terms of industrial proliferation. There is no existing industrial ecosystem in this area. A detailed assessment carried out as above indicates that the proposed EZ stands to leverage from the agricultural production from Manikganj and the surrounding districts. Food processing and agro processing based industries may stand a chance to be developed here. This geographical region cultivates jute in abundance and as a result, jute based small and medium scale industries are potential for set up in the proposed EZ.

Good quality jute is produced in abundance in Manikganj. By leveraging on this agricultural resource, jute processing industries stand a chance for the proposed EZ. Also, small scale industries producing decoration items, containers etc. made of jute have a good potential for the proposed EZ.

Sand extracted from Padma River is a major natural resource in this area. Also, in Manikganj, industries based on construction materials (such as Akiz Particles etc.) are functional. Based on the prevailing industrial ecosystem, industries related to construction materials would be potential for the proposed EZ.

This region produces various crops such as rice, maize, seasonal vegetables. Also, fishing (such as hilsa, prawn, small fishes etc.) is a major profession for local inhabitants in Shivalaya upzilla. Based on the

⁸¹ <http://www.sirajganj.gov.bd/node/14047/>

existing potential of agricultural resources and fishing activities, agro processing and fish processing industries are potential for the proposed EZ.

In nearby Tangail and Faridpur districts, industrial units producing hosiery, knitwear etc. items are functional. Similar industries could be considered fit for proposed EZ in Manikganj as it has access to raw materials and modes of transportation.

9.3. Reconfirmation of the proposed EZ

9.3.1. Location of the proposed EZ

The proposed Economic Zone site falls in Shibalaya upazilla of Manikganj district. It is located on the bank of Padma River (west-central part of the district) and at the tail end of Dhaka Aricha highway (N5). Aricha Ferry Ghat and Paturia Ferry Ghat are in close proximity to the proposed EZ.

Reconfirmation of site details is presented in following table.

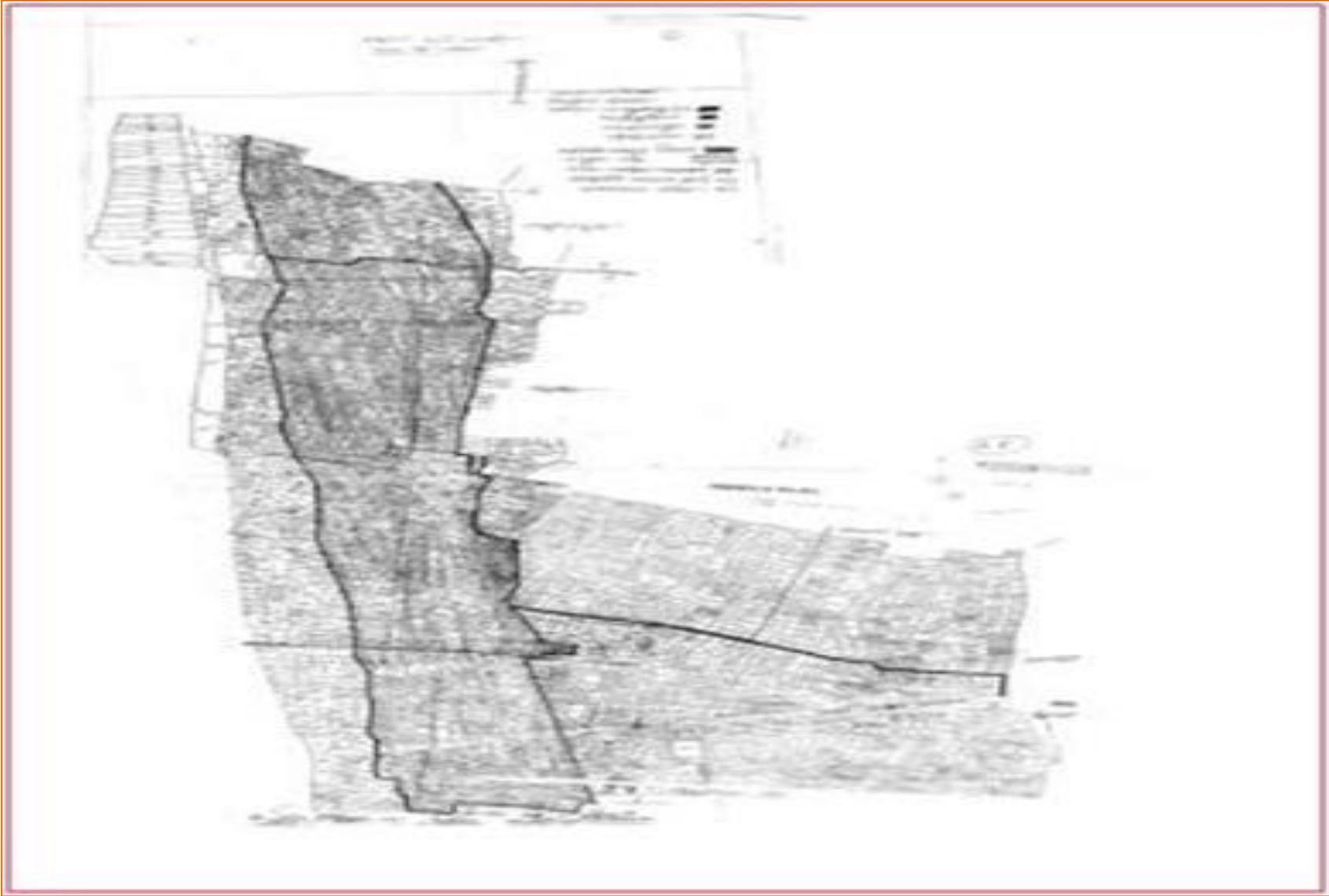
Table: Reconfirmation of site details

Parameters	Details
Site co-ordinates	23°49'55.78'' N - 23°51'42.61'' N & 89°46'38.37'' E - 89°46'32.58'' E
Site boundaries on East	Mud road, Residential houses, Thana police station
Site boundaries on West	Padma river
Site boundaries on North	Jafergange, Private land
Site boundaries on South	Shivalai, Anulia, Private land
Total area of the site	303.47 acres
Land tenure details	Government owned & private land
Government land	175.74 Acres including 3.52 acres acquired land from BIWTA
Private land	127.78 Acres
Others	Nil
Expansion potential	Agriculture, fishing, river bed
Existing land use	Basis preliminary assessment, proposed EZ is surrounded by: <ul style="list-style-type: none"> • Padma River- west side • Police station, road , N5 and residential houses- east side • Villages and private land- north side • Villages, market place and private land- south side As there are location constraints on all four sides of the proposed EZ; hence, it is difficult to expand.
Land cost (per acre)	11 Lakh BDT

Source: PwC Initial Site Assessment (Data collected from UNO office)

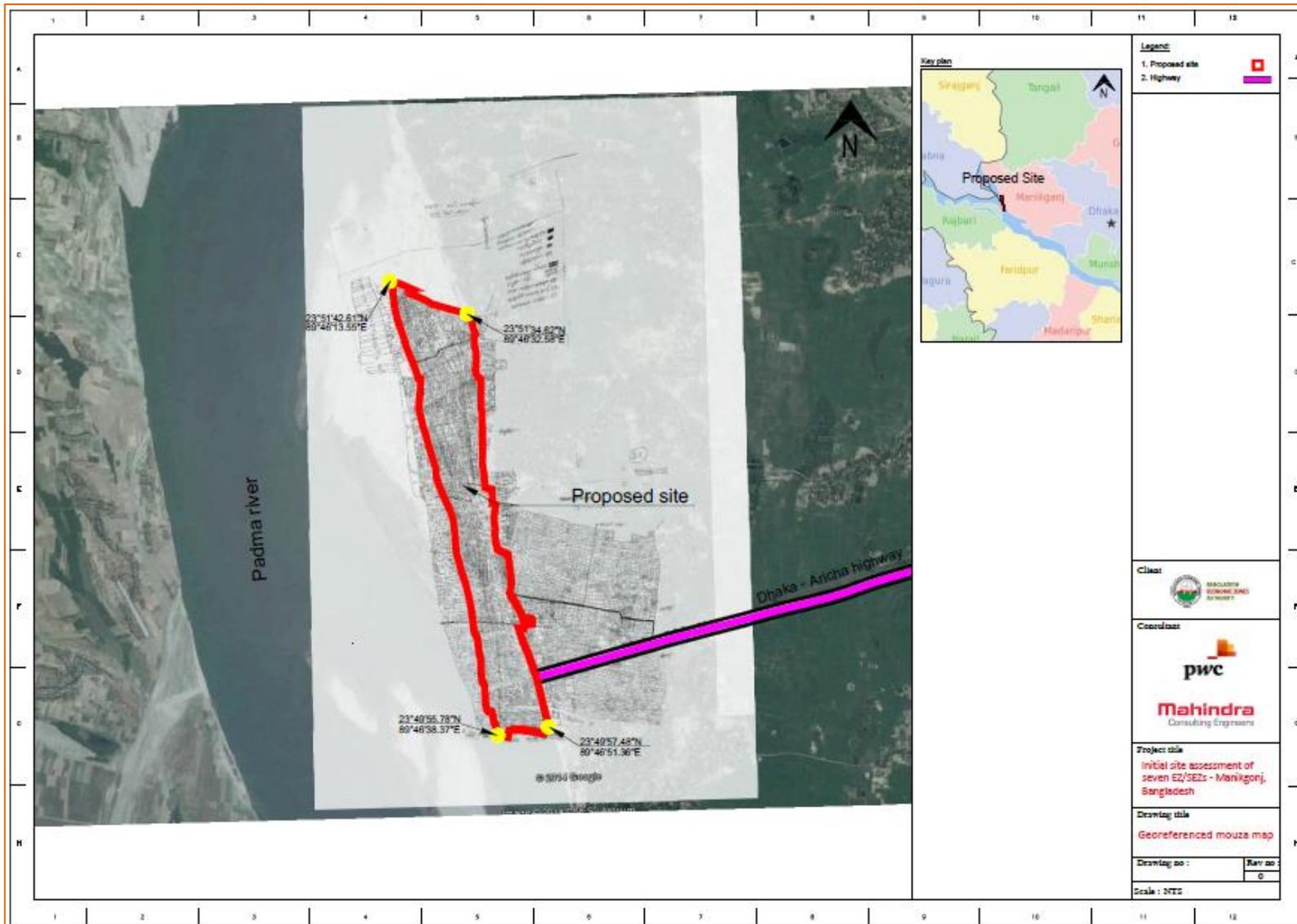
Mouza map of proposed site as provided by Upazila Nirbahi Officer (UNO) and Mouza map superimposed on Google map are presented in the following figures (on the subsequent pages).

Figure: Mouza Map of proposed Manikganj EZ



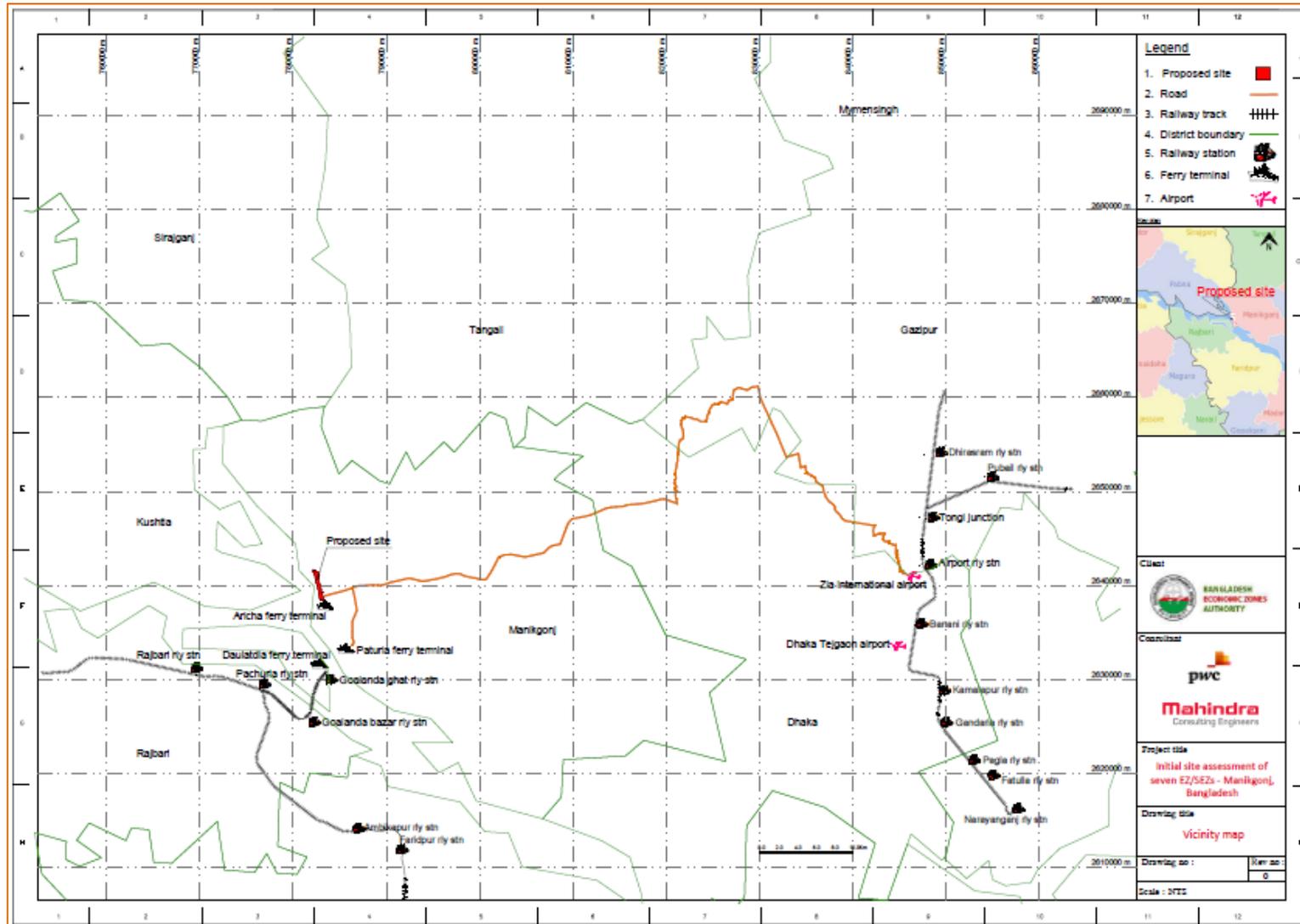
Source: UNO office

Figure: Mouza map superimposed on google map (Manikganj)



Following figure shows the location of the proposed EZ and its vicinity.

Figure: Location of the proposed EZ and its vicinity



9.3.2. Land use / land cover

The land use pattern of the proposed EZ area falls under aquaculture Zone and riverine area. Only in a small strip of land (char area) inside the project area, jute is cultivated. Local inhabitants along the bank of Padma River undertake fishing activity for living. Some of the commonly available fishes in this area are hilsa (Hilsa ilisa), ruhi (Labeo rohita), katla (Catla catla) etc. Agricultural activities (cultivation of jute, rice etc.) take place in the nearby areas. Existing land use pattern for 10 km radius is shown in figures on subsequent pages.

Figure: Fishermen's boats kept inside the project area (Manikganj)



9.3.3. Topography

Basis initial site assessment, it was observed that the proposed EZ has a level difference of 5 to 6 m with a gentle slope from East towards West direction towards Padma River. Entire area of the proposed EZ is located approximately 10-20 feet below the existing road level/ maximum flood level. According to the contour variation, the depth of landfilling across the project area shall vary.

Contour maps of the proposed EZ for 5 km and 10 km radius are presented in figures on subsequent pages.

Figure: Existing land use pattern for 10 km radius (Manikganj)

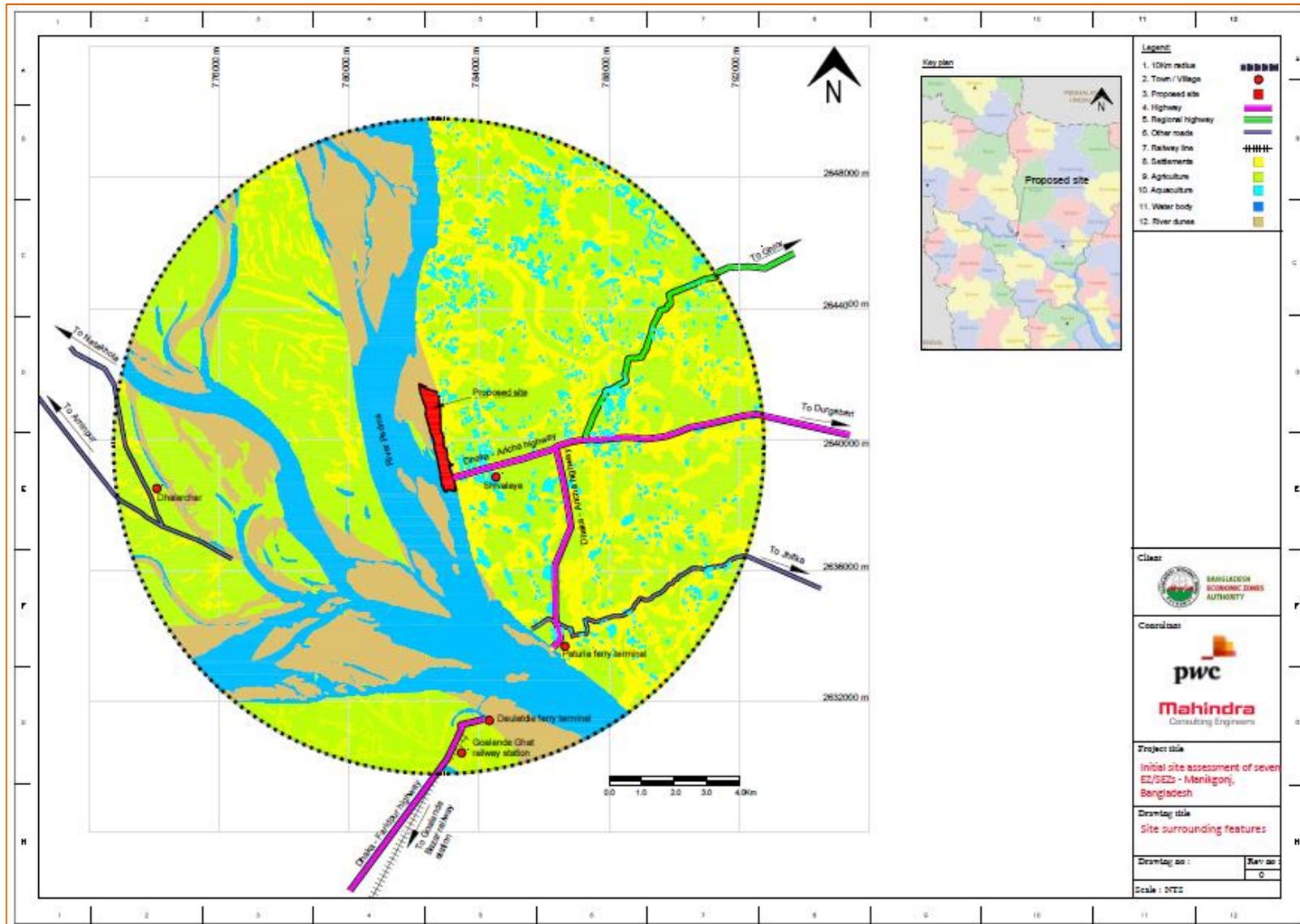


Figure: Existing land use pattern for 10 km radius (Manikganj)-Closer View

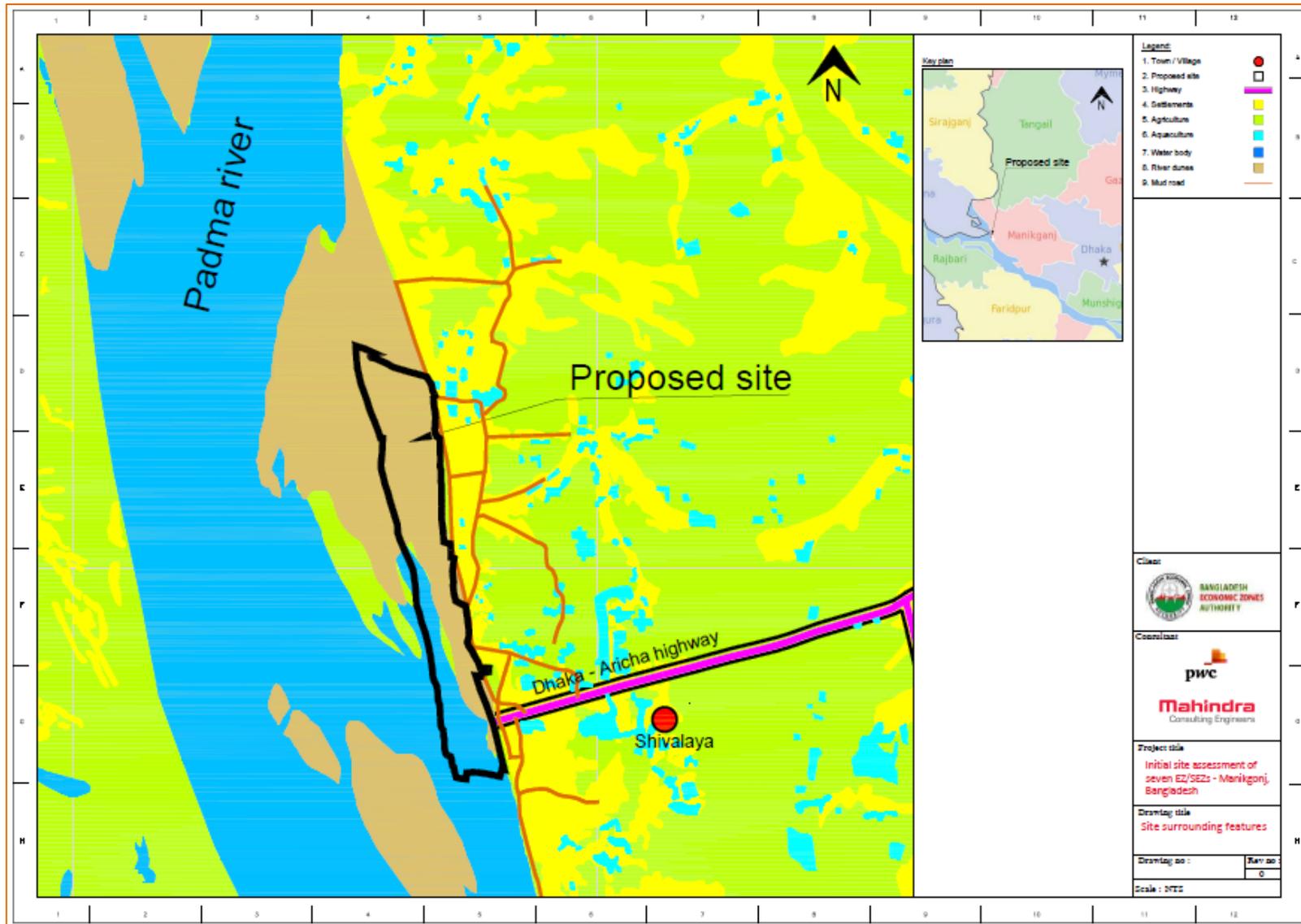
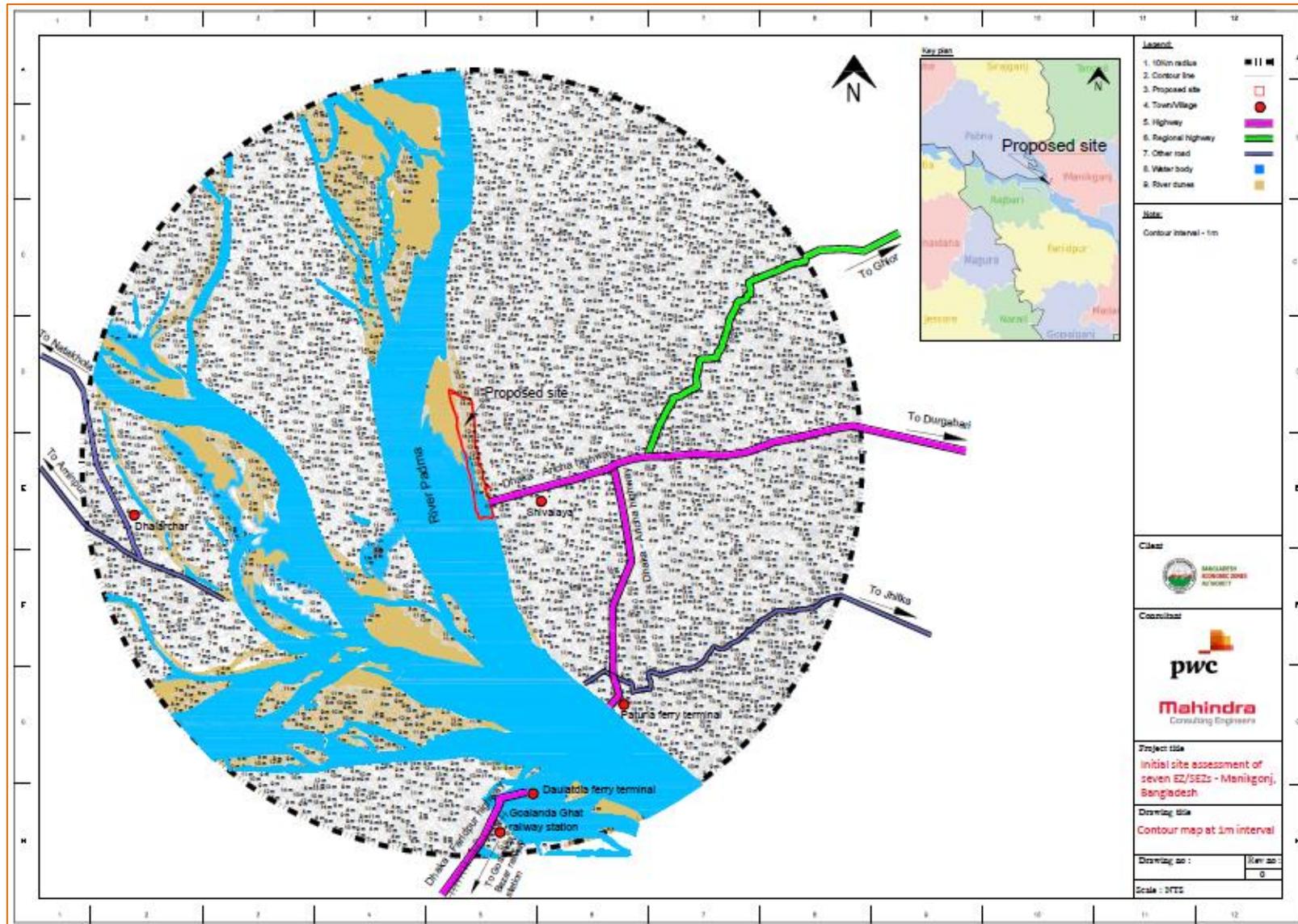


Figure: Contour map of the proposed EZ for 10 km radius (Manikganj)



9.3.4. Physiography

The physiography of the region surrounding proposed EZ falls in Ganges river flood plain which comprises the active floodplain of the Ganges and the adjoining meander floodplain. Morphology of the river flood plain landscape exhibits a smooth landscape of ridges, basins and old channels. The relief is locally irregular alongside the present and former river courses, especially in the west, comprising a rapidly alternating series of linear low ridges and depressions. Local differences in elevation generally are 2-3m on the Ganges floodplain.

Ganges channel is constantly shifting within its active floodplain, by eroding and depositing large areas of new char land each flood season, but it is less braided than that of the Brahmaputra-Jamuna channel. Ganges alluvium is calcareous when deposited, but most basin clays and some older ridge soils have been decalcified and acidified in their upper layers; lime is found only in the subsoil or substratum of such soils. Clay soils predominate in basins and on the middle parts of most ridges, with loamy soils (and occasionally sands) occurring mainly on ridge crests.

Seasonal flooding is mainly shallow in the west and north, with the highest ridge crests remaining above normal flood levels, but flood depths increase towards the east and the south. Flooding is mainly caused by accumulated rainwater and the raised groundwater table, except on the active Ganges floodplain and close to distributary channels which cross the meander floodplain.

The Bangladesh physiography map is presented in Annexure.

9.3.5. Soil

Basis site visit, the top soil layer was found to be mixture of clayey and black cotton soil which needs to be replaced for road construction. This soil is not suitable for laying foundation for any structure. The dominant soil texture is sandy loam. The soil layer is acidic in character and the pH ranges from 5.5 to 6.8. The soil layer is naturally fertile and is recharged every year by fresh deposition by the floodwater.

Figure: Soil type in the proposed Manikganj EZ



9.3.6. Geology

Proposed EZ is located in the Ganges river floodplain. The Genetic alluvium occupies major parts of Manikganj District. The soil layers of the district are mainly loamy on ridges and clay in basins; detailed soil investigation needs to be carried out during the structural design stage.

Geological map of Bangladesh is shown in Annexure.

9.3.7. Earthquake data

Bhola Sadar area falls in the Seismic Zone 2 and the earthquake coefficient is 0.15 for this zone. The area under the proposed EZ falls under the medium seismic range zone; this factor needs to be taken into account while designing the structure of the proposed EZ.

Seismic zoning map of Bangladesh is presented in Annexure.

9.3.8. Wind speed

During winter, the northern and central areas in Bangladesh witness gentle winds blowing at relatively low speeds of 1-3 Km/hr. from the north & northwest. The detailed wind speeds need to be obtained for designing the high rise structures in the proposed EZ.

The wind speed map for Bangladesh is presented in Annexure.

9.3.9. Cyclones and storms

Manikganj has not witnessed any significant cyclone or storms.

9.4. Environment section

9.4.1. Air quality

Ambient air quality measurements are essential:

- to provide a description of the existing conditions,
- to provide a baseline against which changes can be measured and
- to assist in the determination of potential impacts of the proposed EZ construction on air quality conditions

During the field visit, no apparent problem with air quality was noticed. This may be due to the fact that the project area is located in a rural area with very few industries in the surrounding area and the traffic was relatively less.

9.4.2. Floods and Water Logging

Basis interaction with local inhabitants and site visit, the proposed EZ is frequently affected by floodwater. Other dynamics like topography and landform also indicate that the area is affected by flood. It is to be noted that the formation level for the Dhaka-Aricha Highway was raised to obviate the impact of flood.

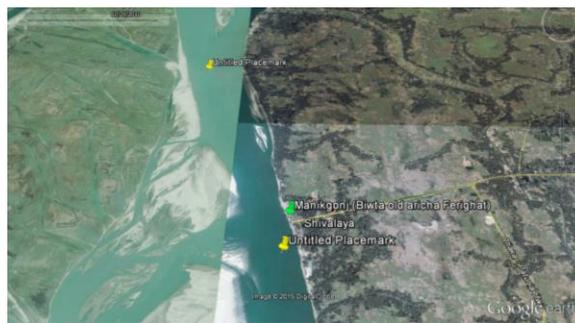
Basis interaction with local inhabitants, the flood level within the area of the proposed EZ during monsoon season varies from 16 feet to 19 feet approximately.

It is believed that Padma River is a meandering river. But lately it has become braided river due to high sediment transportation by Jamuna and deposition of Ganges-Padma river bed. As a result of Padma River's changing trend, the region is prone to erosion. However, google images for various periods clearly indicate that there is no erosion happening at this proposed EZ. However necessary flood protection and erosion protection measures need to be taken for the development of EZ.

Figure: Google images for various periods at the proposed Manikganj EZ



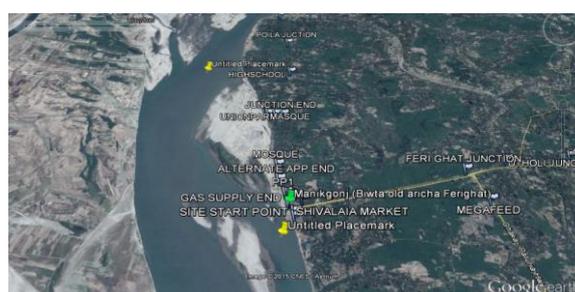
Google image during February 2007



Google image during October 2010



Google image during September 2013



Google image during August 2015

9.4.3. Noise

During the field visit, no apparent problem of noise was observed in and around the proposed EZ.

9.4.4. Land filling

Basis the interaction with the UNO officials and local inhabitants, flood level varies from 16 to 19 feet depth inside the proposed EZ area. To avoid inundation during monsoon season, minimum land filling of 0.6 m above the flood level is considered.

Based on the assumption, an average depth of 18 feet to 22 feet of land filling has been envisaged for the proposed EZ area. This figure is indicative and detailed topography survey needs to be carried out to calculate the exact quantity of land filling at the project area.

9.5. Infrastructure Linkages to the Proposed Site

9.5.1. Physical Infrastructure- Availability of Utility Connection

9.5.1.1. Power Availability for the proposed EZ

Existing 33/11 KV substation (of capacity 20 MVA) near Shibalaya is located at a distance of around 7 km from the proposed EZ. Basis discussion with Rural Electrification Board (REB) officials, no surplus power is available from this substation.

Figure: 33/11 KV substation near Shibalaya



Another 33/11 KV substation is located in Uthli (approximately 7-8 km away from the proposed EZ). Basis information obtained from REB officials, capacity of this substation is 15 MVA and 5 MVA surplus power is available from this substation.

Figure: 33/11 KV substation in Uthli



Basis interaction with REB officials, one 33/11 KV substation of 10 MVA capacity is under construction in Kathersen mouza (located within 5 km from the proposed EZ). It is expected to be commissioned by 2017. Option of sourcing power from this substation to cater to the requirements during initial phases of development of the proposed EZ could be explored further.

Basis discussion with REB officials, 132/33 KV grid substation in Manikganj (at a distance of around 17 km from the proposed EZ), is overloaded and it can't cater to any additional power requirements. Another 132/33 KV grid substation of 70 MVA capacity is proposed in Borangal (located at a distance of approximately 10 km from the proposed EZ). Site selection for the same is yet to take place.

30 MW solar power plant is proposed adjacent to climate department building (near Aricha Ghat). Basis information obtained from UNO officials, 5 acre of land parcel has been allocated for this project. This project is at the feasibility stage and it is expected to be developed in PPP mode.

Preliminary assessment suggests that the option of sourcing power to cater to the ultimate power requirement (during fully operational stage) for the proposed EZ from either Borangal grid substation or solar power plant could be explored further.

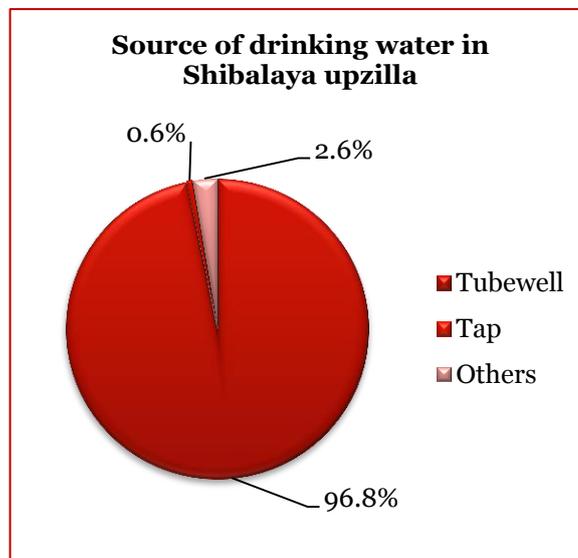
Basis working knowledge and best practices followed, power requirement in a typical EZ could be transmitted by a dedicated 33 KV line for demand up to 25 MW. If the demand is more than 25 MW, then the option of 132 KV transmission lines needs to be further explored. Proximity to 33 KV power connection and surplus power availability in the vicinity of the proposed EZ are the crucial factors to decide on the potential of power availability to the proposed EZ.

Utility Map shown in figure at the end of the section illustrates the electricity availability in and around the proposed EZ.

9.5.1.2. Water Availability for the proposed EZ

There is no existing water supply system at the proposed site. The local inhabitants are dependent on tube wells for the purpose of drinking water. The sources of drinking water in Shibalaya upzila is captured in following figure.

Figure: Sources of drinking water in Shibalaya upzila



Source: District Statistics, BBS 2011

Proposed EZ is located on the Padma riverbed. Basis discussion with local inhabitants, villagers are obtaining water from tube wells located in char land of this river.

Basis interaction with local inhabitants, the ground water is available at a depth of 100 to 120 feet (approximately) from natural ground level. Water in this region contains high volume of iron and arsenic. Preliminary assessment suggests that the water requirement could be met either by extracting water from the Padma River or from bore wells. Bore wells could be developed in the char land which is located adjacent to the project area. Further, our preliminary assessment also suggests that extracting

water from the river located on the western boundary of the proposed EZ may be considered by providing suitable intake system and water treatment plant.

Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Manikganj EZ is around 2.58 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could be extracted through bore wells. Extraction of more water through bore wells might result in depletion of the aquifer level. Proposed site has proximity to Padma River, thus the option of extracting water from Padma River may be further explored. Decision regarding extraction of water from bore well/ Padma River needs to be taken after detailed feasibility analysis.

9.5.1.3. Gas supply to the proposed EZ

Titas Gas Company is the nodal agency responsible for supply of gas in this region.

Basis interaction with representative of the local gas substation (located at a distance of approximately 5 km from the proposed EZ) of Titas, 12” incoming line is available up to the gas substation and the outgoing distribution line from the gas substation is of dia. 8”.

Figure: Titas Gas substation in Shibalaya



Distribution line from the gas substation is available up to Aricha Ghat (around 150 feet from the proposed EZ). It was communicated to us that the gas pressure capacity at the local substation is 150 psi. However pressure obtained in this region is not adequate and regular fluctuations in gas pressure have been observed. Basis discussion with Titas officials, another gas distribution line (of capacity 250 psi) from Tongi to Manikganj is proposed.

Preliminary assessment indicates that the option of necessary tapping from this existing line for the proposed EZ could be further explored.

9.5.1.4. Telecom/ Internet connectivity to the proposed EZ

Basis interaction with UNO officials, optic fiber cables are laid up to UNO Office. At present, the internet and telecom services in this region are provided by private telecom operators such as Grameen Phone, Bharti Airtel, Banglalink, Teletalk.

Following figure illustrates the utility connection to the proposed EZ.

9.5.2. Social Infrastructure

9.5.2.1. Institutional

Manikganj district has 28 colleges (government and non-government colleges) and 154 secondary schools (government and non-government schools). The district also has 1 medical college and 2 technical and vocational institutions.

Some of the major colleges located in Manikganj are:

- Shibalaya sadar Uddin Degree College
- Singair Degree College
- Ghior Government College

The technical and vocational institutions are located in Manikganj Sadar upzila. Some of the Technical institutes located in the radius of 50 km (approx.) from the proposed EZ are:

- Manikganj Technical School and College
- National Institute of Textile Engineering & Research, Nayarhat
- Faridpur Polytechnic Institute

A broader view suggests that the proposed EZ being located at a distance of 80 km (approx.) from Dhaka has an advantageous position in terms of availability of educational institutions. There are a total of 26 technical and vocational institutions and 44 universities located in Dhaka district.⁸²

Some of the major educational institutions located in Dhaka are:

- Bangladesh University of Engineering and Technology (BUET)
- Dhaka University of Engineering and Technology (DUET)
- Jahangirnagar University etc.

9.5.2.2. Healthcare Facilities

Government hospital is available in Shibalaya upzila and has provision for 50 beds. Different categories of health centers are shown below.

Table: Details of healthcare facilities in Shibalaya upzila

Details	Numbers
Government health complex	1
Private hospital/ Clinic	1
Union health center	7
Diagnostic center	3

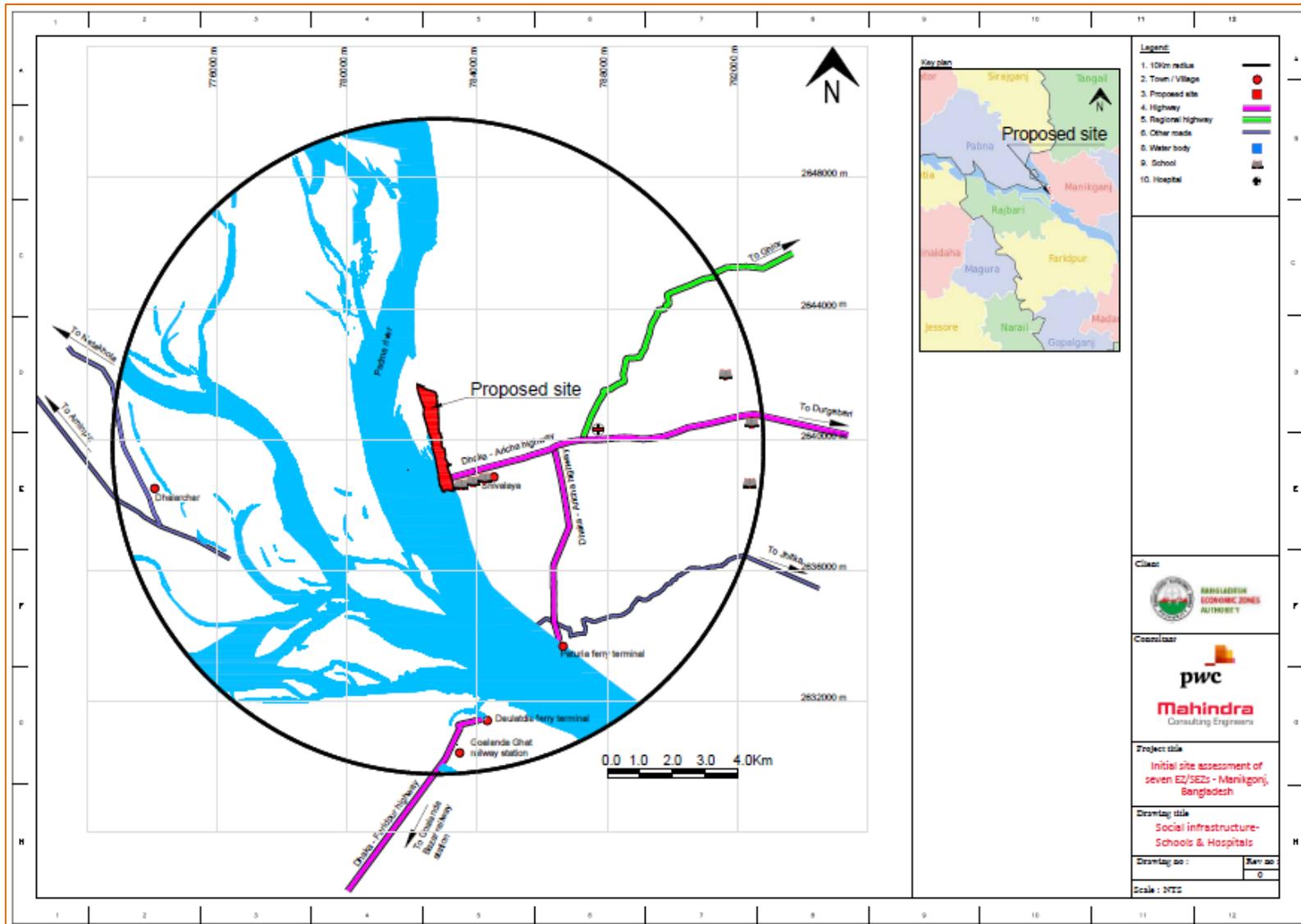
Source: District Statistics, BBS 2011

There is an eye hospital exists adjacent to the proposed EZ. Monno Medical College & Hospital is located in Manikganj (around 20 km away from the proposed EZ).

Preliminary assessment suggests that healthcare facilities available in Shibalaya upzila are of substandard quality. Manikganj Sadar upzila located in proximity to proposed EZ has comparatively better healthcare facilities available. Basis discussion with local inhabitants, for serious medical problems the local people need to travel to Dhaka city for treatment. Travel time (by Dhaka-Aricha highway) from Shibalaya to Dhaka city takes around 2.5-3 hours.

⁸² Dhaka District statistics, 2011

Figure: Schools and Hospitals in the vicinity of proposed Manikganj EZ



9.5.3. Connectivity

Roadway and waterway are the most convenient means of accessing the proposed EZ. Road distance between the center of Shibalaya upzilla and the proposed EZ is about 6 km. Proposed EZ is located at the end of Dhaka Aricha highway (N5) which is the main access road to the proposed EZ.

Proposed EZ is well connected by road with the capital city of Bangladesh. Distance between Shibalaya and Dhaka city is around 75 km.

9.5.3.1. Road

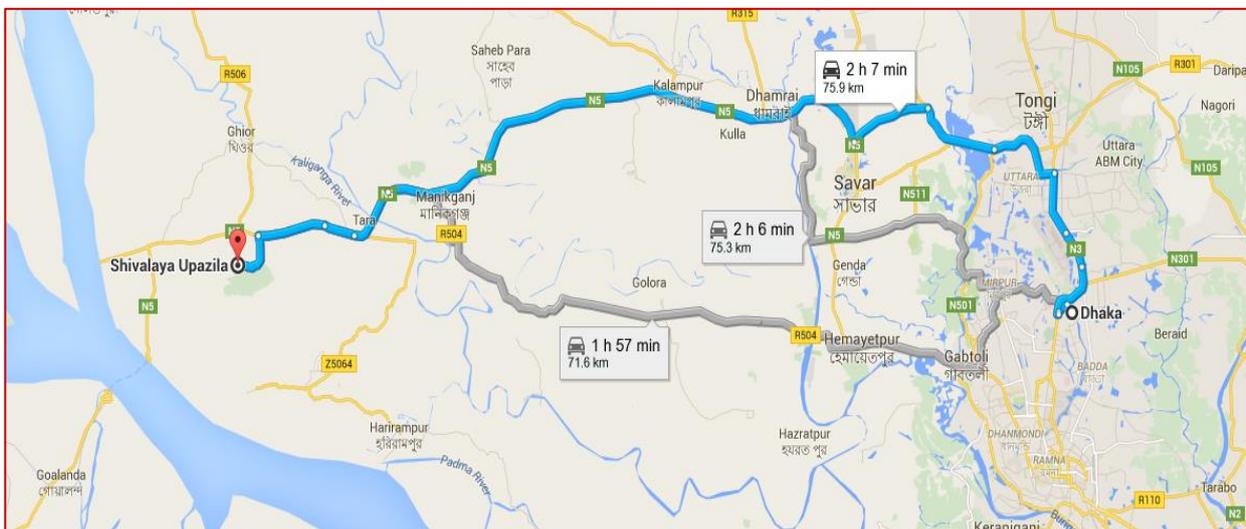
Proposed EZ is connected to capital city Dhaka by Dhaka-Aricha Highway (N5). It's a two-lane bituminous road and during site visit, it was observed that the road condition is good and favorable for passage of heavy vehicles.

Figure: Dhaka-Aricha Road connecting the proposed EZ to Dhaka city



Distance between Dhaka and the proposed EZ by Dhaka Aricha highway is around 80 km and travel time is around 2.5-3 hours. Alternate access to Shibalaya upzilla (and the proposed EZ) from Dhaka city is travelling by Savar Manikganj Highway (R504) and Dhaka Aricha highway (N5). For this access, both distance and travel time would remain the same as by the Dhaka-Aricha highway.

Figure: Access to the proposed EZ from Dhaka

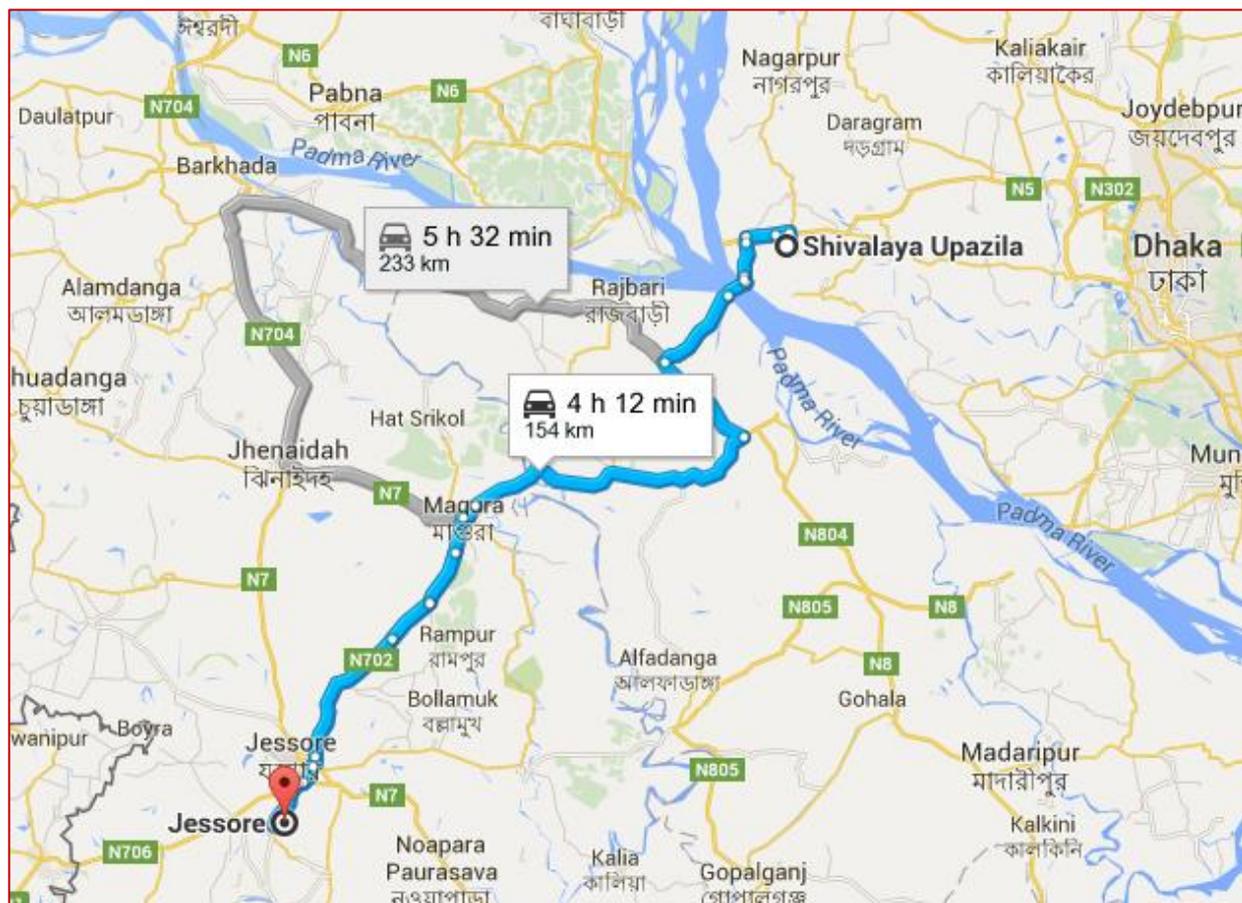


Access from Jessore to the proposed requires different modes of transportation. Road distance is approximately 155 km and travel time is around 4.5-5 hours. For accessing Jessore following route needs to be taken:

1. Dhaka-Aricha Road (N5) to reach Paturia ferry ghat.
2. Travel by ferry from Paturia ferry ghat to Daulatdia ferry ghat
3. Dhaka-Khulna Highway (N7) from Daulatdia ferry ghat to Magura
4. Jessore Northern Bypass (N702) from Magura to Jessore

Basis discussion with UNO officials, N7 and N702 are two-lane bituminous road and road conditions are favorable for passage of heavy vehicles.

Figure: Access to Jessore from Shibalaya upzilla (proposed EZ)



Road network for 10 km radius is shown in figures on subsequent pages.

Approach Road

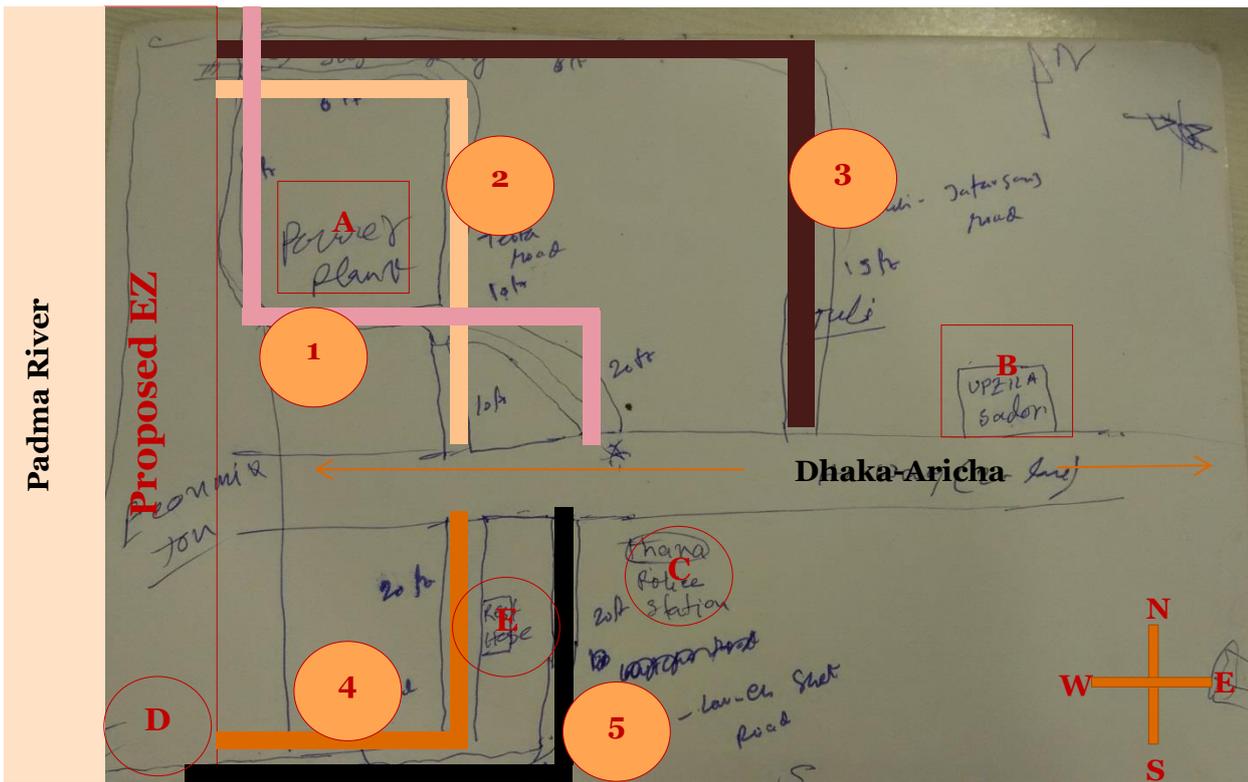
At present five approach roads are existing for the proposed EZ. All these roads join the proposed EZ to Dhaka – Aricha Highway (N5).

Figures on subsequent pages depict the last mile connectivity aspect of the proposed EZ.

3. **Approach Road 1:** It's a LGED road which is a branch from the Dhaka-Aricha Highway. It is located beside Padma River and runs from south to north up to Jafarganj village. This existing approach road has two stretches:
 - a. Around 500-700 m stretch of bituminous road of width 20 feet (approximate). Widening is not possible as several temporary shops are located on both sides of the road. It runs parallel to the proposed EZ.
 - b. Around 2 km stretch of paver road of width 6 feet (approximate). Widening is not possible as river bank is located on one side of the road and the residential colony,

- schools, mosque etc. are located on the other side of the road. Refer Figures on subsequent pages for photograph of this stretch.
4. **Approach Road 2:** Testa Road is a LGED road which is located on the eastern side of the proposed solar plant (30 MW capacity). It's a bituminous road of width 15 feet (approximate) and widening is not possible as it would attract resettlement problems. Refer Figures on subsequent pages for photograph of this road.
 5. **Approach Road 3:** Utuli-Jafarganj road is a LGED road which runs from Jafarganj village to Uthuli and ultimately meets Dhaka-Aricha Highway near to the Shibalaya UNO office. This approach road has two stretches:
 - a. Around 5-6 km bituminous road of road width 6 feet (approximate) up to Jafarganj market. Widening is not possible in this stretch as it would attract severe resettlement problem. Some residential colonies and markets are located on both sides of this road. During site visit several culverts were observed in this stretch. Refer Figures on subsequent pages for photograph for this stretch of the road.
 - b. Around 6-7 km bituminous road of road width 15 feet (approximate) up to Dhaka-Aricha Highway. Basis discussion with UNO officials, widening is not possible in this stretch as private land (residential) is located on both sides of the road.
 6. **Approach Road 4:** It is a LGED road which runs parallel to Aricha Ferry ghat. This approach road has two stretches:
 - a. First 600-700 m stretch (approximate) is paved road of width 6 feet (approximate). Widening is not possible as it runs through a local market. Refer Figures on subsequent pages for photograph for this stretch of the road.
 - b. Next stretch runs for around 700-900 m and ultimately meets Dhaka-Aricha Highway. This stretch is bituminous road of width 20 feet (approximate). Widening is not possible for this stretch as it runs through local marketplace.
 7. **Approach Road 5:** Aricha Launch ghat road is a bituminous road of width 20 feet (approximate) and length of this alignment is around 1-1.5 km. It originates from Aricha Launch ghat and ultimately meets Dhaka-Aricha Highway near Shibalaya Police Station. Widening of this road is difficult; however this option is the best fit with respect to the other four options. Refer Figures on subsequent pages for photograph for this stretch of the road.

Figure: Last Mile Connectivity for the proposed EZ (Part-1)



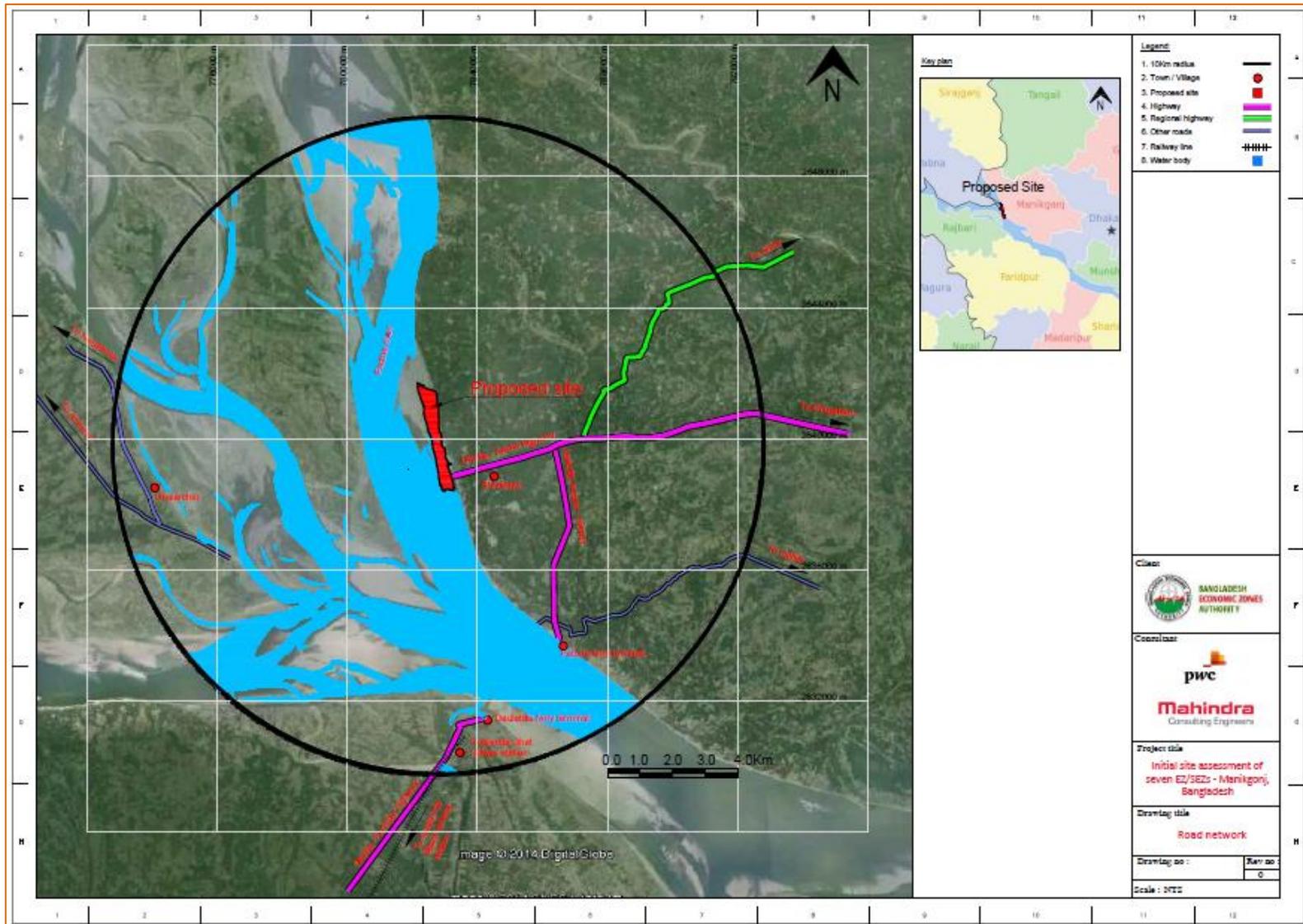
Legends:

- A: Proposed Solar Power plant (30 MW capacity)
- B: UNO Office
- C: Shibalaya Police Station
- D: Aricha Ferry Ghat
- E: Circuit House

Figure: Last Mile Connectivity for the proposed EZ (Part-2)



Figure: Road Network for 10 km radius (Manikganj)



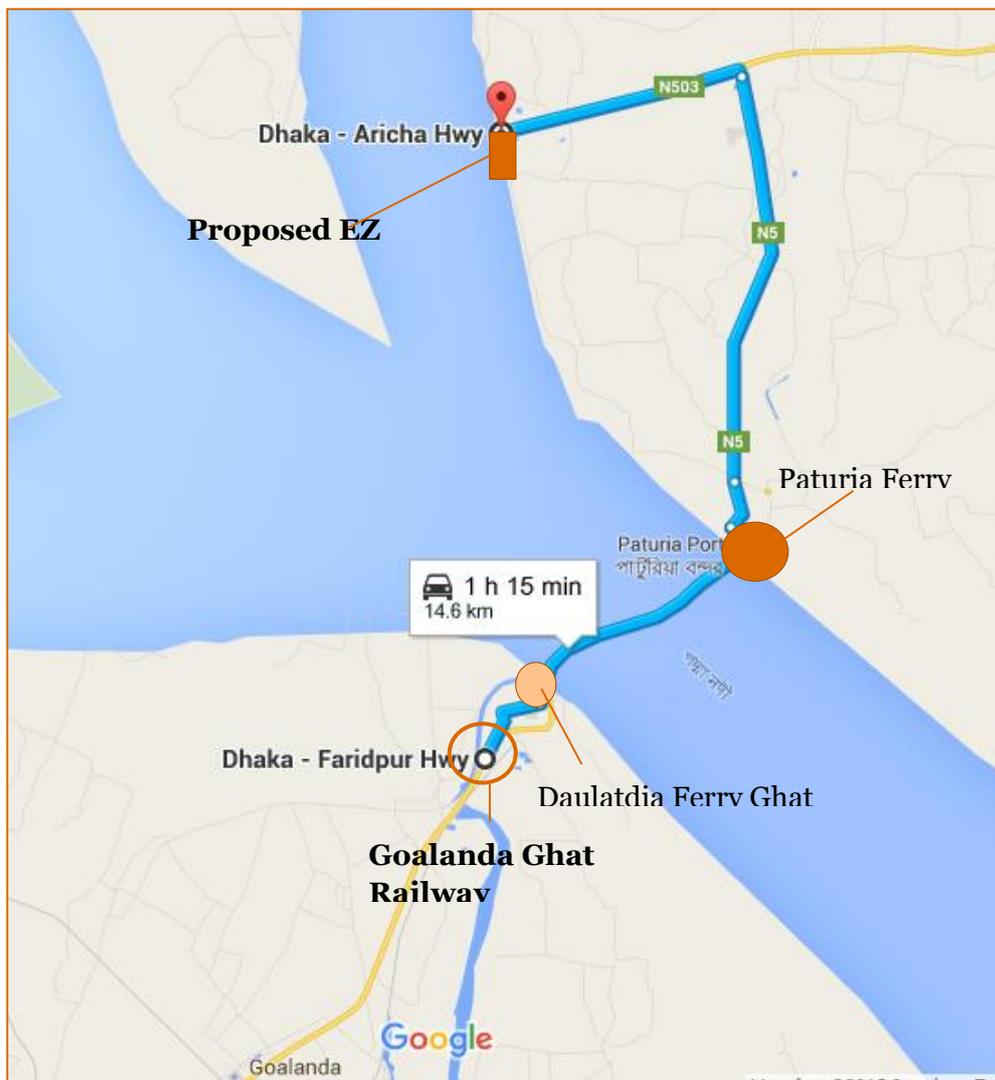
9.5.3.2. Rail

No rail network exists in Shibalaya upzilla.

Goalanda Ghat railway station is about 15 km from proposed EZ, but there is no direct road connectivity to this railway station due to presence of Padma River. Ferry ride is required from Paturia Ferry ghat to Daulatdia Ferry ghat to reach Goalanda Ghat railway station.

Connectivity to Goalanda Ghat rail station is via Dhaka-Faridpur Highway (N7). Basis secondary research, government has taken preliminary steps to construct about 6.10 km long second Padma multipurpose bridge at Paturia-Goalanda point. This bridge could establish direct connection between the capital and the west and south-west part of Bangladesh.⁸³

Figure: Connectivity between Proposed EZ and Goalanda Ghat Railway station



Source: Google map and PwC analysis

Following table depicts major trains which connects Goalanda ghat to other parts of Bangladesh.

⁸³ http://www.mof.gov.bd/en/budget/13_14/ber/en/chapter-11_en.pdf

Table: Rail connectivity of Bheramara to other parts of Bangladesh⁸⁴

Trains and frequency	Terminal Station/ Stoppages	Approximate travel time (hour)
Madhumoti Express (Daily apart from Monday)	Goalanda Ghat -Rajbari-Pangsha-Khoksha-Kumarkhali-Kushtia Court-Poradaha-Bheramara- Ishurdi -Rajshahi	6 hours

9.5.3.3. Airport

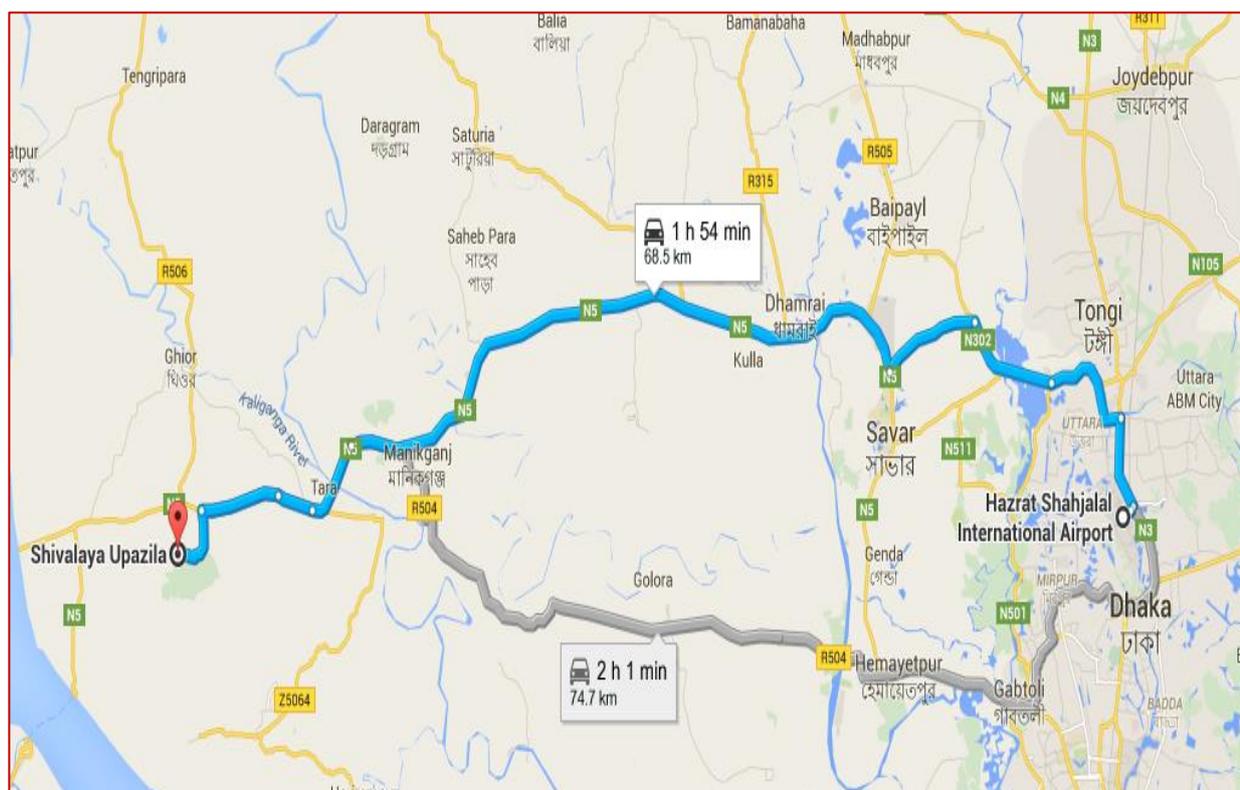
The proposed EZ is located about 77 km from Hazrat Shah Jalal International Airport at Dhaka. The travel time by road to Dhaka International Airport is 3.5 hours (approximate).

Basis secondary research, over 4 million international and 1 million domestic passengers as well as 150,000 MT of freight and mail exchange use Dhaka International airport. This airport has a freight village (warehouse), terminal buildings, hangars and other modern equipments for aircraft handling.

For ease in transportation of construction materials, rail station (airport rail station) is operation near the Dhaka International airport.

Govt. of Bangladesh intends to construct a new international airport (Bangabandhu Sheikh Mujib International Airport) with a view to create a hub airport in close proximity to Dhaka and to meet the demand of future growth in aviation sector. The Civil Aviation and Tourism Ministry is in the process to finalise the location of the proposed international airport. Some of the locations which are being considered as prospective locations for the development of new airport are: (1) Char Janajat under Shibchar Upazila in Madaripur district, (2) Keyain and Latobdi under Shirajdikhan Upazila in Munshiganj district and (3) Char Bilashpur under Dohar Upazila of Dhaka district.

Figure: Connectivity between Dhaka airport and Shibalaya upzilla (proposed EZ)



⁸⁴ <http://sumonmadpur.yolasite.com/train-schedule.php>

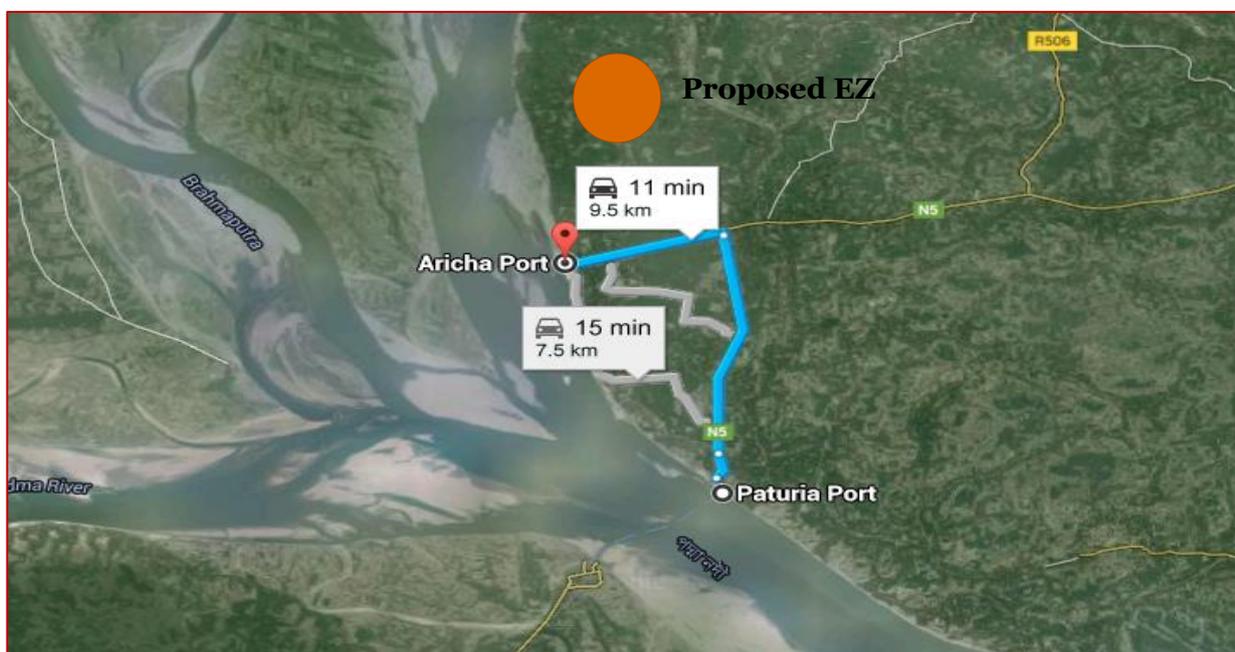
9.5.3.4. Water Connectivity

The primary transportation system of Bangladesh is its extensive inland waterways. Bangladesh Inland Water Transport Authority (BIWTA) is responsible for development, maintenance and control of inland water transport and of certain inland navigable waterways. Bangladesh, as a riverine country with 24,000 km waterways, has a navigable network varying from 5968 km during the monsoon to 3865 km during the dry season. Inland water transport (IWT) is an important mode of transport not only in the inland movement of freight and passengers but also in the transportation of import and export items through the ports of Chittagong and Mongla.⁸⁵ Inland waterway network of Bangladesh is depicted in Annexure.

Much of the importance of the proposed EZ is owing to its excellent performance as river ports like Aricha ghat, Paturia ghat and Doulatia ghat. Proposed EZ is located adjacent to Padma River and old Aricha ghat is located within the project boundary.

Aricha river port and Paturia river port are located within 10 km radius of the proposed EZ. Following figure attempts to capture the proximity of river ports to the proposed EZ.

Figure: Locations of Aricha port, Paturia port and proposed EZ



Dhaka-Aricha highway provides road access from the proposed EZ to the mentioned river ports.

Paturia Port

There is a river port in Paturia and ferry services are also available from Paturia ghat to Daulatia ghat and Kazirhat ferry terminal. Basis discussions with BIWTA officials, it was informed to us that there are total 18 ferries (for both cargo and passengers) providing 24x7 services from Paturia ghat to Daulatdia ghat and average frequency is 25 -35 ferries per day.

Two types of ferries (both for passenger and cargo) are being operated from Paturia ghat:

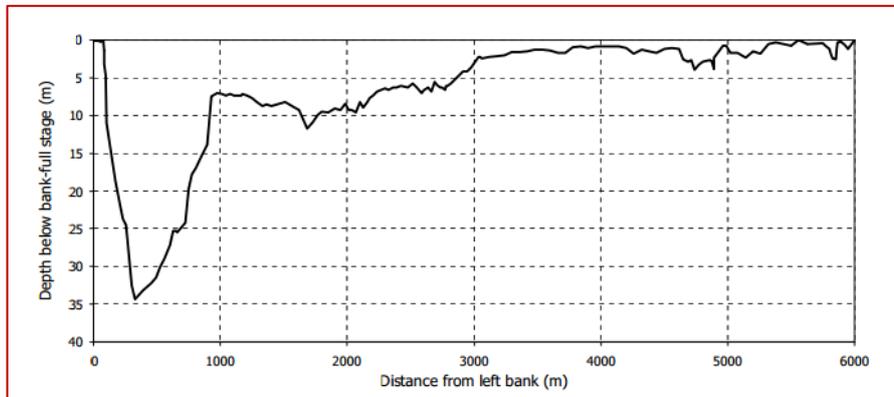
- **Big Ferry:** Capacity: 12 Trucks or 18 Buses or 50 Cars
- **Utility Ferry:** Capacity: 6 Trucks or 9 Buses or 25 Cars

Information about available draught in Padma River near Paturia port couldn't be obtained during our site visit. As per our discussion with local boatmen and fishermen, draught at this area of Padma River

⁸⁵ BIWTA: Waterways Assessment Report

varies from 3 to 3.5 m. However, due diligence needs to be undertaken to ascertain the same. Basis secondary research, following figure captures the draught availability in Padma River.

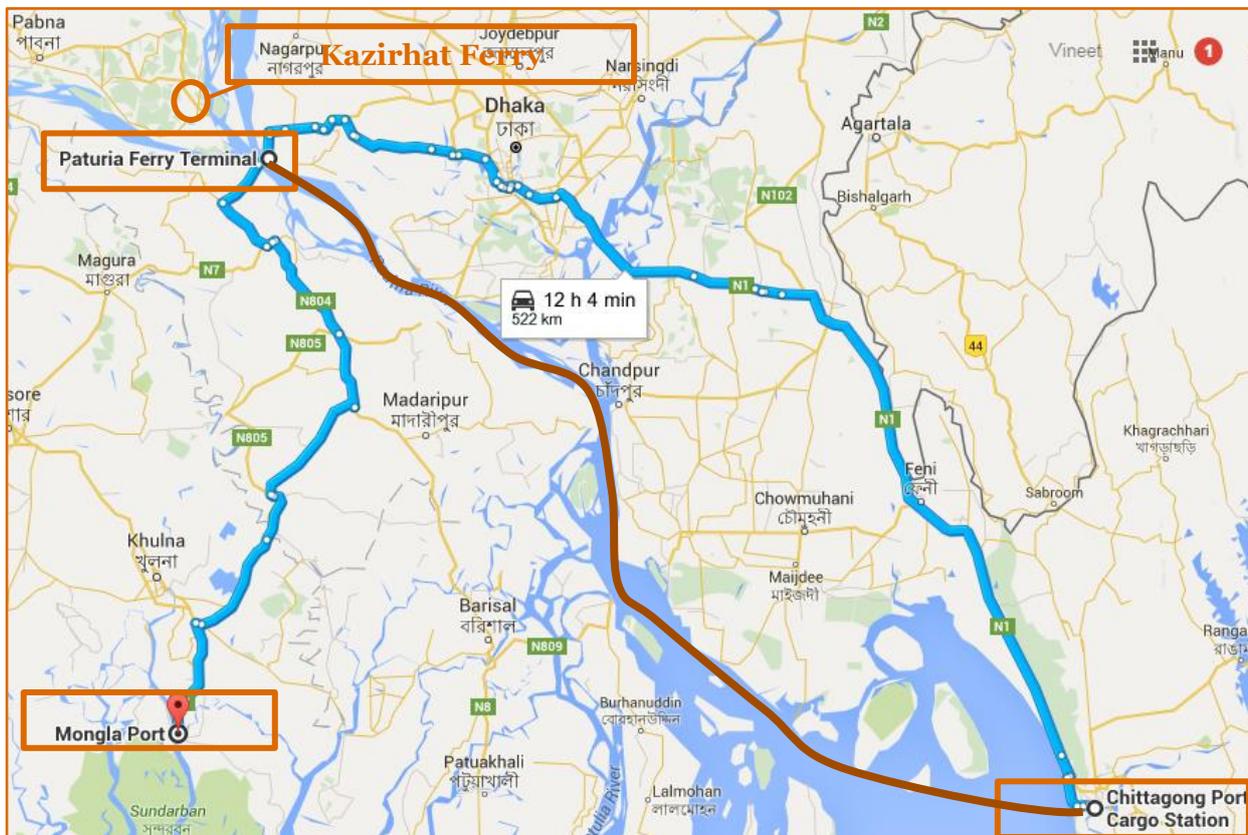
Figure: Draught Availability in Padma River



Basis secondary research, in August 2015, the water depth at Daulatia-Paturia ferry route was below 9 feet⁸⁶ and in September 2013 also, the water depth at Daulatia-Paturia channel was below 7 feet⁸⁷.

Location of Paturia port/ ferry terminal is such that Mongla port can be accessed by road after crossing the river up to Daulatia ghat. Chittagong port is accessible by both road and water mode of transportation. In the following figure, accessibility of Chittagong port from Paturia port by water mode is shown in red color and by road mode is shown in blue color.

Figure: Strategic location of Paturia Ferry terminal/ River Port



Source: Google Map and PwC analysis

⁸⁶ <http://www.daily-industry.com/?p=15216>

⁸⁷ <http://www.dhakatribune.com/bangladesh/2013/sep/02/bus-movement-daulatdia-paturia-ferry-ghats-halted-72-hours>

Paturia – Daulatdia Ferry service (3km route length)

Paturia – Daulatdia Ferry service across Padma River connects Manikganj to Faridpur district.

Figure: Paturia-Daulatdia Ferry Service

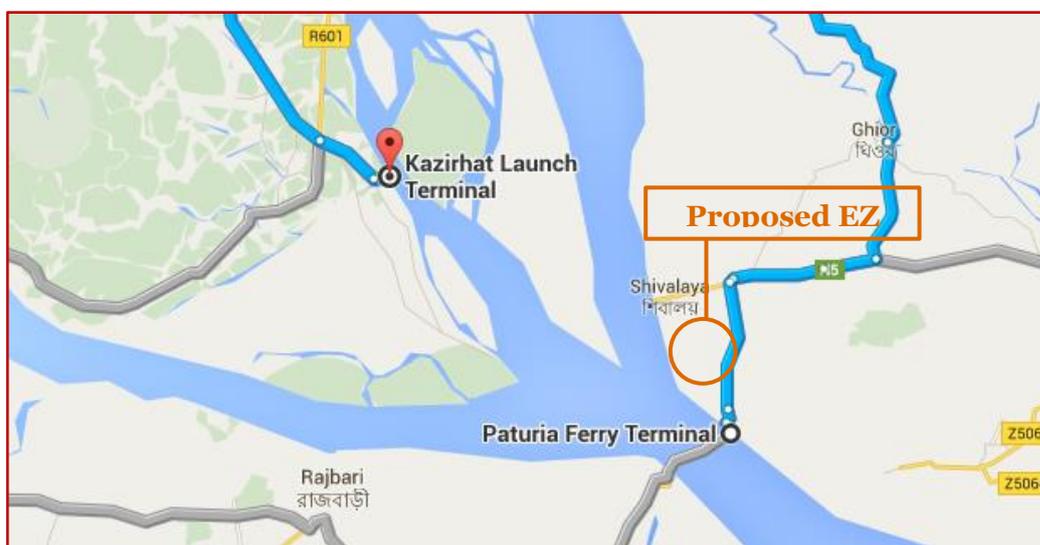


Source: Google Map and PwC analysis

Paturia – Kazirhat Ferry service (19 km route length)

Paturia – Kazirhat Ferry service connects Dhaka division to Rajshahi division of Bangladesh if seen from a larger view. This route is strategically important as it connects Dhaka to Pabna district (in Rajshahi division) through Manikganj district.

Figure: Paturia - Kazirhat Ferry service

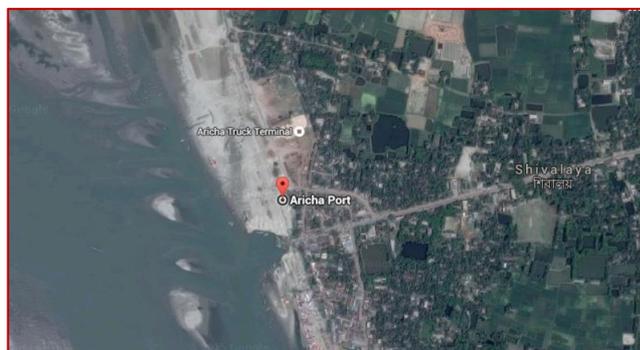


Source: Google map and PwC analysis

Aricha Port

Aricha river port is located adjacent to Paturia river port. Proposed EZ is located very near to Aricha port.

Figure: Aricha River Port



Details of river draught available near Aricha ghat were not available with the UNO officials. Basis discussion with local boatmen and fishermen, water draught at this region varies from around 3 to 3.5 m. However, due diligence needs to be undertaken to ascertain the same.

One important aspect that needs to be taken into account while deciding on the feasibility of the cargo transfer through waterways is the river draught. Following figure captures the river draught available on Chittagong and Mongla port routes.⁸⁸

Figure: Water depth available on routes from Mongla and Chittagong ports

5.5.5.2 River/Barge

Route	Water depth (m)	Distance (Km)
Chittagong - Dhaka	3.7	307
Chittagong - Mongla	3.7	369
Mongla - Dhaka	3.7	304
Mongla - Khulna	3.7	47
Mongla - Barisal	3.7	47

Table 28: Major barge routes from Mongla Port and Chittagong Port
Source: Bangladesh Water Transport Authority

Preliminary assessment indicates that to integrate the potential of the widespread waterways connectivity of Bangladesh with the proposed EZ, Paturia port or Aricha Port may be utilized for cargo transfer. Alternative to this, the option of developing a private jetty in the project area may also be further explored. Old Aricha ghat is located within the project area and it is non-functional. If a private jetty be constructed at the old Aricha ghat, it would provide easy access to waterways for amenable transfer of cargo. However, any decision pertaining to the same is subjected to detailed feasibility analysis.

⁸⁸ <http://www.adb.org/sites/default/files/project-document/81001/39460-012-tacr-01.pdf>

Figure: Old Aricha ghat



Potential for Cross-Border Trade

Connectivity to Mongla Port and Chittagong port could enable cross-border trade with countries like India, Myanmar, Singapore etc.

In June 2015, India and Bangladesh renewed a bilateral trade agreement and inked two separate pacts on coastal shipping the use of Bangladesh's Chittagong and Mongla ports. Indian merchant vessels can now use the two ports to directly ship cargo to Bangladesh, instead of routing goods through ports such as Singapore. This will bring shipping time down to a week or less.⁸⁹

Also, India and Bangladesh have agreed on the extension of Protocol on Inland Water Transit and Trade (PIWTT) with the provision of automatic renewal in line with the proposed amendment to Bangladesh-India trade agreement.⁹⁰ As per PIWTT, Narayanganj, Mongla, Khulna and two more ports are "Ports of Call" to provide facilities to the vessels of the India.

Basis preliminary assessment, proposed EZ is poised to facilitate cross border trade via its connectivity to widespread network of waterways.

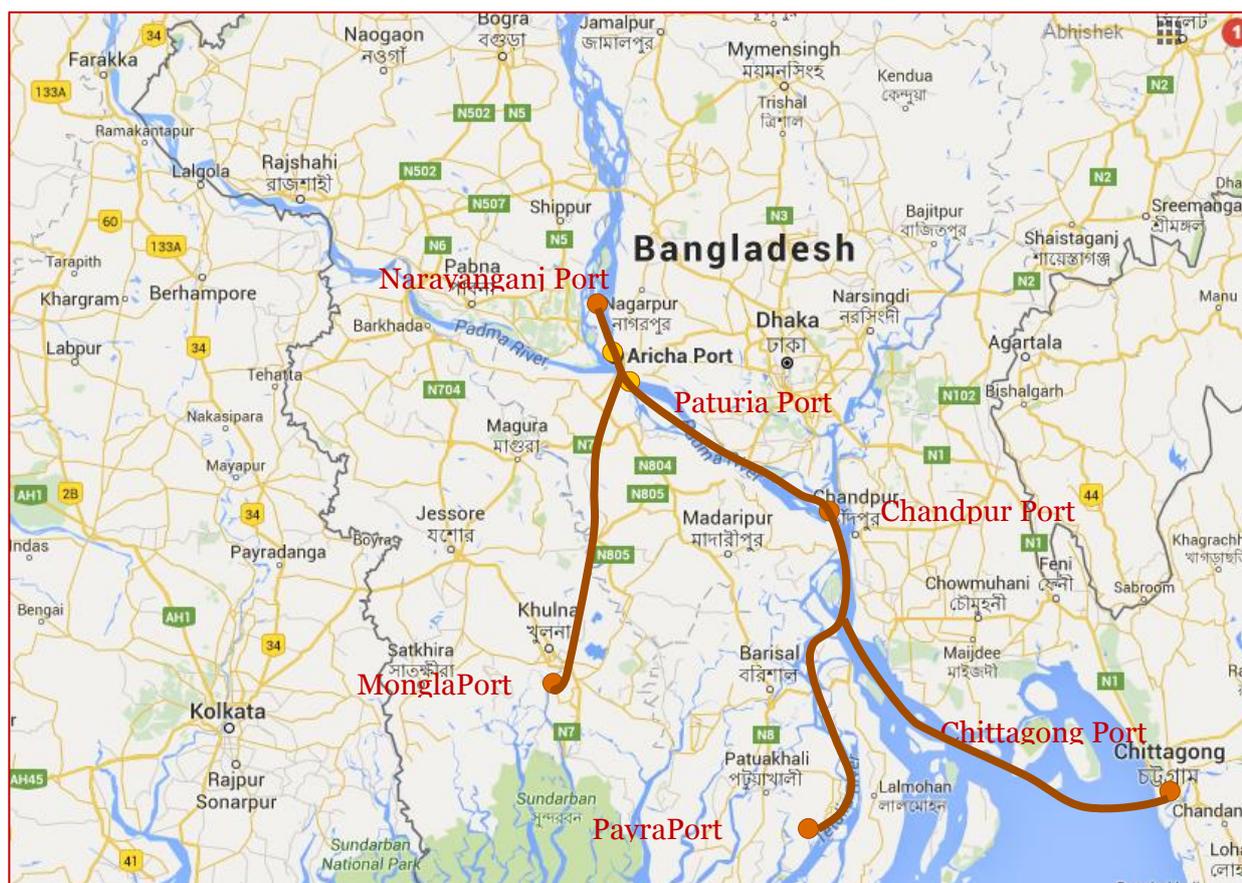
Macro level preliminary assessment indicates that the proposed EZ is well-connected to the widespread waterways' network of Bangladesh. While developing the proposed EZ, decision needs to be taken regarding utilizing the existing Aricha port or Paturia port. As an alternative, the option of developing private jetty at Old Aricha ghat may be further explored. However, these decisions are subjected to detailed feasibility analysis.

Following figure attempts to capture the waterways connectivity potential of the proposed EZ.

⁸⁹ <http://www.hindustantimes.com/india-news/modi-visit-all-you-need-to-know-about-india-bangladesh-pacts-on-boundary-and-trade-/article1-1355921.aspx>

⁹⁰ http://articles.economictimes.indiatimes.com/2015-04-21/news/61379041_1_inland-water-transit-bangladesh-delegation-bangladesh-side

Figure: Waterways connectivity potential of the proposed EZ



9.5.3.5. Intermodal Cargo Transfer

This section attempts to carry out a broad level assessment of the possibilities of linking the proposed EZ through different modes of transportation. All the other modes of transportation (other than road) require multimodal transport. Attempt has been made to evaluate the potential of integrating different modes of transportation with the proposed EZ. It is envisaged that integration of rail, water and air mode of transportation via road accessibility need to be assessed. However, this assessment is carried out at a broad level on the basis of the preliminary assessment. Any further decision on the same needs to be taken after detailed feasibility analysis

Rail Connectivity: No railway network exists in Shibalaya upzilla. Goalanda Bazar railway station is about 15 km from proposed EZ, but there is no direct road connectivity to this railway station due to presence of Padma River. Ferry ride is required from Paturia Ferry ghat to Daulatdia Ferry ghat to reach Goalanda Bazar railway station. Last mile connectivity (approach) to Goalanda Bazar rail station is via one LGED single lane bituminous road, which takes a bypass from Dhaka-Faridpur Highway (N7). Basis discussion with UNO officials, this traffic stagnation takes place in this LGED road and widening is also not possible as it is located in close proximity to a market place.

Connectivity to Goalanda Ghat rail station is via Dhaka-Faridpur Highway (N7). Basis secondary research, government has taken preliminary steps to construct about 6.10 km long second Padma multipurpose bridge at Paturia-Goalanda point. This bridge could establish direct connection between the capital and the west and south-west part of Bangladesh.⁹¹

Broad level assessment depicts that there is a possibility of integration of rail network to intermodal cargo transfer; however for the same, the conceived bridge needs to be developed to provide amenable

⁹¹ http://www.mof.gov.bd/en/budget/13_14/ber/en/chapter-11_en.pdf

access to cargo transfer. Also, development of cargo handling facility and storage facility could be explored at Goalanda Bazar rail station. This is subjected to detailed feasibility analysis.

Airport Connectivity: Proposed EZ is located about 77 km from Hazrat Shah Jalal International Airport at Dhaka. The travel time by road to Dhaka International Airport is 3.5 hours (approximate). Access to Hazrat Shah Jalal International Airport takes place via Dhaka Aricha highway (N5). It's a two lane bituminous road and road condition is favorable for passage of heavy vehicles.

Broad level assessment depicts that there seems to be a possibility of integration of airport to intermodal cargo transfer; however for the same, seamless access to airport needs to be further explored. Decision may be formulated on cargo handling and other pertinent infrastructure aspects. This is subjected to detailed feasibility analysis.

Waterways Connectivity: Proposed Manikganj EZ is located in proximity to Aricha port and Paturia port. Access to waterways could facilitate smooth transfer of cargo. In the previous section a macro level analysis has been carried out to capture the adequacy of these ports and inland waterways network of Bangladesh in terms of some key performance indicators (such as draught available, navigability, cargo facility etc.) and it seems that the possibility of integration of waterways connectivity for intermodal cargo transfer is comparatively better than the other modes of transportation.

Macro level preliminary assessment indicates that while developing the proposed EZ, decision needs to be taken regarding utilizing the existing Aricha port or Paturia port. As an alternative, the option of developing private jetty at Old Aricha ghat may be further explored. However, these decisions are subjected to detailed feasibility analysis.

9.6. Resettlement issues

9.6.1. Social impacts

The impacts have been assessed on the following parameters:

- (xxvii) Loss of land (for existing land owners),
- (xxviii) Loss of homes/structures,
- (xxix) Loss of Trees
- (xxx) Loss of livelihood systems/ income opportunity
- (xxxi) Loss of water bodies.
- (xxxii) Resettlement issues pertaining to approach road
- (xxxiii) Resettlement issues due to relocation of old Aricha Ghat Ferry terminal

The expected types of losses are described in the following sub-sections.

9.6.1.1. Loss of land

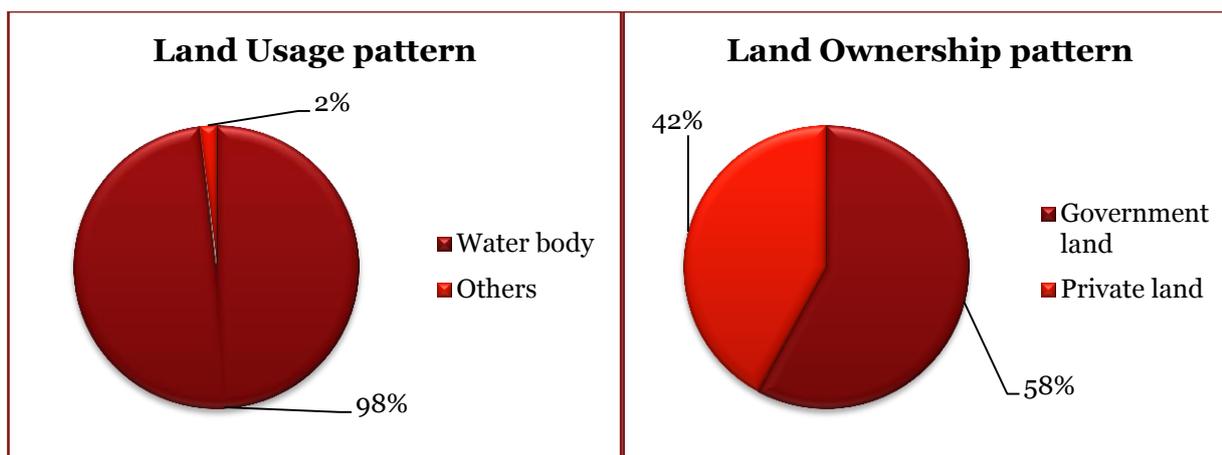
To establish the proposed EZ project, a total of 303.87 acres of land has been demarcated by the authority. As per Field Measurement Book (FMB) superimposed on google map the total area works out to approximately 309.67 acres. The land usage pattern for this area is as under:

- Water body- 303.87 acre (approx.)

Ownership pattern of the land is as follows:

- Government land- 175.74 acres
- Private land – 127.78 acres

Figure: Land Ownership and Usage pattern



Source: Data collected from Dohar UNO Office

9.6.1.2. *Loss of homes/structures*

There are no household structures present within the project area.

9.6.1.3. *Loss of trees*

There are no trees present within the project area.

9.6.1.4. *Loss of income/livelihood*

During site visit, it was observed that the surrounding villagers are parking their boats to reach the char land to undertake fishing activity. BIWTA operates boat service (near the proposed solar power plant) for transporting the passenger from this place to new ferry terminal in Paturia ghat and a few other areas nearby. Some temporary shops (basis preliminary assessment, around 25-30 in number) are also located nearby which are dependent on the ferry service to/from this area.

Basis discussion with local inhabitants, during dry season stocking of dredging sand and selling is being done by some private players which is transported through boat from Meghna River to this area.

As a result of the development of the proposed EZ, following local inhabitants would stand a chance to lose sources of income:

- Local fishermen
- Local Boatmen
- Temporary shop owners
- Local three wheeler drivers
- Labors involved in sand selling

Figure: Ferry service adjacent to the project area



Figure: Temporary shops adjacent to the project area



Basis interaction with UNO officials and local inhabitants, it seems that due to the development of the proposed EZ approximately 120-150 families could stand a chance to lose income. However, due diligence for the same needs to be carried out to ascertain the exact number.

9.6.1.5. Loss of water bodies

During site visit, it was observed that the entire project area gets submerged during high flood time. The proposed EZ and the surrounding areas have been observed as a rich fishing ground. Various types of fish cultures & traps are earmarked within the project site. As a result of the development of the proposed EZ, project interventions (i.e. filling up of the existing water bodies and discharge of waste water along the Padama River) might affect the fish spawning & nursing ground and subsequently income source of the local fishermen from pen culture (katha fishing). As a result of the same, significant environmental and social impacts are anticipated. Basis discussion with local inhabitants, it was

communicated to us that the water body is the only mean of transport for the villagers to reach char land throughout the year.

Figure: Fishermen's boats parked near the proposed EZ



9.6.1.6. Resettlement issues due to the construction of approach road

As discussed in section on road connectivity of the proposed EZ, all the five options of approach road connecting the proposed EZ are restricted owing to resettlement issues along the approach road.

Preliminary assessment suggests that the fifth option of approach road to the proposed EZ may be considered. This option is the best fit with respect to the former four options.

9.6.1.7. Resettlement issues due to the relocation of old Aricha Ghat

On the southern part of the project site, BIWTA old Aricha Ghat is located. Some temporary shops are also located at the entrance of the old Aricha ghat. Basis discussion with local inhabitants, old Aricha Ghat is not functional now and no ferry service takes place from this terminal.

Due to the development of the proposed EZ in Mainkganj, old Aricha ghat needs to be relocated to some other location. As a result of the same, pertinent resettlement issues need to be taken care of.

Figure: Old Aricha ghat



9.6.2. Constraints and its mitigation for resettlement aspects

The major constraints and its mitigation are presented in following table.

Table: Major Constraints and Mitigation measures

Sl. No.	Constraints	Mitigation measures
1	Low lying land	Basis preliminary assessment, landfilling of depth 18-22 feet needs to be undertaken.
2	Loss of income/ livelihood	As a result of the development of the proposed EZ, following local inhabitants would stand a chance to lose their income. <ul style="list-style-type: none"> ➤ Local fishermen ➤ Local Boatmen ➤ Temporary shop owners ➤ Local three wheeler drivers ➤ Labors involved in sand selling Broad level assessment indicates that as a result of the development of the proposed EZ, around 120-150 number of families could stand a chance to lose income. However, due diligence needs to be undertake to ascertain this number.
3	Resettlement issues due to the construction of approach road	Widening of existing approach roads connecting the proposed EZ is restricted owing to the presence of settlements located on both sides of the road. Preliminary assessment suggests that the fifth option of approach road to the proposed EZ may be considered. This option is the best fit with respect to the former four options (refer section on Road Connectivity)
4	Resettlement issues due to the relocation of old Aricha Ghat	As a result of the development of the proposed EZ, old Aricha ghat needs to be relocated to some other location. Basis discussion with local inhabitants, old Aricha ghat is not functional.

9.6.3. Block Cost Estimation for development of Offsite Infrastructure

Based on preliminary assessment and available information (the schedule of rates published by the competent public authorities, prevailing market prices, in-house data bank and experience gained over similar / comparable development), the Block Cost estimate for the proposed offsite infrastructure components required for developing EZ has been calculated.

Wherever applicable, we have considered all the possible options to arrive at the cost of development and the option of maximum development cost is considered to arrive at the total cost of the proposed offsite infrastructure development. This exercise has been carried out to indicate the approximate cost to be incurred for the development of EZ and it may vary to any extent during implementation stage depending upon the detailed technical information and new developments which may affect / contribute to this EZ. The techno-commercial viability of these options needs to be explored during feasibility stage.

Following table depicts the broad level Block Cost estimates for development of Offsite infrastructure for Manikganj EZ. The figures provided are indicative and may vary depending on the master planning, feasibility analysis and the timeline of development activities.

The broad Block Cost estimate for off-site infrastructure development for proposed Manikganj EZ is calculated as BDT 28,052 Lakh (approx.)

Table: Block cost estimation for proposed Manikganj EZ

Manikganj – EZ										
S.No	Description	Option -1			Option -2			Considered cost option		
		Qty	Unit	Amount in Lakh BDT	Qty	Unit	Amount in Lakh BDT	Qty	Unit	Amount in Lakh BDT
1	Site filling	Lumpsum		21038	Lumpsum		21038	Lumpsum		21038
2	Compound wall	7953	Mtr	756	7953	Mtr	756	7953	Mtr	756
3	Diaphragm wall	7953	Mtr	3181	7953	Mtr	3181	7953	Mtr	3181
4	Approach Road (10.50 mtr Carriage way)	0.26	Km	187	0.26	Km	187	0.26	Km	187
5	Electrical (External connectivity- 33 kv LINE with 33/11 KV substation)	7	Km	1220	7	Km	1220	7	Km	1220
6	Water supply - Water Intake from River - 6.38 MLD	1	Km	1670				1.00	Km	1670
7	Water supply (Water from Bore well- bore well 4 Nos - 6.38 MLD				5	Km	556			
Total				28052			26938			28052

Source: PwC and MACE analysis

9.7. Voice on the Ground

9.7.1. Stakeholder consultation

Following table lists the details of stakeholders consulted at UNO office to obtain first-hand information from about the proposed EZ.

Table: Stakeholders consulted

Name	Description	Phone number
A.K.M Galiv Khan	UNO	+8801711067411
Mr. Obaidu	GM(REB)	+8801769400047
Mr. Md. Khonioor Shiek	Heavy machinery operator	+8801711523007
Mr. Akhil	Engineer(Gas)	+8801977765817
Mr. Aslam Uddin	Mega feed, Manager	+8801717744152

9.7.2. Consultation with Private Sector

Further to the site visit for the initial assessment, private sector consultation was also carried out to understand the preliminary level demand assessment of the proposed EZ to gauge the interest of unit investors from various sectors. Some of the major aspects which were discussed with the private investors to understand their interest are as below:

- Location attractiveness
- Availability of physical infrastructure
- Availability of social infrastructure
- Ease of availability of quality manpower
- Marketability of the site
- Support required from the Government

We discussed the salient features of the proposed EZ of the proposed EZ with various investors in Bangladesh to understand how attractive this project is for them. Also, we tried to understand the macro level infrastructure requirements that any investor looks upon before making an investment decision. The results of the Private Sector consultation are summarized in the following table.

Table: Summary of the results of the Private Sector consultation

Sl. No.	Parameters	Discussions	Excerpts from the interaction (if any)
Infrastructure aspects that investors take into consideration while making investment decisions:			
1	Connectivity of the site	According to the investors, the EZ site should be located in the proximity of any industrial center &/or city. The connectivity by road and rail should be excellent and also the access to port is important as this will ease the conveyance of the finished goods to	<p><i>“Manikganj EZ is located in close proximity to Dhaka and as a result of this; industries would easily be able to transport goods.”</i></p> <p>- A K Khan & Company Limited, Bangladesh</p>

		<p>customers.</p> <p>Basis discussion with private sector, Manikganj is located in proximity to Dhaka city and it is easily accessible via Dhaka-Aricha highway. Access to IWT facilitates access to locations such as Jessore and Khulna on the other side of Padma River. Connectivity of the proposed EZ in Manikganj would enable seamless movement of raw materials and finished goods to/ from the project site.</p>	
2	Proximity to Port	<p>Access to port is very important for development of multi-product EZs as it will facilitate easy transportation of raw materials and finished goods.</p> <p>However, the proposed site is not located near to any major sea port of Bangladesh. Private sector investors expressed concern that in such as case, conveyance of goods might be a problem.</p>	<p><i>“Manikganj project site is not located adjacent to any sea port and hence cost of transport of goods would be a problem.”</i></p> <p>- Orion Group, Bangladesh</p>
3	Utility Connection	<p>For a multi-product EZ to function and for manufacturing units to effectively continue production, utility connection is a prerequisite.</p> <p>According to unit investors, gas supply is not adequate in the proposed EZ and as a result of the same it might be difficult for the heavy industries to operate in this EZ.</p>	<p><i>“Availability of Gas, Power and Water is the prerequisite to set up any manufacturing based industry.”</i></p> <p>- NASSA Group, Bangladesh</p>
Marketability of proposed Manikganj EZ:			
4	Location of the site	<p>Investors opined that the location of the proposed EZ is attractive for domestic investors as it is located in proximity to Dhaka city.</p>	<p><i>“EZs located in close proximity to Dhaka would facilitate easy sourcing of raw materials and would ensure availability of quality</i></p>

		Also, locations such as Jessore and Khulna are accessible from the proposed EZ and as a result of the same cargo transfer and sourcing of quality manpower would be easy for the private sector.	manpower.” -A K Khan & Company Limited, Bangladesh
5	Demand among local and foreign investors	<p>Considering the location and other facilities available, the demand for development of units in the proposed EZ in Manikganj should be quite high.</p> <p>According to private sector, local investors would be able to easily transfer cargo from this location. Further to this, private sector also informed us that the domestic investors from Bangladesh prefer locations close to major cities and industrial hub so that they can benefit from the existing industrial ecosystem.</p> <p>Due to the non-proximity to any sea port, private sector investors opined that foreign investors &/or export oriented units might not get interested in the proposed EZ.</p>	<p><i>“Demand among local investors is expected to be high.”</i></p> <p>- Orion Group, Bangladesh</p>

9.8. Overall Adequacy of the EZ Site in Manikganj

Evaluation of the proposed EZs with respect to key parameters required to establish multi product economic zones are presented in following table.

Table: Overall Adequacy of the Manikganj EZ Site

Sl. No.	Parameters	Illustration of the present facilities	Remarks/ Analysis	
A	Connectivity			
1 (A)	Road Connectivity Existing Road Connectivity to Dhaka and other major cities of Bangladesh	<ul style="list-style-type: none"> ➤ Proposed EZ in Manikganj is well-connected to Dhaka by Dhaka-Aricha Highway. Distance by road is 75km (approximate). During site visit, it was observed that the road condition is smooth and favorable for passage of heavy vehicles. ➤ Proposed EZ is connected to Jessore. Road distance is approximately 155 km and travel time is around 4.5-5 hours. This route includes ferry ride at Paturia ferry terminal. 	<p>For any Multiproduct EZ to develop the site must be near to the main city and the connectivity via road should be excellent.</p> <p>Proposed EZ in Manikganj is connected to Dhaka and Jessore.</p> <p>Seamless cargo transfer to Dhaka seems to be possible, however for Jessore it involves crossing the river.</p>	
1 (B)	Road Connectivity Last Mile Connectivity	<p>Five options of approach road exist for the proposed EZ and these provide access to Dhaka-Aricha Highway.</p> <p>Broad level initial assessment depicts that Aricha Launch ghat road is a bituminous road of width 20 feet (approximate) and length of this alignment is around 1-1.5 km. It originates from Aricha Launch ghat and ultimately meets Dhaka-Aricha Highway near Shibalaya Police Station. This approach road is the best fit out of the five options.</p>	<p>The alignment for an approach road is essential for developing a multiproduct EZ as it shall enable the access for the manpower and heavy commercial vehicles to national highways and expressways.</p> <p>Broad level assessment indicates that all the existing options of approach road attract resettlement problem. Fifth option of approach road is comparatively better than the other four options.</p>	

			However, decision regarding approach road subjected to topography survey and detailed feasibility analysis.	
2	Rail Connectivity	<ul style="list-style-type: none"> ➤ No rail network exists in Shibalaya upzilla. ➤ Goalanda Ghat railway station is about 15 km from proposed EZ, but there is no direct road connectivity to this railway station due to presence of Padma River. Ferry ride is required from Paturia Ferry ghat to Daulatdia Ferry ghat to reach Goalanda Ghat railway station. ➤ Connectivity to Goalanda Ghat rail station is via Dhaka-Faridpur Highway (N7). 	<p>Rail mode of transportation is vital for goods with high volume and timeliness of delivery.</p> <p>There is no rail station in the vicinity. Cargo transfer to Goalanda ghat rail station involves river crossing.</p>	
3	Waterways Connectivity	<ul style="list-style-type: none"> ➤ Proposed EZ has good access to waterways connectivity. ➤ Project site is located near to Paturia and Aricha river port. <ul style="list-style-type: none"> ○ Paturia – Daulatdia (Faridpur district, Khulna division) Ferry service ○ Paturia – Kazirhat (Pabna district, Rajshahi division) Ferry service ➤ Macro level assessment indicates that upon development of the proposed EZ, old aricha ghat could be developed as a cargo terminal. Decision on the same is subjected to detailed feasibility analysis. 	<p>Connectivity to IWT is essential for easy transfer of labor, raw material from local sourcing and for transfer of finished goods to nearby areas to cater to the local demand.</p> <p>Proposed EZ in Manikganj is well connected to Waterways and major ports of Bangladesh are accessible from the proposed EZ by water mode of transportation.</p>	
4	Airport Connectivity International airport in the proximity	<ul style="list-style-type: none"> ➤ Manikganj EZ is located about 77 km away from Hazrat Shah Jalal International Airport in Dhaka and approximate travelling time by road is approximately 3.5 hours. ➤ Govt. of Bangladesh intends to construct a new international airport (Bangabandhu Sheikh 	<p>For movement of goods by air cargo, proximity to airport is essential.</p> <p>Dhaka Airport is 77 km (approximate) from the proposed EZ. Cargo transfer</p>	

		Mujib International Airport) with a view to create a hub airport in close proximity to Dhaka and to meet the demand of future growth in aviation sector. Location for the same is yet to be finalized.	from the proposed EZ to the airport needs development of adequate infrastructure.	
B	Utility Connections			
1	Power Availability	<ul style="list-style-type: none"> ➤ 5 MVA surplus power is available from 33/11 KV substation located in Uthli (approximately 7-8 km away from the proposed EZ). ➤ 33/11 KV substation of 10 MVA capacity is under construction in Kathersen mouza (located within 5 km from the proposed EZ). It is expected to be commissioned by 2017. ➤ 132/33 KV grid substation of 70 MVA capacity is proposed in Borangal (located at a distance of approximately 10 km from the proposed EZ). Site selection for the same is yet to take place. ➤ 30 MW solar power plant is proposed near the project site. This project is at feasibility stage. 	<p>24×7 uninterrupted electricity supply is a prerequisite for development of any manufacturing facility.</p> <p>Basis working knowledge and best practices followed, power requirement in a typical EZ could be transmitted by a dedicated 33 KV line for demand up to 25 MW. If the demand is more than 25 MW, then the option of 132 KV transmission lines needs to be further explored. Proximity to 33 KV power connection and surplus power availability in the vicinity of the proposed EZ are the crucial factors to decide on the potential of power availability to the proposed EZ.</p>	
2	Water Availability	Preliminary assessment suggests that the water requirement could be met either by extracting water from the Padma River or from deep tube well. Bore wells could be developed in the char land which is located adjacent to the project area. Further, our preliminary assessment also suggests that extracting water from the river located on the western boundary of the proposed EZ may be considered by providing suitable intake system and water treatment plant.	<p>It is very important to have adequate and sustainable source of potable water for the development of multiproduct EZ so that the labours don't face any scarcity of drinking water. The industrial units need uninterrupted supply of good quality water for industrial consumption.</p> <p>Drawing water from Padma river may be considered (in addition to using bore</p>	

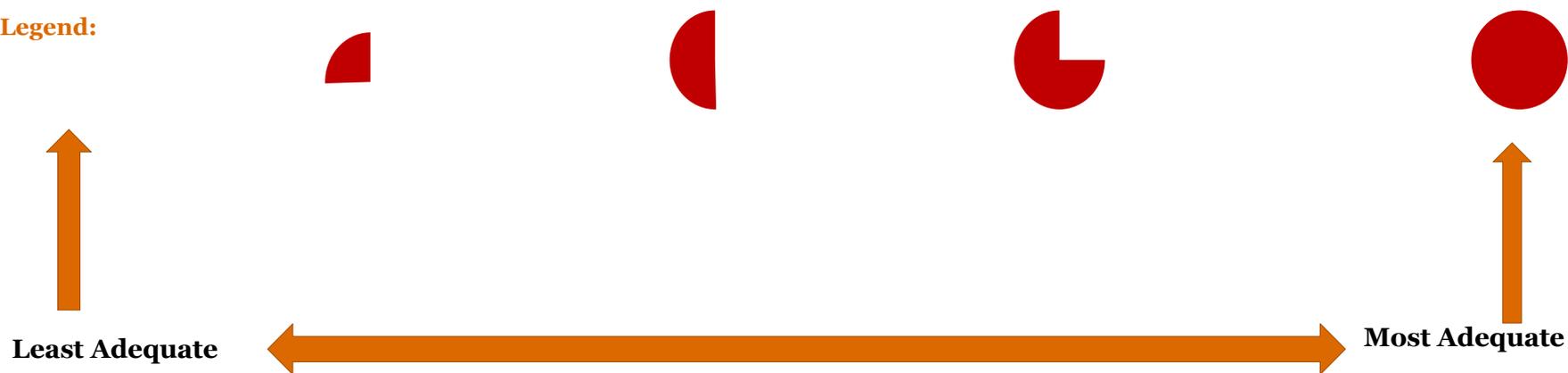
		Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Manikganj EZ is around 2.58 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could be extracted through bore wells. Extraction of more water through bore wells might result in depletion of the aquifer level.	well) subject to detailed study. Proposed site has proximity to Padma River, thus the option of extracting water from Padma River may be further explored. Decision regarding extraction of water from bore well/ Padma River needs to be taken after detailed feasibility analysis.	
3	Gas Availability	<ul style="list-style-type: none"> ➤ Local gas substation of Titas is located at a distance of around 5 km from the proposed EZ. ➤ Distribution line from the gas substation is available up to Aricha Ghat (around 150 feet from the proposed EZ). It was communicated to us that the gas pressure capacity at the local substation is 150 psi. ➤ However pressure obtained in this region is not adequate and regular fluctuations in gas pressure have been observed. ➤ Basis discussion with Titas officials, another gas distribution line (of capacity 250 psi) from Tongi to Manikganj is proposed. 	Gas supply is a prerequisite for development of any manufacturing facility. Preliminary assessment indicates that the option of necessary tapping from this existing line for the proposed EZ could be further explored.	
C	Suitability for industrial development			
1	Existing industrial ecosystem and Possible Backward linkages for industries	<ul style="list-style-type: none"> ➤ Major natural resources in this region are: sand extracted from Padma River, jute, rice, maize, seasonal vegetables and fish. ➤ BSCIC industrial complex in Manikganj has some industrial units pertaining to textile and apparels. 	Existing industrial ecosystem facilitates easy development of industries in the economic zone based on backward linkages and ease in raw material sourcing.	

		<ul style="list-style-type: none"> ➤ Tangail district is located adjacent to Manikganj and it has experienced proliferation of small and cottage scale industries based on sugar, textile, cold storage, knit wear etc. ➤ Surrounding Sirajganj district is renowned for silk production and related industries, dairy and milk products, rice mill, oil mill etc. 	Proximity to Dhaka, Tangail and Sirajganj would enable industries (based on backward and forward integration of existing industries) to develop in the proposed EZ.	
2	Proximity to major cities	Manikganj EZ is located in proximity to Dhaka. Also, the project site has access to Jessore (via Paturia ferry ghat).	Proximity to major cities facilitates the proliferation of industrial development. Existing industrial ecosystem provides access to raw material sourcing and skilled manpower.	
D	Challenges in developing the economic zone (Resettlement Issues and social aspects)			
1	Landfilling	Basis preliminary assessment, landfilling of depth 18-22 feet needs to be undertaken.	Landfilling has to be done for the entire site, which means some initial cost has to be borne before the commencement of the development works. Depth of landfilling is more than the average depth of landfilling for the six sites.	
2	Other Resettlement Issues	<ul style="list-style-type: none"> ➤ As a result of the development of the proposed EZ, old Aricha ghat (non-functional) needs to be relocated to some other location. ➤ Local inhabitants who would stand a chance to lose income are: local fishermen, local boatmen, temporary shop owners, local three wheel drivers etc. Around 120-150 families stand a 	Mentioned resettlement aspects need to be considered before the development of the economic zone project.	

		<p>chance to lose income as a result of the development of the proposed EZ.</p> <ul style="list-style-type: none"> ➤ All the five options of existing approach road involve resettlement issues. 		
E	Availability of Social Infrastructure			
1	Availability of good residential facility in the nearby areas	<p>The proposed EZ is located 23 km away from Kusthia town. Dwelling units and residential facilities are available for labours in Shibalaya and Manikganj.</p>	<p>The labours working in the proposed EZ shall have access to the dwelling units and residential areas within close proximity to the proposed EZ.</p> <p>To cater to the requirement of residential facilities for the executive level employees in the proposed EZ, the option of developing residential facilities inside the EZ may be considered in the master planning stage.</p>	
2	Medical facilities available in the nearby areas	<p>One government hospital (Upzilla Health Complex) is available in Manikganj district with 50 beds. Manikganj Sadar hospital is located in proximity to the proposed EZ.</p> <p>There is an eye hospital adjacent to the proposed EZ.</p> <p>Monno Medical college & Hospital is located in Manikganj (around 20 km away from the proposed EZ)</p>	<p>There are few medical facilities available within 10 km radius of the proposed EZ to cater to the healthcare requirements of the workforce.</p> <p>Major healthcare facilities are available in Dhaka (around 3-4 hours journey from Shibalaya upzilla).</p>	
3	Air and water pollution at the site (prevailing condition)	<p>The site is free from air and water pollution and no significant noise was observed when the site visit was undertaken.</p>	<p>The location of any multi product EZ should ideally be free from air and water pollution. Pollution would lead to health</p>	

		The incidence of water and air pollution at the site is insignificant. Also, the incidence of water borne diseases wasn't recorded in the locality.	hazards and non-conductive working environment for the workforce. From the initial site assessment, it appears that the site is free from all such pollution problems.	
4	Availability of manpower	<p>Manikganj district has 28 colleges (government and non-government colleges) and 154 secondary schools (government and non-government schools). The district also has 1 medical college and 2 technical and vocational institutions.</p> <p>Some of the Technical institutes located in the radius of 50 km (approx.) from the proposed EZ are:</p> <ul style="list-style-type: none"> • Manikganj Technical School and College • National Institute of Textile Engineering & Research, Nayarhat • Faridpur Polytechnic Institute 	<p>Availability of manpower is a prerequisite in development of multiproduct economic zones.</p> <p>Quality manpower could be sourced from the technical institutes located in Manikganj, Nayarhat, Faridpur etc.</p> <p>Manpower requirements could also be sourced from Dhaka (located at a distance of 80 km (approx.) from the proposed EZ)</p>	

Legend:



9.9. SWOT Analysis of Manikganj Economic Zone

Based on the detailed analysis carried out in the above, SWOT analysis of the proposed EZ is depicted below:

Parameters	Strengths	Weaknesses
Last mile connectivity		Five options of approach road exist for the proposed EZ and these provide access to Dhaka-Aricha Highway. However, all the approach roads have resettlement problems. Best-fit for approach road is Aricha Launch ghat road.
Water availability inside the proposed EZ	Proposed EZ is located adjacent to Padma River. Preliminary assessment suggests that the water requirement could be met either by extracting water from the Padma River or from deep tube well. Bore wells could be developed in the char land which is located adjacent to the project area.	Basis discussion with UNO officials, ground water is available at a depth of 100-120 feet (approx.) from natural ground level.
Block cost of off-site infrastructure development		Block cost estimate for off-site infrastructure development is BDT 28,052 lakh. Block cost estimate for off-site infrastructure development for unit area is calculated at 92.44 BDT lakh per acre, which is fifth lowest.
Social and resettlement aspects		<ul style="list-style-type: none"> Landfilling of around 18-22 feet is envisaged Local inhabitants who would stand a chance to lose income are: local fishermen, local boatmen, temporary shop owners, local three wheel drivers etc. Around 120-150 families stand a chance to lose income as a result of the development of the proposed EZ. As a result of the development of the proposed EZ, old Aricha ghat (non-functional) needs to be relocated to some other location.
Cost of private land acquisition		Around 127.78 acre of private land need to be acquired which would result in a cost of BDT 1405.58 lakh. Proposed EZ stands at third lowest figure for cost of land acquisition.
Parameters	Opportunities	Threats
Road connectivity	Proposed EZ in Manikganj is well-connected to Dhaka by Dhaka-Aricha Highway. Distance by road is 75km (approximate). During site visit, it was observed that the road condition is smooth and favorable for passage of heavy vehicles.	Proposed EZ is connected to Jessore. Road distance is approximately 155 km and travel time is around 4.5-5 hours. This route includes ferry ride at Paturia ferry terminal.
Rail connectivity	<ul style="list-style-type: none"> Dhaka (Kamalapur) rail station is located at a distance of around 80-85 km from the proposed EZ and 	<ul style="list-style-type: none"> No rail network exists in Shibalaya upzilla. Goalanda Ghat railway station

	access takes place via Dhaka-Aricha highway.	is about 15 km from proposed EZ, but there is no direct road connectivity to this railway station due to presence of Padma River. Ferry ride is required from Paturia Ferry ghat to Daulatdia Ferry ghat to reach Goalanda Ghat railway station.
Waterways connectivity	<ul style="list-style-type: none"> Proposed EZ has good access to waterways connectivity. Project site is located near to Paturia and Aricha river port. Macro level assessment indicates that upon development of the proposed EZ, Paturia or Aricha port needs to be utilized for cargo transfer. As an alternative, old aricha ghat could be developed as a cargo terminal. Decision on the same is subjected to detailed feasibility analysis. 	
Air connectivity	Manikganj EZ is located about 77 km away from Hazrat Shah Jalal International Airport in Dhaka and approximate travelling time by road is approximately 3.5 hours.	
Power connection	<p>Following power connections are available in the proximity of the proposed EZ:</p> <ul style="list-style-type: none"> 5 MVA surplus power is available from 33/11 KV substation located in Uthli (approximately 7-8 km away from the proposed EZ). 33/11 KV substation of 10 MVA capacity is under construction in Kathersen mouza (located within 5 km from the proposed EZ). It is expected to be commissioned by 2017. 132/33 KV grid substation of 70 MVA capacity is proposed in Borangal (located at a distance of approximately 10 km from the proposed EZ). Site selection for the same is yet to take place. 30 MW solar power plant is proposed near the project site. This project is at feasibility stage. 	
Gas connection	<ul style="list-style-type: none"> Local gas substation of Titas is located at a distance of around 5 km from the proposed EZ. Distribution line from the gas substation is available up to Aricha Ghat (around 150 feet from the proposed EZ). It was communicated to us that the gas pressure capacity at the local substation is 150 psi. 	<ul style="list-style-type: none"> However pressure obtained in this region is not adequate and regular fluctuations in gas pressure have been observed. Basis discussion with Titas officials, another gas distribution line (of capacity 250 psi) from Tongi to Manikganj is proposed.
Existing industrial	<ul style="list-style-type: none"> Major natural resources in this region are: sand extracted from 	Industrial proliferation hasn't grown in Shibalaya upzilla.

ecosystem and Possible Backward linkages for industries	<p>Padma River, jute, rice, maize, seasonal vegetables and fish.</p> <ul style="list-style-type: none"> • BSCIC industrial complex in Manikganj has some industrial units pertaining to textile and apparels. • Tangail district is located adjacent to Manikganj and it has experienced proliferation of small and cottage scale industries based on sugar, textile, cold storage, knit wear etc. • Surrounding Sirajganj district is renowned for silk production and related industries, dairy and milk products, rice mill, oil mill etc. 	
Proximity to major cities	Manikganj EZ is located in proximity to Dhaka.	
Access to quality manpower	<ul style="list-style-type: none"> • Manikganj district has 28 colleges (government and non-government colleges) and 154 secondary schools (government and non-government schools). The district also has 1 medical college and 2 technical and vocational institutions. • Around 3 technical training centres are located within 50 km radius of the proposed EZ. 	Quality manpower could be sourced from the technical institutes located in Manikganj, Nayarhat, Faridpur etc. Manpower requirements could also be sourced from Dhaka (located at a distance of 80 km (approx.) from the proposed EZ)
Availability of medical facilities	<ul style="list-style-type: none"> • One government hospital (Upzilla Health Complex) is available in Manikganj district with 50 beds. Manikganj Sadar hospital is located in proximity to the proposed EZ. • There is an eye hospital adjacent to the proposed EZ. • Monno Medical college & Hospital is located in Manikganj (around 20 km away from the proposed EZ). 	However for serious medical treatment, local inhabitants need to travel to Dhaka.
Availability of residential facilities	Dwelling units and residential facilities are available for labours in Shibalaya and Manikganj.	No international standard residential facilities are available in the vicinity to the proposed EZ.

Shariatpur Zajira EZ

10. Shariatpur Zajira Economic Zone

10.1. Location Details and Salient Features

10.1.1. General Profile of Shariatpur District

Geographical Location

Shariatpur was a sub-division of Faridpur District. It was upgraded to a district in March, 1984. It is located at the southern part of Bangladesh, around 100 km from Dhaka, the capital of Bangladesh.

Shariatpur district is surrounded by:

- North- Padma River and Munshiganj district,
- East- Padma River and Chandpur district,
- South- Barisal district
- West- Madaripur district

It lies between 23°01' and 23°27' North latitudes and between 90°13' and 90°36' East longitudes. The district spreads over an area of about 1174.05 sq. km.⁹²

The district consists of 6 upazilas:

- Bhedarganj
- Damudya
- Gosairhat
- Naria
- Shariatpur Sadar
- Zajira

Proposed EZ is located in Zajira upzilla. Naria and Shariatpur Sadar upzilla are in close proximity to the proposed EZ.

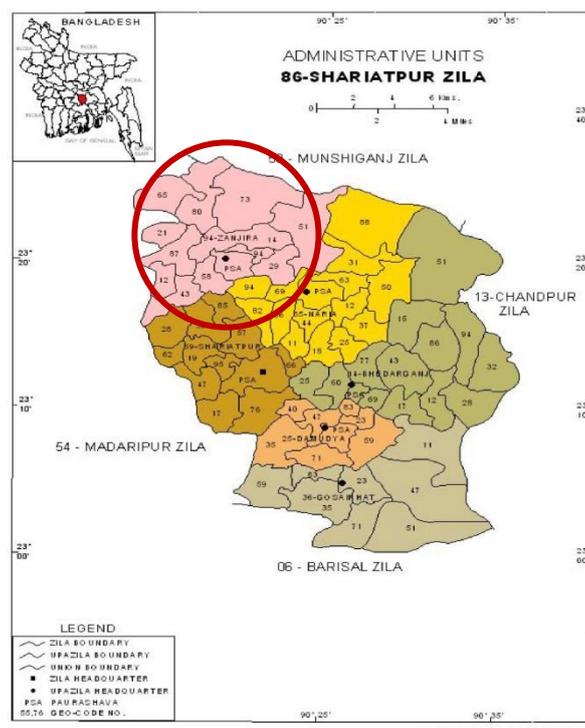
Demographics

As per Housing and Population Census 2011, Shariatpur district has overall population of 1,154,824. Upzilla wise population details as per census are presented in following table.

Table: Upzilla wise population details of Dhaka District

Name	Status	Population Census		
		2001	2011	Growth
Shariatpur	District	1,082,300	1,154,824	6.7%
Bhedarganj	Sub district (Upazila)	237,769	253,234	6.5%
Damudya		116,643	109,003	-6.5%
Gosairhat		124,014	157,655	27.1%
Naria		225,536	231,644	2.7%
Shariatpur Sadar		199,016	210,259	5.6%

⁹² Shariyatpur District website, <<http://www.shariyatpur.gov.bd>>



Source: Shariatpur District Website

Zajira		179,322	194,019	8.2%
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Climate Condition

The annual average temperature of Shariatpur district varies from maximum 37.8°C to a minimum of 12.6°C. Average annual rain fall of this district is 2105 mm.⁹³

Agriculture

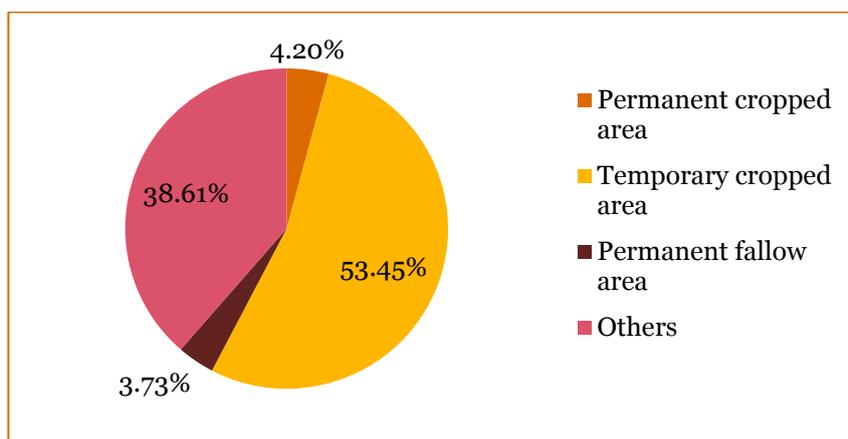
Total agriculture land in Shariatpur district is 793.2 sq. km., which amounts to approximately 67.5% of the total area of the district.⁹⁴

Major agriculture crops cultivated in the district are paddy, jute, sweet potato, wheat, oil seeds, potato, onion, garlic, tomato etc.

Major horticulture crops in this district are blackberry, mango, banana and wood apple.

Major portion of the agriculture land is utilized as temporary cropped area in this district. The land use pattern of the agriculture land for the year 2008 is presented in the following figure.

Figure: Land use pattern (2008)



Source: District Statistics 2011, Shariatpur, published by Bangladesh Bureau of Statistics (BBS)

Irrigation

Irrigated area classifications fall into two categories:

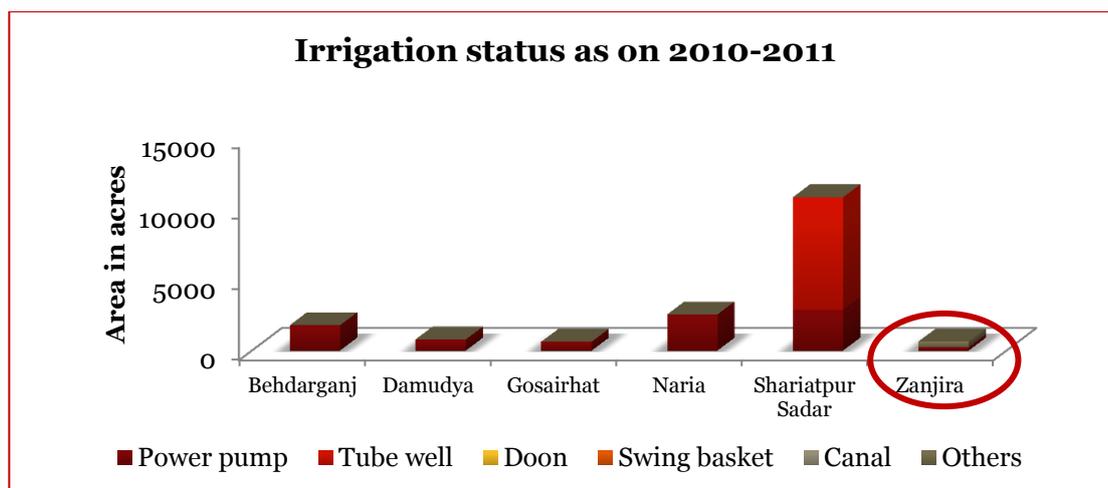
- Surface water irrigation with main water sources being rivers, canals, ponds, and other water bodies;
- Underground water irrigation with water lifted by shallow tube-wells, deep tube wells, and country traditional devices.

Currently, 30.9% of total agricultural area is under irrigation in this district. The percentage of total area under irrigation in Zanjira upzila is only 1%. Upzila wise the method of irrigation during the year 2010-11 is presented in the following figure.

⁹³ District Statistics, BBS 2011

⁹⁴ District Statistics, BBS 2011

Figure: Irrigation Status (2010-11)



Source: District Statistics 2011, published by Bangladesh Bureau of Statistics (BBS)

10.2. Broad Level Market Potential Assessment of the proposed EZ

Proposed EZ is located in Zajira upzilla in Shariatpur district. This district is surrounded by Munshiganj district in north, Barisal district in south, Chandpur district in east and Madaripur district in west. Project site is located at a distance of around 90 km from Dhaka and the access is via Dhaka-Mawa highway and ferry crossing from Mawa ghat. Alternate access to the project site is via Kawrakandi ferry ghat. Proposed EZ is located at a distance of approximately 35 km from Kawrakandi ferry ghat and approximately 15 km from Shariatpur ferry ghat.

The economy of Shariatpur district is predominantly agricultural. Out of total 225,523 holdings of the district, 65.89% are agriculture farm holdings that produce varieties of crops, namely local and HYV paddy, wheat, vegetables, spices, cash crops, pulses and others. Fish of different varieties abound in the district.

Proliferation of industrial development hasn't taken place in this district. There are a total of 405 small scale and 3118 cottage scale industries are functional in this district.⁹⁵ Bangladesh Small and Cottage Industries Corporation (BSCIC) Industrial Complex is located in Shariatpur Sadar. According to district website, a total of 149 plots are being occupied by 142 industrial units in the industrial complex.

Some of the major industries functional in this district are: rice mill, saw mill, wheat mill, cold storage, oil mill, brick field etc bamboo and cane industry, wooden furniture industry, electronics, gas etc. Recently, it has been observed that tourism is also a major industry in coming up in Shariatpur District.

Table: Distribution of Industries of Shariatpur district

Company type	Number
Garments Factory	0
Textile Mills	0
Rice Mills	162
Match Factory	0
Steel and engineering	0
Aluminum	0
Jute Mills	0
Others	0

⁹⁵ <http://www.shariatpur.gov.bd/node/465029/>

Source: Dhaka District Statistics, BBS 2011

On the south side of the EZ, in Barisal district, several big industries are operating. A snapshot of the same is provided below:

- Pharmaceuticals (such as Opso Pharma etc.)
- Saline (such as Opso Saline etc.)
- Cement (such as Anchor cement etc.)
- Biscuit and Food Processing (such as Bengal Biscuit etc.)

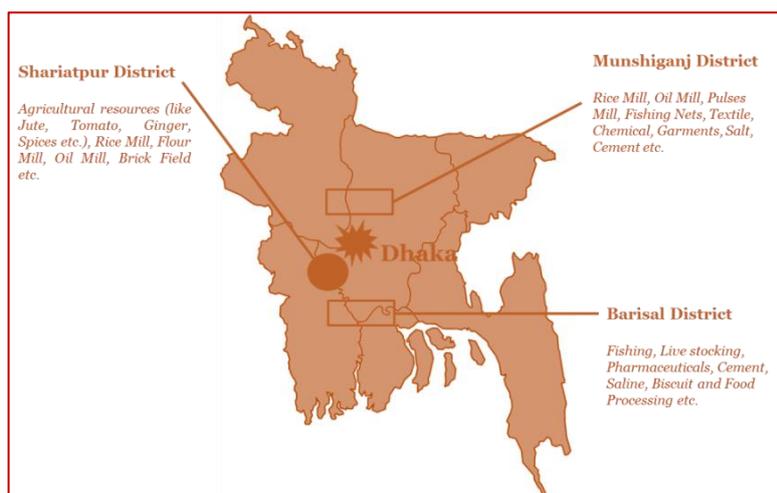
Barisal is one of the major sources for cultivation of food grains and fisheries in the country. It is known as “Venice of Bengal”; some of the major crops cultivated in this area are: rice, paddy, seasonal vegetables etc. Fishery and live stocking takes place in abundance in this region. Barisal river port is a very important river port in Bangladesh.

Munshiganj district is industrial powerhouse of Bangladesh. This district has maximum number of cold storages in Bangladesh. There are several rice mill, oil mill, pulses mill and maida mill located in this region. Apart from this, other major industries in Munshiganj district are: textile, chemical, garments, fishing net, salt and cement.

Snapshot of industrial landscape in Munshiganj is captured below:

- Cold Storage: 67 in number
- Cement: 6 in number
- Salt Factory: 2 in number
- Paper Factory: 2 in number
- Shipbuilding Industry: 3 in number

Following figure depicts the landscape of industry and natural resources in and around Zajira.



Location of the proposed EZ is in close proximity to the approach of Padma Bridge. Once Padma Multipurpose Project and Bhanga-Biswa Road are operational, proposed EZ would be connected to Jessore, Khulna and Dhaka. This in turn would enable smooth access to Chandpur Port and Mongla Port. As a result of the same, industries dependent on logistics would stand to gain.

A detailed assessment carried out as above indicates that the proposed EZ stands to leverage from the agricultural production from Shariatpur district and surrounding areas. Food processing and agro processing based industries may stand a chance as it would be able to locally source the raw materials from the vicinity.

Barisal and Munshiganj districts are known as industrial hubs of Bangladesh. Downstream and upstream industries based on the existing industrial ecosystem in these two districts are also prospective for the proposed EZ in Zajira.

Fertile land in this area leads to cultivation of varieties of crops such as rice, paddy, sugarcane, mustard, onion, garlic, pepper, tomato, spices etc. Based on the natural resources and connectivity potential of the

area, industries based on agro processing, spices manufacturing and food processing are supposed to gain significantly from the proposed EZ.

Ferry terminals located in close proximity to the proposed EZ and the project site is situated near to Padma River. Potential assessment for Shipbreaking/ Shipbuilding industries may also be considered for the proposed EZ.

To cater to the requirements of machineries and equipment for the operation and process of agro processing, shipbuilding, construction materials etc. light engineering industry may also be conceived.

10.3. Reconfirmation of the proposed EZ

10.3.1. Location of the proposed EZ

The proposed Economic Zone falls in Zajira upazila, North-West part of Shariatpur district.

Reconfirmation of site details is presented in following table.

Table: Reconfirmation of site details

Parameters	Details
Site co-ordinates	23°20'52.99'' N - 23°22'7.75'' N & 90°16'54.21'' E - 90°18'5.70'' E
Site boundaries on East	Canal, Jalmahal (fishing land), Shariatpur - Kawrakandi Zilla road (Z8012)
Site boundaries on West	Settlements , agricultural activity
Site boundaries on North	Canal, Proposed Eco- park buffer zone near the approach of Padma Bridge
Site boundaries on South	Settlements, Zajira bazaar
Total area of the site	525.27 Acres
Land tenure details	Government and private owned
Government land	52.5 acre
Private land	472.7 acre
Others	Nil
Expansion potential	<p>Basis preliminary assessment, proposed EZ is surrounded by the following:</p> <ul style="list-style-type: none"> • Zajira Market- South • Canal and Environmental Buffer Zone- North • Agricultural and settlements- West • Zilla Road and Jalmahal- East <p>Basis discussion with local inhabitants, it was understood that expanding the proposed EZ could be possible on western side. However, this is subjected to land survey and detailed feasibility analysis.</p>
Existing land use	Agriculture
Land cost (per acre)	50 Lakh BDT

Source: PwC Initial Site Assessment (Data collected from UNO office)

Surrounding Features of the proposed EZ

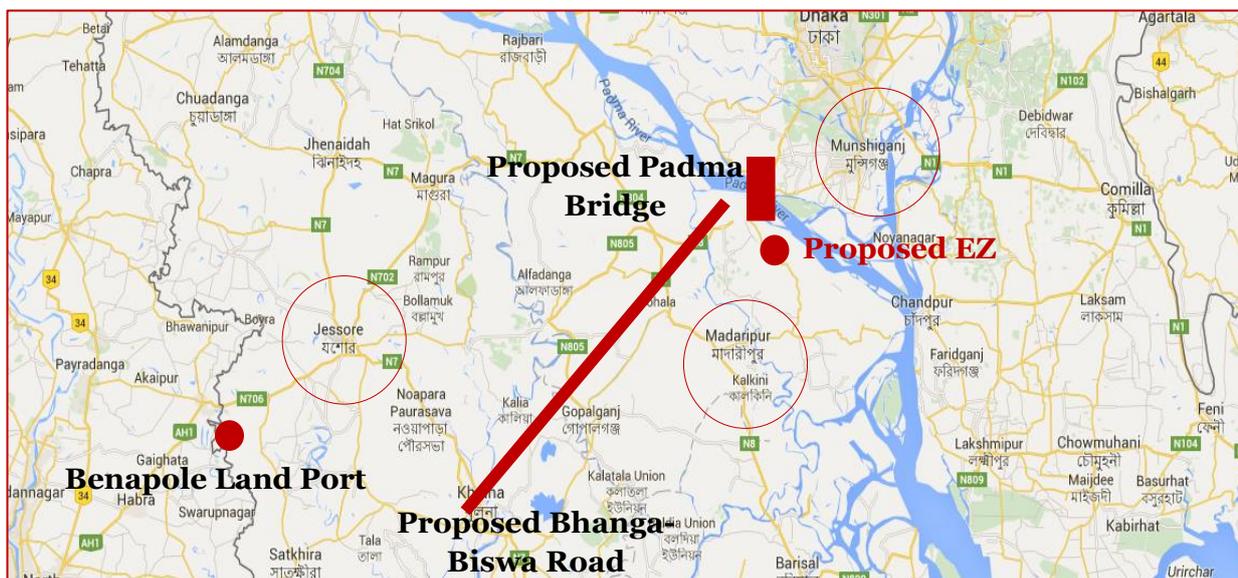
Padma multipurpose project, which is the path-breaking infrastructure project in Bangladesh, is under construction. It shall connect Mawa to Zajira and the estimated future (in 2025) traffic demand in this route is 41,550 vehicles/ day⁹⁶. Once the Padma Bridge is operational, it shall facilitate quick access for the cargo and passenger movement from Dhaka to Mongla and Benapole route (*and vice-versa*). Construction work for widening Dhaka Mawa expressway to 4-lane is supposed to commence from December 2015.⁹⁷ Once, the Padma Bridge is functional, rail connectivity and gas is expected to be available to the proposed EZ. Padma Bridge shall meet Zajira upzila near to Sariatpur-Majirghat road (within 3 km from proposed EZ). Construction for the approach road to Padma Bridge is ongoing. This approach road would meet Bhanga-Biswa Road (proposed 4-lane road from Kathalbari to Mongla Port) by crossing Kathalbari Road. Once, Bhanga-Biswa road and Padma Bridge are operational, proposed EZ would have better access to Dhaka and Mongla Port. After the construction of Bhanga-Biswa Road, quick access would be set up between this area and Jessore & Benapole.

Chandpur Port is also accessible from the proposed EZ. Distance between Chandpur Port and proposed EZ is approximately 100 km and travel time is around 4.5 hours.

In the junction where Padma Bridge meets Zajira upzila, Naruba Railway station is proposed. Land acquisition for the same is completed and compensation has already been disbursed to project affected people. This rail station is located at a distance of approximately 2 km from the project area.

Location of the proposed EZ is strategic. Once Padma Bridge and Bhanga-Biswa Road are operational, industrial and trade hubs such as Dhaka, Jessore, Mongla, Benapole etc. would be easily accessible from the proposed EZ. Access to Benapole land port would also be set up which in turn would facilitate the cross border trade with India.

Following figure illustrates the location of the proposed EZ in Zajira and the surroundings.



Mouza map of proposed site as provided by Upazila Nirbahi Officer (UNO) and Mouza map superimposed on Google map are presented in following figures (on subsequent pages).

Subsequent figures also illustrate the vicinity of the proposed EZ.

⁹⁶ <http://bba-beta.dayspringltd.com/wp-content/uploads/2015/01/Padma-Bridge-Feasibility-Study-Report-Executive-Summary.pdf>

⁹⁷ <http://newagebd.net/139954/expanding-dhaka-mawa-highway-to-4-lane-to-begin-in-december/#sthash.mHflekuz.dpbs>

Figure: Mouza Map of proposed Shariatpur EZ



Source: Map Collected from UNO office

Figure: Mouza map superimposed on google map (Shariatpur)

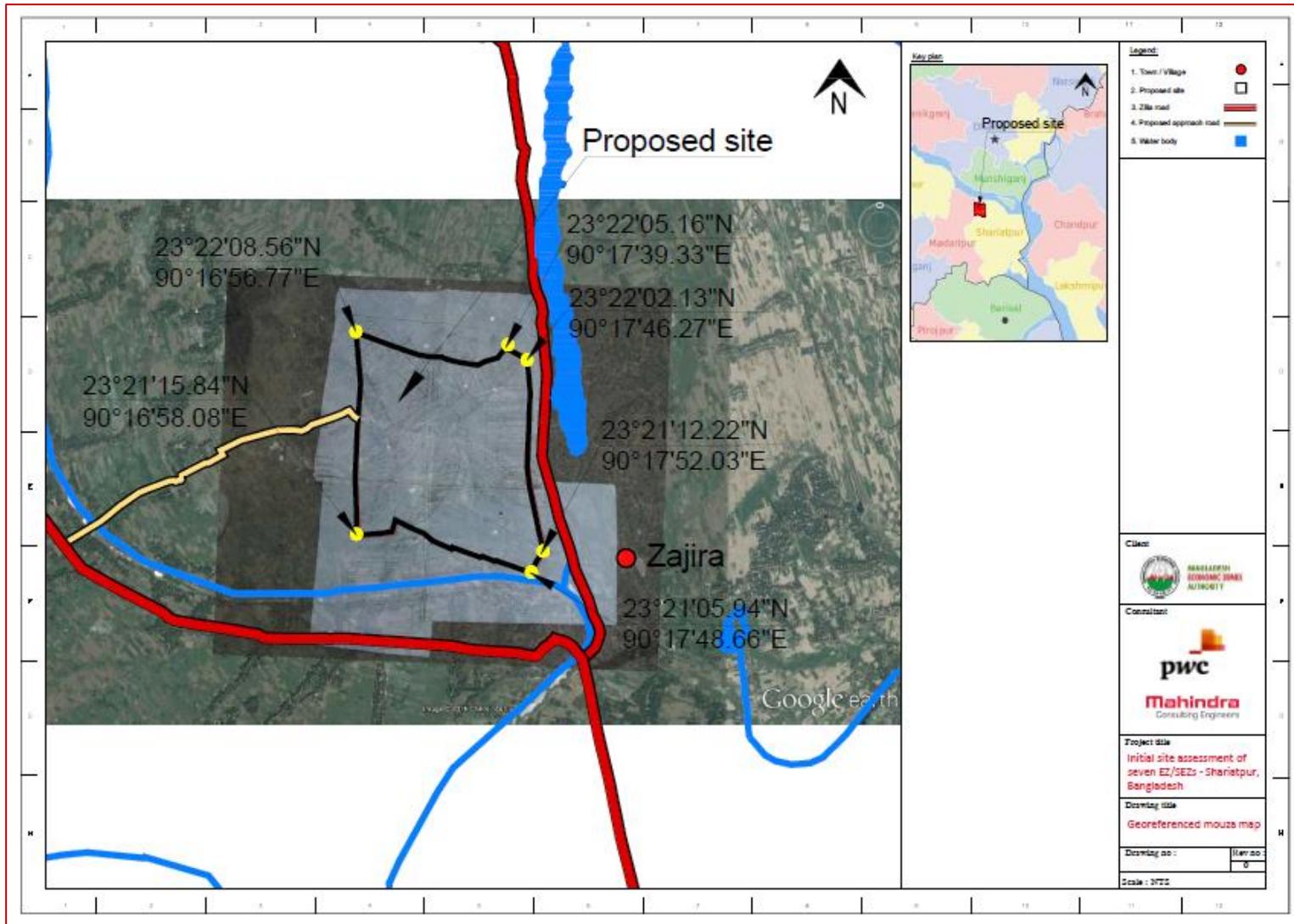


Figure: Surrounding features in the vicinity of proposed EZ

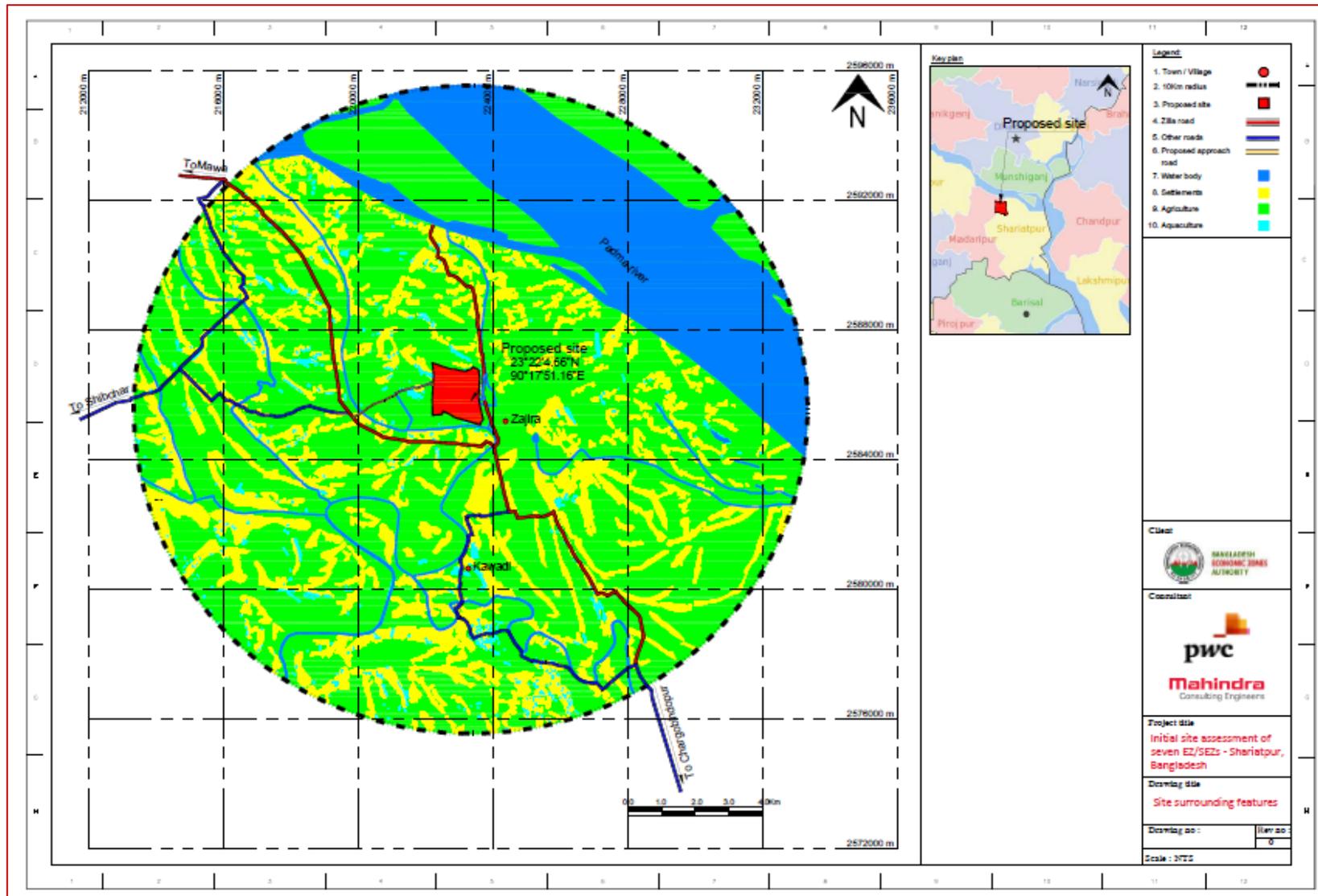
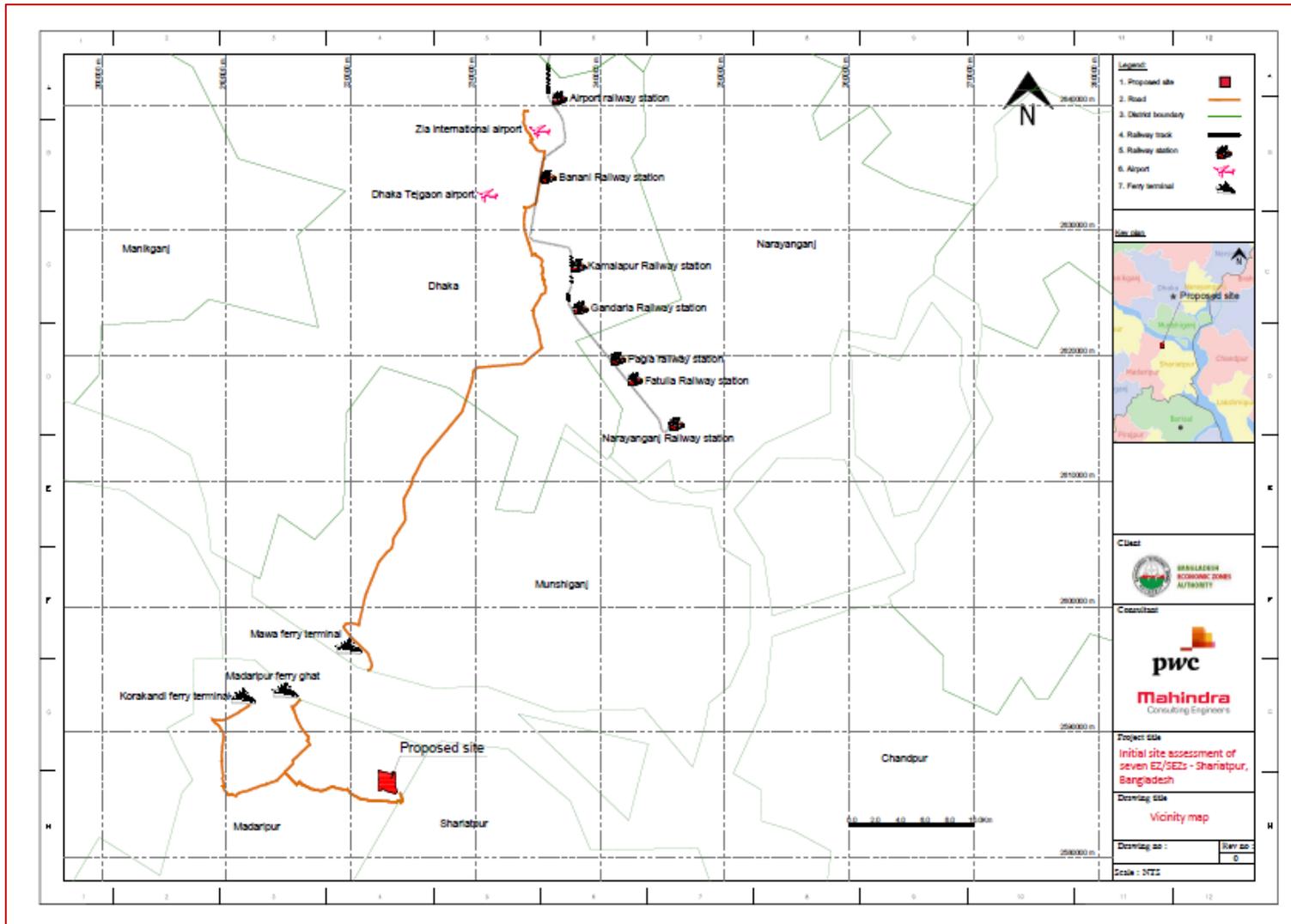


Figure: Proposed EZ and its vicinity



10.3.2. Land use / land cover

The land use pattern of the proposed EZ area falls under agriculture zone of Shariatpur district. It was observed during our site visit that two crops are being cultivated at some land parcels throughout the year. Main crops cultivated inside the proposed EZ area are mustard, sesame, potato, onion and Jute. Existing land use pattern for 10 km radius is shown in figures on subsequent pages.

Figure: Agriculture activities within the project area



10.3.3. Topography

Basis initial assessment, it was observed that the proposed EZ has a level difference of 5 to 6 m (approximately) with a gentle slope on North West and South west towards west with minor undulations. The entire site is located below the Maximum flood level. As per the contour variation, the depth of landfilling across the project area shall vary. The natural slope of ground is advantageous for gravity network of water supply, sewer and storm water drains.

Contour maps of the proposed EZ for 5 km and 10 km radius are presented respectively in figures on subsequent pages.

10.3.4. Physiography

The physiography of the region surrounding the proposed EZ falls in Ganges river floodplain which exhibits morphology composed of low ridges and depression. The Ganges channel is constantly shifting within its active floodplain, eroding and depositing large areas of new char land each flood season, but it is less braided than that of the Brahmaputra-Jamuna. Ganges alluvium is calcareous when deposited, but most basin clays and some older ridge soils have been decalcified and acidified in their upper layers; lime is found only in the subsoil or substratum of such soils. Clay soils predominate in basins and on the middle parts of most ridges, with loamy soils (and occasionally sands) occurring mainly on ridge crests.

Bangladesh physiography map is presented in Annexure.

Figure: Existing land use pattern for 10 km radius (Shariatpur)

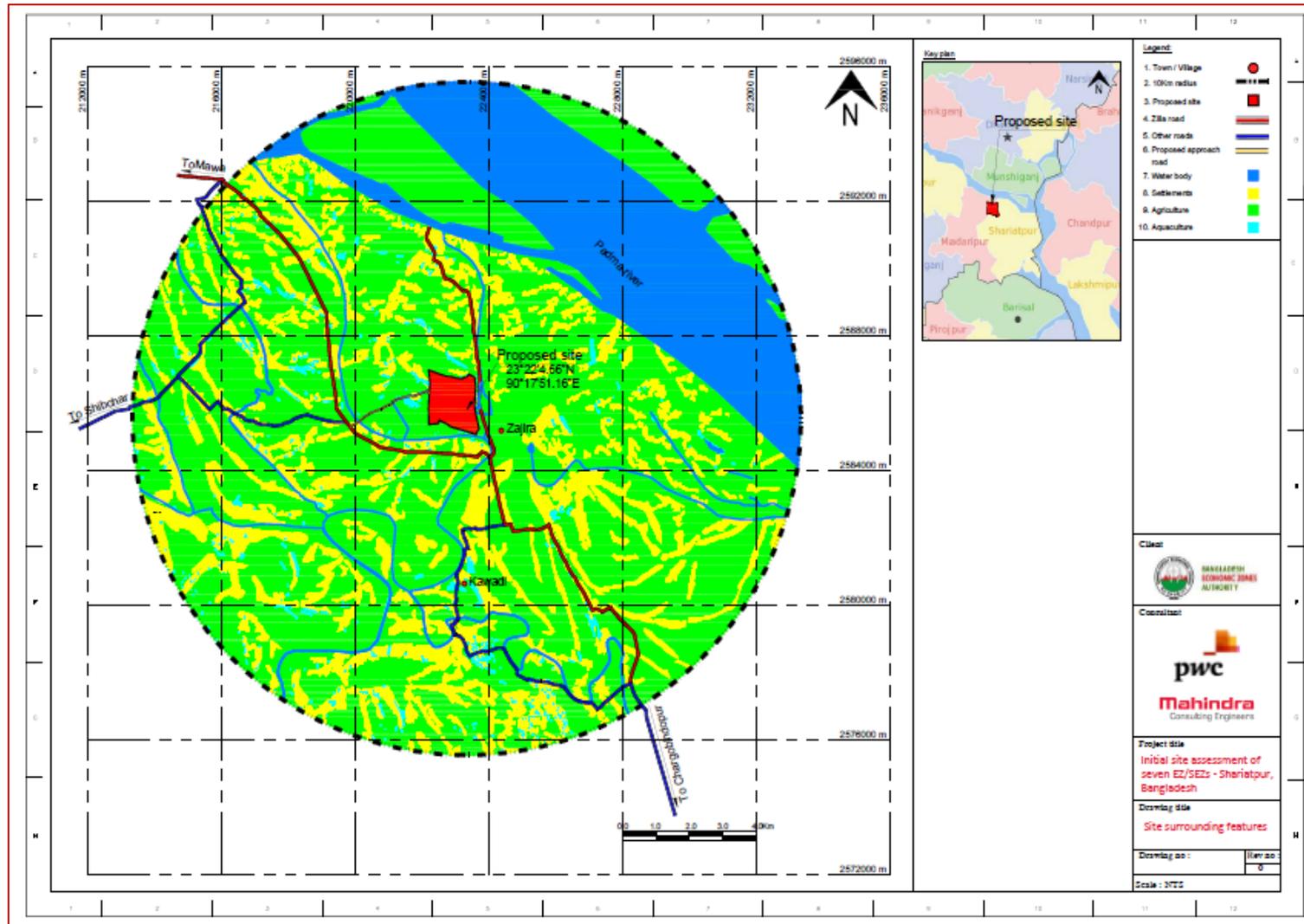


Figure: Existing Land Use Pattern of the proposed EZ for 5 km radius (Closer View)

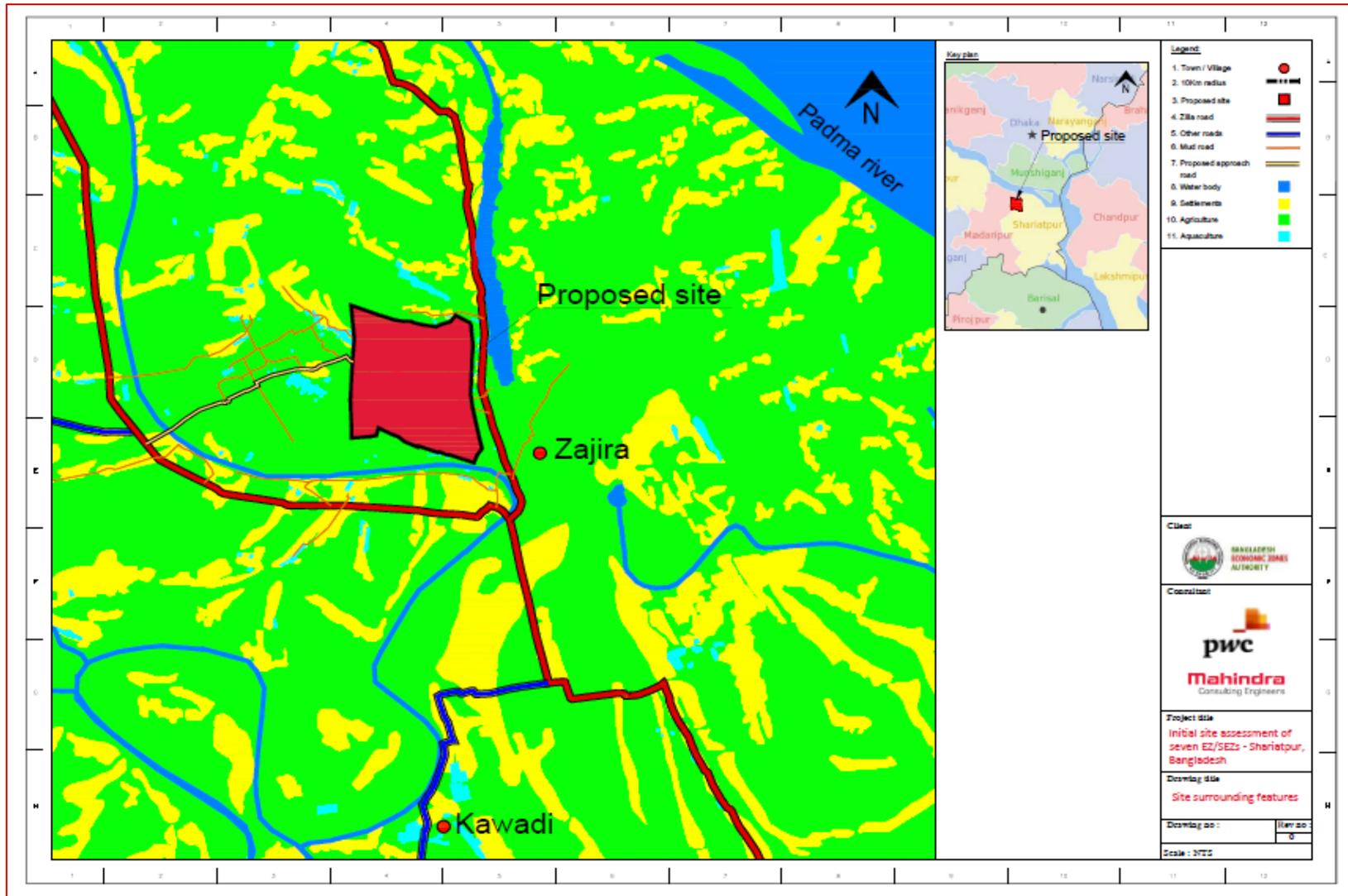


Figure: Contour map of the proposed EZ for 5 km radius (Shariatpur)

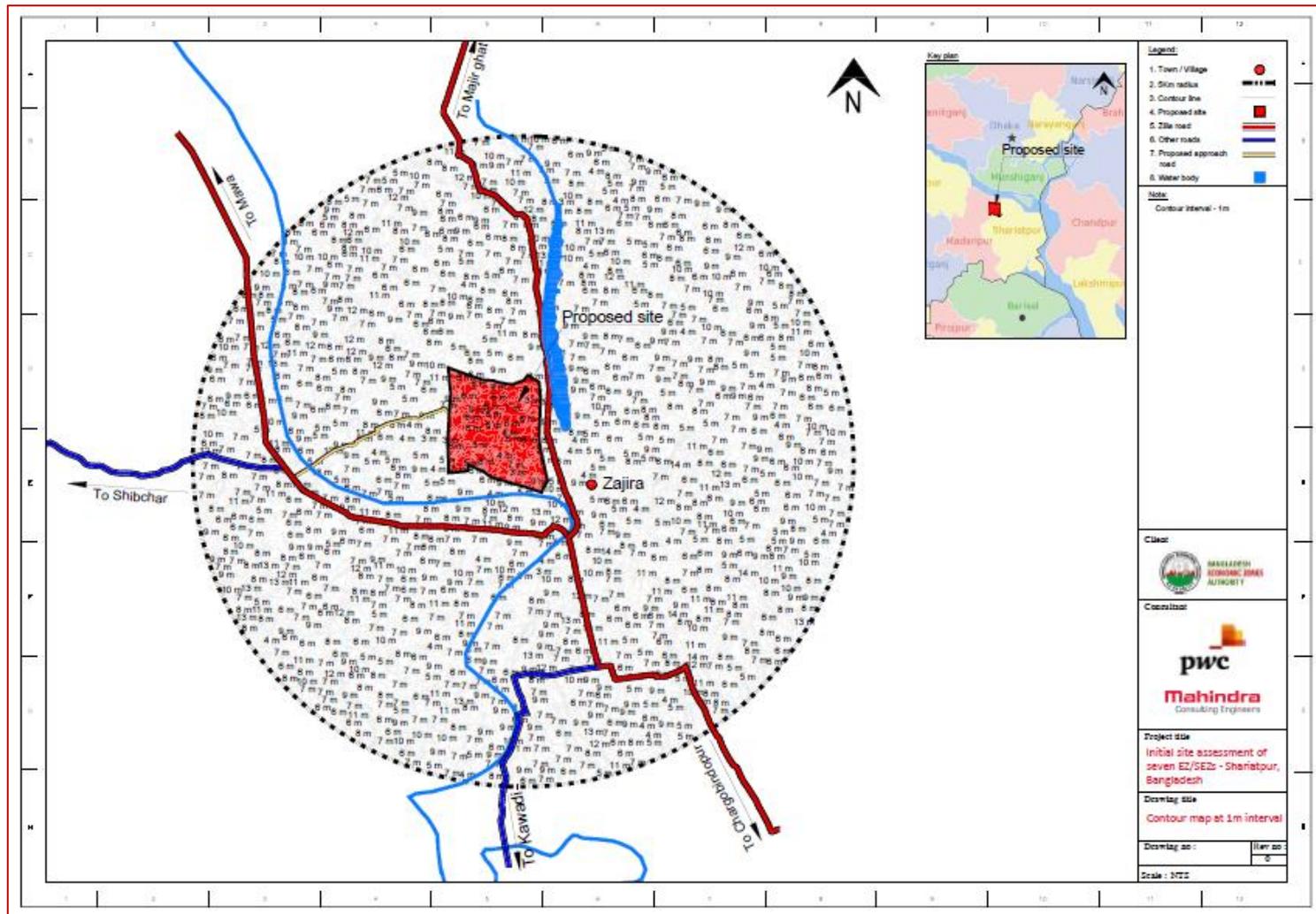
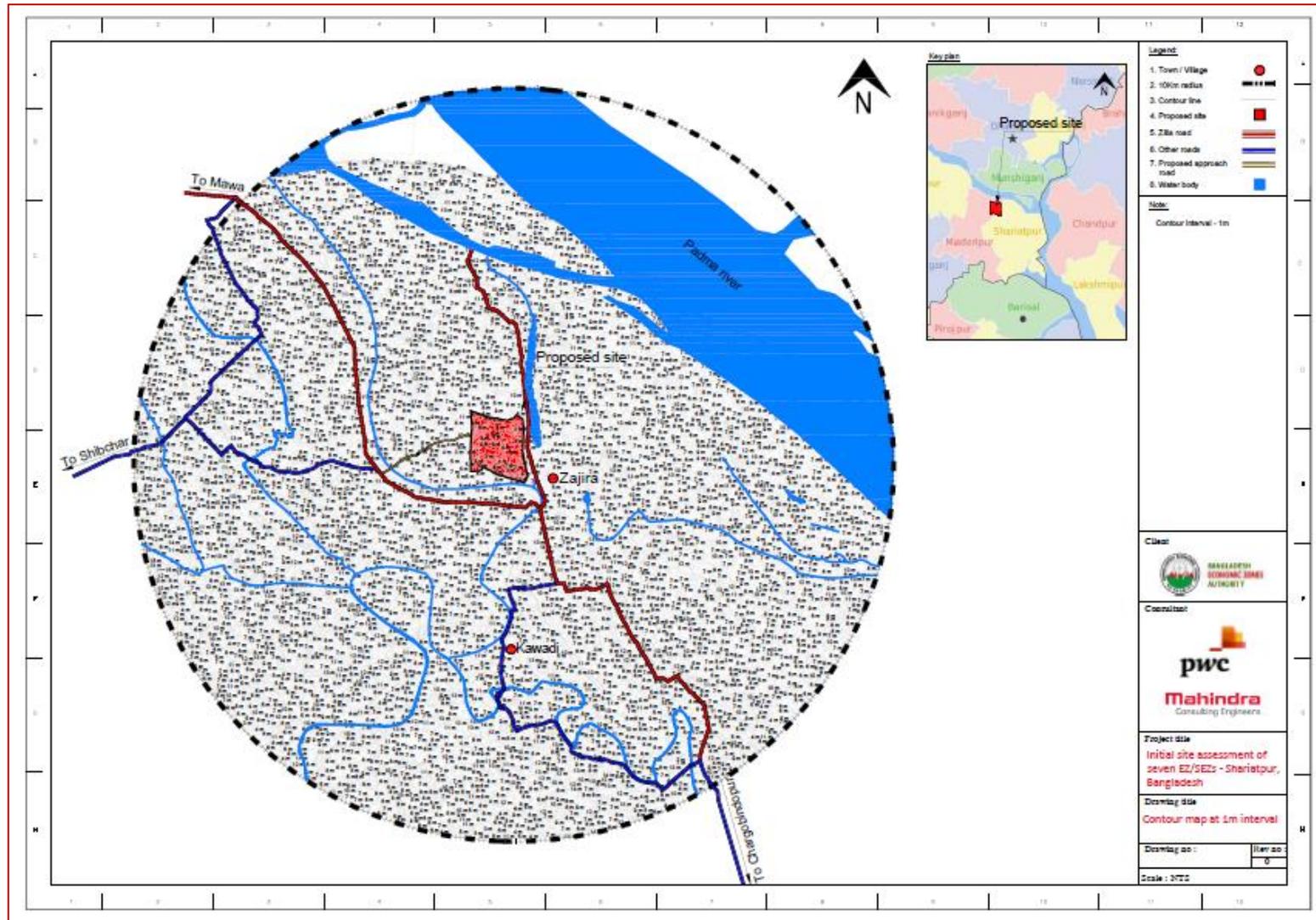


Figure: Contour map of the proposed EZ for 10 km radius (Shariatpur)



10.3.5. Soil

Basis site visit, the top soil layer was found to be mixture of clayey and black cotton soil which needs to be replaced for road construction. This soil is not suitable for laying foundation for any structure. The dominant soil texture is sandy loam. The soil layer is acidic in character and the pH ranges from 5.5 to 6.8.

Figure: Soil Type in proposed EZ



10.3.6. Geology

The type of soil strata in this type of geological area is Gangeyo palal land it has a clay loam to light sandy loam; this soil strata is not suitable for laying foundation for structure. Detailed soil investigation needs to be carried out during the structural design stage.

The geological map of Bangladesh is shown in Annexure D.

10.3.7. Earthquake data

Dohar area falls in the Seismic Zone 1 and the earthquake coefficient is 0.075 for this zone. The area under the proposed EZ falls under the medium seismic range zone; this factor needs to be taken into account while designing the structure of the proposed EZ.

Seismic zoning map of Bangladesh is presented in Annexure E.

10.3.8. Wind speed

During winter, the northern and central areas in Bangladesh witness gentle winds blowing at relatively low speeds of 1-3 Km/hr. from the north & northwest. The detailed wind speeds need to be obtained for designing the high rise structures in the proposed EZ.

The wind speed map for Bangladesh is presented in Annexure F.

10.3.9. Cyclones and storms

Shariatpur has not witnessed any significant cyclone or storms in the past.

10.4. Environment section

10.4.1. Air quality

Ambient air quality measurements are essential:

- to provide a description of the existing conditions,
- to provide a baseline against which changes can be measured and
- to assist in the determination of potential impacts of the proposed EZ construction on air quality conditions

During the field visit, it was observed that the ambient air quality is good in the vicinity of the proposed EZ. This is due to the fact that not much industrial development has taken place in the surrounding area.

10.4.2. Floods and Water Logging

Basis the interaction with the UNO Officials and local inhabitants, it was communicated to us that the low lying areas in Shariatpur district experiences flood and water logging. Entire project site is subjected to waterlogging of depth 2 m during monsoon season. Basis discussion with UNO officials, flood level in the project site is approximately 2 m above the waterlogging.

Necessary flood protection and land filling measures need to be taken for the development of EZ.

10.4.3. Noise

During the field visit, no apparent problem of noise was observed. This may be due to the fact that the project site is located in a village and no significant industrial development has taken place in this area.

10.4.4. Land filling

During site visit, it was observed that the entire project area is subjected to waterlogging of average depth 2 m. Basis discussion with UNO officials, flood level in the project site is approximately 2 m (average) above the waterlogging.

To avoid inundation during monsoon season, minimum land filling of 0.6 m above the flood level is considered.

Based on the assumption, an average depth of 6 to 7 metre of land filling has been envisaged for the proposed EZ area. This figure is indicative and detailed topography survey needs to be carried out to calculate the exact quantity of land filling at the project area.

10.5. Infrastructure Linkages to the Proposed Site

10.5.1. Physical Infrastructure- Availability of Utility Connection

10.5.1.1. Power Availability for the proposed EZ

Zajira substation is the nearest substation to the proposed EZ and it has a total capacity of 10 MVA. It is located at a distance of around 3 km from the project site. Basis interaction with UNO and Rural Electrification Board (REB) officials, this substation has surplus capacity of 3 MVA.

REB officials informed us that another power plant is proposed in Mazir Ghat, which is at a distance of 4km from the proposed EZ. Information about the capacity of this proposed power plant couldn't be obtained during site visit.

Figure: Existing Zajira Substation



Preliminary assessment depicts that the option of sourcing power for the proposed EZ from the Zajira substation could be further explored. Any decision on the same is subjected to due diligence.

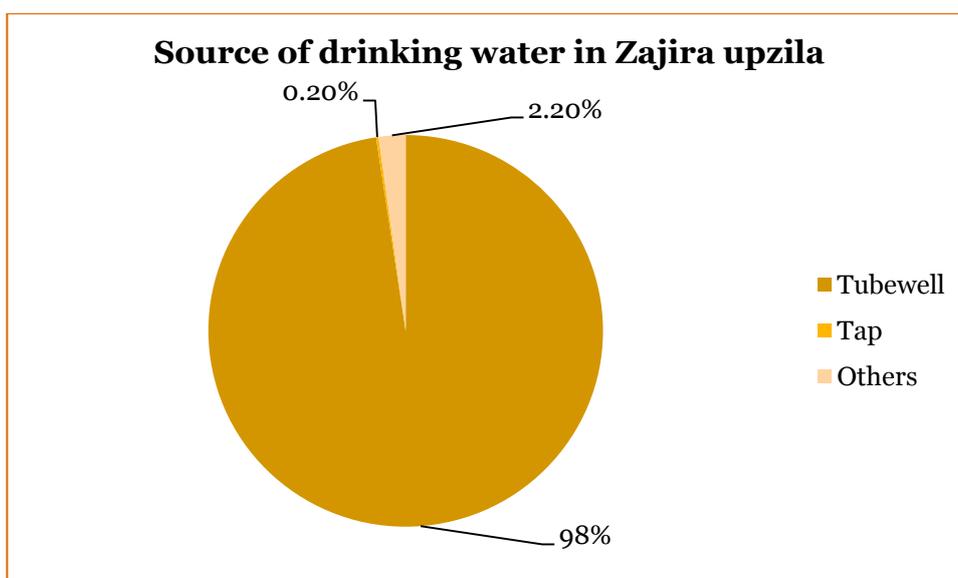
Basis working knowledge and best practices followed, power requirement in a typical EZ could be transmitted by a dedicated 33 KV line for demand up to 25 MW. If the demand is more than 25 MW, then the option of 132 KV transmission lines needs to be further explored. Proximity to 33 KV power connection and surplus power availability in the vicinity of the proposed EZ are the crucial factors to decide on the potential of power availability to the proposed EZ.

Locations of the substations and power connections to the proposed EZ are captured in the utility map in figure at the end of the section.

10.5.1.2. Water Availability for the proposed EZ

There is no existing water supply system at the proposed site. The sources of drinking water in Zajira upzilla are captured in following figure.

Figure: Sources of drinking water in Zajira upzilla



Source: District Statistics, BBS 2011

Basis initial site visit, source of drinking water in the area surrounding the proposed EZ is tube well.

As per our discussion with UNO Officials and local inhabitants, it was communicated to us that the depth of water table is at 40-50 feet from the ground level.

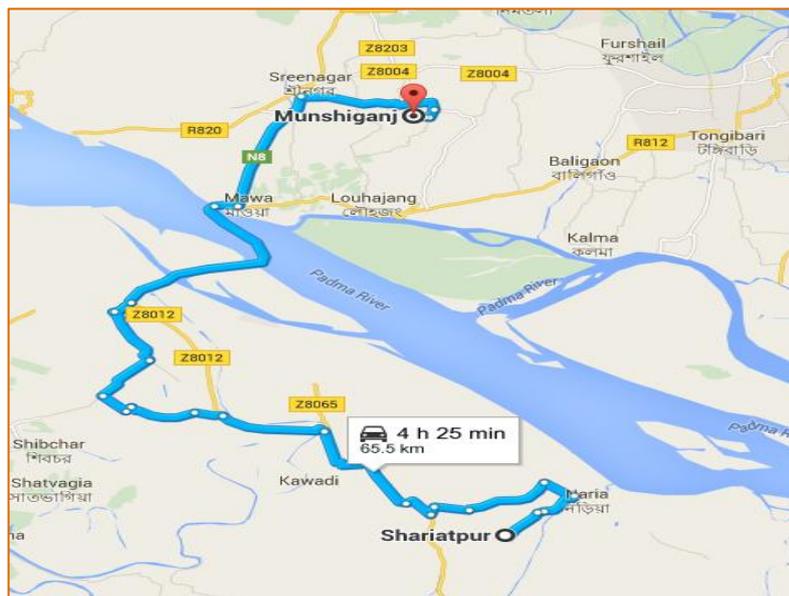
Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Shariatpur EZ is around 4.46 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could be extracted through bore wells. Extraction of more water through bore wells might result in depletion of the aquifer level. Proposed site has proximity to Padma River, thus the option of extracting water from Padma River may be further explored. Decision regarding extraction of water from bore well/ Padma River needs to be taken after detailed feasibility analysis.

10.5.1.3. Gas supply to the proposed EZ

There is no gas source or gas supply near to the proposed EZ.

Basis discussion with UNO officials, it was informed to us that the nearest gas pipeline is available in Munshiganj (located at road distance of around 50 km from the proposed EZ, on the other side of Padma River). Once Padma Bridge is operational, gas pipeline is expected to be available near to the proposed EZ. Construction for the approach to the Padma Bridge is ongoing at a location around 3 km away from the project site.

Figure: Location of Munshiganj and Shariatpur



10.5.1.4. Telecom/ Internet connectivity to the proposed EZ

Optical fiber cables are laid till Zajira UNO office and the bandwidth available is around 2 mbps. At present, the internet and telecom services are provided by private telecom subscribers such as Grameen Phone, Bharti Airtel, Banglalink, Teletalk in this region. Service by private operators has significantly improved the telecom connectivity in the region.

Utility map for the proposed EZ is illustrated in following figure.

10.5.2. Social Infrastructure

10.5.2.1. Institutional

Shariatpur district has 7 colleges (government and non-government colleges) and 23 secondary schools (government and non-government schools).

Some of the major colleges located in Zajira Upzilla are:

- Dr Moslem Uddin Khan Degree College
- Bikenagara Bangabandhu Degree College
- Zazeera degree college

The University in Shariatpur district for science and technology is ZH Sikder University of Science and Technology

There are 4 technical and vocational institutions and 3 polytechnic institutes. Some of the Technical institutes located in the radius of 50 km (approx.) from the proposed EZ are:

- Shariatpur Polytechnic institute
- Technical and vocal Education

There are a total of 300 vocational education institutions (48 public and 252 private) in Bangladesh. Basis preliminary assessment, the unskilled/ semi-skilled and skilled/executive level manpower could be sourced from these technical institutes.

10.5.2.2. Healthcare Facilities

There is no international standard hospital located in the vicinity. Available healthcare facilities in Zajira upzilla are captured in the following table.

Table: Available Healthcare Facilities in Zajira

Facility Type(s)	Total (No.)	No. of beds
No. of Upazila Health Complex	1	31
No. of Union Sub-Centers	4	N/A
No. of Union Health and Family Welfare Centers	9	N/A
No. of Community Clinics	15	N/A

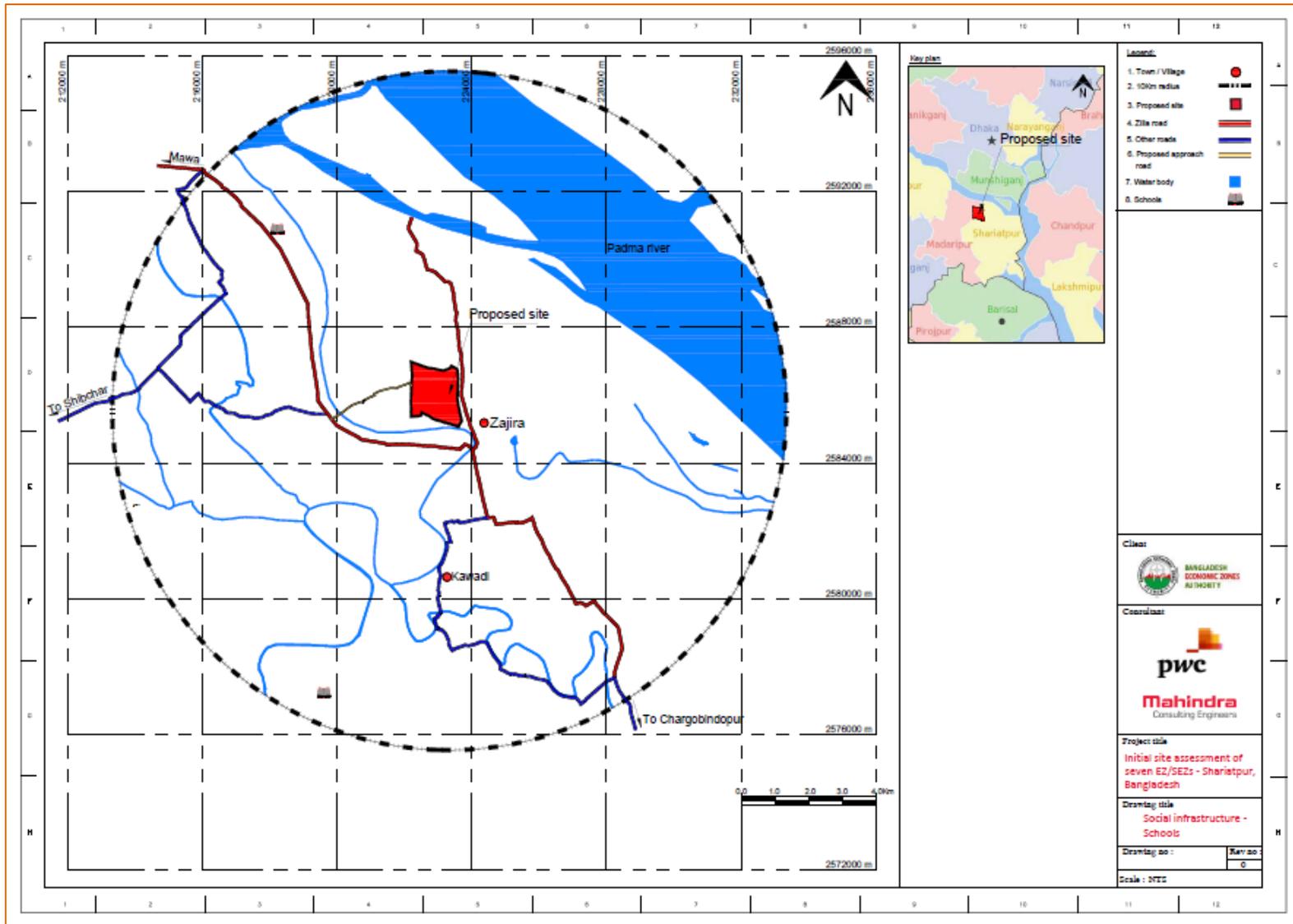
Source: Zajira Upazila Health Complex | Health Bulletin 2014

Other Medical Facilities /Hospitals in the district are :

- Maria Stopes, Shariatpur
- Shariatpur Sadar hospital
- District Hospital

Following figure illustrates the location of school and hospitals in the vicinity of the proposed EZ.

Figure: Schools and Hospitals in the vicinity of proposed EZ



10.5.3. Connectivity

Roadways and waterways are the major convenient means of accessing the EZ. The distance between Dhaka city and the proposed EZ is 90 km (approximate). Access takes place by Dhaka-Mawa Highway and ferry ride from Mawa ghat to Shariatpur ghat.

10.5.3.1. Road

Zajira upzilla and the proposed EZ can be accessed from Dhaka as per the following route:

- 3. Dhaka Mawa Highway:** Dhaka-Mawa highway is a two lane bituminous road and upgradation of this highway to four lane highway has been proposed.⁹⁸ Road condition is excellent and favorable for passage of heavy vehicles. This highway connects the Mawa Ferry ghat to Dhaka. Construction of the Padma Multipurpose project is ongoing near to Mawa ghat.

Figure: Dhaka-Mawa Highway



- 4. Ferry ride from Mawa ghat to Shariatpur Ghat:** Travel by ferry from Mawa ghat to Shariatpur ghat takes around 2 hours. Following figure illustrates the connectivity between Mawa ghat and Shariatpur ghat.

Figure: Connectivity between Mawa ghat to Shariatpur ghat



⁹⁸ <http://newagebd.net/139954/expanding-dhaka-mawa-highway-to-4-lane-to-begin-in-december/>

5. **From Shariatpur Ghat to Zajira upzila:** From Shariatpur ghat the zajira upzila (proposed EZ) can be accessed through Shariatpur - Kathalbari Zilla road (Z8012) at a distance of 13 km. Z8012 is a single lane bituminous road favorable for passage of heavy vehicles. Basis discussion with UNO officials, Shariatpur-Kathalbari road would be widened by 6 feet on both sides and land acquisition for the same is under progress. During site visit, it was observed that there is a scope of widening of this road. This road further connects to Chandpur port.

Figure: Photograph of Z8012 road

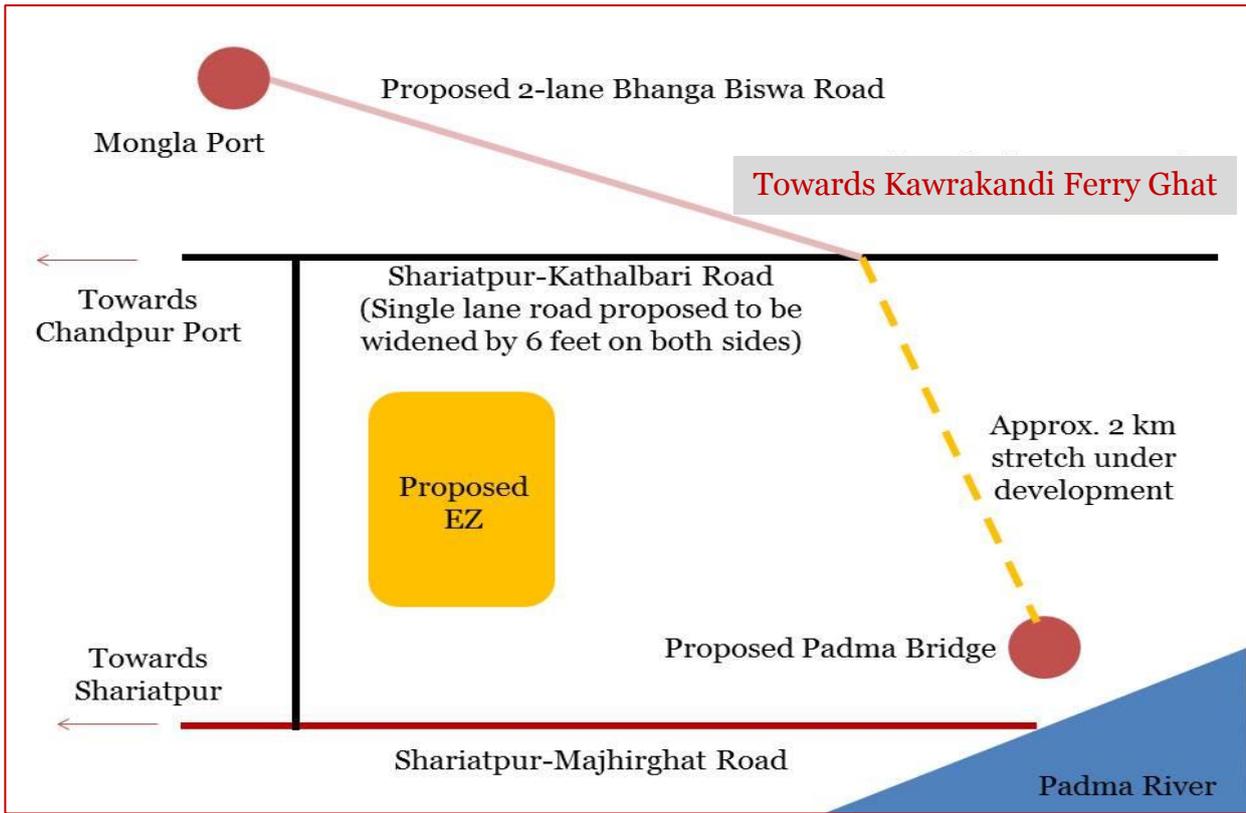


Connectivity to Mongla Port

The Shariatpur Kathalbari Zilla road (Z8012) meets Bhanga Biswa road, which is a two lane road currently under construction. The project site of Bhanga Biswa Road is located at a distance of around 10 km from the proposed EZ. From this project site, the Bhanga Biswa road connects to Mawa-Bhanga National Highway (N8) at a distance of around 25 km.

Upon completion of Padma Bridge and Bhanga-Biswa Road, proposed EZ would be easily accessible by road from Jessore/ Khulna region, Mongla port and from Dhaka. Following figure (not to scale) illustrates the outline of future connectivity potential of the proposed EZ.

Figure: Future Connectivity Potential of the proposed EZ



Last Mile Connectivity (Approach Road)

Approach Road 1: Shariatpur-Kathalbari Zilla Road (Z8012) is located at a distance of 2.2 km on the southern portion of the proposed EZ. During site visit, it was observed that it is connected by a kutchra road to the project site.

Basis discussion with UNO officials, it is proposed to widen Z8012 by 6 feet on both the sides and land acquisition for the same is in progress. This kutchra road may be widened to provide better access to the proposed EZ. Basis discussion with UNO officials, around 50 households would be affected due to this development. It was informed to us that the land on both sides of the kutchra road is government land.

Figure: Kutchra Road connecting the proposed EZ



Approach Road 2: Shariatpur-Majhirghat road is located adjacent to the project area. It's a single lane bituminous road and road condition is favorable for passage of heavy vehicles. Approach road to the site can be provided anywhere from Shariatpur-Majhirghat road. However, during site visit it seems difficult to widen Shariatpur-Majhirghat road due to settlements located on both sides of the road and due to presence of multiple culverts.

Figure: Shariatpur-Majhirghat Road



During site visit, it was observed that a single lane culvert and a paver road connect the proposed EZ to Shariatpur-Majhirghat road. Basis discussion with UNO officials, project boundary is located at a distance of around 100 -150 feet from the Shariatpur-Majhirghat road. However, the exact distance needs to be ascertained during the master planning stage.

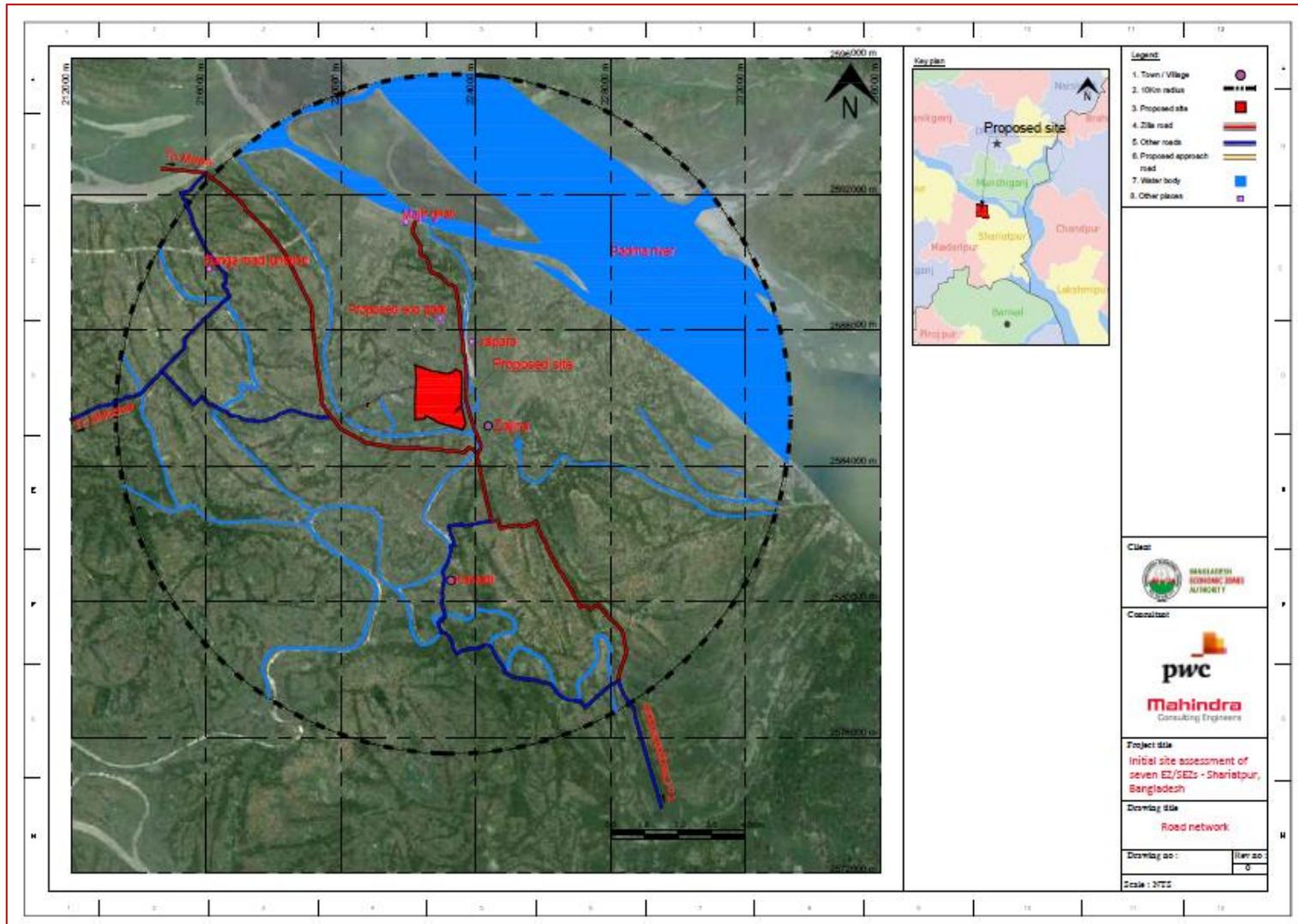
Figure: Paver road inside the project area and Culvert approaching the project area



Basis preliminary assessment, possibility of constructing another approach road towards the Naruba Rail station/ Padma Bridge could be further explored. Project site of Padma Bridge is located at a distance of around 3 km from the proposed EZ; this approach road would provide seamless access for cargo transfer to/ from proposed EZ. However, this decision is subjected to topography survey and detailed feasibility analysis.

Following figure indicates the road network for 10 km radius of the proposed EZ.

Figure: Road Network for 10 km radius (Shariatpur)

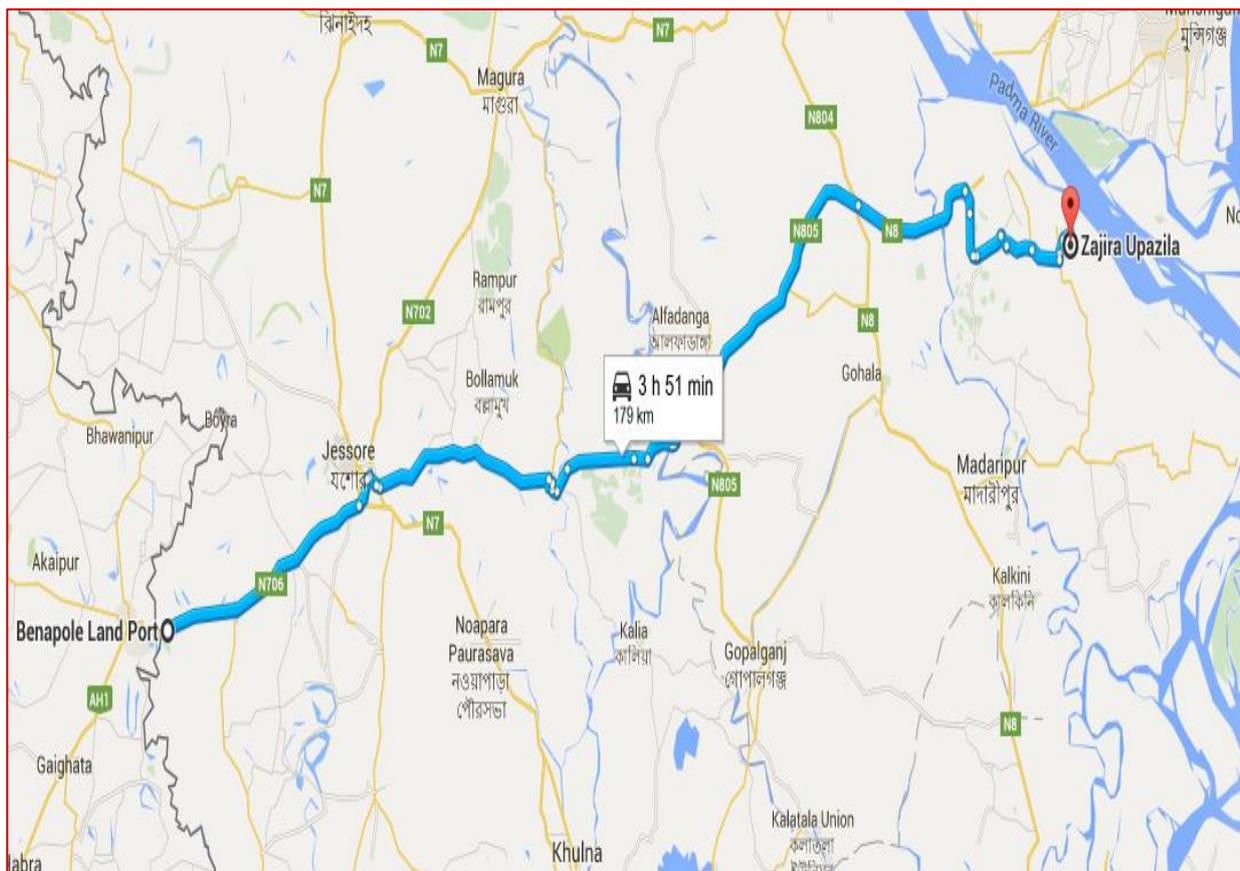


10.5.3.2. Land Port

Proposed EZ is located at a distance of around 180 km from Benapole Land port. Access to Benapole land port takes place via Jessore-Narail Road and Dhaka Khulna Highway. This route includes a ferry crossing at Kalna Ferry terminal. Approximate travel time is around 4.5-5 hours.

Following figure illustrates the connectivity between Zajira upzilla and Benapole land port.

Figure: Connectivity between Zajira upzilla and Benapole land port



Following table provides a glimpse of the major import and export commodities to/from Benapole land port, which indicates the market potential for cross-border trade from proposed Shariatpur EZ.

Table: Major import and export to/ from Benapole land port⁹⁹

Major imports	Cotton, chemical, motor car, motor cycle, tyre-tube, machinery & spare parts, food grains, fish, spices, sugar, egg, aluminium, refrigerator, paper etc.
Major exports	Jute & jute goods, fish, soap, plastic goods, battery, construction materials etc.

Salient features of Benapole land port is outlined in the following table.

⁹⁹ http://114.130.54.109/blpa/index.php?option=com_content&task=view&id=800&Itemid=229

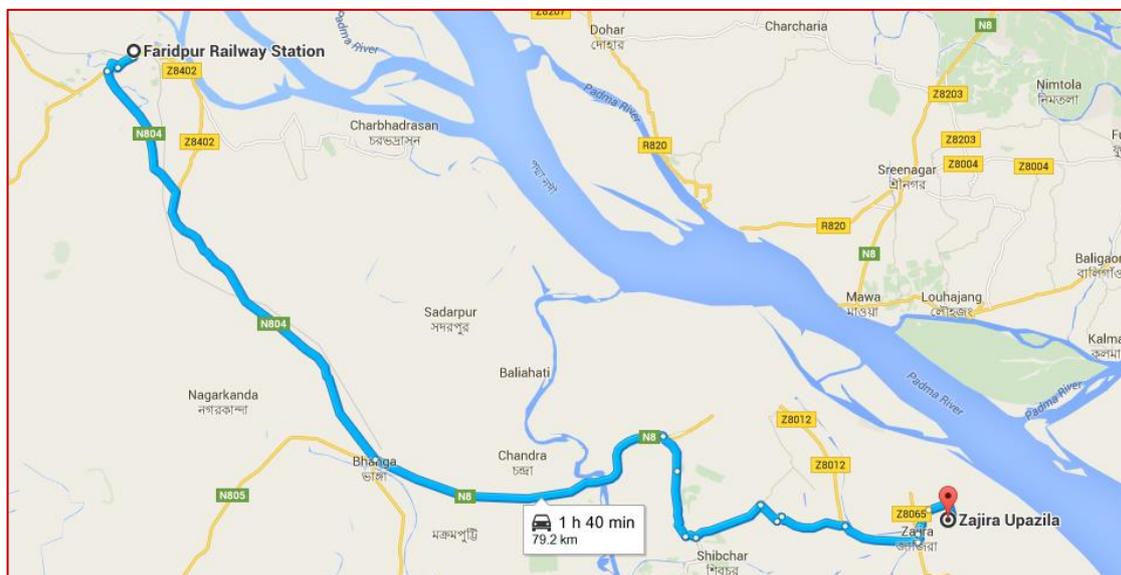
Table: Salient features of Benapole land port¹⁰⁰

Parameters	Details
Bangladesh side	Benapole, Sharsha, Jessore
Indian side	Petrapole, Bongaon, 24-Parganas, West Bengal
Commencement of work	February 01, 2002
Storage capacity	40,000 MT
Total land area	60.782 Acre
Infrastructure	Warehouse-36, Warehouse-cum-yard-5, Open stack yard-2, Transshipment yard-1, Truck Terminal (import & export)-2, Weighbridge scale-2 (100 MT), International Passenger Terminal, International Bus Terminal, Administrative and residential building, fire brigade, standby power generator, Observation towers, Lighting, water supply & sewerage system in operational areas, Security posts, Boundary wall
Handling capacity	2.00 mln MT (yearly) out of which 1.20 mln MT (yearly) manually
Goods handled (2011-12)	Import- 1.22 mln MT Export - 0.46 mln MT

10.5.3.3. Rail

Faridpur is the nearest rail station from the project site. It is located at a distance of around 75 km from the proposed EZ. Access to Faridpur rail station takes place via Z8012 and Faridpur-Bhanga highway (N804). Basis discussion with UNO officials, N804 is a two-lane bituminous road. It was communicated to us that this alignment is favorable for passage of heavy vehicles.

Figure: Locations of Faridpur rail station and Zajira upzilla

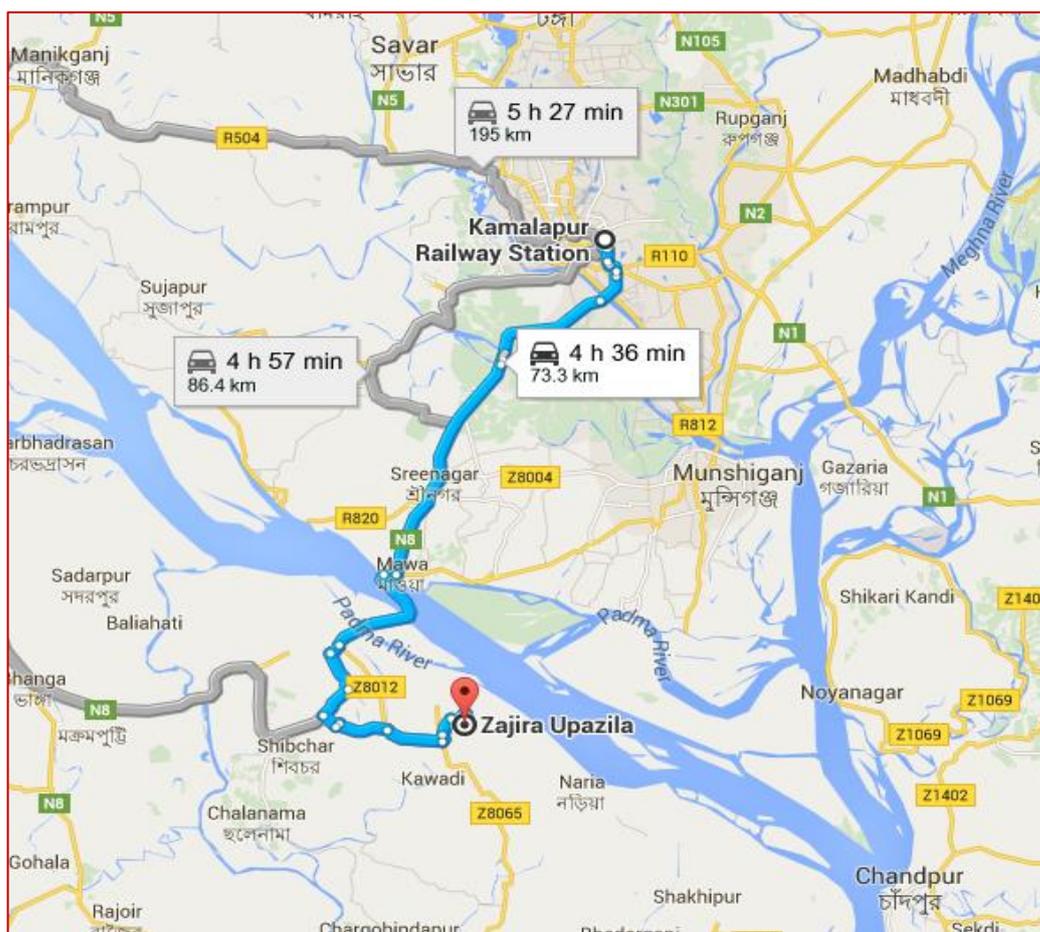


Source: PwC Analysis and Google Map

Dhaka (Kamalapur) rail station is approximately 75 km away (by road) from the proposed EZ and travel time by road is 4.5-5 hours (approximate). Access takes place via Z8012 and Dhaka Mawa Highway. This route includes ferry ride at Mawa ghat. Once Padma Bridge is operational, connectivity between Zajira upzilla and Dhaka would significantly improve. As a result of the same, accessibility of rail facilities in Dhaka would get easier.

¹⁰⁰ http://114.130.54.109/blpa/index.php?option=com_content&task=view&id=800&Itemid=229

Figure: Locations of Kamalapur rail station and Zajira upzilla



Cargo Handling Facilities:

There is an inland container depot (ICD) near Kamalapur railway station, Dhaka. The facilities available at ICD are tabulated below¹⁰¹:

Details	Specifications
Area Capacity	1473225 sq feet
Handling capacity	90,000 TEUs ¹⁰² annually
Equipment	2 No. Forklift of 36 Tons Capacity. 1 No. Forklift of 28 Tons Capacity. 1 No. Forklift of 8 Tons Capacity. 1 No. Forklift of 5 Tons Capacity. 1 No. Forklift of 3 Tons Capacity.

Basis preliminary assessment Bangladesh Railways is procuring a rail mounted gantry crane for faster wagon loading and unloading operation works at the ICD at Kamalapur Rail station, Dhaka. Cargo storage facilities are not available at the ICD.

¹⁰¹ (<http://www.irfca.org/~shankie/brly/inland.htm>),

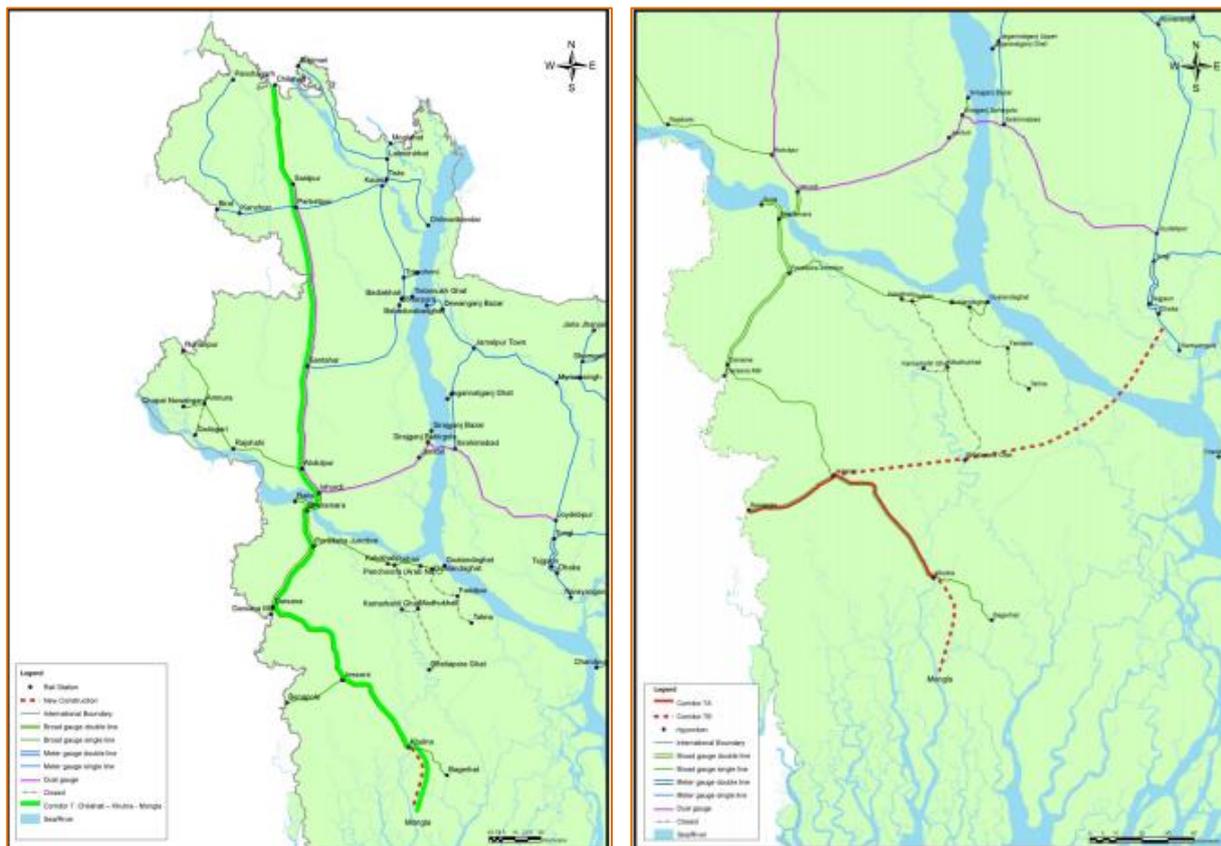
(<http://www.oocl.com/bangladesh/eng/localinformation/terminalsandfacilities/Pages/default.aspx>)

¹⁰² TEU; Twenty Foot Equivalent Unit

Prominence of Faridpur and Dhaka railway station

Faridpur has connectivity to “Chilahati- Ishurdi- Khulna- Mongla corridor” which connects Khulna River Port (with a road link to Mongla seaport in the south to Chilahati border point in the north of the Bangladesh railways. This corridor is the busiest Broad Gauge section in the west zone of Bangladesh for passenger and freight transport of Bangladesh railway.

Figure: Chilahati- Ishurdi- Khulna- Mongla and Dhaka-Mawa-Zajira-Bhanga-Jessore- Khulna-Mongla rail corridors of Bangladesh railway



Source: Bangladesh Railway master plan, http://railway.portal.gov.bd/sites/default/files/files/railway.portal.gov.bd/page/67cd2529_587a_45b9_84e0_cd12c8d8c9bd/8.%20Formulation%20of%20BR%20Masterplan.pdf

The construction of Padma Bridge at Mawa – Zajira will open up new opportunities for Bangladesh Railway for linking Dhaka directly with Jessore and Mongla Port as well as southern part of Bangladesh. The whole Faridpur area is expected to fall in the catchment area of rail transport for passenger as well as freight traffic.

The new line (Dhaka-Jessore) will reduce the distance both for corridors 7A (Dhaka-Mawa-Zajira-Bhanga-Jessore-Khulna-Mongla) and 7B (Dhaka-Mawa-Zajira- Bhanga-Jessore-Benapole) and will become the shorter route for traffic originating from Faridpur areas and there as well as Rajshahi areas, because Broad Gauge (BG) trains from that area will have no load restriction over proposed Padma Bridge as on Bangabandhu Bridge. There also is an ongoing work on “Re-opening of Pachuria – Faridpur – Pukuria section and construction of Pukuria – Bhanga railway line (GOB)” on Dhaka-Jessore corridor to carry new/additional traffic from Faridpur.¹⁰³

¹⁰³ Bangladesh Railway (Formulation of Master Plan), http://railway.portal.gov.bd/sites/default/files/files/railway.portal.gov.bd/page/67cd2529_587a_45b9_84e0_cd12c8d8c9bd/8.%20Formulation%20of%20BR%20Masterplan.pdf

Dhaka railway station is the central railway station in Dhaka. Dhaka-Chittagong Cox's Bazar- Deep Sea Port Corridor is the busiest rail track for passenger and freight transport. The line carried about 14 crore tonne-km freight in the year 2007 and of them, petroleum (diesel, kerosene and petrol), wheat, rice, marble and stone, fertiliser, sugar, iron and steel, and other grains were the prominent ones.¹⁰⁴

Figure: Dhaka-Chittagong Cox's Bazar- Deep Sea Port Corridor of Bangladesh railway



Basis discussion with the UNO officials, at the approach of Padma Bridge, Naruba rail station is proposed. This rail line would be connected to Dhaka on one side and Khulna on the other side. It was informed to us that land acquisition for the same is ongoing.

Once Padma Bridge is functional, proposed EZ would have access to rail facility at a distance of around 3 km from the project site.

Figure: Location of the Proposed Naruba Station



¹⁰⁴ Bangladesh Railway (Formulation of Master Plan), http://railway.portal.gov.bd/sites/default/files/files/railway.portal.gov.bd/page/67cd2529_587a_45b9_84e0_cd12c8d8c9bd/8.%20Formulation%20of%20BR%20Masterplan.pdf

10.5.3.4. Airport

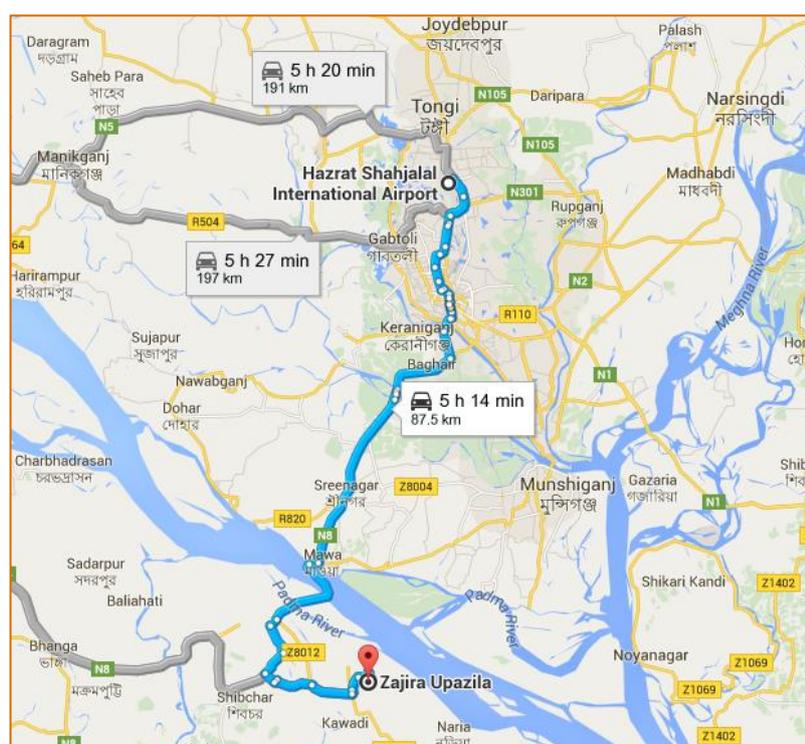
Proposed Shariatpur EZ is located around 82 km from Hazrat Shah Jalal International Airport at Dhaka. The travel time by road to Dhaka International Airport is 4-4.5 hours (approximate). This includes ferry ride from Shariatpur ghat to Mawa ghat. Z8012 and Dhaka-Mawa highway provide access to the airport.

Once Padma Bridge is operational, access to the international airport would be significantly improved and travel time would reduce significantly.

Basis secondary research, over 4 million international and 1 million domestic passengers as well as 150,000 MT of freight and mail exchange use Dhaka International airport. This airport has a freight village (warehouse), terminal buildings, hangars and other modern equipments for aircraft handling.¹⁰⁵

For ease in transportation of construction materials, rail station (airport rail station) is under operation near the Dhaka International airport.

Figure: Connectivity between Dhaka international airport and Zajira upzila



Govt. of Bangladesh intends to construct a new international airport (Bangabandhu Sheikh Mujib International Airport) with a view to create a hub airport in close proximity to Dhaka and to meet the demand of future growth in aviation sector. The Civil Aviation and Tourism Ministry is in the process to finalise the location of the proposed international airport. Some of the locations which are being considered as prospective locations for the development of new airport are: (1) Char Janajat under Shibchar Upazila in Madaripur district, (2) Keyain and Latobdi under Shirajdikhan Upazila in Munshiganj district and (3) Char Bilashpur under Dohar Upazila of Dhaka district.

¹⁰⁵ <http://www.shahjalalairport.com/>

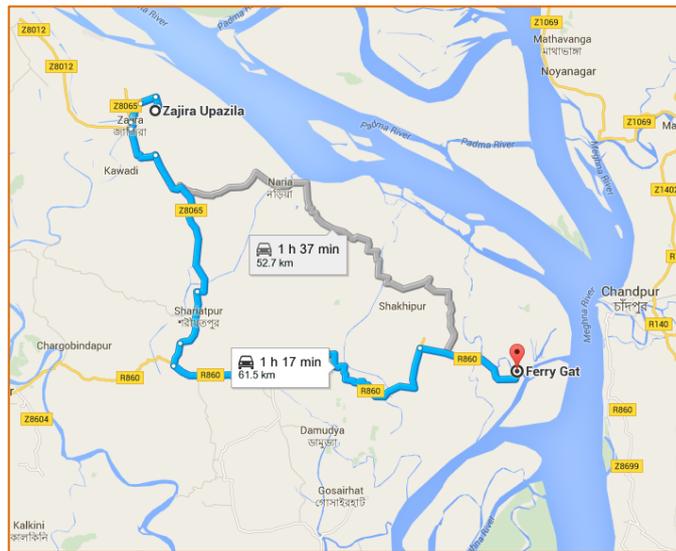
10.5.3.5. Water Connectivity

Bangladesh, as a riverine country with 24,000 km waterways, has a navigable network varying from 5968 km during the monsoon to 3865 km during the dry season. Inland water transport (IWT) is an important mode of transport not only in the inland movement of freight and passengers but also in the transportation of import and export items through the ports of Chittagong and Mongla. Annexure-J illustrates the inland waterways map of Bangladesh.

Proposed EZ is located in proximity to following ferry terminals viz.

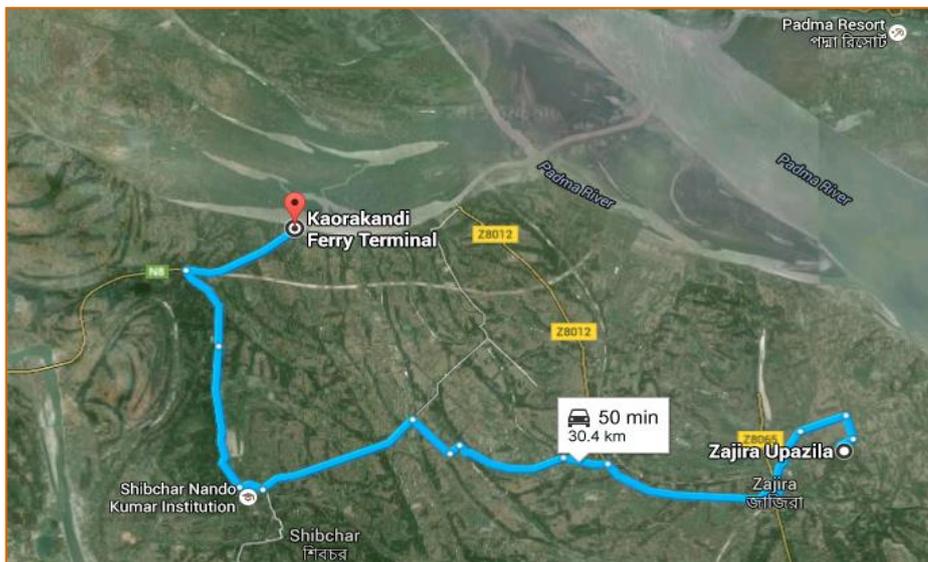
1. **Shariatpur ferry ghat:** Located at a distance of around 65 km from the proposed EZ. Access to Shariatpur ferry ghat takes place by Mazirghat-Kazirhat road (Z8065). Basis discussion with UNO officials, it's a single lane bituminous road. Scope of widening in this road might attract resettlement problems. Ferry service from Shariatpur ghat runs up to Mawa ghat on the other side of Padma River. Travel time by ferry is around 2 hours.

Figure: Connectivity between Shariatpur ghat and Zajira upzilla



2. **Kawrakandi ferry ghat:** Proposed EZ is located at a distance of around 35 km from Kawrakandi ferry ghat. Access takes place via Z8012. Ferry service from Kawrakandi ghat runs up to Mawa ghat on the other side of Padma River. Travel time by ferry is around 1.5 hours.

Figure: Connectivity between Kawrakandi ghat and Zajira upzilla



3. **Majhirghat ferry terminal:** It is located at a distance of around 5 km from the proposed EZ. Access takes place via Shariatpur-Majhirghat road. Speed boats and motorized boats operate from this area to locations such as Kawrakandi ghat, Shariatpur ghat.

The connectivity of these ghats is to Mawa Ghat which in turn connects to Chittagong port and Payra port. However, transportation via two riverine Ghats (Shariatpur – Mawa or Kawrakandi-Mawa or Majhirghat – Mawa) increases the transshipment cost and transshipment time and accordingly, makes the prospects of IWT transportation via these routes weaker.

10.5.3.6. Assessment of Intermodal Cargo Transfer

This section attempts to carry out a broad level assessment of the possibilities of linking the proposed EZ through different modes of transportation. All the other modes of transportation (other than road) require multimodal transport. Attempt has been made to evaluate the potential of integrating different modes of transportation with the proposed EZ. It is envisaged that integration of rail, water and air mode of transportation via road accessibility need to be assessed. However, this assessment is carried out at a broad level on the basis of the preliminary assessment. Any further decision on the same needs to be taken after detailed feasibility analysis.

Rail Connectivity: Faridpur is the nearest rail station from the project site. It is located at a distance of around 75 km from the proposed EZ. Access to Faridpur rail station takes place via Z8012 and Faridpur-Bhanga highway (N804).

Dhaka (Kamalapur) rail station is approximately 75 km away (by road) from the proposed EZ and travel time by road is 4.5-5 hours (approximate). Access takes place via Z8012 and Dhaka Mawa Highway. This route includes ferry ride at Mawa ghat. Once Padma Bridge is operational, connectivity between Zajira upzilla and Dhaka would significantly improve. As a result of the same, accessibility of rail facilities in Dhaka would get easier. There is an inland container depot (ICD) near Kamalapur railway station. Cargo handling capacity of the ICD is 90,000 TEUs annually, but cargo storage facility is not available at the ICD. Kamalapur railway station is the central railway station in Dhaka. Dhaka-Chittagong Cox's Bazar-Deep Sea Port Corridor is the busiest rail track for passenger and freight transport. The line carried about 14 crore tonne-km freight in the year 2007 and of them, petroleum (diesel, kerosene and petrol), wheat, rice, marble and stone, fertiliser, sugar, iron and steel, and other grains were the prominent ones. Upon completion, Padma Bridge would also provide seamless access from the proposed EZ to the rail station.

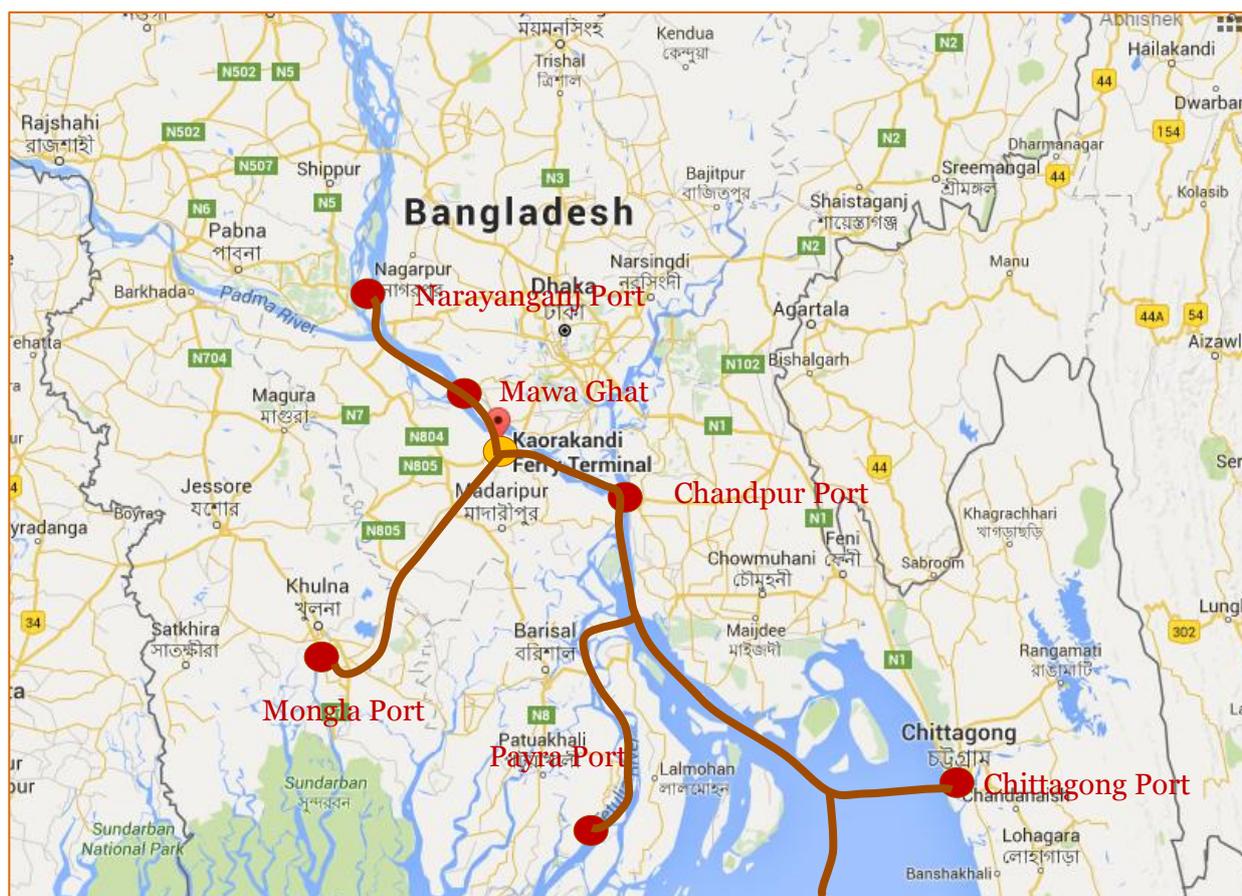
Naruba rail station is proposed at the approach of Padma Bridge. It is located at a distance of around 3 km from the proposed EZ. Basis discussion with UNO officials, land acquisition for the same is undergoing. Approach road from the EZ to proposed Naruba rail station needs to be developed.

Preliminary assessment indicates that linking the proposed EZ with rail mode of transport seems to be a possibility; however this is subjected to detailed feasibility assessment.

Water Connectivity:

From preliminary assessment, connectivity via IWT at present appears to be restricted (in terms of many transshipment legs involved). However with the construction of Padma Bridge, this connectivity is expected to improve with larger integration of multimodal transportation involving IWT sector.

Figure: Waterways Connectivity potential of the proposed EZ



10.6. Resettlement issues

10.6.1. Social impacts

The impacts have been assessed on the following parameters:

- (xxxiv) Loss of land (for existing land owners),
- (xxxv) Loss of homes/structures,
- (xxxvi) Loss of Trees
- (xxxvii) Loss of livelihood systems/ income opportunity
- (xxxviii) Loss of water bodies.
- (xxxix) Resettlement issue pertaining to approach road
- (xl) Resettlement issue of brick field located within the project site
- (xli) Proximity to Environmental Buffer Zone and Jalmahal

The expected types of losses are described in the following sub-sections.

10.6.1.1. Loss of land

To establish the Shariatpur EZ project, a total of 525.27 acres of land has been demarcated by the authority. Proposed EZ comprise of 4 Mouza's namely Diara gopalpur, Majir hat, Purbanodusa and Vajir

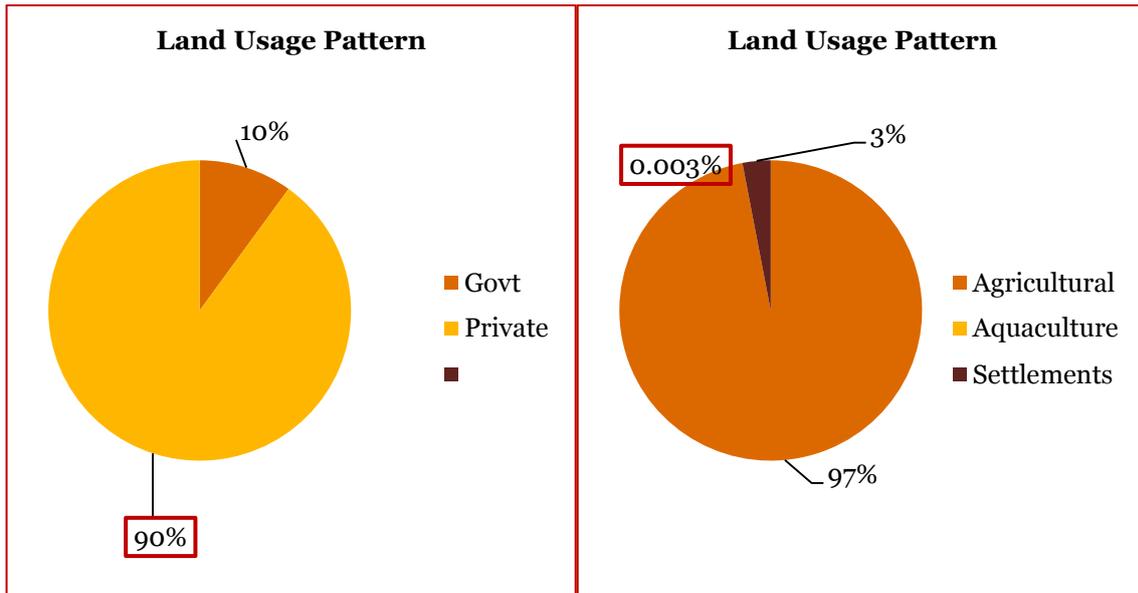
hat. As per FMB superimposed on google map the total area works out to approximately 532.00 acres. The land usage pattern for this area is as under:

- Agricultural land- 432.90 acre (approx.)
- Aquaculture- 1.40 acre (approx.)
- Settlements- 12.60 acres (approx.)

Ownership pattern of the land is as follows:

- Government- 52.70 acres
- Private land - 472.70 acres

Figure: Land Ownership and Usage pattern



Source: Data collected from Sharaitpur UNO Office

10.6.1.2. Loss of homes/structures

As informed to us by the UNO officials, due to the development of this project, 45-50 household structures (approximate) will be directly affected. This includes dwellings and associated infrastructures are to be re-located. All affected structures are 'kutchha' structures and the average size of the structures is 150 sq. ft. with a minimum size of 100 sq. ft. and a maximum of 250 sq. ft.

Figure: Photograph of Residential structure within the project area



10.6.1.3. Loss of trees

Loss of trees in the project area is less. The master plan (during the feasibility stage) can be prepared in a way that maximum number trees could be retained and earmarked as green area. Basis discussion with local inhabitants, around 250 to 400 trees are located within the project area. However, detailed topographical survey needs to be undertaken to ascertain the same.

Figure: Trees within the project area



10.6.1.4. Loss of income/livelihood

As a result of loss of agricultural land, the following would be directly affected:

- Local farmers,
- Sharecroppers,
- Yearly lease holders (agricultural land)
- Owners of agricultural assets (deep tube-wells and shallow tube-wells etc.)

Indirectly, seasonal agriculture labors, fishermen and crop traders will be affected.

Basis preliminary assessment and interaction with local inhabitants, around 200-300 number of households could stand to lose their income/livelihood as a result of the development of the project. However, due diligence needs to be undertaken to ascertain the exact number.

Figure: Agricultural activities ongoing within the project area



10.6.1.5. *Loss of water bodies*

During site visit, it was observed that no ponds exist within the proposed EZ except nallah crossing the project site. Basis preliminary assessment, length of the nallah is around 2 km from west to east. During the master planning stage, this nallah could be rerouted.

10.6.1.6. *Resettlement Issue due to the construction of approach road*

As discussed in Section on road connectivity of the proposed EZ, existing kutcha road of length 2.2 km (approximate) may be developed from Shariatpur-Kathalbari Road (Z8012) to provide last mile connectivity to the proposed EZ.

This kutcha road may be widened to provide better access to the proposed EZ. Basis discussion with UNO officials, around 50 households and some trees would be affected due to this development. It was informed to us that the land on both sides of the kutcha road is government land.

Figure: Kutcha Road connecting the proposed EZ



10.6.1.7. *Resettlement Issue of brick field located within the project site*

During site visit, it was observed that a brick field is located within the project area. Basis discussion with local inhabitants, it was informed to us that the brick field is non-functional. As a result of the development of this project, this brick field needs to be relocated and measures need to be formulated accordingly.

Figure: Brick field located within the project area



10.6.1.8. Proximity to Environmental Buffer Zone and Jalmahal

During site visit, it was observed Environmental Buffer Zone is being developed at a distance of around 3 km from the proposed EZ. It is located on the northern side of the proposed EZ and on the boundary of the construction yard of Padma Bridge project.

11,000 saplings have been planted in the buffer zone. The types of saplings are: Mehgani, Chikrasi, Neem, Jhaw, Kadam, Bahera, Shimul etc.

Figure: Environmental Buffer Zone



During the development of the proposed EZ, precautions need to be taken so that this Environmental Buffer Zone doesn't get affected.

On the eastern side of the project boundary, Jalmahal (aquaculture waterbodies) is located. Basis interaction with UNO officials, it's a government land which is leased out to local fishermen. Basis discussion with local inhabitants, more than 100 fishermen are dependent on Jalmahal to carry out fishing activities, which is the only source of livelihood for them.

Figure: Photograph of Jalmahal



As a result of the development of the proposed EZ, this surrounding area may get subjected to environmental degradation and care needs to be taken to preserve the existing ecosystem of fisheries in Jalmahal.

10.6.2. Summary of Constraints and its mitigation-Resettlement Issues

The major constraints and its mitigation are presented in the following table.

Table: Major Constraints and Mitigation measures

Sl. No.	Constraints	Mitigation measures
1	Low lying land	Basis preliminary assessment, landfilling of depth 6-7 metre needs to be undertaken.
2	Residential units	Due to the development of this project, 45-50 household structures (approximate) will be directly affected.
3	Loss of trees	Trees existing in the site can be retained and earmarked as green area during the preparation of master plan.
4	Loss of water bodies	During the master planning stage, the nallah crossing the project site could be rerouted.
5	Loss of income/livelihood	Basis preliminary assessment and interaction with local inhabitants, around 200-300 number of households could stand to lose their income/livelihood as a result of the development of the project. However, due diligence needs to be undertaken to ascertain the number.
6	Resettlement Issues due to construction of approach road	Existing kutcha road from Z8012 may be widened to provide better access to the proposed EZ. Basis discussion with UNO officials, around 50 households and some trees would be affected due to this development. It was informed to us that the land on both sides of the kutcha road is government land.
7	Resettlement issues of brick field located within the project site	A non-functional brick field is located within the project site. As a result of the development of this project, this brick field needs to be relocated and measures need to be formulated accordingly.
8	Proximity to Environmental Buffer Zone and Jalmahal	Environmental Buffer Zone is being developed at a distance of around 3 km from the proposed EZ. It is located on the northern side of the proposed EZ and on the boundary of the construction yard of Padma Bridge project. During the development of the proposed EZ, precautions need to be taken so that this Environmental Buffer Zone doesn't get affected. On the eastern side of the project boundary, Jalmahal (aquaculture waterbodies) is located. As a result of the development of the proposed EZ, this surrounding area may get subjected to environmental degradation and care needs to be taken to preserve the existing ecosystem of fisheries in Jalmahal.

10.6.3. Block Cost Estimation for development of Offsite Infrastructure

Based on preliminary assessment and available information (the schedule of rates published by the competent public authorities, prevailing market prices, in-house data bank and experience gained over similar / comparable development), the Block Cost estimate for the proposed offsite infrastructure components required for developing EZ has been calculated.

Wherever applicable, we have considered all the possible options to arrive at the cost of development and the option of maximum development cost is considered to arrive at the total cost of the proposed offsite infrastructure development. This exercise has been carried out to indicate the approximate cost to be incurred for the development of EZ and it may vary to any extent during implementation stage depending upon the detailed technical information and new developments which may affect / contribute to this EZ. The techno-commercial viability of these options needs to be explored during feasibility stage.

Following table depicts the broad level Block Cost estimates for development of Offsite infrastructure for Dohar EZ. The figures provided are indicative and may vary depending on the master planning, feasibility analysis and the timeline of development activities.

The broad Block Cost estimate for off-site infrastructure development for proposed Shariatpur EZ is calculated as BDT 16,088 Lakh (approx.). Rationale behind the block cost estimate has been outlined in Annexure.

Table: Block Cost Estimation

Shariatpur-Jajira - EZ										
S.No	Description	Option -1			Option -2			Considered cost option		
		Qty	Unit	Amount in Lakh BDT	Qty	Unit	Amount in Lakh BDT	Qty	Unit	Amount in Lakh BDT
1	Site filling	lump sum		12157	lump sum		12157	lump sum		12157
2	Compound wall	7750	Mtr	736	7750	Mtr	736	7750	Mtr	736
3	Electrical External connectivity- 33 kv LINE with 33/11 KV substation)	4.5	km	1070	5	km	1070	5	km	1070
4	Water supply - Water Intake from River - 11.07 MLD	6	Km	2125				6	Km	2125
5	Water supply (Water from Bore well- bore well 7 Nos - 11.07MLD				2	km	461			
Total				16088			14424			16088

10.7. Voice on the Ground

10.7.1. Stakeholder consultation

Following table lists the details of stakeholders consulted at UNO office to obtain first-hand information from about the proposed EZ.

Table: Stakeholders consulted

Name	Description	Phone number
Mr. Abdul Kader	UNO	+8801782609353
Mr. Kamal	Construction engineer, Local contractor	+8801718713275
Mr. Bilal	Farmer	+8801718381175
Mr. Reza Sha Alam	Union Land Assistant Officer	+8801712477417

10.7.2. Consultation with Private Sector

Further to the site visit for the initial assessment, private sector consultation was also carried out to understand the preliminary level demand assessment of the proposed EZ to gauge the interest of unit investors from various sectors. Some of the major aspects which were discussed with the private investors to understand their interest are as below:

- Location attractiveness
- Availability of physical infrastructure
- Availability of social infrastructure
- Ease of availability of quality manpower
- Marketability of the site
- Support required from the Government

We discussed the salient features of the proposed EZ with various investors in Bangladesh to understand how attractive this project is for them. Also, we tried to understand the macro level infrastructure requirements that any investor looks upon before making an investment decision. The results of the Private Sector consultation are summarized in the following table.

Table: Summary of the results of the Private Sector consultation

Sl. No.	Parameters	Discussions	Excerpts from the interaction (if any)
Infrastructure aspects that investors take into consideration while making investment decisions:			
1	Connectivity of the site	According to the investors, the EZ site should be located in the proximity of any industrial center &/or city. The connectivity by road, rail and airport should be excellent and also the access to port is important as this will ease the conveyance of the finished goods to customers.	<p><i>“Access to Zajira is difficult; however, once Padma Bridge is operational connectivity to the proposed site would improve.”</i></p> <p>- A K Khan & Company Limited, Bangladesh</p>

		<p>Investors opined that though the proposed EZ is located in close proximity to Dhaka, but access takes place via ferry. As a result of the same, significant time is required to access the project site. However, once Padma Bridge get operational, project site would have access to road and rail connectivity. This in turn would facilitate seamless transfer of cargo to/ from Dhaka.</p> <p>Investors also expressed concern that industrial development hasn't taken place in Zajira area. Lack of existing industrial ecosystem might act as a disadvantage for the proposed EZ.</p>	<p><i>"There is no industrial development in Zajira."</i> - Orion Group, Bangladesh</p>
2	Proximity to Port	<p>Access to port is very important for development of multi-product EZs as it will facilitate easy transportation of raw materials and finished goods.</p> <p>Proposed EZ may access Mongla Port for transfer of cargo.</p>	<p><i>"The proximity to port is very important for any industry to develop."</i> - NASSA Group, Bangladesh</p> <p><i>"We look for proximity to port while selecting a site."</i> - AK Khan & Company Limited., Bangladesh</p>
3	Utility Connection	<p>For a multi-product EZ to function and for manufacturing units to effectively continue production, access to power supply, water availability and gas supply is very important.</p> <p>Investors expressed concern that gas is not available at the project site and as a result of the same, heavy industries might get discouraged to set up units in the proposed EZ.</p>	<p><i>"Availability of Gas, Power and Water is the prerequisite to set up any manufacturing based industry."</i> - Orion Group, Bangladesh</p> <p><i>"This side of Padma River doesn't have gas connection."</i> - NASSA Group, Bangladesh</p>
Marketability of proposed Sharaitpur EZ:			
4	Location of the site	<p>The proposed EZ is located near to Dhaka city and it has access to various nearby industrial hubs of Bangladesh.</p> <p>Investors communicated to us that this site lacks in connectivity; however, once Padma Bridge is operational, it might be an attractive location. They also</p>	<p><i>"Zajira doesn't have an existing industrial ecosystem."</i> - A K Khan & Company Limited, Bangladesh</p>

		intimated that lack of existing industries might act as a negative point for the proposed EZ.	
5	Demand among local and foreign unit investors	Investors felt that the demand of the proposed EZ would be high among the domestic investors. They also felt that food processing industries stand a chance.	<p><i>“Demand among local investor should be quite high.”</i></p> <p>- Orion Group, Bangladesh</p>

10.8. Overall Adequacy of the EZ Site in Shariatpur

Evaluation of the proposed EZs with respect to key parameters required to establish multi product economic zones are presented in following table.

Table: Overall Adequacy of the Shariatpur EZ Site

Sl. No.	Parameters	Illustration of the present facilities	Remarks/ Analysis
A	Connectivity		
1 (A)	Road Connectivity Existing Road Connectivity to Dhaka and other major cities of Bangladesh	<ul style="list-style-type: none"> ➤ Proposed EZ is located at a distance of around 80 km from Dhaka. ➤ Access takes place via Dhaka-Mawa Highway. Further, ferry ride has to be taken from Mawa ghat to Shariatpur. ➤ From Shariatpur ghat the zazjira upzilla (proposed EZ) can be accessed through Shariatpur - Kathalbari Zilla road (Z8012) at a distance of 13 km. Z8012 is a single lane bituminous road favorable for passage of heavy vehicles. ➤ Land acquisition is ongoing for widening of Z8012. ➤ Proposed EZ is located at a distance of around 3 km from the approach to Padma Bridge. ➤ Once Padma Bridge is operational, proposed EZ would have seamless access to Dhaka. ➤ Construction for Bhanga-Biswa road is ongoing. Once Bhanga-Biswa road is operational, access to Jessore and Khulna would get improved significantly. 	<p>For any Multiproduct EZ to develop the site must be near to the main city and the connectivity via road should be excellent.</p> <ul style="list-style-type: none"> ➤ Existing connectivity of the proposed EZ to Dhaka takes significant time. ➤ Padma Bridge and Bhanga Biswa Road, once operational would enable seamless movement of cargo vehicles to Dhaka and Khulna/ Jessore, which in turn would facilitate easy sourcing of raw materials and transport of finished goods to/ from various locations of Bangladesh.

<p>1 (B)</p>	<p>Road Connectivity Last Mile Connectivity</p>	<ul style="list-style-type: none"> ➤ Shariatpur-Kathalbari Zilla Road (Z8012) is located at a distance of 2.2 km on the southern portion of the proposed EZ. During site visit, it was observed that it is connected by a kutchra road to the project site. ➤ This kutchra road may be widened to provide better access to the proposed EZ. Basis discussion with UNO officials, around 50 households would be affected due to this development. It was informed to us that the land on both sides of the kutchra road is government land. ➤ Approach road to the site can be provided anywhere from Shariatpur-Majhirghat road. However, during site visit it seems difficult to widen Shariatpur-Majhirghat road due to settlements located on both sides of the road and due to presence of multiple culverts. ➤ Basis preliminary assessment, possibility of constructing another approach road towards the Naruba Rail station/ Padma Bridge could be further explored. 	<p>The alignment for an approach road is essential for developing a multiproduct EZ as it shall enable the access for the manpower and heavy commercial vehicles to national highways and expressways.</p> <p>A broad level initial assessment indicates that providing approach road to the proposed EZ doesn't involve major resettlement issues for the first option (Shariatpur-Kathalbari Zilla Road (Z8012)). Other options may be explored</p>	
<p>2</p>	<p>Rail Connectivity</p>	<ul style="list-style-type: none"> ➤ Faridpur is the nearest rail station from the project site. It is located at a distance of around 75 km from the proposed EZ. ➤ Dhaka (Kamalapur) rail station is approximately 75 km away (by road) from the proposed EZ and travel time by road is 4.5-5 hours (approximate). Access takes place via Z8012 and Dhaka Mawa Highway. This route includes ferry ride at Mawa ghat. Once Padma Bridge is operational, connectivity between Zajira upzilla and Dhaka would significantly improve. As a result of the same, accessibility of rail 	<p>Rail mode of transportation is vital for goods with high volume and timeliness of delivery.</p> <p>At present, any rail station is not located in close proximity to the proposed EZ. However, once Padma Bridge is operational proposed EZ would get access to rail connectivity within 3 km.</p> <p>Dhaka and Faridpur rail stations are located at around 75 km from the proposed EZ.</p>	

		<p>facilities in Dhaka would get easier.</p> <ul style="list-style-type: none"> ➤ Basis discussion with the UNO officials, at the approach of Padma Bridge, Naruba rail station is proposed. This rail line would be connected to Dhaka on one side and Khulna on the other side. It was informed to us that land acquisition for the same is ongoing. ➤ Once Padma Bridge is functional, proposed EZ would have access to rail facility at a distance of around 3 km from the project site. 		
3	Waterway Connectivity	<ul style="list-style-type: none"> ➤ Proposed EZ has access to three ferry terminals viz. Shariatpur ghat, Kawrakandi ghat and Majhirghat. ➤ These ferry terminals are well connected to Mawa ghat and all major ports of Bangladesh through the widespread waterways network of Bangladesh. ➤ However, using these ghats would result in multiple transshipment in the overall supply chain, thereby increasing the cost and time of transport. This renders the prospects of IWT weak in its current form 	The current scenario renders weak prospects of using IWT transport, however, with construction of Padma bridge, the connectivity to Mongla port is expected to improve	
4	Airport Connectivity International airport in the proximity	<ul style="list-style-type: none"> ➤ Proposed Shariatpur EZ is located around 82 km from Hazrat Shah Jalal International Airport at Dhaka. The travel time by road to Dhaka International Airport is 4-4.5 hours (approximate). This includes ferry ride from Shariatpur ghat to Mawa ghat. Z8012 and Dhaka-Mawa highway provide access to the airport. ➤ Once Padma Bridge is operational, access to the international airport would be significantly improved and travel time would reduce significantly. 	<p>For movement of goods by air cargo, proximity to airport is essential.</p> <p>Dhaka Airport is around 82 km from the proposed EZ.</p> <p>Upon completion of Padma Bridge, access to Dhaka airport is expected to improve.</p>	

		<ul style="list-style-type: none"> ➤ Govt. of Bangladesh intends to construct a new international airport (Bangabandhu Sheikh Mujib International Airport) with a view to create a hub airport in close proximity to Dhaka and to meet the demand of future growth in aviation sector. Location for the same is yet to be finalized. 		
B	Utility Connections			
1	Power Availability	<ul style="list-style-type: none"> ➤ Zajira substation is the nearest substation to the proposed EZ and it has a total capacity of 10 MVA. It is located at a distance of around 3 km from the project site. Basis interaction with UNO and Rural Electrification Board (REB) officials, this substation has surplus capacity of 3 MVA. ➤ REB officials informed us that a power plant is proposed in Mazir Ghat, which is at a distance of 4km from the proposed EZ. 	<p>24×7 uninterrupted electricity supply is a prerequisite for development of any manufacturing facility.</p> <p>Basis working knowledge and best practices followed, power requirement in a typical EZ could be transmitted by a dedicated 33 KV line for demand up to 25 MW. If the demand is more than 25 MW, then the option of 132 KV transmission lines needs to be further explored. Proximity to 33 KV power connection and surplus power availability in the vicinity of the proposed EZ are the crucial factors to decide on the potential of power availability to the proposed EZ.</p>	
2	Water Availability	<ul style="list-style-type: none"> ➤ Basis initial site visit, source of drinking water in the area surrounding the proposed EZ is tube well. ➤ As per our discussion with UNO Officials and local inhabitants, it was communicated to us that the depth of water table is at 40-50 feet from the ground level. ➤ However, detailed feasibility study could be taken up to assess withdrawal of water from 	<p>It is very important to have adequate and sustainable source of potable water for the development of multiproduct EZ so that the labours don't face any scarcity of drinking water. The industrial units need uninterrupted supply of good quality water for industrial consumption.</p> <p>Higher water table and presence of</p>	

		<p>Padma River and the ground water potential. Detailed feasibility study needs to be undertaken to estimate the ultimate water demand and decision needs to be taken accordingly.</p> <ul style="list-style-type: none"> ➤ Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Shariatpur EZ is around 4.46 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could be extracted through bore wells. Extraction of more water through bore wells might result in depletion of the aquifer level. 	<p>Padma river increases prospects of sourcing the water to meet the demand.</p> <p>Proposed site has proximity to Padma River, thus the option of extracting water from Padma River may be further explored. Decision regarding extraction of water from bore well/ Padma River needs to be taken after detailed feasibility analysis</p>	
3	Gas Availability	<ul style="list-style-type: none"> ➤ There is no gas source or gas supply near to the proposed EZ. ➤ Basis discussion with UNO officials, it was informed to us that the nearest gas pipeline is available in Munshiganj (located at road distance of around 50 km from the proposed EZ, on the other side of Padma River). ➤ Once Padma Bridge is operational, gas pipeline will be available near to the proposed EZ. Construction for the approach to the Padma Bridge is ongoing at a location around 3 km away from the project site. 	<p>Gas supply is a prerequisite for development of any manufacturing facility.</p> <p>Non-availability of gas would discourage various industries (textile, cement, heavy engineering, electronics, leather etc.) from establishing their units in the proposed EZ.</p>	
C	Suitability for industrial development			
1	Existing industrial ecosystem and Possible Backward linkages for	<ul style="list-style-type: none"> ➤ Zajira upzilla hasn't witnessed any significant industrial proliferation. ➤ However, Zajira is rich in agricultural 	<p>Existing industrial ecosystem facilitates easy development of industries in the economic zone based on backward</p>	

	industries	<p>resources.</p> <ul style="list-style-type: none"> ➤ In Barisal district, major industries operating are: Pharmaceuticals, saline, cement, food processing etc. ➤ Barisal is one of the major sources for cultivation of food grains and fisheries in the country. ➤ Munshiganj district has maximum number of cold storages in Bangladesh. There are several rice mill, oil mill, pulses mill and maida mill located in this region. Apart from this, other major industries in Munshiganj district are: textile, chemical, garments, fishing net, salt and cement. 	<p>linkages and ease in raw material sourcing.</p> <p>There is no industrial ecosystem present in Zajira upzilla.</p> <p>Proximity to Barisal, Munshiganj would enable industries (based on backward and forward integration of existing industries) to develop in the proposed EZ.</p>	
2	Proximity to major cities	<p>Shariatpur EZ is located at a distance of around 80 km from Dhaka city. Connectivity to Dhaka takes long duration, however once Padma Bridge is operational, connectivity would improve significantly.</p> <p>Further, once Bhanga-Biswa Road is operational, proposed EZ would be well-connected to Khulna region.</p>	<p>Proximity to major cities facilitates the proliferation of industrial development. Existing industrial ecosystem provides access to raw material sourcing and skilled manpower.</p>	
D	Challenges in developing the economic zone (Resettlement Issues and social aspects)			
1	Landfilling	<p>Basis preliminary assessment, landfilling of depth 6-7 meter needs to be undertaken.</p>	<p>Landfilling has to be done for the entire site, which means some initial cost has to be borne before the commencement of the development works.</p> <p>Depth of landfilling appears to be higher than the other six sites.</p>	

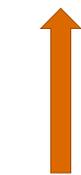
2	Residential units to be rehabilitated	Basis preliminary assessment, 45-50 units need to be rehabilitated as a result of the development of this project.	Mentioned resettlement aspects need to be considered before the development of the economic zone project.	
3	Other Resettlement Issues	<ul style="list-style-type: none"> ➤ Trees existing in the site can be retained and earmarked as green area during the preparation of master plan. ➤ During the master planning stage, the nallah crossing the project site could be rerouted. ➤ Basis preliminary assessment and interaction with local inhabitants, around 200-300 number of households could stand to lose their income/livelihood as a result of the development of the project. ➤ Basis discussion with UNO officials, around 50 households and some trees would be affected due to construction of approach road. It was informed to us that the land on both sides of the kutchra road (existing approach road) is government land. ➤ A non-functional brick field is located within the project site. As a result of the development of this project, this brick field needs to be relocated and measures need to be formulated accordingly. ➤ Environmental Buffer Zone is being developed at a distance of around 3 km from the proposed EZ. It is located on the northern side of the proposed EZ and on the boundary of the construction yard of Padma Bridge project. During the development of the proposed EZ, precautions need to be taken so that this Environmental Buffer Zone doesn't get affected. ➤ On the eastern side of the project boundary, 	Mentioned resettlement aspects need to be considered before the development of the economic zone project.	

		Jalmahal (aquaculture waterbodies) is located. As a result of the development of the proposed EZ, this surrounding area may get subjected to environmental degradation and care needs to be taken to preserve the existing ecosystem of fisheries in Jalmahal.		
E	Availability of Social Infrastructure			
1	Availability of good residential facility in the nearby areas	Dwelling units and residential facilities are available for labours in Zajira and Shariatpur.	The labours working in the proposed EZ shall have access to the dwelling units and residential areas within 5-10 km radius of the proposed EZ. Demand for residential facilities of executives could be catered by proposing residential facilities within the EZ during master planning stage.	
2	Medical facilities available in the nearby areas	There is no international standard hospital is present in the vicinity. 1 Government hospital and 14 private clinics are available within 10 km of the proposed EZ.	There are few medical facilities available within 10 km radius of the proposed EZ to cater to the healthcare requirements of the workforce. Major healthcare facilities are available in Dhaka city (80 km away from proposed EZ).	
3	Air and water pollution at the site (prevailing condition)	The site is free from air and water pollution and no significant noise was observed when the site visit was undertaken. The incidence of water and air pollution at the site is insignificant. Also, the incidence of water borne diseases wasn't recorded in the locality.	The location of any multi product EZ should ideally be free from air and water pollution. Pollution would lead to health hazards and non-conducive working environment for the workforce. From the initial site assessment, it appears that the site is free from all	

			such pollution problems.	
4	Availability of manpower	<p>There are 4 technical and vocational institutions and 3 polytechnic institutes. Some of the Technical institutes located in the radius of 50 km (approx.) from the proposed EZ are:</p> <ul style="list-style-type: none"> • Shariatpur Polytechnic institute • Technical and vocal Education <p>There are a total of 300 vocational education institutions (48 public and 252 private) in Bangladesh. Basis preliminary assessment, the unskilled/ semi-skilled and skilled/executive level manpower could be sourced from these technical institutes.</p>	<p>Availability of manpower is a prerequisite in development of multiproduct economic zones.</p> <p>Proposed EZ in Shariatpur could access to quality manpower from the mentioned technical institutions. However, sourcing manpower from the nearby areas might be a challenge as not much industrial proliferation has taken place in the vicinity.</p>	

Legend:

No Moon



Least



Most



10.9. SWOT Analysis of Shariatpur-Zajira Economic Zone

Based on the detailed analysis carried out in the above, SWOT analysis of the proposed EZ is depicted below:

Parameters	Strengths	Weaknesses
Last mile connectivity	<ul style="list-style-type: none"> Shariatpur-Kathalbari Zilla Road is located at a distance of 2.2 km on the southern portion of the proposed EZ. During site visit, it was observed that it is connected by a kutchra road to the project site. This kutchra road may be widened to provide better access to the proposed EZ. Approach road to the site can be provided anywhere from Shariatpur-Majhirghat road. However, during site visit it seems difficult to widen Shariatpur-Majhirghat road due to settlements located on both sides of the road and due to presence of multiple culverts. Basis preliminary assessment, possibility of constructing another approach road towards the Naruba Rail station/ Padma Bridge could be further explored. 	
Water availability inside the proposed EZ	As per our discussion with UNO Officials and local inhabitants, it was communicated to us that the depth of water table is at 40-50 feet from the ground level.	
Block cost of off-site infrastructure development		Block cost estimate for off-site infrastructure development is BDT 16,088 lakh. Block cost estimate for off-site infrastructure development for unit area is calculated at 30.63 BDT lakh per acre, which is the lowest.
Social and resettlement aspects		<ul style="list-style-type: none"> Landfilling of around 6-7 m is envisaged Basis preliminary assessment and interaction with local inhabitants, around 200-300 number of households could stand to lose their income/livelihood as a result of the development of the project. Basis preliminary assessment, 45-50 units need to be rehabilitated as a result of the development of this project. Trees existing in the site can be retained and earmarked as green area during the preparation of master plan. During the master planning stage,

		<p>the nallah crossing the project site could be rerouted.</p> <ul style="list-style-type: none"> A non-functional brick field is located within the project site. As a result of the development of this project, this brick field needs to be relocated and measures need to be formulated accordingly.
Cost of private land acquisition		<p>Around 472.70 acre of private land need to be acquired which would result in a cost of BDT 23,635.00 lakh. Proposed EZ stands at the highest figure for cost of land acquisition.</p>
Parameters	Opportunities	Threats
Road connectivity	<ul style="list-style-type: none"> Proposed EZ is located at a distance of around 3 km from the approach to Padma Bridge. Once Padma Bridge is operational, proposed EZ would have seamless access to Dhaka. Construction for Bhanga-Biswa road is ongoing. Once Bhanga-Biswa road is operational, access to Jessore and Khulna would get improved significantly. 	<p>Access to Shariatpur/ Zajira takes place via (a) Dhaka-Mawa Highway and (b) further, ferry ride has to be taken from Mawa ghat to Shariatpur.</p>
Rail connectivity	<ul style="list-style-type: none"> Dhaka (Kamalapur) rail station is approximately 75 km away from the proposed EZ and travel time by road is 4.5-5 hours (approximate). Access takes place via Z8012 and Dhaka Mawa Highway. This route includes ferry ride at Mawa ghat. Once Padma Bridge is operational, connectivity between Zajira upzilla and Dhaka would significantly improve. As a result of the same, accessibility of rail facilities in Dhaka (Kamalapur) would get easier. Basis discussion with the UNO officials, at the approach of Padma Bridge, Naruba rail station is proposed. This rail line would be connected to Dhaka on one side and Khulna on the other side. It was informed to us that land acquisition for the same is ongoing. 	<ul style="list-style-type: none"> Faridpur is the nearest rail station from the project site. It is located at a road distance of around 75 km from the proposed EZ.
Waterways connectivity	<ul style="list-style-type: none"> Proposed EZ has access to three ferry terminals viz. Shariatpur ghat, Kawrakandi ghat and Majhirghat. These ferry terminals are well connected to Mawa ghat and all major ports of Bangladesh through the widespread waterways network of Bangladesh. 	
Air connectivity	<p>Once Padma Bridge is operational, access to the international airport would be significantly improved and travel time</p>	<p>Proposed Shariatpur EZ is located around 82 km from Hazrat Shah Jalal International Airport at Dhaka. The travel</p>

	would reduce significantly.	time by road to Dhaka International Airport is 4-4.5 hours (approximate). This includes ferry ride from Shariatpur ghat to Mawa ghat. Z8012 and Dhaka-Mawa highway provide access to the airport.
Power connection	<p>Following power connections are available in the proximity of the proposed EZ:</p> <ul style="list-style-type: none"> • Zajira substation is the nearest substation to the proposed EZ and it has a total capacity of 10 MVA. It is located at a distance of around 3 km from the project site. Basis interaction with UNO and Rural Electrification Board (REB) officials, this substation has surplus capacity of 3 MVA. • REB officials informed us that a power plant is proposed in Mazir Ghat, which is at a distance of 4km from the proposed EZ. 	
Gas connection	Once Padma Bridge is operational, gas pipeline will be available near to the proposed EZ. Construction for the approach to the Padma Bridge is ongoing at a location around 3 km away from the project site.	There is no gas source or gas supply near to the proposed EZ.
Existing industrial ecosystem and Possible Backward linkages for industries	<ul style="list-style-type: none"> • However, Zajira is rich in agricultural resources. • In nearby Barisal district, major industries operating are: Pharmaceuticals, saline, cement, food processing etc. • Nearby Munshiganj district has maximum number of cold storages in Bangladesh. There are several rice mill, oil mill, pulses mill and maida mill located in this region. Apart from this, other major industries in Munshiganj district are: textile, chemical, garments, fishing net, salt and cement. 	Zajira upzilla hasn't witnessed any significant industrial proliferation.
Proximity to major cities	However once Padma Bridge is operational, connectivity would improve significantly.	Shariatpur EZ is located at a distance of around 80 km from Dhaka city. Connectivity to Dhaka takes long time at present.
Access to quality manpower	There are 4 technical and vocational institutions and 3 polytechnic institutes. Around 2 technical training centres are located within 50 km radius of the proposed EZ. Proposed EZ in Shariatpur could access to quality manpower from the mentioned technical institutions.	However, sourcing manpower from the nearby areas might be a challenge as not much industrial proliferation has taken place in the vicinity.
Availability of medical facilities	1 Government hospital and 14 private clinics are available within 10 km of the proposed EZ.	There is no international standard hospital is present in the vicinity. For serious medical treatment, local inhabitants need to travel to Dhaka.
Availability of residential facilities	Dwelling units and residential facilities are available for labours in Zajira and Shariatpur.	No international standard residential facilities are available in the vicinity to the proposed EZ.

Jaliardip (Teknaf) EZ

11. Jaliardip Economic Zone

11.1. Location Details and Salient Features

11.1.1. General Profile of the District

Geographic Location

Cox's Bazar is a district in the Chittagong division located in the extreme Southern part of Bangladesh and 160 km (approx.) away the Chittagong. There are total of 11 districts under Chittagong division.

Cox's Bazar is surrounded by:

- North- Chittagong district;
- East- Bandarban district and Myanmar;
- South- Bay of Bengal
- West- Bay of Bengal.

It lies between 20°43' and 21°56' North latitudes and between 91°50' and 92°23' East longitudes. The district spreads over total area of about 2,491.85 sq.km. of which 940.58 sq. km is under forest.¹⁰⁶

Cox's Bazar has 8 upzilas:

- Chakaria
- Cox's Bazar Sadar
- Kutubdia
- Moheshkhali
- Pekua
- Ramu
- Teknaf
- Ukhia

The proposed EZ is located in Jaliardip (an island in Teknaf upzila). Teknaf upzila forms the southmost point in mainland Bangladesh and Naaf River forms the boundary of the same.

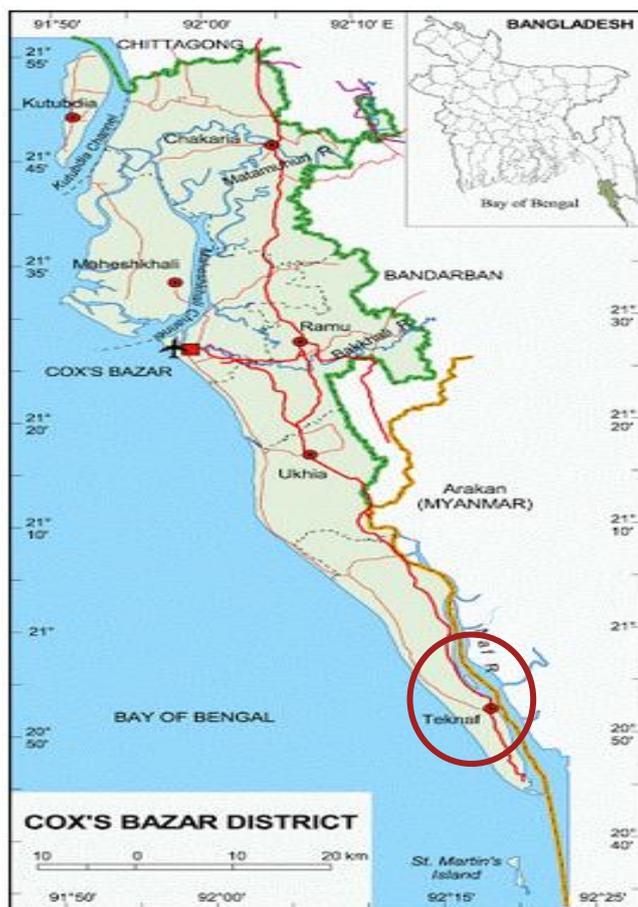
Demographics

The district has overall population of 22,89,990 as per Population and Housing census 2011. The gender ratio in 2011 was 104 (no. of males per 100 females). Total numbers of households were 415954 (average household size was 5.45 persons per household) while the literacy rate is 39.3%.

Upzila wise population details as per census 2011 are presented in the following table.

Table: Upzila wise population details of Cox's Bazar District

Name	Status	Population census		Growth
		2001	2011	
Cox's Bazar	District (Zila)	1773709	2289990	29%
Chakoria	Sub district	5,03,390	474465	12%



Source: Cox's Bazar District website

¹⁰⁶ Population and Housing Census Manik ganj District, BBS 2011

Name	Status	Population census		Growth
Cox's Bazar Sadar	(Upazila)	348075	459082	6%
Kutubdia		107221	125279	32%
Moheshkhali		256546	321218	17%
Pekua		-	171538	-
Ramu		202683	266640	32%
Teknaf		200607	264389	32%
Ukhia		155187	207379	34%

Source: Population and Housing Census Cox's Bazar District, BBS 2011

Climate Condition

The annual average temperature of Cox's Bazar district varies from maximum 34.8°C to a minimum of 16.1°C. Average annual rain fall and average relative humidity recorded in this district were 4285 mm and 75.5% respectively (2011 figures).¹⁰⁷

Agriculture

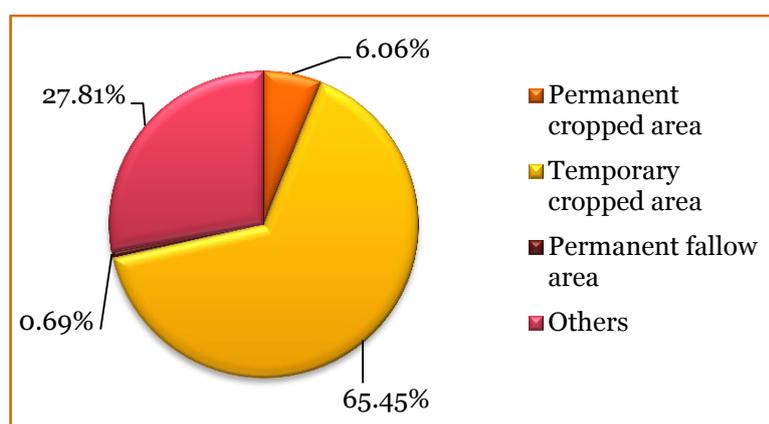
Total agriculture land in Cox's Bazar district is 811.27 sq. km., which amounts to 32.56% (approx.) of the total area of the district.¹⁰⁸

Major agriculture crops cultivated in the district are Paddy, tobacco, rubber, sugarcane, wheat, onion, ground nut pulses and different type of vegetables.

Major horticulture crops in this district are Mango, coconut, guava, lemon and other fruits.

Major portion of the agriculture land is utilized as temporary cropped area in this district. The land use pattern of the agriculture land for the year 2008 is presented in the following figure.

Figure: Land use pattern (2008)



Source: District Statistics 2011, Cox's Bazar, published by Bangladesh Bureau of Statistics (BBS)

Irrigation

Irrigated area classifications fall into two categories:

- Surface water irrigation with main water sources being rivers, canals, ponds, and other water bodies;

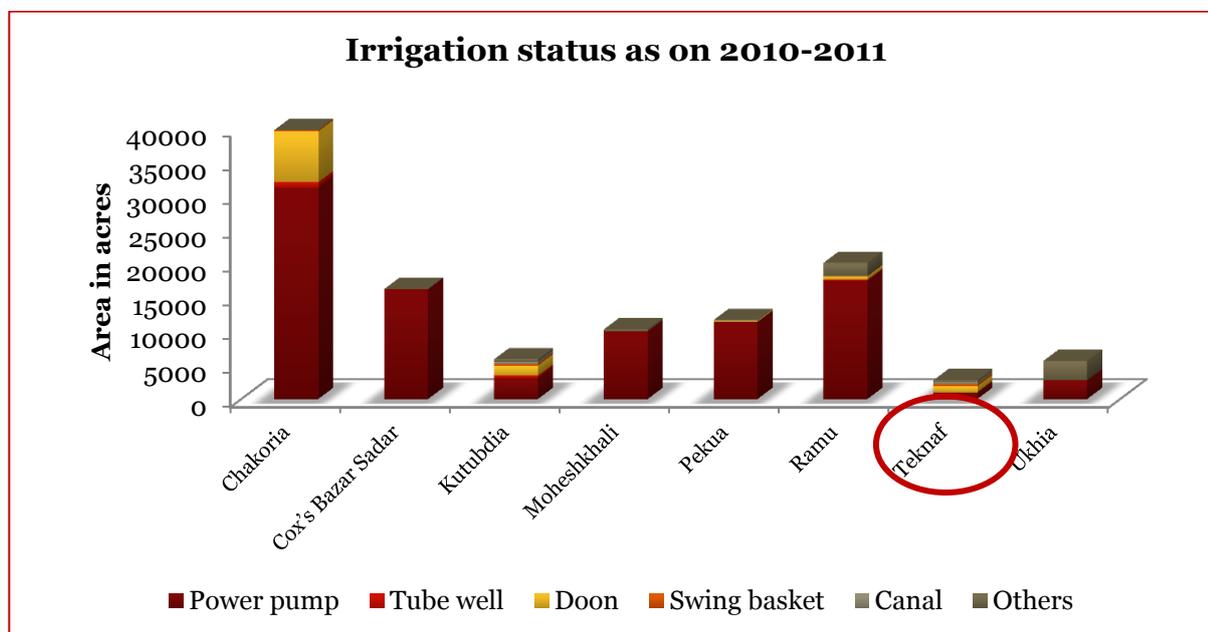
¹⁰⁷ Districts statistics, BBS 2011

¹⁰⁸ District Statistics, BBS 2011

- Underground water irrigation with water lifted by shallow tube-wells, deep tube wells, and country traditional devices.

Currently, 55.5% (approx.) of total agriculture area is under irrigation in this district. However, the percentage of total area under irrigation in Teknaf upzila is 12.4%, significantly lower than the district figure. Upzila wise the method of irrigation during the year 2010-11 is presented in the following figure.

Figure: Irrigation Status (2010-11)



Source: District Statistics 2011, published by Bangladesh Bureau of Statistics (BBS)

Industrial Landscape

The region has presence of manufacturing sector (at SME level). There are around 473 rice mills, 38 salt mill, 64 ice factories, 145 flour mills, 31 fish processing industries, 74 saw mills and 18 printing presses. In addition, there are about 27 large scale industries in Cox Bazaar Region.

The distribution of other industries across upazilas is shown in the following table.

Table: Distribution of other industries across upazilas

Upazila	Growth centre	Hat /bazar	Poultry farm	Dairy farm	Nursery	Horticulture centre	Brick kiln	Decorator service
Chakaria	40	34	102	90	20	0	37	51
Cox's Bazar Sadar	8	29	180	60	19	1	10	41
Kutubdia	1	2	5	0	6	0	4	15
Moheshkhali	7	32	50	3	15	2	2	20
Pekua	4	9	0	2	0	0	3	32
Ramu	7	15	158	23	3	0	26	23

Upazila	Growth centre	Hat /bazar	Poultry farm	Dairy farm	Nursery	Horticulture centre	Brick kiln	Decorator service
Teknaf	2	17	40	44	7	0	6	21
Ukhia	5	9	48	8	15	50	3	33
Total	74	147	583	230	85	53	91	236

Source: District Statistics 2011, Cox’s Bazaar, published by Bangladesh Bureau of Statistics (BBS)

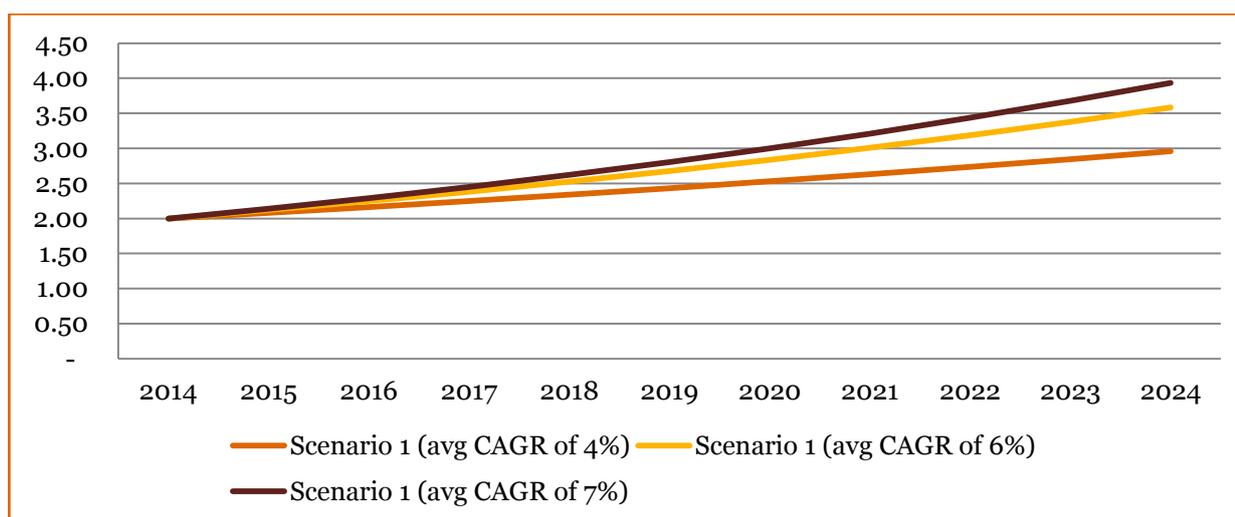
Tourism in Cox’s Bazaar

Cox’s Bazaar is one the most popular tourist centres in the country. Located at the head of the world’s longest sea beach, the area is blessed with many tourist attractions. These includes – Aggmeda Khyang – a Buddhist monastery, Himchari picnic spot, Innani beach, Sonadia Island, Saint Martin Island a beautiful coral island 13kms from the headquarters and the Teknaf peninsula 80 km from the headquarters.

Although there is no official record of Cox’s Bazaar contribution to the tourism traffic, **it has been estimated from interactions with local officials that nearly 2 million¹⁰⁹ people visit Cox’s Bazar in peak season from November to March, with Labonee beach being the mostly visited attracting 30,000 tourists daily.** Most of the visitors are Bangladeshi nationals. The place already has many hotels and restaurants including high ends run by both private and Government.

Considering the macro economic conditions, government’s initiatives to promote tourism sector in the country and Cox’s Bazaar’s position as a leading tourist destination; three scenarios for possible tourist growth have been assessed for Cox Bazaar as illustrated in the following figure.

Figure – Cox Bazaar’s tourist projections (Domestic +Foreign)



Source: Primary interactions and PwC Analysis

To facilitate the above growth in tourism, it is imperative to have coordinated efforts in development of the relevant support infrastructure.

¹⁰⁹ Department of General and Continuing Education, North South University, Bangladesh and <http://archive.thedailystar.net/beta2/news/the-great-potential-of-tourism/>

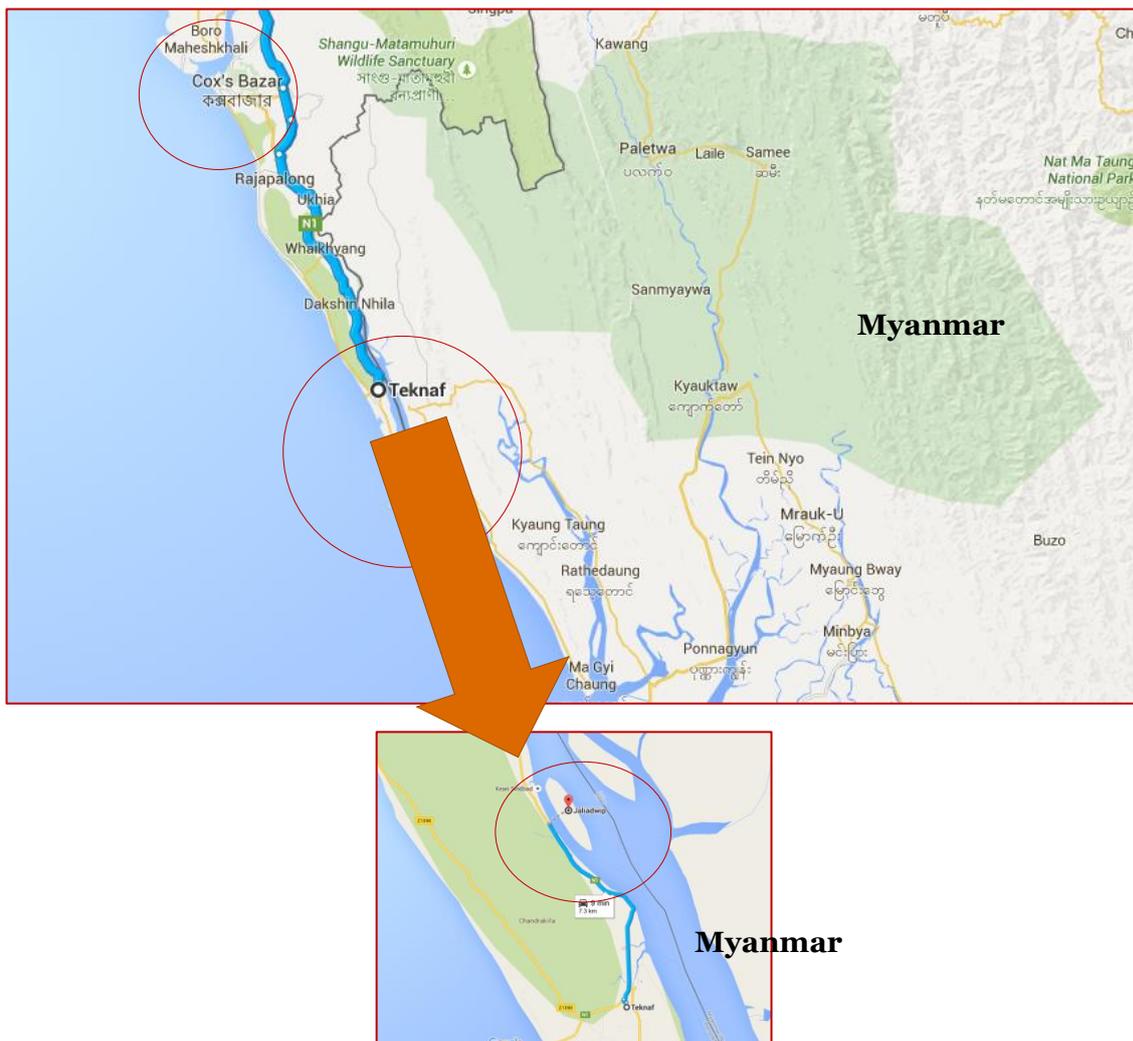
11.2. Broad level Market Assessment proposed Jaliardip EZ

Proposed EZ is located in Jaliardip (an island in Teknaf upzilla). This upzilla forms the southmost point in mainland Bangladesh and Naaf River forms the boundary of the same. Proposed EZ is located very close to Myanmar border. Proposed EZ and Teknaf are approximately 100 km from Cox’s Bazar (popular tourism location in Bangladesh which attracts several domestic and foreign tourists throughout the year).

Due to its geographical location, this sub-district has become an attraction for foreign and local tourists. Because of the tropical weather of Bangladesh most tourists usually go to visit this place during October to March.

Teknaf Peninsula is one of the longest sandy beach ecosystems (80 km) in the world. Some of the important habitats in this region are mangrove, mudflats, beaches and sand dunes, canals and lagoons and marine habitat. Mangrove forest occurs in Teknaf peninsula both as natural forest with planted stands and mostly distributed in the intertidal zone. Teknaf peninsula mangroves support the habitat of different species of fish. Teknaf reserved forest is one of the oldest reserved forests in Bangladesh.

Following figure illustrates the geographical location of the proposed EZ and the surrounding geographical regions.



At present the only access to the proposed EZ is by water. Cox's Bazar to Teknaf can be travelled in 3 hours; after that Naaf River has to be crossed to reach Jaliardip Island. Due to geographical profile of this place, it is secluded from rest of Bangladesh.

Cox's Bazar and Teknaf can be accessed from Dhaka and other parts of Bangladesh by road. There is a domestic airport located in Cox's Bazar; it is proposed to be upgraded as an international airport.

Cox's Bazar district is rich in mineral resources. Estimation by Bangladesh Energy Commission (BEC) indicates that in the sand beach of Nazirtek to Teknaf, around 17.4 Lakh MT mineral is deposited of value 12,000 Crore BDT. Minerals such as Zircon, Ilmenite, Magnetite, Garnet, Rutayl etc. can be excavated from this area.¹¹⁰ According to Cox's Bazar Sea Beach Extraction Centre, at present the mineral resources are being excavated on experimental basis.

Due to lack of agricultural resources and connectivity problem, industrial development hasn't taken place in this area. Snapshot of industrial activities in Cox's Bazar is presented below:

- **Fisheries:** Fishing takes place in abundance in this area. Due to the proximity to Bay of Bengal, Naaf River and other rivers, varieties of species of fish, crab and prawn are available. After catering to domestic requirements, fishes are exported to abroad.
- **Handicrafts:** Varieties of handicrafts items such as small containers, decoration items etc. made of sea shells, wood are available in abundance in this area.
- **Tourism Industry:** Cox's Bazar and Teknaf are known for the panoramic beauty and tourism industry has developed extensively. Throughout the year, several local and foreign tourists accumulate here.
- **Minor Forest Produce:** In Fulchari Range, Dumuriaghona Range, Meherghona Range, bakkhali Range, Inani, Ramu, Uthia and Teknaf region, deep forests are located from which varieties of minor forest produce items are generated such as: Segun, Mehgani, Chapalis, Keora, Bain, Bamboo, Wax, Rubber etc. This sector is totally unorganized and the end products cater to local requirements. Apart from this, Paan and Areca Nut (Supari) produced in Maheskhal area is very popular. Paan and Areca Nut produced from this area is exported to Pakistan and Middle East.

Teknaf Land Port is located near to the proposed EZ. Its counterpart is Mungdu (Myanmar) and trade to/ from Myanmar is operated from this land port. It is spread over an area of 24 acre and has storage capacity of 1,000 MT. This land port has a handling capacity of 30,000 MT (manual-yearly). Import of 86,000 MT and Export of 633 MT has been recorded in 2011-12 from Teknaf Land Port. Following table indicates the major items imported/ exported from this land port.¹¹¹

Major Imports	Lentil, spice, fish, wood, shoe, bamboo, leather, umbrella, betel nut etc.
Major Exports	Cement, readymade garments, potato, egg, hair, aluminium products, plastic goods etc.

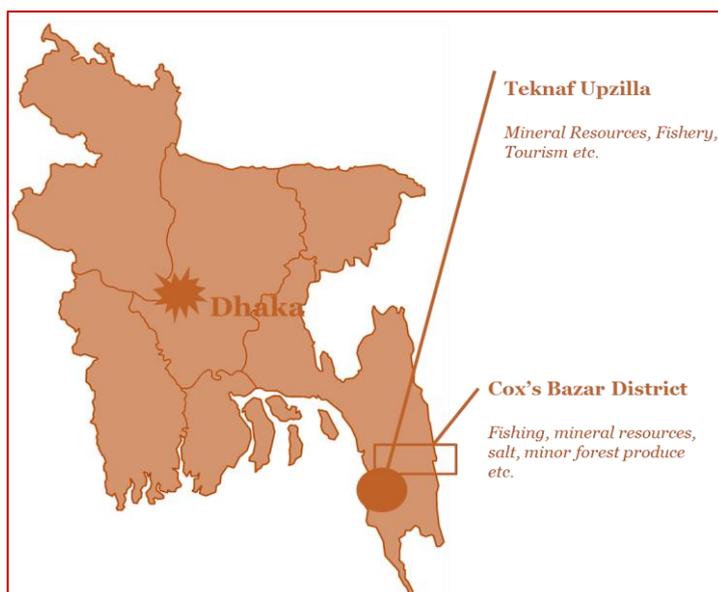
The overall region is blessed with scenic beauty and has various tourist attractions and most of these are accessible from the proposed EZ. Proposed EZ is located near a picturesque beach which is a part of the world's longest beach with a length of 120 Kms running from Cox's Bazaar to Sabraang. Owing to the upcoming Marine Drive, accessing the site will be convenient from the Cox's bazar Airport (which is under consideration for an upgrade).

The fact that Cox's Bazaar is the tourist capital of Bangladesh, location of the Teknaaf peninsula within 80 kms of Cox's Bazaar and the presence of many natural tourist attractions within few kms of the proposed EZ presents a case, where the proposed EZ can expect a decent traffic inflow of tourists.

Following figure depicts the landscape of industry and natural resources in and around Teknaf.

¹¹⁰ <http://www.coxsbazar.gov.bd/node/797434/>

¹¹¹ http://www.bsbk.gov.bd/dmdocuments/Land%20Ports%20in%20a%20Brief%20_2_.pdf



Geographical location and profile of Teknaf and Jaliardip is a major challenge in the development of the proposed EZ. It faces issue of connectivity and infrastructure linkages. Access to Teknaf land port and proximity to Myanmar border would enable cross border trade to/ from Myanmar.

Rich natural resources (such as fishery, mineral, forest produces and salt etc.) are key features of this geographical region. Potential of the same may be harnessed to develop related industries in the proposed EZ.

Proposed EZ has potential to develop as eco-tourism destination. Teknaf and Cox's Bazar have steady footfall of tourists. Virgin sea beaches, picturesque scenic beauty and unexplored island make this location fit for tourism based economic zone.

Some of the important habitats in this region are mangrove, mudflats, beaches and sand dunes, canals and lagoons and marine habitat. Mangrove forest occurs in Teknaf peninsula both as natural forest with planted stands and mostly distributed in the intertidal zone. Teknaf peninsula mangroves support the habitat of different species of fish. Teknaf reserved forest is one of the oldest reserved forests in Bangladesh.

Cox's Bazar district is rich in mineral resources and industries pertaining to construction materials and heavy industries based on mineral extraction and mineral processing stand to gain from the proposed EZ. Also, salt is available in abundance in this region. According to BSCIC data, around 63,532 acre of salt deposit is located in and around Cox's Bazar. The same may be utilized to set up salt producing industries.

In addition to the above, fishery industries in Cox's Bazar district in unorganized in nature and it can be streamlined to develop industries related to fish processing. Proximity to Myanmar and access to Chittagong Port may be utilized to export the same to abroad.

In Fulchari Range, Dumuriaghona Range, Meherghona Range, bakkhali Range, Inani, Ramu, Uthia and Teknaf region, deep forests are located from which varieties of minor forest produce items are generates such as: Segun, Mehgani, Chapalis, Keora, Bain, Bamboo, Wax, Rubber etc. This sector is totally unorganized and the end products cater to local requirements. Apart from this, Paan and Areca Nut (Supari) produced in Maheskhali area is very popular. Paan and Areca Nut produced from this area is exported to Pakistan and Middle East.

Industries based on minor forest produce, rubber production, wax processing, Paan and Areca Nut processing are better fitted for the proposed EZ.

11.3. Reconfirmation of the proposed EZ

11.3.1. Location of the proposed EZ

The proposed EZ is located in Jaliardip (an island in Teknaf upzila). It is bound by Naithang Reserve forest on the west and Myanmar on the East, making it an eco-Sensitive area in Teknaf. Teknaf Peninsula is one of the longest sandy beach ecosystems (approx. 80 km) in the world.

Reconfirmation of site details is presented in Table below:

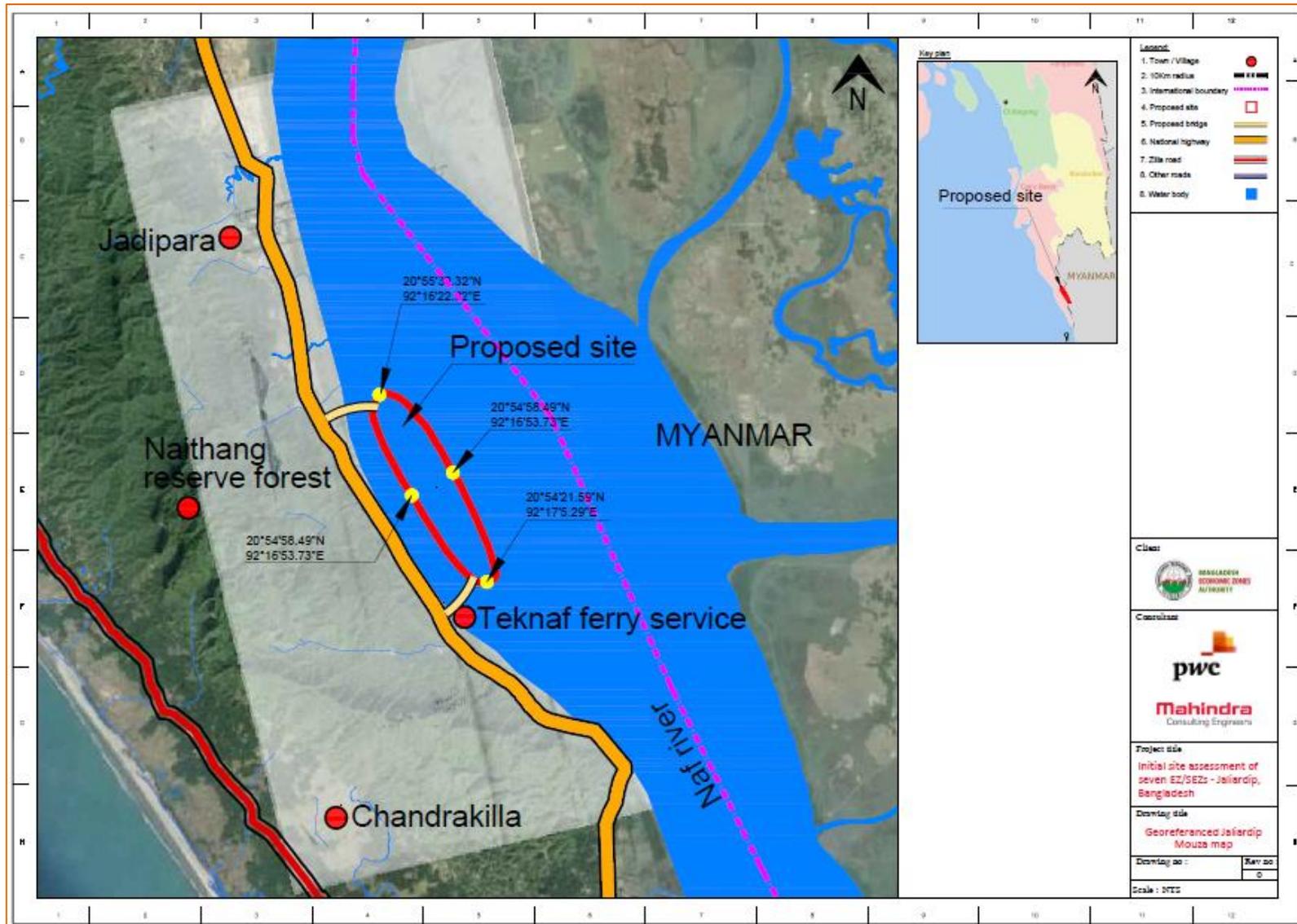
Table: Reconfirmation of site details

Parameters	Details
Site co-ordinates	20°54' 21.59'' N - 20°55' 30.32'' N & 92°16' 35.52'' E - 92°16' 53.73'' E
Site boundaries on East	Naf River, Myanmar
Site boundaries on West	Naf River, Naithang Reserve forest
Site boundaries on North	Naf River
Site boundaries on South	Naf River
Total area of the site	271.93 Acres
Land tenure details	Government owned
Others	Nil
Expansion potential	Not possible
Existing land use	Agriculture, fishing
Land cost (per acre)	Not applicable since the entire land belong to government. Land cost along the road is around 7 Lakh BDT

Source: PwC Initial Site Assessment (Data collected from UNO office)

Mouza map of proposed site as provided by Upazila Nirbahi Officer (UNO) and the same superimposed on Google maps are presented in the figures in the subsequent pages. Location of proposed EZ and its vicinity is shown the next Figures (subsequent pages).

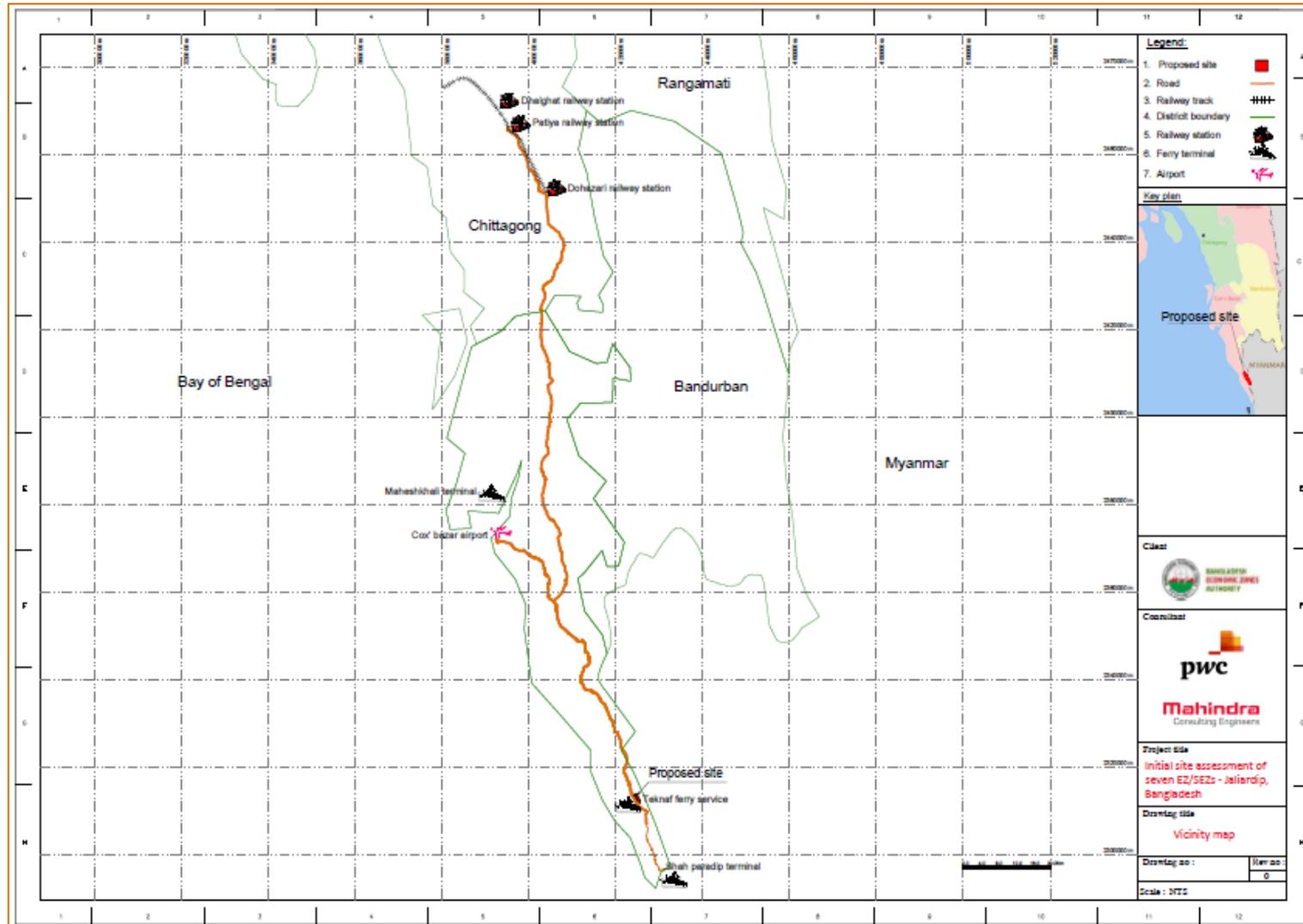
Figure: Mouza map superimposed on google map (Jaliardip)



Source: Source: Mouza Map collected from UNO Office and Google Earth

Following figure shows the location of the proposed EZ and its vicinity.

Figure: Location of the proposed EZ and its vicinity



Source: Google Map and PwC Analysis

11.3.2. Land use / land cover

The land use pattern of the proposed EZ area falls under aquaculture zone of Cox's bazaar district. Due to the proximity to Bay of Bengal, Naaf River and other rivers, proposed EZ acts as a habitat for varieties of species of fish, crab and prawn. After catering to domestic requirements, fishes are exported to abroad. Basis our interactions with government officials the ponds in the proposed EZ are leased for fishing by the Government.



11.3.3. Topography

Basis initial site assessment, it was observed that the proposed EZ has a level difference of 5 to 7 m with a gentle slope towards South East direction with minor undulations. The entire site is located below the Maximum flood level. The depth of land filling across the project area would vary according to the contour variation.

Contour maps of the proposed EZ for 5 km and 10 km radius are presented in the following figures:

Figure: Existing land use pattern for 10 km radius (Jaliardip)

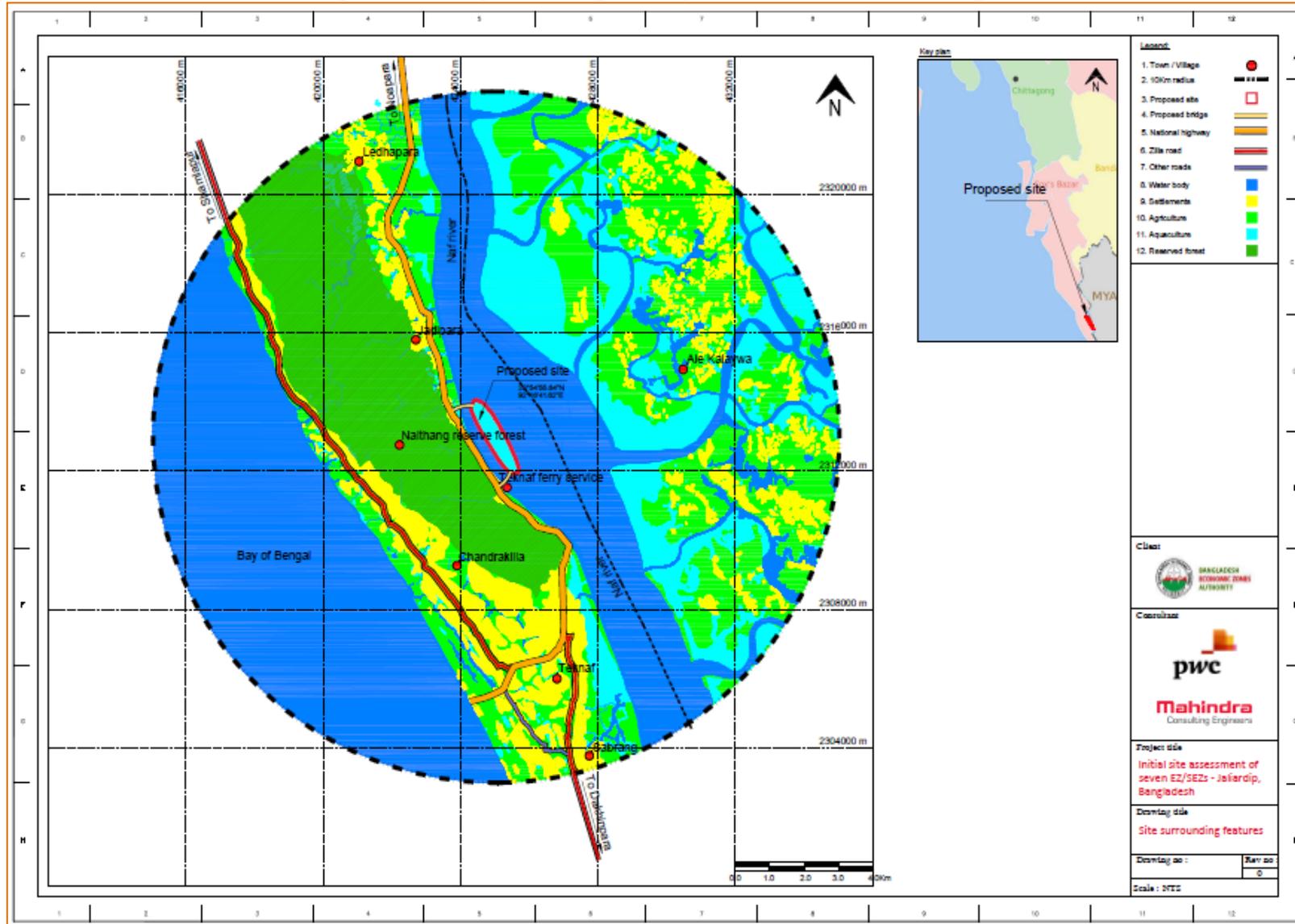


Figure: Existing land use pattern for 10 km radius (Jaliardip)-Closer View

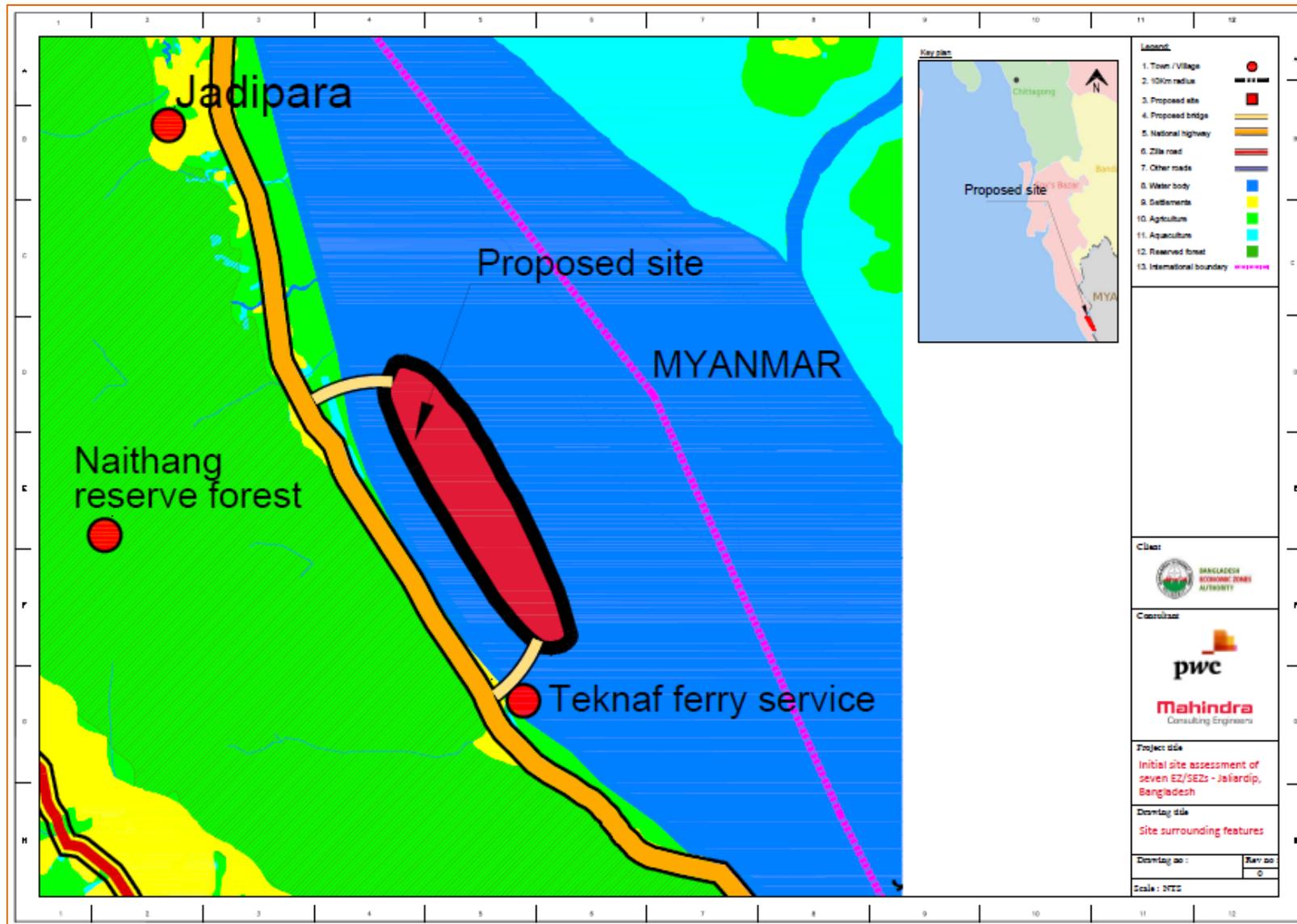


Figure: Contour map of the proposed EZ for 5 km radius (Jaliardip)

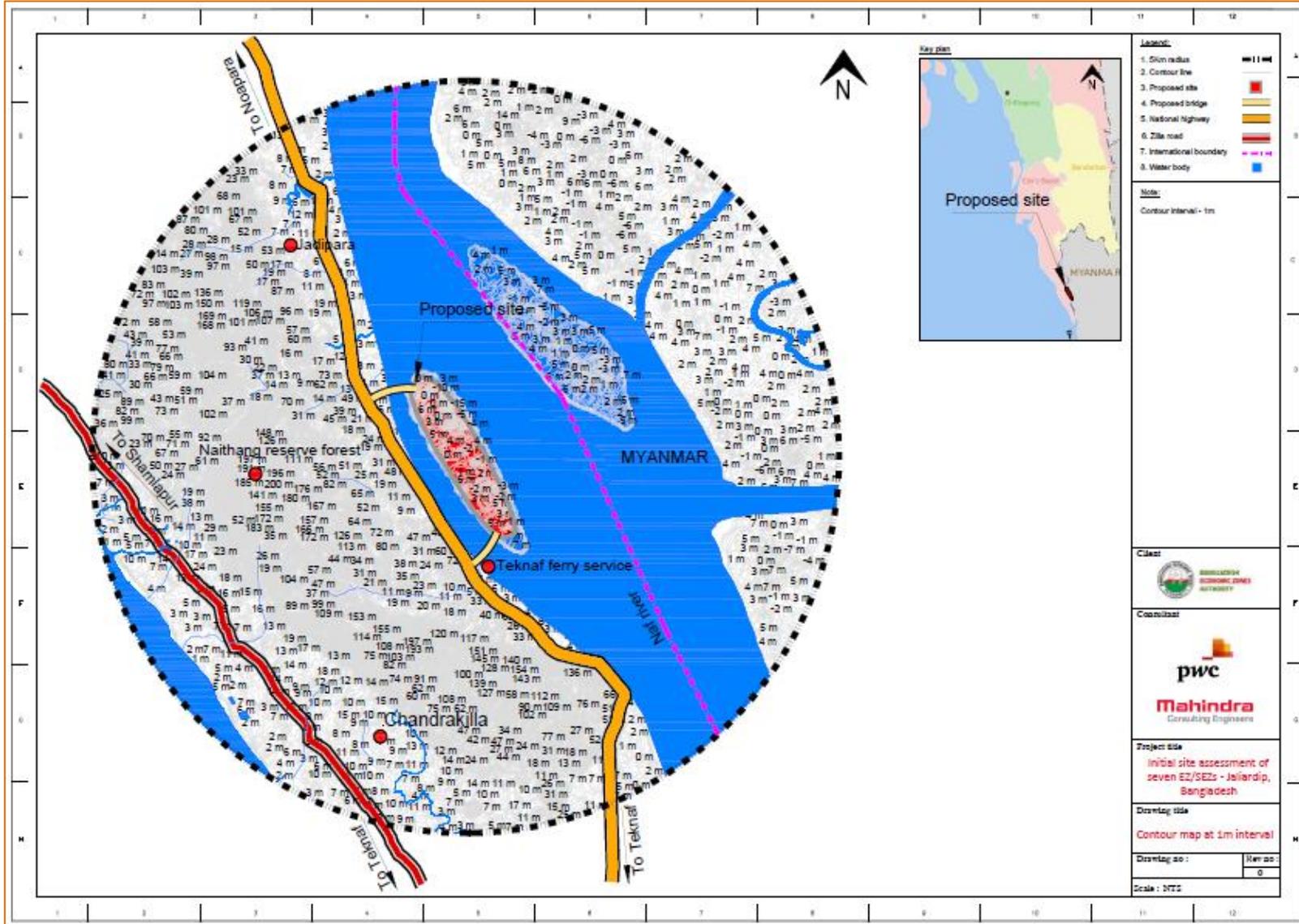
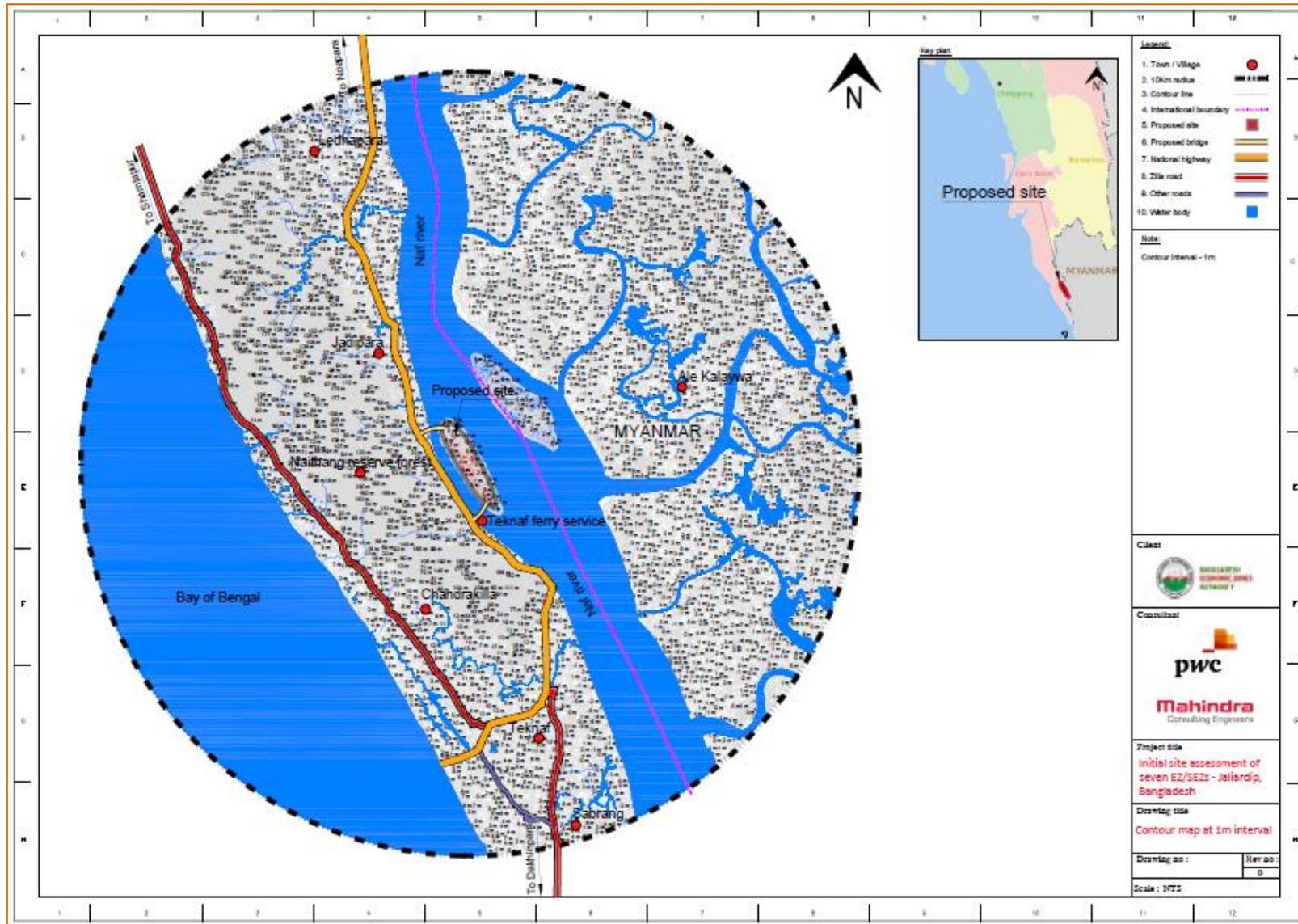


Figure: Contour map of the proposed EZ for 10 km radius (Jaliardip)



11.3.4. Physiography

Since the proposed site is formed due to sedimentation activity there is no specific physiography details available. However Teknaf region falls in low hill range which would not be applicable to this site.

The Bangladesh physiography map is presented in Annexure.

11.3.5. Soil

Basis site visit, the top soil layer was found to be clayey.

Figure: Soil type in the proposed Jaliardip EZ



11.3.6. Geology

Preliminary assessment suggests that the proposed EZ site is formed due to sedimentation activity and that is why there is no specific geology details available.

Geological map of Bangladesh is shown in Annexure.

11.3.7. Earthquake data

The proposed EZ falls in the Seismic Zone 2 and the earthquake coefficient is 0.15 for this zone. The area under the proposed EZ falls under the same seismic range zone; this factor could be taken into account while designing the structure of the proposed EZ.

Seismic zoning map of Bangladesh is presented in Annexure.

11.3.8. Wind speed

The wind speed in the coastal areas could go up to 3-6 Km/hr. From March to May, violent thunderstorms, called northwesters, are observed with a wind speed up to 60 km per hour. The early summer and late monsoon seasons are characterized by intense storms where southerly winds of more than 160 km per hour and induce around 6 meter high waves in the Bay of Bengal. This is a prime cause for most of the flooding witnessed each year in the coastal areas.

The wind speed map for Bangladesh is presented in Annexure.

11.3.9. Cyclones and storms

Bangladesh is highly vulnerable to cyclones due to its geographical location, coastal areas. The proposed Jaliardip EZ is severely affected by cyclones.

The coastal region of Bangladesh is prone to multi hazard threats such as cyclones, storm surges and floods, as well as earthquakes and above all, climate change. It is frequently visited by the cyclone-induced storm surge. Coastal regions as well as the disaster prone areas of Bangladesh are depicted in Annexure.

Bangladesh very often becomes the landing ground of cyclones formed in the Bay of Bengal. This is because of the funnel shaped coast of the Bay of Bengal, Most of the damage occurs in the coastal regions of Khulna, Patuakhali, Barisal, Noakhali and Chittagong and the offshore islands of Bhola, Hatiya, Sandwip, Manpura, Kutubdia Maheshkhali, Nijhum Dwip, Urir Char and other newly formed islands. The coastal zone of Bangladesh is disaster prone. Areas affected by cyclones in Bangladesh are presented in Annexure. Following Table presents the major cyclones occurrences in the recent past in Bangladesh.

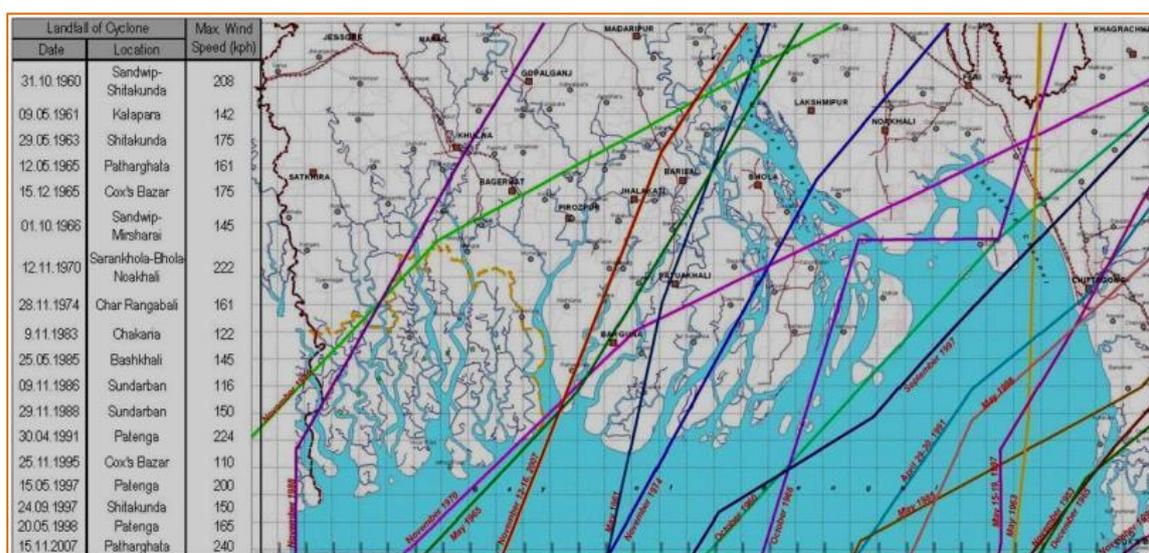
Table: Major cyclones occurrences in Bangladesh

Date	Maximum wind speed (km/hr)	Storm Surge height (meters)	Death Toll
11 May 1965	161	3.7 – 7.6	19,279
15 December 1965	217	2.4-3.6	873
01 October 1966	139	6.0-6.7	850
12 November 1970	224	6.0-10.0	300,000
25 May 1985	154	3.0-4.6	11,069
29 April 1991	225	6.0-7.6	138,882
19 May 1997	232	3.1-4.6	155
15 November (SIDR) 2007	223		3363
25 May (AILA) 2009	92		190

Source: Bangladesh Meteorological Department

Following Figure shows the tracks of few major cyclones that hit Bangladesh during the period 1960 – 2007

Figure: Major cyclones that had hit Bangladesh



Source: Bangladesh Meteorological Department

11.4. Environment section

11.4.1. Air quality

Ambient air quality measurements are essential:

- to provide a description of the existing conditions,
- to provide a baseline against which changes can be measured and
- to assist in the determination of potential impacts of the proposed EZ construction on air quality conditions

During the field visit, it was observed that the ambient air quality is good in the proposed site.

11.4.2. Floods and Water Logging

The entire site is prone to flood and water logging. Necessary filling with suitable protection structures would need to be carried out for the development of proposed EZ.

Following figure are photographs of the proposed EZ taken during our visit to the site area.



11.4.3. Noise

During the field visit, no apparent problem of noise was observed in and around the proposed EZ.

11.4.4. Land filling

Basis our interaction with the UNO officials and local inhabitants, flood level during monsoon season varies from 2 meters to 3 meters depth inside the proposed EZ area.

To avoid inundation during monsoon season, minimum land filling of 0.6 m above the flood level could be considered.

Based on the assumption, an average depth of 5 meters to 7 meters land filling has been envisaged for the proposed EZ area. This figure is indicative and detailed topography survey needs to be carried out to calculate the exact quantity of land filling at the project area.

11.4.5. Eco sensitive area

Basis the interaction with the UNO officials and local inhabitants, Naithang forest reserve and Teknaf wildlife sanctuary is located within one km from the proposed site. It was established in 1983 as a sanctuary to protect wild Asian Elephants. This vast sub-tropical forest has several other attractions like Nitong Hill, Kudum Cave, Kuthi Hill etc. The popular Toinga Peak has an elevation of about 1000 feet. This Sanctuary is rich in biodiversity. Sufficient care need to be taken during feasibility stage to formulate the master plan and to identify the target sectors considering this eco sensitive area.

11.5. Infrastructure Linkages to the Proposed Site

11.5.1. Physical Infrastructure- Availability of Utility Connection

11.5.1.1. Power Availability for the proposed EZ

The nearest substation to the proposed EZ is Teknaf substation having capacity of 10 MVA. Basis interaction with UNO and Rural Electrification Board (REB) officials, this substation has excess capacity of 3.5 MVA. On interaction with the official it was found that substation with the required capacity for the proposed EZ could be built within the proposed site.

33 KV line is passing along the road which is located within 500 meters from the proposed EZ. Basis our discussions with UNO officials, tapping may be taken from this line and 33/11 KV substation may be proposed at site. Grid substation 132/33 KV is available at Cox's Bazar which is located at a distance of 80km from the site.

Bangladesh government has proposed to develop multi-plant power complex with 6000 MW Ultra Super Critical Coal Based Thermal Power Plant and 3000 MW LNG Based Combined Cycle Power Plant in different phases at Moheshkhali Upazila in Cox's Bazar District, and is expected to be commissioned by 2021.

Figure: Teknaf substation



Basis working knowledge and best practices followed, power requirement in a typical EZ could be transmitted by a dedicated 33 KV line for demand up to 25 MW. If the demand is more than 25 MW, then the option of 132 KV transmission lines needs to be further explored. Proximity to 33 KV power connection and surplus power availability in the vicinity of the proposed EZ are the crucial factors to decide on the potential of power availability to the proposed EZ.

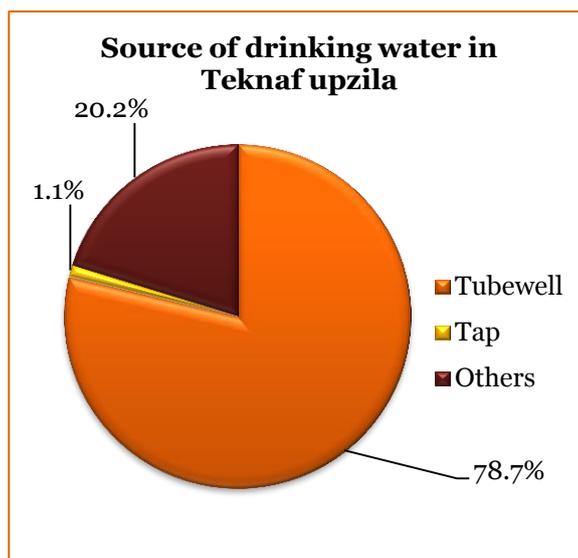
Utility Map in shown in figure at the end of section illustrates the electricity availability in and around the proposed EZ.

11.5.1.2. Water Availability for the proposed EZ

There is no existing water supply system at the proposed site. The local inhabitants are dependent on tube wells for the purpose of drinking water. The source of drinking water in the EZ is based on tube well. Depth of water table is 120 meters – 150 meters from the ground level.

The sources of drinking water in Teknaf upzila is captured in following figure.

Figure: Sources of drinking water in Shibalaya upzila



Source: District Statistics, BBS 2011

Further, our preliminary assessment also suggests that extracting water from the Naf River may be explored by providing suitable intake system and water treatment plant. Proposed EZ is bounded by Naf river on all sides and hence the intake well could be positioned anywhere in the river adjacent to the

project boundary. However the location would need to be finalized during master planning stage. The approximate location as suggested above has been earmarked in the utility map shown in figure at the end of section.

Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Teknaf EZ is around 2.31 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could be extracted through bore wells. Extraction of more water through bore wells might result in depletion of the aquifer level. Proposed site has proximity to Naf River, thus the option of extracting water from Naf River may be further explored. Decision regarding extraction of water from bore well/ Naf River needs to be taken after detailed feasibility analysis.

11.5.1.3. Gas supply to the proposed EZ

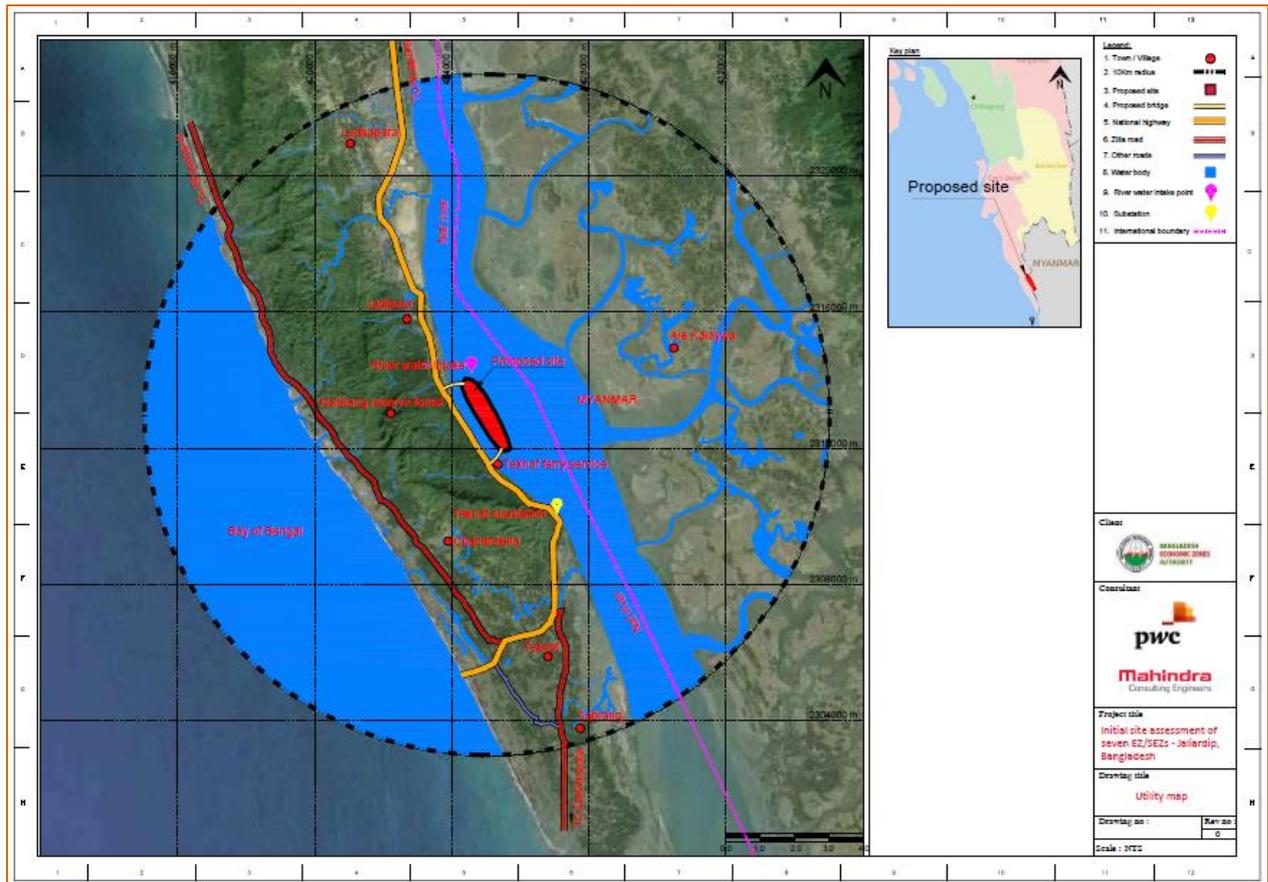
There is no gas supply point available near the proposed EZ. 24" gas transmission line is available upto Shikalbaha power plant, Chittagong (located at a distance of approx. 190 km from proposed EZ). Basis preliminary assessment, a 16" gas pipe line from this place to Cox's bazar could be proposed to be laid out. Further, during primary interactions with Govt. of Bangladesh officials, it was told that there is availability of gas in Myanmar and the Govt. of Bangladesh is in discussion with Govt. of Myanmar for gas supply agreement. The same when implemented may improve the gas supply scenario for this site.

11.5.1.4. Telecom/ Internet connectivity to the proposed EZ

Basis interaction with UNO officials, optic fiber cables are not available in vicinity of proposed EZ. The internet and telecom services are currently provided by mobile companies such as Grameen Phone, Bharti Airtel, Banglalink, Teletalk in this region. Service by private operators has improved the telecom connectivity in the district.

Following figure illustrates the utility connection to the proposed EZ.

Figure: Utility Map for the proposed EZ in Jaliardip



11.5.2. Social Infrastructure

11.5.2.1. Institutional

Cox's Bazar district has 21 colleges (government and non-government colleges) and 157 secondary schools (government and non-government schools). The district also has 1 medical college and 7 technical and vocational institutions. Most of these institutions are located in Chakoria and Cox's Bazar Sadar upzila. There is no technical and vocational institution located in Teknaf upzila.

Some of the major colleges located in Cox's Bazaar district are:

- Cox's Bazar Technical school and college
- Cox's Bazar Polytechnic Institute
- Cox's Bazar government college
- Ukhiya Degree college

11.5.2.2. Healthcare Facilities

Government hospital is available in Teknaf upzila located at 6 km (approx.) from the proposed EZ and has provision for 50 beds. Different categories of health centers are shown below. Following figure illustrates the healthcare facilities available in Teknaf Upzila.

Figure: Healthcare facilities In Teknaf Upazilla



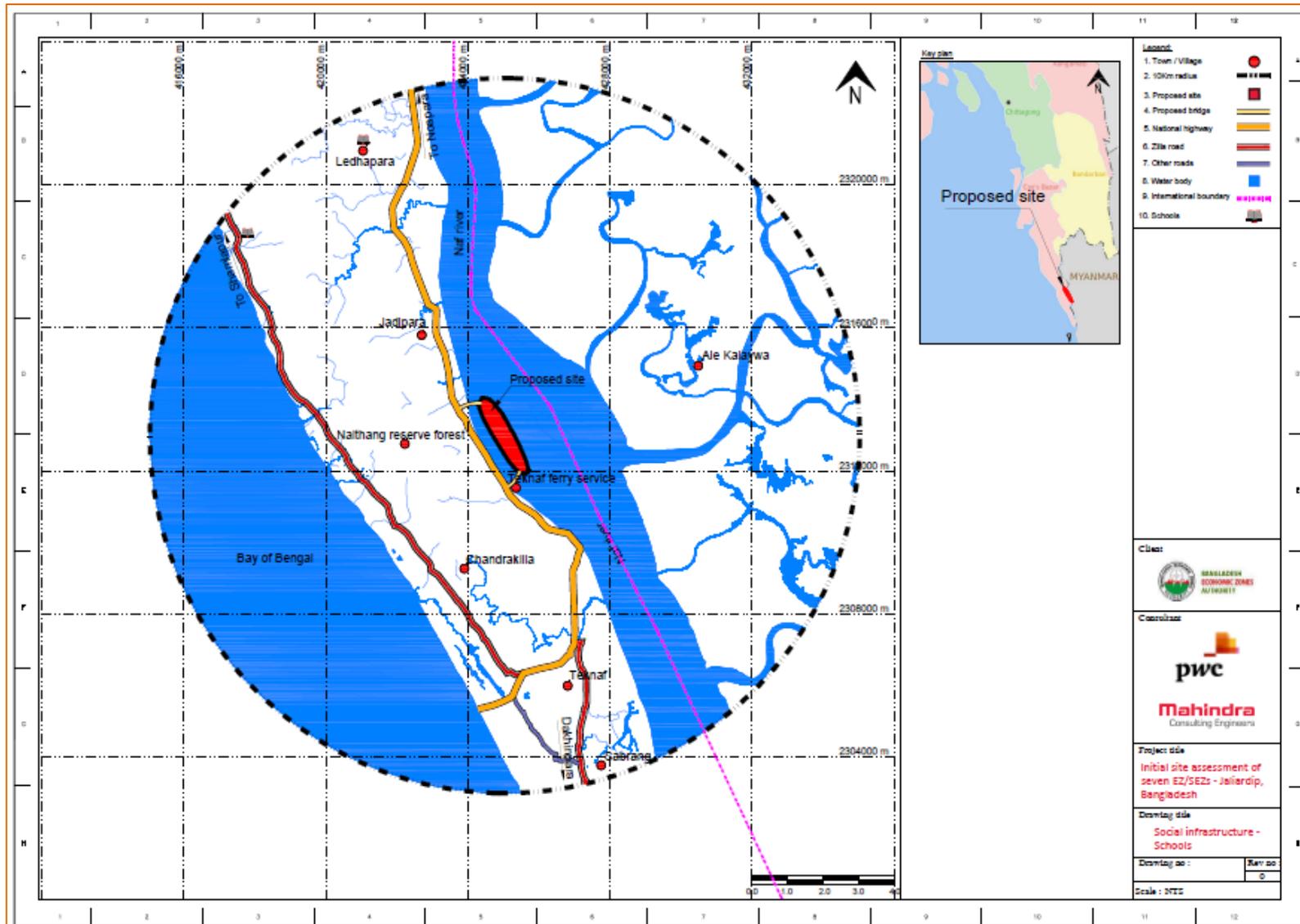
Source: Data collected from UNO Office

Some major Healthcare centers in the vicinity of proposed EZ are:

- Cox's Bazar Medical college & Hospital
- Cox's Bazaar Sadar Hospital

Following figure illustrates the schools and hospitals in vicinity of the proposed EZ.

Figure: Schools and Hospitals in the vicinity of proposed Jaliardip EZ



Source: PwC analysis

11.5.3. Connectivity

Roadway and waterway are the most convenient means of accessing the proposed EZ. Road distance between Cox’s Bazar city and proposed EZ via N1 highway (Cox’s Bazar-Teknaf Highway) is 80 km (approx.). Last mile connectivity to proposed EZ (located in Jaliardip Island, being bounded by Naf River on all sides) could only be possible by waterways.

11.5.3.1. Road

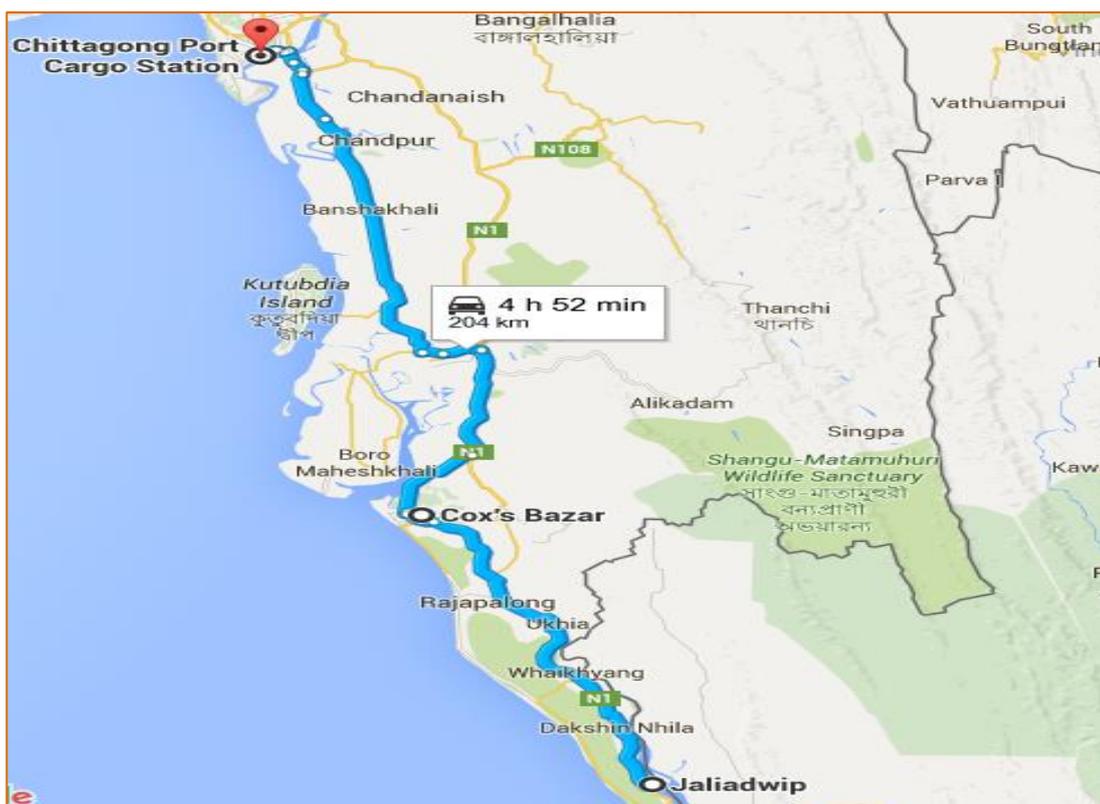
The proposed EZ can be accessed through two roads from Cox’s bazaar i.e. 1.Dhaka – Chittagong highway (N1) approximately 80 km distance to the site. 2. Cox's Bazar-Teknaf Sea beach Road (Z1098) which runs up to Teknaf and then from Teknaf it connects the proposed site through Dhaka – Chittagong highway (N1). The total distance to the site via route 2 is approximately 100 km. These roads are single lane and it takes around 3 hours to reach the Cox’s bazaar from the proposed EZ by road. Following figures illustrate the accessibility of proposed EZ through Cox's Bazar-Teknaf Sea beach Road (Z1098) and Dhaka-Chittagong Highway (N1) as well as connectivity of proposed EZ to Cox’s Bazar and from Cox’s Bazar to Chittagong.

Figure: Proposed EZ, Cox's Bazar-Teknaf Sea beach Road (z1098) and Dhaka-Chittagong Highway (N1)



Source: Google map and PwC analysis

Figure: Proposed EZ and its connectivity to Chittagong



Source: Google map and PwC analysis

The N1 highway is one of the most important transportation arteries in Bangladesh, between Dhaka and Teknaf Upazila. The road links the country's two largest cities, Dhaka and Chittagong and also touches Comilla and Feni. The highway is known along various stretches as the Dhaka–Chittagong Highway, the Chittagong–Cox's Bazar Highway and the Cox's Bazar–Teknaf Highway.

The road traffic on this route is severely hampered because of the lack of capacity of the existing highway and the load restrictions of bridges; with journeys taking around 10 hours due to the congestion of the road. The road also suffers from poor road safety records because of the lack of segregation between local and national traffic and between motorized and non-motorized traffic.¹¹²

One of the major ongoing projects in Bangladesh of upgrading Dhaka-Chittagong highway to four lanes could ensure fast and smooth conveyance of goods and passengers between Dhaka and Chittagong. These roads form part of the regional road network, as well as the Trans-Asian Road network facilitating trade between Bangladesh and neighboring countries.¹¹³

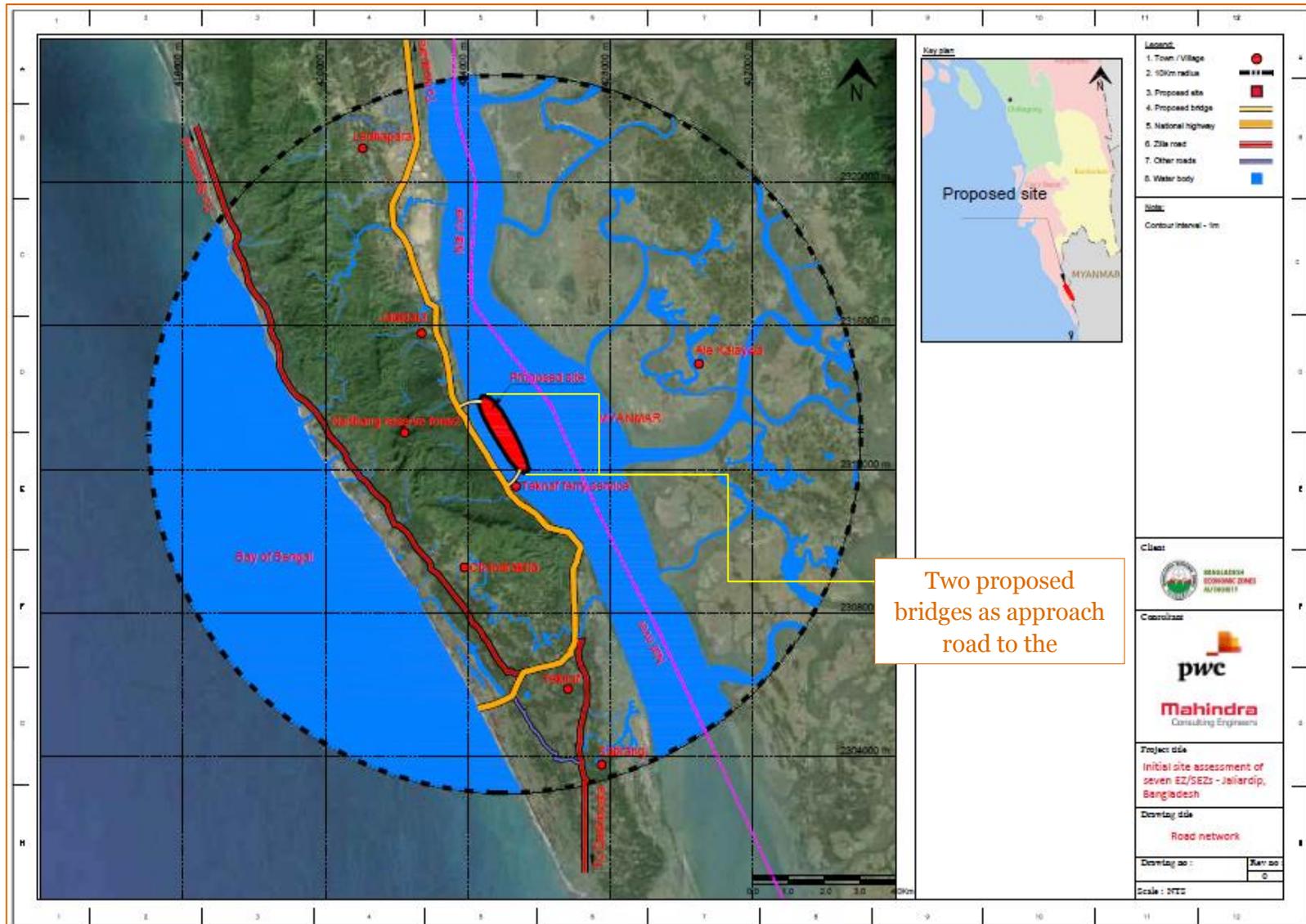
Last Mile Connectivity (Approach Road)

At present waterway is the only possible approach to the proposed EZ. Basis preliminary assessment, it is proposed that two bridges could be constructed to the proposed EZ from Dhaka – Chittagong National highway (N1) with a length of 1050 meters and width of 20 meters on both end of the island with a minimum clearance of 12 m from the highest flood level. However detailed hydrography survey need to be carried out prior to finalization of the bridge alignment. Besides, this assessment is carried out at a broad level on the basis of the preliminary assessment. Any further decision on the same needs to be taken after detailed feasibility analysis. Following figure illustrates the two proposed bridges and road network for 10 km radius of the proposed EZ.

¹¹² <http://www.pppo.gov.bd/projects-dhaka-chittagong-access-controlled-expressway.php>

¹¹³ <http://www.plancomm.gov.bd/wp-content/uploads/2013/09/Perspective-Plan-of-Bangladesh.pdf>

Figure: Road Network for 10 km radius (Jaliardip)



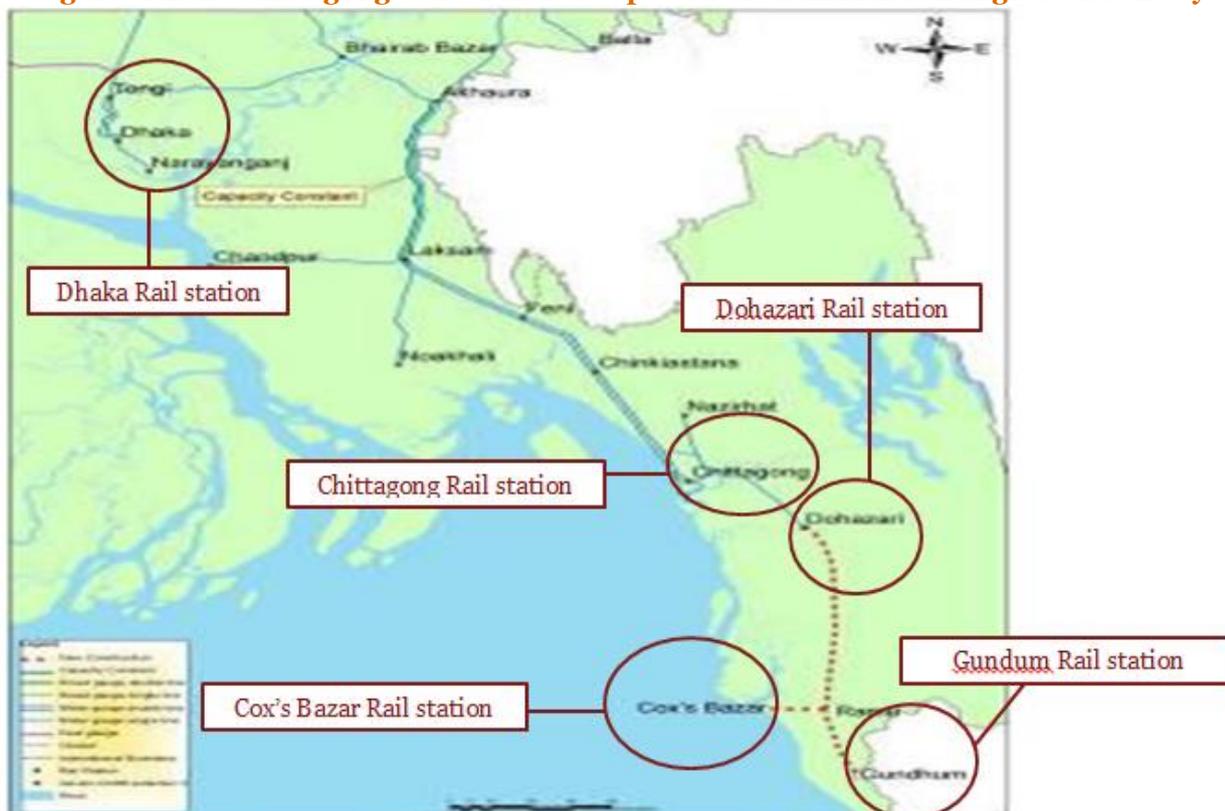
Source: PwC Analysis

11.5.3.2. Rail

At present there are no railway stations in the Cox's Bazaar.

However, Cox's Bazaar is located on the Bangladesh Railway's "Dhaka-Chittagong Cox's Bazar- Deep Sea Port Corridor". Currently this corridor is operational upto Dohazari railway station (marked in the figure below).

Figure: Dhaka-Chittagong Cox's Bazar- Deep Sea Port Corridor of Bangladesh railway



Source: Bangladesh Railway master plan, http://railway.portal.gov.bd/sites/default/files/files/railway.portal.gov.bd/page/67cd2529_587a_45b9_84e0_cd12c8d8c9bd/8.%20Formulation%20of%20BR%20Masterplan.pdf

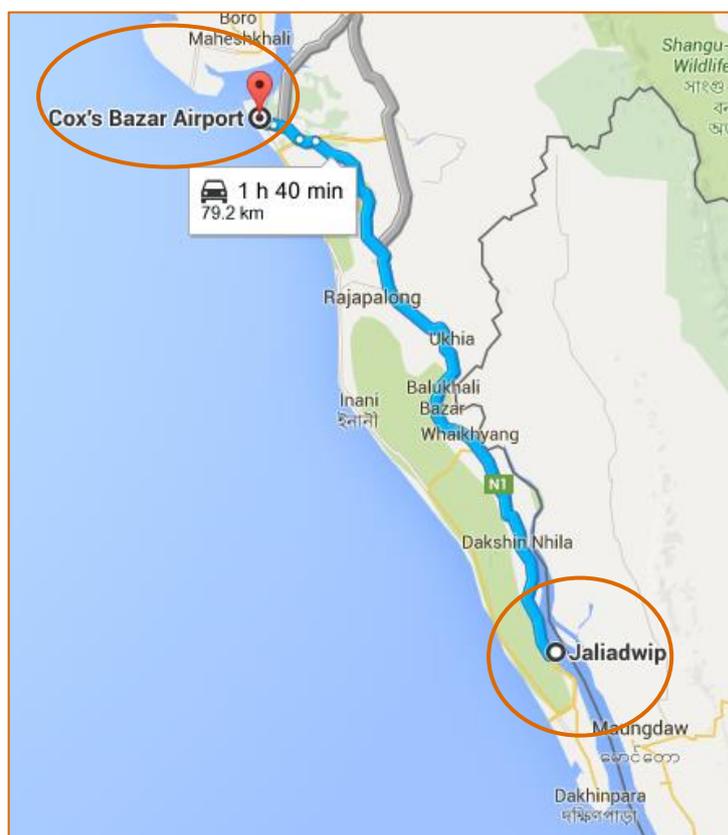
Basis preliminary assessment, the Chittagong-Cox's Bazar section of the corridor, is gaining special consideration as per Bangladesh railways development is concerned. Feasibility Study for Improvement and Rehabilitation of Branch Lines of Bangladesh Railway (2007) suggested for rehabilitation of Chittagong-Dohazari (41km) section of the corridor. There seems a government initiative to find a suitable location for a Deep Sea Port/Mega Port that would a Hub Port for the region. Suitable location of the Deep Sea Port is proposed to be around Sonadia Island- 9 square km in area located 7-km north-west of Cox's Bazar. The extension of the railway from Dohazari up to that area (around 102 km) could be justified and the government has decided to go for this potential port. Further extension of the railway up to Cox's Bazar needs urgent construction considering strategies to be adopted to attract tourist traffic. Initiatives may be taken from the Bangladesh Railway (BR) to extend the railway line from Dohazari to Gundum with a view to link with the railway in Myanmar, in future. Feasibility Study including Detail Design and Tendering Services ADB is going on under Asian Development Bank (ADB) funding.

A broader vision suggests that these reforms in Bangladesh railway along the "Dhaka Chittagong Cox's Bazar Myanmar Border" could strategically be an advantage to the proposed Jaliardip EZ in Cox's Bazaar.

11.5.3.3. Airport

Cox's Bazaar domestic airport is at a distance of 80 km (approx.) from the proposed EZ. The connectivity from airport to the proposed EZ takes around 2-2.5 hours (approx.) of travel time via Cox's Bazaar-Teknaf National Highway (N1) road.

Figure: Connectivity of Cox's Bazaar Airport to proposed EZ



Source: Google Map and PwC analysis

The Airport is being considered for an upgrade by the Bangladesh Civil Aviation and Tourism Ministry.

The objective is to develop the airport into an international airport by upgrading its runway to enable large aircrafts coming from Europe, America and East Asia to land directly in Cox's Bazaar. This is part of the larger agenda to attract foreign tourist to the area. Prime Minister of Bangladesh has recently inaugurated (Jul' 2015) the commencement of construction works for International Airport in Cox's Bazar.

11.5.3.4. Water connectivity

The site at present is an island and last mile connectivity in terms of port or a bridge is absolutely essential for the success of the proposed EZ. This aspects need to be considered, if the EZ development is implemented.

However, once the EZ last mile connectivity is in place, the site may be linked to other waterway terminals which in turn may further help in making the EZ successful. These are explained below:

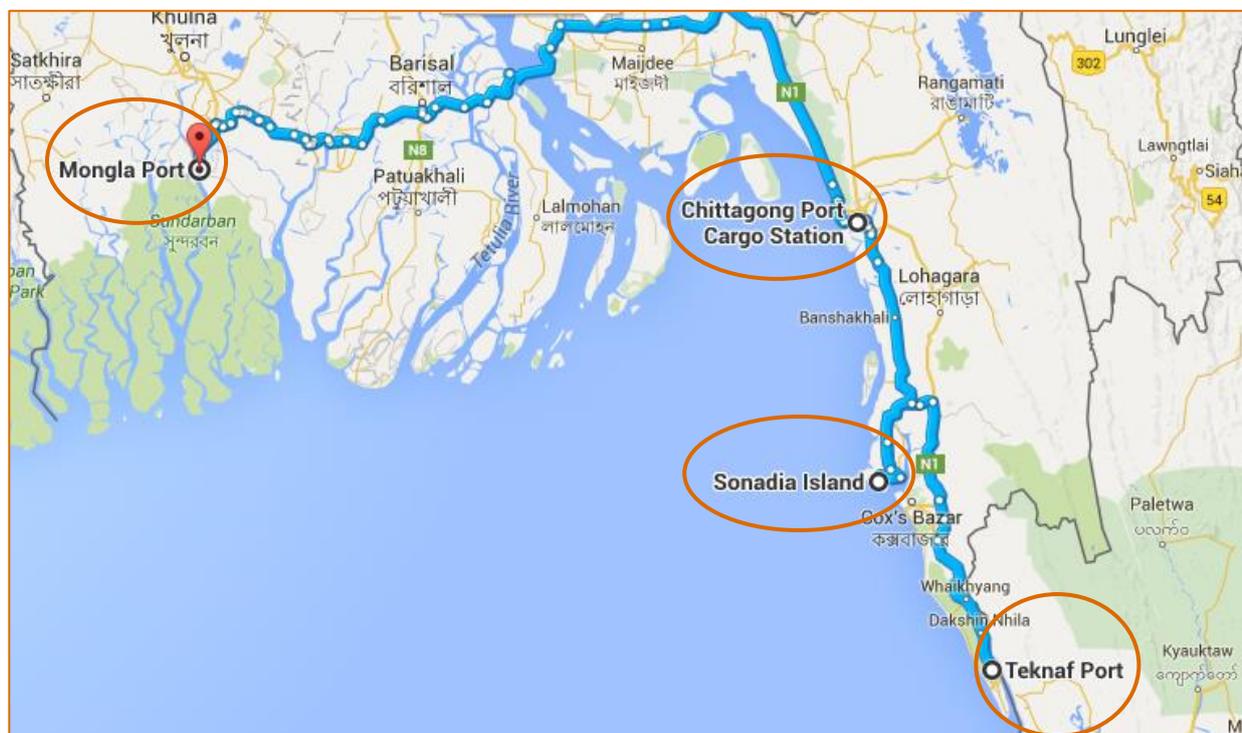
Chittagong port is the principal Port of Bangladesh. Proposed EZ is located at a about distance of 190 km from this port.

Teknaf port is only used to transport goods and passengers between Bangladesh and Myanmar to cross the river for about 1 km width. Approximately 3-5 trips are being made to & fro from Bangladesh. Preliminary assessment suggests that expansion of cargo and passenger handling capacity of Teknaf port

to other major ports of Bangladesh as well as to ports in Myanmar may be explored. Once the proposed EZ is developed, this could aid in trade related transport to other parts of Bangladesh as well as exports to Myanmar. However the any such decision would need to be finalized during master planning stage and would require detailed feasibility analysis.

Following figure illustrates the geographical importance of proposed EZ with respect to water connectivity to Chittagong port, proposed Sonadia deep sea port and Mongla port.

Figure: Location of Teknaf Port, Sonadia Island, Chittagong and Mongla port



Source: Google map and PwC analysis

Saint Martin: An attractive tourism location

Bangladesh Inland Water Transport Authority (BIWTA) currently operates daily Teknaf - Saint Martin Sea-Truck Service.¹¹⁴

Saint Martin Island (a coral island located at a distance of 30-40 km (approx.) away from the proposed EZ) is a tourist attraction. The island is accessed by ships/boats sailing from the Saint Martin Port. Saint Martin port was developed by United Group Ports in Public Private Partnership (PPP) mode. During peak seasons 7 ships run up and down between the island and the mainland carrying about 350 – 800 people (approx.) per day. Following figure illustrates the location of proposed Jaliardip EZ and Saint Martin Island and Cox's Bazar on map.

¹¹⁴ BIWTA, <<http://www.biwtc.gov.bd/tariff.php>>

Figure: Location of Jaliardip, Saint Martin Island and Cox's Bazar



Source: Google map and PwC analysis

Preliminary assessment suggests that River Cruise (and similar recreational facilities) could be proposed between Jaliardip EZ and Saint Martin Island which in turn could facilitate seamless movement of tourists to the proposed EZ.

11.5.3.5. *Intermodal Cargo Transfer*

Since the proposed EZ is located on an island, presence of a water way port or a bridge is paramount for intermodal cargo transfer to/from the EZ. This is the critical infrastructure required to connect the EZ with other important part of the country and this aspect should be considered while undertaking the detailed feasibility for the site.

11.6. Resettlement issues

11.6.1. Social impacts

The impacts have been assessed on the following parameters:

- (xlii) Loss of land (for existing land owners),
- (xliii) Loss of homes/structures,
- (xliv) Loss of Trees
- (xlv) Loss of livelihood systems/ income opportunity
- (xlvi) Loss of water bodies.
- (xlvii) Resettlement issues pertaining to approach road
- (xlviii) Resettlement issues due to relocation of old Aricha Ghat Ferry terminal

The expected types of losses are described in the following sub-sections.

11.6.1.1. Loss of land

To establish the EZ project, a total of 271 acres of land has been demarcated by the authority. It is comprised of two mouza namely South Hnila and Teknaf sadar which is of 56.51 acres and 215.42 acres; the land is owned by the Government, hence loss of land is nil. As per Field Measurement Book (FMB) superimposed on Google map the total area works out to approximately 273 acres. The land usage pattern for this area is as under:

- Aquaculture- 265 acre (approx.)

11.6.1.2. Loss of homes/structures

There is no loss of homes and structures. However there are 4-5 temporary sheds available for fishermen those who are taken the land under lease agreement from government of Bangladesh.

Figure: Temporary residential structures (sheds) available in the region



11.6.1.3. *Loss of trees*

The loss of trees in the project area is less. Basis discussion with local inhabitants, around 200-300 number of trees might be located within the project area. However, during master planning stage this needs to be ascertained. The master plan (during the feasibility stage) can be prepared in a way that maximum number trees could be retained and earmarked as green area.

Figure: Photographs of trees in the project area



11.6.1.4. *Loss of income/livelihood*

As a result of loss of aquaculture land, the fishermen's will be directly affected due to the development of this project. The government has leased the ponds inside the proposed EZ to fishermen's, hence the development of the proposed EZ would affect the fisherman's who are depended on the ponds for income.

11.6.1.5. *Loss of water bodies*

There are fishponds located within the proposed EZ. The surroundings of the EZ have been observed as a rich fishing ground. Project interventions i.e. land filling of the existing water bodies and discharge of waste water along the Naf River might affect the fish spawning & nursing ground and subsequently income source from fishing. Therefore, significant environmental and social impacts are anticipated

Figure: Fish ponds located in the proposed EZ



11.6.1.6. Resettlement issues due to the construction of approach road

There are no resettlement issues.

11.6.2. Constraints and its mitigation

The major constraints and its mitigation are presented in the following table:

Table: Major Constraints and Mitigation measures

Sl. No.	Constraints	Mitigation measures
1	Low lying land	Basis preliminary assessment, landfilling of depth 5-7 meters needs to be undertaken.
2	To provide access to the site	Necessary hydrography survey would need to be carried out to finalize the suitable type of access such as bridge, ropeway, etc. during feasibility stage.
3	Loss of trees	Trees existing in the site can be retained and earmarked as green area during the preparation of master plan.
4	Loss of water bodies	Land filling need to be undertaken for fish ponds located within the proposed EZ.

11.6.3. Block Cost Estimation for development of Offsite Infrastructure

Based on preliminary assessment and available information (the schedule of rates published by the competent public authorities, prevailing market prices, in-house data bank and experience gained over similar / comparable development), the Block Cost estimate for the proposed offsite infrastructure components required for developing EZ has been calculated.

Wherever applicable, we have considered all the possible options to arrive at the cost of development and the option of maximum development cost is considered to arrive at the total cost of the proposed offsite infrastructure development. This exercise has been carried out to indicate the approximate cost to be incurred for the development of EZ and it may vary to any extent during implementation stage depending upon the detailed technical information and new developments which may affect / contribute to this EZ. The techno-commercial viability of these options needs to be explored during feasibility stage.

Following table depicts the broad level Block Cost estimates for development of Offsite infrastructure for Jaliardip EZ. The figures provided are indicative and may vary depending on the master planning, feasibility analysis and the timeline of development activities.

The broad Block Cost estimate for off-site infrastructure development for proposed Jaliardip EZ is calculated as BDT 67379 Lakh (approx.)

Table: Block cost estimation for proposed Jaliardip EZ

Jaliardip - EZ										
S.No	Description	Option -1			Option -2			Considered cost option		
		Qty	Unit	Amount in Lakh BDT	Qty	Unit	Amount in Lakh BDT	Qty	Unit	Amount in Lakh BDT
1	Site filling	Lumpsum		9377	Lumpsum		9377	Lumpsum		9377
2	Compound wall	5700	Mtr	542	5700	Mtr	542	5700	Mtr	542
3	Diaphragm wall	5700	Mtr	2280	5700	Mtr	2280	5700	Mtr	2280
4	RCC bridge	2100	Mtr	52290	2100	Mtr	52290	2100	Mtr	52290
5	Electrical (External connectivity- 33 kv LINE with 33/11 KV substation)	7	km	1220	7	Km	1220	7	Km	1220
6	Water supply - Water Intake from River - 5.69 MLD	1	km	1670				1.00	Km	1670
7	Water supply (Water from Bore well- bore well 4 Nos - 5.69 MLD				3	Km	416			
Total				67379			66125			67379

Source: PwC and MACE analysis

11.7. Voice on the Ground

11.7.1. Stakeholder consultation

Following table lists the details of stakeholders consulted at UNO office to obtain first-hand information from about the proposed EZ.

Table: Stakeholders consulted

Name	Description	Phone number
Mr. Shahmujahid Uddin	UNO	+8801720096744
Mr. Balai Mitra	Deputy GM (PBS)	+8801769400124
Mr. Biplol Chakravorty	Office Assistant	+8801814106939
Mr. Sydur Rahman	Surveyor	+8801712717833
Mr. Zahid Iqbal	Executive Magistrate	+8801733373208

11.7.2. Consultation with Private Sector

Further to the site visit for the initial assessment, private sector consultation was also carried out to understand the preliminary level demand assessment of the proposed EZ to gauge the interest of unit investors from various sectors. Some of the major aspects which were discussed with the private investors to understand their interest are as below:

- Location attractiveness
- Availability of physical infrastructure
- Availability of social infrastructure
- Ease of availability of quality manpower
- Marketability of the site
- Support required from the Government

We discussed the salient features of the proposed EZ of the proposed EZ with various investors in Bangladesh to understand how attractive this project is for them. Also, we tried to understand the macro level infrastructure requirements that any investor looks upon before making an investment decision. The results of the Private Sector consultation are summarized in the following table.

Table: Summary of the results of the Private Sector consultation

Sl. No.	Parameters	Discussions	Excerpts from the interaction (if any)
Infrastructure aspects that investors take into consideration while making investment decisions:			
1	Connectivity of the site	According to the investors, the EZ site should be located in the proximity of any industrial center &/or city. The connectivity by road and rail should be excellent and also the access to port is important as this will ease the conveyance of the finished goods to	“We should focus on developing the connectivity of Bangladesh so that we can reach out to foreign tourists.” -Director-Sales & Marketing, Westin, Dhaka

		<p>customers.</p> <p>The proposed site is located in Teknaf upzila and is accessible only through waterways (Jaliardip Island, bounded by Naf River on all sides). However Dhaka-Chittagong Highway could be directly connected to the proposed EZ, if a bridge is constructed across the Naf River (the width of Naf river across project site and N1 highway being approx. 250 m).</p>	<p><i>“Our major source of revenue is from the foreign travellers.”</i></p> <p>-Manager-Sales & Marketing, Grand Oriental Hospitality Limited, Bangladesh</p> <p><i>“Undoubtedly Cox’s Bazar is a great tourist spot.”</i></p> <p>-Executive-Sales & Marketing, Galesia Hotels & Resort Limited, Bangladesh</p>
2	Proximity to Port	<p>Access to port is very important for development of multi-product EZs as it will facilitate easy transportation of raw materials and finished goods.</p> <p>However, the proposed site is not located near to any major sea port of Bangladesh. Teknaf port is only used to transport goods and passengers between Bangladesh and Myanmar to cross the river for about 1 km width Private sector investors expressed concern that in such as case, conveyance of goods might be a problem.</p>	<p><i>“Teknaf port does not have cargo transfer facility and passenger service is restricted to Myanmar. Any plans to develop the same would be a challenging task. Also Chittagong port is located approx. 200 km from the proposed site, so significant transportation cost could incur”</i></p> <p>- Orion Group, Bangladesh</p>
3	Utility Connection	<p>For a multi-product EZ to function and for manufacturing units to effectively continue production, utility connection is a prerequisite.</p> <p>According to unit investors, due to non-availability of gas supply to the proposed EZ and as a result of the same it might be difficult for the heavy industries to operate in this EZ.</p>	<p><i>“Availability of Gas, Power and Water is the prerequisite to set up any manufacturing based industry.”</i></p> <p>- NASSA Group, Bangladesh</p>
Marketability of proposed Jaliardip EZ:			
4	Location of the site	<p>Investors opined that the site development would be a challenging task as the site is generally flooded and water-logged. Also the site is prone to cyclones, which may act as a hindrance.</p> <p>Locations such as Chittagong and Cox’s Bazar are favorable to the proposed EZ.</p>	<p><i>“Teknaf has access to the industrial belt of Bangladesh and it is nearby Cox’s Bazar city. We feel that this EZ has good prospect.”</i></p> <p>- A K Khan & Company Limited,</p>

			Bangladesh
3	Proximity to market places nearby	<p>Hospitality industry needs access to market place, where from they can procure vegetables, meat, fish etc. food items on a daily basis. The quality of the raw food items is very important as the hotel/ resort has to abide by the quality standards.</p> <p>The proposed Sabrang EZ has good access to nearby market places.</p>	<p><i>“Access to market place is very important for us as we need to procure raw food items on a daily basis.”</i></p> <p>-Manager-Sales & Marketing, Grand Oriental Hospitality Limited, Bangladesh</p>
5	Demand among local and foreign investors	<p>Prospects for Hospitality and tourism may also be considered for the proposed EZ. Hospitality and tourism industry mostly caters to two broad types of consumer segment viz. (1) Business Travellers and (2) Leisure Travellers. The revenue source from the latter is fluctuating in nature and is seasonal.</p> <p>According to investors, the existing hotels and resorts in Cox’s Bazar do business for approximately four months in a year and in the remaining period, the tourist inflow is minimal. Hence, the demand assessment before commencing operation is very important to gauge profitability.</p> <p>Some of the investors also communicated that they won’t be interested in setting up units in the location as several hotels already exist in this location and the demand is also known by the market players and the chance for a sudden surge in the same is not expected. Hence, these investors felt that the profitability is an issue in regard to the same.</p>	<p><i>“The prospect of setting up recreational facilities and other entertainment arrangements apart from hotels/ resorts should be thought of in this location ”</i></p> <p>-Director-Sales & Marketing, Westin, Dhaka</p> <p><i>“The business period in Cox’s Bazar is only 4 months in a year.”</i></p> <p>-Manager-Sales & Marketing, Grand Oriental Hospitality Limited, Bangladesh</p> <p><i>“Only during festive seasons and during holidays, tourist inflow is attractive; it is difficult to break even during the lean period.”</i></p> <p>-Executive-Sales & Marketing, Galesia Hotels & Resort Limited, Bangladesh</p>

11.8. Overall Adequacy of the EZ Site in Jaliardip

Evaluation of the proposed EZs with respect to key parameters required to establish multi product economic zones are presented in the following table.

Table: Overall Adequacy of the Jaliardip EZ Site

Sl. No.	Parameters	Illustration of the present facilities	Remarks/ Analysis
A	Connectivity		
1 (A)	Road Connectivity Existing Road Connectivity to Chittagong and other major cities of Bangladesh	<ul style="list-style-type: none"> ➤ N1 (Dhaka-Chittagong National Highway) known along various stretches as the Dhaka–Chittagong Highway, the Chittagong–Cox's Bazar Highway and the Cox's Bazar–Teknaf Highway connects Teknaf with Chittagong, Dhaka, Comilla, Feni and other major cities of Bangladesh. ➤ However, the road traffic on Dhaka Chittagong Highway is severely hampered because of the lack of capacity of the existing highway and the load restrictions of bridges; with journeys taking around 10 hours due to the congestion of the road. The road also suffers from poor road safety records because of the lack of segregation between local and national traffic and between motorized and non-motorized traffic. ➤ One of the major ongoing projects in Bangladesh of upgrading Dhaka-Chittagong highway to four lanes could ensure fast and smooth conveyance of goods and passengers between Dhaka and Chittagong. These roads can form part of the regional road network, as well as the Trans-Asian Road network facilitating trade between Bangladesh and neighboring countries. 	<p>For any Multiproduct EZ to develop the site must be near to the main city and the connectivity via road should be excellent.</p> <ul style="list-style-type: none"> ➤ The proposed EZ in Teknaf has good road connectivity to Chittagong, Dhaka and other major cities of Bangladesh. ➤ Dhaka-Chittagong highway considered to be the most important highway is the lifeline of commerce in Bangladesh. ➤ However, road traffic on Dhaka-Chittagong highway is severely hampered. Project in ongoing to upgrade it to a four lane highway.

		<ul style="list-style-type: none"> ➤ Cox's Bazar-Teknaf Sea beach Road (Z1098) connects Teknaf to Cox's Bazar running in parallel to N1 highway along the Cox's Bazar-Teknaf sea beach. ➤ Z1098 is a single lane road and it takes around 3 hours to reach the Cox's bazaar from the proposed EZ by road. 		
1 (B)	<p>Road Connectivity</p> <p>Last Mile Connectivity</p>	<p>There is no existing approach road from Dhaka-Chittagong Highway to the proposed EZ. Proposed site is surrounded on all sides by Naf River and is currently accessed by boats.</p>	<p>Basis preliminary assessment, it is proposed that two bridges could be constructed to the proposed EZ from Dhaka – Chittagong National highway (N1) with a length of 1050 meters and width of 20 meters on both end of the island with a minimum clearance of 12 m from the highest flood level.</p> <p>However detailed hydrography survey need to be carried out prior to finalization of the bridge alignment. Besides, this assessment is carried out at a broad level on the basis of the preliminary assessment. Any further decision on the same needs to be taken after detailed feasibility analysis.</p>	
2	<p>Rail Connectivity</p>	<p>At present there are no railway stations in the Cox's Bazaar.</p> <p>However, Cox's Bazar is located on the Bangladesh Railway's "Dhaka-Chittagong Cox's Bazar- Deep Sea Port Corridor". Currently this corridor is operational upto Dohazari railway station (located approx. 160 km from the proposed EZ via N1 National Highway)</p> <p>Dhaka-Chittagong Cox's Bazar- Deep Sea Port</p>	<p>Bangladesh railway in its master plan suggests that extension of the railway up to Cox's Bazar needs urgent construction considering strategies to be adopted to attract tourist traffic. It also suggests that initiatives may be taken from the Bangladesh Railway (BR) to extend the railway line from Dohazari to Gundum with a view to link with the railway in Myanmar, in future.</p>	

		Corridor is the busiest rail track for passenger and freight transport.	However the site is at island, so having direct rail connectivity appears to be challenging or costly affair. Accordingly, the EZ would require multimodal connectivity for using rail based transport which in turn is expected to increase the cost and time in the overall supply chain.	
3	Water Connectivity	<p>Teknaf port is located at an aerial distance of 20 m (approx.) from Teknaf port but is accessible through waterways only.</p> <p>Proposed EZ is seems to be strategically located with respect to water connectivity to Chittagong port, proposed Sonadia deep sea port and Mongla port.</p> <p>Teknaf port is currently used only to transport goods and passengers between Bangladesh and Myanmar to cross the river for about 1 km width. Approximately 3-5 trips are being made to & fro from Bangladesh.</p>	<p>The site requires water way linkage for connecting to the other main parts of the country. This may need to be planned at the time of EZ development and would be critical for the success of the EZ</p> <p>Currently, the site has no formal plans for setting up of a formal cargo terminal</p>	
4	Airport Connectivity International airport in the proximity	<p>Cox's Bazaar domestic airport is at a distance of 80 km (approx.) from the proposed EZ. The connectivity from airport to the proposed EZ takes around 2-2.5 hours (approx.) of travel time via Cox's Bazar-Teknaf National Highway (N1) road.</p> <p>The Airport is being considered for an upgrade by the Bangladesh Civil Aviation and Tourism Ministry. Prime Minister of Bangladesh has recently inaugurated (Jul' 2015) the commencement of construction works for International Airport in Cox's Bazar.</p> <p>Access via Cox's Bazar-Teknaf National Highway (N1) could provide seamless cargo transfer to/ from the proposed EZ. This could also reduce the cargo traffic at Shah Amanat International airport, Chittagong.</p>	Any such access would require either construction of bridge or a port at the proposed EZ. This would be very crucial for the seam less connection with the airport	

		However the any such decision would need to be finalized during master planning stage and would require detailed feasibility analysis		
B	Utility Connections			
1	Power Availability	<ul style="list-style-type: none"> ➤ The nearest substation to the proposed EZ is Teknaf substation having capacity of 10 MVA. Basis interaction with UNO and Rural Electrification Board (REB) officials, this substation has excess capacity of 3.5 MVA. ➤ Basis our discussions with UNO officials, tapping may be taken from this line and 33/11 KV substation may be proposed at site. Grid substation 132/33 KV is available at Cox's Bazar which is located at a distance of 80km from the site. ➤ 33 KV line is passing along the road which is located within 500 meters from the proposed EZ. 	<p>24x7 uninterrupted electricity supply is a prerequisite for development of any manufacturing facility.</p> <p>Bangladesh government has proposed to develop multi-plant power complex with 6000 MW Ultra Super Critical Coal Based Thermal Power Plant and 3000 MW LNG Based Combined Cycle Power Plant in different phases at Moheshkhali Upazila in Cox's Bazar District, and is expected to be commissioned by 2021.</p> <p>Basis working knowledge and best practices followed, power requirement in a typical EZ could be transmitted by a dedicated 33 KV line for demand up to 25 MW. If the demand is more than 25 MW, then the option of 132 KV transmission lines needs to be further explored. Proximity to 33 KV power connection and surplus power availability in the vicinity of the proposed EZ are the crucial factors to decide on the potential of power availability to the proposed EZ.</p>	
2	Water Availability	There is no existing water supply system at the proposed site. The local inhabitants are dependent on tube wells for the purpose of drinking water.	It is very important to have adequate and sustainable source of potable water for the development of multiproduct EZ so that the labours don't face any	

		<p>As per our discussion with UNO officials and local inhabitants, it was communicated to us that the depth of water table is 120 meters – 150 meters from the ground level.</p> <p>Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha/day for a typical multiproduct EZ. Based on this figure, approximate water demand in the proposed Teknaf EZ is around 2.31 MLD. Considering typical yield of 1-2 MLD (depending on location) per bore well, best practices suggest that around 4-5 MLD of water could be extracted through bore wells. Extraction of more water through bore wells might result in depletion of the aquifer level.</p>	<p>scarcity of drinking water. The industrial units need uninterrupted supply of good quality water for industrial consumption.</p> <p>Proposed site is surrounded by Naf River, thus the option of extracting water from Naf River may be further explored. Decision regarding extraction of water from bore well/ Naf River needs to be taken after detailed feasibility analysis.</p>	
3	Gas Availability	<p>There is no gas supply point available near the proposed EZ. 24”gas transmission line is available upto Shikalbaha power plant, Chittagong (located at a distance of approx. 190 km from proposed EZ).</p> <p>Basis preliminary assessment, a 16”gas pipe line from this place to Cox’s bazar could be proposed to be laid out. However, Cox’s bazar is 80 km (approx.) away from the proposed EZ.</p>	<p>Gas supply is a prerequisite for development of any manufacturing facility.</p> <p>Non-availability of gas would discourage various industries (textile, cement, heavy engineering, electronics, leather etc.) from establishing their units in the proposed EZ.</p>	
C	Suitability for industrial development			
1	Existing industrial ecosystem and Possible Backward linkages for industries	<ul style="list-style-type: none"> ➤ Cox’s Bazar district has presence of manufacturing sector (at SME level). There are around 473 rice mills, 38 salt mill, 64 ice factories, 145 flour mills, 31 fish processing industries, 74 saw mills and 18 printing presses. In addition, there are about 27 large 	<p>Existing industrial ecosystem facilitates easy development of industries in the economic zone based on backward linkages and ease in raw material sourcing.</p> <p>Cox’s Bazar district is rich in mineral</p>	

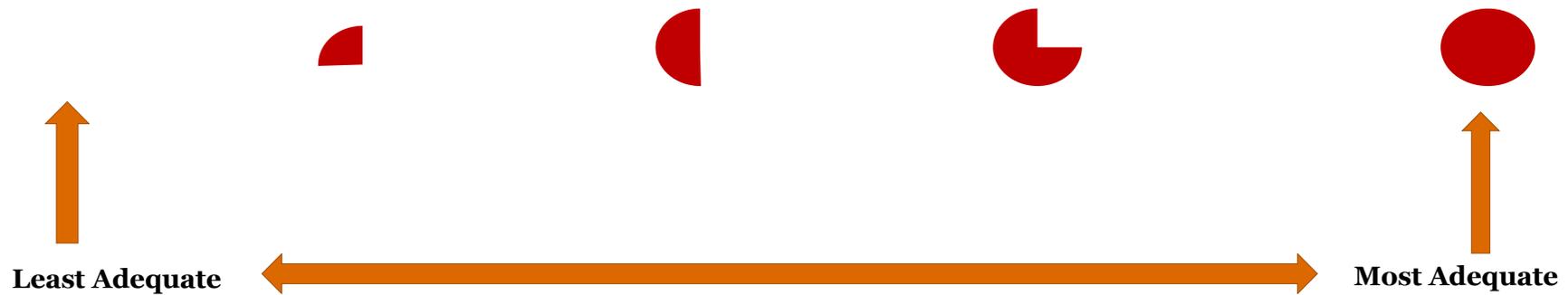
		<p>scale industries in Cox Bazaar Region.</p> <ul style="list-style-type: none"> ➤ Cox's Bazaar is one the most popular tourist centres in the country. Located at the head of the world's longest sea beach, the area is blessed with many tourist attractions. These includes – Aggmeda Khyang – a Buddhist monastery, Himchari picnic spot, Innani beach, Sonadia Island, Saint Martin Island a beautiful coral island and the Teknaf peninsula. ➤ Geographical location and profile of Jaliardip Island is a major challenge in the development of the proposed EZ. 	<p>resources and industries pertaining to construction materials and heavy industries based on mineral extraction and mineral processing stand to gain significantly from the proposed EZ. Also, salt is available in abundance in this region. According to BSCIC data, around 63,532 acre of salt deposit is located in and around Cox's Bazar. The same may be utilized to set up salt producing industries.</p> <p>Fishery industries in Cox's Bazar district in unorganized in nature and it could be streamlined to develop industries related to fish processing. Proximity to Myanmar and access to Chittagong Port may be utilized to export the same to abroad.</p> <p>Paan and Areca Nut produced from this area is exported to Pakistan and Middle East. Industries based on minor forest produce, rubber production, wax processing, Paan and Areca Nut processing are best fit for the proposed EZ</p>	
2	Proximity to major cities	<p>Proposed EZ is located in close proximity to Cox's Bazar city and is connected to Chittagong through Dhaka-Chittagong-Cox's bazar-Teknaf Nation Highway (N1).</p> <p>However, Chittagong is located at a distance of (approx.) 190 km from the proposed EZ.</p>	<p>Proximity to major cities facilitates the proliferation of industrial development. Existing industrial ecosystem provides access to raw material sourcing and skilled manpower.</p>	
D	Challenges in developing			

	the economic zone (Resettlement Issues and social aspects)			
1	Landfilling	Based on our assumption and discussions with UNO officials, an average depth of 5 meters to 7 meters land filling has been envisaged for the proposed EZ area. This figure is indicative and detailed topography survey needs to be carried out to calculate the exact quantity of land filling at the project area.	Landfilling has to be done for the entire site, which means some initial cost has to be borne before the commencement of the development works. Depth of landfilling appears to be equal than the other six sites.	
2	Residential units to be rehabilitated	There is no loss of homes and structures. However there are 4-5 temporary sheds for fishermen those who are taken the land under lease agreement from government of Bangladesh.	Rehabilitation and resettlement issues are minimal.	
3	Other Resettlement Issues	<ul style="list-style-type: none"> ➤ Basis discussion with local inhabitants, around 200-300 number of trees might be located within the project area. However, during master planning stage this needs to be ascertained. The master plan (during the feasibility stage) can be prepared in a way that maximum number trees could be retained and earmarked as green area. ➤ As a result of loss of aquaculture land, the fishermen who are depended on the ponds for income will be directly affected due to the development of this project. ➤ The surroundings of the EZ have been observed as a rich fishing ground. Project interventions i.e. land filling of the existing water bodies and discharge of waste water along the Naf River might affect the fish spawning & nursing ground and subsequently income source from fishing. 	Mentioned resettlement aspects need to be considered before the development of the economic zone project.	

E	Availability of Social Infrastructure			
1	Availability of good residential facility in the nearby areas	<p>There are no Dwelling units and residential facilities are available in the vicinity of the proposed EZ.</p> <p>Good quality residential units are available in Cox's bazaar. However Cox's bazar is located at a distance of 80 km (approx.) from the proposed EZ.</p>	<p>The labours working in the proposed EZ would need to have access to the dwelling units and residential areas within 5-10 km radius of the proposed EZ.</p> <p>For residential requirements for executives working in the economic zone, good quality residential facilities may need to be developed within the EZ.</p>	
2	Medical facilities available in the nearby areas	<p>Government hospital is available in Teknaf upzila and has provision for 50 beds.</p> <p>However, better Healthcare facilities are available in Cox's Bazar which is far away from the proposed EZ (80 km approx.).</p>	<p>There are few medical facilities available within 10 km radius of the proposed EZ to cater to the healthcare requirements of the workforce.</p> <p>Major healthcare facilities are available in Cox's Bazar (80 km away from proposed EZ).</p>	
3	Air and water pollution at the site (prevailing condition)	<p>During the field visit, it was observed that the ambient air quality is good in the proposed site.</p> <p>The site is free from air and water pollution.</p>	<p>The location of any multi product EZ should ideally be free from air and water pollution. Pollution would lead to health hazards and non-conducive working environment for the workforce. From the initial site assessment, it appears that the site is free from all such pollution problems.</p>	
4	Availability of manpower	<p>Cox's Bazar district has 21 colleges (government and non-government colleges) and 157 secondary schools (government and non-government schools). Apart from this, the district also has 1 medical college and 7</p>	<p>Availability of manpower is a prerequisite in development of multiproduct economic zones.</p>	

		<p>technical and vocational institutions.</p> <p>Most of these institutions are located in Chakoria and Cox's Bazar Sadar upzila. There is no technical and vocational institution located in Teknaf upzila.</p> <p>Some of the major colleges located in Cox's Bazaar district are:</p> <ul style="list-style-type: none"> ➤ Cox's Bazar Technical school and college ➤ Cox's Bazar Polytechnic Institute ➤ Cox's Bazar government college 	<p>Quality manpower could be sourced from the educational institutions around Chittagong and Cox's Bazar.</p>	
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Legend:



11.9. SWOT Analysis of Teknaf-Jaliardip Economic Zone

Based on the detailed analysis carried out in the above, SWOT analysis of the proposed EZ is depicted below:

Parameters	Strengths	Weaknesses
Last mile connectivity		There is no existing approach road from Dhaka-Chittagong Highway to the proposed EZ. Proposed site is surrounded on all sides by Naf River and is currently accessed by boats.
Water availability inside the proposed EZ		There is no existing water supply system at the proposed site. The local inhabitants are dependent on tube wells for the purpose of drinking water. The source of drinking water in the EZ is based on tube well. Depth of water table is 120 meters – 150 meters from the ground level.
Block cost of off-site infrastructure development		Block cost estimate for off-site infrastructure development is BDT 67,379 lakh. Block cost estimate for off-site infrastructure development for unit area is calculated at 247.78 BDT lakh per acre, which is the highest.
Social and resettlement aspects		<ul style="list-style-type: none"> • Landfilling of around 5-7 m is envisaged • As a result of loss of aquaculture land, the fishermen's will be directly affected due to the development of this project. The government has leased the ponds inside the proposed EZ to fishermen's, hence the development of the proposed EZ would affect the fisherman's who are depended on the ponds for income. • There is no loss of homes and structures. However there are 4-5 temporary sheds for fishermen those who have taken the land under lease agreement from government of Bangladesh. • As a result of loss of aquaculture land, the fishermen who are depended on the ponds for income will be directly affected due to the development of this project. • Trees existing within the project area may be retained and earmarked as green area during the preparation of master plan.

Cost of private land acquisition		Entire land for the project development is government land and no cost of land acquisition is required.
Parameters	Opportunities	Threats
Road connectivity	One of the major ongoing projects in Bangladesh of upgrading Dhaka-Chittagong highway to four lanes could ensure fast and smooth conveyance of goods and passengers between Dhaka and Chittagong. These roads can form part of the regional road network, as well as the Trans-Asian Road network facilitating trade between Bangladesh and neighboring countries.	<ul style="list-style-type: none"> Chittagong–Cox's Bazar Highway and the Cox's Bazar–Teknaf Highway connects Teknaf with Chittagong, Dhaka, Comilla, Feni and other major cities of Bangladesh. However, the road traffic on Dhaka Chittagong Highway is severely hampered because of the lack of capacity of the existing highway and the load restrictions of bridges; with journeys taking around 10 hours due to the congestion of the road. The road also suffers from poor road safety records because of the lack of segregation between local and national traffic and between motorized and non-motorized traffic.
Rail connectivity	<ul style="list-style-type: none"> Cox's Bazar is located on the Bangladesh Railway's "Dhaka-Chittagong Cox's Bazar- Deep Sea Port Corridor". Currently this corridor is operational upto Dohazari railway station (located approx. 160 km from the proposed EZ via N1 National Highway) Dhaka-Chittagong Cox's Bazar-Deep Sea Port Corridor is the busiest rail track for passenger and freight transport. 	Proposed EZ in Teknaf-Jaliardip has no railway station in the vicinity. At present there are no railway stations in Cox's Bazaar.
Waterways connectivity	<ul style="list-style-type: none"> Proposed EZ is seems to be strategically located with respect to water connectivity to Chittagong port, proposed Sonadia deep sea port and Mongla port. Teknaf port is currently used only to transport goods and passengers between Bangladesh and Myanmar to cross the river for about 1 km width. Approximately 3-5 trips are being made to & fro from Bangladesh. Proposed EZ could leverage on its proximity to water connectivity for seamless movement of cargo to other parts of Bangladesh and also for cross-border trade to Myanmar, Singapore etc. 	
Air connectivity	<ul style="list-style-type: none"> Cox's Bazaar domestic airport is at a distance of 80 km (approx.) from the proposed EZ. The connectivity from airport to the proposed EZ takes around 2-2.5 hours (approx.) 	

	<p>of travel time via Cox's Bazar-Teknaf National Highway.</p> <ul style="list-style-type: none"> The Airport is being considered for an upgrade by the Bangladesh Civil Aviation and Tourism Ministry. Prime Minister of Bangladesh has recently inaugurated (Jul' 2015) the commencement of construction works for International Airport in Cox's Bazar. 	
Power connection	<p>Following power connections are available in the proximity of the proposed EZ:</p> <ul style="list-style-type: none"> The nearest substation to the proposed EZ is Teknaf substation having capacity of 10 MVA. Basis interaction with UNO and Rural Electrification Board (REB) officials, this substation has excess capacity of 3.5 MVA. Basis our discussions with UNO officials, tapping may be taken from this line and 33/11 KV substation may be proposed at site. Grid substation 132/33 KV is available at Cox's Bazar which is located at a distance of 80km from the site. 33 KV line is passing along the road which is located within 500 meters from the proposed EZ. 	
Gas connection		<p>There is no gas supply point available near the proposed EZ. 24" gas transmission line is available upto Shikalbaha power plant, Chittagong (located at a distance of approx. 190 km from proposed EZ).</p>
Existing industrial ecosystem and Possible Backward linkages for industries	<ul style="list-style-type: none"> Cox's Bazar district has presence of manufacturing sector (at SME level). Rice mills, Salt mill, ice factories, flour mills, fish processing industries, saw mills etc. are located in the vicinity. In addition, there are about 27 large scale industries in Cox Bazaar Region. Cox's Bazaar is one the most popular tourist centres in the country. Located at the head of the world's longest sea beach, the area is blessed with many tourist attractions. These includes – Aggmeda Khyang – a Buddhist monastery, Himchari picnic spot, Innani beach, Sonadia Island, Saint Martin Island a beautiful coral island and the Teknaf peninsula. 	<p>Geographical location and profile of Jaliardip Island is a major challenge in the development of the proposed EZ. Instead of natural and geographical challenges, this area is rich in mineral sources and minor forest produce sources which could provide the EZ easy access to raw materials.</p>
Proximity to major cities	<p>Proposed EZ is located in close proximity to Cox's Bazar city and is connected to</p>	

	Chittagong	
Access to quality manpower	Cox's Bazar district has 21 colleges (government and non-government colleges) and 157 secondary schools (government and non-government schools). Apart from this, the district also has 1 medical college and 7 technical and vocational institutions. Most of these institutions are located in Chakoria and Cox's Bazar Sadar upzila. There is no technical and vocational institution located in Teknaf upzila. Around 3 technical training centres are located in Cox's Bazar district.	However proposed EZ is not in close proximity to Chittagong and it seems that it might get difficult for it to source quality manpower from the existing industrial ecosystem in Chittagong.
Availability of medical facilities	Government hospital is available in Teknaf upzila and has provision for 50 beds. However, better Healthcare facilities are available in Cox's Bazar which is far away from the proposed EZ (80 km approx.).	There is no international standard hospital is present in the vicinity. For serious medical treatment, local inhabitants need to travel to Dhaka.
Availability of residential facilities	Good quality residential units are available in Cox's bazaar. However Cox's bazar is located at a distance of 80 km (approx.) from the proposed EZ.	There are no Dwelling units and residential facilities are available in the vicinity of the proposed EZ.

Ranking of the sites

12. *Ranking of the Sites*

Lastly, this report endeavours to compare the seven sites on all the parameters discussed in the earlier chapters.

12.1. *Relative ranking and rationale*

After the detailed assessment of each of the seven economic zone sites, the report endeavours to relatively compare the sites on all the parameters discussed above. This comparison is relative in nature and the scorings are comparative with respect to each other.

The following table summarizes the comparison of the multi product EZs across different parameters.

Road Connectivity

Trunk Connectivity

Name of the EZ	Rationale
Dhaka-Dohar	<p>(1) R820 (Zinzira-Keraniganj-Nawabganj-Dohar-Srinagar Road) and N8 (Dhaka Mawa highway) connect Dohar with Dhaka and other major cities of Bangladesh.</p> <p>(2) Dohar-Mawa Road connects the proposed EZ to N8. During site visit, the road conditions in both the stretches (N8 and Dohar-Mawa Road) were observed to be favorable for passage of heavy vehicles.</p> <p>(3) Preliminary assessment depicts that some maintenance works might be required to improve the road condition in R820. But, road condition of Dhaka-Mawa highway is excellent and it's supposed to be upgraded to four lanes.</p>
Bhola Sadar	<p>(1) Direct road connectivity is not available from Bhola to other parts of Bangladesh. Waterways need to be accessed for the same.</p> <p>(2) Bhola district is approachable only via ferry by crossing the river on both east and west side.</p> <p>(3) Proposed EZ is connected to capital city Dhaka via Barisal and it is connected to Chittagong via Laxmipur.</p> <p>(4) After crossing the waterways, access to Dhaka takes place via Barisal by R890 and N8. Basis discussion with UNO Officials, road conditions in these two alignments are favorable for passage of heavy vehicles</p>
Kustia-Bheramara	<p>(1) Proposed EZ in Bheramara is well-connected to Jessore by N704. Distance by road is 155km (approximate) and travel time is around 3-3.5 hours. During site visit, it was observed that the road condition is smooth and favorable for passage of heavy vehicles.</p> <p>(2) Jessore is well- connected to Mongla and Khulna region.</p> <p>(3) Dhaka is also accessible from the proposed EZ. Project site is located adjacent to Lalan Shah Bridge. Lalan Shah Bridge and Jamuna Bridge provide access to Dhaka. Distance between Dhaka and Bheramara is approximately 230 km and travel time is around 5-6 hours. During site visit, it was observed that the road condition is favorable for passage of heavy vehicles.</p>
Nilphamari Sadar	<p>(1) Project site is connected to Saidpur (approximate 20 km away) by Saidpur-Nilphamari Road (R570). It's a single lane bituminous road and widening is proposed. However there are resettlement issues at certain stretches of this road</p> <p>(2) Proposed EZ in Nilphamari is located at a distance of 350 km (approximate) from Dhaka and travel time is around 7-8 hours.</p> <p>(3) R570 and N5 provide access to Dhaka. N5 is a two-lane bituminous road and road condition is favorable for passage of heavy vehicles.</p> <p>(4) N5 is a part of Asian Highway (AH2). Asian highway 2 runs through 13,177 kilometers from Denpasar (Indonesia) to Merak and Singapore to Khosravi (Iran).</p>
Manikganj	<p>(1) Proposed EZ in Manikganj is well-connected to Dhaka by Dhaka-Aricha Highway. Distance by road is 75km (approximate). During site visit, it was observed that the road condition is smooth and favorable for passage of heavy vehicles.</p> <p>(2) Proposed EZ is connected to Jessore. Road distance is approximately 155 km and travel time is around 4.5-5 hours. This route includes ferry ride at Paturia ferry terminal.</p>
Shariatpur-Zajira	<p>(1) Proposed EZ is located at a distance of around 80 km from Dhaka.</p>

	<p>(2) Access to Shariatpur/ Zajira takes place via (a) Dhaka-Mawa Highway and (b) further, ferry ride has to be taken from Mawa ghat to Shariatpur.</p> <p>(3) From Shariatpur ghat the zazjira upzilla (proposed EZ) can be accessed through Shariatpur - Kathalbari Zilla road (Z8012) at a distance of 13 km. Z8012 is a single lane bituminous road favorable for passage of heavy vehicles.</p> <p>(4) Land acquisition is ongoing for widening of Z8012.</p>
Jaliardip-Teknaf	<p>(1) N1 (Dhaka-Chittagong National Highway) known along various stretches as the Dhaka–Chittagong Highway, the Chittagong–Cox's Bazar Highway and the Cox's Bazar–Teknaf Highway connects Teknaf with Chittagong, Dhaka, Comilla, Feni and other major cities of Bangladesh.</p> <p>(2) However, the road traffic on Dhaka Chittagong Highway is severely hampered because of the lack of capacity of the existing highway and the load restrictions of bridges; with journeys taking around 10 hours due to the congestion of the road. The road also suffers from poor road safety records because of the lack of segregation between local and national traffic and between motorized and non-motorized traffic.</p> <p>(3) One of the major ongoing projects in Bangladesh of upgrading Dhaka-Chittagong highway to four lanes could ensure fast and smooth conveyance of goods and passengers between Dhaka and Chittagong. These roads can form part of the regional road network, as well as the Trans-Asian Road network facilitating trade between Bangladesh and neighboring countries.</p> <p>(4) Cox's Bazar-Teknaf Sea beach Road (Z1098) connects Teknaf to Cox's Bazar running in parallel to N1 highway along the Cox's Bazar-Teknaf sea beach.</p> <p>(5) Z1098 is a single lane road and it takes around 3 hours to reach the Cox's bazaar from the proposed EZ by road.</p>

Future Potential for Road Connectivity

Name of the EZ	Rationale
Dhaka-Dohar	Proposed Padma Bridge is located at a distance of around 40 km from the proposed EZ and access takes place via Dohar-Mawa Road. Once Padma Bridge is operational, proposed EZ in Dohar would have access to the other part of Padma River (Jajira, Bhanga, Mongla etc.)
Bhola Sadar	N/A
Kustia-Bheramara	N/A
Nilphamari Sadar	<p>(1) BBIN group of countries (Bangladesh, Bhutan, India and Nepal), signed a sub-regional Motor Vehicles Agreement (MVA) with the objective of enabling movement of cargo across their borders.</p> <p>(2) MVA would provide access for local products to neighboring markets (India, Bhutan and Nepal).</p>
Manikganj	N/A
Shariatpur-Zajira	<p>(1) Proposed EZ is located at a distance of around 3 km from the approach to Padma Bridge.</p> <p>(2) Once Padma Bridge is operational proposed EZ would have seamless access to Dhaka.</p> <p>(3) Construction for Bhanga-Biswa road is ongoing. Once Bhanga-Biswa road is operational, access to Jessore and Khulna would get improved significantly.</p>
Jaliardip-Teknaf	N/A

Last Mile Connectivity

Name of the EZ	Rationale
Dhaka-Dohar	(1) Existing approach road (1.5 km length) from Kartikpur Bazar to Moinat Ghat is a single lane Kutchra road. During site visit, it was observed that widening of this stretch would attract resettlement problem. (2) Basis preliminary assessment, another approach may be proposed to connect the North-East part of the land parcel from Kartikpur Bazar. Detailed feasibility needs to be undertaken for the same.
Bhola Sadar	a) Zilla Road (LGED road) is abutting the proposed EZ on the northern side boundary. As a result of this, access from the Zilla Road to the proposed EZ can be provided at any location. b) Its'a single lane bituminous road. c) There is no need for separate approach road for the proposed EZ. d) Alignment of Zilla road runs from Bheduria Ghat (Banker Haat Bazar) to R890.
Kustia-Bheramara	Approach Road 1: Kutchra road which connects the eastern part of the proposed EZ to Rajashi – Kushtia highway (N704) near the approach to Lalan Shah Bridge. Length of this kutchra road alignment is around 500-700 m. Approach Road 2: Bheramara-Allardorga road (LGED road) connects the proposed EZ from West side. Bheramara – Allardorga road is a single lane bituminous road favorable for passage of heavy vehicles. From this LGED road, a paver road (stretch of around 1km) starts which runs inside the proposed EZ. Widening of Bheramara-Allardorga road might attract some resettlement issues as it runs through residential colonies and market places.
Nilphamari Sadar	No separate approach road is required for the northern part of the land. Rail line is located adjacent to the southern boundary of the project area and during master planning stage; a rail over bridge may be proposed to cross the railway line to reach the southern portion of the land.
Manikganj	Five options of approach road exist for the proposed EZ and these provide access to Dhaka-Aricha Highway. Broad level initial assessment depicts that Aricha Launch ghat road is a bituminous road of width 20 feet (approximate) and length of this alignment is around 1-1.5 km. It originates from Aricha Launch ghat and ultimately meets Dhaka-Aricha Highway near Shibalaya Police Station. Although, all five options have resettlement problems, this approach road seems to be the best fit out of the five options.
Shariatpur-Zajira	(1) Shariatpur-Kathalbari Zilla Road (Z8012) is located at a distance of 2.2 km on the southern portion of the proposed EZ. During site visit, it was observed that it is connected by a kutchra road to the project site. (2) This kutchra road may be widened to provide better access to the proposed EZ. Basis discussion with UNO officials, around 50 households would be affected due to this development. It was informed to us that the land on both sides of the kutchra road is government land. (3) Approach road to the site can be provided anywhere from Shariatpur-Majhirghat road. However, during site visit it seems difficult to widen Shariatpur-Majhirghat road due to settlements located on both sides of the road and due to presence of multiple culverts. (4) Basis preliminary assessment, possibility of constructing another approach road towards the Naruba Rail station/ Padma Bridge could be further explored.
Jaliardip-Teknaf	There is no existing approach road from Dhaka-Chittagong Highway to the proposed EZ. Proposed site is surrounded on all sides by Naf River and is currently accessed by boats.

Trunk connectivity and travel time to major cities (such as Dhaka, Jessore) is amenable for Dhaka-Dohar, Bheramara and Manikganj. Ferry crossing is required to reach (from Dhaka) proposed EZs in Shariatpur and Bhola and direct road connectivity is not available. But, if we consider future potential, due to the construction of Padma Bridge, Dhaka-Dohar and Shariatpur are expected to gain significantly as a result of the development. Nilphamari EZ has access to Asian Highway Network and implementation of MVA would enable cross border trade for the proposed EZ. Teknaf EZ seems to be have not so good potential for road connectivity. Regarding approach road (last mile connectivity), apart from Bheramara and Nilphamari, all other EZs seem to have resettlement problems. Considering all the mentioned factors a relative scoring is presented below.

Name of the EZ	Relative Scoring
Dhaka-Dohar	4
Bhola Sadar	2.5
Kustia-Bheramara	4
Nilphamari Sadar	5
Manikganj	3.5
Shariatpur-Zajira	3.5
Jaliardip-Teknaf	2

Rail Connectivity

Name of the EZ	Rationale
Dhaka-Dohar	(1) Faridpur Railway station: It is located at 91 km (approx.) from the proposed EZ. Access takes place Dhaka-Faridpur highway and ferry crossing at Paturia Ferry Terminal. (2) Kamalapur Railway station: it is located at a distance of 50 km (approx.) and could be accessed through Dhaka-Mawa highway. ICD is located in Kamalapur rail station but Cargo storage facility is not available. Last mile connectivity to Kamalapur rail station takes place via Toyenbee Circular Road/ Kamalapur Road. This stretch experiences moderate traffic congestion. Upon completion of Padma Bridge, proposed EZ would have access to rail connectivity via Padma Bridge.
Bhola Sadar	Proposed EZ doesn't have access to any rail network as Bhola district is surrounded by water.
Kustia-Bheramara	(1) Bheramara railway station is located at a distance of around 7 km from the proposed EZ. Basis discussion with UNO officials and local inhabitants, cargo facility is available at Bheramara rail station and goods are transported to Khulna and Rajshahi from this region. (2) Pakshi rail station is connected to the proposed EZ by Lalan Shah Bridge and Kushtia-Jhenaidah Highway (N704). (3) Approach road to both the rail stations experience moderate traffic congestion. (4) Both the stations are well connected to other parts of Bangladesh. (5) Apart from trains to other parts of Bangladesh, trains to Kolkata (India) are also accessible from both the rail stations.
Nilphamari Sadar	(1) Proposed EZ is located in between two railway stations viz. Saidpur and Nilphamari. R570 connects these two rail stations. Road condition is favorable for passage of heavy vehicles and widening is proposed (as per UNO officials). (2) These stations are located at 10 km and 7 km respectively from the proposed site. (3) Saidpur railway station is accessible from the proposed EZ by R570 (up to Saidpur) and then by Station Road.

	<p>(4) Station Road (LGED road) is a single lane bituminous road with no scope of widening as it might attract resettlement issues.</p> <p>(5) Rail siding is available at Saidpur station; however, this rail siding is not used for industrial/ commercial purpose.</p> <p>(6) Bangladesh's biggest rail workshop is located in Saidpur.</p>
Manikganj	<p>(1) No rail network exists in Shibalaya upzilla.</p> <p>(2) Goalanda Ghat railway station is about 15 km from proposed EZ, but there is no direct road connectivity to this railway station due to presence of Padma River. Ferry ride is required from Paturia Ferry ghat to Daulatdia Ferry ghat to reach Goalanda Ghat railway station.</p> <p>(3) Connectivity to Goalanda Ghat rail station is via ferry and Dhaka-Faridpur Highway (N7).</p> <p>(4) Dhaka (Kamalapur) rail station is located at a distance of around 80-85 km from the proposed EZ and access takes place via Dhaka-Aricha highway. ICD is located in Kamalapur rail station but Cargo storage facility is not available. Last mile connectivity to Kamalapur rail station takes place via Toyenbee Circular Road/ Kamalapur Road. This stretch experiences moderate traffic congestion.</p>
Shariatpur-Zajira	<p>(1) Faridpur is the nearest rail station from the project site. It is located at a road distance of around 75 km from the proposed EZ.</p> <p>(2) Dhaka (Kamalapur) rail station is approximately 75 km away from the proposed EZ and travel time by road is 4.5-5 hours (approximate). Access takes place via Z8012 and Dhaka Mawa Highway. This route includes ferry ride at Mawa ghat. Once Padma Bridge is operational, connectivity between Zajira upzilla and Dhaka would significantly improve. As a result of the same, accessibility of rail facilities in Dhaka (Kamalapur) would get easier. Kamalapur rail station doesn't have access to cargo handling facility but ICD is located in Kamalapur rail station.</p> <p>(3) Basis discussion with the UNO officials, at the approach of Padma Bridge, Naruba rail station is proposed. This rail line would be connected to Dhaka on one side and Khulna on the other side. It was informed to us that land acquisition for the same is ongoing.</p> <p>(4) Thus, once Padma Bridge is functional, proposed EZ would have access to rail facility at a distance of around 3 km from the project site.</p>
Jaliardip-Teknaf	<p>Proposed EZ in Teknaf-Jaliardip has no railway station in the vicinity. At present there are no railway stations in Cox's Bazaar.</p> <p>However, Cox's Bazar is located on the Bangladesh Railway's "Dhaka-Chittagong Cox's Bazar- Deep Sea Port Corridor". Currently this corridor is operational upto Dohazari railway station (located approx. 160 km from the proposed EZ via N1 National Highway)</p> <p>Dhaka-Chittagong Cox's Bazar- Deep Sea Port Corridor is the busiest rail track for passenger and freight transport.</p>

Proposed EZ in Bhola Sadar doesn't have access to rail network. Teknaf-Jaliardip EZ doesn't have any rail network in the vicinity, but Cox's Bazar is located on the Bangladesh Railway's "Dhaka-Chittagong Cox's Bazar- Deep Sea Port Corridor", which is the busiest rail corridor for freight transfer. Proposed EZs in Dohar, Manikganj and Shariatpur have access to Dhaka (Kamalapur) and Faridpur rail station but the time of travel and distance is significant and transport requires multimodal logistics as no direct road access is there at present. Further, there is a ICD in Kamalapur station but cargo storage facility is not available. Dhaka-Faridpur rail corridor is an important rail corridor for freight transfer. Nilphamari EZ has access to Saidpur rail station and rail siding facility is available. However, there seems to be resettlement problem for the last mile connectivity to the rail station. Cross border trade to India (Kolkata)

may also be facilitated from Saidpur rail station. For Bheramara EZ, it has good access to Bheramara and pakshi rail stations. It was communicated to us that cargo is transferred to Khulna from Bheramara station. Considering all the mentioned factors a relative scoring is presented below.

Name of the EZ	Relative Scoring
Dhaka-Dohar	3
Bhola Sadar	1
Kustia-Bheramara	5
Nilphamari Sadar	4
Manikganj	2
Shariatpur-Zajira	2.5
Jaliardip-Teknaf	2

Waterways Connectivity

Name of the EZ	Rationale
Dhaka-Dohar	<p>(1) Location of Moinat ghat inside the project area could be utilized to connect the proposed EZ to Mawa ghat, Narayanganj river port and other major ports of Bangladesh. Mawa ghat and Narayanganj riverport could be accessed both by roadways and waterways from the proposed EZ.</p> <p>(2) From Mawa ghat, several other locations such as Jessore, Khulna, Zajira etc. are accessible. Narayanganj river port is an important port in Bangladesh and various cargos are transported from this river port.</p> <p>(3) Proposed EZ is located at the central part of Bangladesh and upon development of Moinat ghat as a cargo terminal, it may envisage seamless movement of cargo via waterways to Mongla Port, Chittagong Port and other major ports/ ferry terminal of the country.</p>
Bhola Sadar	<p>(1) Bhola Sadar upzilla has excellent access to IWT connectivity.</p> <p>(2) The proposed EZ has access to Bheduria ghat and Kheya ghat at a distance of 5 km and 16 km respectively.</p> <p>(3) Other major ghats are: Ilisha Ghat and Lalmohan Ghat.</p> <p>(4) Broad level preliminary assessment indicates that the nearby ferry ghats may be developed as cargo terminals which could provide access to widespread IWT connectivity.</p> <p>(5) Preliminary assessment also indicates that integration of ports (like Mongla port, Chittagong Port, Payra Port) with the proposed EZ seems possible. Also, there seems to be possibility of cross border trade through the waterways. However the development of Bheduria ghat/ Kheya ghat as cargo terminals is subjected to external factors. Also, the last mile connectivity from the ghats to the proposed EZs has resettlement issues and widening seems to be a problem.</p> <p>(6) Detailed feasibility needs to be undertaken to evaluate the potential of the same.</p>
Kustia-Bheramara	<p>(1) Proposed EZ doesn't have any direct access to cargo terminal/ ferry ghat in the vicinity. However, project site is located adjacent to Padma River.</p> <p>(2) Broad level initial assessment depicts that Paturia port is located at an approximate distance of 100-110 km from the proposed EZ. Existing cargo facility at Paturia port may be further explored to facilitate seamless movement of cargo via waterways.</p>

	<p>(3) Alternate access to waterways seems possible by developing a private jetty/ cargo terminal in the project area. This in turn would provide access to widespread waterways' network of Bangladesh. Accessing major ports such as Mongla, Chittagong, Payra etc. seems possible.</p> <p>(4) Mongla port is also accessible by road from the proposed EZ. Proposed EZ is located about 254 km from this port. Mongla port is accessible by either Khulna-Mongla Highway or via Dhaka-Kushtia Highway. Road condition is favorable for passage of heavy vehicles.</p> <p>(5) Detailed feasibility analysis needs to be undertaken to ascertain the mentioned possibilities.</p>
Nilphamari Sadar	<p>(1) Proposed EZ in Nilphamari doesn't have any direct access to waterways network. It is connected to other parts of Bangladesh by road and rail modes of transportation.</p> <p>(2) Mongla port and Chittagong port could be accessed by road from the proposed EZ.</p> <p>(3) To access the waterways, cargo can access Paturia port and secondary access may take place by road. However, this is a cost-intensive option.</p>
Manikganj	<p>(1) Proposed EZ has good access to waterways connectivity.</p> <p>(2) Project site is located near to Paturia and Aricha river port.</p> <p>(3) Macro level assessment indicates that upon development of the proposed EZ, Paturia or Aricha port needs to be utilized for cargo transfer. As an alternative, old aricha ghat could be developed as a cargo terminal. Decision on the same is subjected to detailed feasibility analysis.</p>
Shariatpur-Zajira	<p>(1) Proposed EZ has access to three ferry terminals viz. Shariatpur ghat, Kawrakandi ghat and Majhirghat.</p> <p>(2) These ferry terminals are well connected to Mawa ghat and all major ports of Bangladesh through the widespread waterways network of Bangladesh.</p> <p>(3) However, using these ghats would result in multiple transshipment in the overall supply chain, thereby increasing the cost and time of transport. This renders the prospects of IWT weak in its current form.</p>
Jaliardip-Teknaf	<p>Teknaf port is located at an aerial distance of 20 m (approx.) from Teknaf port but is accessible through waterways only. Proposed EZ is seems to be strategically located with respect to water connectivity to Chittagong port, proposed Sonadia deep sea port and Mongla port.</p> <p>Teknaf port is currently used only to transport goods and passengers between Bangladesh and Myanmar to cross the river for about 1 km width. Approximately 3-5 trips are being made to & fro from Bangladesh.</p> <p>Proposed EZ could leverage on its proximity to water connectivity for seamless movement of cargo to other parts of Bangladesh and also for cross-border trade to Myanmar, Singapore etc.</p>

Proposed EZ in Nilphamari doesn't have access to waterways. Presence of Moinat ghat and Aricha ghat within the project boundaries of Dohar and Manikganj EZs respectively may enable development of private cargo terminals to connect to the waterways. Bheramara EZ is located on the banks of Padma River and hence, private jetty development may be considered further. For Bhola and Shariatpur EZ, there are last mile connectivity problems to the approach to the ferry ghats. Also, development of the ferry ghats as private cargo terminal is dependent on external factors. Moreover, multiple transshipment of goods would increase the cost of goods movement. Teknaf EZ has good access to waterways and proximity to Chittagong port makes it well-connected to waterways however currently there is no terminal at the proposed site and the same may need to be constructed as part of the EZ development. Considering all the mentioned factors a relative scoring is presented below.

Name of the EZ	Relative Scoring
Dhaka-Dohar	5
Bhola Sadar	2
Kustia-Bheramara	4
Nilphamari Sadar	1
Manikganj	5
Shariatpur-Zajira	3
Jaliardip-Teknaf	4

Air Connectivity

Name of the EZ	Rationale
Dhaka-Dohar	<p>(1) Proposed EZ is located at a distance of 48 km (approximate) from Hazrat Shah Jalal International airport in Dhaka. Travel time is around 2.5 hours by road.</p> <p>(2) Dhaka international airport is accessed through Dhaka-Mawa highway. During site visit it was observed that this road alignment is favorable for passage of heavy vehicles.</p> <p>(3) Govt. of Bangladesh intends to construct a new international airport (Bangabandhu Sheikh Mujib International Airport) with a view to create a hub airport in close proximity to Dhaka and to meet the demand of future growth in aviation sector. Location for the same is yet to be finalized.</p>
Bhola Sadar	<p>(1) Proposed EZ in Bhola Sadar is located at a distance of approximately 65 km from Barisal airport. However, river crossing via ferry/ launch service at Ilisha Ghat needs to be undertaken to reach the proposed EZ.</p> <p>(2) Dhaka-Barisal Highway (N8) and Barisal-Bhola Highway (N809) connect the proposed EZ to Barisal airport.</p> <p>(3) Dhaka international airport is located about 237 km from the proposed EZ including ferry crossing.</p>
Kustia-Bheramara	<p>(1) Bheramara EZ is located about 225 km of International Airport at Dhaka and approximate travelling time by road is approximately 5 hours.</p> <p>(2) Proposed EZ is located at a distance of around 120 km from Jessore airport. Approximate travel time is 3-3.5 hours by road.</p> <p>(3) Jessore airport is a domestic airport and access to this airport is via N7 and N704. During site visit, traffic stagnation wasn't observed in this stretch and road condition was favorable for passage of heavy vehicles.</p>
Nilphamari Sadar	<p>(1) Nilphamari EZ is located about 20 km away from Saidpur Airport. Access to Saidpur airport takes place from the proposed EZ via R570.</p> <p>(2) Saidpur airport is a domestic airport and air travel to Dhaka takes around 1 hour.</p>
Manikganj	<p>(1) Manikganj EZ is located about 77 km away from Hazrat Shah Jalal International Airport in Dhaka and approximate</p>

	travelling time by road is approximately 3.5 hours. (2) Govt. of Bangladesh intends to construct a new international airport (Bangabandhu Sheikh Mujib International Airport) with a view to create a hub airport in close proximity to Dhaka and to meet the demand of future growth in aviation sector. Location for the same is yet to be finalized.
Shariatpur-Zajira	(1) Proposed Shariatpur EZ is located around 82 km from Hazrat Shah Jalal International Airport at Dhaka. The travel time by road to Dhaka International Airport is 4-4.5 hours (approximate). This includes ferry ride from Shariatpur ghat to Mawa ghat. Z8012 and Dhaka-Mawa highway provide access to the airport. (2) Once Padma Bridge is operational, access to the international airport would be significantly improved and travel time would reduce significantly. (3) Govt. of Bangladesh intends to construct a new international airport (Bangabandhu Sheikh Mujib International Airport) with a view to create a hub airport in close proximity to Dhaka and to meet the demand of future growth in aviation sector. Location for the same is yet to be finalized.
Jaliardip-Teknaf	(1) Cox's Bazaar domestic airport is at a distance of 80 km (approx.) from the proposed EZ. The connectivity from airport to the proposed EZ takes around 2-2.5 hours (approx.) of travel time via Cox's Bazar-Teknaf National Highway (N1) road. (2) The Airport is being considered for an upgrade by the Bangladesh Civil Aviation and Tourism Ministry. Prime Minister of Bangladesh has recently inaugurated (Jul' 2015) the commencement of construction works for International Airport in Cox's Bazar. (3) Access via Cox's Bazar-Teknaf National Highway (N1) could provide seamless cargo transfer to/ from the proposed EZ. This could also reduce the cargo traffic at Shah Amanat International airport, Chittagong. However the any such decision would need to be finalized during master planning stage and would require detailed feasibility analysis.

Proposed EZ in Bhola doesn't have good access to international airport. Dohar and Manikganj EZs are located at around 75-80 km away from Hazrat Shah Jalal International airport in Dhaka and travel takes by road. Road conditions for both the cases are favorable for passage of heavy vehicles. Proposed EZs in Nilphamari and Bheramara are located quite far away from Dhaka airport and nearby airports (Saidpur and Jessore respectively) are domestic. Shariatpur EZ has access to Dhaka airport but river crossing needs to be undertaken which involves multiple transshipment of cargo. Once Padma Bridge is operational, connectivity would be enhanced. For accessing Cox's Bazar airport from Teknaf EZ, Naf river needs to be crossed and road travel needs to be undertaken for around 80 km. Considering all the mentioned factors a relative scoring is presented below.

Name of the EZ	Relative Scoring
Dhaka-Dohar	5
Bhola Sadar	1
Kustia-Bheramara	3
Nilphamari Sadar	3
Manikganj	5
Shariatpur-Zajira	2
Jaliardip-Teknaf	1

Utility Connection

Power Connection

Name of the EZ	Rationale
Dhaka-Dohar	<p>(1) Basis discussion with REB officials, existing Dohar substation (20 MVA capacity) has no surplus power available.</p> <p>(2) REB officials informed us that there is a proposal to setup 33/11kv new substation at Mohabadpur with a capacity of 20 MVA.</p> <p>(3) One 132 kV grid substation (World Bank funded project) has been proposed in Hashnabad with a capacity of 50 MVA. It is located at a distance of 10 km (approximate) from the proposed EZ.</p> <p>(4) All these substations are located within 10 km radius of the proposed EZ.</p>
Bhola Sadar	<p>(1) Existing 33/11 KV substation (of capacity 10 MVA) near Bangla Bazar is located at a distance of around 18 km from the proposed EZ. It would be upgraded to 20 MVA by 2016. After catering to the local demand, 2 MVA surplus power is available from this substation.</p> <p>(2) One additional 33/11 KV substation of 10 MVA capacity is proposed within one km radius of the proposed EZ. Exact location for the substation is yet to be finalized and it is planned to commission by June 2016. Capacity of this substation is 5 MVA.</p> <p>(3) There is a 132 KV substation located in Patuakhalia (at a distance of around 65 km from the proposed EZ) and a 230 KV substation is located in Buranuddin (approximate 25 km away from the proposed EZ).</p> <p>(4) Apart from the above power sources, one 225 MW gas-fired Combined Cycle Power Project is available within approximately 3 km distance from site.</p>
Kustia-Bheramara	<p>(1) Indo Bangla Transmission Centre (500 MW HVDC Back-to-Back power station) is located adjacent to the proposed EZ.</p> <p>(2) One 360 MW combined cycle power plant (CCPP) is under construction which is located within 2 km from the proposed EZ. It is expected to be functional by Mid 2016.</p> <p>(3) A 33/11 kv substation (under-construction) of capacity 10 MVA is located at 12th Mile (10.4 km from the proposed EZ).</p>
Nilphamari Sadar	<p>(1) 33/11 KV substation (of capacity 15 MVA) is located at a distance of around 10 km from the proposed EZ. Around 5 MVA of surplus power is available from this substation.</p> <p>(2) Gas turbine power plant of 20 MW capacity is located in Saidpur at a distance of around 10 km from the proposed EZ. 132/33 KV grid substation with a capacity of 1x20 MVA and 2x25/41 MVA is available at this location.</p> <p>(3) A new 132/33 KV grid substation of capacity 50 MVA is proposed in Jaldhaka which is located at a distance of 30km (approx.) from the proposed EZ.</p>
Manikganj	<p>(1) 5 MVA surplus power is available from 33/11 KV substation located in Uthli (approximately 7-8 km away from the proposed EZ).</p> <p>(2) 33/11 KV substation of 10 MVA capacity is under construction in Kathersen mouza (located within 5 km from the proposed EZ). It is expected to be commissioned by 2017.</p> <p>(3) 132/33 KV grid substation of 70 MVA capacity is proposed in Borangal (located at a distance of approximately 10 km from the proposed EZ). Site selection for the same is yet to take place.</p> <p>(4) 30 MW solar power plant is proposed near the project site. This project is at feasibility stage.</p>
Shariatpur-Zajira	<p>(1) Zajira substation is the nearest substation to the proposed EZ and it has a total capacity of 10 MVA. It is located at a</p>

	distance of around 3 km from the project site. Basis interaction with UNO and Rural Electrification Board (REB) officials, this substation has surplus capacity of 3 MVA. (2) REB officials informed us that a power plant is proposed in Mazir Ghat, which is at a distance of 4km from the proposed EZ.
Jaliardip-Teknaf	(1) The nearest substation to the proposed EZ is Teknaf substation having capacity of 10 MVA. Basis interaction with UNO and Rural Electrification Board (REB) officials, this substation has excess capacity of 3.5 MVA. (2) Basis our discussions with UNO officials, tapping may be taken from this line and 33/11 KV substation may be proposed at site. Grid substation 132/33 KV is available at Cox's Bazar which is located at a distance of 80km from the site. (3) 33 KV line is passing along the road which is located within 500 meters from the proposed EZ.

Access to power substations/ sources has been considered as basis for the ranking exercise. Sites which have access to power substation (having surplus power available) in the vicinity have been given higher marks. Considering all the mentioned factors a relative scoring is presented below.

Name of the EZ	Relative Scoring
Dhaka-Dohar	2.5
Bhola Sadar	5
Kustia-Bheramara	3.5
Nilphamari Sadar	3.5
Manikganj	4.5
Shariatpur-Zajira	3.5
Jaliardip-Teknaf	3

Gas Connection

Name of the EZ	Rationale
Dhaka-Dohar	(1) Gas pipeline is available near BSCIC, Keraniganj which is located at a distance of 40Km (approximate) from the proposed EZ. However basis discussion with industries at BSCIC Keraniganj, gas pressure obtained is not adequate. (2) The construction of Padma Bridge and connecting the gas line to the other side of the river would enhance the gas availability at a distance of around 30 km from proposed EZ.
Bhola Sadar	(1) Local gas substation is located at a distance of around 4 km from the proposed EZ and it has a capacity of 45 MMscf per day with surplus of 1 MMscf per day. (2) As informed to us by the UNO officials, pressure obtained in the substation is also adequate. (3) In Shahbazpur gas field and in Buranuddin, gas source is available. It could be used for industrial consumption.
Kustia-Bheramara	(1) At present there is no gas supply available to the proposed EZ. Difficulty in laying gas transmission pipeline across the Padma Riverbed is holding up gas supply to the south western part of Bangladesh. (2) CGS Gas substation in Bheramara is located at a distance of approximately 2 km from the proposed EZ and its capacity

	is 100 MMcfd.
Nilphamari Sadar	(1) Gas supply is not available in this region. (2) Gas pipeline is laid only till Bogra, which is at a distance of 180 km (approximately) from the proposed EZ.
Manikganj	(1) Local gas substation of Titas is located at a distance of around 5 km from the proposed EZ. (2) Distribution line from the gas substation is available up to Aricha Ghat (around 150 feet from the proposed EZ). It was communicated to us that the gas pressure capacity at the local substation is 150 psi. (3) However pressure obtained in this region is not adequate and regular fluctuations in gas pressure have been observed. (4) Basis discussion with Titas officials, another gas distribution line (of capacity 250 psi) from Tongi to Manikganj is proposed.
Shariatpur-Zajira	(1) There is no gas source or gas supply near to the proposed EZ. (2) Basis discussion with UNO officials, it was informed to us that the nearest gas pipeline is available in Munshiganj (located at road distance of around 50 km from the proposed EZ, on the other side of Padma River). (3) Once Padma Bridge is operational; gas pipeline will be available near to the proposed EZ. Construction for the approach to the Padma Bridge is ongoing at a location around 3 km away from the project site.
Jaliardip-Teknaf	There is no gas supply point available near the proposed EZ. 24”gas transmission line is available upto Shikalbaha power plant, Chittagong (located at a distance of approx. 190 km from proposed EZ). Basis preliminary assessment, a 16”gas pipe line from this place to Cox’s bazar could be proposed to be laid out. However, Cox’s bazar is 80 km (approx.) away from the proposed EZ.

Access to gas has been considered as the basis for gas availability calculation. Sites which have access to gas have been given higher marks and sites which don't have access to gas connection in the vicinity have been given lower marks. Considering all the mentioned factors a relative scoring is presented below.

Name of the EZ	Relative Scoring
Dhaka-Dohar	2.5
Bhola Sadar	5
Kustia-Bheramara	2
Nilphamari Sadar	1
Manikganj	2.5
Shariatpur-Zajira	2.5
Jaliardip-Teknaf	1.5

Water Connection

Name of the EZ	Rationale
Dhaka-Dohar	<p>Basis preliminary assessment, the water requirement for the proposed EZ could be met with the intake from either extracting water from the Padma river adjacent to the site boundary or from bore wells which could be developed within the project area. Basis discussion with UNO officials, ground water is available at a depth of 200 feet (approx.) from natural ground level.</p> <p>Preliminary assessment suggests that extracting water from river located on the western boundary of the proposed EZ may be considered by providing suitable intake system and water treatment plant. Exact location of water intake needs to be finalized during the master planning stage.</p>
Bhola Sadar	<p>Basis discussion with UNO officials, ground water is available at a depth of 200-300 feet (approx.) from natural ground level. Preliminary assessment suggests that the water requirement could be met by extracting water from Tetulia River by providing suitable intake system and water treatment plant.</p>
Kustia-Bheramara	<p>Basis discussion with UNO officials, ground water is available at a depth of 200 feet (approx.) from natural ground level. Preliminary assessment suggests that the water requirement could be met either by extracting water from the Padma River or from deep tube well (which could be developed within the project area). Further, our preliminary assessment also suggests that extracting water from Padma River located on the eastern boundary of the proposed EZ may be considered by providing suitable intake system and water treatment plant.</p>
Nilphamari Sadar	<p>(1) At the project site, ground water is available at a depth of 500 feet (approximately) from natural ground level.</p> <p>(2) Around 5-6 bore wells are located within the proposed EZ. However, the utilization of the same could be ascertained during feasibility stage.</p> <p>(3) Basis the bore well water test reports provided by the UNO Officials, the water quality parameters are well within the limits for drinking water purpose except one report.</p>
Manikganj	<p>Basis discussion with UNO officials, ground water is available at a depth of 100-120 feet (approx.) from natural ground level. Preliminary assessment suggests that the water requirement could be met either by extracting water from the Padma River or from deep tube well. Bore wells could be developed in the char land which is located adjacent to the project area. Further, our preliminary assessment also suggests that extracting water from the river located on the western boundary of the proposed EZ may be considered by providing suitable intake system and water treatment plant.</p>
Shariatpur-Zajira	<p>(1) Basis initial site visit, source of drinking water in the area surrounding the proposed EZ is tube well.</p> <p>(2) As per our discussion with UNO Officials and local inhabitants, it was communicated to us that the depth of water table is at 40-50 feet from the ground level.</p> <p>(3) However, detailed feasibility study could be taken up to assess withdrawal of water from Padma River, ground water potential and estimation of the ultimate water demand and decision needs to be taken accordingly.</p>
Jaliardip-Teknaf	<p>There is no existing water supply system at the proposed site. The local inhabitants are dependent on tube wells for the purpose of drinking water. The source of drinking water in the EZ is based on tube well. Depth of water table is 120 meters – 150 meters from the ground level.</p> <p>The proposed EZ is bounded by Naf River on all its sides. Preliminary assessment suggests that the water requirement could be met with the intake from extracting water from the Naf River.</p>

Basis working knowledge and best practices followed, ultimate water requirement is 21 cum/ ha for a typical multiproduct EZ. Considering typical yield of 1-2 MLD (depending on location) per borewell, best practices suggest that around 4-5 MLD of water could be extracted through bore wells, beyond which aquifer would be depleted. Sites which have proximity to river, option of extracting water from the rivers may be further explored. For the EZ sites, which don't have access to rivers in the proximity, option of bore wells needs to be explored. This is subjected to detailed feasibility and master planning. Water table and proximity to river have been considered as basis for the ranking exercise. Considering all the mentioned factors a relative scoring is presented below.

Name of the EZ	Relative Scoring
Dhaka-Dohar	5
Bhola Sadar	3
Kustia-Bheramara	4
Nilphamari Sadar	2.5
Manikganj	5
Shariatpur-Zajira	4
Jaliardip-Teknaf	3

Suitability for Industrial Development

Existing industrial ecosystem and Possible Backward linkages for industries

Name of the EZ	Rationale
Dhaka Dohar	<p>(1) Dohar upzilla hasn't witnessed any significant industrial proliferation. Very few industries (cottage and small scale in nature) are located in and around the proposed EZ.</p> <p>(2) These industries include innerwear, lungis, hand-made containers made of wood and jute etc.</p> <p>(3) The land in this area is fertile in nature due to the proximity of Padma River, as a result the land is suitable for cultivation of various crops such as (but not limited to) rice, pulse, jute, seasonal vegetables etc. Sand extracted from Padma River is a major natural resource of this area.</p> <p>(4) This area is located near to Nawabganj, Munshiganj and Narayanganj. These areas are industrial hubs of the country. Some of the popular industries in these areas are: fabrics, steel, cotton, food processing, light engineering, shipbuilding etc.</p>
Bhola Sadar	<p>(1) Bhola is rich in natural resources such as rice, jute, potato, chilli, cucumber, watermelon etc.</p> <p>(2) This region is known as watermelon hub and watermelon from Bhola region is transported to all parts of Bangladesh; Potato from this region is exported to Russia.</p> <p>(3) Due to the adjacency of Padma River, fishing activities take place in this area.</p> <p>(4) There is no big industrial set up in this district. Several small and medium scale industries are operating in this region.</p> <p>(5) Some industries operating in Bhola area are: fish net, garments and textile, plastic, wax, shoes, hatchery, cold storage etc.</p>
Kushtia-Bheramara	<p>(1) Kushtia is renowned for various small and medium scale industries pertaining to textile, fabrics, cables, metals, tobacco, sugar etc.</p>

	<p>(2) Kushtia district is also rich in natural resources such as rice, sugarcane, jute, maize etc.</p> <p>(3) This area is located near to Pabna and Rajshahi district. Pabna is known for pharmaceutical industry and hosiery based industries. Rajshahi district is renowned for agriculture and silk.</p> <p>(4) Some popular industries in the nearby districts are: jute, bamboo, wood, knitwear, tobacco etc. Major export items from Rajshahi district are: jute, sugarcane, date, pan, mango, lichi, green vegetables, turmeric and silk items. Apart from that, livestock farming (cattle) and fishing are other major activities undertaken by local inhabitants.</p>
Nilphamari Sadar	<p>(1) About 90% of population of this district is dependent on agricultural activities. Major crops produced in this region are bamboo, rice, paddy, potato, tobacco, maize, onion, peanuts and green vegetables.</p> <p>(2) Uttara EPZ is located in close proximity (within 5-6 km of distance) to the proposed EZ. Some of the existing industries inside Uttara EPZ are ceramics, sanitary ware, textile, coffin manufacturing etc.</p> <p>(3) Some other industries (in small and medium scale) present in this area are: rice mill, metal, light engineering, jute mill, cold storage, plastic, food processing etc.</p> <p>(4) Saidpur upzilla in Nilphamari is renowned for railways workshop. It is the biggest railway workshop in Bangladesh and several small and cottage industrial units related to light engineering, metal etc. are located in this place.</p> <p>(5) In nearby Panchgarh district, tea cultivation is a predominant industry.</p>
Manikganj	<p>(1) Major natural resources in this region are: sand extracted from Padma River, jute, rice, maize, seasonal vegetables and fish.</p> <p>(2) BSCIC industrial complex in Manikganj has some industrial units pertaining to textile and apparels.</p> <p>(3) Tangail district is located adjacent to Manikganj and it has experienced proliferation of small and cottage scale industries based on sugar, textile, cold storage, knit wear etc.</p> <p>(4) Surrounding Sirajganj district is renowned for silk production and related industries, dairy and milk products, rice mill, oil mill etc.</p>
Shariatpur-Zajira	<p>(1) Zajira upzilla hasn't witnessed any significant industrial proliferation.</p> <p>(2) However, Zajira is rich in agricultural resources.</p> <p>(3) In nearby Barisal district, major industries operating are: Pharmaceuticals, saline, cement, food processing etc.</p> <p>(4) Barisal is one of the major sources for cultivation of food grains and fisheries in the country.</p> <p>(5) Munshiganj district has maximum number of cold storages in Bangladesh. There are several rice mill, oil mill, pulses mill and maida mill located in this region. Apart from this, other major industries in Munshiganj district are: textile, chemical, garments, fishing net, salt and cement.</p>
Jaliardip-Teknaf	<p>(1) Cox's Bazar district has presence of manufacturing sector (at SME level). Rice mills, Salt mill, ice factories, flour mills, fish processing industries, saw mills etc. are located in the vicinity. In addition, there are about 27 large scale industries in Cox Bazaar Region.</p> <p>(2) Cox's Bazaar is one the most popular tourist centres in the country. Located at the head of the world's longest sea beach, the area is blessed with many tourist attractions. These includes – Aggmeda Khyang – a Buddhist monastery, Himchari picnic spot, Innani beach, Sonadia Island, Saint Martin Island a beautiful coral island and the Teknaf peninsula.</p> <p>(3) Geographical location and profile of Jaliardip Island is a major challenge in the development of the proposed EZ.</p> <p>(4) Instead of natural and geographical challenges, this area is rich in mineral sources and minor forest produce sources which could provide the EZ easy access to raw materials.</p>

Proximity of major cities

Name of the EZ	Rationale
Dhaka Dohar	Dohar EZ is located in proximity to Dhaka city.
Bhola Sadar	Bhola Sadar EZ is located in close proximity to Barisal. Other major cities are also accessible from Bhola; however, it involves crossing the ferry and there is no direct road connectivity to other parts of Bangladesh.
Kushtia-Bheramara	Bheramara EZ is located in close proximity to Jessore. Dhaka is also accessible from the proposed EZ and travel time is around 5-6 hours.
Nilphamari Sadar	Nilphamari EZ is located in proximity to Saidpur. Dhaka is located at a distance of around 350 km from the project site.
Manikganj	Manikganj EZ is located in proximity to Dhaka. Also, the project site has access to Jessore (via Paturia ferry ghat).
Shariatpur-Zajira	Shariatpur EZ is located at a distance of around 80 km from Dhaka city. Connectivity to Dhaka takes long duration, however once Padma Bridge is operational, connectivity would improve significantly. Further, once Bhanga-Biswa Road is operational, proposed EZ would be well-connected to Khulna region.
Jaliardip-Teknaf	Proposed EZ is located in close proximity to Cox's Bazar city and is connected to Chittagong through Dhaka-Chittagong-Cox's bazar-Teknaf Nation Highway (N1). However, Chittagong is located at a distance of (approx.) 190 km from the proposed EZ.

Any other facilitator for industrial proliferation

Name of the EZ	Rationale
Dhaka Dohar	
Bhola Sadar	
Kushtia-Bheramara	Proposed EZ has access to Benapole land port which could facilitate in cross border trade to India
Nilphamari Sadar	(1) Proposed EZ has access to Banglabandha, Burimari and Hili land port which could facilitate cross border trade with India. (2) Proposed EZ has access to Asian Highway network, which may facilitate in seamless cargo transfer to neighbouring countries (3) Once MVA is implemented, it would facilitate transfer of cargo to neighbouring countries like India, Bhutan, Nepal etc.
Manikganj	
Shariatpur-Zajira	Upon completion of Bhanga Biswa road, proposed EZ would have good connectivity with Mongla port and Benapole land port, which could facilitate smooth cargo transfer to India.
Jaliardip-Teknaf	Chittagong port is accessible from the proposed EZ. Also, proximity to Myanmar could facilitate cross border trade.

Some of the major factors taken into account as the basis for the scoring: (i) Proximity to major cities; (ii) existing industrial ecosystem in the vicinity; (iii) Potential for access to new market; (iv) Possibility of cross border trade. Considering all the mentioned factors a relative scoring is presented below.

Name of the EZ	Relative Scoring
Dhaka Dohar	5
Bhola Sadar	2
Kushtia-Bheramara	4.5
Nilphamari Sadar	3.5
Manikganj	4.5
Shariatpur-Zajira	2.5
Jaliardip-Teknaf	1.5

Off-Site Infrastructure

Name of the EZ	Rationale		
	Area of the EZ	Cost of Off-site Infra (BDT Lakh)	Cost of Off-site Infra (BDT Lakh per acre)
Dhaka Dohar	316.35	34018	107.53
Bhola Sadar	304.07	13686	45.01
Kushtia-Bheramara	506.77	18427	36.36
Nilphamari Sadar	357.76	27828	77.78
Manikganj	303.47	28052	92.44
Shariatpur-Zajira	525.27	16088	30.63
Jaliardip-Teknaf	271.93	67379	247.78

Site with the lowest cost of off-site infra per acre has been assigned maximum marks and other sites have been marked on a relative basis, where the marking has been provided on proportionate basis of the cost per unit area. Considering all the mentioned factors a relative scoring is presented below.

Name of the EZ	Relative Scoring
Dhaka Dohar	1.42
Bhola Sadar	3.40
Kushtia-Bheramara	4.21

Nilphamari Sadar	1.97
Manikganj	1.66
Shariatpur-Zajira	5.00
Jaliardip-Teknaf	0.62

Social and Resettlement Aspect

Loss of Income

Name of the EZ	Rationale
Dhaka Dohar	Basis preliminary assessment and details shared by UNO office, 35 households (approximate) and 15 fishermen families could stand to lose their income/livelihood as a result of the development of the project.
Bhola Sadar	Basis preliminary assessment and details shared by UNO office and local inhabitants, 100-200 numbers of households (approximate) could stand to lose their income/livelihood as a result of the development of the project.
Kushtia-Bheramara	Basis preliminary assessment and details shared by UNO office and local inhabitants, 250 numbers of households (approximate) could stand to lose their income/livelihood as a result of the development of the project.
Nilphamari Sadar	Basis discussion with local inhabitants and UNO officials, around 180-250 households could stand a chance to lose income as a result of the development of this project.
Manikganj	Local inhabitants who would stand a chance to lose income are: local fishermen, local boatmen, temporary shop owners, local three wheel drivers etc. Around 120-150 families stand a chance to lose income as a result of the development of the proposed EZ.
Shariatpur-Zajira	Basis preliminary assessment and interaction with local inhabitants, around 200-300 number of households could stand to lose their income/livelihood as a result of the development of the project.
Jaliardip-Teknaf	As a result of loss of aquaculture land, the fishermen's will be directly affected due to the development of this project. The government has leased the ponds inside the proposed EZ to fishermen's, hence the development of the proposed EZ would affect the fisherman's who are depended on the ponds for income.

Residential units to be rehabilitated

Name of the EZ	Rationale
Dhaka Dohar	Basis preliminary assessment, 35 units need to be rehabilitated as a result of the development of this project.
Bhola Sadar	Basis preliminary assessment, 87 household structures (approximate) need to be rehabilitated as a result of the development of this project.
Kushtia-Bheramara	Basis preliminary assessment, 154 units (approximate) need to be rehabilitated as a result of the development of this project.
Nilphamari Sadar	Basis discussion with UNO officials, as a result of the development of this project, 150 houses and 36 Kutcha shops

	(approximate) will be directly affected.
Manikganj	There are no household structures present within the project area.
Shariatpur-Zajira	Basis preliminary assessment, 45-50 units need to be rehabilitated as a result of the development of this project.
Jaliardip-Teknaf	There is no loss of homes and structures. However there are 4-5 temporary sheds for fishermen those who have taken the land under lease agreement from government of Bangladesh.

Other major resettlement issues

Name of the EZ	Rationale
Dhaka Dohar	Land filling need to be undertaken for two fish ponds located within the proposed EZ.
Bhola Sadar	Trees existing in the site can be retained and earmarked as green area during the preparation of master plan.
Kushtia-Bheramara	(1) During the master planning stage, temporary canals need to be rerouted along the boundary of the proposed EZ in order to increase the utilization of project area. (2) Trees existing within the proposed EZ can be retained and earmarked as green area during the preparation of master plan.
Nilphamari Sadar	(1) Trees existing within the project site may be retained and earmarked as green area during the preparation of master plan. (2) Small nallahs/ canals crossing the project site may be removed or rerouted during master planning stage. (3) During master planning stage, the bore wells may be retained to the maximum possible extent provided the yield of the bore wells meets the water requirement. (4) 11 KV electrical overhead lines need to be rerouted along the project boundary during master planning stage.
Manikganj	As a result of the development of the proposed EZ, old Aricha ghat (non-functional) needs to be relocated to some other location.
Shariatpur-Zajira	(1) Trees existing in the site can be retained and earmarked as green area during the preparation of master plan. (2) During the master planning stage, the nallah crossing the project site could be rerouted. (3) Basis discussion with UNO officials, around 50 households and some trees would be affected due to construction of approach road. It was informed to us that the land on both sides of the kutchra road (existing approach road) is government land. (4) A non-functional brick field is located within the project site. As a result of the development of this project, this brick field needs to be relocated and measures need to be formulated accordingly. (5) Environmental Buffer Zone is being developed at a distance of around 3 km from the proposed EZ. It is located on the northern side of the proposed EZ and on the boundary of the construction yard of Padma Bridge project. During the development of the proposed EZ, precautions need to be taken so that this Environmental Buffer Zone doesn't get affected. (6) On the eastern side of the project boundary, Jalmahal (aquaculture waterbodies) is located. As a result of the development of the proposed EZ, this surrounding area may get subjected to environmental degradation and care needs to be taken to preserve the existing ecosystem of fisheries in Jalmahal.
Jaliardip-Teknaf	(1) As a result of loss of aquaculture land, the fishermen who are depended on the ponds for income will be directly affected due to the development of this project.

	<p>(2) The surroundings of the EZ have been observed as a rich fishing ground. Project interventions i.e. land filling of the existing water bodies and discharge of waste water along the Naf River might affect the fish spawning & nursing ground and subsequently income source from fishing.</p> <p>(3) Trees existing within the project area may be retained and earmarked as green area during the preparation of master plan.</p>
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Major resettlement issues have been considered for this assessment. Site with the major resettlement problem has been given the highest score and relative scoring has been considered. Considering the mentioned factors, relative scoring is presented below:

Name of the EZ	Relative Scoring
Dhaka Dohar	5
Bhola Sadar	3
Kushtia-Bheramara	2.5
Nilphamari Sadar	2.5
Manikganj	3
Shariatpur-Zajira	2.5
Jaliardip-Teknaf	3

Access to quality manpower

Name of the EZ	Rationale
Dhaka Dohar	<p>Dohar upazilla has 3 government colleges, 40 secondary schools, 56 primary schools and 1 Technical and Vocational education facilities.</p> <p>Dohar being well connected to Dhaka city enjoys the availability of several educational institutions in and near Dhaka city. There are a total of 26 technical and vocational institutions and 44 universities located in Dhaka district, which could cater to the manpower requirements of proposed EZ. Proposed EZ in Dohar is in proximity to Dhaka city.</p>
Bhola Sadar	<p>Bhola district has a total of 12 technical and vocational institutions, 1 agriculture and veterinary college, 35 (government and non-government) colleges, 262 (government and non-government) secondary schools and 241 madrasa. Sourcing of additional manpower may be considered from Dhaka or other prominent places of Bangladesh and this may pose some constraints, given the location and connectivity challenges pertaining to the site.</p>
Kushtia-Bheramara	<p>Kushtia district has 1 university, 62 colleges (government and non-government colleges) and 299 secondary schools (government and non-government schools). The district also has 5 engineering colleges, 3 agriculture and veterinary college, 5 medical colleges and 9 technical and vocational institutions. Quality manpower could be sourced from the prominent technical institutes located in Kushtia and Pabna districts. Jessore located at 120 km (approx.) could also act as source of manpower requirements. Existing industrial ecosystem in Jessore and Kushtia may be beneficial for sourcing of</p>

	quality manpower at affordable cost.
Nilphamari Sadar	There are 8 technical and vocational institutions located in Nilphamari Sadar upzila. Around 3 technical training centres are located within 50 km radius from the proposed EZ. Proximity to Saidpur may also act as another source of quality manpower.
Manikganj	Manikganj district has 28 colleges (government and non-government colleges) and 154 secondary schools (government and non-government schools). The district also has 1 medical college and 2 technical and vocational institutions. Around 3 technical training centres are located within 50 km radius of the proposed EZ. Quality manpower could be sourced from the technical institutes located in Manikganj, Nayarhat, Faridpur etc. Manpower requirements could also be sourced from Dhaka (located at a distance of 80 km (approx.) from the proposed EZ)
Shariatpur-Zajira	There are 4 technical and vocational institutions and 3 polytechnic institutes. Around 2 technical training centres are located within 50 km radius of the proposed EZ. Proposed EZ in Shariatpur could access to quality manpower from the mentioned technical institutions. However, sourcing manpower from the nearby areas might be a challenge as not much industrial proliferation has taken place in the vicinity.
Jaliardip-Teknaf	Cox's Bazar district has 21 colleges (government and non-government colleges) and 157 secondary schools (government and non-government schools). Apart from this, the district also has 1 medical college and 7 technical and vocational institutions. Most of these institutions are located in Chakoria and Cox's Bazar Sadar upzila. There is no technical and vocational institution located in Teknaf upzila. Around 3 technical training centres are located in Cox's Bazar district. However proposed EZ is not in close proximity to Chittagong and it seems that it might get difficult for it to source quality manpower from the existing industrial ecosystem in Chittagong.

Basis of this analysis is the availability of manpower from local technical institutions and industries. Proximity to major cities has also been considered as a parameter which in turn could provide source of quality manpower for the EZ due to the existing industrial ecosystem. Considering the mentioned factors, relative scoring is presented below:

Name of the EZ	Relative Scoring
Dhaka Dohar	5
Bhola Sadar	2
Kushtia-Bheramara	4
Nilphamari Sadar	3
Manikganj	4
Shariatpur-Zajira	2.5
Jaliardip-Teknaf	1

Social Infrastructure

Availability of Medical Facilities

Name of the EZ	Rationale
Dhaka Dohar	One government hospital (Upzilla Health Complex) is available in Dohar sub district with 50 beds and a private hospital in the Pourashava. For serious medical treatment, patients need to travel to Dhaka.
Bhola Sadar	One government hospital is available in Bhola with 250 beds and 20 - 30 private hospital with 10 - 15 beds. However for serious medical treatment, local inhabitants need to travel to Dhaka. Travel to Dhaka takes place by road and water mode of transportation and approximate travel time for passengers is around 9-10 hours.
Kushtia-Bheramara	One government hospital (Upzilla Health Complex) is available in Bheramara sub district with 50 beds. Kushtia Medical College & Hospital is located at a distance of 28 km (approx.) from the proposed EZ.
Nilphamari Sadar	Government hospital is available in Nilphamari Sadar upzila and has provision for 120 beds. However, for serious medical treatment, local inhabitants travel to Dhaka.
Manikganj	One government hospital (Upzilla Health Complex) is available in Manikganj district with 50 beds. Manikganj Sadar hospital is located in proximity to the proposed EZ. There is an eye hospital adjacent to the proposed EZ. Monno Medical college & Hospital is located in Manikganj (around 20 km away from the proposed EZ)
Shariatpur-Zajira	There is no international standard hospital is present in the vicinity. 1 Government hospital and 14 private clinics are available within 10 km of the proposed EZ.
Jaliardip-Teknaf	Government hospital is available in Teknaf upzila and has provision for 50 beds. However, better Healthcare facilities are available in Cox's Bazar which is far away from the proposed EZ (80 km approx.).

Availability of Residential Facilities

Name of the EZ	Rationale
Dhaka Dohar	Dwelling units and residential facilities are available for labours in Karthikpur, latakula and Jaipara.
Bhola Sadar	Dwelling units and residential facilities are available for labours in Bhola Sadar area. As Bhola is a not easily accessible from other parts of Bangladesh, proliferation of quality residential facilities haven't taken place in this area.
Kushtia-Bheramara	The proposed EZ is located 23 km away from Kusthia town. Dwelling units and residential facilities are available for labours in Kusthia.
Nilphamari Sadar	The proposed EZ is located 20 km away from Saidpur town. Dwelling units and residential facilities are available for labours in Saidur and Nilphamari.
Manikganj	Dwelling units and residential facilities are available for labours in Shibalaya and Manikganj.
Shariatpur-Zajira	Dwelling units and residential facilities are available for labours in Zajira and Shariatpur.

Jaliardip-Teknaf	There are no Dwelling units and residential facilities are available in the vicinity of the proposed EZ. Good quality residential units are available in Cox's bazaar. However Cox's bazaar is located at a distance of 80 km (approx.) from the proposed EZ.
-------------------------	---

Basis of this analysis is the availability of healthcare and quality residential facilities in the vicinity to the EZ. Proximity to major cities has also been considered as a parameter of the analysis. Considering the mentioned factors, relative scoring is presented below:

Name of the EZ	Relative Scoring
Dhaka Dohar	5
Bhola Sadar	2
Kushtia-Bheramara	4
Nilphamari Sadar	3
Manikganj	4
Shariatpur-Zajira	2.5
Jaliardip-Teknaf	1

Cost of Land Acquisition

Name of the EZ	Rationale		
	Land Price (BDT lakh per acre)	Private land (acre)	Cost of land Acquisition (BDT Lakh)
Dhaka Dohar	1.9	96.45	183.3
Bhola Sadar	10	302.72	3027.2
Kushtia-Bheramara	30	47.1	1413
Nilphamari Sadar	30	251.7	7551
Manikganj	11	127.78	1405.6
Shariatpur-Zajira	50	472.7	23635
Jaliardip-Teknaf	7	0	0

Site with the lowest cost of land acquisition (apart from Teknaf, since it has completely government land) has been given the maximum marks. Other sites have been marked on a relative basis. Considering the mentioned factors, relative scoring is presented below:

Name of the EZ	Relative Scoring
Dhaka Dohar	4.0
Bhola Sadar	0.2
Kushtia-Bheramara	0.5
Nilphamari Sadar	0.1
Manikganj	0.5
Shariatpur-Zajira	0.0
Jaliardip-Teknaf	5.0

12.2. Summary of the relative rankings

The seven sites are ranked relatively to each other. This indicates that if a site is better placed on a particular parameter vis-à-vis the other sites, highest marks (on a scale of 1 to 5, 1 being the lowest and 5 being the highest) are allocated to it. The other sites are ranked relatively to this site. These ratings are qualitative as well as quantitative (where possible) in nature, but as a principal, the assignments of scores are based on a logical rationale. Following table summarizes the comparison of the seven sites across different parameters.

The above parameters are clubbed into broad groups of “necessary parameters” and “good to have parameters”. While assigning the weightage to individual parameters it has been kept in mind to broadly assign equal weightage to all parameters falling under similar broad groups. Likewise, any sub parameters (e.g. modes of transportation like roads, rails, ports, airports etc. under parameter Connectivity) are assigned equal weightages. Of course, at a broad level, the necessary parameter group has a higher weightage than good to have parameters.

Following table summarized the relative rankings and weighted scores of the seven sites.

		Parameters	Weightage	Dhaka Dohar		Bhola Sadar		Kustia-Bheramara		Nilphamari Sadar	
				Score	Weightage×Score	Score	Weightage×Score	Score	Weightage×Score	Score	Weightage×Score
		Rank		Rank-1		Rank-6		Rank-2		Rank-5	
			100%		4.172		2.505		3.401		2.510
Necessary Parameters (75%)	Infrastructure Linkages, Connectivity and Access to Market	(1) Connectivity	15.0%		0.53		0.23		0.50		0.45
		Road	5.0%	4	0.20	2.5	0.13	4	0.20	5	0.25
		Rail	2.5%	3	0.08	1	0.03	5	0.13	4	0.10
		Water connectivity	5.0%	5	0.13	2	0.05	4	0.10	1	0.03
		Airport	2.5%	5	0.13	1	0.03	3	0.08	3	0.08
		(2) Utility Connection	15.0%		0.50		0.65		0.48		0.35
		Power connection	5.0%	2.5	0.13	5	0.25	3.5	0.18	3.5	0.18
		Gas connection	5.0%	2.5	0.13	5	0.25	2	0.10	1	0.05
		Water connection	5.0%	5	0.25	3	0.15	4	0.20	2.5	0.13
	(3) Suitability for industrial development	15.0%	5	0.75	2	0.30	4.5	0.68	3.5	0.53	
Challenges	(4) Off-site Infrastructure Development	15.0%	1.4	0.213618955	3.4	0.51	4.2	0.63	2.0	0.30	
	(5) Social & Resettlement Aspects	15.0%	5	0.75	3	0.45	2.5	0.375	3	0.375	
	(6) Access to quality manpower	8.3%	5	0.42	2	0.17	4	0.33	3	0.25	
Good to Have parameters (25%)	(7) Social Infrastructure	8.3%	5	0.42	2	0.17	4	0.33	3	0.25	
	(9) Cost of land acquisition	8.3%	4.0	0.60	0.2	0.04	0.5	0.08	0.1	0.01	

		Parameters	Weightage	Manikganj		Shariatpur-Zajira		Teknaf-Jaliardip	
				Score	Weightage×Score	Score	Weightage×Score	Score	Weightage×Score
		Rank		Rank-3		Rank-4		Rank-7	
			100%		3.193		2.784		2.334
Necessary Parameters (75%)	Infrastructure Linkages, Connectivity and Access to Market	(1) Connectivity	15.0%		0.48		0.36		0.28
		Road	5.0%	3.5	0.18	3.5	0.18	2	0.10
		Rail	2.5%	2	0.05	2.5	0.06	2	0.05
		Water connectivity	5.0%	5	0.13	3	0.08	4	0.10
		Airport	2.5%	5	0.13	2	0.05	1	0.03
		(2) Utility Connection	15.0%		0.60		0.50		0.38
		Power connection	5.0%	4.5	0.23	3.5	0.18	3	0.15
		Gas connection	5.0%	2.5	0.13	2.5	0.13	1.5	0.08
		Water connection	5.0%	5	0.25	4	0.20	3	0.15
		(3) Suitability for industrial development	15.0%	4.5	0.68	2.5	0.38	1.5	0.23
	Challenges	(4) Off-site Infrastructure Development	15.0%	1.7	0.25	5.0	0.75	0.6	0.09
(5) Social & Resettlement Aspects		15.0%	3	0.45	2.5	0.375	3	0.45	
(6) Access to quality manpower		8.3%	4	0.33	2.5	0.21	1	0.08	
Good to Have parameters (25%)	(7) Social Infrastructure	8.3%	4	0.33	2.5	0.21	1	0.08	
	(9) Cost of land acquisition	8.3%	0.5	0.08	0.0	0.00	5.0	0.75	

Annexures

Annexure A. - Questionnaire

	Name of the site:		Date:	Time:
	Name of the Project:	Initial site assessment of five EZ/EZs at Narayanganj, Panchagarh, Anowara - 2 (Chittagong), Dhaka IT and Sabrang Tourism (Cox's Bazar)		
	Name & contact details of official met :			
A	General			
1.	Land availability - Is there enough land for demand?			
2.	Total area of site in Acres/square meters			
3.	Ownership - Does land need to be assembled?			
4.	Title - Is the land in public or private ownership?			
5	Adjacencies - Is land contiguous with other industrial zones?			
6	Is the identified land is fully acquired			
7	Whether the boundary points are earmarked at site			
8	Is the entire proposed land is in possession of owner			

	Name of the site:		Date:	Time:
9	Nature of land profile - Flat / Slopping / Hilly terrain/ undulating			
10	Site layout with contours if available please collect.			
11	Is it agriculture land – if so is it B.C soil			
12	Ground water is available at a depth of			
13	Is ground water potable			
14	MSL / MFL			
15	Seismic zone			
16	Flood / cyclone history, if any			
17	Rainfall (avg)			
18	PCB guidelines			
19	Development control Rules (Like DTCP)			
20	FMB sketch of the land			

	Name of the site:		Date:	Time:
21	Land shape/configuration - square or rectangular preferred			
22	Adjacent properties - <div style="text-align: right; margin-right: 20px;">on EAST</div> <div style="text-align: right; margin-right: 20px;">on WEST</div> <div style="text-align: right; margin-right: 20px;">on North</div> <div style="text-align: right; margin-right: 20px;">on South</div>			
23	Proximity - Is the site close to other industrial facilities?			
24	In close proximity to existing residential communities?			
25	In close proximity to proposed residential communities?			
26	Buildings - Will buildings have to be removed from the site?			
27	Roads - Are there existing roads on the site?			

	Name of the site:		Date:	Time:
28	Are there schools, community facilities, police stations in the region?			
29	Labor -Is the site in close proximity to available labor?			
30	Public Transportation - Is there public transportation to the site?			
31.	Local Development Plan issues			
32.	Name of Local Body, where site is located			
33.	Name of nearest town if located in a remote place			
34.	Name of Village, Tehsil and District, where site is located			
35.	Nearest Federal Highway and distance from site	Federal Road/ State Road / Major district road /Village road – Details -7		
36.	Nearest Airport name and distance from site			
37.	Nearest Railway station and distance from site			
38	Co-ordinates of the site N, E			
39	Delineation map of identified EZ			

	Name of the site:		Date:	Time:
40	Whether the site is already developed – Is it Green field			
B	Road			
41.	Approach road name			
42.	Distance from approach road to site			
43.	Type of road			
44.	Number of lanes of Approach road			
45.	Does the road require strengthening - If yes length and width of the road	Length -	NO	Width -
46.	Does the approach road having street light			
C.	Water Bodies			
47.	Name of nearest water body			
48.	Type of water body			
49.	Nature of water body (perennial or seasonal)			
50.	Information on water availability for			

	Name of the site:	Date:	Time:
	consumption		
D.	Water Source		
51	Existing water source if any and its capacity		
52	Source of proposed water supply and distance		
53	Are bore holes used in the vicinity? Ground water level and distance from site		
54	Nearest external source of water – available quantity, intake point, etc.		
E	Drain		
55.	Any existing storm drain found adjacent to site – if yes – distance?		
56.	In case of non-availability of drain network – is it necessary to provide drain network at the proposed site – if so where and how far will be the discharge point?		
F	Sewer		
57.	Is there network available nearby site, if so at what distance?		
58.	Is there existing sewerage treatment		

	Name of the site:		Date:	Time:
	Plant system nearby? If so efficiency of the same? Spare capacity available?			
G	Soil conditions			
59.	Has soil testing been done?			
60.	If yes, to provide the Test Report			
61.	Arrange to dig trial pit, if possible & note down the observations - or details on type of foundation carried out for nearby structures. – Footing/Pile/ Raft etc.			
H	Power			
62	Nearest Substation – distance & total Capacity , available capacity			
63	Supply voltage available at or near site			
64	Power availability in hours per day			
65	Telecommunications - Are land lines available in the vicinity?			
66	Are there telecom issues in the region?			

	Name of the site:		Date:	Time:
	Constraints:			
67.	Is there any power line crossing the proposed site. What is the voltage of the electricity? High/Medium/Low?			
68.	Is there any drainage / nallah crossing the proposed site			
69	Is the site thickly vegetated/bushes etc.			
70	Is the site contains tree plantation – if so do we require to get permission from forest department?			
71	Is the land flat?			
72	Is the land solid or swampy? Are there pools of water on the property?			
73	Will the land flood during monsoon season?			
74	Is this an earthquake region?			
75	Does the land need to be raised? By how much?			
76	Any other constraints			

	Name of the site:		Date:	Time:
J	Environment data - General			
77	Climate - Is climate information for this location easy to obtain?			
78	Annual rainfall data (for min 10 years)			
79	Noise - Is there industrial noise in the region? Are statistics easy to obtain?			
80	Ground water issues - Is there likely to be ground water issues in the region?			
81	Contaminated Materials - Are there contaminated materials on site?			
82	Do the contaminated materials need to be removed?			
83	Soil issues - Is there likely to be contaminated soils on the property?			
84	Is there any wind rose diagram available for this site			
85	Are there potential leaching issues?			
86	local knowledge indicators			

	Name of the site:		Date:	Time:
87	Archaeological significance, cemeteries or burial grounds			
K	Biological Environment data			
88	Are there streams, rivers, or lakes on the site?			
89	Are there rare flowers or plants on the site?			
90	Are there water fowl, fish or flowers on/near the site?			
91	Are there any protected areas on/near the site?			
92	Any forest or defense areas – details			
93	Is there any animal wildlife that needs to be protected on the site?			
94	Are these agricultural lands?			
95	What types of crops are grown on the site?			
96	How many crops are grown per year on the site?			
L	Human Environment data			
97	Are livelihoods being affected by this development?			

	Name of the site:		Date:	Time:
98	What types of livelihoods are being affected?			
99	Are people living on the site?			
100	How many houses?			
101	Type of house – Brick / concrete / steel			
102	Is resettlement required? How many people affected?			
103	How many women are being affected by this resettlement?			
104	Are there any historical buildings or sites on this property?			
105	Are there any cultural sites on this property?			
106	Are there any religious facilities on this property?			
107	Are there schools/universities on this property?			
108	Are there community facilities on this property'?			
109	Is there a hospital on this site?			

	Name of the site:		Date:	Time:
110	Are there government offices or facilities on this site?			
111	Do any of the above facilities need to be protected?			
M	Material availability (with rates possible)			
112.	Schedule of rates for construction (As per Government)			
N	Stakeholders - communication with interested parties			
113	public bodies:			
114	private:			
115	pressure groups:			

Site visit conducted by:

- 1.
- 2.
- 3.

Annexure B. - Success story of Dahej Special Economic Zones Limited (DSL)

Dahej Special Economic Zones Limited (DSL)

Dahej SEZ Ltd (DSL) is a company registered under the Companies Act, 1956 and is promoted jointly by Gujarat Industrial Development Corporation (GIDC) and Oil & Natural Gas Corporation (ONGC) for development of Special Economic Zone (SEZ). DSL is developing a multi-product SEZ at Dahej in Vagra Taluka of Bharuch district in Gujarat, India. Dahej SEZ is located in Vagra Talulka of western part of Bharuch District, Gujarat, India. It is well connected with National Highway (NH-8). Road and Railway both are having the connectivity to New Delhi, the National Capital and Mumbai, the commercial Capital of India.¹¹⁵

SEZ is a part of Dahej Petroleum, Chemicals and Petrochemicals Investment Region (PCPIR) and is within Delhi-Mumbai Investment Corridor (DMIC). Dahez SEZ has received investments worth around 29000 crores (approx. USD 45 Billion) and is providing employment to 22000 people (*approximate*). In just 5 years, Dahej SEZ has achieved cumulative exports in thousands of crores. The exports figures have increased by leaps and bounds every year since its inception. Table below illustrates the same. It has about 28 operational units from industries like Chemicals, Agrochemicals, Petrochemicals, Pharmaceuticals, Ship building, Ship repairing and heavy fabrication projects etc. These units include ONGC's C2 and C3 plant and ONGC Petro-additions Limited (OPaL), one of the anchor tenants of DSL.

Exports from Dahej SEZ

Year	Export (Rs. Cr.)	Operational Units
2009-10	83	2
2010-11	428	5
2011-12	864	12
2012-13	1420	16
2013-14	2069	21
2014-15	2376	28

Area of Dahej SEZ

Dahej SEZ covers the total land area of 1682 Hectare, wherein 1573 Hectare is processing area and 34 Hectare is non-processing area.

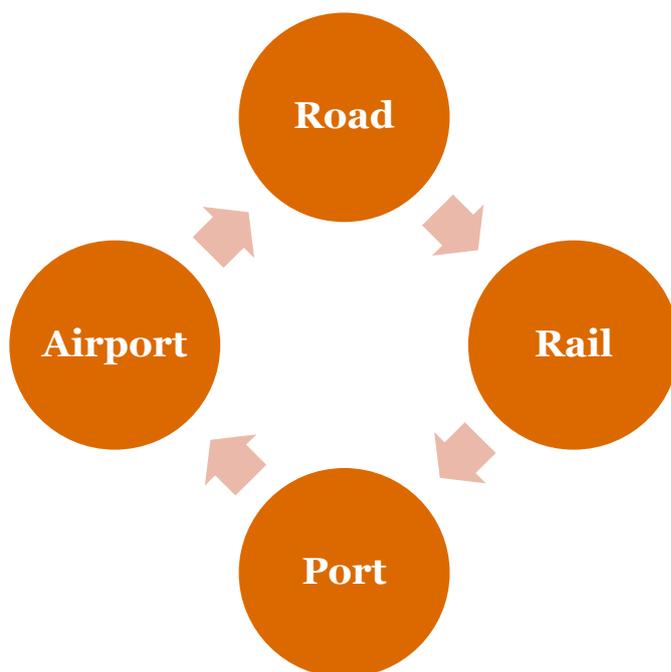
SEZ is divided into two parts.

- Part-I (East) about 1200 Hect. and
- Part-II (West) about 461 Hect.

Part I and Part II are joined by a dedicated corridor of 21 Hect. Following figure illustrates Dahej SEZ development plan.

¹¹⁵ http://dahejsez.com/dahej_sez_profile.html

B.1. Location/ connectivity



Road connectivity

Dahej SEZ is on 6 lane State Highway connecting of Bharuch (50 Kms) with National Highway No. 8 of India

Rail connectivity

Dahej SEZ is located at a distance of 50 kms (approx) from Bharuch, Main Rail Head connecting Mumbai - Delhi.

Port connectivity

1. GCPTCL for chemical cargo

Gujarat Chemical Port Terminal Company Limited (GCPTCL) is a most modern commercial port and storage terminal located at Dahej, District Bharuch, Gujarat in the Gulf of Khambhat (Cambay) on the west coast of India. This gives GCPTCL the leverage of pleasing proximity to the production facilities of oil, petroleum products & chemicals, and the vast hinterland spanning entire Western, Northern & Central India.

2. Adani-Petro LNG for solid bulk cargo handling

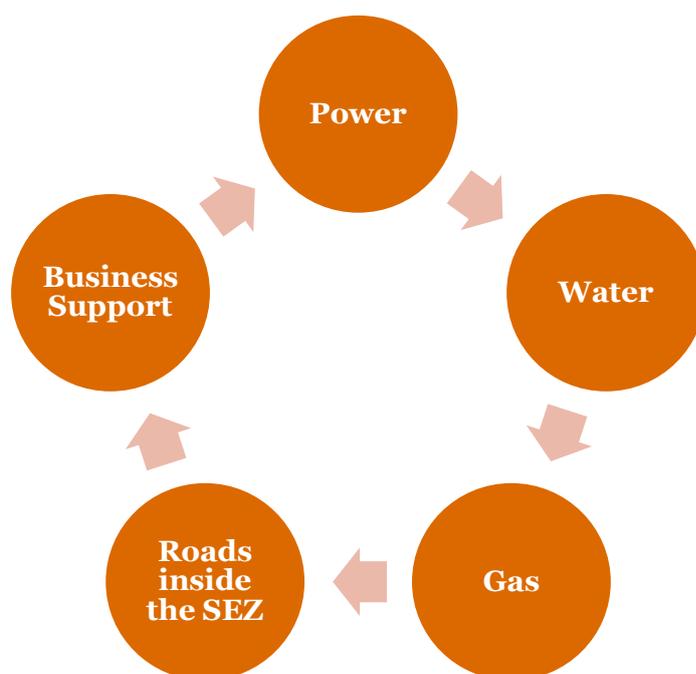
Petronet LNG limited: A Solid Cargo Port through a Joint Venture company namely Adani Petronet (Dahej) Port Private Ltd., has already commenced its Phase 1 operations from August 2010 at Dahej Port. Solid Cargo Port Terminal would have facilities to import/export bulk products like coal, steel and fertilizer. PLL has 26% equity in this JV.

Airport connectivity

Airports located near to dahej SEZ are

- Baroda (located 140 kms from Dahej SEZ)
- Surat (located 120 kms from Dahej SEZ)
 - Has daily flights to Mumbai & Delhi)

B.2. Utilities



Power

- Torrent Energy Ltd. (TEL) is co-developer for power distribution in SEZ
- 33/11 KV Two sub-stations – one each in Part I & Part II are set up.
- Power distribution network is in place.
- Power Project of 1200 MW is under implementation in SEZ.
- TEL has provided power connections to 39 units in SEZ.

Water

- GIDC is co-developer for water supply in SEZ.
- Water distribution network for 10 MGD water supply.
- Water Reservoirs, Pumping Stations and ESRs in both parts of SEZ.
- GIDC has provided connections to 44 units in SEZ.

- A Desalination project is being set up by Swarnim Dahej Spring Desalination Pvt. Ltd. (a Consortia of Hitachi & ITOCHU of Japan and Hyflux of Singapore) another Co-developer in SEZ to meet additional water requirement of SEZ units.

Drainage / Effluent Disposal

- GIDC is co-developer for collection of treated effluent and disposal.
- Underground pipeline for collection of treated effluent.
- Collection Sump and Guard Pond in both part of SEZ.
- Effluent from Guard Ponds is discharged to Dahej-Vilayat GIDC Effluent Treatment Plant outside SEZ and to sea for Dahej Industrial Estate, for which consent and authorization is granted by GPCB in November 2008.
- GIDC has provided connections to 7 units in SEZ.

Gas Supply

- Gujarat State Petronet Ltd. (GSPL) is co-developer for gas distribution within SEZ
- Gas supply distribution network and Monitoring stations are in both parts of SEZ.
- GSPL has provided gas supply connection to 6 units in SEZ.

Roads inside the SEZ

- RCC Roads
 - 50 mtrs wide - 1.6 Kms.
 - 30 mtrs wide - 13.8 Kms.
 - 20 mtrs wide - 10.0 Kms.
- Street lights
- Storm Water Disposal (SWD) facility alongside road.

Business Support utilities

1. Telecommunication and Data Transmission

- Bharat Sanchar Nigam Limited (BSNL) is Co-developer for Telecommunication and data transmitting Network.
- Telecommunication services in SEZ is started by BSNL.

2. Fire & Safety Services

- Fire Safety Service station is Operational in Dahej SEZ.

3. Weigh Bridge Service

- Weigh Bridge Service is operational in SEZ Part – I.

4. Bank offices

- Bank of Baroda is operational in Dahej SEZ Part-1.
- ATM of HDFC Bank within Dahej SEZ.

5. Hotel & Convention Centre

- Cambay SEZ Hotels Pvt. Ltd. is a Co-developer has completed work of Phase - I & Commenced Commercial Operation.
- Sapthagiri Hospitality Pvt. Ltd. is another Co-developer Commenced Commercial Operation.

6. Internal Bus Services

- Internal Transport Service is operational.

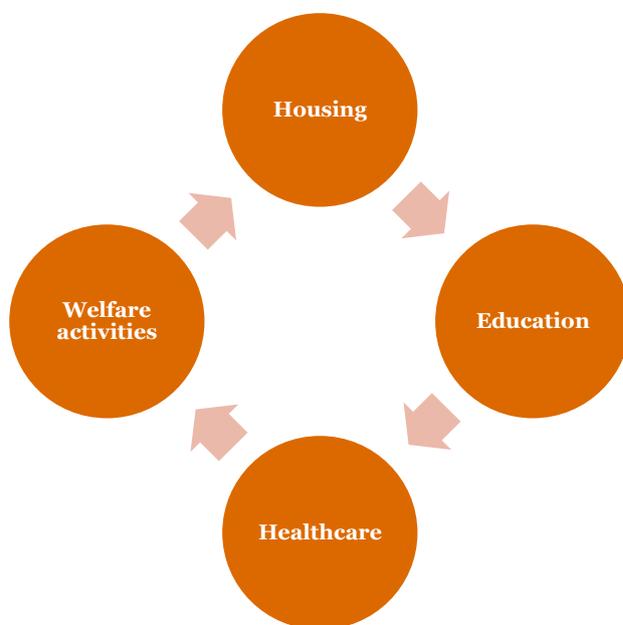
7. Food Court

- Food Court is in operation.

8. Administrative Block

- Administrative buildings of SEZ Part- I and SEZ Part – II are operational.

B.3. Social Infrastructure



Housing

1. Township/Housing Blocks

- Atali - Housing complex about 10 Kms. from Dahej SEZ is developed by GIDC in which Units located in SEZ are offered plots.

2. Security Service

- Service Agency for Security & Traffic is in place.

3. Parking & Toilet Blocks

- Toilet blocks in SEZ Part - I and SEZ Part - II with Parking.

4. Other Services

- Housekeeping
- Plantation

Education

1. Training Center

- ITI (Industrial Training Institutes) centres are opened in Dahej Industrial Area outside SEZ.

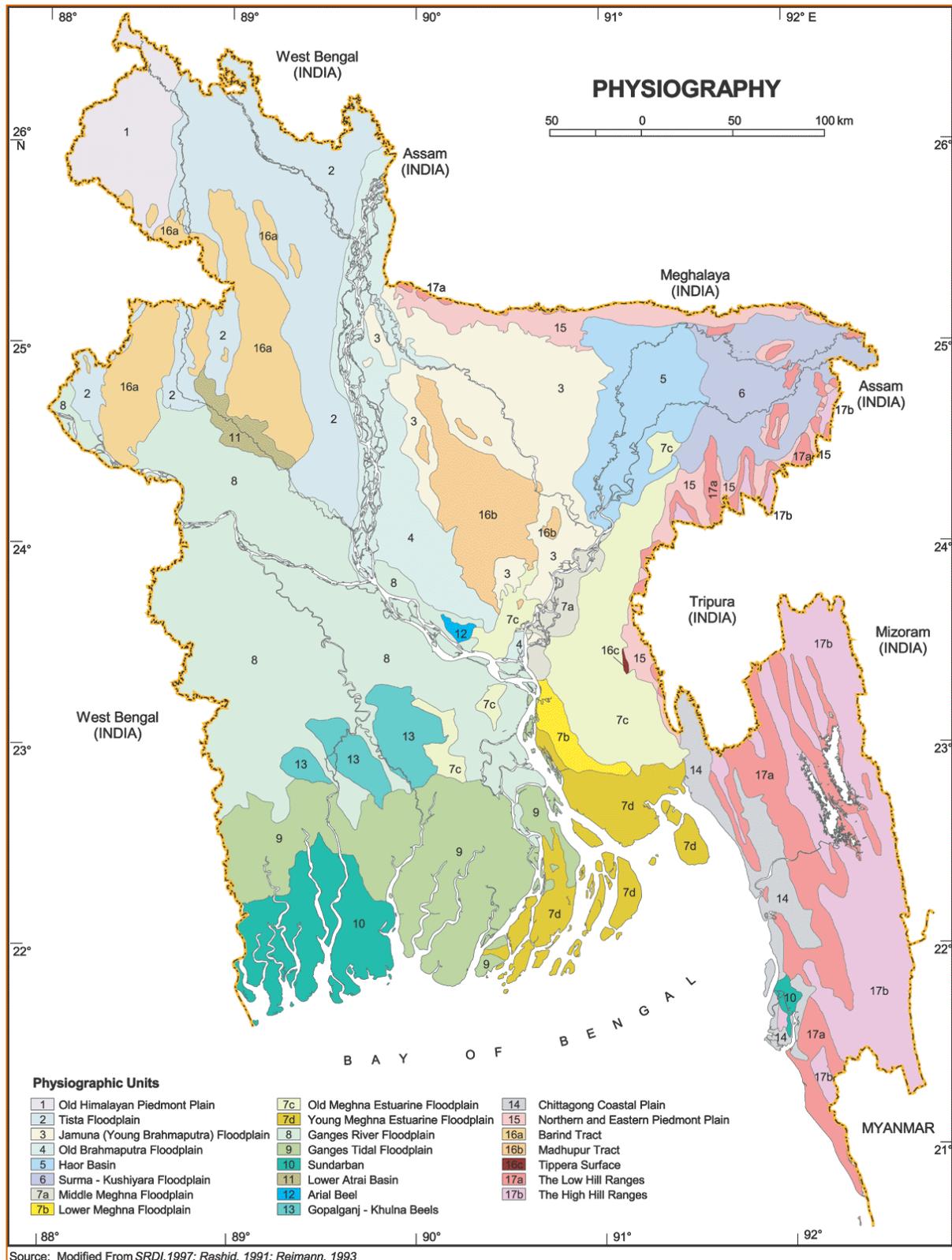
2. Medical Centre

- Medical Centres are in operation in IPCL and Birla Copper Plant in the vicinity of Dahej SEZ.
- A new Hospital at Dahej is under construction.

Welfare Activity for nearby areas

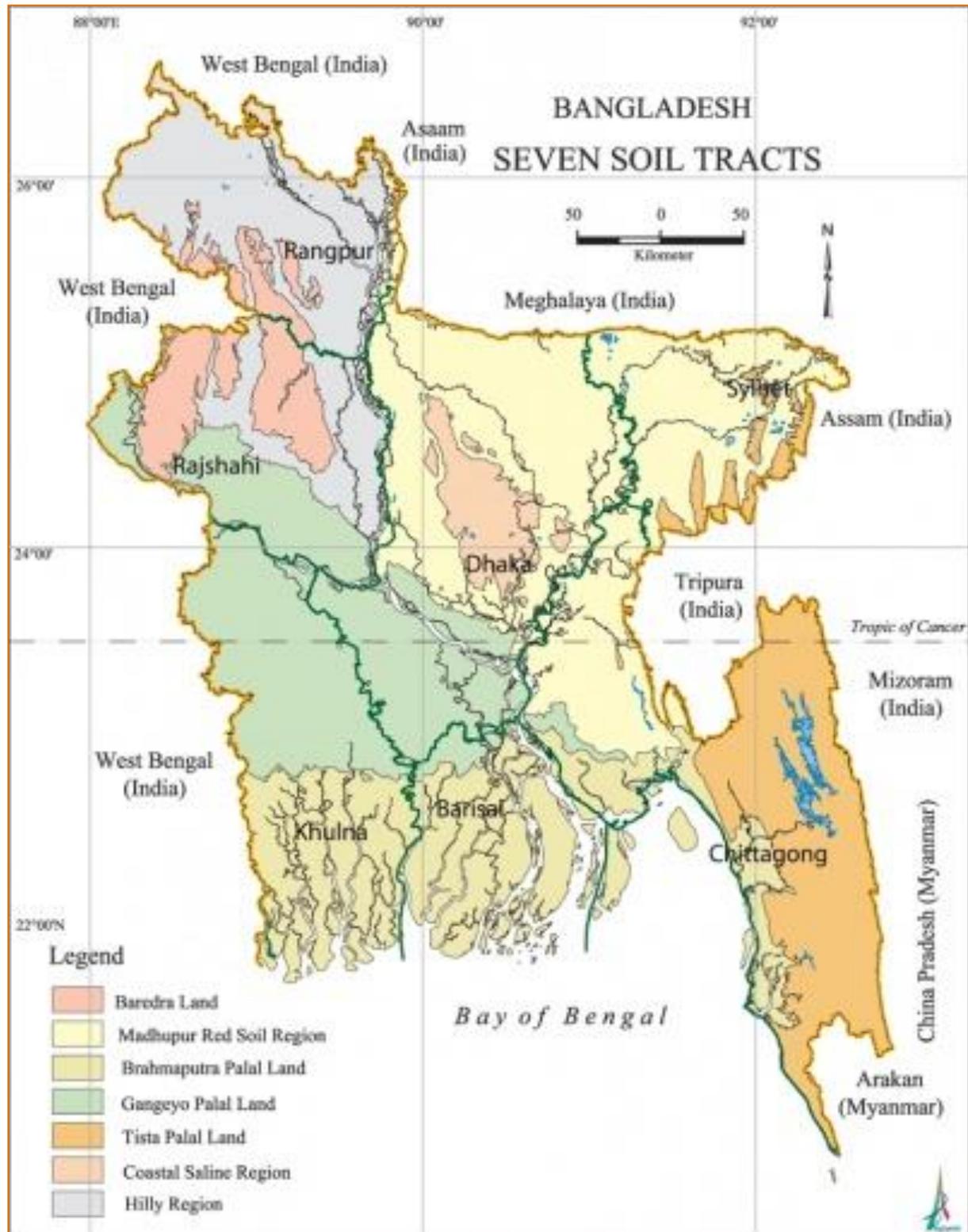
- Gujarat PCPIR Welfare Society is constituted to carry out welfare activities in 18 villages of Dahej area including 5 villages of SEZ land

Annexure C. - Physiography map of Bangladesh



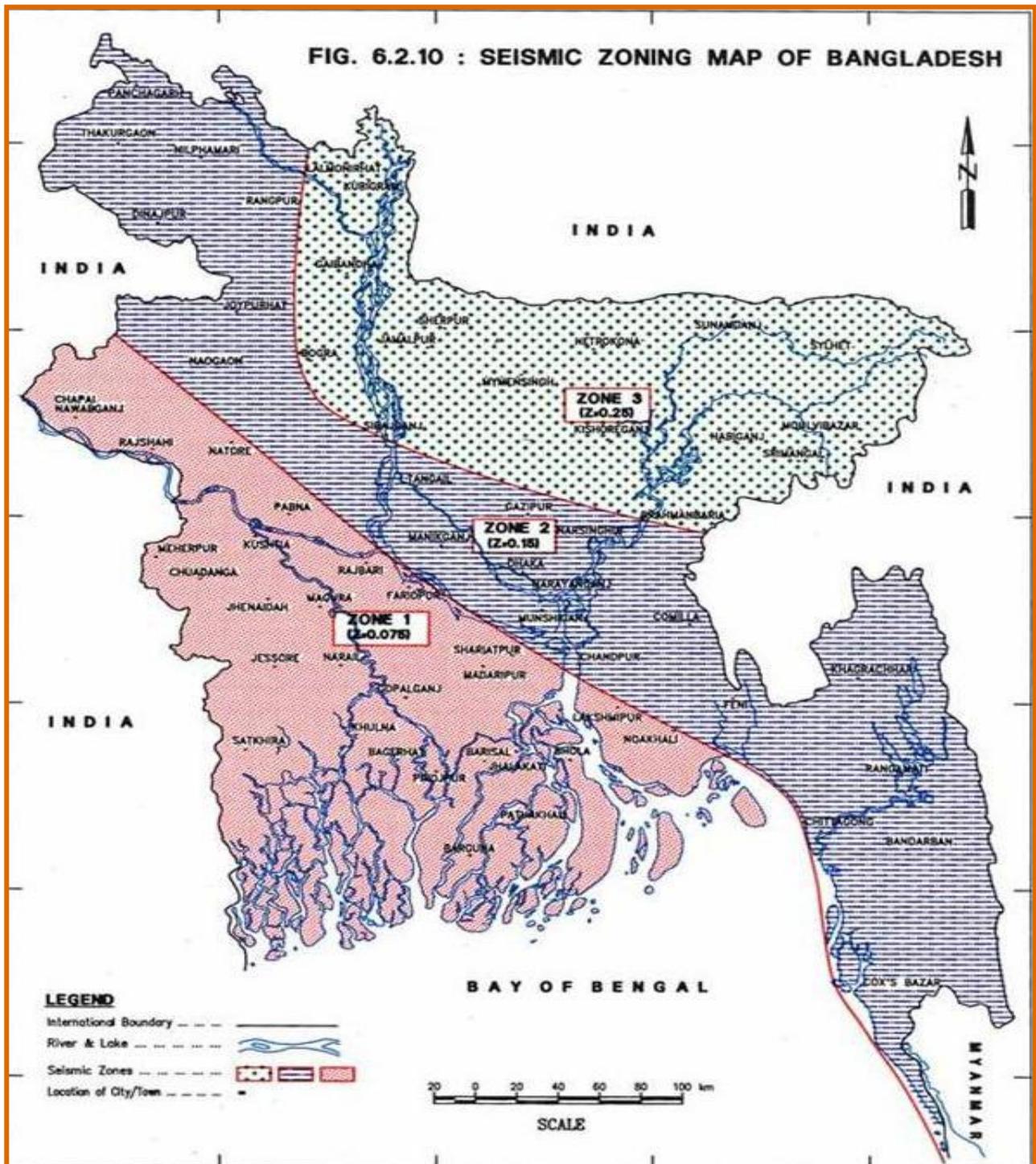
Source: Bangladesh Bureau of Statistics- Physiography Map

Annexure D. - Geological map of Bangladesh



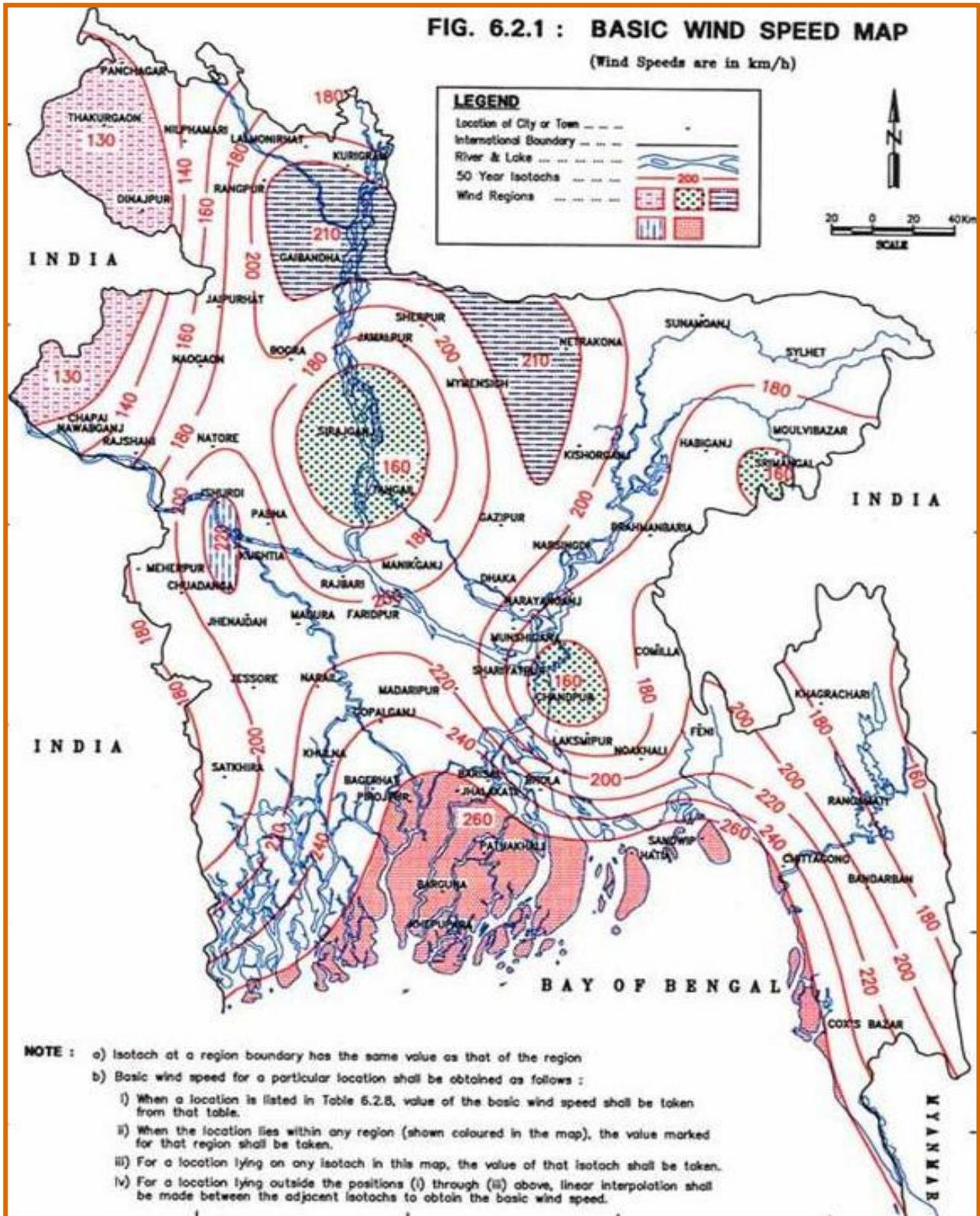
Source: Ministry of Geology, Bangladesh- Website

Annexure E. - Seismic Zoning map of Bangladesh



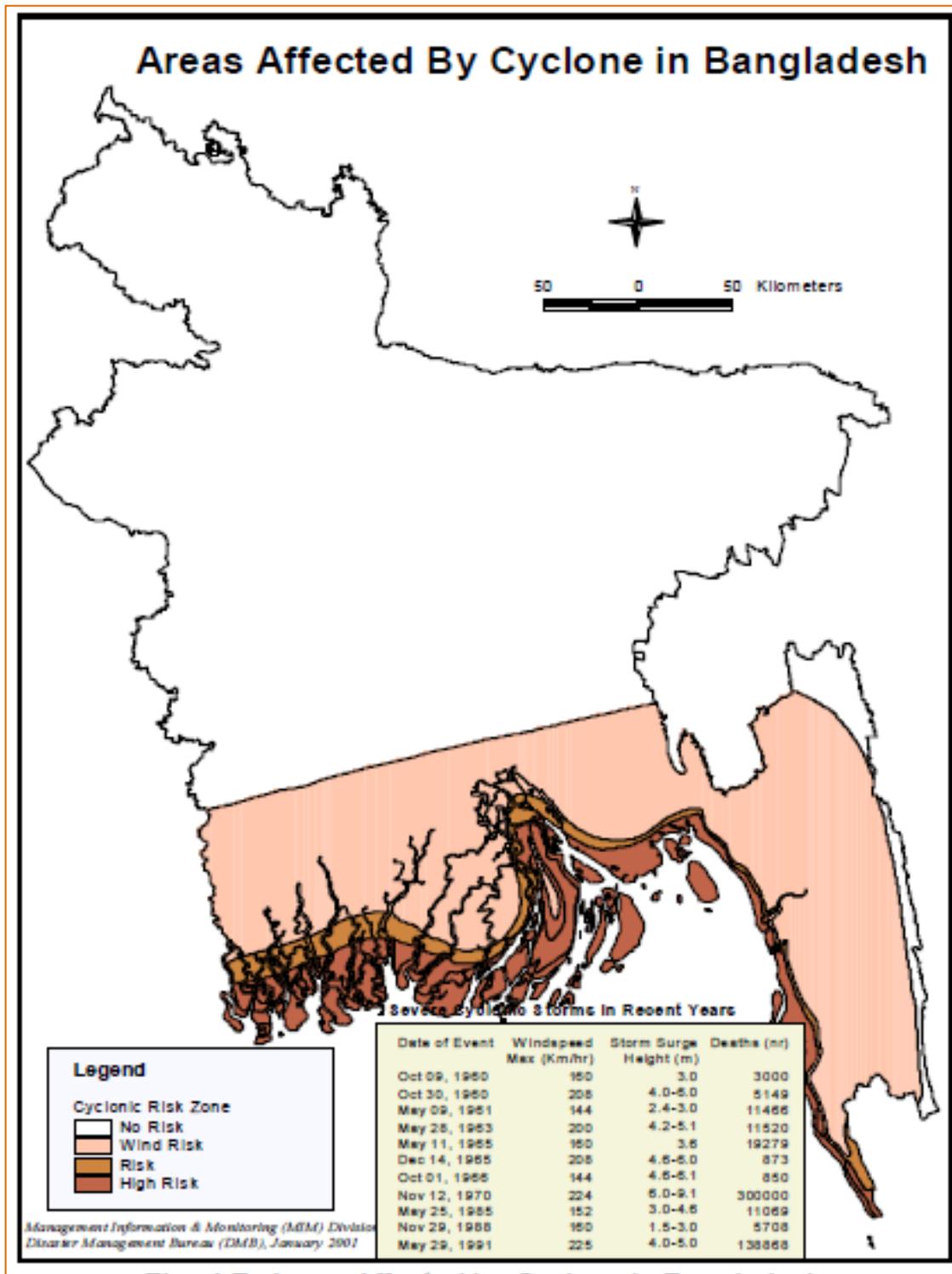
Source: Bangladesh Bureau of Statistics- Seismic Map

Annexure F. - Basic Wind speed map of Bangladesh



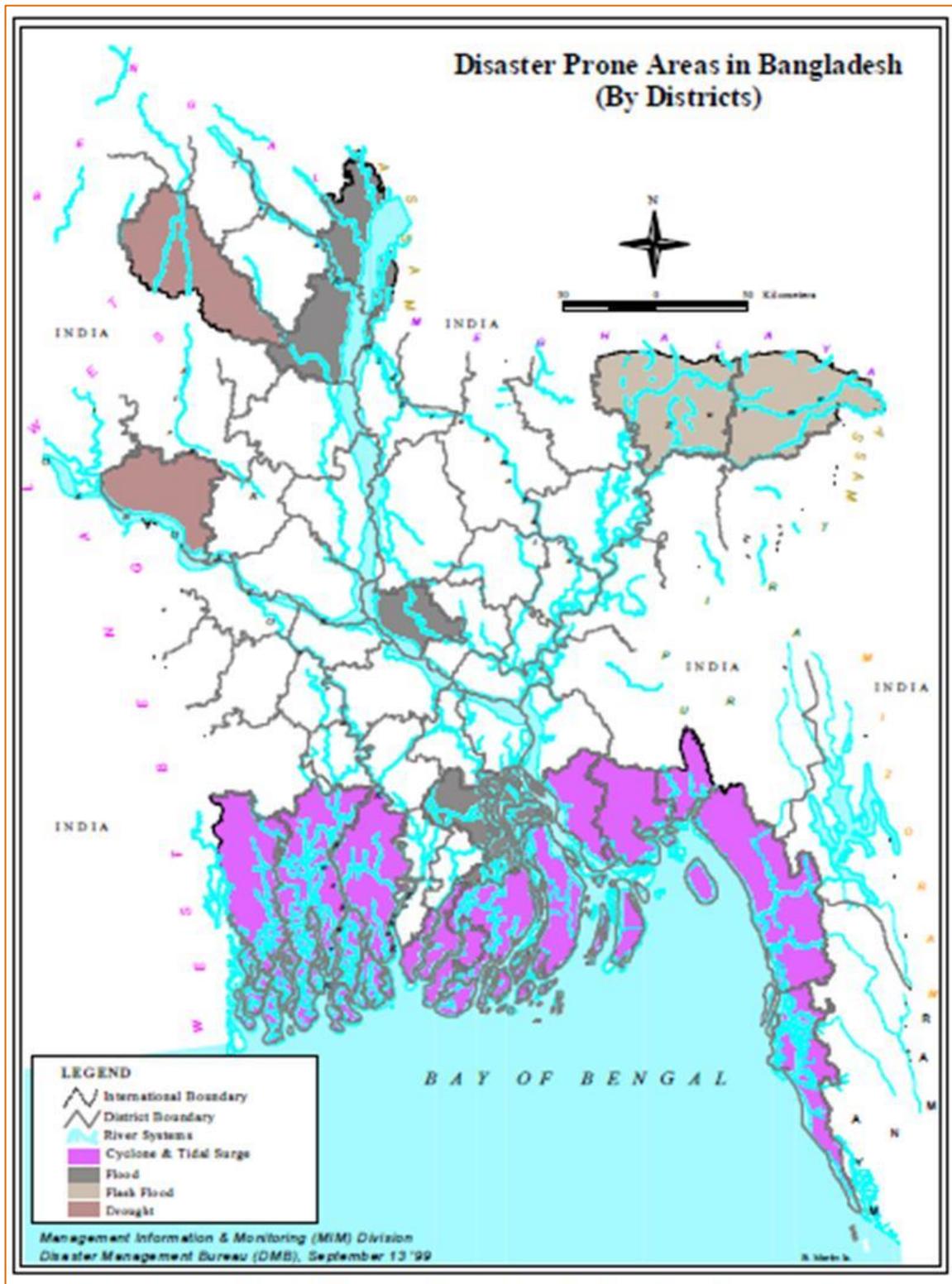
Source: BMD- Bangladesh

Annexure G. - Cyclone affected areas Bangladesh



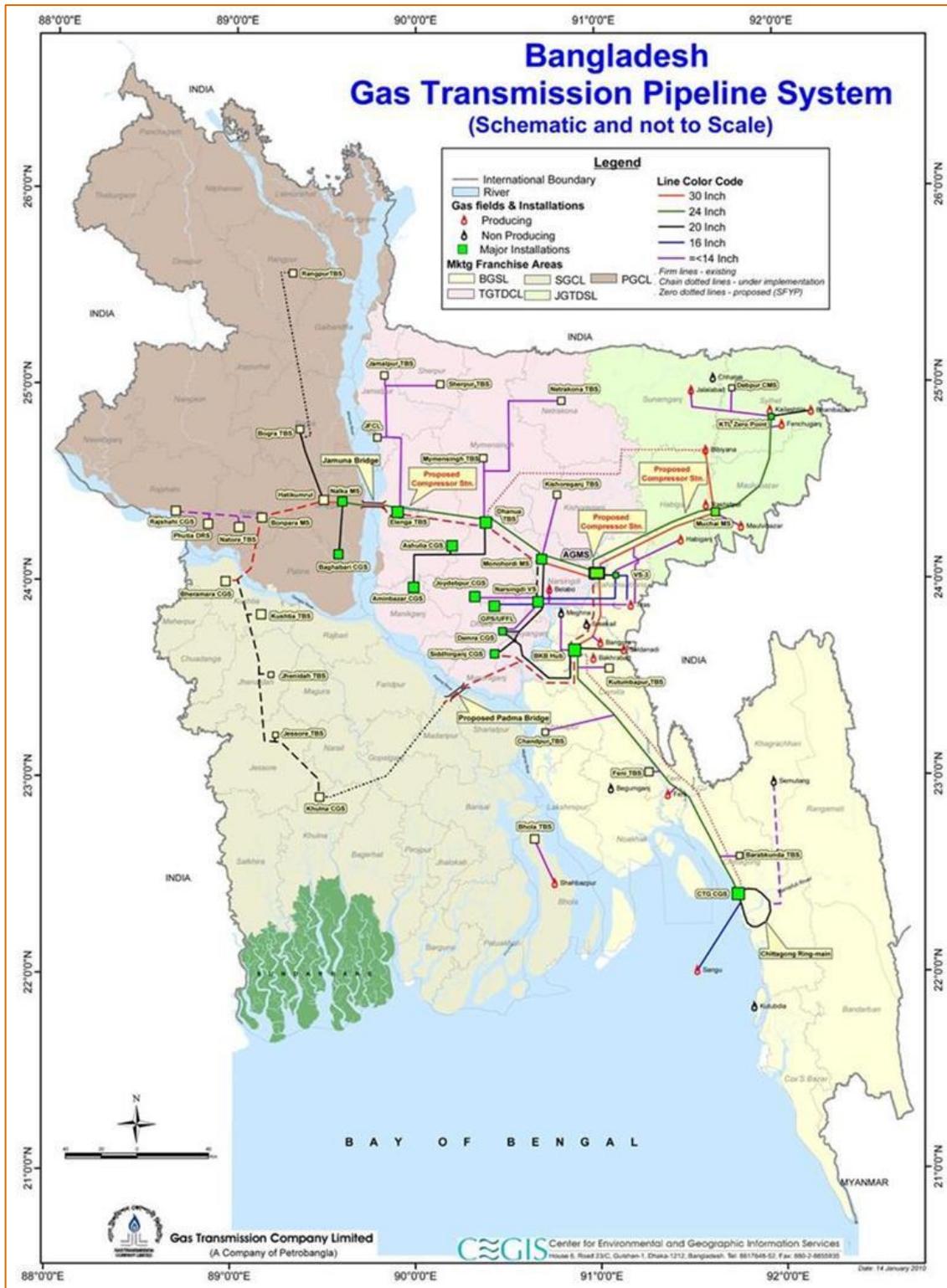
Source: BMD- Bangladesh

Annexure H. - Disaster prone areas in Bangladesh



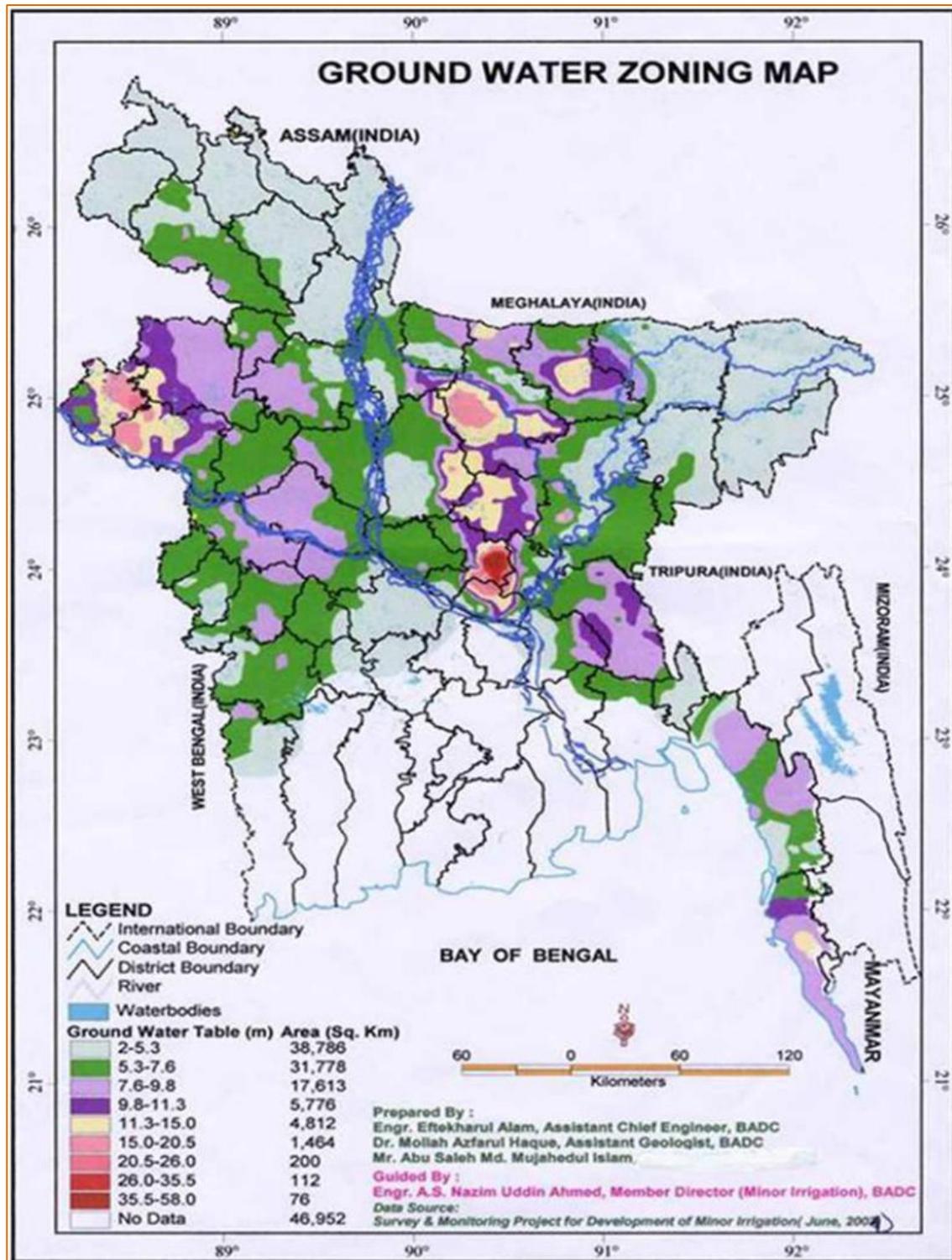
Source: BMD Bangladesh

Annexure I. - Bangladesh Gas Transmission pipeline system



Source: Titas Gas Website

Annexure J. - Ground Water Zoning Map in Bangladesh



Department of Minerals, Bangladesh

Source:

