

THE PEOPLE'S REPUBLIC OF BANGLADESH

**THE PEOPLE'S REPUBLIC OF
BANGLADESH
PROJECT FOR DEVELOPMENT OF
ECONOMIC ZONES AND CAPACITY
ENHANCEMENT OF BANGLADESH
ECONOMIC ZONES AUTHORITY**

FINAL REPORT

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JAPAN INTERNATIONAL COOPERATION AGENCY

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PREFACE

The Government of Bangladesh has declared themselves in its development plan Vision 2021 that they would become a middle-income nation by 2021, and is promoting its industrialization policy based on medium- to long-term views. The Government has identified the promotion of Foreign Direct Investment (FDI) as one of the key policies, coupled with further promotion and diversification of the export, while they are also intensively developing various infrastructures such as power supply, ports, highways and railways. Although Bangladesh Economic Zone Authority (BEZA) has been established in 2010 and they are actively promoting the development of Economic Zone, the Government of Bangladesh has requested the Government of Japan for assisting the development of Economic Zone and capacity enhancement of BEZA with an attempt to attract more Japanese entities to Bangladesh.

The Joint Venture has, under the appointment of Japan International Cooperation Agency (JICA), conducted surveys and prepared a report on the results of fact-finding the related legal systems and business environment in Bangladesh, formulation of Economic Zone guidelines, selection of candidate sites for the short-term Economic Zone development and formulation of its basic development plan, drawing master plan for the medium-term Economic Zone at Maheskhali Island, and planning an action plan for the capacity enhancement of BEZA organization.

It is our sincere desire that this report will be of use for the capacity enhancement of BEZA and contribute to the promotion of FDI to Bangladesh and development of Economic Zone in Bangladesh.

Taking this opportunity, the Joint Venture wishes to extend a deep appreciation to the officials concerned of Government of Bangladesh for their close cooperation extend to the survey.

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The Joint Venture of
World Business Associates Co., Ltd.
Japan Development Institute Ltd.
RECS International Inc.
Oriental Consultants Global Co., Ltd.

People's Republic of Bangladesh
Project for Development of Economic Zones and Capacity
Enhancement of Bangladesh Economic Zone Authority

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**The People's Republic of Bangladesh
Project for Development of Economic Zones and Capacity
Enhancement of Bangladesh Economic Zones Authority**

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Abbreviation

ADB	Asian Development Bank
ADDIE	Analysis, Design, Development, Implement, Evaluation
API	Active Pharmaceutical Ingredient
ASEAN	Association of South East Asia Nations
BAPI	Bangladesh Association of Pharmaceutical Industry
BASMS	Bangladesh Auto-rerolling and Steel Mills Association
BASIS	Bangladesh Association of Software & Information Services
BB	Bangladesh Bank
BBS	Bangladesh Bureau of Statistics
BCSIR	Bangladesh Council of Scientific & Industrial Research
BDS	Business Development Services
BDT	Bangladesh Taka
BEIOA	Bangladesh Engineering Industry Owners'Association
BEPZA	The Bangladesh Export Processing Zones Authority
BEZA	Bangladesh Economic Zones Authority
BGMEA	Bangladesh Garment Manufacturers and Exporters Association
BIFFL	Bangladesh Infrastructure Finance Fund Limited
Big-B	Bay of Bengal Industrial Growth Belt
BIM	Bangladesh Institute of Management
BIWTA	Bangladesh Inland Water Transport Authority
BIWTC	Bangladesh Inland Water Transport Corporation
BKPM	Indonesia Investment Coordinating Board
BMOGC	Bangladesh Mineral Oil & Gas Corporation
BOI	Board of Investment
BPDP	Bangladesh Power Development Board
BPR	Business Process Re-engineering
BR	Bangladesh Railway
BSBID	Bangladesh Ship Building Industry Association
BTMA	Bangladesh Textile Mills Association
BWDB	Bangladesh Water Development Board
CCEA	Cabinet Committee on Economic Affairs
CCI	Chamber of Commerce and Industry
CDC	The Council for Development of Cambodia
CDL	Chart Detum Level
CDM	Clean Development Mechanism
CETP	Central Effluent Treatment Plant
CFS	Container Freight Station
CFT	Cross Functional Team

CoO	Certificate of Origin
CPA	Chittagong Port Authority
CPP	Captive Power Plant
CSR	Corporate Social Responsibility
CTT	Coal Transfer Terminal
DFID	Department for International Development
DNA	Designated National Authority
DOE	Department of Environment
DOF	Department of Forest
DPA	Domestic Processing Area
DRM	Dispute Resolution Mechanism
ECA	Environmental Critical Area
ECC	Environmental Clearance Certificate
EGCB	Electricity Generation Company of Bangladesh Limited
EIA	Environmental Impact Assessment
EN	Exchange of Note
Enterprise Survey (1)	Enterprise Survey of Investment and Financial Demand
Enterprise Survey (2)	Enterprise Survey on Potential Investment to Up-coming Economic Zones in Bangladesh Demand
EPA	Export Processing Area
EPB	Export Promotion Bureau
EPZ	Export Processing Zone
ERC	Export Registration Certificate
ERP	Enterprise Resources Planning
EZ	Economic Zone
FBCCI	Federation of Bangladesh Chamber of Commerce and Industry
FCL	Full Container Load
FDI	Foreign Direct Investment
F/S	Feasibility Study
FTA	Free Trade Agreement
GATS	General Agreement on Trade and Services
GDP	Gross Domestic Product
GEG	Greenhouse Effect Gas
GIDC	Gujarat Industrial Development Corporation
GIS	Geographic Information System
GNI	Gross National Income
GoB	Government of Bangladesh
GoJ	Government of Japan
GPS	Global Positioning Systems
GPV	Grid Point Value
GTCL	Gas Transmission Company Limited

GSP	Generalized System of Preferences
HIDA	The Overseas Human Resources and Industry Development Authority
HWL	HWL(Mean Monthly Highest Water Level)
IBP	Incentive Benefit Package
ICT/ICD	Inland Container Terminal
IDA	International Development Association
IDCOL	The Infrastructure Development Company Limited
IEAT	Industrial Estate Authority of Thailand
IEE	Initial Environmental Examination
IFC	International Finance Corporation
IFRD	Institute of Fuel Research & Development
IFST	Institute of Food Science and Technology
IPP	Independent Power Producer
IRC	Import Registration Certificate
ISCID	International Center for the Settlement of Investment Dispute
ISO	International Organization for Standardization
ICT	Information & Communication Technology
JBCCI	Japan Bangladesh Chamber of Commerce and Industry
JBIC	Japan Bank for International Cooperation
JCC	Joint Coordination Committee
JCIAD	Japan Commerce & Industry Association in Dhaka
JCM	Joint Crediting Mechanism
JETRO	Japan External Trade Organization
JGESC	JICA's Guidelines for Environmental and Social Considerations
JI	Joint Implementation
JV	Joint Venture
KUM	Karnataka Udyog Mitra
L/C	Letter of Credit
LCC	Location Clearance Certificate
LDCs	Least Developed Countries
LFMAB	Leather goods & Footwear Manufacturer Association of Bangladesh
LFPR	Labor Force Participation Rate
LFS	Labor Force Survey
LIC	Low Income Country
LWL	LWL(Mean Monthly Lowest Water Level)
MIDC	Maharashtra Industrial Development Corporation
MOA	Ministry of Agriculture
MOC	Ministry of Commerce
MOEF	Ministry of Environment and Forest
MOPEMR	Ministry of Power, Energy & Mineral Resources
MOF	Ministry of Finance

MOI	Ministry of Industries
MOLGRO	Ministry of Local Government, Rural Development and Cooperatives
MOPA	Ministry of Public Administration
MoU	Memorandum of Understanding
MSL	Mean Sea Level
NBR	National Board of Revenue
NEXT 11	NEXT Eleven
NGO	Non-governmental Organization
NPV	Net Present Value
O&M	Operation and Maintenance
ODA	Official Development Assistance
OECD	Organization for Economic Cooperation and Development
OEM	Original Equipment Manufacturing
OJT	On-the-Job Training
OSS	One Stop Shop
PDCA	Plan, Do, Check, Action
P-EPZ	Private Export Processing Zone
PGCB	Power Grid Company of Bangladesh
PMO	Prime Minister's Office
PPA	Power Purchase Agreement
PPP	Public Private Partnership
PPPTAF	PPP Technical Assistance Fund
PSDSP	Private Sector Development Support Project
PSL	Project Sector Loan
PwC	PricewaterhouseCoopers
QGC	Quay Gantry Crane
QTEC	Qualification and Tender Evaluation Committee
RAJUK	Rajdhani Unnayan Kartripakkha
REB	Rural Electrification Board
RFP	Request for Proposal
RFQ	Request for Quotation
RHD	Road and Highway Department
RMG	Ready-made Garments
RMGC	Railway Mounted Gantry Crane
SCF	Standard Conversion Factor
SEA	Strategic Environmental Assessment
SIPCOT	State Industries Promotion Corporation of Tamil Nadu Ltd.
SOBs	State-owned Banks
SME	Small and Medium-sized Enterprise
SPC	Special Purpose Company
SRS	Stratified Random Sampling
TA	Technical Assistance

TEU	Twenty Feet Equivalent Unit
TIDCO	Tamil Nadu Industrial Development Corporation
TITAS	TITAS Gas Transmission and Distribution Company Limited
TNA	Training Needs Assessment
TNPCB	Tamil Nadu Pollution Control Board
TSL	Two-step Loan
TVET	Technical and Vocational Education and Training
UNCTAD	United Nations Conference on Trade and Development
UNIDO	United Nations Industrial Development Organization
UNFCCC	United Nations Framework Convention on Climate Change
VAT	Value Added Tax
VGF	Viability Gap Fund
VND	Viet Nam Dong
WB	World Bank
WTO	World Trade Organization

Executive Summary

1. Overview of the Survey

In its development plan Vision 2021, the Government of Bangladesh has declared that they would like to become a middle-income nation by 2021, and is promoting its industrialization policy based on medium- to long-term projections. By identifying the policy for attracting FDI as a priority, the Government of Bangladesh has been working on the development of an Economic Zone (EZ) coupled with the further promotion and diversification of exports, in addition to the improvement of infrastructure such as electricity, ports, roads and railroads. In 2010 the Bangladesh Economic Zone Act was enacted, and the parameters for the development of an EZ in Bangladesh were outlined while at the same time the Bangladesh Economic Zone Authority (BEZA) was established. Although BEZA has been promoting EZ development with the support of the World Bank and other institutions since 2012, they also requested support and assistance from the Government of Japan with respect to the development of an EZ, and attempted to attract Japanese companies with the capacity for enhancement of BEZA.

This survey consists of a fact-finding survey with regard to the related legal systems and business environment in Bangladesh, the formulation of EZ guidelines, the selection of candidate sites for short-term SEZ development, and the formulation of its basic development plan; furthermore, the survey addressed the drawing of a master plan for a medium-term EZ around Matarbari Island, and the planning and implementation of an action plan concerning capacity enhancement of the BEZA organization.

2. Confirmation of current conditions of the Legal System related to EZ Development

The legal systems related to EZ development in Bangladesh are divided into two major areas: the first is made up of legal systems directly related to EZ development, and the second consists of legal systems related to the PPP scheme, which is one of the methods for developing an EZ. In both legal systems, the laws are highest in the system's hierarchy, followed by policies or strategic documents, then enforcement regulations, contracts and guidelines. Some of the laws and enforcement regulations are currently under discussion in the legislature. The legal system that regulates the One Stop Service, or OSS (which plays an important role in attracting FDI), has been prepared with the support of the World Bank and an earlier enactment and enforcement of the said legal systems are expected. With regard to the OSS, comparative surveys have been made on the contents of OSS systems in neighboring countries, as well as of similar institutions in Bangladesh. In addition, the investment incentives being used to create an environment that would give Bangladesh a competitive edge have been studied in comparison with those of neighboring countries by objectively observing the investment environment of Bangladesh.

3. Formulation of EZ Development Guidelines

In the process of formulating EZ development guidelines, comparisons and analyses were made of similar legal systems in other countries, and recommendations were proposed about desired legal systems for Bangladesh. A matrix analysis was conducted from the viewpoint of the EZ regulatory agency, EZ developers, and EZ tenant investors on one side and the sequence of development of EZ such as legal requirements, the developments, and management and operation stages of EZ. The EZ Development Guideline is composed of 7 chapters: "Development Concept of EZ", "Functional Framework of EZ Approval Agencies", "Process of EZ Development", "Basic plan for Development and Feasibility Study", "Procurement of EZ Developers by PPP scheme", "Implementation and Operation of the EZ Development" and "Supporting Measures for Tenant Enterprises in EZ".

4. Formulation of the Basic Development Plan for a Short-term EZ

- Confirmation of the development possibility of Bangladesh, and its direction

Upon consideration of short-term EZ development in Bangladesh, intensive collection and analysis of information has been made on the development potential of Bangladesh, especially with respect to the population, potential markets, production costs, and others, together with the risks and issues related to investment. The directives of development indicated by the supreme policies was confirmed and the needs survey to the potential investors for EZ development was conducted. An observation tour was subsequently conducted in Vietnam and Thailand, which are considered to be benchmarks for Bangladesh. As a concept for short-term EZ development, an export processing zone complex model was adopted, which focused mainly on export oriented industries, but where the investment in domestic and domestic demand-oriented industries would also be promoted. The EZs shall become very competitive by developing infrastructure facilities that meet global standards, good business environments, highly convenient one stop services, due environmental and social consideration for neighbouring communities, low cost operations, and so on. According to the results of surveys about the industries to be located in Bangladesh, the following industries are recommended: apparel and ready-made garments, apparel accessories, textiles, home textiles, motorcycle & motorcycle parts, automobile & automobile parts (including wire harnesses), metal, non-ferrous processing, electric and electronic, mechanical parts, general assembly, plastic processing, agricultural product processing, medicine and health food, cosmetics, etc.

- Selection of candidate sites and the formulation of a basic development plan

Candidate sites were selected from among the sites within easy commuting distance from the Dhaka capital area. In choosing suitable sites, surveys were conducted by observing the direction of urban development in the Dhaka metropolitan area, future infrastructure development plans, as well as making environmental and social considerations to the candidate sites and surrounding areas. Finally, through both qualitative and quantitative analysis, sites at Araihazar and Nayapur were selected from the list of nineteen (19) candidate sites. A basic development plan for these two candidate sites was formulated. Although more than 200 hectares of land are available for each site, a basic development plan for 100 hectares for the two (2) sites was formulated as part of the first phase of development, on the assumption that the potential industries identified through the previous processes would have been located. In the basic development plan, infrastructure development plans are proposed, in addition to the land use and layout plans at the two EZs, as well as the basic development plan for on-site infrastructure facilities. The on-site infrastructure facilities include compound roads, drainage facilities, water supply and sewage, electricity and gas supply, logistics center, etc. As to the off-site infrastructure facilities, access road, high voltage power supply, gas supply mains and its connection, solid waste treatment plant, and the others are designed. Economic and financial analyses were conducted after estimates were made of the development costs for these facilities. In the economic and financial analysis, a case for the first phase development (100 ha) and another case for the first and second phases (200 hectares total) were conducted. A stress tolerance (Sensitivity) analysis was also conducted, taking into consideration the potential risks which may occur during the development and operation stages. Finally, the implementation plan for the two projects was proposed after examination.

Perspective Drawing for Arihazar Candidate Site



Perspective Drawing for Nayapur Candidate Site



5. Selection of candidate sites for Medium-term EZ development and the formulation of a Master Plan

- EZ Development Vision of Bangladesh and selection of Industries to be located

The Government of Japan proposed the "Bay of Bengal Industrial Belt Conception" (Big-B) to Bangladesh and JICA supports the planning of large-scale coal-fired power plants.

Taking into account the construction of a deep sea port for accommodating imported fuel-coals, development of an EZ has been planned to encourage the development of large scale power plants, oil and gas chemical industries, heavy and chemical industries, and materials industries in the hinterland areas, which are possibilities for economic development in Bangladesh. Assuming that the proposed EZ will be finished in conjunction with the completion of the coal-fired power plants and deep sea ports cited above, a development vision for the EZ, selection of potential industries to be located at the EZ, and development master plans have been drawn. Considering the site conditions, there are two types of EZs for medium-term EZ development; Sea-board EZs and General EZs. With respect to the development vision for a Sea-board EZ, "Heavy and Chemical Industrial Complex in the good harmony with the Environment" was suggested, where environmentally conscious heavy chemical industries which are committed to the reduction of CO₂ emissions are to be promoted to create bases for the development of manufacturing industries in Bangladesh.

In the case of the General EZ, proposals were made to form an industrial cluster triggered by FDI in the assembly industry that centers on the food processing and light industries as "the Center of Excellence for General Manufacturing Industries".

For the Seaboard EZ, it was proposed that an industrial cluster consisting of ship-breaking, steel industries (electric furnaces) and shipbuilding, as well as backward linkage petrochemical plants (mainly composed of synthetic fiber manufacturers) should be attracted. This would be done as part of an upstream process of the Ready-made Garment industry, of which Bangladesh is a world leader.

For the General EZ (food), it was suggested that agriculture and fishery processing industries should be situated there in order to make use of and add value to the domestic resources of Bangladesh (linkage of EZ and Domestic Industry). Additionally, a production and export center for halal foods targeting the markets in Middle Eastern and African countries would be created. In addition, export oriented industries (such as large-scale ready-made garment and shoe industries, and the assembly of light industry like Bicycles) are also possibilities for that location.

- Selection of potential Development Sites and the formulation of a Master Plan

As the candidate site for the development of the Sea-board EZ (about 600 hectares) and the General EZ (about 400 hectares), two sites were selected along with the core area development plan. They are indicated by Option 1', under the Big-B development concept proposed by the South Chittagong Regional Development Study Team that was appointed by JICA.

Both candidate sites are located on the west coast of Maheshkhali Island, which are state-owned lands and where there is currently no industry other than some salt fields. Environmental and social consideration surveys were conducted on these candidate sites, and it has been confirmed that there would not be significant difficulty in relocating residents in relation to the development of the EZ. Prior to the formulation of the master plan, topographic maps were made using digital mapping. The master plan includes a land grading plan and a land use plan, on-site infrastructure facilities (such as roads) inside the EZ, rainwater drainage facilities, and water supply and sewage networks. It also includes electricity and gas distribution networks, as well as off-site infrastructure facilities such as access roads, electricity and gas trunk lines for both candidate sites. In the Seaboard EZ, preparations are being made to upgrade an access channel which will be extended from the port area of the Matabari Coal-fired Power Plant to the turning basin for ships calling to the dedicated jetty at Seaboard EZ. The burden of development costs should be shared among the developers responsible for the neighboring industries/facilities that will use the same

access channel and the turning basin. Rough estimation on the development costs (based on those facilities' development plans) were carried out, and it was found that the majority of those expenses would be derived from the development of coastal dikes and land-filling works which will be required for disaster prevention purposes. However, it has to be noted that this Master Plan was delineated based on a temporary plotting of the facilities to be located at around the proposed Matarbari Deep Sea Port.

Perspective Drawing for the SEABOARD EZ



Perspective Drawing for the GENERAL EZ



6. Capacity Building of the BEZA organization

BEZA is a new organization, established by the BEZA Act that was enacted in 2010 as a public institution responsible for the development and operation of Economic Zones in Bangladesh. BEZA is administrated primarily by officers dispatched from other government agencies, and those officers are subject to personnel rotation systems under which they are transferred to other agencies when their two to three year assignment with BEZA ends. This is an organizational flaw which makes it difficult for officers to acquire the appropriate knowledge and experience of EZ operations within BEZA. Although BEZA seeks to expand its organization in proportion to its business expansion, an adequate number of properly trained personnel are yet to be secured. Workshops were carried out to train BEZA staff concerning the selection of candidate sites for the EZ and the basic methods of planning for EZ development.

In addition, Vietnam and Thailand were chosen as benchmarks for EZ development in Bangladesh, and visits were made to both of these countries in order to observe the operations of the Special Economic Zone Development Organizations and their SEZs. Furthermore, in order to facilitate the standardization of the works in BEZA, a draft of the operation management/operation manual was prepared and submitted to BEZA. With regard to the capacity enhancement of BEZA staff, a Training Needs Assessment (TNA) was conducted mainly for executive staff and a list of needs for education and training were assembled. Regarding the capability improvement of BEZA's organizational structure, a future action plan is being made based on the management and operation manual and also based on an analysis of the results of TNA as mentioned hereinabove. The Survey Team has supported the publicity activities of BEZA. These activities include the preparation of publicity materials, preparation of imagery presentation materials to Japanese industries, providing assistance to potential Japanese developers with respect to BEZA's marketing promotion activities, and the organization of BEZA's Investment Seminars in Tokyo and Osaka.

Chapter 1: Background of the Project and Brief of the Study

1.1 Background of the Project

The Government of Bangladesh (hereinafter referred to as GoB) has declared in its Vision 2021 development plan that; Bangladesh would become a middle-income nation by 2021, and is promoting its industrialization policy with medium- to long-term goals. By identifying the policy for attracting FDI as one of its chief priorities, the GoB has been working on the development of an Economic Zone (EZ). These efforts have been coupled with the further promotion and diversification of exports, as well as the improvement of infrastructure such as electricity, ports, roads and railroads. In 2010, the Bangladesh Economic Zone Act was enacted and the direction of EZ development in Bangladesh was outlined, while at the same time the Bangladesh Economic Zone Authority (BEZA) was established. Although BEZA has been promoting EZ development with the support of the World Bank and other institutions since 2012, they also asked the Government of Japan for its help and support with the development of the EZ in an attempt to attract Japanese companies, and for the capacity enhancement of BEZA. It is anticipated that various surveys are to be conducted through the Project such as: the fact-finding survey on the related legal systems and the business environment in Bangladesh, the formulation of EZ guidelines, the selection of candidate sites for short-term SEZ development and the formulation of its basic development plan, the drawing of a master plan for a medium-term EZ near Matarbari Island, and the planning and implementation of an action plan for the capacity enhancement of the BEZA organization.

1.2 Objectives of the Project

Considering the background of the Project, the following objectives of the Project were established:

- 1) Present conditions on the legitimate development related to EZ development and business environment should be thoroughly examined,
- 2) The deliberation of EZ development concepts and the formulation of EZ development guidelines shall be executed,
- 3) The selection of a candidate site for the short-term EZ development in the vicinity of the Dhaka capital region (and its Basic Development Plan shall be drafted),
- 4) A development Master Plan for the medium-term EZ development at Matarbari Island and/or its surrounding areas shall be drawn up,
- 5) Capacity enhancement programs for BEZA staff will be implemented and an Action Plan for the capacity development of BEZA staff will be developed.

1.3 Implementation Structure of the Project

Although this survey team consists of twelve (12) experts, the survey works have been implemented primarily by three (3) different disciplinary groups; an EZ development framework study group, a Model EZ development plan deliberation group, and a BEZA capacity enhancement group. Each working group tried to adopt a comprehensive approach while conducting the surveys. This was done in close coordination with other groups, in order to achieve integrated and consolidated outcomes. With regard to the preparation of topographic maps, as well as the conduct of environmental and social consideration surveys, these tasks have been carried out with support from specialist consultants from Japan and Bangladesh.

1.4 Implementation Policy of the Project

According to the EZ development policy created by BEZA, 1) EZ development shall be carried out primarily by the private sector who will develop, own, manage and operate the EZ, 2) the promotion of domestic industries will be encouraged by creating linkage between the industries in the EZ and the domestic industries, 3) Rectification of the regional imbalance will be accomplished through EZ development, and, 4) Seeking the development of an industrial cluster by capitalizing the development of EZ are indicated. In this survey, directives of this EZ development policy were thoroughly examined and confirmed by conducting additional and in-depth supplemental surveys on subjects such as EZ development needs, the identification of industries to be promoted, and the EZ functions to be performed.

Since the basic EZ development policy in Bangladesh says that EZ development shall be led by the private sector, the EZ development guide has been devised keeping in mind that said guide should be handy and friendly to both EZ developers and tenant investors to EZs. Also, the short-term EZ basic development plan and medium-term master plan were developed as much as practical for better use in a scene of the real business world, by duly considering the internal and external economic environment and by paying due attention to the minds of private industry who is forced to make a decision within very severe global competition. Furthermore, the opinions of potential Japanese developers were gathered through JICA and these were reflected in the development plans.

Based on this survey, a bench-mark was determined by observing many instances of success and failure in the region, and by confirming the desired standing of the Bangladeshi economy and of BEZA itself in the accelerating environment of economic globalization. In particular, in-depth surveys have been conducted with respect to strategies in EZ development and the promotion of Foreign Direct Investment in India, Cambodia, Laos, Myanmar and Viet Nam, which are deemed to be direct competitors of Bangladesh. Additionally efforts are being made to establish an EZ development guide, an EZ Basic Development Plan and an EZ Master Plan which may demonstrate the competitive potential of Bangladesh in the global arena, and which may directly benefit EZ developers and tenant investors.

As for the capacity enhancement of BEZA staff, many programs such as “Conduct of due diligence on the organizational structure and business implementation systems of BEZA”, “Shape-up of “Goals to achieve””, “Delineation and conduct of capacity improvement training programs, Training at the third country (Observation Programs)”, “Development of Capacity Enhancement Action Plan and implementation of a part thereof”, “Preparation of the Operation and Management Manual and supporting in adopting the Manual through OJT program”, “Assistance in the preparation of Publicity Materials”, and others, were performed.

With due consideration to the background and objectives of the Project, the surveys have been conducted along with the work flow as shown in the figure below.

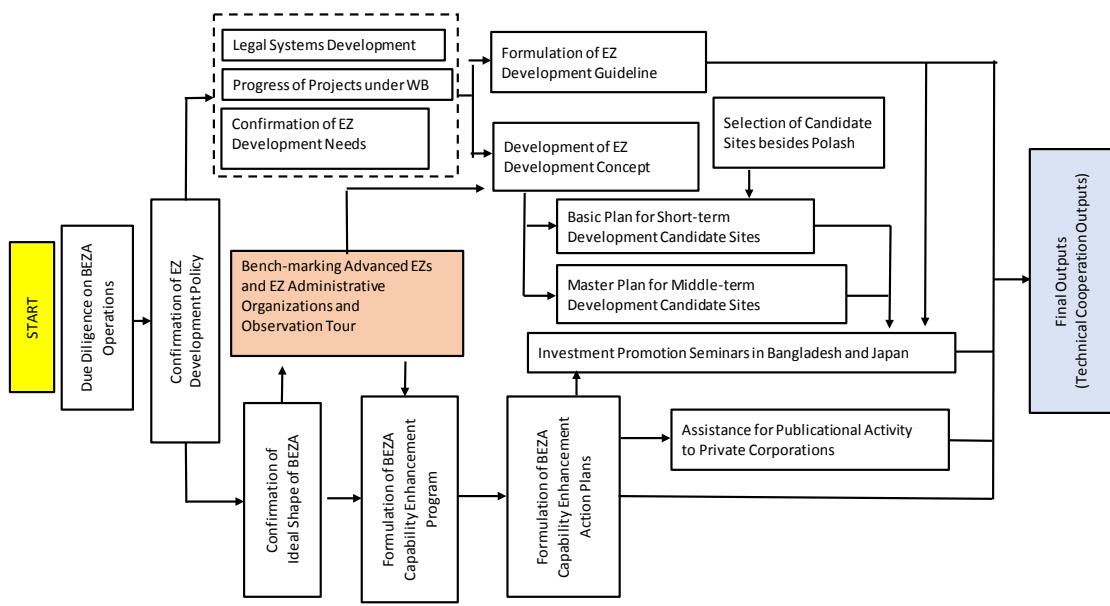


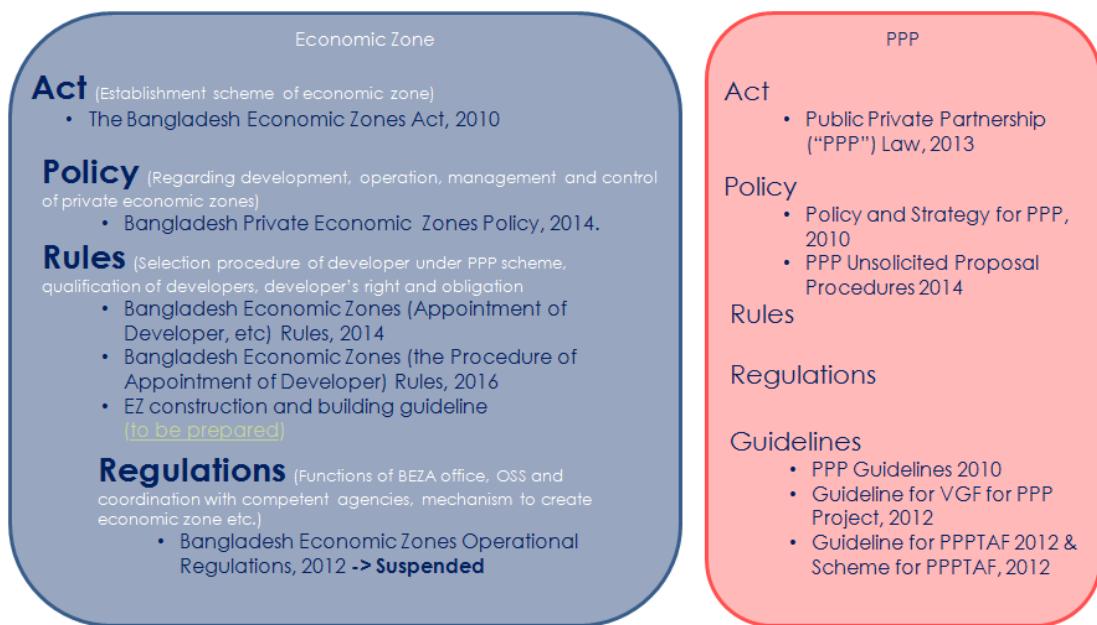
Figure 1-1 : Flow diagram of the Survey

Chapter 2 Confirmation and Clarification on the Legal Systems related to EZ Development

2.1 Economic Zone development related legislation

- (1) Economic Zone act, Public-Private Partnership act (hereinafter "PPP Act") and existing related legislation,

The legal system in relation to the Economic Zone development and operation was summarized as follows, and an overview of the applicable laws and regulations are reviewed as below.



(Source) JICA Study Team

Figure 2-1: Legal system in relation to Economic Zone development

Legal system on the Economic Zone development in Bangladesh is built under the umbrella of the Bangladesh Economic Zone Act, in that the organization and the role of the regulatory agency and related government offices responsible for the Economic Zone development is defined with the purposes of the Economic Zone in the outline. The specific development methods and supervision such as the Code of Conduct of the authority are separately defined by different modes of development scheme of the Economic Zones. Namely Policy defines the code of conducts of the private sector initiative and the Rule defines the public-private partnership approach. For the Economic Zone development through public-private partnerships, in particular, there was a circumstance that practical guideline for the selection of Zone Developer was not formulated in that PPP Guideline, 2010 was supposed to be applied as it is stipulated in the Rule, and now new Guideline is supposed to be developed that defines the code of conducts for selecting a Zone Developer in the public-private partnership approach. Consequently, these Act, Policy¹, Rule and Guideline are forming a legal system pertaining to the development and operation of Economic Zones at each level and every norm holds a legal binding force.

a. Bangladesh Economic Zone Act, 2010

¹ The Bangladesh Private Economic Zones Policy, 2015, which specifies the EZ development system for private EZ development business, is confirmed to have legal binding force like various Rules, BEZA confirms that it will not be modified into another Rules.

This Act took effect in 2010 in order to substitute the functionality of Export Processing Zones (EPZ) as an industrial and investment promotion instrument that would be significantly more effective. The establishment scheme and system of an economic zone is defined in this Act. The government's selection procedure to identify a suitable site for an Economic Zone was to announce the plan for such a Zone in the official gazette, and, earn authority approval for a zoning plan (Master Plan) along with an Export Processing Area (EPA), Domestic Tariff Area (DPA), Commercial Area, and Non-processing Area. As for the appointment of economic zone developers, this Act states separate rules must be prepared for administrative operation.

In Economic Zones, industrial and commercial organizations shall be promoted as unit investors. Also invited and encouraged industries and services are cited, to be determined by Authority (Banking service is subject to the approval of Bangladesh Central Bank). Financial and non-fiscal benefits are going to be papered for investors involved in Economic Zone development as well as for Unit Investors. In this line, this Act stipulates that government provides at least an equal extent of tariffs and financial benefits in conformity with all EPZs and Economic Zones to be developed by the private sector, for Economic Zones. Facilitation for both developer and industrial units are also cited as a One-Stop Service.

The structure and role of BEZA (Executive and Governing Boards) are also defined in this Act in that the Authority may have a branch office. The branch office can acquire land/appoint developers independently or by a PPP initiative, and can plan infrastructure development, develop infrastructure, and own establishments. The branch office promotes investment and the ownership of plots. The Governing board is comprised of members even from the private sector like FBCCI, and two more Chamber of Commerce members and two women entrepreneurs are invited². The Governing board has the power to approve the establishment of the Economic Zone. For the governing rule of the staff service term and conditions, BEZA regulation will be formed and the way of spending of the BEZA Fund³ will also be stipulated in the regulation. Moreover, this Act states that BEZA rules will be prepared to prescribe the cancellation of an Economic Zone license, appointment of Economic Zone developers and accounting and auditing of BEZA. As to BEZA Fund, the Act stipulates that the Fund is not required to reimburse to the central bank.

This act also stipulates the relation with the environment and labor affairs in that the environment and labor law (international and domestic) should be applicable to the Economic Zone. And it is clearly stated that BEZA can order a shut down and/or a dismissal of personal engaged in labor unrest, strikes, or lockouts.

As a special right of BEZA, removal of difficulties by the government is cited for the betterment of the systematic operation of the Economic Zone.

b. Bangladesh Economic Zones (Amendment) Act, 2015

It describes the amendments of the Bangladesh Economic Zone Act, 2010 in that mainly the use of two additional methods was added as the development approach of the Economic Zones. Namely Economic Zone development by bilateral government agreements, and that in partnership with Bangladesh government authorities and organizations are added. As for the restriction set forth on the usage of the land within City Corporation Municipality and Cantonment Board, this amendment made it possible to develop Economic Zones for the ICT industry.

² Such a system of inviting the committee members from private sector organizations can be seen in IEAT (Thailand) as well.

³ BEZA fund is cited in Economic Zone Act, and the Fund is supposed to be established for the purpose of being a capital pool for the BEZA's needed activities (including land acquisition).

c. Bangladesh Private Economic Zones Policy, 2015

Although the contents of this policy had been transferred from the suspended BEZA Regulations as described below, it states that the establishment scheme of a private special economic zone, criteria on suitable land, application, requirements, procedure to obtain a private economic zone license, and licenses required for a sub-contract (Bangladesh enterprise) etc. The way of issuing a license is performed with publication and gazette.

In this policy, rights and obligations of Licensees are described in such way that completion of the work of the establishment shall be done within a time schedule given by the license is an obligation of the Licensee, and it is also stated that a foreign entity can own 100% of the Economic Zone (private), as it can be done as a local entity.

As for the structure and functions of BEZA, the branch office can issue an user permit, and an OSS office can be introduced at the head office and the branch offices. Also it stipulates that a One-stop service and coordination manager shall be appointed by the Executive Chairman, and it is stated that duties and responsibilities of the BEZA staff shall be prescribed in the Rules.

Appointment of private economic zone developer and operator is also stipulated in this policy. Rights and obligations of developers and operators are cited in detail in that a developer can sub-lease a landed asset. A developer's obligations are noted relative to construction of on-site infrastructure, transportation networks, workers' quarters, land use/zoning plan, social mitigation measures, submission of annual reports, and the environment and labor act. An operator's obligations/rights are described as issuing an user permit (a permit cannot be sold/transferred without approval of BEZA, although a land and asset can be transferred), formulating/issuing informal operating rules/procedures, and promoting Private Economic Zones in cooperation with BEZA.

This policy describes the process of issuing a private economic zones user permits as well as a resident at the private economic zone.

As for a procedure to obtain construction permission, this policy does not cover the features, and it states that different laws, acts, rules, and regulations will be prepared for governing it. Environment clearance affairs are described in that an environmental impact assessment (air, water, soil and waste) can be expedited with special rules and procedures in consultation with applicable laws/rules of the Ministry of Environment and Forest (MoEF). Also green technologies for energy saving and environment conservation are encouraged. Labor affairs are stated to be followed in conformity with the set of EPZ rules already applied.

d. Bangladesh Economic Zones (Appointment of Developer, etc.) Rules, 2014

This rule states the necessity of formulating the separate guidelines for appointment of developers of an Economic Zone project. Until formulation of such a guideline, a guideline for PPP (the policy and strategy for PPP, 2010) is cited as the logical surrogate. In accordance with this rule the tenure of a developer is set to be 50 years (extendable).

The qualifications of developers are also described in this rule in that an eligible developer must have 3 years' experience in establishing and operating industrial estates of this kind, and having experience in designing/financing Economic Zones within the last 3 years. Also the entity must be have been earning a gross revenue of 10 million USD per year for last 3 years during the operation of the Economic Zone, and possess a net worth (own capital/equity capital) over 25 million USD.

The developer's right and obligation are also described in this rule. As an obligation of the developers, provision of all type of utilities and other basic services as well as development of the installation including on-site infrastructure and a transportation

network are required. On the other hand, profit can be transferred outside Bangladesh depending upon approval of the Government. The procedures for suspension and cancellation of a developer's license as well as the procedure of selecting a substitute developer are stipulated. The remedy of developers is also cited in this rule.

e. **Bangladesh Economic Zones Operational Regulations 2012 (DRAFT) - Suspended**

This regulation was drafted in 2012, but after discussion of its contents between the Bangladesh government and the World Bank Group, eventually it was suspended. However, the contents of it are inherited in a manner as reorganized in the current legislations of the Policy and Rule stated hereinabove.

In its contents, the structural setting of the BEZA office, the OSS, and coordination with other competent agencies are stated in that an MoU is referred to as the administrative legal instrument executed by both BEZA and any competent agency that establish the rules, operating procedures, formalities, and scope of authority, for which the BEZA and such agencies coordinate their duties, functions, and responsibilities.

Website application is cited as a requirement so that electronic submission was targeted. Duties, functions and responsibilities of OSS were proposed to be set forth by resolutions of the Executive Board. The issuance responsibility of Economic Zone licenses is proposed to remain in the head office, whereas the issuance responsibility of Economic Zone User Licenses was cited to be delegated to branch offices as well as to Economic Zone operators. Economic Zone operating rules and procedures governing daily administration at the Economic Zone in question was also described in this regulation. It states that Economic Zone building permits can be delegated to a branch office as well as to an Economic Zone operator, and procedures for environmental permits and clearance and labor and residency permits are described. Moreover green-zone Economic Zones for relocation of polluting enterprises was also cited. Consequently, it states that the governing board of BEZA can set relevant policies.

Mechanisms to create economic zones was stipulated in detail in which selection criteria for Economic Zone land was set to avoid double/triple cropped land. Also Economic Zone Licenses can only be granted in accordance with Act and Chapter IV of this regulation. A separate guideline formulation for appointment of a developer is stated, and it states that public land for Economic Zones is to be developed and operated by private parties after a process of competitive tender-selection (in accordance with the Public Procurement Act 2006).

This regulation states that an EIA is required to obtain an Economic Zone License (at the final approval stage). As the criteria for Economic Zone final approval, the following documents are cited necessary:

- Land use plan, zoning, on-site infrastructure plan, development phasing
- Close proximity to off-site infrastructure
- Financially and economically viable F/S
- Environment/social Impact Assessment and necessary measures
- Economic benefits
- Land ownership with no dispute or legal claim

It is also stated that Sublease of land and asset by Economic Zone Developers is possible. Developers are deemed to follow the project development upon submission of a phased project development schedule, and an Economic Zone developer as well as Economic Zone operators' rights and obligations are cited.

As for Economic Zone users, it is stated that an Economic Zone User can sell/transfer the License upon approval by BEZA, and the regulation states that an Economic Zone Operator can employ both regional and international workers without restriction. Establishment of special arrangements in each Economic Zone for import/export

customs becomes possible, and, 100% ownership by a foreign company of an Economic Zone enterprise was guaranteed.

The conditions to become Economic Zone residents, Economic Zone benefits, and customs are described. Environment clearance affairs and its joint coordination with MOEF for environmental related matters were also cited. Also labor affairs are prescribed in that coordination between the Ministry of Labor and Empowerment (MOLE) for labor related matter as well as coordination with the National Immigration Authority for VISA related matters was cited. The procedure for obtaining building permits is stipulated in detail in that Economic Zone construction and building guidelines are described and the process of Economic Zone Building Permits / Economic Zone Building Completion Certificates / Economic Zone Occupancy Permits to be submitted by authorized engineering consultants are all described.

f. Bangladesh Economic Zones (the Procedure of Appointment of Developer) Rules, 2016

The Rules at first describe the qualification criteria as developers for Economic Zones, and their rights and obligations set forth in Rules, 2014 shall be followed. It states that the national, foreign, government-own entity can form a JV/Consortium to become an Economic Zone developer, though the lead firm is required to hold stocks of more than 26% of such entities. A foreign company/JV/Consortium also need to register as a legal entity in Bangladesh.

Anti-corruption measures are cited with definition as well as the course of prohibited acts leading to rejection of a proposal and legal action. As for the procedure of appointment of a developer, the Rules state that there are two type of approaches in that as the one method of just following Request for Proposal (RFP) process, and the other method of following two step approach of evaluation of applications in responding to Request for Quotation (RFQ), then evaluation of proposal by the shortlisted entities in responding to RFP shall be proceeded. The Rules also cite that BEZA shall prepare for a common format of RFQ and RFP documents, which may be used with modifications to be required to suite each different condition of unique Economic Zone projects. Clarification procedures of an RFP and the manner of operation as well as an amendment procedure of an RFP

It should be noted that, in accordance with the Rules, prior to the submission of applications and/or proposal in respond to RFQ/RFP, pre-application/pre-proposal meeting will be held for the company interested in participating the bids. In these meetings the overview of the project shall be presented, and question-and-answer session shall be organized. Also site visit of the concerned Economic Zone is planned in this course.

It follows the description of bid document (application and proposal) preparation, bid security treatment, submission manner of RFP and deadlines, consequences for late submission of bids, as well as a bid validity period, and modification arrangement (allowed before deadline).

The Rules also stipulates the formation of a committee for bid opening and bid evaluation. As for a bid evaluation committee, it is comprised of 5 – 7 members, who can be from BEZA, representatives from other organizations and line ministries, although at least 2 members should be non-BEZA external members. BEZA appoints a chairperson / member secretary, and it is stated that members can be replaced. A Policy of the tenure of the evaluation committee is not yet formalized, though it could be common or unique member, unless conflict of interest can be observed, even for different RFP / projects. Appointment of a technical sub-committee is also cited as possible if it is required.

Bid opening procedure and the manner of operation are prescribed in that in evaluation of bids, an evaluation committee will perform as described in this Rules, and 7 technical evaluation criteria, but not restricted to, such as the design philosophy, drawings, project concept, marketing, implementation plan, etc., are evaluated. As the financial evaluation criteria, the followings are prescribed - projected capital investment, operational cost and revenue, projected source of financing, payments and returns to the Authority. In the process of evaluation, the Rules stipulate that recommendations of the evaluation committee should be prepared by the committee to evaluate reports with recommendations for BEZA, although such recommendations cannot be final but can be rejected by BEZA, so that the authority's right to accept or reject bids can be retained.

Once a successful bidder was identified, a Developer Agreement shall be drafted and the Rules stipulate the items to be incorporated in the draft. Also in prior to the agreement, the successful bidder is supposed to be granted a Letter of Award (LOA). After obtaining a LOA, in order to comply with requirements, the successful bidder must follow instructions as well as the time schedule set forth in the RFP document in that in addition to the plans and designs submitted in its technical proposal in the bidding phase, a comprehensive master plan submission is required. In the comprehensive master plan, the following documents are required:

- Land use planning / zoning
- Onsite infrastructure plan
- Phasing plan

Also an F/S as well as an Environment and Social Impact Assessment (EIA) must be carried out taking into consideration of the following items:

- Financial / economical /commercial viability
- Benefits to Bangladesh such as increased investment, job creation and diversification of exports that outweigh the costs incurred by the Government to facilitate the project.

The Rules also stipulate the format of developer agreement and the signing procedure of developer agreement. The expiration of the developer agreement is set at 50 years, in accordance with the guideline.

Dispute resolution mechanism is cited and removal of difficulties is noted with a principle of mutual consultation of the parties, and the guideline states BEZA may prescribe additional forms, schedules, appendices and attachment for better operation, and if it is required, the formation of committee(s) and sub-committee(s) is deemed applicable.

g. Bangladesh OSS Act, 2017 (Draft)

This Act was formulated to envisage providing a facilitation of time-bound accelerated processing of applications and requests through one stop service (OSS) for all essential services, clearances, licenses, and permits stated in the attached schedule to the Act..

Firstly the definition of Central One Stop Service Authority⁴ is stated to be a guardian of time-framed service provision for an entrepreneur or investor to implement any project or initiatives within a specific time frame. Secondly, the scope of services provision are defined, and the service providing agencies are supposed to nominate a focal point person who will be considered as the member of the authority to fulfill the objective of this law and he/she will be empowered with the authority and the responsibility to implement the activities on behalf of his/her organization. In addition, establishment of regional One Stop Service Center can be considered, and it is supposed

⁴ Bangladesh Investment Development Authority (BIDA), Bangladesh Economic Zones Authority (BEZA), Bangladesh Export Processing Zone Authority (BEPZA), and Bangladesh Hi-Tech Park Authority

to provide the services for a specific region.

The operational mandates/procedures of OSS are to be described in the rules, which are supposed to be subsequently prepared by the authority to handle the applications in association with the focal point persons, who are supposed to be the nominated officers from the respective Competent Authority for processing and approval of the applications and issuing clearances on behalf of such Competent Authority. And then the act states a profound principle that all authorities, service providing agencies, and focal points are deemed to dispose of the applications with assurance of the time bound framework.

Furthermore empowerment of the authority was stated to include or delete anything in described schedule and formulate rules to define operational formalities to govern such administrative operations through Government Gazette. And the Act defines that Government Gazette can be issued to expedite and endorse one stop service relevant to this Act in general or special terms.

This act is in the stage where the Governing Board of BEZA approved the contents in principle, and resolution signed by the Prime Minister is yet to come, which follows by the discussion and approval at Cabinet then the draft goes to the Law Ministry and the Parliament for further discussion and ultimate enactment.

h. Customs (Economic Zones) Procedures, 2016 (Draft)

This administrative document stipulates the formalities and procedures for the transactions of goods to be made in relation to the economic activities in the Economic Zones. The formalities are basically based on the Customs Act, 1969 (IV of 1969), and the following economic transactions are prescribed; Import of Goods into the Export Processing Area of a Zone (① and ② in the following diagram), Introduction of Goods into the Export Processing Area of a Zone from Tariff Area (③), Export of Goods from the Export Processing Area of a Zone (④), Removal of goods from the Export Processing Area of a Zone to Tariff Area (⑤), Import of Goods into the Domestic Processing Area of a Zone (⑥), Introduction of Goods into the Domestic Processing Area of a Zone from Tariff Area (⑦), Export of Goods from the Domestic Processing Area of a Zone (⑧) and Removal of goods from the Domestic Processing Area of a Zone to Tariff Area (⑨), Procedures in relation to Commercial Area of the Zone, and Inter-bond Transfer (⑩). “Commissioner of Customs (Bond)” stationed at the Zones is deemed to possess an authority to approve all customs formalities.

The key notes are described in the following diagram for all transactions stipulated in this document.

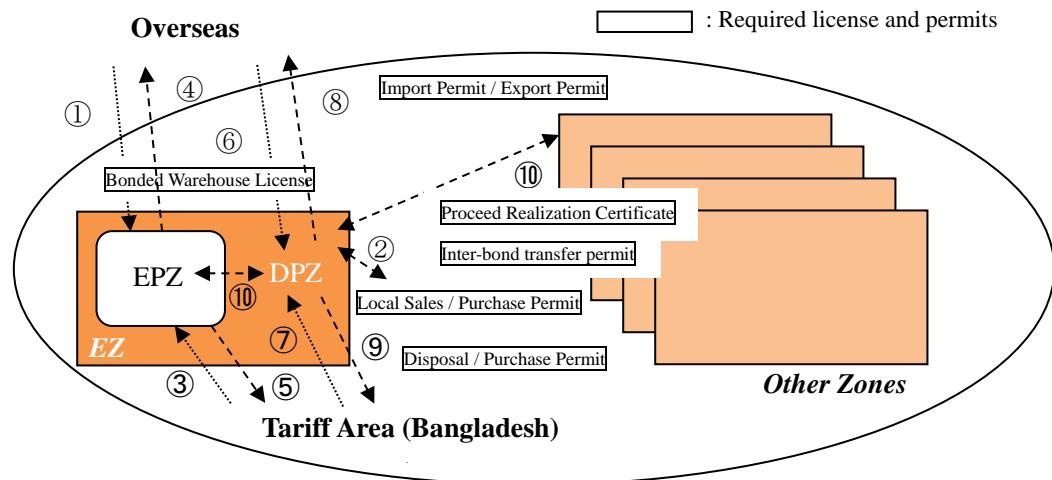


Figure 2-2: Customs transaction in relation to Economic Zones

- ① The transaction can be entitled to exemption of Customs duties and Value Added Tax on exportation.
- ② Customs Duty, Regulatory Duty, Supplementary Duty, Value Added Tax and Advanced Income Tax (if applicable) will be realized at the time of giving permission for domestic sale.
- ③ The transaction can be admitted after completion of export formalities which are normally observed for export out of the country, and entitled to exemption or repayment of Customs duties and Value Added Tax on exportation.
- ④ The transaction is deemed to follow the export procedure.
- ⑤ The quantity of the goods for removal will be determined by the Commissioner of Customs (Bond), but it shall not exceed more than 20% of the export volume of the concerned bonded warehouse in the previous fiscal year.
- ⑥ The transaction can be entitled to exemption of Customs duties and Value Added Tax on exportation.
- ⑦ The transaction can be admitted after completion of export formalities which are normally observed for export out of the country, and entitled to exemption or repayment of Customs duties and Value Added Tax on exportation.
- ⑧ The transaction is deemed to follow the export procedure.
- ⑨ The transaction is deemed to be an import of goods from out of Bangladesh, and prescribed all requirement set forth in the Customs Act, 1969 and rules shall be applied.
- ⑩ Inter-bond transfer of goods can be made along with permissions from the Commissioner of Customs (Bond), and Proceed realization certificate (PRC) needs to be submitted within 3 (three) months period after completion of their utilization.

Also the document prescribes the procedures related to the transaction of goods in and out of the Commercial Area of the Zone. Also the formalities for issuance of Import Permit and Export Permit and related customs procedures are described. The customs procedure for disposal of used machineries and scrap is also prescribed, then the procedures of waste disposal to be caused in the Zones is addressed.

Additionally, the formalities of annual audit as well as liable penalty clause are stated in the document. There is a special clause included in the document in terms of security measures of a zone in that the height of boundary wall for each zone is stipulated to be more than 12 (twelve) feet, also the means of access and working hour of business is supposed to be a subject of restrictions by the power of the Commissioner of Customs (Bond).

The presence of customs officers is also prescribed that the officers in charge Customs procedures are all posted in each zone, and their necessary administrative expenses are supposed to be provided by the BEZA.

i. **Bangladesh Economic Zones (Construction of Buildings) Rules, 2016 (Draft)**

For the purpose of defining the building norms to be applicable for construction of buildings in all categories of Economic Zones in Bangladesh, these rules were formulated. The rules were approved by the government board of BEZA in December, 2016.

In terms of Economic Zone design requirements, the following particulars are specified as construction, structural and architectural standards for each key item.

Table 2-1 Particulars specified as Economic Zone design requirements

Items	Particulars	Remarks								
1. Open space	5% of the total land area for minimum size shall be 600m ² .									
2. Other amenities	5% of the total land area should be allocated for their requirements	Other amenities include utility services (water, electricity, gas, telecommunication, and internet) as well as central ETP.								
3. Green space along the road network	5% of the total land area. The width of the green strip cannot be less than 1.5m and 3m for the ones used along the roads and used for any kind of utility service line.									
4. Recommended plot size and site layout	4,000 sqm per plot	A certain recommendations are referred for taking advantage of passive solar values and preventing winds.								
5. Secondary road width	Two way roads (7.3m) with road side footpath of 1.5m width in both sides; hence minimum 10.3m wide	Roads of more than 10.3 meters wide should have minimum 2.5 meters wide footpath and minimum 2 meters wide road side planters. Additionally, Traffic Impact Assessment [TIA] should be done before planning the master plan of the economic zone. Maximum Permissible Length of Internal Roads in Non-Residential Plots is as follows;								
6. Primary entry road serving maximum 12 plots	Two way roads (7.5m) with road side footpath of 1.5m and green belt of 1.5m width in both sides; hence minimum 13.5m wide									
7. Primary entry road serving maximum 36 plots	Two way roads (7.5m) with road side footpath of 2.5m and green belt of 2m width in both sides; hence minimum 25m or 27m wide	<table border="1"> <thead> <tr> <th>Width</th><th>Maximum Permissible</th></tr> <tr> <th>(m)</th><th>Length (m)</th></tr> </thead> <tbody> <tr> <td>7</td><td>80</td></tr> <tr> <td>8</td><td>150</td></tr> </tbody> </table>	Width	Maximum Permissible	(m)	Length (m)	7	80	8	150
Width	Maximum Permissible									
(m)	Length (m)									
7	80									
8	150									

8.	Primary entry road serving more than 36 plots	Two way roads incorporating bus lanes and bicycle lane with road side footpath of 2.5m and green belt of 2m width in both sides.	9 10 or over	300 Unlimited
9.	Drainage and waste management	Preparation of master plan for drainage, waste management system is required.		For heterogeneous effluents, pretreatment at individual plot before discharging to CETP is required as per requirements of CETP. STP is supposed to be equipped in each individual plot.
10.	Electricity and water supply	Economic zones having more than 80 acre in size have to have their central power, water supply system with metering system.		
11.	Fire appliance access	Adequate fire brigade stations need to be provided.		The minimum width of the dual carriage way should be 7.3m wide for one-way traffic. The minimum width of a carriageway without a central divider should be 13.5m for two-lane two-way traffic.

(Source) JICA Study Team

As for the individual building design requirements, the following particulars are specified as construction, structural and architectural standards for each key item.

Table 2-2 Particulars specified as individual building design requirements

Items	Particulars	Remarks
1. Floor area ratio	Floor area ration will be 6.	Internal roads, open to sky drive way & parking area, tanks, STP, ETP will be excluded from FAR calculation.
2. Site coverage	Max. 50%: factory building, power house, storage, covered parking, ETP, overhead STP etc; 30% (indicative): the drive way, open parking, 50 sq.m guard room, fire command center, cycle stand, internal roads, underground water tank and septic tank; Min. 20%: open to sky area	
3. Set back	Min. 12m from Primary road. Min. 4.5m from Secondary road. Min. 3.5m from Boundary wall with neighbor.	
4. Community open space	For the Economic Zones having 1.0 hectare or more, a minimum of 10% of the total area, but not exceeding 0.25 hectare.	The space is for recreational activities of the persons working in the industry for safe exit during emergency.
5. Fencing	Fences higher than 1.5 meters should not generally be constructed across the entire frontage.	Should be Unobtrusive and generally semitransparent and articulated, with provision of adequate security for the premises. Solid and unarticulated fencing should be avoided.

6.	Fire-fighting	Requirements are as per BNBC	Necessary clearance and /or certificate must be obtained from Fire Service and Civil Defense Department.
7.	Car parking	One car for every 800 sq.m. One truck for every 2,000 sq.m. One container vehicle loading/unloading bay with turning circle of 11.6m outer radius needs to be provided for a site over 2,000 sq.m.	Some provisions including separation of service/haulage vehicles from visitor and staff parking areas, and consideration of the visitor parking areas are mentioned.
8.	Energy management	At least one percent of total requirement shall be consumed from online solar system.	The use of efficient and durable means for lighting, water heating and water management system need to be considered.
9.	Rain water harvesting	Min. 200m ² (or 50% of the available roof catchment area for roof areas less than 400m ²).	

(Source) JICA Study Team

Additionally, the rules state there are two required permits for the development of buildings within Economic Zones, in that Building Permit and Occupancy Certificate are mentioned. Once the Building Permit was granted, the construction is deemed to be progressed at least up-to plinth level within the period of 12 months, and Occupancy Certificate shall be issued after verification of the Authorized Officers on the completion of the work for which permit was granted.

The formality for submitting application for these permits and subsequent disposal of application together with specified time bound principle are stipulated, and yet the procedure is supposed to be presented in a separate document. Moreover, for a safeguard for securing a certain quality and conformity of drawings with BNBC, which are to be evaluated in such permits administration, involvement of registered professionals who are supposed to poses considerable competence for each technical field is considered and his/her signature on the drawings is deemed equivalent to certifying that the drawing appears to conform to all the requirements of BNBC and these Rules.

Furthermore, formalities in relation to an unsafe building, which may cause danger for the public domain are described with certain counter measures as well as the responsibilities of the developer.

j. Public Private Partnership Act, 2015

At firstly the purpose of formulation of the Act was noted for accelerating socio-economic growth through infrastructure development. Based on the Act, Public-Private Partnership Advisor Council as well as PPP Office as Council's secretariat are organized to mainly exercise the reviewing and monitoring of PPP activities, and supervision and coordination of PPP projects. Also the authority of Cabinet Committee is defined that it can recommend formulation of PPP Policy, guidelines, rules and regulations, approve PPP projects as well as nominated bidder for PPP projects, and related affairs. Moreover the function of PPP Office, appointment of Chief Executive Officer and staff member are all clearly defined. In addition, in order to execute PPP projects, the Act stipulates that the Contracting Authority shall be formed to evaluate the PPP projects, seek for principal approval from Cabinet Committee, conduct feasibility study, proceed tenders, contract agreement with private sector entities and monitor activities of PPP projects.

For a procedure for getting approval of PPP projects, the Contracting Authority is

deemed to submit a proposal to PPP Office first, then the proposal is going to be evaluated and reviewed by the Cabinet Committee, so that approval on principle or rejection shall be cited. After the approval on principle, feasibility study shall be conducted, then procedures of the tender, negotiation with selected bidder and final approval shall be subsequently followed. The act also defined the declaration of nationally priority projects, government's financial participation and incentive offering.

Private partnership selection process is defined as double steps methods of pre-qualification and tender process, or single stem method of just tender process. In accordance with pre-qualification process, the Contracting Authority shall invite applications, and evaluation report prepared by the Tender Evaluation Committee will be produced with recommendations. Then the Chief of the Contracting Authority shall take decide of appointing pre-qualified private organizations. Similarly, tender process shall be organized to examine the proposal to be prepared by the bidders so that the Contracting Authority shall select the best bidder for PPP projects. After selection of the best bidder, both the Contracting Authority and the bidder are supposed to negotiate the conditions of partnership agreement. And finally selected bidder, before execution of a PPP project, is deemed to form Public Limited Company with signing of PPP Agreement.

In the act, measures in case of corruption are stated, and conditions of partnership contract are also stipulated. Furthermore, Rules for PPP is deemed to be formulated and the exiting policy and strategy for Public Private Partnership (PPP), 2010 are deemed to be abolished.

k. Policy and Strategy for PPP, 2010

In this policy and strategy, the nature of a PPP is described in that the sectoral coverage of a PPP is extended into the area of Economic Zones, industrial estates, and IPs. As eligible private parties, Bangladesh and foreign entities legally registered in Bangladesh can participate in Requests for Qualification (RFQ) or unsolicited proposals.

Classification of PPP projects is defined by investment size into three groups: large (a total investment above BDT 2.5 trillion as identified in the pre-feasibility report), medium (between BDT 500 million and 2.5 trillion) and small (below BDT 500 million). Participation scheme of the government is described in that detailed procedure and guidelines will be issued and specified by Finance Division with the approval of the Cabinet Committee on Economic Affairs (CCEA). Also the description of technical assistance financing, Viability gap financing (VGF), and infrastructure financing are cited.

Importance of linked components of PPP projects are noted as the acquisition of land, rehabilitation and re-settlement, provision of utility services, approach road construction, etc. Incentives to private investors are also referred, and institutional framework and role of related parties for PPP, which includes the PPP Advisory Council (PPPAC), Cabinet Committee on Economic Affairs (CCEA), and an office for PPP are described, together with the method of formulating PPP projects.

I. PPP Unsolicited Proposal Procedures 2014

This legal regulation prescribes the treatment of unsolicited proposal for PPP projects in that the validity period is set 18 months after "In Principal" Approval from CCEA. Also in order to comply with the formality, it is stated that a Formal Government Request needs to be issued for an Original Proponent. There is a description about the contents of an unsolicited proposal. And the procedure of an unsolicited proposal is described that the proposal needs to be submitted to the line ministry together with a copy to the PPP Office at first, then the PPP Office scrutinizes proposals and the PPP screening process will be conducted by CCEA for its approval. Consequently the result

shall be informed to the line ministry. If the result was positive, the project shall be placed in the list of potential PPP projects that are earmarked for procurement. In this process, it is deemed that the PPP office and the line ministry shall consider any terms and conditions to be imposed on the project.

In accordance with this regulation, the competitive bidding process is considered with a bonus system which shall be used for a medium or large PPP project under the PPP policy. The point is for the original proponents to have the right to re-submit a revised proposal, if the highest evaluated score was not obtained in the initial bidding. Also it is cited that the Qualification and Tender Evaluation Committee (QTEC) will include an original proponent bonus, which is to the extent of 7% of the evaluation score, in order to enhance the evaluation score of the original proponent.

m. PPP Guidelines for Large projects under PPP, 2010

The procedure for project formulation is described in this guideline in that the line ministry/implementing agency can identify the projects, then private investor can submit a proposal with a feasibility report, and it is stated that the PPP office can conduct feasibility studies in consultation with the line ministry/implementing agency. In the procedure, CCEA gives “In Principal” approval⁵ to the proposal submitted by Office for PPP, then the line ministry/implementing agency calls for an RFQ/RFP. Once the evaluation of the proposal is complete, and approval is granted by CCEA, the line ministry/implementing agency signs the contract with the selected bidder. The time frame for each project phase is also stated.

n. Guideline for VGF for PPP Project, 2012

In this guideline, the rationale of Viability Gap Fund (VGF) is stated in that eligible projects are meant to be infrastructure projects where financial viability is not ensured but their economic and social viability is high according to the guideline, VGF can be arranged either through the form of a capital grant or annuity. The criteria for an eligible project is set through competitive bidding, certain levels of economic rate of return specified by the PPP Unit, the Financial Division, and from the sector stipulated in the Policy and Strategy for PPP, 2010. Disbursement of the fund is stated mainly based on best come, best served basis.

As for the management of the VGF, the Finance Division in the Ministry of Finance through its designated PPP Unit is stipulated to be able to manage and administrate the VGF. Procedure of VGF approval is also described, and a Detailed Feasibility Study (DFS) is deemed necessary with an Economic Rate of Return (ERR) as well as a description of an affordable PPP project structure and estimate of VGF required. A guideline prescribed DFS should be conducted after implementing the agency received “In-Principle” approval.

The nature of the VGF is prescribed that VGF cannot exceed 30% of the project estimated cost excluding land, and VGF shall be released after obtaining appraisal from the VGF Appraisal Committee and approval of the Finance Minister. Moreover the line ministry publishes an RFQ and RFP in the tender process, and the tenderer with the lowest VGF requirement shall be invited for negotiation. Consequently, among PPP unit, the Finance Division, the lead financial institute, and the private sector company, a tripartite agreement for the disbursement of the VGF grant shall be forged. The guideline also describes the monitoring mechanism.

o. Guideline for PPPTAF 2012 & Scheme for PPPTAF, 2012

Nature of PPP Technical Assistance Fund PPPTAF is prescribed in this guideline in

⁵ The basic intent of the project approval by CCEA

that PPTAF shall be granted to those projects that are In-Principal approved. It regulates that the PPP office can utilize funds to appoint consultants to support all project development activities, i.e. project identification, pre-FS, FS, procurement procedures, documentation and evaluation, and contractual and negotiation activities, and the PPPTAF is deemed to be fully or partially recovered from the successful tenderer as agreed under the PPPTAF approval process. The guideline also describes the monitoring mechanism.

(2) Confirmation on the progress of Projects undertaken by the World Bank Group

a. Review on the progress of Economic Zone projects undertaken by the World Bank group

The World Bank / IFC Group has been supporting Bangladesh Economic Zone development as a part of the private sector promotion projects since 2008. To date, i) suspension of new EPZ development by BEPZA since 2008, ii) the enactment of the Economic Zone Act in 2010 as a substitute measure replacing the EPZ act, iii) establishment of BEZA in 2011, iv) F/S for four candidate sites (Mongla, Sherpur, Mirershori, Anwara) for Economic Zone development (2013-2014) have been completed, and then v) BEZA Advisory consultants support (one-stop service, preparation of bidding documents, and Economic Zone developer appointment guidelines) are currently in progress.

The World Bank has already started to prepare bid documents as well as off-site infrastructure development projects as supporting measures for BEZA as to four Economic Zone sites where feasibility was recently determined. The progress on each Economic Zone project is reviewed as follows:

Table 2-3 Progress of Economic Zone development through the support of the World Bank Group

	Process of Developer selection	Development schedule	Division of roles between developer and BEZA	Remarks
1. Mongla Economic Zone	Economic Zone development shall be carried out by the PPP scheme. Through tender process stipulated by a RFP, Power Pac Holding has acquired the Economic Zone developer license. Landfill work and construction of administration building have started.	The off-site infrastructure projects are supported by the World Bank. The infrastructure development (access road, administrative building, water supply pipeline and substation) is planned to be completed by March 2017. The operation of the Economic Zone is planned in 2018.	The government leases the land, and private developer/operator performs on-site infrastructure development / Economic Zone management. Off-site infrastructure government is supposed to be developed by the Government.	The World Bank has prepared a Mongla Economic Zone Operation Manual in May 2015.
2. Mirershori Economic Zone	The review of suppliers bidding documents of the access road construction was carried out and bidding documents for land filling was prepared in September, 2015. Now the bidding process is	The vendor selection for access road construction was planned by September 2015. Tender was offered for selection of zone developer, which was made in February, 2016, yet the selection is not being finalized.	The government leases the land, and a private developer/operator performs on-site infrastructure development / Economic Zone management. Off-site infrastructure is supposed to be	The government completed the land acquisition of 5,000 ha, and still 1,600 ha of land must be acquired.

	underway for selection of a zone developer.		developed by the Government.	
3. Anwara Economic Zone	Economic Zone developer is not yet selected, and the land acquisition is still on its way.	Not yet determined	The government leases the land, and private developer/operator performs on-site infrastructure development / Economic Zone management. Off-site infrastructure is supposed to be developed by the Government.	Challenges for erosion by waves, as well as the construction of breakwater prevents the project from moving forward.
4. Sherpur Economic Zone	Economic Zone developer is not yet selected, and the land acquisition is still under way.	Not yet determined	The government leases the land, and private developer/operator performs on-site infrastructure development / Economic Zone management. Off-site infrastructure is supposed to be developed by the Government.	In the process of land acquisition, the progress of the project has come to a halt.

(Source) JICA Study Team

- b. Identification the challenges and lessons learned from the development, management and operation of the Economic Zone.

As a result of interview survey with the World Bank as well as a BEZA legal consultant, it was revealed that, contrary to the intention of the World Bank, Economic Zones Operational Regulations, 2012 which was prepared and drafted by a consortium comprised of IFC (World Bank Group), DFID and the EU was rejected by the intention of the Bangladesh Government, and the contents described in the Regulation is mostly split into two documents at present; one for Bangladesh Private Economic Zones Policy, 2014 which stipulates Private Economic Zone development rules, BEZA roles and functions and Economic Zone User / Resident rules, and the other one for Bangladesh Economic Zones (Appointment of Developer, etc.) Rules, 2014, which is governing Economic Zone development rules under PPP schemes, despite some areas of legal descriptions (detailed construction permission procedures related to EZ business, customs clearance system, etc.) having been removed from those policy and rules.

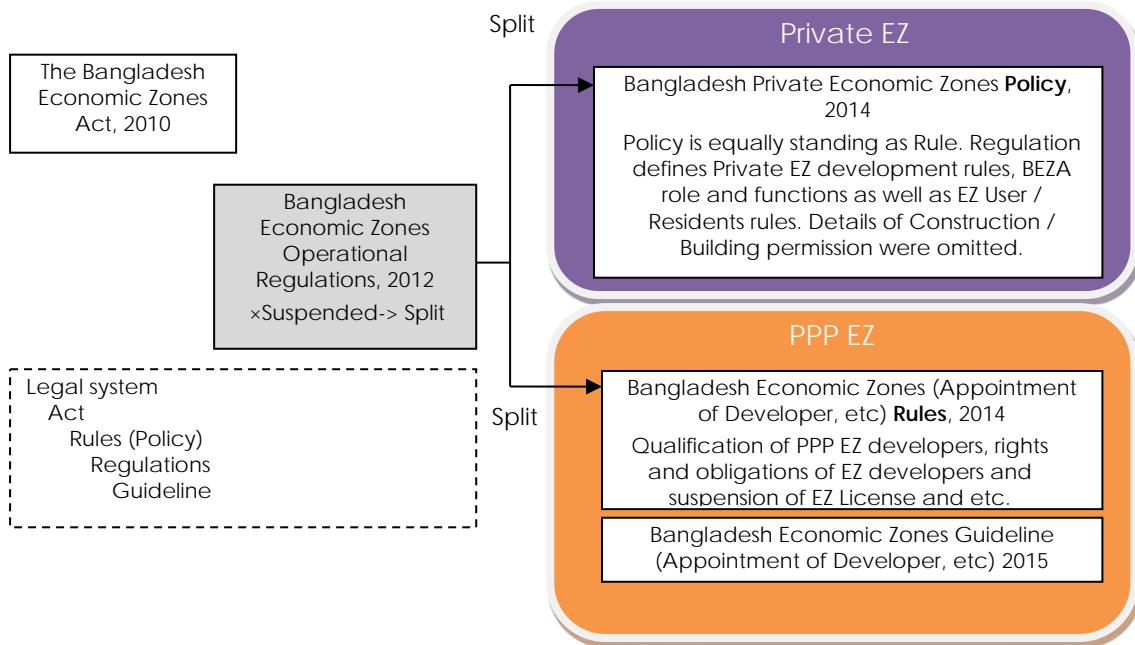


Figure 2-3 Legal Flow related to EZ Development

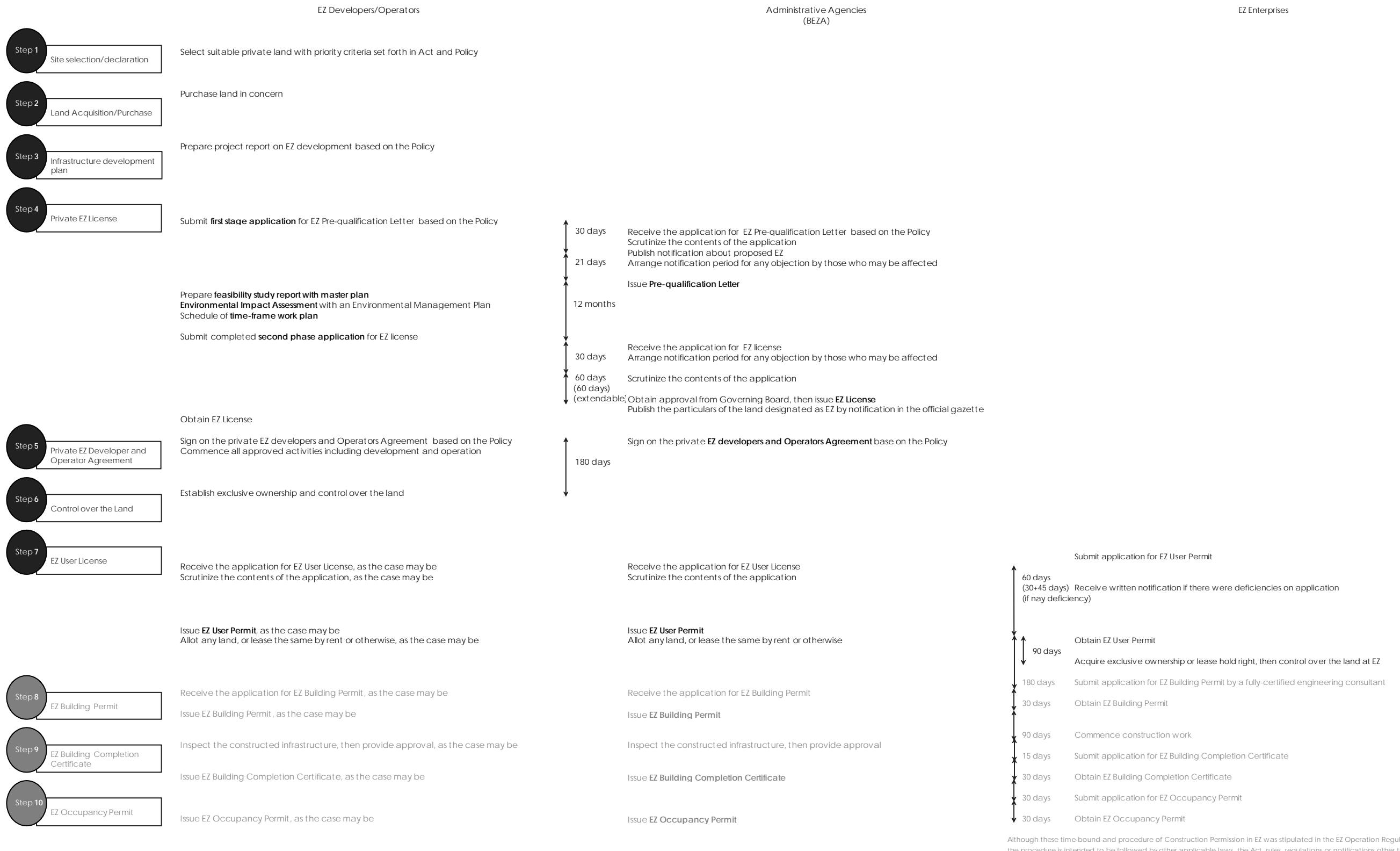
Currently, the development process for Private Economic Zones is performed in compliance with the Policy, and Guideline (Appointment of Developer, etc.), 2015, prepared through World Bank assistance, and the development procedures of the Economic Zone under PPP scheme is stipulated in the Rules. At present legislation of BEZA OSS Rules are under preparation (currently internal consensus building and mutual agreement are pursued in the form of the MoU with other ministries and agencies⁶), and yet there is no tangible technical assistance scheme involved and to be planned so far by the World Bank in the process.

2.2 Workflow of Economic Zone development in accordance with Economic Zone Act, policy, rules and guidelines

The work flow for Economic Zone development based on the Economic Zone act, policy, rules and guidelines, which are studied in (1) are summarized hereinafter, along with the attention to the procedures, rules and the role of the administrative body of the Government of Bangladesh, the Economic Zone developer and tenants, as follows.

⁶ Characteristics of tourism industries are incorporated in the concept of an EZ project through a MoU between the Ministry of Civil Aviation and tourism and off-site infrastructure development in terms of water access was agreed in Mirershori and Sherpur EZ with the Department of Public Health Engineering through an MoU.

1) Workflow of Private EZ development based on EZ Act and Policy



1) Workflow of Private Economic Zone development based on the Economic Zone Act and Policy

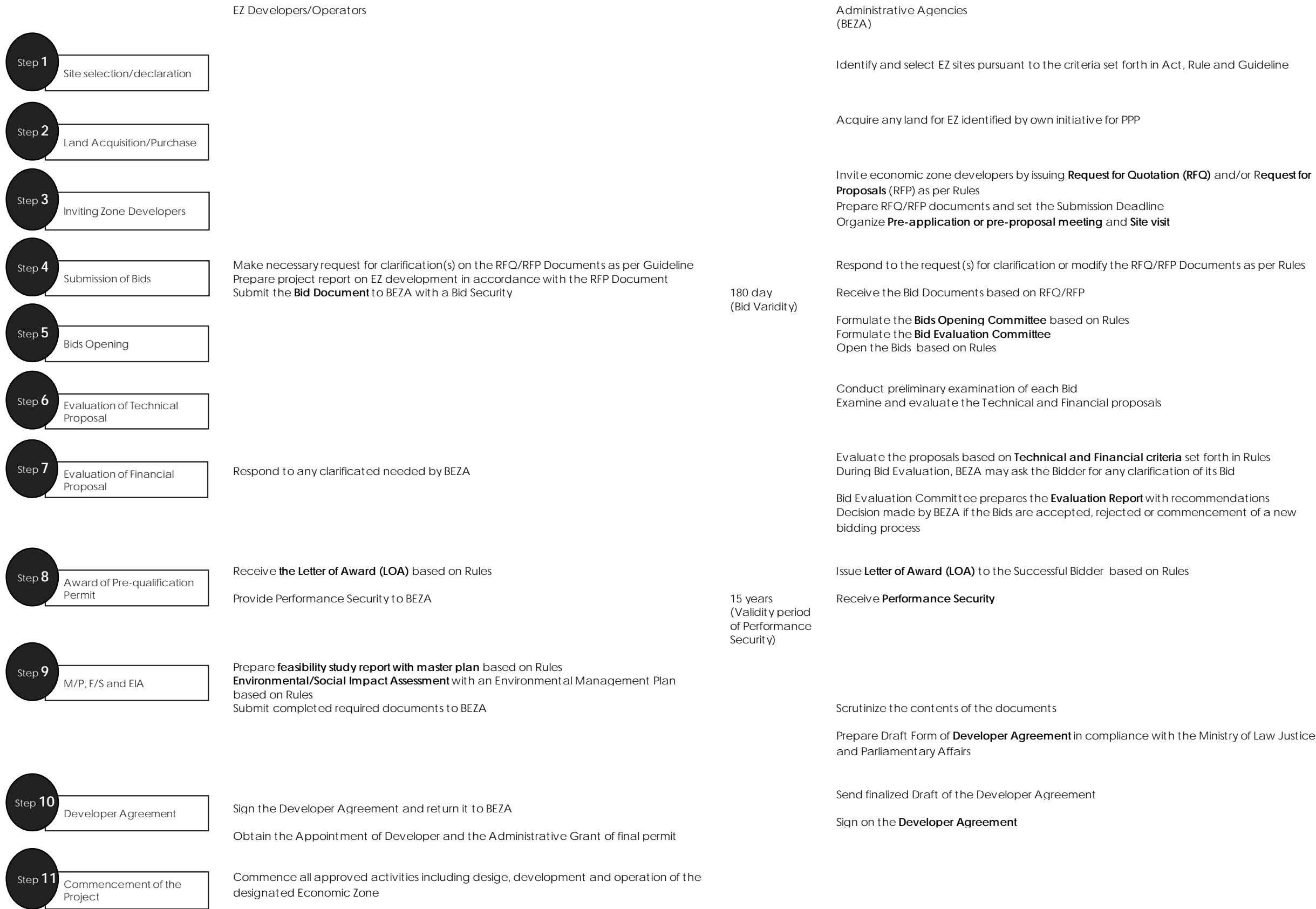
As for Economic Zone development by private companies, its requirements, the necessary administrative procedures, as well as the rights and obligations of Economic Zone development operators, are defined in Bangladesh Economic Zone Policy, 2014. Therefore, the Private Economic Zone is deemed to proceed in accordance with this Policy. According to the Policy, private Economic Zone developers and operators must obtain an Economic Zone License for development and operation of Economic Zones, and the formality of application and issuance of the License is described.

Evaluation of applications for an Economic Zone License is a two-stage process in that a Pre-Qualification License shall be issued after the evaluation of a First Stage Application, then after subsequent documentation works and their scrutiny is carried out, within 12 months an Economic Zone License shall be issued. A Private Economic Zone developer is requested to submit documents specified in Schedule-4 in order to obtain a Pre-Qualification License; those documents are a Company Profile, information about Economic Zone project, a marketing analysis, a master plan (site plan and on-site infrastructure), an investment scale and estimated time schedule for the project development, etc. After the completion of those informational works, Economic Zone developers are supposed to submit the documents along with a one-time non-refundable fee. BEZA shall scrutinize the documents within 30 days, then, if there are no clarifications needed, the process of a public hearing will be conducted by publishing in a national newspaper and an official gazette the project description of the Economic Zone in concern. The period of receiving any objections from those who may be affected from the Economic Zone project is set within 21 days. Throughout this procedure, Pre-qualification shall be an issue along with an approval from the Governing Board of BEZA.

As the final approval for Economic Zone development and operation, the Economic Zone License needs to be obtained by the private Economic Zone developers after Pre-Qualification was issued. The required formality for the License is specified in the Policy and it begins with fulfillment and submission of Schedule-3. For the final approval of the License at this final evaluation stage, the following required documents are deemed to be prepared in addition to the document prepared at the first stage; an F/S report, a detailed master plan, an EIA report, a resettlement plan (if any), a schedule of an approximate time-frame for construction and commencement of the project, a list of fees to be charged for utilities services and a statement for verified financial resources for the project, etc. Further details of the required items in the F / S report and master plan are also defined in the Policy.

In the second/final stage of evaluation, the similar public hearing procedure shall be followed after 30 days' of document scrutiny at BEZA. Consequently, after 60 days (another 60 days can be extendable) from the end of the public hearing procedure, an Economic Zone License will be issued. The event of an Economic Zone License issuance will be published in the official gazette, and the project will be declared an Economic Zone. Then the Economic Zone developer and BEZA shall enter into a Private Economic Zone Developer and Operator Agreement for commencing the private Economic Zone by the private Economic Zone developers.

2) Workflow of PPP EZ development based on EZ Act and Rules



2) Work flow of Economic Zone development under a PPP scheme

Bangladesh government defines Economic Zone development under a PPP scheme as the government to acquire and lease suitable land for Economic Zone development, and then invite private developers and operators to develop and operate the Economic Zone together with on-site infrastructure development for its service provision. Bangladesh Economic Zones (Appointment of Developer, etc.) Rules, 2014 and the Bangladesh Economic Zones (the Procedure of Appointment of Developer) Rules, 2016 are prepared as the legislations that define the particular formalities and procedures for Economic Zone development under a PPP scheme. In the Rules, 2014, developer selection criteria as well as the rights and obligations of Economic Zone developers are defined as the prescription set forth by BEZA, and then the Rules, 2016 stipulates the developer selection process and work flow to be followed by both BEZA and Economic Zone developers.

While the rules, 2015 states that BEZA is going to formulate a guideline for the selection process of developers with a Developer Agreement for the land to be acquired and declared as an Economic Zone by the Government, up to now, such a guideline is not in operation, temporarily, in accordance with the statement of the Rules, 2015, the PPP Guideline set forth by the Prime Minister's Office substitutes the legal base of the competitive selection process of Economic Zone developers under a PPP scheme.

But to come here, enactment of a guideline for appointment of Economic Zone developers was prepared, and, in the beginning of the year 2016, with indications from the Ministry of Law, Justice and Parliamentary Affairs, without the use of the guidelines, for the selection process of the EZ developer, a new Rules, was drafted in BEZA. Thus in this section work flows of Economic Zone development under a PPP scheme shall be reviewed in accordance with the Economic Zone development Rules, 2016.

The selection process of Economic Zone developers will begin with publication of a Request for Quotation (RFQ) and/or a Request for Proposal for Economic Zone projects. Economic Zone developers are supposed to submit an application and/or proposal.. In the RFQ/RFP document, a project description, the procedure for appointment of an Economic Zone developer, and the criteria of evaluation will all be described. Those Economic Zone developers who applied for the Economic Zone development project in particular are supposed to submit applications and/or proposals to the authority, and then those proposals are evaluated by a committee comprised of 5 to 7 members selected by BEZA as well as other ministries. The committee prepares an evaluation report for BEZA, and after final evaluation by BEZA, the Economic Zone developer obtained the highest score shall be given a Letter of Award (LOA)and the right to negotiate an agreement. However, this LOA alone does not grant any development activities. The first ranked Economic Zone developer needs to submit a detailed Feasibility Study, Master Plan, and an EIA report, in addition to the document submitted at the RFP stage. Having a set of completed documents, the Economic Zone developer and BEZA shall enter into an agreement, then, a private Economic Zone developer can commence development work at the project site.

3) Comparison of Economic Zones development work flow by private sector initiative and PPP scheme

The following diagram illustrates the summarized two different methods of the Economic Zone development with key milestones.

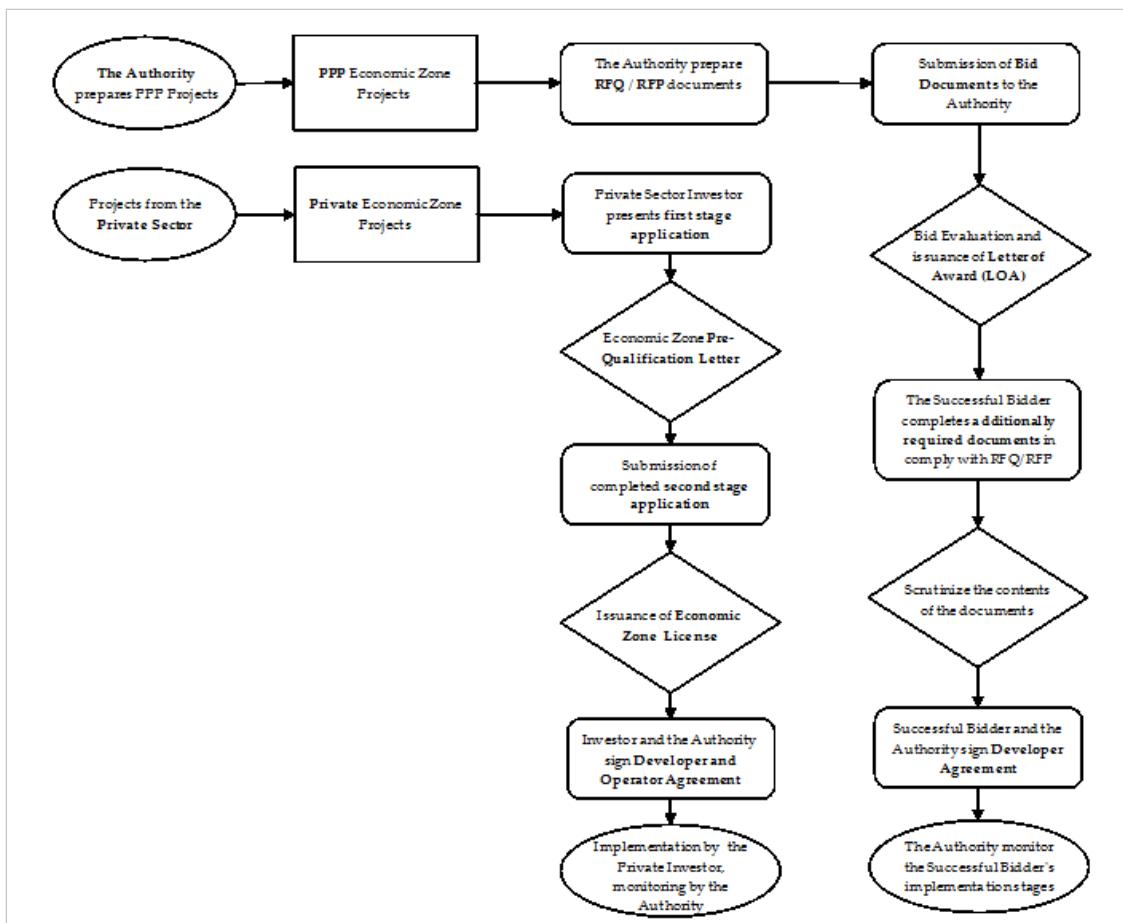


Figure 2-4 Summary of Economic Zone development work flows by the private sector initiative and PPP scheme

Moreover, a comparison of different development scheme in the operational contents by each development stage can be made as follows.

Table 2-4 Comparison of the private sector initiative and PPP scheme of Economic Zone development in the operational contents by each development stage

Name of Stage	Stage 0	Stage I	Stage II	Stage III	Stage IV	Stage V
Project Identification	Master Plan and Feasibility Study	Commercial Framework	Evaluation	Negotiation	Construction	
Stage Completion Milestone	Submission of Project Proposals	Preparation of RFP	Issuance of RFP	Issuance of Economic Zone License or Permit	Sign Agreement	Start of Commercial Operation
Process and Actions						
Private Sector initiative	<ul style="list-style-type: none"> • Select suitable private land with priority criteria set forth • Purchase land in concern • Prepare project report on report with master plan • EZ development 	<ul style="list-style-type: none"> • Submit first stage application for EZ Pre-qualification Letter • Prepare feasibility study • Environmental Impact Assessment with an Environmental Management Plan • Schedule of time-frame work plan • Receive Pre-qualification Letter 	<ul style="list-style-type: none"> • Submit completed second phase application for EZ license 	<ul style="list-style-type: none"> • Obtain EZ License 	<ul style="list-style-type: none"> • Sign on the private EZ developers and Operators Agreement 	<ul style="list-style-type: none"> • Commence all approved activities including development • Establish exclusive ownership and control over the land
PPP Scheme	<ul style="list-style-type: none"> • Identify and select EZ sites pursuant to the criteria and set the Submission set forth • Acquire any land for EZ identified by own initiative for PPP 	<ul style="list-style-type: none"> • Prepare RFP document and set the Submission Deadline 	<ul style="list-style-type: none"> • Issuing Request for Quotation (RFQ) and/or Request for Proposals (RFP) • Make and receive necessary request for clarification(s) on the RFQ/RFP Documents • Organize Pre-application or pre-proposal meeting and Site visit 	<ul style="list-style-type: none"> • Receive the Bid Documents • Formulate the Bids • Make and receive necessary request for clarification(s) on the RFQ/RFP Documents • Open the Bids • Examine and evaluate the Technical and Financial proposals • Decision made by the Authority if the Bids are accepted, rejected or commencement of a new bidding process 	<ul style="list-style-type: none"> • Prepare feasibility study report with master plan • Environmental/Social Impact Assessment with an Environmental Management Plan • Submit completed required documents to the Authority • Scrutinize the contents of the documents • Prepare Draft Form of Developer Agreement and Documents in compliance with the Ministry of Law Justice and Parliamentary Affairs 	<ul style="list-style-type: none"> • Sign on the Developer Agreement • Obtain the Appointment of Developer and the Administrative Grant of final permit • Commence all approved activities including design, development and operation of the designated Economic Zone
Approx. Time required						
Private initiative	6 months to 1 year	2 months	3 months to 5 months	1 to 3 months	1 to 3 months	6 months
PPP scheme	6 months to 3 years	6 months to 1 year	1 to 3 months	1 to 3 months	1 to 3 months	3 to 6 months

4) Workflow for entry into Economic Zone

As occupancy rules to Economic Zone, companies wishing to operate in the Economic Zone are required to obtain the Economic Zone User Permit as stipulated in the above Policy (Section 28). For the application to the permit, the following information is required to be filled in the specified form and the form must be submitted to BEZA or the Economic Zone license holding company (Economic Zone developer and operator).

- receipt of payment of the one-time non-refundable application fee
- a valid business-registration certificate
- a notarized written statement about applicant enterprise
- a proposed activities along with the approved master plan
- an estimated time schedule for the designing, construction and activation facility
- an approximate number and nationality of the workers
- a plan of environmental management
- proof of compliance with the rules-regulations in force relating to the environment, health, safety, and risk involved

A set of application forms will be evaluated by either BEZA or the Economic Zone developer/operator, and then, in case there are clarifications required, such notice shall be given within 30 days. The applicant enterprise is deemed to respond to the request for clarification and re-submit the application form within 45 days. If no clarifications needed, the Economic Zone User Permit will be granted in 60 days' time. In addition, according to the Policy, the Economic Zone User Permit holders are given 90 days, after issuance of Economic Zone User License, to acquire or lease industrial plot in the Economic Zone (Section 30 (3)). The Economic Zone User Permit cannot be sold or transferred to third parties (Section 30 (4)).

5) Work flow related to land acquisition in the public-private partnership approach

According to article 5(1) of Economic Zone Act 2010, the Government may, by notification in the official Gazette may declare any specific land area as economic zones after selection. If for any economic zone, land is required for construction of infrastructures, such as roads, bridges, etc., the government may acquire such land under the provisions of the Land Acquisition and Requisition of Immovable Property Ordinance, 1982 (Ordinance No. II of 1982) by the Article 6(1) of the Economic Zone Act, 2010. The procedure is as follows;

The Requisitioning body (Here BEZA, in case of Economic Zone development under PPP scheme) with the permission from its Governing Board will write to the concerned Deputy Commissioner (DC) of the district where the earmarked land is located to express the desire for acquisition of land.

The DC will instruct his Land Acquisition Office/ Land Acquisition Officer to start the process of Acquisition. Part of the process will include; survey of the land, identification of the owners as per land records as available, valuation of land, structures, trees, plantations as per Land acquisition norms

Notice will be served to the land owners and other stakeholders about the intention and necessity of the land acquirement under section 3 of the Ordinance which will be followed by the section 4 for filling Objection against Acquisition by the land owner, the section 5 Final Decision of Acquisition by the DC, the section 6 for serving Notice to Persons Interested i.e., individual interest against ownership by other heirs/amount of compensation and all other stakeholders, the section 7 for Award of Compensation by the Deputy Commissioner, the section 10 for Payment of Compensation and the section 11 for Acquisition and possession.

As per the section 4 of the Ordinance, if the asking property is more than 50 bigha (16.33 acres/6.6 ha) of land, the Deputy Commissioner need to move for getting Government approval before proceeding for Acquisition. Also in accordance with the section 8 of the Ordinance the compensation of the land shall be determined on the basis of average price of other land in the vicinity of earmarked land with 50% compensation as TOP UP on the actual price.

The price assessment of other structures, trees, plantation shall have to be made on market price basis by the Department of Public Works (PWD) as per requisition of DC. In addition, as per the section 7, the requisitioning body shall have to deposit the assessed amount of compensation with the DC within 60 days of the assessment of compensation.

As per the section 14 and 15 of the Ordinance the Government will facilitate acquisition of land for a person/body other than the Govt. body, in this case the requiring private sector or others need to pay the entire cost of acquisition including normal administrative charge imposed by the DC. As per the section 17 of the said Ordinance, in future the Acquired Property cannot be used other than the purpose it was acquired.

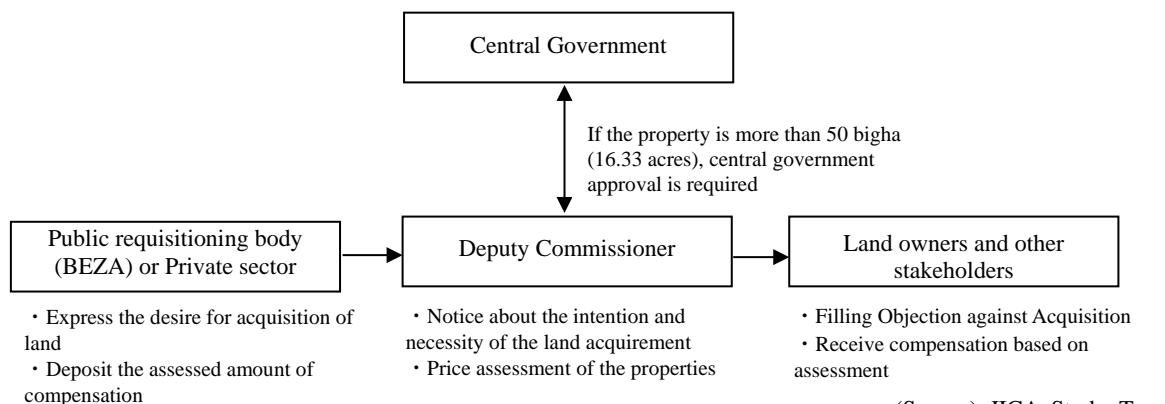


Figure 2-5 Workflow of land acquisition

2.3 The contents of a one-stop service in relation to various licensing procedures (OSS)

In this section, the scope, contents, procedure and service provision system of OSS, to be performed by BEZA, was reviewed in comparison to those having practiced in Bangladesh (through BIDA and BEPZA) as well as in India and other Southeast Asian countries. From the perspective of smooth zone development and investment promotion, OSS plays a vital role. Making the OSS suitable for Bangladesh would lead to the foundation building for enhancing the international competitiveness and extending better administrative services of the Bangladesh Government, while listening to the voice of investors.

(1) The content of OSS to be planned by BEZA

1) The contents, procedure, scope, and service structure of OSS

The contents of the OSS that is planned by BEZA are shown below, along with its scope, specific service items, as well as the relation to the competent government agencies having jurisdiction of each permission and clearance.

Table 2-5 List of OSS to be planned by BEZA

Sl N o	Required Document/ License for Foreign Investors	Timelines DCCI ⁷ Guideline (2014) BOI	Competent Agencies	BEZA Plan	
				Developer	Unit Investor
Company establishment/Registration	1 Name Clearance Certificate	1 day	RJSC (Office of the Register of Joint Stock Companies and Firms)	X	
	2 Certificate of Incorporation	15 - 30 days	RJSC / BIDA (in case for Foreign Company)	Role of BIDA can be substituted by BEZA	
	3 Tax Identification number (TIN) Certificate	15 - 20 mins	NBR (National Board of Revenue)	X	
	4 Trade License	3 - 4 days (Commercial) 10 – 15 days (Manufacturing)	City Corporation / Municipality	To be exempted	To be exempted
	5 Open Bank Account	1-5 days for 100% foreign Investment	Bank (International or Local Banks)	Necessary advices to be provided	
	6 VAT Registration	2 days	NBR	O	
	7 Approval of Central Bank	-	Central Bank	Not required in case for Economic Zone	
	8 Registration with BIDA	1 day	BIDA	Not required in case for Economic Zone	
	9 Project Clearance	6 months - 1 year	City Corporation / Municipality	O	Developer's Clearance followed by BEZA
Before					

⁷ Dhaka Chamber of Commerce & Industry (DCCI)

					Expedited process applicable under the circumstance where units are in-line with EZ Master Plan with E/C.
10	Environment Clearance	1 - 5 months	DOE (Department of Environment, MoEF)	One-stop entry and facilitation service	
11	Building Plan Approval	×	City Development Authority	O	BEZA or Zone Developer
12	Factory Registration / Factory Plan Approval	2 months	DIFE (Department of Inspection for Factories and Establishments, Ministry of Labor and Empowerment)	×	O
13	Water Plumbing Clearance	3 months	Water department	One-stop entry and facilitation service	Developer's responsibility
14	Electricity Wiring Approval	35 days	Electricity distribution department	One-stop entry and facilitation service	Developer's responsibility
15	Provisional Fire Safety Clearance	-	Bangladesh Fire Services & Civil Defense	One-stop entry and facilitation service	
Sl N o	Required Document/ License for Foreign Investors	Timelines DCCI ⁸ Guideline (2014) BOI	Competent Agencies	BEZA Plan	
				Developer	Developer
16	Fire Clearance / License	90 days	Bangladesh Fire Services & Civil Defense	One-stop entry and facilitation service	
17	Building Completion Certificate	-	City Corporation / Municipality	-	-
18	Telecommunication line connection	2 - 3 months	Bangladesh Telecommunication Company Ltd., Board: BTCL	One-stop entry and facilitation service	One-stop entry and facilitation service
19	Gas connection	60 days (Commercial) 120 days (Industrial)	Titas Gas Transmission & Distribution Company Limited: TGTDCL	Facilitation Service	Facilitation Service
20	Work Permit Recommendation	15 days	Ministry of Home Affairs	One-stop entry and facilitation service	
21	Registration to Chamber of Commerce	1 month	Chamber of Commerce	-	
22	Import Registration Certificate (IRC) / Export Registration Certificate (ERC)	1 month	CCI&E (Office of the Chief Controller of Imports & Exports), the Ministry of Commerce	-	

⁸ Dhaka Chamber of Commerce & Industry (DCCI)

23	Customs Clearance (Local Sales/Purchase Permit)	-	the Commissioner of Customs	Local sales Permit, Local Purchase Permit and Sub-contract Permit: O Every import and export requires permit from the Custom officials
24	Boiler Registration	30 - 40 days	Office of the Chief Inspector of Boilers, Ministry of Industries	- O
25	VISA recommendation	15 days	Dept. Of Immigration & Passport	O
26	Captive Power Plant -Gas - Site Clearance	Gas: 120 days (Industrial) 60 days (Commercial)	Gas Authority (Energy Regulatory Commission) and DoE	One-stop entry and facilitation service (whereas gas clearance needs to be obtained separately)
27	No Objection certificate for loan/ Approval of Foreign Borrowing Agreement	-	BIDA	O
28	Bond License	1 month	the Commissioner of Customs	X
29	Certification Mark License	1 - 2 days	Bangladesh Standard Testing Institute (BSTI), Ministry of Industries	X
30	Certificate of Origin	-	Bangladesh Export Promotion Bureau / Chamber of Commerce and Industry	- O

(Source) JICA Study Team

In addition, BEZA considers to take the followings into the service menu of OSS. Namely, these are Sample permit, Sub-contract permit, NOC for Offshore Banking License, Permission for installation of WTP and ETP, and Permission for installation of Generator.

2) Comparison between BIDA and BEPZA

In Bangladesh, there are specialized agencies holding a mission to promote investment and assist the start-up of the foreign investors; these are the Bangladesh Investment Development Authority: BIDA (the former Board of Investment (BOI)) and Bangladesh Export Processing Zone Authority (BEPZA). In case investors wish to advance their business into EPZ, BEPZA shall be the contact point; otherwise BIDA shall provide OSS to receive applications for various clearances and licenses for the case where investors come to Domestic Transaction Area (DTA). The following table illustrates, in comparison to BIDA and BEPZA, the positioning of OSS, which is planned for implementation by BEZA. Accordingly, BEZA is envisaging, not only facilitation of licensing, but also the expansion of the content and range of OSS that has been provided by BEPZA, in that a wider range of services and simplification of the documentation and procedures are pursued under close coordination with line ministries and competent agencies, that have provided permissions and clearance in the past.

Table 2-6 Comparison between BEZA, BIDA and BEPZA

No	Required Document/ License for Foreign Investors	BEZA	BIDA	BEPZA
Company establishment/Registration	1 Name Clearance Certificate	✓	×	×
	2 Certificate of Incorporation	✓	Facilitation service	×
	3 Tax Identification number (TIN) Certificate	✓	×	×
	4 Trade License	✓	Facilitation service	×
	5 Open Bank Account	✗ ⁹	Facilitation service	×
	6 VAT Registration	✓	×	×
	7 Approval of Central Bank	✗	×	×
	8 Registration with BIDA	✗ ¹⁰	✓	×
Before construction of	9 Project Clearance	✓	Facilitation service	Not required
	10 Environment Clearance	Facilitation service	Facilitation service	Facilitation service
	11 Building Plan Approval	✓	Facilitation service	Not required
	12 Factory Plan Approval	✓	Facilitation service	Not required
No	Required Document/ License for Foreign Investors	BEZA	BIDA	BEPZA
Construction before After Factory Construction before	13 Water Plumbing Clearance	Facilitation service ¹¹	Facilitation service	✓
	14 Electricity Wiring Approval	Facilitation service ¹²	Facilitation service	✓
	15 Provisional Fire Safety Clearance	Facilitation service	Facilitation service	✓
	16 Fire Clearance / License	Facilitation service	Facilitation service	✓
	17 Building Completion Certificate	✓	Facilitation service	✓
	18 Telecommunications line connection	Facilitation service ¹³	Facilitation service	✓
	19 Gas connection	Facilitation service ¹⁴	Facilitation service	✓
	20 Work Permit	Facilitation service	Facilitation service	Facilitation service
After Constru	21 Registration to Chamber of Commerce	✗	✗	✗

⁹ Usually, it is filed and obtained by companies themselves but necessary assistance services shall be provided.

¹⁰ Application to the BOI is not required for Economic Zone affairs.

¹¹ BEZA holds a view that EZ developer and operators and/or tenants should hold responsibility of utility connection.

¹² BEZA holds a view that EZ developer and operators and/or tenants should hold responsibility of utility connection.

¹³ BEZA holds a view that EZ developer and operators and/or tenants should hold responsibility of utility connection.

¹⁴ BEZA holds a view that EZ developer and operators and/or tenants should hold responsibility of utility connection.

	Import Registration			
22	Certificate (IRC) / Export Registration Certificate (ERC)	✓	Facilitation service	Not required
23	Custom Clearance	Facilitation service	Facilitation service	Facilitation service
24	Boiler Registration	✓	Facilitation service	✓
25	VISA recommendation	✓	Facilitation service	✓
26	Captive Power Plant -Gas - Site Clearance	Facilitation service	Facilitation service	Facilitation service
27	No Objection certificate for loan/ Approval of Foreign Borrowing Agreement	✓	✓	Not required
28	Bond License	✗	✗	✗
29	Certification Mark License	✗	✗	✗
30	Certificate of Origin	✓	✗	✗

"Facilitation service" is referred to a service to receive applications and facilitate permission/license/clearance provision from the competent agencies.

✓ means that the service provision is being provided or under considerations.

(Source) JICA Study Team

3) Comparison between other countries in the structure and content of OSS

In this section, the OSS, which has been practiced in India and Southeast Asian countries, is referred to and compared with the systems and content, to be attempted in Bangladesh Economic Zones.

In India, specific organizations are established by state law such as the One Stop Service Act in effect in each state. In response to the transfer of authority to the organization, these organizations practice one-stop service or one-stop facilitation services for the delivery of a variety of licensing. However, at present, the central government still holds a significant power on business licensing (namely, customs clearance, access to national roads and environmental Clearance affairs etc) and the one-stop service practiced by the state government has been facing difficulties in improving the performance of approvals of work in this regard.

When we look at the practice performed in Thailand, Indonesia, Vietnam, Philippines, and Myanmar, the designated organizations that have jurisdiction over the industrial park / special economic zone issues and the approval license in terms of land as well as for the construction of factories, on behalf of the competent ministries and agencies who would normally take charges in issuing such license in case the investor comes in DTA. In particular in Thailand and Philippines, in addition to the facilitation of investment procedures for entry to the IPs, the Industrial Estate Authority of Thailand (IEAT) and Philippines Economic Zone Authority (PEZA), which also have a mandate to develop and own industrial estates (including through JV), performs OSS even for zone developers with adequate competence of staff member as well as legitimate legal back-ups, hence the practices of IEAT could be relevant to the planned OSS for BEZA in that regard. Cambodia and Myanmar also practice OSS, and yet they have unique systems to dispatch government staff from relevant ministries (mainly, customs, labor, trade, local government) to each SEZ, then OSS is practiced on site on behalf of the central authority.

Also, it should be highlighted that the organization/agency, designated as a one-stop service provider, is defined in law, and its power is enforced by that law in that the head of state clearly holds the legitimacy of position in Southeast Asia. The recruitment of staff of a one-stop service provider is often made from senior officers who have extensive practical experience and are expected to work as full-time staff. Human resource development and training is carefully

undertaken to ensure that the employees understand the mindset of the private sector. Often such training programs are conducted in overseas countries.

As the OSS to be practiced in Bangladesh Economic Zone, the provision of licenses relating to the land and construction of factories is considered as a jurisdiction of BEZA on behalf of other competent agencies, and the coordination with those agencies is undertaken. For a menu of OSS, especially the procedure for EIA clearance, is shaped in an advanced scheme in Southeast Asia as well as in India (Simplified EIA is applied when entering an industrial park where environmental clearance was already acquired.). Such practice is regarded as a kind of incentive for investors to consider their business in the IP /SEZ. Thus, as OSS, for companies wishing to move to the Economic Zone, already in receipt of an overall EIA clearance, BEZA should attain a faster and simplified environment clearance procedure through an agreement with the Department of Environment, MOEF and that would be a necessary measure at least in order to stand on an equal footing with the other countries' industrial / special economic zones.

Table 2-7 Comparison between OSS

		Company establishment/Registration	Land allotment/Lease permit	Factory construction permits/Fire safety	Environment clearance	Utilities connection	Export/Import permits	Labor permits/VISA
India	Gujarat	X	X	X	X	X	X	X
	Maharashtra	X	O	O	X	O	X	X
	Tamil Nadu	X	O	O	O	O	X	X
	Karnataka	O	O	O	X	O	X	X
	AP	X	O	O	X	O	X	X
	SEZ	O	X	O	Δ	O	O	X
Thailand	O	O	O	X ¹	O	O	O	O
Indonesia	O	O	O	Δ	X	O	O	O
Vietnam	O	O	O	Δ	X	O	O	O
Cambodia	O	O	O	X	X	O	O	O
Philippines	O	O	O	Δ	O	O	O	O
Myanmar	O	O	O	O	X	O	O	O
Bangladesh	O	O	O	O	O	O	O	O

O : OSS X : Not OSS Coverage Δ : Simplified

¹ : Receive EIA report and provide necessary advices

(Source) JICA Study Team

In addition, OSS provision system in each country and their service content are summarized as shown in the table below, as well as in the Appendix.

Table 2-8 One stop service system practiced in other countries

Country	One stop service provision system	Status and service contents
India Industrial area		
Gujarat	indEXTb, under administrative supervision of Dept. of Industries and Mine is supposed to provide a one-stop service to investors about the Special Investment Region (SIR) development	indEXTb is supposed to provide the following service, but in reality the Dept. of Industry and Mines and/or GIDC are functioning as a window for investors. <ul style="list-style-type: none"> - Enquiries for domestic projects coming from all over the country, other than Gujarat and their follow up. - Follow up of projects involving domestic investment. - Coordination for monitoring of Industrial Approvals with Industries Commission, iNDEXTb Offices/Officers, Computer Centre and presentation of reports.
Maharashtra	MIDC has established a Single Window Clearance, which provides an electronic application platform to investors.	MIDC provides following approvals / licensing on behalf of the competent authorities in the following fields; <ul style="list-style-type: none"> - Land Dept. (Grant of Permission for Leasing, Grant of permission for Sub-leasing, Permission for Mortgages, etc.) - Fire Dept. (Provisional Fire Approval, Final Fire Approval etc.) - Water Dept. (Water Supply Connection) - Drainage Dept. (Drainage service) - Power Dept. (Grant of NOC for power connection) - Special Planning Authority (SPA) Dept. (Application form for Building Plan & allied approvals for new allotments, Building Completion Certificate/Occupancy Certificate/Application for Drainage plan approval) - Technical Advisor (TA) Dept.(LOI for HW Unit, LOI for Software/IT/ITES Unit) - IT SEZ Dept.(Permission for Co-Developer Status)
Tamil Nadu	"Guidance Bureau" provides a one-stop service to investors by charging a fee.	Integrated Single Application Form is used to combine a variety of applications for authorization. A hearing which led to the decision in relation to the application is organized to provide Composite Approval as a provisional licensing for business. Various approvals that Guidance Bureau can accept and provide before operation (pre project clearances) are as follows. <ul style="list-style-type: none"> - Planning permission - Fire Service clearance - Environmental Clearance from TNPCB - Land allotment by (SIPCOT/TIDCO/SIDCO) - Water Supply - Power supply from TNEB - Electrical safety certificate from CEI - Approval under Factories Act - Registration under Boilers act
Karnataka	Karnataka State Investment Agency (KUM) is providing a one-stop service to investors taking a fee	KUM functions as the window of "One-stop service" in Karnataka, which provides various incentives for investment promotion. The system offers a monitoring system for paper screening, which has due dates,

Country	One stop service provision system	Status and service contents
	<p>in the process. Development of a platform ("e-Udyami") that allows the submission of licensing application through online was made.</p>	<p>online application, etc. based on "Karnataka Industrial Policy" and "Karnataka Facilitation Act". Items that can be applied for licensing through the portal as follows:</p> <ul style="list-style-type: none"> - Karnataka Industrial Areas Development Board - Karnataka Small Scale Industries Development Corporation - Karnataka State Pollution Control Board - Factories, Boilers, Industrial Safety & Health Department - Industries and Commerce Department - Town Planning Department and Local Planning Authorities - Municipal Administration Department - BESCOM/GESCOM/HESCOM/CESCOM/MESCOM - Karnataka State Fire and Emergency Services Department - Water Resources Department
AP	<p>The one-stop service is performed to investors based on the "AP Single Window Act 2002," stating that the Prime Minister becomes the chairman of the service providing agency. Electronic application platform is developed.</p>	<p>Based on state law, the provision of a licensing process based on the due date is performed by the State Investment Promotion Board or the Empowered Committee. Implementation of licensing provision itself is also carried out. It should also be noted that in the case it happens that the application was delayed as the process of application did not follow a specific time framework and was beyond the schedule, a Deemed Provision will be issued to the person in charge of the delay.</p> <p>To start an industry a subset of 24 different clearances may be required. Of these, 13 approvals / clearances are necessary in the Pre-establishment stage and 11 approvals / clearances are necessary in the Pre-operation stage. List of clearances available under the Single Desk Policy is provided as below;</p> <ol style="list-style-type: none"> 1. Pre-establishment stage <ul style="list-style-type: none"> - Power Feasibility certificate/sanction of power supply Power Connection - Electrical Inspectorate statutory approval for drawings - Building /Site Permission /Approval/License from Municipality/ UDA/ DT&CP/ - Building /Site Permission from Gram Panchayat - Approval for water supply from ULB s-MA & UD Department Water Connection Permission to draw water from river/public tanks, Irrigation & CAD Department Permission to dig new wells from Ground Water Department - Factory Plan Approval - Fire-No Objection Certificate - Registration for VAT, CST - Consent for Establishment <ul style="list-style-type: none"> - Green Category - Orange Category - Red Category

Country	One stop service provision system	Status and service contents
		<ul style="list-style-type: none"> - Approval of change of land use for Industrial purpose - Registration of Partnership Firms - License for manufacture of bulk drugs / formulations / cosmetics - License for manufacture of ayurvedic, homeo, siddha, unani <p>2. Pre-operation stage</p> <ul style="list-style-type: none"> - Final approval from Electrical Inspectorate- Department of Energy-Chief Electrical Inspector - Registration under Professional Tax - Factory Registration / licensing - Registration of shops & establishments - Occupancy certificate from the Fire Services Department - Consent for Operation/ Authorization <ul style="list-style-type: none"> - Green Category - Orange Category - Red Category - Authorization of units handling hazardous wastes - Boiler registration - Registration of establishments deploying contractual workmen - Registration of establishments deploying inter-state migrant workmen - Registration of plastic manufacturers / recyclers - License for storage of petroleum, diesel, and Naptha - License for possession and use of Rectified Spirit and Denatured Spirit
Special Economic Zone (SEZ)	The Central government (Mo Commerce) designates the Development Commissioner as the chairman and a nominal approval committee in each SEZ that has a total control of various problems in the SEZ.	<p>Even though Development Commissioner is assigned, environmental problems will be entrusted to the pollution control board of the Central government (MoEF) /the state government depending on its content. The other organizations under the state government will be in charge of labor and the related problems. Thus, it appears that the total management isn't the actual situation.</p> <p>Moreover, if the central government decides that delegation of the authority to a Board of Approval, Approval Committee and Development commissioner is needed, it can do so (SEZ Act Article 19) and also the state government can delegate the authority to the Development Commissioner (Article 50). Thus, it could be improved, however, Development Commissioner is only a designated post from Ministry of Commerce and Industry, and there is still a question left if it can make a superimposing decision over the authority of the Ministry of Commerce and Industry.</p> <p>In addition, SEZs managed by the central government are only located in Noida and Mumbai. Other SEZs are managed by either the Development Corporation of the state government, the private sector, or a JV of both, hence <u>there is no common practices of the one-stop service applied over those SEZs. But in</u></p>

Country	One stop service provision system	Status and service contents
Thailand	<p>As for building construction and factory construction, it is regulated to follow the Factory Act, the Building Standard Act, and the Urban planning Act. However the governor or the person who was delegated the authority of the governor of IEAT has the authority for permission, which authorities belong to these other Ministries, according to Industrial Estate Act, Article 42/1979). It means IEAT has been delegated the authority for permission.</p>	<p>any of the SEZs, an SEZ office is installed, and staff members from the central government (Ministry of Industry and Trade / Development Commissioner) perform various administrative services and customs clearance. While licensing in the SEZ would be managed nominally by the appointed Development Commissioner from the Ministry of Commerce, the issues over environmental and labor relations are confined to the jurisdiction of the Pollution Control Board (Ministry of Environment and Forest) and another organization in the state government respectively, and not necessarily become the centralized management.</p> <p>In the privately operated SEZ, the site plan and construction plan that is usually required to be submitted to and approved by the state government authorities can be processed by the private zone operators, as long as the factory size was less than 10 acres. Such an agreement signed between the state government and private zone operator can be used to perform a kind of one-stop service.</p> <p>The building construction, plant construction license provided for industrial estate, also entry of foreign experts and their families to work in the industrial park, are all applicable to IEAT, and the system is named as a "one-stop service center." Accompanied services provided are as follows;</p> <ol style="list-style-type: none"> 1. An Information center one-stop service center: the latest situation and information about the industrial parks in Thailand on a national basis, for example the locations, the number of factories, and project progress reports, can be provided. <ul style="list-style-type: none"> - Benefit, Permission, Approval center one-stop service center: It can accept applications and give permissions/approvals in the industrial parks. It can also give permission to operate which includes land use and other related activities. Land use for business or other related activities - Building permission - Permission to operate factories - Permission to bond in the free zone - Permission for receipt/dispatch of goods in free zones - Permission to own land in the industrial parks - Permission to stay/work permit for foreign technicians/specialists and their dependent families 2. Permission/Approval center for industrial park developers <ul style="list-style-type: none"> - Declaration of industrial park area - Permission for basic plans (master plan) - Permission for building plans of public facilities and establishment of infrastructure - Land for sale 3. While consulting about the investment in the related organization's corporate center in the industrial park, also aiming to simplify and smooth the procedures by reporting and cooperating with related organizations such as BOI, customs office, Immigration, Department of Commerce, Bank, Industrial Bureau.

Country	One stop service provision system	Status and service contents
Indonesia	<p>The government body for investment is the Investment Coordinating Board (BKPM) and it executes all by applying a “One-door integrated service” from acceptance of various permissions/approvals to examinations and decisions.</p>	<p>4. E - Service, inquiry counter and coordinator service</p> <ul style="list-style-type: none"> - Service regarding land use and business management - Service regarding permission to bond in the free zones <p>BKPM has not only a unified service window but is also trying to ease the conditions for permissions/approvals, to simplify the procedures, to shorten the duration, to indicate the fees and to reduce the fees. BKPM also can go through the procedures for acquisition of land rights and factory constructions. As an exception, Batam, Bintan and Karimun islands have the free trade zone port control board, which acts for BKPM, with the delegation of authorities for investment, imports/exports and other various procedures in industrial fields. Besides that, Private industrial park developers are providing support for the acquisition of various permissions/approvals for companies there.</p> <p>Permission and clearance, which are granted by BKPM are as under;</p> <ol style="list-style-type: none"> 1. License <ul style="list-style-type: none"> - Principal Licenses - Business Licenses - Representative office license for foreign companies (KPPA) - Business License for trade-company representative office (SIUP3A) 2. Permission <ul style="list-style-type: none"> - Machinery Import duty facility / Material Import duty facility - Recommendation for import tax facility - Import identification number for procedure (API-P) / General Importer Identification number (API-U) - Plan to hire foreign workers (RPTKA) - Recommendation for work visa (TA.01) - Permit to hire foreign workers (IMTA) <p>Clearance not covered by BKPM</p> <ul style="list-style-type: none"> - NPWP (Tax Payers Number) - Capital Goods Importation facilities - Corporate Income Tax Recommendation - TDP (Company Registration Certificate) - Payment of Capital • IMB (Construction Permit)
Vietnam	<p>The investment review committee for each industrial park is established by the prime minister of Vietnam in order to smooth administrative procedures toward foreign companies. The committee is in charge of providing proper guidance to the companies in the</p>	<p>The system of the investment review committee consists of a chairman, who is a principal member of the local people's committee, and members from The Central Government such as the Ministry of Planning and Investment, the Ministry of Finance, and the Ministry of Home Affairs.</p> <p>There is no need to apply to or to consult with The Central Government for Permissions/approvals in regards to investment up to US\$40,000,000, permission to export/import, building permission or granting</p>

Country	One stop service provision system	Status and service contents
	industrial parks, accepting investment application paperwork and delivering them to the proper organization.	VISAs as the Investment review committee has its own authority. <ul style="list-style-type: none"> - Survey, information providing and approval for investment intent - Issuance of Certificate of Investment outside Industrial Zones - Introduction for investment site - Issuance of Planning Certificate - Land recovery, land allocation, land lease and approval for change of land-use - Signing land lease contract - Issuance of certificates of land use rights, certificate of house ownership and ownership of other properties associated with land - Appraisal and approval for Environmental Impact Assessment - Approval for fire prevention and fighting profile - Issuance of Building Permits
Cambodia	There is a regulation of the Council for Development of Cambodia (CDC), The General Department of Customs and Excise of Cambodia (GDCE), Ministry of Commerce (MOC), Camcontrol Department, MLVT and the state/special city representative to station in the SEZ office and to provide “One-stop service” for the residents. (2005/ Special Economic Zone Act)	In each SEZ, the following administrative services are to be provided on-site <ul style="list-style-type: none"> - Company registration - Investment license - VISA - Work permits / Labor accounting - Customs inspections - Import-export permit
Philippines	One-stop function to be offered in the case for investment in the government-owned Special Economic Zone is guaranteed along with the Special Economic Zone Act (1995) as per Section 36 and carried out by the investment promotion agency of PEZA (Philippine Economic Zone Authority) which is under the Department of Trade and Industry (DTI).	Among the approvals required for business activities in the special economic zone, the following affairs can be addressed either through direct issuance or facilitation service made by the One Stop Shop Center (OSSC) of PEZA: <ul style="list-style-type: none"> - Business registration for receiving preferential incentives - Issuance of construction permits and completion inspection certificate - Import and export license - Special non-immigrant visa procedures - Environmental licensing procedures that can be simplified (by the Memorandum of Understanding between the Department of Environment and Natural Resources) - Exemption of local government business license procedures
Myanmar	As per Section 13of the SEZ Act, the role and responsibilities of the SEZ Management Committee is defined in that, based on the current law, the management committee is allowed to perform permissible administrative business as one-stop service. The staffs responsible for the administrative services for investors are dispatched from representatives of Customs, Trade Department,	At the OSC which is situated in the SEZ office, issuance of permits, licenses, and the registration certificate or the like can be performed. Specific OSC functionality is described as below: <ul style="list-style-type: none"> - Acceptance of the investment application form - Customs duties relating to the import and export - Customs duties and other tax refund procedures - Issuance of certificate of origin - Issuance of import licenses - Company registration

Country	One stop service provision system	Status and service contents
	Investment and Company Registration Bureau, Tax Department, Department of Labor, Immigration Bureau, the Ministry of Industry, the Ministry of Construction, and the Environmental Protection Agency, and performing services at One-Stop Service Center (OSSC).	<ul style="list-style-type: none"> - Registration of tax number, payment, refund of taxes - Issuance of work permits to foreigners - Factory workers registration, approval of the employment provisions (conditions) - VISA to expatriates and their families, residence permit, issued by the FRC - Acceptance of the application for registration - Issuance of construction permit and fire protection equipment - Quarantine operations - Approval of environmental protection - License related to the business of the other SEZ, the handling of the approval documents

(Source) JICA Study Team

(2) Enforcement policy to be considered for OSS system

1) Current conventional practice of license and permit provision outside Economic Zones and what are possible differences to be caused by BEZA's OSS

In reference to the prevailing administrative procedures for investments coming to outside EPZs/EZs/Private EZs, as well as to EPZs, the following diagram illustrations were attempted (See Figure 2-6, and 2-7).

Having those procedures in mind, PricewaterhouseCoopers Pvt Ltd (PwC) worked on system design road mapping for BEZA's OSS in October 2015. The followings are the suggestions highlighted for possible changes and/or eliminations on administrative procedures to be applicable through implementation of BEZA's OSS, and these observations are the base of shortlisting the services to be provided in BEZA's OSS.

Figure 2-6 Workflow of the Overall Procedure for Commencement of Commercial Operation of the Business by the Investor in Bangladesh (Outside EPZs/EZs/Private EPZs)

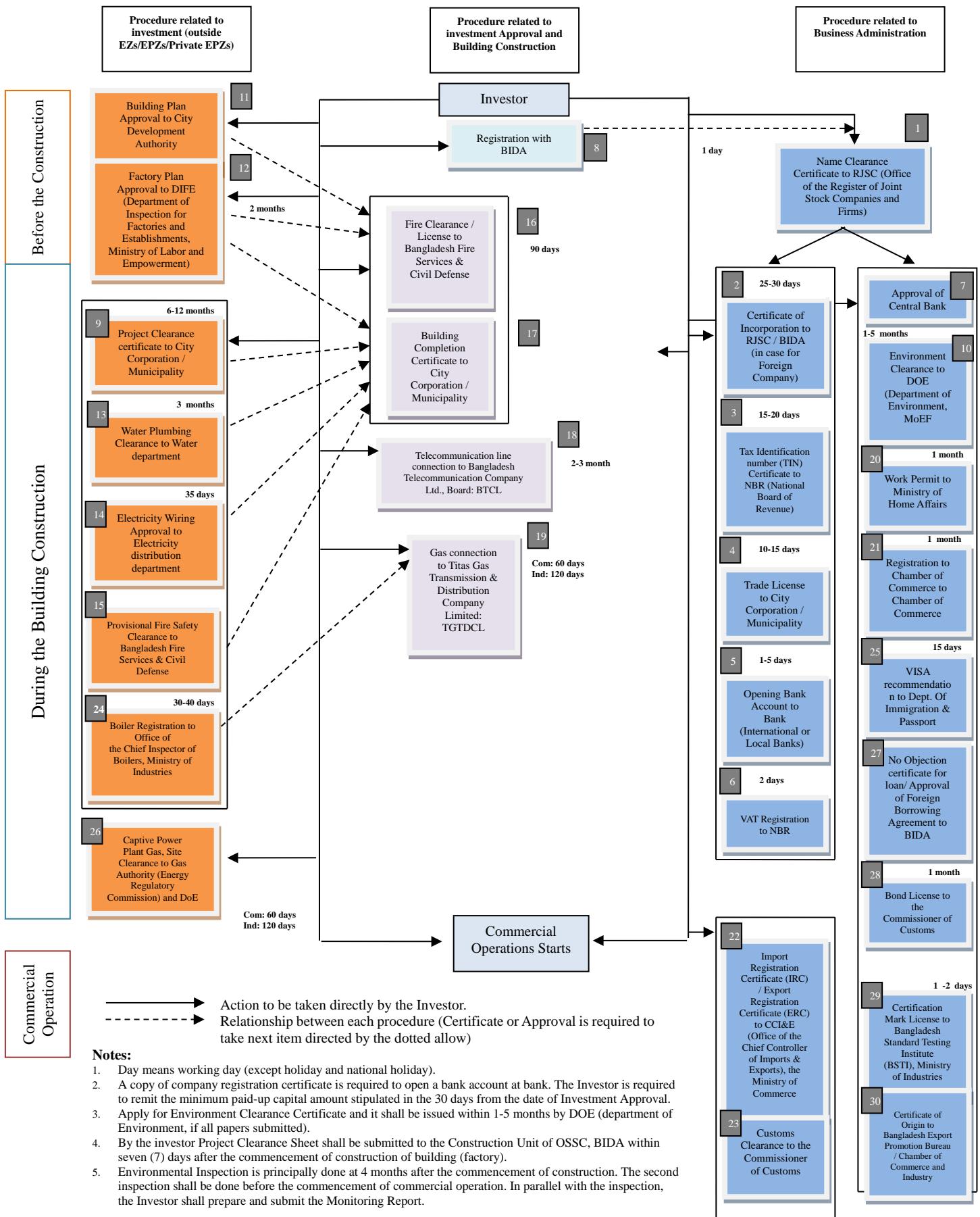
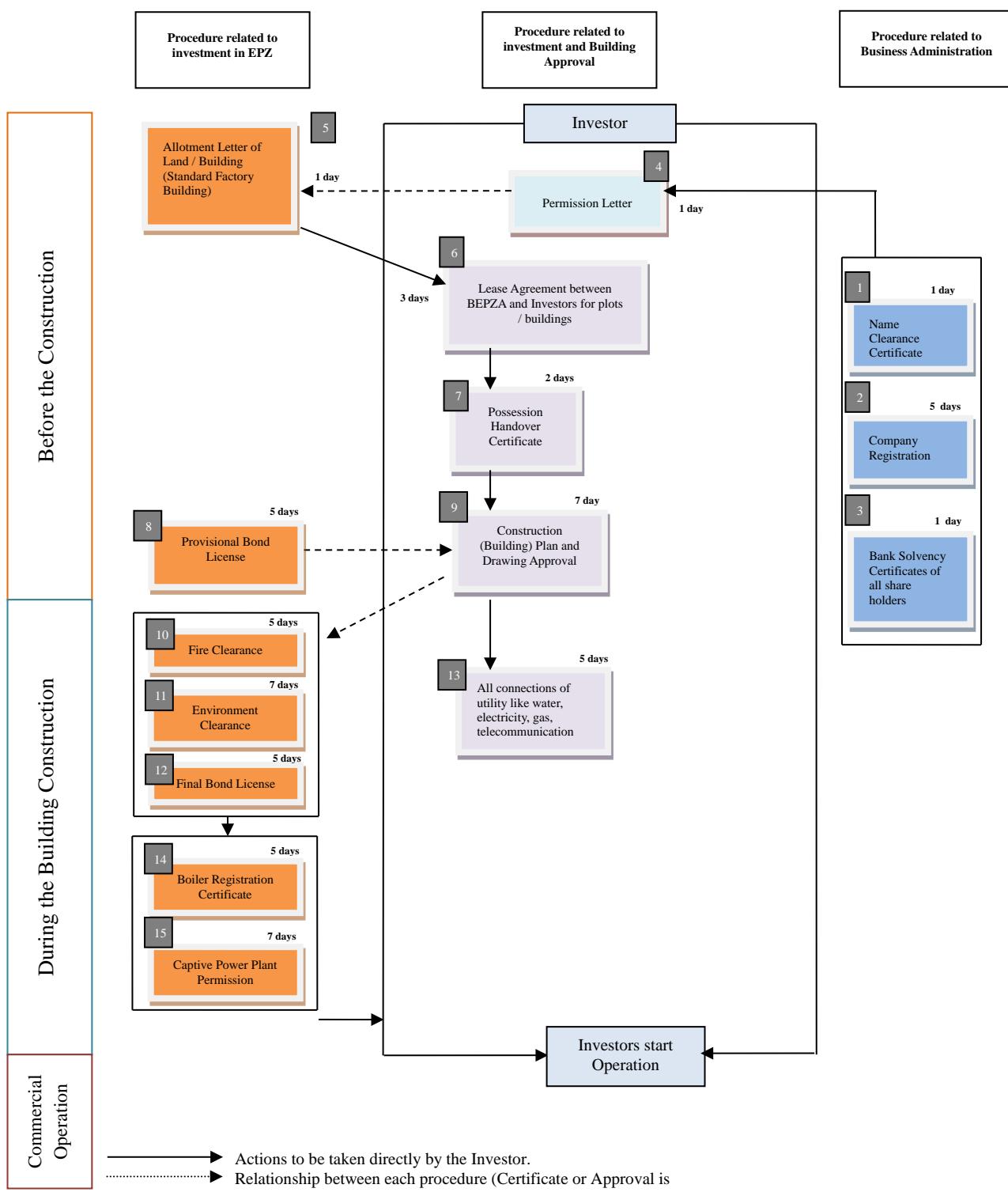


Figure 2-7 Traditional Workflow of the Overall Procedure for Commencement of Commercial Operation of the Business by the Investor in BEPZA of Bangladesh



Notes:

1. Day means working day (except holiday and national holiday).
2. A copy of company registration certificate is required to open a bank account at bank.
3. The Investor is required to remit the minimum paid-up capital amount stipulated from the date of Investment Approval.
4. Apply for Environment Clearance Certificate and will be issued clearance within 7 days by DOE (department of Environment, if all papers submitted).
5. By the investor Project Permission and allotment of plots/ factory building Sheet shall be submitted to the Construction within two (2) days after the commencement of construction of building (factory).
6. Environmental Inspection is principally done at 4months after the commencement of construction. The second inspection shall be done before the commencement of commercial operation. In parallel with the inspection, the Investor shall prepare and submit the Monitoring Report.

Table 2-9 Assessment of each clearance/approval

Approval/Clearance	Assessment	Developer	Unit Investor
Name Clearance	The name clearance process is already available on-line with limited scope of efficiency improvement.	Process is the same for the developer as well as the unit investors.	
Registration of the company	Registration process is also automated and there is limited scope to improve efficiency.	Process is the same for the developer as well as the unit investors.	
TIN certificate	TIN certificate can also be obtained online and there is limited scope of bringing in efficiency.	Process is the same for the developer as well as the unit investors.	
Trade License	<p>There is scope of bringing in efficiency in trade license process.</p> <ul style="list-style-type: none"> • Trade license process is not available online • In many cases municipal authorities do not define clear timelines and even in cases where timelines are defined, actual time taken is often more than the stipulated time. 	<p>Developer should be exempted from obtaining the trade license from the local authority. Instead the license granted by BEZA should be sufficient for the developer to undertake zone development.</p>	Unit investor may leverage the OSS services for obtaining trade license.
VAT Registration	<p>There is scope for bringing in efficiency.</p> <ul style="list-style-type: none"> • VAT registration process is currently not online • NBR conducts physical inspection of the site before making VAT registration. Time can be saved by providing VAT registration under BEZA's OSS. 	Both developer as well as the unit investor can benefit from the VAT registration services under OSS.	
Project Approval	BEZA will have the authority to provide approval on master plan of the EZ. Also, developer would require seeking approval from BEZA if there is any deviation in the master plan. For unit investors will also require approval from BEZA. This would be to ensure that the investment is in line with the agreed master plan.	Developer would require approval on its master plan or if there are any changes in the agreed master plan.	Unit investor would require approval from firstly the developer and then from BEZA to ensure the project is as per the agreed master plan.
Environment Clearance	<p>There is scope to bring in efficiency.</p> <ul style="list-style-type: none"> • Environment clearance is required for the EZ master plan as well as by the unit investor • The process/time line for obtaining Environment clearance for a unit investor can be re-looked if the planned unit is in-line with the master planned approved by DoE 	Both developer as well as unit investors can avail OSS for obtaining environment clearance. Developer can utilize the services for obtaining master plan approval, captive power plant etc. Whereas unit investors can utilize the services for obtaining factory plan approval and captive plant approval if required.	
Building Plan Approval	<p>There is scope for bringing in efficiency and it will reduce redundancy in the system.</p> <ul style="list-style-type: none"> • BEZA has its own building plan code. Hence, it should retain the right to assess whether the planned building is in-line with the guidelines • Also, BEZA intends to implement its own labor code and hence, by including building plan approval in its OSS, BEZA can eliminate the requirement of factory 	Developer should be exempted from obtaining building plan approval. However, BEZA would retain the right to monitor and ensure the building is as per the prescribed guidelines.	Unit investor would be required to obtain the approval from the developer. BEZA would monitor whether the developer is complying with the specified norms.

Approval/Clearance	Assessment	Developer	Unit Investor
	<p>registration with the DIFE</p> <ul style="list-style-type: none"> However, the responsibility of providing approval to Building Plan can be transferred on to the developer. BEZA can provide its Building Plan code to the developer and get agreement from the developer on its adherence. 		
Plumbing Plan clearance/Water connection	<p>There is scope to reduce redundancy and bring in efficiency.</p> <ul style="list-style-type: none"> In case of EZ managed and licensed by BEZA, developer will have the responsibility to provide and manage water supply Hence, it will bring in efficiency if developer is given the responsibility of providing clearance to the plumbing plan of the unit investor Liaising with other water departments would be restricted to bulk water supply. 	<p>Developer would not require approval on EZ's plumbing. However, BEZA retains the right to monitor whether the developer is complying with the prescribed guidelines.</p>	<p>Unit investor would be required to obtain the approval from the developer. BEZA would monitor whether the developer is complying with the specified norms.</p>
Electricity wiring clearance/Electricity connection	<p>There is scope to reduce redundancy and bring in efficiency.</p> <ul style="list-style-type: none"> In case of EZ managed and licensed by BEZA, developer will have the responsibility to provide and manage electricity supply Hence, it will bring in efficiency if developer is given the responsibility to provide clearance to the electricity wiring installed by the unit investor. 	<p>BEZA would be liaising with electricity generation and transmission department to provide electricity connection to BEZA. However, distribution of electricity would be the responsibility of the developer.</p>	<p>Unit investor would be required to obtain the approval from the developer. BEZA would monitor whether the developer is complying with the specified norms.</p>
Fire Safety Clearance	<p>Inclusion of fire safety clearance under BEZA's OSS would reduce redundancy in the system. Moreover, similar services are provided by other international OSS.</p>	<p>Both developer and unit investor can avail the OSS services following a common process.</p>	
Boiler Registration	<p>There is scope to bring in efficiency. Moreover, similar service is also provided by other Economic Zone development Authorities (like BEPZA).</p>	<p>Both developer and unit investor can avail the OSS services following a common process.</p>	
Captive Plan approval	<p>Governing Board of BEZA has provided BEZA the authority to provide approval for any captive power plant in the EZ.</p>	<p>Both developer and unit investor can avail the OSS services following a common process.</p>	
Visa Recommendation	<p>There is expected to be frequent requirement for visa recommendation. Hence, inclusion of these services would support to bring in efficiency.</p>	<p>Both developer and unit investor can avail the OSS services following a common process.</p>	
Work Permit	<p>There is expected to be frequent requirement for custom clearance. Hence, inclusion of these services would support to bring in efficiency.</p>	<p>Both developer and unit investor can avail the OSS services following a common process.</p>	
Custom Clearances	<p>There is expected to be frequent requirement for custom clearance. Hence, inclusion of these services would support to bring in efficiency. Moreover, governing board of BEZA has already provided BEZA to provide custom clearance in the bonded area.</p>	<p>Both developer and unit investor can avail the OSS services following a common process.</p>	

Approval/Clearance	Assessment	Developer	Unit Investor
NOC for Bank Loan	Unit investor would require an NOC before they receive any bank loan. BEZA should ensure that unit investors do not mortgage land for loan.	Both developer and unit investor can avail the OSS services following a common process.	

(Source) One Stop Services, PwC, 2015

2) OSS menus

BEZA started provision of OSS on the following 5 menus from November, 2016 to the unit investors. Namely these are 1) Project Clearance, 2) VISA recommendation¹⁵, 3) Work Permit, 4) Export Permit, and 5) Import Permit. A possible reason behind for the selection of such menus would lie in the simplicity for provision of such licenses and permits, where BEZA holds autonomous decisive mandate over their disposal. On the other hand, BEZA is working for provision of OSS for delivery of other licenses and permits through its domain, but it requires a certain coordination and mutual understanding between competent authorities.

As it was observed in the above there are concerned licenses and permits, which are pursued by BEZA for its OSS coverage (See Table 2-6), BEZA also envisages a road map to cover all OSS menus in a phased approach in that the following principle was shared with the JICA Team.

- The menus/items requested from prospective investors need to be prioritized.
- Available resources in terms of the number of competent government officers/staffs and budgetary allocation for effective operation of OSS need to be considered.
- Locational consideration (headquarter, zonal and on-site) should be also given for consideration of the provision of OSS, which shall be governed by the scope of business administrative works required in frequency on spot and level of delegation of the power for authorization.

In line with the above, the following licenses and permits are also being considered by BEZA as the first phase group of OSS coverage, with relative simplicity in coordination with competent authorities as well as in consideration of BEZA's autonomous governmental jurisdiction over these business administrations.

- a. Building Permit
- b. Clearance of Electricity Wiring/Plan
- c. Clearance of Electricity Plumbing/Water Connection
- d. NOC for Bank Loan
- e. Local Sales/Purchase Permit
- f. Sub-contract Permit
- g. Permission for Utility Connection

Moreover, reflecting from requests/opinions from prospective investors as well as Zone Developers/Operators¹⁶, the followings may be considered prioritized menus of OSS provision by BEZA.

- h. Certificate of incorporation (Register of Joint Stock Companies)
- i. VAT Registration (National Board of Revenue)

¹⁵ Separate service called “VISA Assistance” can be also provided for prospective investors who shall conduct field activities for their market studies and etc. in Bangladesh.

¹⁶ An association (Private Economic Zone Association: PEZA) was created to have discussions among Zone Developers/Operators regarding the tasks that must be undertaken in order to improve the framework of Economic Zone activities and summarize industry opinions.

- j. Trade License (Local Government Bodies)
 - k. Environment Clearance (Department of Environment)
 - l. Land lease and registration (National Board of Revenue)
- * () : Competent authorities

3) OSS operation

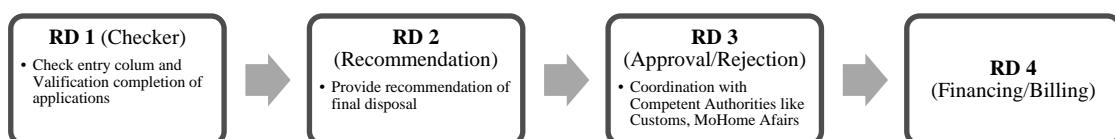
For the operational system deployed on the ongoing 5 OSS menus, the following scheme is being practiced. Since it is the first operational practice for BEZA to commence OSS provision, at the outset BEZA entered into MoU with a private firm, which poses a certain experience of conducting similar service for BEPZA and former-BOI, in designing and putting online the OSS platform where business administrative applications on the 5 OSS menus can be submitted. Such platform was rented and the applications submitted through such channel shall be ultimately processed by BEZA in the following manner as described below.

Table 2-10 Current OSS operational procedure on each clearance and permit

Menu	Actions
1. Project Clearance	BEZA receives an application form in conformity with the application forms applicable for the entry to EZ, and issue the clearance after its evaluation.
2. VISA recommendation	Once applications were received, recommendations shall be produced by BEZA and it shall be forwarded to Ministry of Home Affairs for its check-ups.
3. Work Permit	Once applications were received, the permit shall be produced by BEZA and it shall be forwarded to Ministry of Home Affairs for its check-ups.
4. Export Permit	Once applications were received, the permit shall be produced by BEZA and it shall be forwarded to Customs for its check-ups. The application form is the standard form used for EPZ operation.
5. Import Permit	Once applications were received, the permit shall be produced by BEZA and it shall be forwarded to Customs for its check-ups. The application form is the standard form used for EPZ operation.

(Source) JICA Study Team

The internal formality within BEZA for processing applications is designed as follows, and the Monitoring Information System is installed in that the Chairman of BEZA is supposed to be in charge of observing the entire operation of OSS system.



* RD stands for Regulated Desk

(Source) JICA Study Team

Figure 2-8 OSS operational system at BEZA

In accordance with BEZA, this is R&D stage and then once adequate experience was gained, the online platform together with ideal formatting of application forms shall be designed and

produced along with the new BEZA OSS Rules, and own system operation shall be managed. For the application fee, BEZA collects USD 500 per project for project clearance, and BDT 500 on the rest of 4 OSS menus for each application. There is no time-bound principle yet to be applied for the above 5 licenses and permits so far.

For the sake of the future system designing, it is advisable to consider preparation of operational system where the practice for envisaging the formulation of the universal application forms as well as the single payment system of application fees at an electronic platform should be considered by BEZA, and such system shall be prevailed in all investment projects into the Economic Zones through coordination with other competent agencies. So that the simplified, transparent and more efficient transaction/exchange of required information and business administrative applications can be pursued among industrial units, BEZA and other line ministries along with time-line management.

(3) Proposed items to be considered for the OSS system

In consideration of the above by taking significance and prioritized menus of OSS to be planned by BEZA, the following three subjects were reviewed in reference to the practices deployed by other countries, and the possible suggestions and presentation of action plans for formulation of efficient and practical procedures of such OSS menus were attempted.

1) Proposed items to be considered in Customs clearance procedures

The followings are possible suggestions in relation to customs clearance procedure of Economic Zone business administration, and those concepts should be considered and incorporated in the administrative document prescribing procedures as well as in the BEZA OSS rules.

- Although the procedure states that the Commissioner of Customs (Bond) may regulate the hours of business, scheduled time for an entry and an exit from the Economic Zones for the authorized persons, including the import-export of goods, it should be determined by the internal rules agreed between the investors and the Zone Developer/Operators, who ultimately owns responsibility of securing such transactions.
- The BEZA along with Commissioner of Customs (Bond) should prepare and present all forms of applications for related license and permits required for transactions of goods, along with associated procedures/rules, and those should be simplified, transparent and do not cause any difficulty for the control of those goods.
- There is also a need of description for local purchase transaction in that procedures, taxes or fees to be imposed for local commodities and products imported to the Economic Zones from all the other Bangladesh territories need to be prescribed.
- Particulars of building and construction norm related to security measures particularly on the height of boundary wall should be subject to relevant technical requirements stated in the applicable building and construction rules within Economic Zones, and such rules should be prevailed.
- For the placement of customs officers at the Economic Zone sites, it shall be determined in the request base from the Zone Developers/Operators and the Authority, as the case may be.
- The officers in charge of customs clearance procedures in the Economic Zones should carry out their duties as they are serving administrative business for the country, not for the Authority (BEZA). Hence all related administrative expenses should be covered by the line ministry, which governs the administrative business of customs clearance. And yet, administrative building and office should be provided by the Zone Developers/Operators.
- Required permits and clearance associated with the procedures for all economic transactions related to the Economic Zone business activities should be clearly listed and mentioned with time-bound principle.

Action plan

- Customs procedures in relation to the transaction of goods to/from the Economic Zones shall be enacted.
- All required licenses and permits for the transactions described above shall be listed in the BEZA OSS rules, together with the formalities of time-bound clearance for their applications.
- Formulate the application formats for such licenses and permits.

2) Proposed items to be considered in Building and construction permits procedures

The followings are possible suggestions in relation to building and construction permits procedure related to Economic Zone business administration, and those concepts should be considered and incorporated in the administrative document prescribing procedures as well as in the BEZA OSS rules.

- In principle, for the rules relating to buildings and construction in the Economic Zones, a reference to a planning consent and a building permit shall be ultimately construed by the Authority (BEZA). And to build a factory in Economic Zones, each company is required to observe the building guidelines stipulated by the Authority as a minimum requirement and to submit relevant drawings of the building to the Authority, including the access to a public area.
- However, those guidelines to be stipulated in the rules should not be out of touch with the standards of the BNBC, and if there was no and/or beyond the scope covered by the BNBC, such norms should be newly framed in the BEZA Building and Construction Rules in reference to the international norm and practices.
- Also BEZA Rules should be considered as a guideline, and the detailed specifications applicable for buildings and construction projects can be determined along with the contract to be made between Zone Developers/Operators and Unit Investors (Contractors) within the scope of such guideline.
- The rules should be framed with consideration of business administration required both at the time of the provision of building permits as well as in the stage of operation and maintenance of the buildings.
- The drawings to be submitted are required to clearly show the demarcation between factory site area and the public shared area.
- Ground floor level may be determined by the Authority (The same with side walk level).
- Although building area ratio was stipulated to be maximum 50%, it seems constrictive against international norm, and requirement of minimum 20% for openings is also restrictive in comparison to international standards.
- Floor area ratio of 600% is higher side, while other countries follow around 250% at maximum.
- A certain time bound clause against building permits may be additionally stated for building up a building within a period of time, while it states that within the period of 12 months at least up-to plinth level needs to be constructed.
- A set back norm from a dike and a drainage should also need to be stated.
- A set back norm of a fence from a road boundary as well as a dike and drainage should also need to be stated.
- Guidelines for any access to public shared area need to be stipulated along with considerations for road crossing open channel or other pipe system installation (ex. drainage, water supply, gas, electricity, and communications).
- A certain clause referring to separation of waste water drainage and rain water drainage system should be stated.

- More clarity is required for the requirement of setting up industrial solid waste management for individual plot in that industrial solid wastes are normally kept at each plot in temporary base and central solid waste management facility, which is mostly located outside Economic Zones, shall receive and treat those solid wastes in most of other countries.
- A certain clause referring to the procedures of a modification to existing buildings is required.
- A certain clause referring to requirements and standards parameter for discharging wastewater from Economic Zones to a public sewage system outside the Zones, as well as Ambient Air Quality and Maximum Permitted Noise Level needs to be stated.
- Legal procedures for applying and obtaining fire safety clearance and other certificate related to the jurisdiction of Fire Service and Civil Defense Department, as well as the environment clearance in association with Department of Environment, and building permits and occupancy certificate needs to be clearly stated.
- Building and Construction rules may need to separately address the development cases applicable for commercial and residential zones within the Economic Zones.

Action plan

- Study the particulars (in terms of Land use planning, Infrastructure development (civil engineering field), Architecture, and Environment) to be covered/described in the buildings and construction (Economic Zones) rules applicable both for Zone Developers/Operators and Unit Investors.
- Review the standard guideline of the particulars along with the BNBC and, for the particulars not being described in the BNBC, international norm should be considered if it is applicable.
- Formulate the application formats for Building permits and Occupancy Certificate in the BEZA OSS Rules along with time-bound principle.
- Preparation and enactment of the Buildings and Construction (Economic Zones) rules.

3) Proposed items to be considered in Environment clearance procedures

The followings are possible suggestions in relation to environment clearance procedure related to the projects within the Economic Zones, and those concepts should be considered and incorporated in the BEZA OSS rules prescribing its procedures.

- With a view to expedite the clearance procedure for EIA in relating to the applications evaluation for units investors in Economic Zones, the Environmental Clearances for EZs unit investors should be considered on a high priority.
- Individual units may be exempted from some procedures to obtain Site Clearance in cases where the Economic Zones having the Environmental Clearance as a whole has undergone their site clearance, in that the environment management standards based on the EIA must be observed by the companies located within the Economic Zones in the form of laying down the conditions mentioned in the Clearance. This concept can be supported, for instance, under circumstance that baseline data collection had been already made available by the Zone Developers/Operators for their clearance before unit investor's term.
- The examination of the Environmental Impact Assessment report for the individual units can be made along with the system where Environmental Impact Assessment procedures can be completed by submitting a simple Registration Form while safeguarding environmental standards and going through a screening, since mitigation measures to be deployed by the unit investors are in principle to follow the standard usage of common

environment facilities (CETP, CSTP etc.) available in the Zones, and the certain extent of responsibility to contain the adverse environment impacts remains in the hand of Zone Developers/Operators by the credential of Environment clearance issued for them.

- In case where the type of individual unit/process was not originally included as a part of the Environmental Clearance for the Economic Zone projects at the time of application of their business plans, a fresh Environment Clearance Procedure will be required for that individual unit/process at appropriate time.
- Formalities for monitoring and responsibilities for observing TORs specified in the Environment Clearance should be stated and the roles and responsibilities (together with fines or penalties) of the Zone Developers/Operates as well as the Unit Investors need to be defined along with the roles of BEZA and the Department of Environment and related parties.
- Facilitative instructions and guidelines may be issued by the Authority from time to time aiming at promotion of Economic Zones while retaining environmental integrity.

Action plan

- Review the clearance procedures to be regarded as duplicate/redundancy when an application of Unit Investor's business was fell in the scope of the full-fledged EIA clearance having been granted to the concerned Economic Zone project.
- Define the roles and responsibilities between the Zone Developers and the Unit Investors for integrity of mitigation measures on adverse effects on environment.
- Prepare the application formats for both Zone Developers/Operators as well as for Unit Investors (as the case maybe, a simple Registration Form for Unit Investors).
- Establish rules and operational system of monitoring the compliance against the TORs given in the Clearance.
- Define clearance procedures for Unit Investors through BEZA OSS Rules.

(4) General suggestions for the formulation of the OSS system at BEZA

In reference to discussions with BEZA and presented materials on BEZA's institutional set-ups by BEZA for OSS, the following suggestions were made with an ambition to contribute to practical formulation of OSS operational system at BEZA.

Formalities

- As BEZA has already envisaged, an administrative operational formalities like through BEZA OSS rules should be transformed into law for addressing the time-bound system of each clearance and licenses provision with specific days of issuance of such clearance and licenses.
- Internal regulatory framework applicable for the buildings and construction within the Economic Zone like through building and construction rules, on which regulators like BEZA and investors are deemed to be based for governing and developing projects within the Economic Zone, needs to be transparently and easily assessable for concerned parties, so that for the projects, as long as all criteria are met with such internal regulatory framework/rules, no objection from third parties, even from lines ministries can be claimed.

Human resource management

- As for the structure of OSS implementation organization, where focal point officers are stationing should not be an issue in technical term. But the critical element for the structural management for the efficient and effective focal point officer's work would be governed/manageable by the environment where his/her interest/motivation shall be protected and enhanced. In this regards, some measures to promote and constrain his/her motivation to facilitate or to neglect public services may need to be taken into

consideration. In other countries like in India, for instance, penalty and bonus system are applied like stick and carrot for those who are involved in processing applications for clearance and licenses.

- Consideration of a separate rule governing the salary, bonus and welfare program of the focal point officer, self-recruitment of employees by BEZA, treatment of collected administrative fee from applicants and its usage as a source of such salary, bonus and welfare program for the focal point officers and self-employees may also need to be addressed, along with a usage of BEZA Fund¹⁷.

Institutional set-ups

- Establishment and involvement of much supreme committee sometime called like Conversion Committee, which is comprised of all high-ranking secretaries of component authorities, may be necessary. The role of a supreme body/committee over OSS units is to impose orders to/coordinate with/trouble-shoot the difficulties to be encountered in connection with the acts of competent authorities. The other countries intentionally stipulate that the head of the government administration service (Chief Secretary or Principal Secretary) will eventually intervene and settle the issues caused in connection with the act of component authorities in the regime of SEZs/Industrial Zones.
- For attending to a critical issue for investors, which may need political intervention/decision for its solution, establishment of an instrument/mechanism to address and resolve such issues on spot may need to be considered from now on (In case of Cambodia, Trouble Shooting Committee, headed by Prime Minister, was formed at the time of commencement of SEZ program, and hot line communication among Investors, Zone Operators and Zone Regulatory authority (or Anti-corruption units) is often play an important role)

Key norms to be appreciated in OSS Rules

- Simplified EIA and subsequent clearance may be of value for promotion of Economic Zones in Bangladesh, since prospective investors would appreciate shorter period and less costly measures for environment clearance for project implementation, if the project is deemed to be formulated in an EZ, where full-fledged environmental clearance containing to accommodate such projects was already obtained.
- This time-bound concept/spirits is crucial before the presence of OSS. If possible, time-bound description of each licenses/clearances to be processed through OSS should be incorporated in the OSS rules to be subsequently formulated after OSS Act. The concept/rule of monitoring time-bound document transaction and adopting a system to provide a Deemed Provision by BEZA to commit the time-line of applications is indispensable.

Nature of OSS

- Service scope of OSS should be targeted to include three stages addressing the comfort issues of operating business for investors in Bangladesh Economic Zones; which are pre-investment, investment and post operation. In Southeast Asia, OSS operation covers three phases of project development for industrial units, which are pre-investment (before considering if industrial units comes to host country for their investment/project), during project implementation stage (after deciding to come to host country before operation of the project, and the services are mainly for clearance and license provision and its assistance) and post operation (after construction of industrial unit's factory/office and

¹⁷ This fund is referred in Bangladesh Economic Zones Act, in that all related revenue from economic zone activities and associated expenses are supposed to be dealt/managed through the usage of the Fund, and separate regulations are deemed to be formulated for its operational codes.

project operation, the services are trouble-shooting for major issues critical for going-concern of the projects). In the pre-investment phase OSS units in Southeast Asia could even provide investment climate information, match-making service for business partnership, and likes. In the post operation phase, trouble-shooting is the common practice served by OSS units in Southeast Asia. Consequently, BEZA should dully coordinate with BIDA and BEPZA for optimal OSS operation for industrial units to come to Bangladesh as a candidate/customer for the country.

- Administrative charges should be collected once for all; when applicants submitted an application at BEZA OSS office with necessary charges, there should be no more additional charges to be claimed by line ministries/competent authorities. Some statement needs to be made in legal form to prevent additions charges to be incurred by the investors at respective competent authorities' offices for getting administrative clearance and licenses.
- For investors, foreseeable future planning is utmost important to manage the costs to be incurred for their project implementation. Guaranteed time-bound for clearance and licenses related to their business and no delays caused by unexpected events are also important beside additional unexpected charges to be incurred in the process of obtaining such clearance and licenses.

Cooperation between Zone Developers & Operators

- Collaborative work relation between Private Zone Developers and Operators for the provision of administrative services through OSS should become important soon, because Private Zone Developers and Operators' service to attend to the formalities and preparation of application forms for clearance and licenses should be able to ease the workload of BEZA. Also some cases show that even Private Zone Developers & Operators are deemed to be able to provide a permit for a certain extent of investors' activities within the scope of their own risk management and responsibility (ex. In India, Site Plan and Building Plan for a project less than occupying 10 acre within a private SEZ can be granted by the Private Zone Developers & Operators).

Financial consideration over high performance of OSS

- In order to perform efficient operation of OSS in financially sustainable manner, consideration should be made if additional fees on top of the existing regime are required to run OSS at BEZA. Although disclosure of tariff/fee schedule is anyway necessary.

2.4 Incentives to tenant investors

The Bangladesh government envisions in Economic Zone development focusing on developing an environment where the convenience for business operation can be delivered, particularly from the view of private companies. In fact, the Economic Zone Act (Article 11 financial incentives) stipulates that the government provides equivalent fiscal incentives applied in accordance with the EPZ Act to tenant investors. Fiscal and non-fiscal incentives listed below were approved by the Governing Board in February 2015 and preferential treatment shall be applied to both Economic Zone developers and operators as well as tenant investors.

In an interview survey for the prospective investors who wish to enter into any Bangladesh Economic Zone, as an important requirement to consider the entry, securing land, the infrastructure development situation, the simplification of administrative procedures and the like are highlighted. Also in addition to fiscal incentives, many voices were heard to address convenience of administrative services in relation to Economic Zones. Through the Economic Zone program, as Government envisages a strategy to enhance linkage/ the supply chain building between industries in Economic Zones and the ones in DTA as well as to increase import substitution products, unique customs systems to allow smooth movement of goods, people, and

capital between Economic Zones and DTA is set, and then activation of the production activities and inspiration of linkage inside and outside of the industries of Economic Zones is pursued. Also as the transfer of the polluting industries into Economic Zones are deemed as an objective of the Economic Zone, CETP is regarded as an impetus to facilitate such transfers, thus the subsidy for setting up CEPT is also to be provided to the Economic Zone developer as an incentive given from the Government. For future challenges, the Government would need to consider how effectively and smoothly these incentives can be deployed to promote investment, as they are competing with other countries for attracting investors by pointing its comparative advantage. And it will be an important touchstone for measuring the effectiveness of incentives in the formation of attractive Economic Zone development projects, to which investment promotion of tenant investor will be applied.

(1) Comparison of the incentives in Economic Zones in other countries

In the figure below, comparison of the tax system and financial institutions that involve in the business between Bangladesh, India, and Southeast Asian countries was made. Subsequently, A comparison table on preferential treatment was created in accordance with the provision of incentives that has been practiced in the business scene and tenant investors have been enjoying in the industrial and economic zones of each country. When analyzing the incentives offered in the Economic Zone in Bangladesh in comparison to the other countries, the lease term of 50 years for an Economic Zone is the same as that prevailing in Southeast Asia, but is inferior to that of special economic zones in India. The exemption period for the Zone Developer in term of the corporate tax compared to other Southeast Asian countries, is superior¹⁸. However, as for the exemption period of corporate tax for the unit investors, while among the compared countries, there is a country like India which is offering 10 years of tax exemption period, Bangladesh only offers 3 years of 100% tax exemption, which follows by 80% in the forth years and the later at diminishing rate, and as far as the period of 100% tax exemption, Bangladesh is offering the shortest among the compared countries. About import tariffs, incentives to be applied to the export processing industry, is the same level in comparison with other countries. For the value-added tax, taxation to be applied to the utility service in the Economic Zone is exempted, and it is a unique measure representing the characteristic of supporting measures adopted in Bangladesh. And 100% of the dividend can be repatriated without tax imposition, as it is practiced in Vietnam, consequently, it can be viewed in a positive way from the prospective of investors. Furthermore, it should be noted that loose limit measures on employment of foreign employees can be evaluated as preferential treatment for foreign companies.

¹⁸ In the Southeast Asian countries, there is a background as to why tax incentives are not widely applied in recent years that is for participation to the international trade agreements like WTO, which demands that implementation of preferential tax systems should be avoided because such systems distort markets. In Vietnam, application of tax incentives was abolished in 2009. The tax incentives, in the Southeast Asian countries, have been applied only in particular industries or in specific area/regions.

Table 2-11 Comparison of tax and financial system

Tax / Finance	Bangladesh	India	Thailand	Indonesia	Vietnam	Cambodia
Income tax (effective tax rate)	27.5% (In the case of a stock listed company) 35% (Stock unlisted companies)	43.26% (in case of more than 100 million rupees / foreign corporation) (Varies depending on income)	30% (in principle) 20% (Until the applicable temporary legislation end by 2015 year-end)	25% (in principle) (Small and medium-sized corporation: 12.5%, Listed corporations: 20%)	22% (till the end of 2015) 20% (since 2016)	20%
Personal income tax	30% (Varies depending on income)	30% (4.42 million taka or more/ men of less than 65 years)	35% (In the case of income in excess of one million rupees)	20% (In the case of more than 4 million baht)	20% (In the case of foreign taxpayers)	20% (In the case of non-residents)
Domestic sales tax (VAT)	15%	12.5~14.5%	7.00%	10.00%	0~10.0%	10%
Tariff (average tax rate) (MFN apply)	16.80%	13.50%	11.40%	6.90%	9.50%	10.90%
Import duties other than customs duties (levied at the time of customs clearance)	Adjustment tax, supplemental tax, value added tax, prepaid income taxes, prepaid trade value-added tax	Anti-dumping duties, safeguard tax	VAT + Individual excise tax	VAT (10%) + prepaid income taxes (2.5%: API holder), etc.	VAT + Special consumption tax	Special tax + VAT
Withholding tax rates on dividends to Japan	10% (in case more than 25% of the shares is hold) 15% (Highest tax rate)	10%	10%	10% (Investment ratio of 25% or more)	0% (Tax-exempt)	14% (Highest tax rate)
Financing means of companies	No permission required from BoI and Central bank for foreign currency borrowing by the companies (100% foreign capital) in EPZ. However foreign currency borrowing is disabled as working capital.	Mitigation measure was recently taken for the usage of shareholder's loans as working capital. Also funding through capital increase is also commonly practiced.	Foreign currency funding is practiced through shareholder's loans, and baht-denominated loans is commonly made through local banks	Shareholder's loans is commonly practiced	Shareholder's loans are commonly practiced, and domestic funding is made through local branches of Japanese banks	Foreign currency borrowing and shareholder's loan are free to make between abroad. Therefore, investment (capital increase, etc.) from the parent company many borrowings from the parent company.

(Source) JICA Study Team in reference to JETRO, JETRO, WTO, ASEAN Center, and Investment Promotion Agencies in respective countries

Table 2-12 Comparison of incentives related to industrial development and tenant companies' activities

Incentives	Bangladesh	India	Thailand	Indonesia	Vietnam	Cambodia	Philippines	Myanmar					
Laws related to industrial parks/zones	The Bangladesh Economic Zone Act (2010) The Export Processing Zone Act (1980)	Industrial policy, laws and regulations relating to the Industrial Development Corporation by states	Special Economic Zone Act (2005) and related SEZ rules (2006)	Investment Promotion Act (1997) and Revisions	Industrial Estate Authority of Thailand Act (1972)	Presidential Decree 53 (1989) ¹ , Presidential Decree 41 (1996) and Rule (2009)	Investment law (2007)	Law on Investment (2006) and Decree No.108/2006/ND-CP	Decision No. 33/2009/QD-TTg concerning application of priorities in terms of tax and finance to enterprises investing in border economic zone (EZ) (enforcement from 1 May 2009)	No.147 (Sub-Decree No.147 on the Organization and Functioning of the CDC)No.148 (Sub-Decree No. 148 on the Establishment and Management of the Special Economic Zone)(2005)	Rules And Regulations To Implement Republic Act No. 7916, (The Special Economic Zone Act)(1995) -PEZA SEZ Republic Act No. 7227, or the Bases Conversion and Development Act (1992) -Subic Bay Freeport -Clark Special Economic Zone		
Implementing Agency	Bangladesh Economic Zone Authority: BEZA Bangladesh Export Processing Zone Authority: BEPZA	State Industrial Development Corporation	Department of Commerce, Ministry of Commerce and Industry	Board of Investment	Industrial Estate Authority of Thailand	Ministry of Industry and Trade	KAPET	Board of Management for Industrial Zones	Management Committee	Cambodia Special Economic Zone Board	Philippine Economic Zone Authority Olongapo city Angeles city	Special Economic Zone Management Committee	
Industrial Park/SEZ	Economic Zone EPZ	Industrial Area	SEZ	BOI Zone (No. 1 ~ 3 Zone)	Industrial Estate / IEAT Free Zone	Industrate Park	KAPET - Integrated Economic Development Zone	Industrial Zone	SEZ (including border economic zone)	SEZ	Special Economic Zone	Free Zone	
Lease Period	50 years	30 years	30~99 years (depending on States)	99 years	Freehold (sale in lots)	Right to build ("HGB") 30+20+30years (Max 80 years)	Right to build ("HGB") 30+20+30years (Max 80 years)	50 years	70 years	50 years	50 years (applicable to the extension of another 25 years)	50 years (may renew for 25 years)	
Application requirements	EZ developer (Foreign 100% possible) and EZ Unit (Foreign 100%, JV, National Capital)	Units (Foreign 100%, JV, National Capital)	Industrial park developers who meet certain requirements	SEZ tenants and/or SEZ developers	Subject to BOI decision	Goods and article used to contribute to the industrial activities, services business, etc.	Tenants in Industrial Park	Industries locating in KAPET	Subject to Board of Management for Industrial Zones decision	New investment business in the Economic Zone	Zone developers and/or Zone investors	Registered projects to a operating agency in a particular area	Particular businesses or businesses within special economic zone regardless of the distinction between the internal or foreign capital (Investor or Developer)
Corporate Tax	(EZ developers) - Corporate income tax exemption for 10 years within 15 years period from the year EZ license was granted and its counting starts from the first year when net earning was made. From 11th years the rate will become 70% and 12th years at 30% as reduction measures (EZ units) - 1st and 2nd year: full exemption, 3rd year: 80%, 4th year: 70%, the 5th year: 60%, 6th years: 50%, 7th years: 40%, 8th years: 30%, 9th years: 20%, 10th years: 10% exemption to be applied	(SEZ developers) The corporate tax exemption for export earnings for 10 years out of the 15-years (SEZ units) - 2 year exemption after the incorporation, after that, 3-4 years are 50% of the tax reduction, and 25% of the tax reduction in 5th year - 100% tax exemption (3~10 years) depending on States	For profit generated from export, corporate tax exemption for the first 5 years, then another 5 years is 50% exemption applied. Also further exemption shall be applied for the export earning from re-investment	- Based on BOI approval, depending on the different zones, 3 - 8 years corporate income tax exemption to be applied	- - In the case of Zone 3, further 50% reduction shall be also applied for five years after the exemption period	- - - - Mitigation of the withholding tax on dividends	Preferrential taxation for the industrial park tenant companies was abolished in 2009 by the Corporation Tax Law	(Zone developer) 9 years(Max.) (Zone investors) Same as Qualified Investment Project: QIP: tax exemption for the period of [Trigger period] + 3 years + [Priority Period] (Total up to 9 years)	(PEZA registered export companies) Exemption from Corporate Income Tax for four years, extendable to a maximum of eight years - After the ITH period, payment of the special 5% Tax on Gross Income, (Developer) Exempt of the income tax for the first 8 years from the start of business, 50% exemption of the second five years, 50 percent exemption again for the third five years, in case the profit which was obtained from the business was reinvested within one year in the business as a reserve fund.				
Import duties	(EZ units) - Raw materials, construction materials for project, production facilities and equipments and finished goods shall be exempted for taxation	(SEZ units) - Import duty shall be exempted for raw materials and parts purchased	Zone 1 / 2: 50% tax reduction for a machine which is applicable of import tariff of 10% Zone 3: duty free	※ Exemption in the case of export processing zones	- The reduction of import tariffs to 5% on capital goods and parts for the new business and business expansion (expansion of more than 30% of production capacity) - The reduction of import duties to 5% on raw materials and parts for the amount equivalent of two year production capacity (cumulative production period) - Exemption of import duties on capital goods, raw materials, and other equipment that are directly linked to manufacturing activities that can not be produced in Vietnam	- - Exemption of import duties for the period of two year period on the raw materia, goods, parts and semi-finished products that can not be produced in Vietnam	(Zone developer) - The exemption of import tax on equipment and construction equipment that are imported for infrastructure construction in Zone (Zone investor) - Tax exemption for production equipment, construction material as well as production inputs for export products - For Zone investors qualified for preferential incentives (clothing, sewing, shoemaking and supporting companies and subcontractors of these industries) the amount of value-added tax shall be recorded and eventually exempted, subject to the goods manufactured in such industries shall be exported into overseas countries. Otherwise import tax shall be imposed in accordance with the record.	Exemptions of customs duties and other relevant taxation for the import of raw materials for production, machinery instrument and necessary spare parts Exemption from duties and taxes on imported capital equipment, spare parts, supplies, and raw materials for production; construction materials and motor vehicles for building factory, warehouse and own office					

Incentives	Bangladesh	India	Thailand	Indonesia	Vietnam	Cambodia	Philippines	Myanmar
Customs Duty	<p>(EZ Developers)</p> <ul style="list-style-type: none"> - Exemption of duties on equipment and construction materials for the EZ development (EZ Units) - 100% sales permission of raw materials and accessories to DTA - 20% as ceiling sales permission of finished goods produced in EPA to DTA - Double taxation exemption 	<p>Duty-free export of production goods</p> <ul style="list-style-type: none"> - Double taxation exemption 	<p>- Refund to be applied in certain cases</p>	<p>- Exempted</p>	<p>- 50% tax reduction for machines, which are approved by BOI</p> <ul style="list-style-type: none"> - Exemption of duty on materials for export (varies from 1 to 5 years depending on zonal regions) 	<p>(Companies in the bonded area)</p> <ul style="list-style-type: none"> - Exemption of duty on the equipment and machinery for imported raw materials and parts 	<p>- Postponement of the import duties to capital goods, etc.</p> <ul style="list-style-type: none"> - Exemption of the prepaid taxes of import duty on capital goods, which are directly related to the production activities 	<p>(Investors in SEZ)</p> <ul style="list-style-type: none"> - Equal incentives to be applied as the cases of QIP
Value Added Tax	<p>(EZ Developer)</p> <ul style="list-style-type: none"> - VAT related to electric power and tax on electricity sales, taxes to be imposed when captive power or external power were purchased in the processing area shall be exempted (for 10 years) - Exemption of VAT and sales tax applied to all goods purchased from DTA, other than the purchase of petroleum products <p>(EZ Users/Investors)</p> <ul style="list-style-type: none"> - 80% reduction of the VAT imposed on infrastructure and utility fee that was used in the EZ 	<p>- Exemption of Central Sales Tax (CST)</p>	<p>- Exemption of Central Sales Tax (CST) and VAT</p>	<p>-</p>	<p>- Exemption of tax on production machinery and equipment</p>	<p>(Companies in the bonded area)</p> <ul style="list-style-type: none"> - Exemption of value-added tax on imported raw materials and parts 	<p>- Exemption of value added tax on capital goods, etc. related to the production activities</p>	<p>- Automatic stop measures of VAT taxation on imported goods of the following:</p> <ul style="list-style-type: none"> - Export-oriented QIP; construction materials, production equipment - Domestic market QIP; construction materials and production equipment - Machinery and construction equipment manufactured in SEZ then used in other QIP within the same SEZ
Excise tax	<p>-</p>	<p>-</p>	<p>Exempted</p>	<p>Exempted</p>	<p>-</p>	<p>Exempted for production machinery and equipment</p>	<p>Exemption of luxury goods sales tax on capital goods, etc. related to the production activities</p>	<p>-</p>
Other tax incentives	<p>(EZ Developer)</p> <ul style="list-style-type: none"> - Exemption of tax on Stamp Duty (at the time of EZ development only, to be applied at the time of subsequent lease) - Exemption of tax on dividends - Exemption of income tax to be imposed on infrastructure utility fee <p>(EZ Users/Investors)</p> <ul style="list-style-type: none"> - EPZ - Exemption of tax on dividends (during corporate tax exemption period and after) - Repatriation of capital and dividends is possible at 100% rate - 50% reduction of stamp duty in accordance with the lease contract - Relaxation measures for foreign currency-denominated loan arrangement - Relaxation of employment policy for foreign employees (up to 5% of the total number of employees) 	<p>- Exemption of tax on dividend during tax holiday</p> <ul style="list-style-type: none"> - Subcontracting is possible with subcontractors inside and outside 	<p>- Land ownership of the companies, of which the majority is the foreign company</p> <ul style="list-style-type: none"> - Foreign currency borrowing from abroad can be indefinitely approved up to \$ 500 million and related fees shall be exempted - Up to 10% of products (excluding clothing) can be sold to the domestic market - Up to 10% of the surplus raw materials can be sold to the domestic market ※ With the introduction of the new direct tax law (Direct Tax Code), taxation shall be now imposed on investment 	<p>(SEZ units)</p> <ul style="list-style-type: none"> - Work permits to foreigners required for business - Long-term residence permits for foreigners and their families needed for business - Foreign remittances of capital pertaining to a business, dividends, debt, interest, and license fees 	<p>Subject to the conditions such as regional and amount regions and investment amount, tax exemption can be applied to assets investment of specific industries. Deduction amount from taxable income shall be 30% in total of which 5% shall be applied for 6 years.</p>	<p>Exemption of custom duty, prepaid taxes, and value-added tax shall be applied to the products imported into the Free Trade Zone (FTZ) and interexchanged within the FTZ</p>	<p>- Preferential tax rate shall be applied to income tax of the companies locating in the high-tech park, etc. (10-20%). Applicable for 10-15 years</p> <ul style="list-style-type: none"> - For newly established company, tax exemption for the first 2 to 4 years, and 50% tax reduction applicable for 9 years - 50% reduction of personal income tax for the Vietnamese and foreigners who work in Special Zones - Sealed container can be transported to the border after customs clearance procedures performed in the special economic zones. At the border checkpoints, the customs export documents shall be submitted to customs office, then after receiving the confirmation, if there is no abnormality, export can be performed. 	<p>The developer and the investor of the Special Economic Zone shall be permitted to manage to retrieve the losses for five years after the year of losses incurred</p> <ul style="list-style-type: none"> - The actual expenses of conducting local training by the investor of the Free Zone to the skilled worker or semi-skilled worker or the staff of the management sector and providing the business research and development are deductible from the taxable income.

(Source) JICA Study Team in reference to JETRO, JBIC, ASEAN Center, and Investment Promotion Agencies in respective countries

(2) Administrative procedures of BEZA and related ministries/agencies

As described earlier, its effectiveness of incentives to be provided in Economic Zone can only be realized when an actual implementation of these facilities is performed. Since the presented incentives which Economic Zone developers & operators and tenant investors would be able to enjoy are all approved by the-prime-minister-chaired Governing Board of BEZA, there is no room for a doubt about its legal basis. However, smooth administrative procedures, namely from the viewpoint of timeliness as well as fairness, is significant. In other words, the administrative procedures that BEZA is supposed to manage in relation to customs, work permits, the central bank, and the local administration are important to drop in practical provisions such as a MoU between BEZA and each jurisdictional ministries. And further, an environment where mutual understanding and cooperation can be nurtured needs to be developed among the constituents.

Chapter 3 Economic Zone Development Guide

3.1 Positioning of Economic Zone development guide (tentative name)

With regards to Economic Zone related legislation, it revealed that current legislation is based on a result of a discrepancy between what the World Bank envisaged and what Bangladesh government wanted. World Bank held an idea that the legal systems governing Economic Zone development (both Private Economic Zone and PPP Economic Zone development) should be captured in legislation as Regulation. On the other hand, what the Bangladesh Government intended is that since each Economic Zone should be unique in development style, there should not be static regulations. Consequently, legal bases become complex in that the rules for Private Economic Zone Development is formulated in the Policy, and that of the PPP Economic Zone is separately stipulated in the Rules, 2014, by dividing and redrawing the contents from Economic Zone Operation Regulations, 2012, which was drafted through the technical assistance of World Bank.

Present situations tells that the Economic Zone related legislation is difficult in capturing the comprehensive features even among regulatory parties like BEZA, Zone Developers and Zone Users, and a document something like a guide to describe a whole set of Private and even PPP Economic Zone development procedures would be necessary as a reference document to be used among stakeholders. For the naming of such reference document, many alternative names can be considered like a handbook, or guide books, though the content of the reference document would not be lengthy but simplified, hence the name of “guide” is proposed among BEZA and the World Bank) Also from the results of discussions with the World Bank, it has been confirmed that any of private as well as the PPP Economic Zone development scheme and procedures should be collectively summarized and the creation of such reference document as the guide is welcomed.

Current legal documentation, which was supported by the World Bank, is perceived in a fragmented status in order to describe the whole scene of Economic Zone development. The document that all concerned stakeholders can overview the whole scene of Economic Zone development is currently needed from the point of view of the Economic Zone regulators, Economic Zone developers and Economic Zone tenant investors. This is the basic standpoint of why an Economic Zone development guide is formulated and this view is shared by the World Bank as well. Whereas the basic spirits and understanding, the work of the development of the guide is proposed to be made in consultation with BEZA, as a joint work.

3.2 Formulation of Economic Zone Development Guide (tentative name) (Draft)

In development of the Economic Zone Development Guide (tentative name) (draft), at first, laws and regulation documents related to special economic zones of other countries were reviewed and analyzed as useful references. In the analysis, institutional design and context that are defined as a requirement or necessary measure relating to the development and operation of SEZs / EPZs / IPs in other countries as well as in the Bangladesh EPZ are reviewed, and then checked if Economic Zone institutional and legal systems mention these points, and, if so, how these are prescribed.

This analysis is useful, for understanding the true nature of development and operation of the IP, as several changes and modifications through trial and error have been made in the legal system in Southeast Asia to transform the shape of industrial parks into internationally competitiveness IPs. In the process of changes and modifications, laws and regulations relating to the development and operation of special economic zones / industrial parks have been repeatedly amended to renew and develop a current legal system, and these amendments are perceived as necessary by the Southeast Asian countries as regulatory requirements in the legal provisions and in the institutional structure. We have captured such required items and necessary measures as a group of so-called “Best Practices”, and then the laws and regulations related to Bangladesh Economic

Zones were reviewed along with such requirement items, in order to organize the matters to be incorporated in the Economic Zone Development Guide.

It has proposed that the items of which confirmation in the laws and regulations in writing were not clearly captured, shall be consulted by carrying out the interview survey to BEZA or the World Bank, to confirm the contents, then incorporate them into an Economic Zone Development Guide (draft).

- (1) This section presents comparative analysis of the industrial park business, from the different perspective of development, operation, and from the point of tenants, between the context of Bangladesh, India and Southeast Asia for several key requirements.

In this section, in relation to the industrial zone business, a comparative study on the following institutional items was attempted in reference to the legal and institutional context of SEZ / EPZ and Industrial Parks in Bangladesh, India, and the Southeast Asian countries (See detail comparison sheet in the Appendix). From this work, extraction of the key institutional design and context as the best practices, which is being legislated with necessary legal institutionalization in India and Southeast Asia, was made in order to embed those items in the content of the Economic Zone Development Guide.

- a. Objectives and legal system of SEZ / industrial park development (main rationale laws, jurisdiction organization, the number of industrial parks, etc.)
 - b. Incentive (developers, tenants)
 - c. Development process (master plan, developers selection procedures, land acquisition, zoning, EIA, sales methods),
 - d. Infrastructure (off-site infrastructure development, on-site infrastructure)
 - e. Various business approvals and licenses (investment license to the tenant companies, licensing from other ministries and agencies),
 - f. Services provided in Economic Zone (customs duties, human resource development, etc.)
- a. **Objectives and legal system of SEZ / industrial park development (main rationale laws, jurisdiction organization, the number of industrial parks, etc.)**

Laws and regulations

Regulations for the sake of assurances of smooth business operation in Special Economic Zones together with infrastructure / service specification and regulatory standards of these provisions in industrial parks are necessary measures for ensuring a certain extent of quality of international standards of industrial parks and for attracting investment of international companies. The required guideline is developed in Southeast Asia, and it is clear for zone developers to follow. While Bangladesh has prepared a guideline for Economic Zone Developers, there is no specific standard and specification for infrastructure and industrial zone development, which zone developers are supposed to follow.

Jurisdiction organization

The practice of assigning competent authorities on industrial park development and management is different from country to country. But in Southeast Asia, the delegation of power to a single mandated organization is clearly legally stated under the name of the head of state with respect to industrial park development and management, so that any dysfunction of industrial parks coming from friction between ministries due to different jurisdictional matters can be avoided. The legal framework for Economic Zone development in Bangladesh is also based on this principle, and yet detailed regulatory/administrative jurisdictions among each department and ministry has not yet been formulated. In the sub-decrees, procedures of administrative operations

in relation to the development and operation of industrial parks for issuing various types of required approvals and licenses in line with required time-framework (the number of days required to complete) should be defined.

Number of industrial parks

In Southeast Asia, industrial parks developed by the private sector are recognized as the majority.

Location

In Southeast Asia, there is a mechanism available for selection of the project site to follow the national industrial park development master plan, which was prepared mostly through the use of ODA. In the national industrial park master plan, not only the linkage with the industry infrastructure, more comprehensive views of residential and commercial district development, as well as environmental issues including waste management measures shall be addressed, and such urban planning defines the application area of the industrial park in general. Hence the location of the individual business projects is also allowed in the scope of the master plan. In Bangladesh there is no national industrial park master plan, and Economic Zone development has been proceeded without a comprehensive land use master plan.

Geographical access factor

Both in South and Southeast Asia, there is a common tendency that the industrial park development is concentrated near the large cities, but the number of industrial parks/economic zones which have a good access to urban cities is limited in Bangladesh. The industrial park business in Southeast Asia is an extension of existing industrial areas/estates, while the focus of industrial area development projects in Bangladesh and India is on green-field projects.

Anti-corruption measures

In comparison countries, although there are no specific laws and regulations governing anti-corruption measures in the particular field of development and operation of industrial parks, there is no doubt that one of the significances of the establishment of special economic zone lies in suppression of corruption (reduction of opportunities in facing corruptive activities). This is, because of the fact that in the special economic zone activities there is a focal point of contact for processing the parts where corruptive activities may be encountered such as in customs clearance, various licensing and permission, and the institutional design of such SEZ is meant to be made for minimizing the contacts with the opportunities of corruptive activities for investors.

As for anti-corruption measures in Bangladesh, Anti-corruption Commission Act, 2004 has been formed, whereas legislation of anti-corruption measures in particular for the development and operation of EPZ is not institutionalized. On the other hand, there is an anti-corruption measure described in detail in the Bangladesh Economic Zones Guideline, 2015 where definition of corruption, denial of the proposal which was involved in corruption, and prohibiting activities that lead to legal measures, are defined.

It should be noted that, in Thailand and Cambodia, cooperation between the investment promotion agencies and anti-corruption monitoring institutions is set up with a hot channel through which the industrial park development and management company can quickly correspond to tackle the corruption cases without administrative barriers. In Bangladesh, although the provision of the anti-corruption measures is made in the economic zones developer's selection process, also for the reduction of corruption opportunities in customs clearance, and various licensing and approvals, provision of OSS thorough economic zone administration, and establishment of the hot line between Anti-corruption Commission and developer may be considered for its institutionalization.

b. Incentive (developers, tenants)

Incentives for private zone developers

In Thailand, Indonesia, and Vietnam, the public industrial park development scheme was initially predominated through initiatives from the central and local Governments, but the entry permit has been given to the private zone development companies since the 1990s, and the development by private players is progressing. In Cambodia, there is even a set of incentives given for private zone developers, same as set forth in Bangladesh.

Restrictions on foreign investment

Bangladesh allows even foreign companies to enter the industrial park development/special zone development. In the industrial park development and management business, more than licensing, there are needs for a wide range of field support along with the local business practices. Hence, it consequently becomes one of the responsibilities of local companies/partners to cater to such needs. As for the models of industrial park development in Southeast Asia, JVs between local/foreign capitals have been functioning as the common practice.

Incentives for unit investment

Thailand, Indonesia, and Vietnam offer incentives for investment when investment was made in rural areas as it is practiced in Bangladesh. There are tax benefits and non-tax benefits. The former is a tax-exemption of customs duties and corporate income taxes for certain foreign companies, and the latter may vary from the establishment of 100% foreign companies, land ownership rights to foreign companies, permission of foreign professional engineers, etc. As a set of tax incentives, a tax holiday period applicable in Bangladesh (10 years), in particular, is superior to those in Southeast Asian countries. However the applied reduction measures of 100% corporate tax exemption for 3 years is inferior to the ones applied in India and other Southeast Asian countries. Moreover the upper limit in the percentage of final product import from the Economic Zone into the domestic market is set to be 20%¹, and that is also inferior to the conditions set forth in other countries².

c. Development process (master plan, developers selection procedures/qualification, land acquisition, zoning, EIA, sales methods),

Master Plan

In every country, as a part of an authorization system for the private industrial park/zone business, a system to review their master plan is established. Through such system, the authorities are making efforts to ensure the quality of infrastructure and utility services to a certain level of those industrial parks/zones. Criteria to be set and reviewed in the description of the master plan in many countries are zoning, other physical infrastructure design, financial project evaluation, and environmental impact assessment, etc. In Bangladesh it is also similarly defined the equivalent items as the requirements to be described in the master plans (Policy, 2015 and Rules, 2014).

Selection and qualification of Zone Developer

Although it is practiced through PPP scheme in Bangladesh, the industrial parks/zones development models through public tendering method is not mainstream in many countries, rather

¹ For the EZ companies, 100 percent of their manufactured goods can be sold to Export-oriented enterprises in DTA at duty-free.

² In India SEZ, local sale to the domestic general customs territory after having paid the import tariff is allowed up to 50% of total exports, which is based on the FOB price. Although Indonesia reduced to 25%, previously there was a rule that allow the domestic sales of the equivalent up to 50%.

the industrial parks/zones development are mainly driven by the private sector initiative.

It should be also noted that with regards to the selection criteria/qualifications to participate in the development business, a model which Bangladesh envisages is quite different from the practices made in other countries in that there is no stringent entry barrier like the company scale and related business experience in order to filter the free entry of the private entities into the business of zone development and operation. Instead, there are provisions that as long as business applicants who wish to enter the business were fairly evaluated with the necessary selection process, an entry into the industrial / special zone business can be permitted.

In reference to the cases in Southeast Asia, many cases of industrial park/zone business are run even by corporations who do not have any experience in such business, but they are in association with experienced partner (JV, consultants, engineering companies) so that promotion of investment as well as smooth operation and management of industrial Park has been well conducted, hence the size of company and business experience can be a necessary condition for the success of the industrial / special zone business, but those are not necessary to consider to be a sufficient condition.

Land acquisition

It is common in Southeast Asia for private companies to purchase land under the land ownership system of the private sector businesses, and the acquisition of land by the private sector is assumed as the basis of industrial park development. In India and Bangladesh, institutional land acquisition by the state/local government has been a fundamental premise of industrial park/EPZ development; thus, there is a difference between the two cases of the acquisition method of development land and in the division of roles of the private and public sectors. Also in Southeast Asia, at the time of the land acquisition by the government, the central Government attempts to create a fund for the purpose.

Zoning

Since the industrial zone development by private companies is the majority, maximizing the profitability of the land is the core philosophy from the private sector viewpoint, while planning for use of non-profit land is mostly related to the area of regulations under public purpose infrastructure and utilities, hence regulations on zoning are specified as a rule in Southeast Asia³, where the system to comply with the set-forth guidelines is provided. In Bangladesh, there are no clear zoning rules for EPZ and Economic Zones, and there is likely concern that the zoning of the shared infrastructure such as power generation, substation facilities, wastewater treatment plants and logistics centers may be neglected.. Therefore, as practiced in Southeast Asian countries,, there is a need to create rules/guidelines for zoning for zone developers to follow and delegated authority to manage development of standard level of public infrastructure/utility service in the Economic Zone.

Also from the lesson learnt from the zoning regulations of SEZ in India, it was revealed that the zoning practice of dividing the processing zones into export-oriented and domestic market-oriented casts restriction for the zone developer's marketing activities with lack of flexibility in the sales policy of plots, and eventually failed in adjusting more plots for domestic market-oriented in accordance with the demand of the market. Due to rigid zoning policy restricting entry of those companies who look into domestic market into export-oriented area, thus, as in the case being practiced in Southeast Asia (Thailand and Indonesia), for accommodation of industries regardless of export-oriented or domestic market-oriented, processing zone is open for the processing industries, and each one of the different market-oriented companies can locate adjacent to each other. Consequently zoning policy of Bangladesh Economic Zone can be institutionalized with a design of enough flexibility responding to the needs of companies developing and

³ For example, up to 70% of the industrial park land in land-use planning (zoning) can be developed as industrial land, whereas the remaining 30% are determined to be used as such shared infrastructure and green zone (Indonesia).

operating in the Zone.

Environment impact assessment (EIA) for Zone Developer

For industrial park development companies, the implementation of EIA is required, to one extent or another, in all countries. Thailand seeks a stricter adaptation to environmental regulations. In Bangladesh, there is a norm that the EIA process can be expedited for Economic Zone development, and yet there is no clear legal description and stand-point as to how an overall EIA obtained at the time of Economic Zone development would impact an Economic Zone User's respective EIA procedures.

Environmental impact assessment (EIA) for unit investor

In the Industrial Parks in Indonesia and Vietnam, if the parks are granted the EIA clearance to move forward as an Industrial Park, a detailed EIA is not required to units/companies in the industrial park with a simple examination measures authorized by regulations. On the other hand, in India, an EIA clearance is the subject for each and every business of companies to be operating in the industrial zone, and EIA is the most time-consuming subject for investment approval, and it is the pending factor of investment approval in any places. It appears from this reality, that there is a need in Bangladesh to consider improvement measures on EIA Clearance on Economic Zone development and operation by examining the comparative advantage with other countries from the point of international investors.

Sales method

Sales methods vary from country to country but, the lease agreement of 50 years is common in Indonesia, Vietnam, and Cambodia, while there are some states in India providing lease terms of 99 years. Consequently, 50 years of tenure period at Bangladesh Economic Zone is not inferior to the applicable cases in Southeast Asia but similar standard as an attraction to investors.

d. Infrastructure (off-site infrastructure development, on-site infrastructure)

Coordination with departments in relation to linked infrastructure⁴ / utility development

In Thailand, IEAT is given the privilege of conducting development and operation of the industrial park, where all required coordination for services delivery and infrastructure facilities, even in private industrial park development projects, are given by IEAT. Whereas in Indonesia and Vietnam, representative focal institutions, which have a legal basis in bearing the obligation and mandate are deemed to support infrastructure development/utility services in collaboration with private zone developers through the Ministry of Commerce and Industry and Ministry of planning and investment respectively. In other words, the development authorities of industrial estates like BEZA in case of Bangladesh, as practiced in the Board members of IEAT, are mostly comprised of key ministerial members, such as the Ministry of Industry, the National Public Service Appointment Committee, the Ministry of Transportation, the Ministry of Defense, the Ministry of Planning, the Revenue Agency, the Tourism Bureau, that allows consultation and coordination for various other necessary infrastructures development among the committee which even includes two executives from private enterprises.

In Bangladesh, the coordination role of linked infrastructure development is supposed to lie in BEZA, but tangible legal legislations governing the authority and responsibility of such role is not yet formulated. For assuring establishment of link infrastructure, clear legal description of the role of the Government (for power, road, water, pollution control and labor etc.) is essential and with such institutional design and set-up among difference jurisdictions, the style of industrial

⁴ Referring to the infrastructure that connects the on-site infrastructure and off-site infrastructure of the industrial park.

parks development becomes special. The significance of link infrastructure should be earmarked and role of BEZA to coordinate with relevant government departments and authorities should be clearly defined as an important instrument for smooth establishment of the Economic Zone.

Power supply

Industrial Parks in Southeast Asia, in particular Japanese IPs, attract investor's confidence by offering a stable power supply system with Independent Power Producer (IPP) installation at their parks. However, from the business side, when the IPP business focuses only on tenant investors in the Industrial Park, the business should embrace risk in scale and buyers. Hence most of the IPP business is based on a condition that the surplus power from IPP (the amount of power that exceeds the demand in the IP) should be able to sell externally to power distribution companies in the region and ensure the economy of the business through a reasonable power purchase agreement with the power distribution companies. There is no case in Bangladesh where the industrial park operators themselves supplies electricity within their parks, and public electricity corporation is taking such role. But in the private EZ business, the power supply of its own is attempted to be practiced as the recent trend.

Electric power procurement method

Unlike Southeast Asian countries, captive power plants⁵ (including power backups) in Industrial Parks do not commonly exist in Bangladesh. This situation seems to come from the result of measures for IPP private operators to reduce their business risk, and for the regulatory authority on industrial zone not to hold duties and authority⁶ for development and delivery of power to investors as a clear mandate. While zone developers for Economic Zones are deemed to have the duty to set up required infrastructure, BEZA, as a regulatory authority, should have good legal bases and internal institutional organization to coordinate among relevant government departments and authorities for assurance of their development and supply of electric power.

Water supply

There is no significant difference between the water supply system of the industrial park operations in Southeast and South Asia, except in some industrial zones in India, the industries that use a large volume of water resources are not allowed for entry into the zone. Moreover there is a global trend to make imposition of recycling industrial water in industrial zone/parks. Water recycling is also encouraged through green technology in Bangladesh, yet a practical monitoring system needs to be installed with regulations.

Industrial water securing method

Industrial water supply system is not seen as a major difference between Bangladesh and Southeast Asia. But the privatization of the water supply project is advancing in Southeast Asia.

Sewage treatment

It is found that the concept of wastewater is somewhat different between Southeast Asia and South Asia in that sewage (domestic wastewater) and effluent (industrial wastewater) are clearly defined separately. There is a separate regulatory framework for the industrial wastewater and domestic wastewater, and the system design for treatment is also made assuming that the

⁵ In the case of Captive power plants, during initial power plant operation, the share of electricity sales within the zone is limited and electricity must be sold to outside the zone through the grid, herewith, a PPA with the power company needs to be entered..

⁶ IETA of Thailand is made to have the authority and responsibility to develop and provide the power infrastructure in the park, its board members are also elected from the electric authority, and with a system that any matters related to infrastructure development can be consulted and coordinated within the board. Also Vietnam industrial park management committee is given the authority from the prime minister to ensure all of the processing of the pending issues relating to the development of industrial parks.

treatment is going to be individually processed. At present it is extremely rare that a domestic wastewater treatment plant (centralized processing facility) is available in a Bangladesh industrial zone, and, it is rather common for individual units/companies to install their own treatment plants at their premises and process treatment by their own in accord with regulations.

Effluent treatment

In Thailand, Indonesia, Vietnam, and Cambodia, it has become a standard for an IP to equip a site with a communal industrial wastewater treatment plant from the outset of the development. The availability of a treatment plant that accepts both domestic and industrial wastewater after initial treatment at the plant is also the first and most important condition for units/companies to consider investment in the IP now.

The current situation in Bangladesh illustrates that, in the EPZ developed by the BEPZA, there are only a few EPZs that have industrial wastewater treatment facilities, and then otherwise individual companies have their own treatment facilities provided the company has enough space and expertise. If Bangladesh intends to install a captive Central Effluent Treatment Plant (CETP) in the future, Economic Zone is the ideal site for setting up such a utility that enables wastewater treatment on the assumption that industrial wastewater from unspecified industries can be treated collectively in accordance with the specified inlet standard, and CEPT, in such a development scheme, can maintain a release outlet in compliance with the provisions of the outlet standard, which should be stipulated by a competent authority like MoEF. In addition, Inlet criteria that have been set in the industrial park in the countries below, as well as a comparison table of the outlet standards in Bangladesh and India are shown as a reference.

Parameter for inlet effluent quality of CETP

	Standard (Concentration in mg/l)				
	India (Total discharge upto 25kl/day) VSIP (Vietnam)	IEAT Leamchabang (Thailand)	Amata Nakorn / Amata City (Thailand)	International Industrial Center (Indonesia)	Dhaka Export Processing Zone (Bangladesh)
pH	5.5 - 9.0	6.0 - 9.0	5.5 - 9.0	5.5 - 9.0	6.0 - 8.0
Temperature °C	45	40	45	45	30
Odour	-	-	-	-	-
Colour, Co-Pt at pH=7 / Chromaticity	50	-	-	-	300
BOD ₅ (20 °C) (mg/l)	400	500	500	300	266 - 371
COD (mg/l)	600	750	750	500	800 - 1112
Dissolved Oxygen (DO)	-	-	-	-	0
Suspended solids (SS) (mg/l)	400	200	200	200	262 - 341
TDS	-	3000	3000	2000	2700 - 3000
TKN (Total Kjeldahl Nitrogen)	-	100	100	-	-
Oil & Grease	20	10	10	-	-
Mineral oil and fat	-	5	-	-	10
Animal-vegetable fat and oil (mg/l)	-	16	-	-	5
Ammonical Nitrogen (as N)	50	8	-	-	-
Free ammonia (mg/l)	-	-	-	-	1
Arsenic (as As) (mg/l)	0.2	0.05	0.25	0.25	0.1
Barium (as Ba) (mg/l)	-	1	1	-	2
Blue methyl active compound (mg/l)	-	-	-	-	3
Boron (B)	-	2	-	-	-
Cadmium (as Cd) (mg/l)	-	1	0.05	0.03	0.03
Total Cadmium (as Cr)	-	-	-	-	0.05
Cyanide (as CN)	2	0.07	-	-	-
Cyanide (as HCN) (mg/l)	-	-	0.2	0.2	0.2
Chloride (as Cl ₂) (mg/l)	-	500	2000	2000	-
Residual Chlorine	-	1	-	-	-
Free chlorine	-	-	1	1	-
Chlorine gas (mg/l)	-	-	-	-	1
Chromium (VI) (as Cr ⁶⁺) (mg/l)	2	0.05	0.25	0.25	0.1
Chromium (III) (as Cr ³⁺)	-	0.2	0.75	0.75	-
Chromium (total) (as Cr) (mg/l)	2	-	-	-	0.5
Cobalt (mg/l)	-	-	-	-	0.4
Coliform	-	5	-	-	-
Copper (as Cu) (mg/l)	3	2	2	1	2
Electrical Conductivity	-	-	-	-	-
Fluoride / Fluorine (as F) (mg/l)	15	5	5	5	2
Formaldehyde	-	-	1	1	-
Iron (mg/l)	-	1	-	10	5
Lead (as Pb) (mg/l)	1	0.1	0.2	0.2	0.1
Manganese (as Mn) (mg/l)	-	0.5	5	5	2
Mercury (as Hg) (mg/l)	0.01	0.005	0.005	0.005	0.002
Nickel (as Ni) (mg/l)	3	0.2	1	1	0.2
Nitrate (N molecule) (mg/l)	-	-	-	-	20
Nitric acid (mg/l)	-	-	-	-	1
PCBs (Poly chlorinated biphenyl)	-	-	-	-	0.003
Pesticides	-	-	-	-	-
Pesticides: Organic Phosphorous	-	0.3	-	x	-
Pesticides: Organic Chloride	-	0.05	-	x	-
Phenol (as C ₆ H ₅ OH) (mg/l)	5	0.1	1	1	0.5
Percent Sodium	-	-	-	-	-
Silver (as Ag) (mg/l)	-	1	-	1	-
Scandium (as Sc)	-	0.02	-	-	-
Selenium (as Se) (mg/l)	0.05	-	0.02	-	0.05
Sulphate (as SO ₄)	-	-	-	-	-
Sulfide (mg/l)	0.2	1	1	-	0.05
Surfactants	-	30	30	-	-
Tin (mg/l)	-	-	-	2	-
Total iron	-	-	-	10	-
Total nitrogen	-	-	-	20	-
Total phosphorous	-	-	-	5	-
Dissolved Phosphorus (P)	-	-	-	-	-
Zinc (Zn) (mg/l)	15	3	5	5	5
Gross α activity	-	0.1	-	-	-
Gross β activity	-	1	-	-	-
Radioactive Materials	-	-	-	x	-
Alpha emitters, He/ml	-	10 ⁻⁷	-	-	-
Beta emitters, He/ml	-	10 ⁻⁸	-	-	-

Treated Effluent Quality of Common Effluent treatment Plant set forth in Bangladesh and CPCB, India

Inland Surface Water (Bangladesh)	Public Sewer (Bangladesh)	Irrigated Land (Bangladesh)	Into inland surface waters (India)	On land irrigation (India)	Into Marine Coastal areas (India)
6.0 - 9.0 40(5) 45(40)	6.0 - 9.0 40(5) 45(40)	6.0 - 9.0 40(5) 45(40)	5.5 - 9.0 -1	5.5 - 9.0 -	5.5 - 9.0 45
-	-	-	-	-	-
50	250	100	30	100	100
200	400	400	250	-	250
4.5-9	4.5-8	4.5-8	-	-	-
150	500	200	100	200	200
2100	2100	2100	2100	-	-
100	100	100	100	-	100
10	20	10	10	10	20
50	75	75	50	-	50
5	5	15	-	-	-
0.2	0.5	0.2	0.2	0.2	0.2
2	2	2	2	2	-
0.05	0.5	0.5	1	-	2
-	2	-	2	-	2
0.1	2	0.2	0.2	0.2	0.2
600	600	600	1000	600	-
-	1	-	1	-	1
0.1	1	1	-	-	-
0.5	1	1	-	-	-
0.5	3	3	3	-	3
1200	1200	1200	-	-	-
7	15	10	2	-	15
2	2	2	-	-	-
0.1	0.1	0.1	0.1	-	1
5	5	5	5	-	-
0.01	0.01	0.01	0.01	-	0.01
1	1	1	3	-	5
10	Undetermined	10	-	-	-
-	x	x	x	-	-
1	5	1	1	-	5
0.05	0.05	0.05	0.05	-	0.05
-	-	1000	1000	-	-
-	1	2	2.8	-	3
8	8	10	-	-	-
5	10	10	5	-	15

Source: Information by Bangladesh Atomic Energy Commission

Sewage/effluent treatment method

Common wastewater treatment facilities capable of processing both domestic wastewater and industrial wastewater simultaneously are available in the IPs of Southeast Asia. Each individual unit/company does not need to install independent treatment facilities, otherwise individual companies must treat initial wastewater before discharging into common sewage treatment plants in line with regulatory standards specified by zone developers. In this regard, there is a difference in the system design for wastewater treatment between Bangladesh and Southeast Asia. In order to introduce such a system, as an Economic Zone developer's businesses, the installation of a common sewage/effluent treatment plant should become compulsory, and the provision of wastewater treatment services to the tenant companies is deemed necessary.

Industrial waste disposal

The processing scheme of industrial waste in the IP does not differ between South and Southeast Asia. But the location of the industrial waste treatment plant is not in conjunction with the IP development by region in Bangladesh. Consequently, it seems that business planning and systems design are often required in advance for factory investment.

e. Various business approvals and licenses (investment license to the tenant companies, licensing from other ministries and agencies)

Zone development approval

In Southeast Asia, the structural reform is well advanced, and the organization to provide development approval is specified as the authorized focal point of industrial park development. This is based on the rules, procedures, and conditions predetermined in relation to the required infrastructure/services that are necessary for an industrial park. These organizations are established as the empowered bodies to perform competent approval and licensing in charge of industrial park development and operation. The development approval of land in the industrial park for the purpose of investment promotion and sales of land is facilitated in Thailand, Indonesia, Vietnam, and Cambodia, through efficient licensing systems focused on how speedy/how efficiently the development period can be minimized. Also it can be highlighted that there is a unique feature in those countries, making it possible by preparing basic information provision to private developers through guidelines and various infrastructure standards (including Building and Construction Code). In Bangladesh, although licensing system is defined as a rule, practical competence of such licensing agency needs to be assessed as a future issue⁷.

Conditions for tenancy

As a condition for entry into the Industrial Park, most of all units/companies, except the industries enlisted in the negative list, are expected to be allowed for the entry to the Industrial parks. Although there are restrictions for the industries which consume large volume of industrial water or release effluent discharge, there is little difference in its conditions for tenancy to the Industrial parks. Yet for the EPZs, cases can be seen like the balance of import and export amount needs to be positive as a condition of tenancy. For SEZ, where the foreign manufacturing industry can sell finished products to a certain extent even to the domestic market of the host country, since many manufacturers has started to consider a domestic market in Bangladesh as their key market, entry conditions for Economic Zones should match with the demand of investors that aim to advance into the Bangladesh market.

Lease/Resales possibility

In Bangladesh, the transfer/resale of the industrial land for EPZ use is strictly regulated. In practice, it is nearly impossible for a company to resell or transfer the land title to a third party. However, the land property of the Economic Zone developed by the private sector can be resold or transferred to the third party as long as such transaction was permitted by the regulatory authority as it is stipulated in Economic Zone Policy and Operational Regulations, and it is practiced in Southeast Asia. However, the legal provision of transaction price is not clearly stated whether the market price at that time or the initial price of lease contract shall be applied. Consequently, it becomes a quite critical measure in contributing to the improvement of liquidity/assets for the industrial zone development business by the private parties. In addition,

⁷ For building standards in the Economic Zone, the Housing and Building Research Institute (HBRI) under the Ministry of Public Works develops a draft of Economic Zone Building and Construction Policy, based on the Bangladesh National Building Codes (BNBC). On the other hand, there is still not an adequate practical experience in BEZA in order to interpret the rules, and process its approval or rejection of the master plan to be submitted by each EZ developers. Therefore, for the licensing business related to building permits, it seems to be necessary to devise a better process like the collaboration between BEZA and HBRI.

re-use of the particular plot in the zone needs to be rationally permitted in that the company carrying out a business in the parcel of land can be replaced with other companies/businesses due to sophistication of industrial structure in the country or course of the business, so that resale of land mechanism for private companies is considered important. In other words, even in achieving the "metabolism" of the industry running in the industrial park, introduction of a system with which zone plot can be smoothly traded among any interested industrial buyers becomes crucial. On the other hand, at the time of the sale of zone plot, a certain preventive measures again land speculation needs to be installed in advance, so that the productive activities will not be disturbed. For example in India and Southeast Asian countries, at the time of the sales agreement of the particular zone plot, there is a clause incorporated that the company needs to develop a factory within a certain period of years, then the period is also set for commencement of factory operation after the completion of the factory. Accordingly to the agreement, in case the company could not either finish factory development or start operations within such agreed periods, the zone plot shall be retrieved at cost.

Regulations and conditions regarding financing

There was a stringent restriction for applicability of foreign borrowing in Bangladesh as well as restriction of the uses of loans from the parent company, which is so-called "parent-subsidiary loan," where funds are provided to an overseas subsidiary via a parent company is observed. As a result, there is a significant difference in financing regulation over foreign currency between Bangladesh and Southeast Asia. On the basis of it, it is analyzed that certain incentives that are similar to existing EPZ are also applicable in the Economic Zone, and with regard to short-term borrowing, even though the authorization from the central bank is normally required, in case for the companies locating in an Economic Zone, without obtaining it, the short-term borrowing can be used even for working capital. As for the long-term borrowing, BEZA is now considering to offer an OSS to give authorization, instead of going though the central bank..

Labor: dismissal policy

Upon dismissal of workers, there are rules set forth in the compared countries with a request of prior notice to the workers, and a system of dismissal allowance is also clearly stated. At the same time, in all countries in concern, there is a provision of cases where such dismissal allowance policy can be subject to denial due to dishonest act and the likes.

Any other permit, building permit, operation permit

Tenant companies often face difficulties in obtaining permission and approval from the different jurisdiction ministries and departments at each stage of project development like in plant design, civil engineering and building construction, and equipment installation. In Southeast Asia like in Thailand and Cambodia, an administrative outpost is available at even private industrial parks where government staff members are dispatched and stationed as full-time employees and process business administrations to carry out timely and efficient licensing for the benefit of investors. Whereas most of the factory construction licensing and operation licensing of tenants are often subject to the business services of industrial zone developers and construction companies, and it is a commonly practiced assistance to the tenant companies. As for the Economic Zone in Bangladesh, the licensing procedure for zones' development projects was clearly defined in the suspended Regulations, 2012, thus the business of government staff was clearly defined. However, at present, there is no administrative procedure defined in the current institutional design and framework so far. Eventually, in cooperation with Economic Zone developers, it is believed that BEZA should practice legitimate OSS through tangible legal set-ups so that such systematic operation would lead to the satisfaction of unit investors.

f. Services provided in Economic Zone (customs duties, human resource development, etc.)

Customs duties / procedure

As for the customs clearance practices, different methods, in particular, are not observed so far between South and Southeast Asian countries, in Bangladesh, Statutory Regulatory Orders are prepared by the National Board of Revenue as to the customs business in the Economic Zone. But the customs offices are often established in a number of individual Industrial Parks like in Thailand, Vietnam and Cambodia, so that the efficiency of logistics by having customs offices at remote sites is taken into consideration. Establishment of customs offices is not specifically stipulated in the Bangladesh Economic Zone Act, yet it should be naturally interpreted that, once the volume of transaction increased, BEZA should coordinate with the Customs Office through a MoU for establishment of Customs Office at site with aiming for transparent and smooth service provision.

Residential/commercial establishment

Housing supply for industrial park workers is sometimes one of the encouraged policies in many countries. But in practice, whether it leads to residential and commercial development adjacent to industrial parks depends on the cultural patterns for housing and marketability at the individual project site or country. However, it is also a fact that residential and commercial facility development in Southeast Asia has become an important source of revenue for the industrial park developers. Township development, along with the associated implementation measures of public services and surrounding social infrastructure, has become a successful model by creating synergistic effects in Indonesia, Thailand, and Vietnam. Township development around the IP in Southeast Asia brings about a rich social life in terms of community infrastructure and urban development, which, in turn, offers additional business opportunities as well as a better social life to the workers in the IP.

Human resource development

In order to improve the productivity of workers in the IP, industrial parks have become a place of practical human resource development to encourage employees and local people involved in vocational training in each country. In Bangladesh, in order to increase the stability of the workforce in the region, a Tool Room in association with an Economic Zone developer should be considered to deliver a curriculum where hands-on training of the machine tool and production management can be provided, so to serve as measures to facilitate the competitive advantages of industries.

(2) Implication on the current Bangladesh Economic Zone development legal system

As mentioned above, in comparison with the case of India and other Southeast Asian countries, an overview of the current Bangladesh Economic Zone development and management legal system was analyzed in that there are still some uncertain and advising points to be addressed in the process of formulating the guide under present legal set-up as follows.

- No special rules and procedures for **Environment Clearance** formulated
- No Economic Zone **construction and building** guidelines formulated
- Detailed regulatory / administrative **jurisdictions among each department and ministry** has NOT yet formalized
- **No national EZ master plan**
- **No zoning policy**
- No legal binding/responsibility of government on **Link Infrastructure**
- No clear statement of **on-site custom office**
- **Electric power generation and distribution operation** in Economic Zone

- through private initiative (IPP) must be carefully structured with proper incentives and regulations
- There is no concept of **CETP with clear set of outlet standard** in reference to existing guideline set forth by MoEF
- NO tangible set of rules on **labor force (Human resource) training program** on EZ
- Weak legal binding formulated for **delivery of OSS** in relation to competent agencies
- NO special financing arrangement on **foreign currency borrowing** in EZ
- **Inferior tax incentive and condition for tenancy** in comparison to Southeast Asia.

(3) Compilation of Economic Zone Development Guide (tentative name) (Draft)

In the preparation of the Economic Zone Development Guide (draft), as stated above, references (best practice) are withdrawn from the system being applied in other countries in development and operation of the SEZ / Industrial Parks, so that the practical institutional design and context which organize the system of forming SEZ / Industrial Park development and operation to be attractive are studied. Then those institutional design and context as per the current context of the legal system of the Bangladesh Economic Zone development and operation were put together, and a reference document was created in the form of Guide. Since there are gaps in comparison between the best practices in other countries and ones in Bangladesh, as an appropriate measure for its improvement, it should be noted that the nature of the Guide should also lie in periodical revision. For example, building standards in the Economic Zone, which was formulated by HBRI⁸ and approved by the Governing Board of BEZA, as well as the outlet standards from the sewage/effluent treatment plant in the Economic Zone should be incorporated in the revision of the guide to be catered by BEZA with necessary coordination and consultation.

Consequently, based on the basic discussion with BEZA, Economic Zone development guidelines (draft) was developed as attached to this report in Appendix. The idea used for preparation of the table of contents for the guide was discussed with BEZA and the following principle was agreed as per the below matrix. Accordingly, as the possible users of the guide, EZ regulatory agencies, EZ developers and EZ tenants/unit investors are considered, and the chapters and the sections of the guide are well organized so that each user's needed information can be comprehensively and easily obtainable.

⁸ the Housing and Building Research Institute (HBRI)

Table 3.2-1: The idea used for preparation for the guide

	From the point of an Economic Zone regulator	From the point of an Economic Zone developer	From the point of an Economic Zone unit investor
Legal aspect	<ul style="list-style-type: none"> • What is an Economic Zone • Legal system • Legal base of Authority and its role • Purpose of development • Internal regulations • Incentives <ul style="list-style-type: none"> □ Chapter 1 (Economic Zone Concept), Chapter 2 (Institutional Framework), Chapter 7 (Tools for Economic Zone Projects) 	<ul style="list-style-type: none"> • What are the rights and obligation • The way of participating in the Economic Zone development project • Qualifications as Economic Zone developer <ul style="list-style-type: none"> □ Chapter 3 (The Economic Zone Development Process and Contractual Consideration), Chapter 5 (Tender and award process under PPP scheme) 	<ul style="list-style-type: none"> • Conditions for tenancy • What are the incentives to be given <ul style="list-style-type: none"> □ Chapter 6 (Starting a Project in Economic Zone), Chapter 7 (Tools for Economic Zone Projects)
Development aspect	<ul style="list-style-type: none"> • Synergy with other national projects • Development scheme through Private Economic Zone and PPP Economic Zone • Development license and its suspension(Private Economic Zone) • Tender process (PPP Economic Zone) • Rights and obligation of Economic Zone regulator and Economic Zone developer <ul style="list-style-type: none"> □ Chapter 3 (The Economic Zone Development Process and Contractual Consideration) 	<ul style="list-style-type: none"> • Procedure to obtain Economic Zone development license • Required document for the License • Master plan (zoning, infrastructure development plan) <ul style="list-style-type: none"> □ Chapter 3 (The Economic Zone Development Process and Contractual Consideration), Chapter 4 (Master Plan and Feasibility Study) 	<ul style="list-style-type: none"> • Procedure for factory construction • Status of OSS <ul style="list-style-type: none"> □ Chapter 6 (Starting a Project in Economic Zone), Chapter 7 (Tools for Economic Zone Projects)
Operation aspect	<ul style="list-style-type: none"> • Monitoring method • Contents of OSS • Concerned ministries and authorities <ul style="list-style-type: none"> □ Chapter 3 (The Economic Zone Development Process and Contractual Consideration), Chapter 7 (Tools for Economic Zone Projects) 	<ul style="list-style-type: none"> • Price setting of utility services • Sales method <ul style="list-style-type: none"> □ Chapter 3 (The Economic Zone Development Process and Contractual Consideration), Chapter 4 (Master Plan and Feasibility Study) 	<ul style="list-style-type: none"> • How to obtain incentives • Procedure to enter into Economic Zones <ul style="list-style-type: none"> □ Chapter 7 (Tools for Economic Zone Projects)

(Source) JICA study team

This guide is divided into seven main chapters:

Chapter 1: Economic Zone Concept provides an overview of Economic Zone principles and the necessary preconditions.

Chapter 2: The Institutional Framework describes the role and function of regulatory authority of Economic Zone project

Chapter 3: The Economic Zone Process describes the different stages in Economic Zone development, with necessary information and required procedures as well as contractual considerations given to Zone Developer

Chapter 4: Master Plan and Feasibility Study provides an overview of the elements to be included in an Economic Zone plan.

Chapter 5: Tender and award process under PPP scheme describes the procedure for appointing Economic Zone Developer under PPP scheme

Chapter 6: Implementing a Project in Economic Zone and residing in Economic Zone

Chapter 7: Tools for Economic Zone Projects provides facilitation tools (One-Stop Service and

Incentives) for Unit Investors

(4) Hearing from the private sector about the Economic Zone Development Guide (draft)

In the preparation of the Economic Zone Development Guide (draft), the draft was circulated to the following economic zone developers as well as to the Chamber of Commerce and Industry as a process of soliciting opinions from concerned parties. But so far, noticeable comments have not been raised.

Economic Zone Developers (Pre-qualification licensee)	Chamber of Commerce and Industries
- AKK EZ	- Japan Bangladesh Chamber of Commerce and Industries (JBCCI)
- Meghna EZ	- Federation of Bangladesh Chamber of Commerce and Industries (FBCCI)
- Abdul Monem	
- Aman EZ	
- Bay EZ	

(5) Development of an Economic Zone development guide (final)

For the preparation of the Economic Zone Development Guide (final draft), in the draft proposal, as the future works for BEZA, there are earmarked indications in orders for BEZA to specify draw detailed regulations and separate policies to respond to the foreseeable practical inquiries as to clarifying uncertain elements which may lead to future confusion for proceeding both Economic Zone development as well as operation of tenant companies.

Chapter 4 Basic Development Plans for Short-term EZ Development

Work flow for the formulation of Basic Development Plans is as shown in Fig. 4.1-1 below.

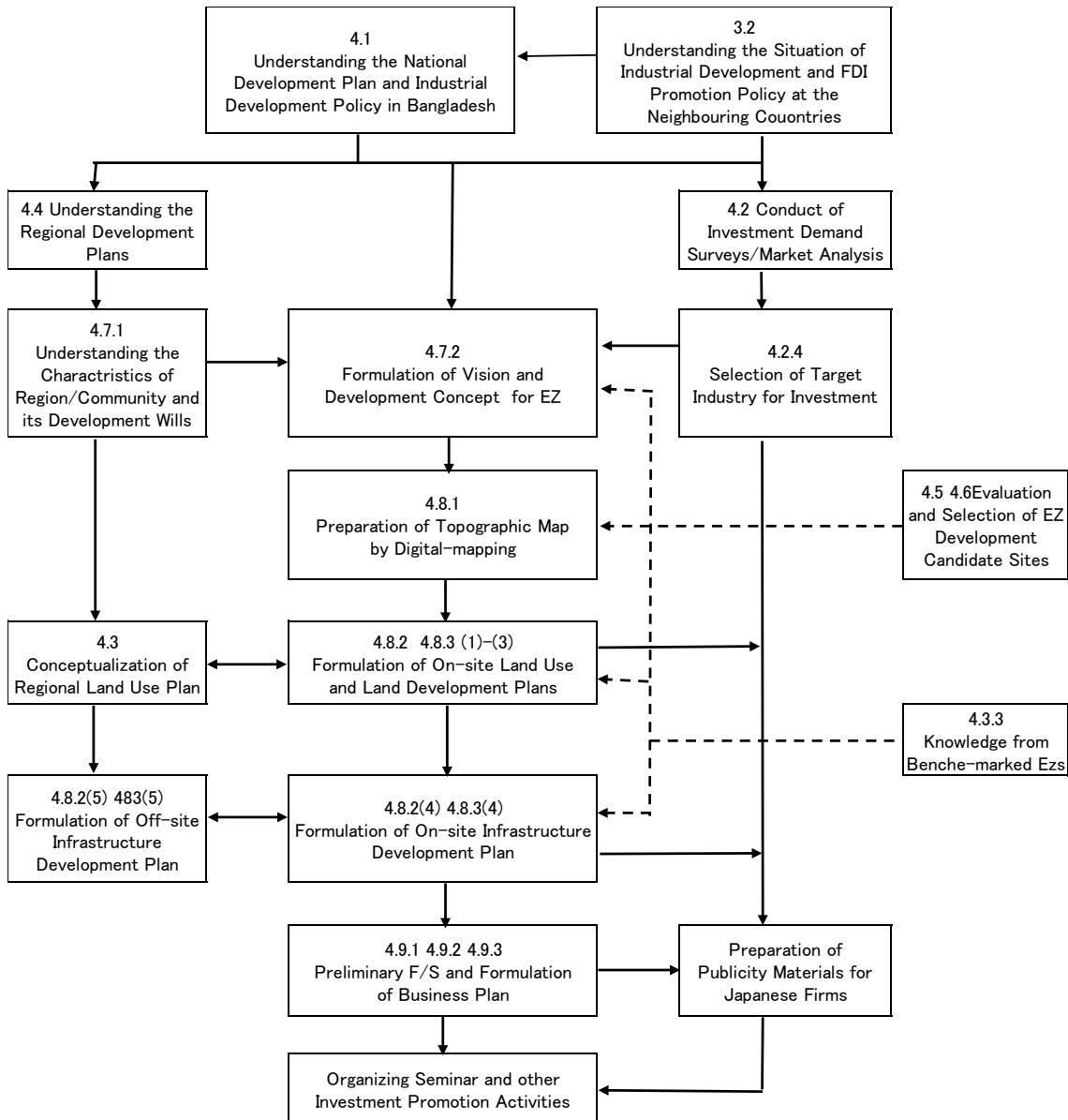


Fig. 4.1-1 : Work flow for the formulation of Basic Development Plan for short-term EZs

The formulation processes of the Basic Development Plans commence with “Understanding the National Development Plan and Industrial Development Policy in Bangladesh” followed by “Conduct of Investment Demand Surveys/Market Analysis”, “Formulation of Vision and Development Concept for EZ”, and many other processes. The detailed works performed at each stage of the Survey are described in detail in the following chapters.

4.1 The national development and industrial development policy in Bangladesh

4.1.1. Macroeconomy and industrial promotion policy and plans

Before formulating a basic plan for short-term EZ development, overall conditions of macroeconomy as well as the national development plan and industrial policy of the Bangladeshi government are outlined as below:

(1) Overall conditions of the macroeconomy in Bangladesh

- a. Bangladesh has recorded a stable GDP growth rate above 6% in recent years. In 2015, the GDP growth rate was 6.41%, with the nominal GDP being 194.6 billion USD, while the GDP per capita reached 1,314 USD.
- b. GDP in the manufacturing industry amounts to 20.2 % of total GDP, its growth rate being 10.32%. Employment in the industry amounts to 12% of total employment in the country.
- c. Overseas trade has increased annually (both in exports and imports) but the trade balance has been in a state of chronic deficit. In 2014, exports amounted to 30.8 billion US dollars, and imports were 40.7 billion US dollars, and the trade balance had a deficit of 10.5 billion USD. Overseas remittance to Bangladesh by expatriate migrant workers amounted to 14.2 billion US dollars, but the shortfall in the current account amounted to 16.5 billion US dollars.
- d. RMG comprised 81.7% of total exported goods in 2015. Exports depend heavily on RMG. The main export market of RMG are the EU and USA, and may be broken down as follows: USA- 5.14 billion USD, Germany 4.37, UK 2.59, France 1.54, Spain 1.51, The Netherlands 0.68, Italy 1.18, Canada 1.00, Turkey 0.62 and Japan 0.57 US (unit: billion USD).
- e. Cotton and cotton products which are supplies for the garment-making industry occupied 13.3% of imported goods in 2015, while fuel and energy occupied 10.7% of imports. Other goods include manufacturing products such as machinery, electrical products, iron and steel, and plastics.
- f. The major destinations for exports from Bangladesh are the EU and USA, which are the major markets for RMG products. Japan amounts to 2.9% of the total destinations for Bangladeshi exports.
- g. With respect to imports to Bangladesh, China accounts for 22% of total imports, India accounts for 15.6%, and Japan accounts for 4.1%. In addition, EPZs amount to 8.1%.
- h. Foreign Direct Investment (FDI)
FDI to Bangladesh was 900 million USD in 2010. FDI increased to 1.6 billion USD in 2013, but decreased to 1.5 billion USD in 2014 and the accumulated FDI balance became 9.35 billion USD. Major countries investing in FDI in 2014 were: UK 180 million USD, Korea 135 million USD, Singapore 120 million USD, Hong Kong 110 million USD, Japan 90 million USD, The Netherlands 80 million USD and India, 70 million USD.
- i. The major sectors for FDI were textiles, finance and infrastructure. The breakdown of the sectors is as follows: textiles 391 million USD, banks 311 million USD, communication 26 million USD, electric power 45 million USD, food 53 million USD, textiles & apparel 45 million USD, trade 45 million USD, medicine 39 million USD, agro products and fishery, 32 million USD, and leather/leather products 32 million USD.

Table 4.1-1 Economic index in Bangladesh

GDP	GDP per capita: 780 USD (2011), 1,314 USD (2015) GDP growth rate: 6.51% (2014/15) The average GDP growth rate per annum for a five year period from 2010/11 to 2014/15: 6.31%
GDP portion (%) by Sector	(2015 tentative) manufacturing 20.2, agriculture/forestry 12.3, fishery 3.7, construction 7.2, wholesales/retails 14.1, transportation/communication 11.4,

	real estate 6.8
Employment portion by Sector (%)	(2010) manufacturing 12, agriculture 47, construction 5, retails & accommodation, restaurant 16, transport & communication 8
GDP growth rate by sector (%)	(2015 tentative) manufacturing 10.32, agriculture / forestry 2.07, construction 8.63, wholesales / retails 6.59, transport / communication 5.99, real estate 4.66
Trade (million USD)	(2014) export 30,176, import 40,675, trade balance deficit 10,499 (2010) export 16,204, import 23,738, trade balance deficit 7,534
Export goods (FOB million USD 2014/15)	RMG 25,461, 81.7%, Jute / Jute products 868, 2.8%, leather / leather products 1,129, 3.6%, fishery products 565, 1.8%, agro products / food 478, 1.5%, manufacturing products 446, 1.4%, medical products 73, 0.2% (%: portion)
Import goods (CIF million USD 2014/15)	Cotton/cotton products 5,398, 13.3%, mineral fuel/products 4,350, 10.7%, machinery/parts 3,496, 8.6%, iron & steel products 2,136, 5.3%, electrical goods/parts 1,933, 4.8%, grain 1,688, .2%, plastics/plastic goods 1,612, 4.0%, edible oil 1,597, 3.9%, fertilizer 1,242, 3.1% (%: portion)
Export FOB value by destination	USA 5,783, 18.6%, Germany 4,705, 15.1%, UK 3,205, 10.3, Spain 1,754, 5.6%, France 1,744 (%: portion), 5.6%, Italy 1,382, 4.4%, Canada 1,029, 3.3%, Japan 915, 2.9% (million USD, %: portion 2014/15)
Import CIF value by country	China 8,232, 22.0%, India 5,828, 15.6%, Singapore 2,199, 5.9%, Japan 1,524, 4.1%, Indonesia 1,398, 3.7%, Malaysia 1,299, 3.3% 1, Korea 1,233, 3.3%, Brazil 928, 2.5%, Import to EPZ 3,022, 8.1% (million USD %: portion, 2014/15)
Trade between Japan and Bangladesh	Exports from Bangladesh to Japan (million USD, 2014/15) RMG 653, 71.4%, leather footwear 87, 9.5%, electric goods / parts 30, 0.3%
	Imports to Bangladesh from Japan (million USD, 2014/15)
	Ships 451, 29.6%, Iron & steel products 404, 26.5%, transport machinery/parts 268, 17.6%, machinery/parts 162, 10.6%, plastics/parts 27, 1.8%

Source: Made by JICA survey team based on information from Bangladesh Bank

(2) Potential of the Bangladeshi economy

Basic conditions related to the potential of the Bangladeshi economy for future development are shown below:

a. Population:

The Bangladeshi population was 158 million in 2015. The average age of the population is young. A demographic bonus period will peak in 2032, and finish in 2051. In 2015 the literacy rate was 62.3% and the poverty rate was 22.4%.

b. Market:

The domestic market has expanded, and the income of the middle class has increased. In Dhaka, the capital city, new businesses targeting the wealthy are thriving.

c. Costs:

The monthly wage for workers in the manufacturing sector is US\$100, which is the lowest in comparison with India and ASEAN countries, and it is 1/4 of the wage in China. Monthly wages for other countries are: Thailand US\$348; Indonesia US\$250; India US\$230; Vietnam US\$185; Cambodia US\$162. Should manufacturing costs in Japan be assumed to be “100”, manufacturing costs in Bangladesh are equivalent to 49.5 (which is 1/8 of China), being lower than 80.6 in India, 76 in Sri Lanka, and 73 in Vietnam.

As for the investment environment in Bangladesh, investment opportunities/potential and issues/risks are summarized as follows:

1) Investment opportunity/potential

- a. The labor force is abundant and is the cheapest in Southeast Asia and South Asia.
 - b. There are industrial concentrations and a strong base for RMG and textile related industries.
 - c. Domestic demand and business opportunities in the domestic market are increasing.
 - d. There are virgin markets that Japanese enterprises and other foreign enterprises have not yet exploited.
 - e. Infrastructure development has increased and the need for infrastructure developments is huge.
 - f. The Bangladeshi people tend to be pro-Japan and they have an affinity for the Japanese.
- 2) The issues / risks
- a. Infrastructures such as electricity, gas, roads, bridges, transport, communication and water supply & sewage systems have been underdeveloped.
 - b. Industrial parks have been underdeveloped. It is difficult to acquire the appropriate land.
 - c. The political and social situation is unstable. Security has recently become an important issue.
 - d. Governance and compliance are fragile. Public procedures are not transparent, and are unpredictable, bureaucratic, and time-consuming.
 - e. Financial and tax systems are very rigid.
 - f. There is a shortage of skilled workers.
 - g. Domestic gas reserves will be depleted after 5 years. Energy countermeasures are recommended to be established at an early stage.

(3) Industrial Promotion Policy and Plans of Bangladesh

The Government of Bangladesh promulgated "Vision 2012", with the aim of elevating the status of Bangladesh from that of a low income country to a medium income country. Under the 6th Five Year Development Plan policy from 2011-15, economic growth was pursued by the labor intensive manufacturing industry, focusing on the export-oriented garment industry. This policy has been extended into the 7th Five Year Development Plan (2016-20), to aim at higher economic growth by diversifying manufacturing industries with both export oriented and import substitution industrialization.

Vision 2021 recognizes the limits of agriculture constrained by finite land resources, and pursues accelerated industrial development. This is being done to generate sufficient employment opportunities for an ever-increasing labor force, and to diversify the economy by forward linkage and backward linkage together with agriculture and services. This policy is expected to respond to the expanding domestic demand and utilize opportunities presented by the global market.

Strategies to realize these goals have been established by the Government, including the following (General Economic Division, Planning Commission, "Outline Perspective Plan of Bangladesh 2010-2021", June 2010) :

- 1) SME-based industrialization, which is labor intensive, should be decentralized in terms of location and the use of indigenous resources;
- 2) Further strengthening of existing labor intensive industries including textiles, RMG, leather products, frozen food etc.;
- 3) The introduction and strengthening of new industries including ICT-based industry, food and beverages, light engineering, cement, high-end RMG, pharmaceuticals, ship building etc.;
- 4) Encouragement of FDI to stimulate access to advanced technologies and the global market;
- 5) Development of exotic tourism geared towards the Asian market;
- 6) Support for service industries with ICT-based industry; and

- 7) Diversification of jute products which are environmentally friendly and biodegradable.

To support these industries, proposed policy measures include human resources development, further liberalization of the capital market, infrastructure development and incentive provision for special zones, among others.

Based on the steady economic growth in recent years, the Government of Bangladesh is now preparing “Vision 2041” as a long term policy guideline. Details are not available yet, but strategies and measures are being examined with the goal of elevating the status of Bangladesh beyond that of a middle income country to that of a developed country. Industrial promotion will be based on the PPP, while the roles of the Government will focus on 1) effective utilization of public resources including Government-owned land, 2) institutional arrangements including investment incentives, and 3) the development of basic infrastructure centering on EZ development.

To facilitate the transition from Vision 2021 to Vision 2041, the current administration has presented the following strategies under the 7th Five Year Development Plan (as expressed in various news articles):

- 1) Completion of basic infrastructure construction such as the Pampal coal-fired thermal plant, the Ruppur nuclear plant, the Sonadia deep sea port and a terminal for the import of natural gas;
- 2) Exploration and development of off-shore natural gas and petroleum;
- 3) Rural development to extend the social safety net thereby increasing employment opportunities through industrial development;
- 4) Human resources development to convert low skilled laborers to semi-skilled and skilled workers; and
- 5) Attainment of agricultural self-sufficiency.

During the early period of steady economic growth, the Government of Bangladesh pursued a principle of export-oriented economic growth by the EPZ development which had been implemented since 1990s. On the basis of this, the Government has introduced a policy to accelerate economic growth via the development of indigenous industries by promoting linkages with export industries. To implement this policy, BEZA was established in 2001 in order to pursue the EZ development.

4.1.2. EZ Vision and EZ Development Concept by BEZA

The BEZA Vision Document (2015) outlines the Vision, Mission, Target and Core Values, categories of EZ and the functions of BEZA as mentioned below:

(1) Vision & Mission

a. Vision

BEZA aspires to become a sustainable development driving force, and a world class investment promotor and service provider to ensure quality of life of the people.

b. Mission

The Mission of BEZA is to persistently create value for the investors by establishing attractive investment facilities in Economic Zones through one-stop service and competitive incentive packages.

c. Target

BEZA wants to establish 100 Economic Zones on 30,000 ha of land in the next 15 years.

d. Core values

BEZA will strive to instill the following core values to reach and realize its Vision and Mission: Customer satisfaction, teamwork, the free flow of information, participation and involvement, unlimited learning, networking and effective public-private partnerships.

e. Vision 2021 and BEZA

Our targets are to develop 100 EZs over the next 15 years and create employment opportunities

for 10 million people, and foster to exports worth 40 billion USD from the Economic Zones development by 2030.

(2) Category of Economic Zones

- a. PPP Economic Zone
- b. Private Economic Zone
- c. Government Economic Zone
- d. Special Economic Zone
- e. G2G Economic Zone

Established due to an initiative by the government of a foreign country or the Government of Bangladesh and/or in partnership between the Government of Bangladesh and the Government of a foreign country.

f. Economic Zones

Established in collaboration and/or in partnership between Government Authorities and Organizations.

(3) BEZA's Main function

BEZA's main function includes the establishment, licensing, operation, management and regulation of the EPZs. Itemized functions are as follows:

- a. To identify and select sites for EZ development, industrial or similar sectors;
- b. To acquire land for Economic Zones identified by the Government's own initiative, or a PPP on behalf of Government;
- c. To appoint an Economic Zone Developer on a competitive basis to develop and manage the acquired land and different types of infrastructure thereof;
- d. To prepare infrastructure development plans for the Economic Zones;
- e. To allot, lease, or rent land, buildings or sites, on a competitive basis in the prescribed manner, to investors who have applied for establishing industrial units, businesses and service providers in Economic Zones for implementation and management of their establishment;
- f. To ensure the development of infrastructure in Economic Zones within the specified period through monitoring of activities of its own and of EZ Developers;
- g. To create opportunities for employment through the establishment of backward linkage industries within or outside Economic Zones by promoting local and foreign investment, including the development of a skilled labor force;
- h. To ensure the efficient use of land in light of clustering principles¹ by dividing the land based on infrastructure and availability of local resources to provide a conductive environment and facilities within economic zones;
- i. To encourage more efficient management and monitoring programs for ensuring commitments to environmental and other matters;
- j. To take steps to establish backward linkage industries in Economic Zones to meet the requirements of the local economy;
- k. To encourage business organizations to relocate polluting and unplanned industries from metropolitan cities through the establishment of separate Economic Zones for different industries;
- l. To encourage public-private partnerships in the development and operation of Economic Zones;
- m. To take the necessary steps to implement social and economic commitments;
- n. To establish the due rights of workers in order to ensure their welfare, and to establish conducive relationships between owners and workers;
- o. To take appropriate steps to implement poverty reduction programs;
- p. To expedite the implementation of the country's industrial policies by promoting planned industrialization of the thrust manufacturing and service sectors; and
- q. To convert the designated Economic Zones into economic centers by developing industrial cities, agro based industrial zones, trade zones and tourism zones through investment from the banking sector; also, to facilitate the availability of skilled labor and efficient service provisions.

¹ Clustering principles: The definition highlights two essential features: Clusters consist of a critical mass of enterprises located in geographical proximity to each other and Enterprises in a cluster share a number of common features.

4.2 Confirmation of EZ Development needs in Bangladesh

The Enterprise survey of potential investment to Economic Zones in Bangladesh (hereinafter referred to as “Enterprise needs survey” or “Needs survey”, unless otherwise specified) has been conducted by JICA in the past. The JICA survey team fully utilized the existing data and conducted a field survey to supplement the survey of the implementation plan:

- Existing survey (1): Data Collection Survey on SEZs in Bangladesh (JICA, 2013)
- Existing survey (2): The FDI Promotion Project in Bangladesh (JICA, 2014)
- This survey: Enterprise survey on Potential Investment to Upcoming EZs in Bangladesh (2015)

This time, the ‘enterprise needs survey’ was assigned to local consultants, who conducted the survey. In the initial plan, the survey was aimed at Japanese companies as well as local companies in Bangladesh. However, upon consultation with JICA, the survey was made to find the needs of local industries, in consideration of the past survey made to Japanese companies by the above Existing survey (2).

4.2.1. Existing Survey (1): Data Collection Survey on SEZs in Bangladesh

Data Collection Survey on Special Economic Zones in Bangladesh (JICA, 2013)

Outline of [Chapter 4: Attitude Survey on the Japanese Firms regarding the Development of Special Economic Zones in Bangladesh] is summarized as below:

(1) Outline of the survey

- 1) Period of survey: From April to May 2013
- 2) Objectives of the survey:

The objectives are to question Japanese firms, which are potential investors in the EZ, with respect to their priorities and preferences when establishing an overseas production base in order to identify and select the elements that SEZ should include.

3) The method of the survey

The Survey Team chose certain firms and distributed a questionnaire by mail. The survey was sent to 1,867 Japanese firms (manufacturers) who have a production base in China with annual sales of more than 5 billion yen. The responses were collected from 174 firms and the analysis was made.

4) Survey items

- Candidate countries for overseas production bases
- Important or essential items to consider when choosing a country for the establishment of a production base

(2) Attributes of the respondent firms

The number of respondent firms was 179. About half of them were SMEs or medium-sized firms with a capital of up to 300 million yen. Many of them belonged to the industries of transportation equipment (25), chemical/medicine (19), electronic parts, device and circuits (18), electric equipment and appliances (16), food and beverages (15), iron and non-ferrous metals (15), production machines and appliances (12), those categorized under “Other manufacture (34) and other than above (20)”.

(3) Candidate country for the establishment of an overseas production base

The Survey Team asked the firms about the “candidate countries when considering the establishment of an overseas production base.” About 10% of the respondent firms (18 companies) chose Bangladesh as a desired country. Ten (10) of the 18 firms, which is more than half, are SMEs with capital of less than 300 million yen. The breakdown is as follows: electronic parts, devices and circuits (4), textiles (3), chemical and medicine (3), rubber and leather (2), iron

and non- ferrous metals (2), food and beverages (1), glass and quarrying (1), production machines and appliances (1) and those categorized under “Other manufacture” (1).

Table 4.2.1-1 Attributes of the respondent firms and firms that chose Bangladesh [Attributes of the respondent firms]

category of business	N	capital	N
Those categorized under “Other manufacture”	34	- 10 million yen	1
Transport-related machinery	25	10 million– 100 million yen	55
Chemical and medicine	19	100 million – 300 million yen	27
Electronic parts, devices, and circuits	18	300 million – 1 billion yen	29
Electric equipment and appliances	16	1 billion yen or more	63
Food and beverages	15		
Iron and non-ferrous metals	15		
Production machines and appliances	12		
other than above	20		

[Attributes of the firms that chose Bangladesh]

category of business	N	capital	N
Electronic parts, devices, and circuits	4	- 10 million yen	0
textile	3	10 million– 100 million yen	8
Chemical and medicine	3	100 million – 300 million yen	2
rubber and leather	2	300 million – 1 billion yen	2
iron and non-ferrous metals	2	1 billion yen or more	6
food and beverages	1		
Glass and quarrying	1		
production machines and appliances	1		
Those categorized under “Other manufacture”	1		

Source: Amended by the JICA survey team based on JICA’s “Data Collection Survey on Special Economic Zones in Bangladesh” report

In a comparison of the “respondent firms” and “firms that chose Bangladesh”, no firms from the transport-related industry (25) or the electrical equipment and appliance industry (16) selected Bangladesh as the preferred site for their manufacturing bases. This implies that those 2 sectors have less interest in Bangladesh, while sectors like electronic parts, devices and circuits, iron and non-ferrous metals, chemical and medicine, have much interest in Bangladesh.

(4) Important elements when choosing a production base

The firms were questioned about the “factors about which they are concerned when choosing a production base.” The following four factors gained higher scores.

- Condition of the basic infrastructure:

Electricity, water supply, fuel (gas), telecommunications, drainage and waste disposal facilities, and access to ports. This subject was cited as being important by 88% of the firms.

- Labor conditions:

Labor conditions have been defined as “whether or not inexpensive labor and high-quality human resources (managers and engineers) can be secured.” This was deemed important by 80% of the firms.

- Country risk:

The country risk has been defined as “security, political situation, natural disasters, necessity to provide bribes, etc.” This was chosen by 71% of the firms.

- Degree of development of the industrial infrastructure:

This has been defined as “the level of development of logistic service providers, raw materials procurement, sub-contractors, etc.” This was chosen as an important item by 70% of the firms.

On the other hand, acquiring land for factories (27%), and living conditions (23%) ranked low among the respondents. From this, it might be determined that most respondents do not have enough knowledge or information about the difficulty of acquiring land or about severe living conditions.

4.2.2. Existing survey (2): The Foreign Direct Investment Promotion Project in Bangladesh (JICA, 2014)

As to “The Foreign Direct Investment Promotion Project in Bangladesh - Enterprise Survey for Investment and Financial Demand Assessment”, the outline is summarized below:

(1) Outline of the survey

- 1) Period of survey: July 15th 2014 to August 23rd 2014
- 2) Objectives of survey:

The Japan International Cooperation Agency (JICA) conducted a Study entitled “FDI promotion project in Bangladesh” in order to help with the formulation of a future JICA project which may support the development of new EZs and surrounding infrastructures. Such a project would also improve financial access to be utilized by enterprises willing to set-up/relocate/expand their factories/business establishments in Bangladesh.

3) Method of survey and who were surveyed?

A total of 115 enterprises were surveyed, of which 55 enterprises were selected from the list of Japanese (-affiliated) enterprises who were members of JBCCI (Japan-Bangladesh Chamber of Commerce and Industry), JETRO (Japan External Trade Organization) and JCIAD (Japan Commerce and Industry Association in Dhaka), as well as those Bangladeshi enterprises which have investment relations with Japanese enterprises. The remaining 60 businesses were selected from Bangladeshi enterprises representing different sectors, including those that already had any close business relations with Japanese investors.

Data collection methods in this survey were face-to-face interviews with the selected enterprises.

4) Contents of the survey

This survey was carried out in order to collect data, and to analyze the current situation and future intentions of these enterprises regarding investment and financial demand. In this way the necessary information/data, as well as implications required for said JICA study, could be provided.

The contents of this survey also include criteria for the selection of the EZ site, demands on investment capital, time of investment, demands on operating funds, interest rates and repayment periods.

(2) Outline of the enterprises for survey

1) Sector of industry

Out of the industries surveyed, 62% of the enterprises in manufacturing sectors have been Japanese, and 45% of them have been local Bangladeshi enterprises. Most manufacturing enterprises specialize in textiles and RMG. The breakdown of the Japanese enterprises is: textile/RMG 38%, trading 22%, leather/shoes 13%, electronic devices/goods 13%, light engineering industries 10%, and other enterprises 11%.

2) Main clients

Major clients of both Japanese and Bangladeshi enterprises are Wholesalers and Retailers. The second largest client group for the Japanese companies consists of affiliated companies whereas the second largest client group for Bangladeshi enterprises is individual consumers. The Japanese enterprises also have significant dealings with the manufacturers, and the third largest client group for the Bangladeshi enterprises is also manufacturers.

Japanese enterprises: Wholesalers/retailers 35%, Relative enterprises 33%, Manufacturing 25%, General consumers 15%, Government 2%, others 29%.

Bangladeshi enterprises: Wholesalers/retailers 72%, General consumers 52%, Manufacturing 25%, Government 22%, Relative enterprises 10%, others 17%.

3) Export market and domestic market

Japanese enterprises (55): Export 39 (74%), Domestic 15 (27%)

Bangladeshi enterprises (60): Export 21(35%), Domestic 42 (70%)

Many Bangladeshi enterprises sell in the domestic market, as do Japanese enterprises to a certain extent.

4) Trade between Japanese enterprises and Bangladeshi enterprises.

42 Bangladeshi enterprises (70%) maintain continuous trading with Japanese enterprises.

5) Criteria for selecting EZs

Japanese enterprises: Sufficient infrastructure (86%), sufficient human resources (64%), managers, proper EZ development, value chain (30% each)

Bangladeshi enterprises: Sufficient infrastructure (86%), procurement of materials (59%), Sufficient human resources, proper EZ development (each 46%), value chain (44%)

(3) Financial Needs

1) Plan for New Capital Investment and Intention to Borrow

It was determined that most of the Japanese enterprises (56%) already have plans for new capital investment, which will surely facilitate the successful establishment of upcoming Economic Zones (EZs) in Bangladesh. Although this percentage is relatively small in the case of Bangladeshi enterprises (53%) the number is significant. Moreover, 37% of Bangladeshi enterprises and 24% of Japanese enterprises intend to have new capital investment depending upon terms and conditions of loan which indicate brisk capital demands.

2) Purpose of new investment

Purpose of new investment is as below:

In the case of Japanese enterprises:

Expansion of current business 38 enterprises (86%), improvement of productivity 14 enterprises (32%), improvement of quality 13 enterprises (30%)

In the case of Bangladeshi enterprises:

Expansion of current business 49 enterprises (91%), cost reduction 26 enterprises (48%), improvement of quality 22 enterprises (41%), improvement of productivity 22 enterprises (41%), environmental protection 10 enterprises (19%)

Bangladeshi enterprises have a greater intent to expand current business than Japanese enterprises.

3) Timing of investment

It was found that companies which have plans for new capital investments, among them 30% of the Japanese companies, are willing to make new capital investments within one year compared to 19% of Bangladeshi companies, which are willing to make new capital investments within one year. Thirty two percent (32%) of Japanese companies and 67% of Bangladeshi companies have new capital investment plans for within 1 to 3 years. In the case of new capital investment within 3 to 5 years, the proportions are 27% and 11% respectively for Japanese and Bangladeshi companies. But, 11% of Japanese companies do not have any plans for new capital investment in the foreseeable future whereas only 2% of Bangladeshi companies do not have any plans for new investment in the foreseeable future.

4) Financial Needs for Equipment Purchase and/or Working Capital

44% of Japanese companies intend to secure loans for procuring equipment and/or meeting working capital requirements, whereas 62% of Bangladeshi companies showed such intentions. Nine (9) Japanese companies (16%) and 14 Bangladeshi companies may borrow upon condition of loan.

5) Intended Amount of Borrowing

About 31% of Japanese Companies have financing demands up to \$10 million USD as industrial loans. Only 22 Japanese companies shared their intentions to secure new loans from the domestic financial market. About 35% of the Japanese companies have the intention to borrow up to \$20 million US for procuring machinery equipment and only 33% of the Japanese companies have intention to borrow up-to \$20 million US for working capital requirements. Therefore, the need for Bangladeshi companies to secure financing in order to procure machinery and equipment is higher than that of the Japanese companies.

(Conclusion) Companies within the EPZ intend to expand their investments, but the Bangladeshi government decided not to set up a new EPZ. There is more incentive in investing in EZs than in EPZs.

4.2.3. Enterprise Survey on Potential Investment to Upcoming Economic Zones in Bangladesh (2015) (Enterprise Survey (2))

(1) Outline of the survey

1) The objectives of the survey:

This Survey was carried out to collect and analyze the current business situation and future intention of the enterprises as well as to identify the target fields of future investment and requirements of support services for the development of EZs and their surrounding infrastructure. The specific objectives of this survey are given below:

- To understand the nature of enterprises who are interested to invest in the upcoming EZs
- To identify the target fields of investment as well as prospective investment decisions
- To determine the factors influencing investment decisions of the enterprises
- To identify the requirements for utility and infrastructure services as well as business support services (BDS)

2) Area for the survey: Dhaka and surrounded industrial area

3) Period of the survey: From July 2 to July 27, 2015

4) Target surveyed: Local (Bangladeshi) enterprises

5) Method of the survey: Interview survey to the enterprises selected

6) The respondents: Business owners and top managers of the enterprises

7) Industry: Manufacturing (27 enterprises), Commerce (3 enterprises)

8) Business Sector: 15 sectors

9) Selected Business Sector:

Table 4.2.3-1 Business Sector surveyed

Selected Business Sector (category-wise)	
A. High Priority Sectors² <ul style="list-style-type: none"> • Agriculture/food processing industry • Plastic and Rubber Products • Ready Made Garments/Apparels • Wooden Products / Furniture • Knitting and Textile, Yarn, Spinning • Jute and Jute Goods Materials • Pharmaceutical and Healthcare Goods • Footwear and Leather Goods • Bi-cycle 	B. Priority Sectors² <ul style="list-style-type: none"> • Automobile /Motor cycle parts • Electrical and Electronics • Light engineering industry C. Other Sectors <ul style="list-style-type: none"> • Garment Accessories • Medical Equipment and Devices Cables, wire harness

Source: JICA Survey Team

10) Sample size: 30 (Medium 9, Large 21)

11) Language used: English and Bengali

12) Sampling Technique: Stratified Random Sampling

13) Survey conducted by:

The Survey and Research Team of Young Consultants (YC) conducted the survey. The survey was implemented by four (4) Research Executives, Abdul Gaffar, Shibu Deb Nath, Ali Imam, Asifuzzaman, under the direct supervision of Mr. M. Zakir Hossain

(2) Outline of the enterprises surveyed

² National Industrial Policy 2015, Ministry of Industry, Government of Bangladesh

- 1) The size of the enterprises: Large 21 (70%), Medium9 (30%)
- 2) Legal status of the enterprises surveyed
Proprietorship 5 (16.7%), Partnership 1 (3.3%), Limited company 24 (80%)
- 3) Domestic Market and Export Market:
Out of 30 enterprises, the primary market of 9 (30%) enterprises are domestic market and equal proportion of enterprises target export market as their primary market. However, 12 (40%) enterprises are currently operating to meet the demand in both domestic and export market.
Domestic market oriented enterprises are Automobile/ Motor cycle parts, Light Engineering, Pharmaceutical and Healthcare Goods and Cables, wire harness.

Table 4.2.3-2 Sector and Enterprise wise Primary Market

Business Sector	Primary market			Total
	Domestic market	Export market	Both domestic and export	
Automobile/ Motor cycle parts	2	0	0	2
Bi-cycle³	0	1	1	2
Electrical and Electronics	0	0	2	2
Footwear and Leather Goods	0	1	1	2
Light Engineering⁴	2	0	0	2
Agro-products, beverage	0	0	2	2
Ready Made Garments/ Apparels	0	2	0	2
Knitting and Textile, yarn, Spinning	0	2	0	2
Garment Accessories	0	2	0	2
Medical Equipment and Devices	2	0	0	2
Pharmaceutical and Healthcare Goods	0	0	2	2
Plastic and Rubber Products	0	0	2	2
Wooden Products/ Furniture	0	0	2	2
Cables, wire harness	2	0	0	2
Jute and Jute Goods Materials	1	1	0	2
Total	9	9	12	30

Sources: JICA Survey Team

- 4) Current Business Trend
While analyzing the current business trend of the enterprises in terms of their sales performance in consecutive years, the Survey Team found the currently 73% of the enterprises are experiencing growing business trend whereas the business performance by 17% enterprises is in a stagnant (not growing or declining) stage. The remaining enterprises are, however, experiencing a declining trend in their respective businesses. Figure-3 summarizes the current business trend of the enterprises.
- 5) Main Client of the Selected Enterprises
Out of 30 enterprises, about 73% enterprises' main target clients are wholesalers/retailers, 67% individual customers, 37% manufacturers, 37% NGOs, 30 governments organizations and remaining 23% is affiliated enterprises.
- (3) Status of Prospective Investment Decision
 - 1) Level of Intention
Out of 30 enterprises, about only 17% (5) enterprises have strong intention for new

³ The products manufactured by the Bi-cycle sector of Bangladesh includes BMX, Trekking Bike, Mountain Bike, Road Bike, Folding Bike, Fat Bike and others

⁴ The Light Engineering sector of Bangladesh is in the manufacturing of wide range of spare parts, castings, moulds and dices, oil and gas pipeline fittings and light machinery, as well as repairing those alongside electrical goods like switch, socket, light shed, channel, cables and electrical fans, generator etc.

investment in upcoming EZ as they have already developed concrete plan whereas 83% (25) enterprises although willing to invest but yet to develop any concrete plan for prospective investment. Generally, these enterprises can be considered as relatively less interested than the prior ones with concrete plans. As the study found, these enterprises are willing to invest but the procrastination in the development process of EZs is discouraging them to formulate any concrete plan yet.

The respondents (5) those have concrete plan for prospective investment in the upcoming EZs belong to four distinct sectors: Footwear and Leather Goods, Cables, wire harness, Light Engineering and Automobile /Motor cycle parts

2) Purpose of the Future Investment in EZ

Most of the enterprises (87%) intend to invest in the upcoming EZs with a view to expand their existing production unit and the remaining 13% enterprises plans to invest to establish new production units in the upcoming EZs.

Table-9 presented below summarizes the sectors to which the 8 enterprises would like move to from their existing business sectors if they make future investment in the EZs:

Table 4.2.3-3 Preferred Business Sector for Future Investment in EZs
(multiple reply)

Existing Business Sector	Preferred Business Sector
Automobile/ Motor cycle parts	Electrical and Electronics
Bi-cycle	Agro-products & beverage
Bi-cycle	Automobile/ Motor cycle parts
Light Engineering	Electrical and Electronics
Knitting and Textile, yarn, Spinning	Bi-cycle
Garment Accessories	Knitting and Textile, yarn, Spinning
Medical Equipment and Devices	Agro-products, beverage
Plastic and Rubber Products	Agro-products, beverage

Source: JICA Survey Team

3) Timing for Investment

The survey result indicates that most of the enterprises are willing to make new investment within a very short time of 1 to 3 years implying high eagerness from the industrial investors to invest in the upcoming EZs. Out of 30 enterprises, about 27 (90%) enterprises said that they will invest within 1 to 3 years after the EZs are established and the remaining 10% enterprises responded that they are interested to invest within 3 to 5 years of establishment.

(4) Influential Factors to Investment Decision

1) Preferred Location of EZ

When the question of the preferred location of the EZs was raised, most of the enterprises (53%) replied that if the zones were established within Dhaka city and its outskirts, it would have been more convenient and preferable for investment. About 17% enterprises are prepared to move to anywhere in Bangladesh whereas the remaining 30% enterprises have no specific choice on locations if required utilities are available.

Table-4.2.3-4 Preferred Location for EZs against Business Sector of Enterprise's

Business Sector	Preferred Location			Total
	Within the outskirts of Dhaka city	Anywhere in Bangladesh	No specific choice for locations if utilities are available	

Automobile/ Motor cycle parts	1	1	0	2
Bi-cycle	0	1	1	2
Electrical and Electronics	1	0	1	2
Footwear and Leather Goods	1	0	1	2
Light Engineering	2	0	0	2
Agro-products, beverage	0	1	1	2
Ready Made Garments/ Apparels	1	0	1	2
Knitting and Textile, yarn, Spinning	1	0	1	2
Garment Accessories	1	0	1	2
Medical Equipment and Devices	2	0	0	2
Pharmaceutical and Healthcare Goods	2	0	0	2
Plastic and Rubber Products	0	1	1	2
Wooden Products/ Furniture	2	0	0	2
Cables, wire harness	1	0	1	2
Jute and Jute Goods Materials	1	1	0	2
Total	16	5	9	30

Sources: JICA Survey Team

However, 11 respondents (36.67%) stated that a distance of 20-30 km from Dhaka is preferable whereas a distance of 30-40 km from Dhaka was reckoned manageable by 6 respondents (20.00%). A distance of 40 km or above is preferable to only 4 respondents (13.33%) and the remaining respondents do not have preference over the distance of the zone from Dhaka.

2) Project Site Selection Criteria

In this study, an attempt has been made to outline the criteria based on which an investor makes his decisions or chooses a particular project site or zone for future investment. The following table shows that existence of sufficient infrastructures is the most critical factor in the investment decision in a zone whereas the existence of industrial clusters nearby the zone has been identified as the least important factor.

Table4.2.3-5 Project Site Selection Criteria (multiple reply)

Criteria for Project Site Selection	Number of Respondents	
	High Priority Sector	Priority Sector
Existence of Sufficient Infrastructure	27	4
Efficient Management of Zone Developer	23	2
Proper Zone Development Plan	22	2
Availability of Adequate Human Resources	17	8
Markets for Products	15	4
Scope of linking with Value Chain	13	6
Availability of Raw Materials	12	5
Industrial cluster nearby	5	6

Source: JICA Survey Team

3) Availability of Facilities

To attract industrial investors, it is imperative that required infrastructural, logistics and utility services are made available. However, the availability of some of the facilities/amenities in a zone was emphasized by the enterprises compared to others. Therefore, the study team attempted to rank the facilities or amenities the investors demand through this study. As the table presented below indicates, the availability of combined effluent treatment plant was identified as the most demanded facility in a zone consecutively followed by security & protection measures, nearby inland container terminal, common water treatment plant, availability of urban amenities and shared warehouse & logistics center.

Required Facilities/Amenities and number of respondent enterprises are as follows:

- ❖ Existence of combined Effluent Treatment Plant 26
- ❖ Security and Protection Measures 24
- ❖ EZ locates nearest to the Inland Container Terminal (ICT) 23
- ❖ Common Water Treatment Plant 21
- ❖ Presence of Urban Amenities 21
- ❖ Shared Warehouse and Logistics Center 16

4) Awareness on Incentives and Benefits Package

An important factor that influences the investment decisions of the enterprises in the EZs is there awareness on the incentive and benefit packages offered to the enterprises operating in those zones. However, as the study team found 93% enterprises are aware about the incentives and benefit packages those will be offered the enterprises in the EZs.

(5) Required Utility and Infrastructure Services

1) Utilities

As mentioned previously, one of the major challenges the study team faced in conducting the survey was the unavailability of required information regarding the current utility consumption by the enterprises. Of the 30 enterprises surveyed, only 21 enterprises of different sectors provided information on their current electricity consumption rate on monthly basis whereas only 11 enterprises shared information on gas consumption. Similarly, only 9 enterprises of different sectors disseminated information on their current water consumption to the study team.

Table 4.2.3-6 Current Utility Consumption by Enterprises/Month

Sector	Type of Enterprise	Nature of Business	Electricity (kwh)	Gas (m ³)	Water (L ³)
Automobile /Motor cycle parts	Large	Manufacturing	445,633	26,408	N/A
Electrical and Electronics	Large	Manufacturing	222,816	36,092	N/A
Footwear and Leather Goods	Medium	Manufacturing	17,825	1,760	522,193
	Large	Manufacturing	255,000	135,000	5,000
	Large	Manufacturing	14,260	528.169	N/A
Light Engineering	Medium	Manufacturing	2,000	N/A	N/A
Agro-products, Beverage	Large	Manufacturing	71,301	N/A	N/A
	Large	Manufacturing	74,000	N/A	29,140,000
Ready Made Garments/Apparels	Large	Manufacturing	143,296	173,706	51,150,895
	Large	Manufacturing	53,476	N/A	1,305,483
Knitting and Textile,	Large	Manufacturing	N/A	2,112,676	N/A

Yarn, Spinning

Garment Accessories	Medium	Manufacturing	53,476	N/A	2,088,773
	Large	Manufacturing	35,651	105,634	N/A
Medical Equipment and Devices	Medium	Trading	3,565	176.1	52,219
	Medium	Manufacturing	2,495	N/A	N/A
Plastic and Rubber Products	Large	Manufacturing	606,061	N/A	17,240,000
	Large	Manufacturing	52,600	N/A	N/A
Wooden Products / Furniture	Medium	Manufacturing	133,690	7,042	1,305,483
	Large	Manufacturing	392,157	N/A	N/A
Cables, wire harness	Medium	Manufacturing	25,000	N/A	30,000
	Large	Manufacturing	106,465	3,004	N/A
Jute and Jute Goods Materials	Large	Manufacturing	106,951	N/A	N/A

Sources: JICA Survey Team

Water:

Of the 30 enterprises surveyed, about 44% enterprise collects water from piped/supply water, 30% enterprise collect ground water, only 23% enterprise uses surface water and the remaining 1% enterprises were reluctant to provide such information.

2) Land and Factory Building

Only three enterprises could inform the study team on the land size and factory building size as presented in the below table:

Table 4.2.3-7 Expected Land Size and Factory Building by Enterprises

Sources: JICA Survey Team

Sector	Type of Enterprise	Nature of Business	Plot Size (m ²)	Factory Building (m ²)
Footwear and Leather Goods	Large	Manufacturing	13,935	9,209
Cables, wire harness	Medium	Manufacturing	12,138	9,104
	Large	Manufacturing	14,182	8,500
Light Engineering	Large	Manufacturing	27,380	-
Automobile /Motor cycle parts	Large	Manufacturing	40,469	-

3) Business Development Services (BDS)

The prospective investors in EZs necessitates the availability of 11 separate types BDS in the EZs. Of the all BDS the extensions of regulatory supports by the EZ authority has been given the highest importance by the prospective industrial investors followed by many other logistics and business support services.

Table4.2.3-8 Required BDS Services (multiple reply)

No.	Business Development Services	High Priority Sector	Priority Sector
1	Regulatory support	25	2
2	Logistics Support including C&F services	21	3

3	Market access and market promotion	21	1
4	Business information support	21	-
5	Training and skill development	16	6
6	Legal and documentation	14	6
7	Printing and packaging	9	7
8	Operation and Maintenance	11	3
9	Recruitment and payroll management	9	3
10	Taxation services	9	2
11	Accounting and Auditing	4	7

Sources: JICA Survey Team

(6) Key Informant Interviews (KII): Summary of Discussions

- 1) In addition to the enterprise survey, the study team also conducted key informant interviews (KII) with 5 professionals such as Engineer, Scientist (Food & Nutrition), Healthcare Specialist and Doctor and Environmental cum Bio-technology Specialist in order to identify innovative potential investment sectors that may emerge to the upcoming economic zones (EZs) in Bangladesh. Table below shows the list of these key informants by category of profession:

Table 4.2.3-9 List of Key Informants Interviewed

SN	Sector	Profile of Key Informant
	Scientist (Food & Nutrition)	1. Dr. Md. Zahurul Haque, Director Institute of Food Science and Technology (IFST), BCSIR 2. Dr. Barun Kanti Saha , Principal Scientific Officer Institute of Food Science and Technology (IFST), BCSIR 3. Md. Rezaul Karim, Senior Scientific Officer Institute of Food Science and Technology (IFST), Bangladesh Council of Scientific & Industrial research (BCSIR) 4. Abu Tareq Mohammad Abdullah, Senior Scientific Officer Institute of Food Science and Technology (IFST), BCSIR 5. Mohammad Shah Jamal, Senior Scientific Officer Institute of Fuel Research & Development (IFRD), BCSIR
	Engineer	Md. Monir Hossain Patwary, Executive Engineer BCSIR, Ministry of Science and Technology, Dhaka
	Medical and Healthcare	Dr. Sharmin Ahmed, Preventive & Family Medicine Specialist Certified Diabetologist , BCSIR, Dhaka
	Environmental Specialist	Dr. Mustafa M. Kamal, Vice Chancellor Civil and Environmental Engineering, America Bangladesh University

Sources: JICA Survey Team

2) Innovative Sectors having Investment Potential

Through the Key Informant Interviews (KII) the study team attempted to identify potential investment sectors for the upcoming EZs some of the may be innovative. After fruitful

discussions with these Key Informants, the study team outlined the following sectors as the innovative and potential ones with future investment prospects in the upcoming EZs in Bangladesh:

Table4.2.3-10 The industries expected to be invested to EZs

Sl	Potential Sectors	Product Specification	Rational
	Electronics	- Semi-Conductor - Home appliances - Assembling Cell Phone	- Recent exponential growth trend in manufacturing industry - Rapidly growing urban population is expected to increase the demand for home appliances - Targeting the ever growing cell-phone market in Bangladesh new cell phone assembling industries can be established
	Auto Mills ⁵	- Rice Auto Mills - Bricks Auto Mills	With the introduction of environment friendly technology these sectors are proving to be prospective business sectors in Bangladesh
	Information and Communication Technology (ICT)	- Data Processing - Software Development	Introduction of “Digital Bangladesh” concept has given momentum to the growth of the ICT sector
	Life Science	- Pharmaceuticals - Medical Equipment & - Healthcare devices	Pharmaceutical sector in Bangladesh has proven business prospects in Bangladesh due to the availability of low cost raw materials and certain liberty that Bangladesh receives in terms of Patent as a LDC country.
	Ceramics	Tableware, Sanitary ware, Insulator	Availability of skilled but cheap labor force
	Natural Gas based Industries	Fertilizer, Petrochemicals and chemical	Ever increasing demand in the domestic market
	Rice Bran Oil Industry	Rice Bran Oil	Availability of raw materials and increasing demand in the domestic market
	Shipbreaking/ Shipbuilding Industry	Ship breaking and Smaller ocean-faring ships	- Ample supply of skilled labor at low cost - Advantageous geographical location
	Genetically Modified /Agro-based Industry	Canned Juice / Fruit, Dairy and Poultry	- Availability of raw materials - Cultivable plane land - Favorable environment for agro activities
	Frozen Foods	Hatcheries, Sustainable aqua-culture technology, Feed meals plants, Processing unit for value-added	- Significant prospect as an export oriented industry - Introduction of modern technology and equipment

⁵ Mills or factories operated with automatic machine or machine tool for processing of agro products and others

	products		-Favorable geographical environment etc.
Animal-Breeding & fattening Industry	Breeding, Fattening		Ever increasing demand in the domestic market
Leather and Leather Goods	Finished Leather, Leather Goods		Availability of raw materials and low cost labor
Light Engineering	Machinery Parts, Consumer Items, Toys		Recent increase in the number of affluent middle class rising the demand for durable consumer goods
Textiles Industry	Fabric, Yarn		Availability manpower and low cost labor

Sources: JICA Survey Team

3) Potential Sectors of Industry and Critical Success Factors for the Upcoming EZs

- Development of Infrastructure:
 - a. One factor that was identified as a critical success factor during the KII was the availability of off-site infrastructure in the EZs. The key informants highlighted the fact that if the EZs are going to be established all around the country especially outside Dhaka and Chittagong then developing customized EZ focused connectivity should be ensured in attracting FDI.
 - b. It was also referred that in case of the construction of on-site infrastructure the developers cannot be held sole responsible. Proactive involvement of donor agencies and GoB in developing the EZs will expedite the establishment of EZs.
 - c. The key informants also indicated that customized connectivity or communication infrastructure may be the construction of by-pass road, tunnel, development of water communication system, development of rail communication system etc.

(7) Key Findings of the Study and Concluding Remarks

1) Level of Intention for Investment:

- a. About 17% (5) enterprises have strong intention for new investment in upcoming EZ as they have already developed concrete plan whereas 83% (25) enterprises although willing to invest but yet to develop any concrete plan for prospective investment. The five enterprises with concrete business plan are Energypac Power Generation Ltd, Macro Cable Ltd, Global Shoes Ltd, BBS Cables Ltd, IFAD Autos Ltd.
- b. Most of the enterprises (73%) intend to invest in the upcoming EZs with a view to expand their existing production unit and the remaining 13% enterprises plans to invest to establish new production units in the upcoming EZs whereas 13% enterprises has willing to do both.

2) Probable Timing and Purpose of Investment:

- a. About 90% (27) enterprises said that they will invest within 1 to 3 years and the remaining 10% (3) enterprises responded that they are interested to invest within 3 to 5 years.
- b. Only 27% (8) enterprises would like to make business exposure to new sectors through new investment in EZs. For example, an enterprise currently operating in the Automobile/ Motor cycle parts would like make business exposure to the Electrical and Electronics sector.
- c. About 70% enterprises want to establish both domestic and export market oriented industry whereas 30% targets export market only.

3) Preferred Location for EZ:

- a. About 53% replied that if the zones were established within Dhaka city and its outskirts, it would have been more convenient and preferable for investment. About 17% enterprises are prepared to establish anywhere in Bangladesh whereas the remaining 30% enterprises have no specific choice on locations if utilities are available.
 - b. Only 37% respondents stated that a distance of 20-30 km from Dhaka is preferable whereas 30-40 km distance from Dhaka manageable from the point of view of 6 respondents (20%).
 - c. The location preferences of the enterprises are different as they are concerned about the availability of forwarded and backward linkage industries in or around the EZs. Hence, the availability of forward and backward industries in or around EZs may prove to be an crucial factor in attracting investors.
- 4) Required Infrastructure Facilities and Other Benefits:
- a. Existence of sufficient infrastructures is the most critical factor while making an investment decision followed by other factors like efficient management of zone developer, proper zone development plan, availability of adequate human resources, markets for products, scope of linking with value chain and availability of raw materials. Existence of industrial clusters nearby the zone has been identified as the least important factor.
 - b. About 93% enterprises are aware about the incentives and benefit packages those will be offered to the enterprises in the EZs.

5) E. Environmental Compliance Issues:

- a. As per the Environment Conservation Rules, 1997 based on impact on environment the surveyed industries falls in the following categories:

List of Industries	Category
<input checked="" type="checkbox"/> Automobile/ Motor cycle parts <input checked="" type="checkbox"/> Medical Equipment and Devices <input checked="" type="checkbox"/> Bi-cycle	Green
<input checked="" type="checkbox"/> Footwear and Leather Goods <input checked="" type="checkbox"/> Agro-products and Beverage <input checked="" type="checkbox"/> Wooden Products/ Furniture <input checked="" type="checkbox"/> Plastic and Rubber Products <input checked="" type="checkbox"/> Ready Made Garments / Apparels <input checked="" type="checkbox"/> Cables, wire harness <input checked="" type="checkbox"/> Garment Accessories	Orange A
<input checked="" type="checkbox"/> Knitting and Textile, Yarn, Spinning <input checked="" type="checkbox"/> Jute and Jute Goods Materials	Orange B
<input checked="" type="checkbox"/> Light Engineering <input checked="" type="checkbox"/> Pharmaceutical and Healthcare Goods <input checked="" type="checkbox"/> Electrical and Electronics	Red

According to this rule, industries falling in Orange A, Orange B and Red categories must make effluent discharge arrangement and submit Layout Plan of Effluent Treatment Plant (ETP) for Environmental Clearance Certificate for both solid and liquid industrial wastes and therefore in establishing EZ this issue must be consider with significance. Therefore, the availability of combined effluent treatment plant was identified as the most demanded facility in a zone consecutively followed by security & protection measures, nearby inland

container terminal, common water treatment plant, availability of urban amenities and shared warehouse & logistics center.

6) Required Utility Facilities:

- a. Only 21 enterprises of different sectors provided information on their current electricity consumption whereas only 11 and 9 enterprises shared information on gas consumption and water consumption respectively
- b. No enterprise could provide information related to the possible future demand for utilities as most of them do not yet have any concrete business plan for investment in the upcoming EZs.

7) Required Land and Factory Space:

- a. Only five (5) enterprises could provide information on the expected land size in EZs. Four (4) large enterprises replied that they would require a plot of 13,935 m², 14,182 m², 27,380 m² and 40,469 m². On the other hand, a medium enterprise replied that it would require a plot of 12,138 m² for making new investment in the EZ.
- b. On the other hand, only three (3) enterprises shared information on the required size of factory building in the upcoming EZs. Two (2) large enterprises replied that they would require 9,209 m² and 8,500 m² of factory building in the EZs whereas the medium enterprise would require 9,104 m² of factory building.

8) Required Business Development Services (BDS):

- a. Opportunity for the extension of 11 separate types of business development services (regulatory support, logistics support including C&F services, market access and market promotion, business information support, training and skill development, legal and documentation, printing and packaging, operation and maintenance, recruitment and payroll management, taxation services, accounting and auditing) required by the industrial has been identified.

9) Concluding Remarks

- a. The enterprises surveyed has shown positive attitude towards making future investment in the EZs. All the enterprises have plans to invest in the EZs although either short or medium term meaning the EZ should be in place to capture these investors. The enterprises are yet to come up with comprehensive business plans for future investment in EZs and therefore, unable to provide information or indication on all the facilities and services required by them. Moreover, the enterprises are not yet fully confident on the success of the EZs initiative in Bangladesh as the implementation is progressing much slowly than expected. However, if the EZ establishment process receives momentum, it is expected the industrial units will be encouraged to invest in the upcoming EZs.
- b. Besides required infrastructure and utility facilities the development of any EZ should also ensure specific support services including BDS. Factors like existence of sufficient infrastructure, efficient management of zone developer and proper zone development plan seem to be higher priority to the prospective tenants compared to other factors. Likewise, provision of regulatory support, logistics support including Container Freight Station (CFS) service, market access and market promotion support and business information support are more important than other services for the prospective investors. Some sophisticated and faster communication infrastructure should be in place to improve movement of commercial and industrial vehicles.
- c. This survey is for the potential needs for Economic Zones Development in general. Although the expected location area is Dhaka and outskirts, the preference and

- requirement for EZ location may vary from investor to investor and subject to the basic plan of EZ development.
- d. Finally, issue of training and human resources development also gets importance while locating the enterprises in the EZs. Therefore, when JICA implements any EZ project in Bangladesh adequate care should be ensured on both hard and soft infrastructure facilities besides various government incentive and benefits.
 - e. Last but not the least, the Government of Bangladesh should not be complacent about its abundant and cheap human resources that may attract FDI, rather it should focus on expeditious implementation of EZs and its required off-infrastructure, improved governance situation and social security and higher degree of enforcement of laws and orders and access to energy (gas). Without ensuring these issues, the foreign investors may not be attracted to invest in the upcoming EZs in Bangladesh.

(8) Potential Industries from the viewpoint of Agricultural Products available at the suburban Dhaka

Gazipur district

To examine potentials of agro-processing as indigenous industries, characteristics of agricultural production in Gazipur are analyzed by comparing cultivated area by crop in the district and Bangladesh as a whole. Based on data of cultivated area by crop, location quotient (LQ) is calculated, and results are summarized in Table 4.2.3-11.

From Table 4.2.3-11, the following are observed related to characteristics of crop cultivation in Gazipur.

- 1) Importance of rice production in Gazipur is similar to the level in Bangradesh (LQ=0.96).
- 2) Sugarcane production is comparatively more important in Gazipur than in Bangradesh (LQ=1.97).
- 3) Modest specialization in turmeric and ginger is seen in Gazipur (LQ=1.38).
- 4) Vegetables production in Gazipur is much more important in Gazipur, reflecting characteristics of suburban agriculture supplying to the urban market of Dhaka (LQ=3.45).
- 5) Importance of fruits production in Gazipur far exceeds that in Bangradesh having the highest level of specialization (LQ=11.78).
- 6) Wheat, jute, oil crops, spices, pulses and other crops are comparatively less important in Gazipur than in Bangradesh as a whole.

Based on these observations, promising agro-industries from the viewpoint of agricultural production may include vegetables and fruits processing, sugar manufacturing, some health products and cosmetics/pharmaceuticals based on turmeric, ginger, rice bran and other raw materials.

Table 4.2.3-11 Comparison of Crop Production in Gazipur Based on Cultivated Area by Location Quotient

	Cultivated area (acre)			Share (%)			Location quotient	
	Sreepur	Gazipur	Bangladesh*	Sreepur	Gazipur	Bangladesh*	Sreepur	Gazipur
Rice- Aus	303	6,012	2,432	0.004	0.018	0.070	0.06	0.25
Aman	33,375	106,388	13,993	0.459	0.315	0.402	1.14	0.78
Boro	30,164	148,250	11,631	0.414	0.439	0.334	1.24	1.31
Total	63,842	260,650	28,056	0.877	0.772	0.806	1.09	0.96
Wheat	58	6,883	930	0.001	0.020	0.027	0.03	0.76
Jute	566	4,012	1,029	0.008	0.012	0.030	0.26	0.40
Sugarcane	2,588	5,556	290	0.036	0.016	0.008	4.27	1.97
Lentil (masur)	20	219	72	0.000	0.001	0.002	0.13	0.31
Mug	24	102	20	0.000	0.000	0.001	0.57	0.53
Maize	3	179	376	0.000	0.001	0.011	0.00	0.05
Pulses	114	655	576	0.002	0.002	0.017	0.09	0.12
Potatoes	127	1,215	1,151	0.002	0.004	0.033	0.05	0.11
Oil seed	3	4,716	903	0.000	0.014	0.026	0.00	0.54
Pepper, onion, garlic	378	2,056	706	0.005	0.006	0.020	0.26	0.30
Turmeric, ginger	340	1,444	108	0.005	0.004	0.003	1.51	1.38
Vegetables	706	7,260	217	0.010	0.021	0.006	1.56	3.45
Fruits	4,016	42,885	375	0.055	0.127	0.011	5.12	11.78
Total	72,785	337,832	34,809	1.000	1.000	1.000	1.00	1.00

Source: District Statistics 2011, Gazipur, December 2013

Narayanganj district

Similarly, characteristics of crop production in Narayanganj are analyzed by comparing shares of cultivated area under different crops by location quotient (LQ). Results are summarized in Table 4.2.3-12. The following are observes from the table.

- 1) Importance of rice production in Narayanganj is similar to the level in Bangradesh (LQ=1.01).
- 2) Specialization in lentil is rather high in Narayanganj (LQ=1.47).
- 3) Specialization in root crops is low in Araihazar but considerably high in Narayanganj as a whole (LQ=1.74).
- 4) Importance of vegetables production in Narayanganj far exceeds that in Bangradesh having the highest level of specialization (LQ=6.55).
- 5) Importance of fruits production is not high in Araihazar but higher in Narayanganj than that in Bangradesh.
- 6) Specialization in oil crops is slightly higher in Narayanganj than that in Bangradesh.

Based on the observations, promising agro-industries from the viewpoint of crop production may include vegetables and fruits processing, processed products of root crops and edible oils with animal feed manufacturing.

Table4.2.3-12 Comparison of Crop Production in Narayanganj Based on Cultivated Area by Location Quotient

	Cultivated area (acre)		Share (%)			Location quotient		
	Araihaazar	Narayanganj						
Rice- Aus	24	522	2,432	0.001	0.004	0.070	0.01	0.06
Aman	16,150	28,162	13,993	0.343	0.220	0.402	0.85	0.55
Boro	24,846	75,732	11,631	0.527	0.592	0.334	1.58	1.77
Total	41,020	104,416	28,056	0.870	0.817	0.806	1.08	1.01
Wheat	552	940	930	0.012	0.007	0.027	0.44	0.28
Jute	764	1,472	1,029	0.016	0.012	0.030	0.55	0.39
Sugarcane	28	208	290	0.001	0.002	0.008	0.07	0.20
Lentil (masur)	220	388	72	0.005	0.003	0.002	2.26	1.47
Mug	7	20	20	0.000	0.000	0.001	0.26	0.27
Maize	1	98	376	0.000	0.001	0.011	0.00	0.07
Pulses	263	406	576	0.006	0.003	0.017	0.34	0.19
Potatoes	631	7,352	1,151	0.013	0.058	0.033	0.40	1.74
Oil seed	1,161	3,764	903	0.025	0.029	0.026	0.95	1.14
Pepper, onion, garlic	623	1,541	706	0.013	0.012	0.020	0.65	0.59
Turmeric, ginger	11	131	108	0.000	0.001	0.003	0.08	0.33
Vegetables	1,742	5,223	217	0.037	0.041	0.006	5.93	6.55
Fruits	102	1,867	375	0.002	0.015	0.011	0.20	1.36
Total	47,125	127,826	34,809	1.000	1.000	1.000	1.00	1.00

Source: District Statistics 2011, Narayanganj, December 2013

(9) Interview survey for Japanese companies in Bangladesh

In Dhaka, the survey team made a visit to conduct an interview survey with the representative office of JETRO, Mitsubishi Tokyo UFG Bank and Nippon Express as they are closely related to information regarding new investment to Bangladesh by Japanese companies.

There are common recognitions among the three as follows:

In 2014, there was a mood to strengthen the partnership between Bangladesh and Japan thanks to prime minister exchange visits and Public Private dialogue meetings held between the two countries. However new investment to Bangladesh by Japanese companies is now stagnant due to the unstable condition of politics and security in Bangladesh as well as Yen depreciation.

JETRO and Mitsubishi Tokyo UFJ Bank receive many inquiries and visitors from Japanese companies. Regrettably those inquiries and visitors from Japanese manufacturing industries are a few but most of them come from industries in commerce and service sectors, Sogo Shosha of infrastructure businesses, plants, general contractors and consultants.

JETRO concluded MOU with BEPZA regarding rental factories for SMEs in the Adamjee EPZ. As a result, only two Japanese SMEs concluded the rental contract with BEPZA and then the MOU expired. One SME is the manufacturer of camera cases and the other one is manufacturing tea products.

According to JETRO, the unstable condition of politics in Bangladesh are settling down now, but a general election to be held next year is scheduled. Accordingly, there would be a possibility that the country becomes unstable again. If so, it is feared that the stagnant condition of investment by Japanese companies may continue for a long period. Unless there is otherwise any clue toward improvement, it is difficult to foresee new investment to Bangladesh any time soon. BEZA has commenced the preparation to FDI promotion activities along with the progress of EZ development. JICA survey team should grasp the real needs of BEZA to support BEZA with its

capacity development in respect to formulating the FDI attraction strategy and FDI promotion plan and implementation, timely and in conformity with the requirement of BEZA.

At the moment, there is no direct connection between BEZA and JETRO, while BOI and BEPZA have established good relations with JETRO which represents the official trade and investment promotion organization in Japan. Along with the development of the project, when the time comes, it will be necessary to formulate the co-work scheme for promoting investment to Bangladesh from Japanese investors. That is a common goal among the parties concerned.

4.2.4. Summary of Enterprise survey on potential Investment in EZs

Making use of existing data

1. Data Collection Survey on Special Economic Zones in Bangladesh (JICA, 2013)

The survey questionnaire was mailed to 1,867 Japanese companies which have production bases in China and a turnover exceeding 5 billion yen. The answer sheet was collected from 174 companies. In the descriptions of 18 firms, 10 were SME's with capital of less than 300 million yen, therefore amounting to more than half. The breakdown of the sectors to which they belong included electronic parts, devices and circuits (4), textiles (3), chemical and medicine (3), rubber and leather (2), iron and non- ferrous metals (2), food and beverages (1), glass and quarrying (1), production machines and appliances (1), and those categorized as "Other manufacture" (1). There are no firms that selected Bangladesh as a candidate for a manufacturing base from the "transport-related industry" (25) or "electric equipment and appliances" (16). This implies that businesses from those 2 sectors are less interested in Bangladesh. On the other hand, the sectors like "electronic parts, devices and circuits", "iron and non-ferrous metals", "chemical and medicine", have great interest in Bangladesh. Even the companies investing in China do have enough information on Bangladesh as a new investment market.

2. The Foreign Direct Investment Promotion Project in Bangladesh (JICA, 2014)

A total of 115 enterprises in 5 EPZs were surveyed (55 Japanese Enterprises and 60 Bangladeshi enterprises). Out of the industries surveyed, manufacturing sectors included Japanese enterprises 62 % and Bangladesh local enterprises 45%. Most of the manufacturing sectors are textiles and RMG. The breakdown of Japanese enterprises included textiles/RMG 38%, trading 22%, leather/shoes 13%, electronic devices/electrical goods 13%, light engineering industries 10%, and other enterprises 11%. With respect to the export market and the domestic market, more than 70% of Bangladeshi enterprises sell to the domestic market. Twenty-seven percent (27%) of Japanese enterprises sell to their domestic market. Forty-two (42) Bangladeshi enterprises have continuous trading with Japanese enterprises.

The criteria for selecting EZs are "sufficient infrastructure", "sufficient human resources & managers", "proper EZ development", and "value chain" etc. Needs for new capital are steady both in Japanese companies and Bangladeshi companies. The purpose of new capital investment is to expand current business. The borrowers' breakdown included 38 Japanese companies (86%) and 49 Bangladeshi companies (91%). In particular, they are keen to expand current business.

As to the timing of investment, 30% of Japanese companies are willing to make new capital investments within one year, compared to 19% of Bangladeshi companies which are willing to make new capital investments within one year.

As to the borrowing amounts, 17 Japanese Companies (31%) and 30 Bangladeshi companies (50%) have financing demands up to \$10 million USD as industrial loans. Two (2) Japanese companies (4%) and 5 Bangladeshi companies (8%) have financing demands of more than \$50 million USD. Bangladeshi companies have a stronger motivation to make investments

<p>in equipment.</p> <p>Above all, companies within the EPZ have a greater motivation to expand investments but the Bangladeshi government decided not to set up any new EPZ. As a result, is more incentive in investing in EZs than in EPZs.</p>
This Enterprise survey
3. Enterprise survey on Potential Investment to Upcoming Economic Zones in Bangladesh (2015)
<p>In this survey, the status quo of the enterprises, data collection and analysis towards the future, target sectors for future investment, necessary support services to develop EZs and needs for off-site infrastructure were surveyed.</p> <p>Five (5) enterprises (17%) out of 30 enterprises surveyed have concrete plans, and the remainder of 25 (83%) want to invest in EZs. The contents of the investment are [Expansion of current business, mostly (73%)], [participation in new industry sectors (13%)], [Both existing industries and new industry sectors (13%)]. It has been determined that there is a strong motivation to participate in new sectors and new markets. As to the timing of the investment, 27 enterprises (90%) are thinking of making investments within 1 - 3 years. 70% of enterprises are targeting the domestic market as well as overseas markets.</p> <p>As to the location of EZs, approximately half of enterprises (53%) consider Dhaka and its outskirts to be convenient and preferable for investment, but the rest do not feel bound by location. Eleven (11) enterprises (37%) consider that the location of an EZ is preferable within 20-30 km from Dhaka, while 6 enterprises (20%) consider that they can manage within a range of 30-40 km. From the viewpoint of current policy, the supply chain becomes a more important factor than the distance from Dhaka (due to traffic). In EZ development, the key factors to success are infrastructure, utility and facility, specific services including BDS (Business development service), acquiring a reliable labor force and human resource development. Furthermore, it is indispensable that the whole of investment and business environment should be attractive to investors.</p>
4. Interview survey of 3 Japanese Organizations (2015)
<p>An interview was conducted with representatives from each of the three organizations, viz., JETRO, Mitsubishi Tokyo UFG Bank and Nippon Express regarding the current situation of investment in Bangladesh by Japanese enterprises.</p> <p>New investment in Bangladesh by Japanese companies has become stagnant due to unstable political and security conditions in Bangladesh, as well as the depreciation of the Yen.</p> <p>JETRO and Mitsubishi Tokyo UFJ Bank receive many inquiries and visitors from Japanese companies. Some of these are from the manufacturing industries, but most come from industries in the commerce and service sectors, Sogo Shosha (Integrated trading firm) of infrastructure businesses, plants, general contractors and consultants.</p> <p>JETRO concluded a MOU with BEPZA regarding rental factories for SMEs in the Adamjee EPZ. Only two companies concluded the rental contract with BEPZA and the MOU has expired.</p>

[The analysis of potential investments to EZ]

- 1) The GDP growth rate for the period from 2011 to 2015 maintained a 6.01 % minimum and a 6.51% maximum, while GDP per capita achieved US \$1,314 in 2015. This is almost on equal levels with the GDP per capita of India and Vietnam after the world financial crisis occurred in 2007. The number of Japanese enterprises that invested/penetrated into Bangladesh increased from 167 in 2013 to 236 in 2015. There are three reasons for the purpose of such investment/penetration: (a) the investors in export oriented industry established the production site for a labor intensive industry, (b) the investor targets the

domestic market, which has a population of 160 million, and (c) the investor is oriented towards social business.

- 2) Some of the existing investors in Bangladesh have the potential to expand their investments and to acquire additional factory sites. As it is difficult to acquire the land for the factory site near Dhaka, there is potentially the need for EZ development, which would be expected by investors. On the other hand, in 2015, the trend of new investments and setting up operations in Bangladesh came to a temporary standstill. In comparison with ASEAN, Myanmar and India, Bangladesh is not well known to Japanese investors, who are generally less interested in Bangladesh. In addition, political volatility and poor security affected the foreign direct investment.
- 3) FDI are classified in two categories: (a) export oriented industry that places production factories in Bangladesh and (b) domestic market oriented industry. Typical examples of export oriented industries that place production factories in Bangladesh are RMG, leather industry, IT outsourcing industry, etc., where not only FDI but also consignment production is popular. Occasionally there are long term relationships between Bangladeshi consignees and foreign consigners in such businesses, which are not reflected in foreign investment statistics.
- 4) The domestic market oriented industry is classified as “B to B” type and “B to C” type. Examples of type “B to B” include the production and sales of apparel accessories and the sale of sewing machines to the RMG sector, which is the largest industry in Bangladesh. Other examples include the sale of raw materials, machinery, and service businesses such as distribution, inspection of clothing products and safety inspection (i.e. that no needles remain to the clothing). Type “B to C” is represented by food products, medical products, motorcycles, medical care and communication. Apart from EPZ, the domestic oriented industry can be located in the EZ, and investment by such industries in the EZ is anticipated.
- 5) As a result of the Investment Needs Survey, the following industries are expected to be investors in the site of the future EZ: RMG, apparel accessories, textiles, home textiles, motorcycle and parts, automobiles and auto parts (including wire harnesses), metal and non-iron processing, electric/electrical goods and parts, machinery and machine parts, plastic products, agricultural processing, and medicine/healthy food/cosmetics.
- 6) The sectors which are cited in item 5 above are listed as Priority Industry Sectors in “Industrial Policy 2015”. The survey team interviewed Bangladeshi government organizations such as the MOI, BOI, EPB and SMED with enquiries about the industrial sectors which they deemed as desirable investors in the EZ. The industries cited in the survey are included above, in item 5.
- 7) Those factors that will lead the EZ to success are locational conditions, the improvement of on-site and off-site infrastructure, land prices and development costs. In addition, it will be necessary to reform other investment & business environments. Necessary reforms include the improvement of the legal system related to investment, transparent, predictable, smooth processing of legal procedures, securing labor power in the required qualities and quantities, as well as financial incentives to attract investment.

4.3 Formulation of EZ Development Concept

When it comes to the “Concept of Economic Zone development”, there are 3 classifications:

- (1) The concept and model of developing Special Economic Zones that are prevailing in the world
- (2) The concept of developing Economic Zones under the Economic Zones Act, 2010 in Bangladesh
- (3) The concept of developing a specific Economic Zone

“The contents in the Economic Zones Act in Bangladesh” mainly consists of the objectives, targets, methods, outcomes, impact, etc. “The concept of developing a specific Economic Zone” is the concrete direction of basic design of EZ to be developed based on the concept of developing EZ under the Bangladesh Economic Zones Act, 2010. The latter includes the industrial sectors invested in EZ, characteristics of tenant industries to be attracted to EZ, functions and facilities of EZs such as commercial and logistics, industrial linkage inside and outside the EZ, and linkage with off-site infrastructure and local area development, all of which are main factors for the basic design.

4.3.1 The Concept and Model of Developing Special Economic Zones

In general, “Special Economic Zones” (SEZ) are used globally for industrial parks or estates with special functions in developing economies through international investment and trade. The development of SEZ began in the 1970’s and has a long history. There are different variations, but SEZ is typically classified according to the following 5 models:

- (1) Free Trade Zone (Commercial Free Zones)
- (2) Traditional Export Processing Zone (Traditional EPZ)
- (3) Hybrid Export Processing Zone (Hybrid EPZ)
- (4) Free Port / Special Economic Zones

The features of each model are shown in Table 4.3.1-1.

Table 4.3.1-1 Model and Characteristics of SEZ

Model of SEZ	Objectives of Development	Typical Size	Typical Place	Function	Market	Example
Free Trade Zone (Commercial Free Zone)	Trade promotion	below 50ha	Port, custom procedure	Free port, Trade	Domestic ReExport	Colon Free Zone (Panama)
Traditional EPZ	Manufacturing & export	below 100ha	none	Manufacturing and processing	Mainly export	Bangladesh Vietnam
Free Enterprises (Single Unit EPZ)	Manufacturing & Export	No lower limit	Nationwide	Manufacturing and processing	Mainly export	Mauritius Mexico
Hybrid EPZ	Manufacturing & Export	Below 100ha	nil	Manufacturing and processing	Export & domestic	La Krabang (Thailand)
Freeport/SEZ	Integrated development	exceeding 1,000	nil	Multi purpose	International, domestic, transport	Aqaba Shenshen

Source: The report prepared by the JICA Survey Team on “SEZs, Progress, Emerging Challenges and Future Direction (World Bank)”

An SEZ is usually established for the purpose of achieving policy objectives as mentioned below:

- a. Attracting FDI: Attracting FDI is the objective in any model, from traditional EPZ's to the large scale Freeport/SEZ.
- b. Increase in employment: The SEZ creates job opportunities on a large scale, thereby facilitating job creation.
- c. Supporting wider economic innovation: SEZ's expand and diversify exports, thus reducing dependency on imported products and therefore promoting import substitute industries.
- d. Serving as an experimental laboratory for the application of new policies: FDI, law, land, labor and pricing policies are all applicable to SEZ's as pilot projects before the establishment of a nationwide implementation plan. SEZ in China is a typical case. China developed large scale SEZ's such as Shenzhen⁶ by attracting FDI's on a large scale, expanding their export industry, and therefore achieving remarkable economic growth.

In a traditional EPZ, the developing country improves its infrastructure while making the best use of cheap labor. Special incentives are also provided (duty free import, bonded warehouse, repatriation of profits, tax rebates, etc.), thereby attracting export oriented industries from abroad. Furthermore, the country utilizes the GSP facility applicable to the least developed country, and this is evident with the apparel industry in Bangladesh. In so doing, EPZs have contributed to economic growth and increased employment opportunities by increasing exports in the short term. However, the increased wages and the abolition of the GSP facility caused the industries in EPZs to lose their international competitiveness. Thus, there is a limit to sustainable economic growth. For those reasons, the concept of SEZ is shifting from that of a traditional EPZ towards the development of SEZ's, which focus on enabling continuous economic growth in accordance with the endowment of resources and other individual conditions of each country. The large scale SEZ integrated development model especially has strategic and diversified targets. These will aid in the structural reform of the economy in order to secure additional employment opportunities, expanded exports and sustainable economic growth. The following are examples of the strategic target:

- a. Strategic linkage of the SEZ with local economies – infrastructure of local communities in the form of urban amenities (commercial, accommodation space, hospitals, university, etc.)
- b. Investment in the SEZ by local industries and the linkage with foreign investors, participation in global supply chain
- c. Providing value added services
- d. The shift of industries to high-end products or services (such as automobiles, electrical and electronic products, ICT and BIO).
- e. Infrastructure, ports of high quality, access roads to connect to the SEZ, custom services at the SEZ site.
- f. Fostering human resources, transferring technology from foreign enterprises, and the mobilization of human resources.
- g. Social consideration and protection of the environment, greater participation of women in the society and improved position of women in the workplace environment.

⁶ Shenzhen used to be a fishing village located next to Hong Kong. In 1980, an SEZ was established in Shenzhen, which attracted a significant amount of FDI. Nowadays Shenzhen has a population of 13 million, making it now the 4th largest city in China. Its GDP amounts to 1.6 billion Yuan (in 2014). In Shenzhen, manufacturing industries have become well developed, and in recent years ITC industries and service industries have expanded. In the past, a 391 square km area made up of 4 districts (including Yantian district and Futian district) were nominated as an SEZ; however in 2010, Shenzhen city in its entirety was nominated as an SEZ. Yantian port in the Shenzhen port area is a large port where large container vessels can enter and where more than 10 million TEU containers were handled in 2013.

4.3.2 The Concept of Developing Economic Zones under the Economic Zones Act in Bangladesh

The concept of developing Economic Zones under the Bangladesh Economic Zones Act is summarized below:

(1) The objectives of developing EZ

The objectives are the establishment of Economic Zones in all potential areas including backward and underdeveloped regions and development, operation, management and control thereof including the matters ancillary thereto with a view to encouraging rapid economic development through increase and diversification of industry, employment, production and export.

(2) Method of developing EZ: 4 categories and development methods

Table 4.3.2-1 Method of Developing EZs

1. PPP (Public-Private Partnership)	Economic Zones established through public-private partnership by local or foreign individuals, bodies or organizations.
2. Private Economic Zones	Economic Zones established individually or jointly by local, non-residential Bangladeshi or foreign investors, bodies, business organizations or groups.
3. Government Economic Zones	Economic Zones established and owned by the Government.
4. Special Economic Zones	Economic Zones established privately, by public-private partnership or by Government initiative, for the establishment of any kind of specialized industry or commercial organization.

Source: JICA Survey Team

(Note 1) G2G Economic Zones

The 5th Category “Government to Government Economic Zones”, which is not stated in the EZ Act, is now under study in BEZA and is outlined in BEZA Vision Documents.

“G2G Economic Zones – established upon initiative by the government of a foreign country or the Government of Bangladesh and/or in partnership between the Government of Bangladesh and the Government of foreign country.”

EZ's to be developed by China and India in Bangladesh have been agreed upon by the governments. G2G EZ appears to be based on such an EZ.

(Note 2) Comparison of EPZ and EZ

EPZ is developed by Government initiative, while an EZ is developed by private initiative. At the present time, the Government has not shown any plans to develop Government Economic Zones.

(Note 3) Special Economic Zones

The examples of Special Economic Zones are Kaliakoir High-Tech Park (Operating under the Bangladesh High-tech Park Authority and the Ministry of Information and Communication Technology), API Park and IT Park.

RMG Industrial Park is classified as a Private Special Economic Zone)

The term “Special Economic Zone” is used globally, however in Bangladesh the word “Special Economic Zone” is classified under Category 4, which carries a different (and more specific) meaning, which is often the cause of some confusion.

(3) Division of an EZ into several areas and developments

BEZA may issue orders as necessary to prepare a master plan for the land connected with any EZ, dividing it into the following areas

Table 4.3.2-2 Areas of EZs

1. Export Processing Area	Specified for export oriented industries.
2. Domestic Processing Area	Specified for industries to be established to meet the demands of the domestic market.
3. Commercial Area	Specified for business organizations, banks, warehouses, offices or any other organization.
4. Non processing Area	Specified for residences, health, education, amusements, etc.

(Note 1) Only Areas 1 & 3 above are applied to EPZ, where there is no division of the zones.

(Note 2) The goal of Area 2 is to make business and industrial linkages between the domestic oriented industries in the Domestic Processing Area, and the export oriented industries in the inside Export Processing Area; achieving the transfer of technology and the formulation of an industrial cluster.

(Note 3) The goal of Area 4, the Non-Processing Area, is to develop local communities, bringing local development and urban development into rural areas.

4.3.3 Cases of Vietnamese EZ Development

(1) Outline of Special Economic Zones in Vietnam

The Government of Vietnam has taken initiatives to attract FDI of export oriented industries to the Special Economic Zones since the 1990's. These initiatives eventually resulted in the increased flow of exports from Vietnam, thus achieving rapid economic growth. As of September 2013, across the country there are 289 **Industrial Parks** (occupying a total land area exceeding 81,000 ha), 15 **Coastal Economic Zones** (occupying a total land area exceeding 698,000 ha) and 28 **Border Economic Zones** (occupying a total land area exceeding 600,000 ha). The SEZs in Vietnam have been developed in diversified models which are fit for the local conditions and requirements of the Investors.

Foreign investors have, jointly with local entrepreneurs, developed a plethora of industrial parks and EPZs for these foreign investors. Of these areas, industrial parks developed by the Japanese developers are namely: Nomura-Hai Phong Industrial Zones (Nomura Security) in the north, Thang Long Industrial Park (Sumitomo Corporation), Amata Industrial Park (Itochu Corporation), Loteco Industrial Park (Sojitz), and Long Duc Industrial Park (Sojitz, Daiwa, Shinko). Average area of each industrial park exceeds 100 ha.

Each Coastal Economic Zone has land space exceeding 10,000 ha, while Border Economic Zones are located near the border with Laos and Cambodia, with an aim towards the development of cross border trade across a broad area.

Through September 2019, the accumulated investment amount to industrial parks, EPZs and SEZs in Vietnam is projected to exceed \$42.6 billion USD with a total of 6,000 cases. In addition, there were 4,820 cases of FDI, where the total investment reached \$110 billion USD. Furthermore, Industrial parks generate 40% of the national production value and 60% of export value, employing a total of 2.1 million people as of June 2013.

(2) Benchmarking

Near Hanoi, in Northern Vietnam, the SEZs follow a different model from Japanese industrial parks. All of them can be good references for the establishment of benchmarks by the Bangladeshis. Some typical cases are Thang Long Industrial Park, developed by Japanese developers; VSIP Hai Phong developed in a joint venture between the government of Singapore and Vietnam; and DVIZ, developed with private Belgian capital in cooperation with the Hai Phong city corporation of the Vietnamese government.

EZ / Industrial park	Feature
THANG LONG INDUSTRIAL PARK	Model of export oriented, EPZ type developed and managed by Japanese developers in ASEAN.
VSIP HAI PHONG	Coastal Economic Zone which integrates the function of an industrial park and urban development. VSIP is jointly developed by the Vietnamese government and the Singaporean government.
DINH VU INDUSTRIAL ZONE	Coastal Economic Zone furnished with a free port, chemical complex, heavy industries and light industries, which is developed by Belgian private enterprises with the cooperation of the Hai Phong city government (People's Committee).

In Bangladesh there are EPZs managed by BEPZA, the government developer. **Thang Long Industrial park** is similar to the EPZ type since the majority of tenants are export oriented, but managed by a private Japanese developer. In Thang Long, the Japanese-based developer provides Japanese based tenants with more customer-oriented and detailed service. The area occupied by development land is 274 ha, which is the appropriate size in terms of economic development. Therefore, this could serve as a benchmarking model for short-term EZ development.

VSIP HAI PHONG is a model of integrated area development with its large 1,600 industrial park. The VSIP development is a joint initiative of the Vietnamese and Singaporean governments, and is also funded by private investors. The residential and commercial area amounts to 69% of the entire site. This would imply that the goal of the development is focused on urban development. This urban development is formulated by real estate developers, and the experience and expertise of Singaporean enterprises are well utilized. It is notable that Japanese based industries amount to 40% of tenants in VSIP.

DVIZ is a model of EZ furnished with a free port. Heavy and chemical industries are located in this oceanfront. The development is on a very large scale, comprising of 2,223 ha. DVIZ is developed through a joint venture between Belgian private enterprises and Hai Phong city. At the island near DVIS, a deep sea commercial port is under construction with assistance from JICA. In terms of container logistics for import and export, the access between DVIS and the commercial port is convenient.

Neither model exists in Bangladesh. They are a more advanced form of EZs. They can be referential models to be considered during the development of urban and industrial integration, and with respect to the development of heavy and chemical industries at the coastal industrial zone adjacent to the deep sea port in mid-term EZ development.

1) THANG LONG INDUSTRIAL PARK

Thang Long Industrial Park has been developed by a joint venture between Sumitomo Corporation and local capital, which mainly targeted Japanese companies. It was established in February 1997. 274 hectares were sold. The park is located in Hai Phong City (at a distance of 16 km from the center of the city to the Park's location in the north. It takes 30 minutes to reach Hai Phong by car.) Hai Phong Park is 120 km away from Hai Phong port, and it takes 3 hours to reach the port by car. The total number of tenant industries is 97, of which 91 are Japanese enterprises such as Canon, Panasonic, Denso, Asahi Optical, etc.

Inside the park, there are fire stations, police offices, customs, clinics, etc. The park's facilities also include infrastructure and utilities such as flood protection works, electric power and water & sewage system. With respect to commercial services there are banks, restaurants, a logistics center, rental factories and rental offices. The park authority holds tenant meetings to exchange information among the tenant industries. The Japanese staff at the park could also provide services to support the operation of the factory during the initial period, if needed.

2) VSIP HAI PHONG

VSIP HAI PHONG (Vietnam Singapore Township Industrial and Service Park) is a Coastal Economic Zone which integrates the functions of an industrial park with urban development. VSIP HAI PHONG is located in the Nguyen District at a distance of 6 km from the center of the business district in Hai Phong. The total area of land occupied is 1,600 ha, which covers 500 ha of industrial park and 1,100 ha of residential and commercial areas. It was established in January 2010 and is part of the Dinh Vu-Cat Hai Economic Zone. The waterfront is 4 km

in length. There are also plans to establish government offices and universities. This concept is the development of a “New residential area, commercial area and the industrial city located along the river”. Urban development methods which have been used successfully in Singapore have been implemented for the development of residential and commercial areas in VSIP.

With the initiative and support of the Vietnamese and Singaporean governments, VISIP are now developing SEZs at 5 locations nationwide (VSIP Binh Duong, VSIP II Binh Duong, VSIP Bac Ninh, VSIP Quang Ngai, and VSIP Hai Phong). The Developer is the joint venture of Sembcorp Singapore (Temasek 49.4%, Public * 50.6%) and BECAMEX (Local Construction Company). Many Japanese enterprises participated in the capital fund in Singapore, which invests in VISIP.

About 40% of the tenants in VSIP HAI PHONG are Japanese citizens, 14% are Taiwanese, and 13% are American and other countries. The industrial sectors of Japanese enterprises are electronic, electrical, auto parts, optical, medical, food, processing and high technology. The services provided are 24 hour security, management offices, banks, post offices, restaurants, on-site maintenance, and dedicated service at start-up time.

3) DINH VU INDUSTRIAL ZONE, DEEP C INDUSTRIAL ZONE (DVIZ)

DVIZ is a model of an EZ heavy and chemical industrial park located at the sea waterfront. It is a Coastal Economic Zone furnished with a free port, chemical complex, heavy industries and light industries. The developer is a joint entity of RENT A PORT (CFE 45%, ACKERMANS VAN HAAREN 45%, Management 10%) being Belgian capital, Infra Asia Investment and the Hai Phong People's Committee. In human resource development, it has in place a training system in coordination with the local university.

The total land space of the development area is 2,223 ha (DVIZ Deep C 541ha, Deep C II 645 ha, Deep C III 550ha, Deep C IV 487 ha), Dinh Vu - Cat Hai Industrial Cluster land has the additional availability of 7,000ha in land area.

The distance from DVIZ to the center of Hai Phong city is 7 km, 3 km to Hai Phong Airport, and 100 Km to Hanoi (Noibai) Airport.

A new 3-lane express highway spanning a distance of 105 km between Hanoi and Hai Phong will open in 2017, and will provide an increased level of convenience. Within SEZ, there is Dinh Vu Port (7m deep) and a jetty with a pipeline installed for berthing 10,000DW vessels and 20,000DW vessels. The oil refinery products discharged at the port will be distributed to petrochemical factories in the SEZ through the pipelines. Nearby, LACH HUYEN DEEP SEA PORT (14M deep, length 1.5km) is under construction and is scheduled to be completed in 2017.

Table4.3.3-1 Cases of Industrial Parks, EPZs and SEZs in Vietnam

Type	Thang Long Industrial Park	VSIP HAI HPONG Vietnam Singapore Industrial Park Hai Hpong	DINH VU INDUSTRIAL ZONE, DEEP SEA INDUSTRIAL ZONE (DVIZ)
Category	Industrial Park,(almost same as EPZ)	Coastal Economic Zone	Coastal Economic Zone
Development Concept	Industrial Park of EPZ type targeting export oriented Japanese industries mainly	SEZ of integrated development of industrial parks and urban city Central business district, 4km waterfront, Finance art district, Future government office district and university (planned), New urban city development in the north of Hai Phong, within Dinh Vu -Cat Hai Economic Zone; Implementing urban development method experienced in Singapore	SEZ with free port, petro-chemical complex and Heavy industries & light industries Training system in cooperation with 5 universities
Developer	JV of Sumitomo Corporation (58%) and Dong Aing Mechanical Company (42%)	JV of Sembcorp Singapore (Temasek 49.4%, Public * 50.6%) and BECAMEX(Local Construction Company) supported by government of Vietnam and Singapore. Many Japanese enterprises participate in *Public.	JV of RENT A PORT (CFE 45%, ACKERMANS VAN HAAREN 45%, Management 10%) and Infra Asia Investment & Hai Phong Peoples Committee
Developing land space	1st phase 274ha (sales completed)	Industrial park 500ha, Residential and commercial area 1,100ha	2,223ha (DVIZ/Deep C 541ha, Deep C II 645ha, Deep C III 550ha, Deep C IV 487 ha Dinh Vu – Cat Hai Industril Cluster land availability +7,000ha
Place & location	Located at Honoi city, Dong Ain District, at 16 km distance from central district in Hanosi. It takes about 30 minutes by car It is 120 km disance to Hai Phong sea port. It takes 3 hours by car.	Hai Phong city, Nguyen District, 6km from city central area Dinh Vu- Cat Hai Economic Zone Port Jetty and Pipeline in SEZ Dinh Vu Port (7m deep) 10,000DW 20,000DW x each 1berth	Hanoi – Hai Phong New Express Highway105km, 3 lane speed 120/km 7km to Hai Phong central district, 3km to Hai Pong Airport, 100Km to Hani Airport LACH HUYEN DEEP SEA PORT 14M deep, length 1.5km, 2017
Established	February, 1997	January, 2010	
Ke tenants	97 industries including 91 Japanese indutries such as Canon, Panasonic, Denso, Asahi Optical etc.	Japanese 40%、Formosa 14%、USA 13% Others	Knauf, Bridgestone, Idemitsu, JX Nippon Oil, Chevron, Shell
Sectors		Electric, electrical, Auto parts, Optical, Medical, Food, Procesing, High-tech	Heavey industries, Petro-chemical industries, General light industries
Facilities	•Flood protection, Rainwater drainage system,(design water level with the probability of flood by 100 years) Wachu method dike with the hight of 2.2–2.4m from orginal gound Filling 1.5 m, Flood regulating water way, Regulating pond •Water 18,000 tons/day, Deep well at the site •Sewage 3,000 tons/day eliminating nitrogen and phosphorus •Electric power 110/22kV transformer station in each factory	69,000m3 / day 39,000m3 / day 200 MW	20,000M3/day S6,500m3/day National grid and Reginal grid 626 MVA Transmission 22KV
Service and facilities	•Security, Fire station, Police station, Custom office, Clinics •Banks, Restaurant (Japanese & Vietnamese) •Logistics center, Standard rental factory, Rental office •Sharing information at monthly meeting, Japanese staff's support to operation	24 hours security Management office, Bank, Post office, Restaurant On-site maintenance (independet business) Dedicated service at set-up period (Before or after liscence such as employment)	In house customs Main banks Ready built workshop / Warehouse
Employment	About 59,000 (Japanese 430)		1.29 million (City of 1.9 million)
Export amount	2,900 million US\$ (2.2% of Vietnam)in year 2013		

Source: Made by JICA survey team

4.4 Understanding development plans in Dhaka Capital Region and Check Points in the formulation of EZ Development Basic Plan.

In this Chapter, identification of restrictive conditions in the planning of EZ Development which deemed to be critical, will be done by through understanding on the natural conditions at the candidate sites and reviewing the existing and future urban and infrastructure development plans at the Dhaka Capital Region.

4.4.1. Development of Greater Dhaka City

(1) Population concentration in Dhaka District

In Dhaka District, more than 12 million people concentrate in the administrative area of 1,460 Km², making the population density 8,249/Km² as of 2011. The average population growth rate was 3.53% per annum during 2001-11, much higher than the average annual population growth of 1.48% in Bangladesh as a whole. The urbanization ratio was 76.7% in 2011. In the economic structure, agriculture accounted only for 7.7%, while services had a dominant share of 87.2% in 2001.

The population concentration in Dhaka City Corporation is particularly high with 6,970,105 people living in the area of 360Km² making the population density 19,361/Km² in 2011. It is reported the population has now exceeded 10 million in the City Corporation jurisdiction.

In Dhaka Division as a whole, however, the urbanization ratio was 17.6% in 2011, only slightly higher than the average urbanization ratio of 15.2% in Bangladesh as a whole. In the economic structure, agriculture still accounted for over 50% in 2001, as the Division represents a transition area from suburban agriculture area to rural area.

The population concentration in Dhaka District may be seen from labor related indices as well. Labor force coefficient (LFC) is high at 70%, and the ratio of male to female population or sex ratio is more or less 120 in recent years. These indices imply large in-migration seeking for employment opportunities. Relatively small average number of family members at 4.32 may also reflect the large employment seeking in-migration.

(2) Directions of Dhaka urbanization

Although the urbanization ratio is still low in Dhaka Division as a whole, urban sprawl of population from Dhaka District with high population concentration to neighboring areas must be proceeding. A main direction of the urbanization from Dhaka District is toward the north along the National Highway No.3, and another direction is toward the southeast along the National Highway No. 1. In the near future, the urbanization toward the southwest will also accelerate as the Padma Bridge is completed, but this urbanization momentum is not strong yet in this direction.

The urbanization to the north along the National Highway No.3 is inevitable as this area has low susceptibility to floods as it has relatively high elevation, and is expected to constitute part of the future economic corridor linking Dhaka and Mymensingh. Sreepur Upazila located along this corridor showed a high average population growth rate at 3.86% during 2001-11. The population density of the Upazila is still low at 1,059/Km², considerably lower than the average in Dhaka Division.

The urbanization to the southeast along the National Highway No.1 is reflected in the rapid urbanization of the Narayanganj city. Sonargaon Upazila along this direction has the population density of 2,332/Km² and the average annual population growth rate at 2.74% during 2001-11, and similarly Rupganj Upazila has the population density of 3,030/Km² and the average annual population growth rate at 2.85% during 2001-11. These are conspicuously high among Upazilas

in Dhaka Division.

The urbanization to the east does not appear to be proceeding much yet. Araihaazar Upazila along this direction has relatively high population density at 2,079/Km² due to its proximity to Dhaka District but the average population growth rate is 1.28% per annum during 2001-11. Similarly, Narsinghdi Sadar Upazila has high population density at 3,315/Km² but the average population growth rate is 2.03% per annum during 2001-11.

Basic socio-economic data are shown in Table 4.4.1-1 for the three Upazilas selected as candidate sites for the EZ development and Dhaka District, Dhaka Division and Bangladesh.

Table 4.4.1-1 : Comparison of Candidate Upazilas⁷ for EZ Development, Dhaka District, Dhaka Division and Bangladesh by Selected Socio-economic Indices

Upazila	Population 1991 census	Population 2001 census	Population 2011 census	Land area (km ²)	Population density 2001 (/km ²)	Population growth rate 2001–11 (%p.a.)	Urbanizat ion rate 2001 2011 (%)	Househol d size 2001 2011	Sex ratio 2001 2011 (%)	Labor force coefficien t 2001 (%)	Literacy rate 2001 (%)	Economic structure
Sreepur	320,530	337,367	492,792	465.24	1,059	3.86	5.1 25.6	4.29 4.01	104.2 104.1	64.9	47.7 54.8	Agriculture 64.4 industry 4.8 Services 30.8 (Rent & remittance 0.62)
Araihaazar		331,566	376,550	181.1	2,079	1.28	3.8 3.8	5.26 4.86	107.1 100.1	58.2	37.4 41.0	Agriculture 28.5 Industry 24.8 Services 46.7 (Rent & remittance 3.44)
Narsingh di Sadar	451,335	578,563	707,525	213.44	3,315	2.03	25.4 33.2	5.05 4.72	111.2 105.8	60.2	42.9 49.6	Agriculture 55.5 industry 6.8 Services 37.7 (Rent & remittance 2.55)
Dhaka District		8,511,228	12,043,977	1,460.00	8,249	3.53	76.7 (2011)	4.32 (2011)	124.0 119.5	70.0	64.8 70.5	Agriculture 7.70 Industry 6.06 Services 87.2
Dhaka Division		38,678,000 (2000)	47,424,418	31,120.00	1,524	1.87	17.9 (2011)	4.37 (2011)	106.7 (2000) 104.0	61.8+	54.2	Agriculture 50.42 Industry 25.78 Services 23.60
Bangladesh		124,355,263	144,043,697	147,570.00	976	1.48	15.2 (2011)	4.48 (2011)	106.4 100.3	60.9 (2001)	46.2 51.8	Agriculture 24.0 Industry 26.8 Services 49.3

Source : Compiled by JICA Survey Team

4.4.2. Industrial structure in greater Dhaka area

The existing industrial structure in the greater Dhaka area is analyzed. For the purpose, the employment structure of manufacturing industries in the Dhaka and seven neighboring districts are compared, and location quotient (LQ) is calculated based on the employment shares of sub-sectors in each district and the greater Dhaka area as a whole. Results are summarized in Table 4.4.2-1.

⁷ Nayampur EZ candidate site is located in Sureepur Upazila and Araihaazar EZ candidate site is located in Araihaazar Upazila.

Table 4.4.2-1 Comparison of Employment Structure by District Using Location Quotient

	Employment								Location quotient								
	Narayan ganj	Narsingh di	Gazipur	Tangail	Manikga nj	Faridpur	Munshig anj	Dhaka	Total	Narayan ganj	Narsingh di	Gazipur	Tangail	Manikg anj	Faridpur	Munshig anj	Dhaka
Textile M	57,181	24,478	65,329	435	380	200	0	7,246	155,249	3.31	2.98	4.39	0.04	0.16	0.06	0.00	0.07
Textile F	13,831	12,637	80,649	716	930	250	69	552	109,634	1.13	2.18	7.68	0.09	0.56	0.10	0.05	0.01
Jute mill	2,590	9,846	534	350	0	14,647	606	10,853	39,426	0.60	4.79	0.14	0.12	0.00	16.94	1.31	0.45
Handloom	11,215	12,238	89	54,385	5,923	85	1,686	8,227	93,848	1.09	2.51	0.01	7.80	4.20	0.04	1.53	0.14
Cottage	18,767	13,732	2,054	24,574	3,080	10,810	3,581	14,351	90,949	1.93	2.97	0.25	3.72	2.31	5.55	3.35	0.26
Bamboo & cane	877	3,985	880	9,510	4,116	1,696	955	2,510	24,529	0.33	3.19	0.39	5.33	11.42	3.23	3.31	0.17
Wooden furniture	14,895	8,569	4,435	11,094	7,365	4,226	9,684	10,188	70,456	2.20	2.66	0.76	2.41	7.93	3.12	11.70	0.27
Saw mill	1,088	1,222	2,125	3,066	888	1,258	970	2,341	12,858	0.82	1.94	1.87	3.41	4.89	4.75	6.42	0.30
Rice mill	934	851	1,735	8,075	394	552	1,054	2,111	15,706	0.57	1.10	1.24	7.29	1.76	1.69	5.71	0.23
Oil mill	538	178	46	463	555	578	140	0	2,498	2.05	1.43	0.20	2.60	15.40	11.00	4.77	0.00
Bakery	1,699	455	479	876	391	965	566	2,310	7,741	2.13	1.20	0.70	1.61	3.57	6.04	6.22	0.51
Pottery	10	544	774	5,964	1,223	1,458	350	1,090	11,413	0.01	0.93	0.73	7.13	7.23	5.92	2.61	0.16
Garment	62,913	0	0	7,372	0	0	145	991,404	1,061,834	0.53	0.00	0.00	0.09	0.00	0.00	0.01	1.49
Flour mill	819	127	178	609	525	835	229	1,717	5,039	1.53	0.50	0.39	1.67	7.14	7.79	3.87	0.55
Plastic	495	406	2,213	64	0	0	13	1,780	4,971	0.90	1.55	4.66	0.17	0.00	0.00	0.22	0.57
Total	187,852	89,268	161,520	127,553	25,770	37,560	20,048	1,056,580	1,706,151	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Source: District Statistics 2011

In Table 4.4.2-1, such sub-sectors that have LQ values larger than 2.5 are highlighted in color as characteristic industries in each district. Following are observed as the industrial structure in the greater Dhaka area.

- 1) Textile industries concentrate in Gazipur, Narayanganj and Narsinghdi having good access from the Dhaka city center.
- 2) Composition of male and female workers engaged in textile industries is different in these districts, reflecting difference in skill levels and division of works among them.
- 3) In the five other districts other than Gazipur and Narayanganj, rural industries are dominant characterized by specialization in simple raw material processing such as bamboo and cane, wooden furniture and pottery as well as handloom industries, and saw mill, rice mill and flour mill having large LQ values.
- 4) Narsinghdi, as it is close to Dhaka city center, shows characteristics of rural industries, and in particular specialization in jute industry is high.
- 5) Gazipur is specialized also in Plastic industry.
- 6) Garment industry as the most downstream industry of the entire textile related industry concentrate almost exclusively in Dhaka district.

The difference in industrial structure between districts around Dhaka city is in line with the urbanization directions examined in Sub-section 4.4.1(2). That is, main directions of urbanization proceeding from the Dhaka center are first to the north along the national highway no. 3, and second to the southeast along the national highway no.1. Gazipur and Narayanganj along these directions exhibit relatively advanced industrial structure centering on textile industry. The other five districts show the characteristics of rural industries dominant in respective districts, but probably Narsinghdi may be positioned between these two types of districts.

4.4.3. Confirmation of Infrastructure Needs and Plans for the Surrounding Area

(1) Transportation and Logistics Infrastructure

The transport infrastructure of Bangladesh has 21,040 km of paved roads and 2,835 km of railway. Roads occupy a large part of each transport mode, accounting for nearly 90% of cargo transport volume. Railway takes second place and makes up about 10% of cargo volume and 15% of the ton-kilometer base. Inland water transport has been used for liquid products, such as petroleum, and bulk products, such as grain and landfill material, or general products. Up to now, inland water transport has not been used for container transport. However, the public and private bodies of the Inland Container Depot Harbor are considering starting operations. Moreover, in 2015, inland water transport facilities developments have been decided in cooperation with India. Hence, the development of a river port and waterways can be expected in the future.

1) Roads

264 km of National Highway N1, which connects Dhaka to Chittagong, becomes the backbone transport route of raw material imports and product exports to/from candidate EZ sites around Dhaka. Currently, construction of the second cross-linking of the three bridges of Kanchpur, Meghna, Gumti and the widening to four lane roads will be implemented in order to increase transport capacity and reduce congestion of national highways. Furthermore, according to the Road and Highway Department (RHD), in the future the same route will be changed to a toll highway. Additionally, three comparative routes connecting Dhaka and Chittagong within three hours are under consideration. The national road networks of RHD are shown in Figure 4.4.3-1. The position of related facilities such as the main connection road, ICD (railway depot), ICT (inland water depot), and each EZ candidate site at Nayapur and Araihazar are shown in Figure 4.4.3-2. Figure 4.4.3-2 includes the Dhaka Metropolitan Roads development plan prepared by RSTP (“The Project on the Revision and Updating of the Strategic Transport for Dhaka”, JICA).

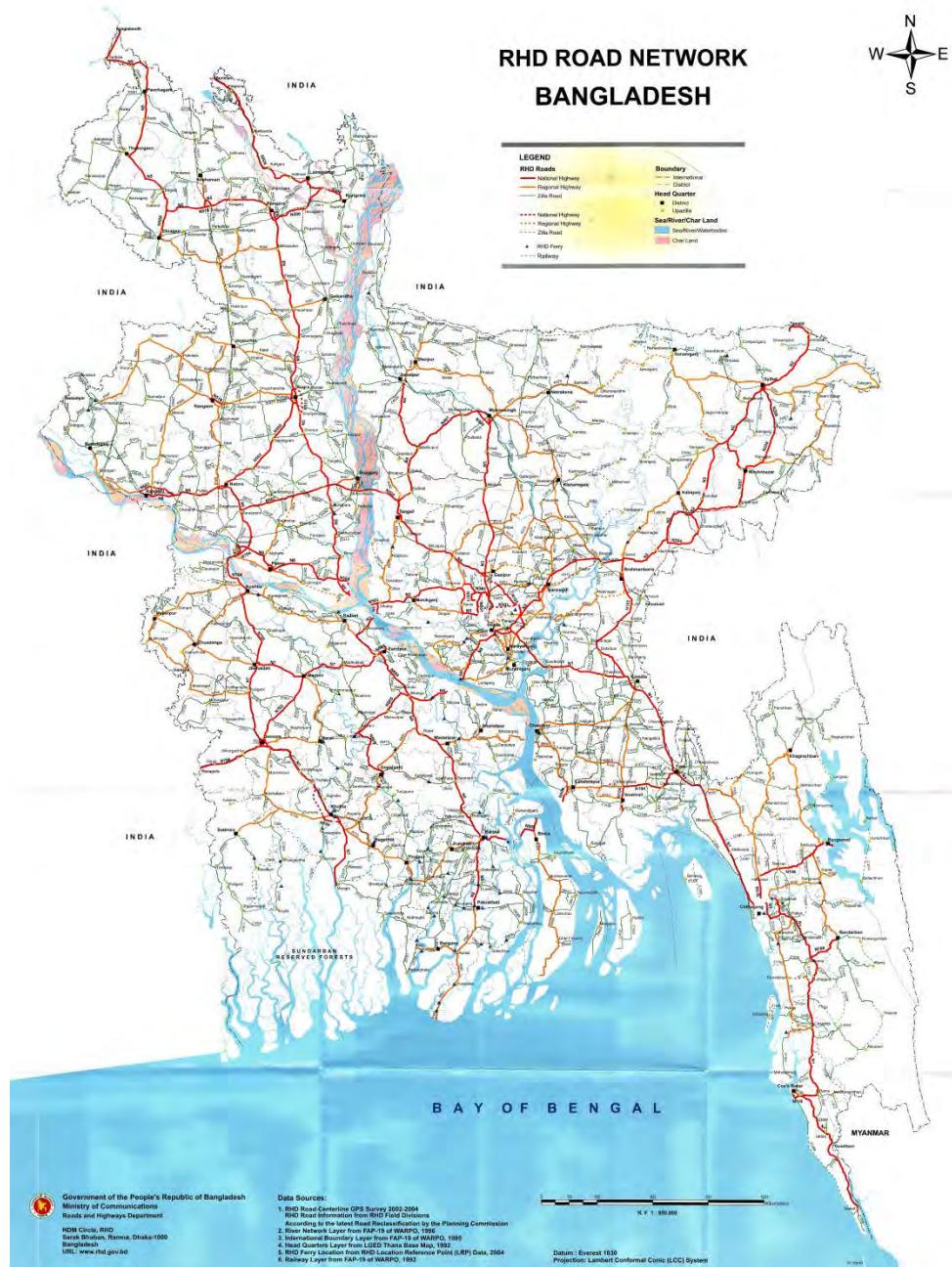


Figure 4.4.3.1 : Bangladesh road network (RHD)

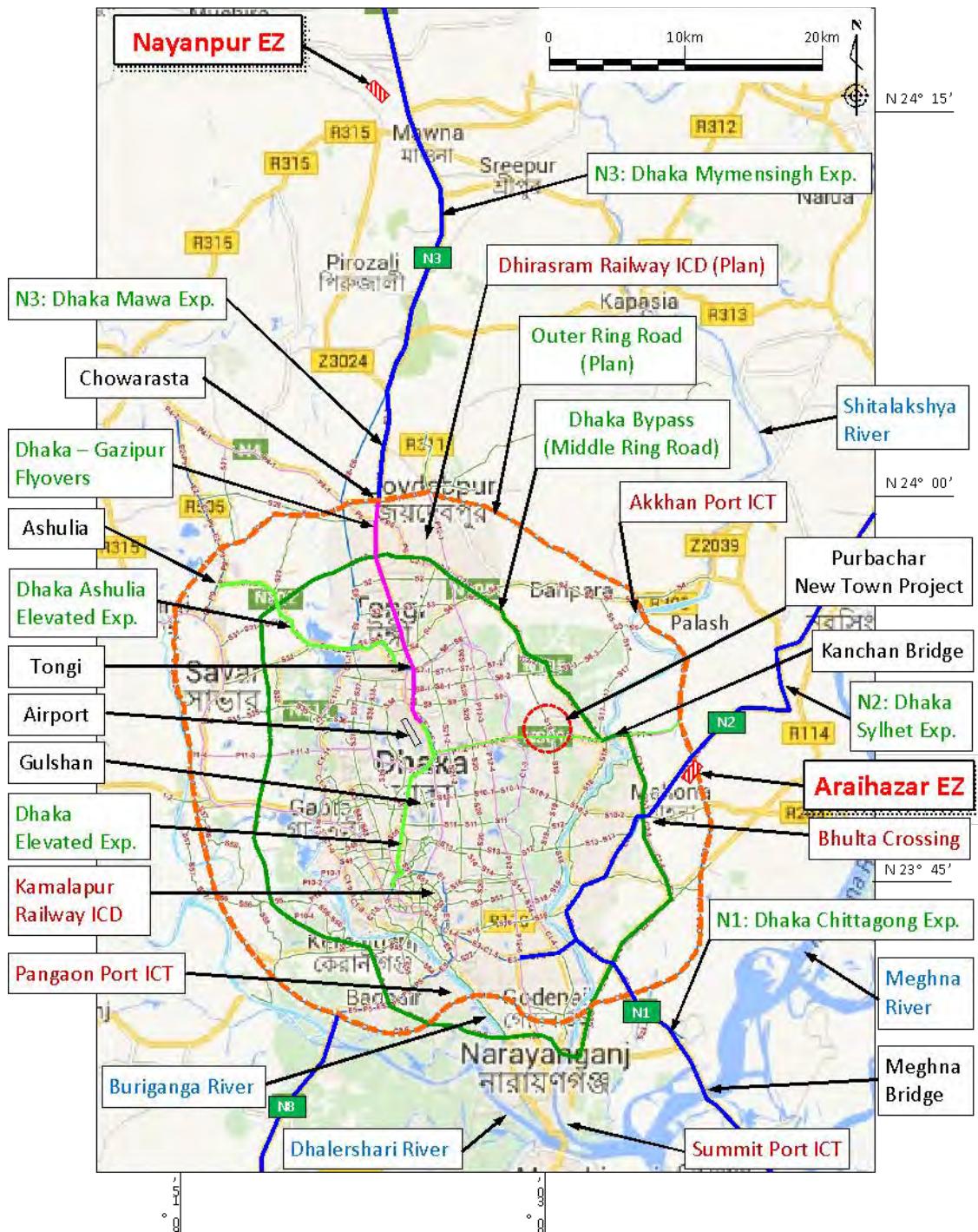


Figure 4.4.3.2 Location Plan of Dhaka and surrounding EZ candidate sites and relevant infrastructures

Amongst the above Dhaka Road Plans, in order to reduce traffic jams in Dhaka city, east-west roads that connect the Outer Ring Road, the Middle Ring Road, and National Highway N1 (Dhaka-Chittagong Exp.) to N8 (Dhaka-Mawa Exp.) are prioritized for construction.

Table 4.4.3.1 shows the planned distance interval of the associated main road and the project cost. As indicated in the 7th National Plan, construction of these roads has been implemented and a part of the budget was approved.

Table 4.4.3.1 Project Plan of Main Roads

Project Components	Length (km)	Project Cost (BDT, Crore)
1. Expressway	126	31,042
1.1 Dhaka Elevated Expressway	20	8,940
1.2 Dhaka Ashulia Elevated Expressway	38	13,654
1.3 Dhaka Chittagong Expressway	16	1,501
1.4 Dhaka Sylhet Expressway	16	795
1.5 Dhaka Mawa Expressway	18	5,169
1.6 Dhaka Mymensingh Expressway	19	983
2. Ring Roads	310	35,335
2.1 Inner Ring Road	73	11,319
2.2 Middle Ring Road	108	4,065
2.3 Outer Ring Road	129	19,951
3. Primary Roads	290	10,984
4. Secondary Roads	471	18,962
Total	1,198	96,324

Source RSTP

1)-1 Araihaazar Road Network (See Figure 4.4.3 -2)

The access road from Gulshan (center of Dhaka) to Araihaazar starts from the airport and continues eastward. It reaches the EZ site after passing the planned area of Purbachar New Town, the Kanchan Bridge, the Dhaka Bypass (future of the Middle Ring road), the Bhulta 6-way intersections and the National Highway N2 (Dhaka Sylhet Exp. Road). The Shitalakshya River crossing Kanchan Bridge is illustrated in Fig. 4.4.3-3.

Figure 4.4.3.3 Kanchan Bridge (Shitalakshya river crossing bridge, right side of figure towards to Araihaazar EZ)



Among these, the extension and improvement of the Dhaka Bypass and N2 were included in the construction plan of RHD. In addition, as for the flyover construction plan (see Figure 4.4.3-4) of the Bhulta 6-way intersections that are frequently affected by congestion at present, construction-bidding procedures—by Bangladeshi national budget (RHD)—are in progress and construction is expected to be completed after two years (i.e. 2017). Bhulta Flyover, the National Highway N2 in the Figure below will be the elevated each two-lane for both directions. The standard cross-sectional view is shown in Figure 4.4.3.5. The distance from the Bhulta Flyover to Araihaazar EZ is about 4 km along the northeastern side of N2 (upper right corner of below figure).

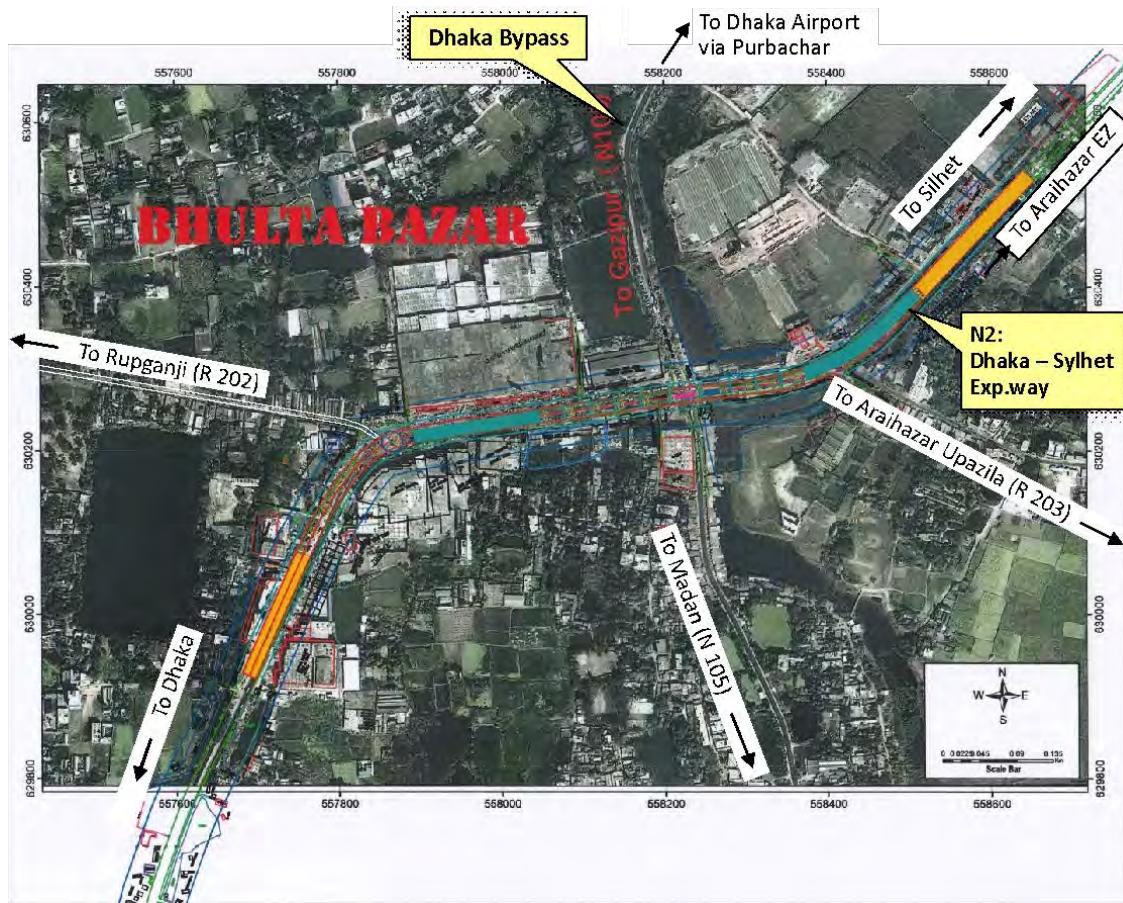


Figure 4.4.3.4 Bhulta Flyover (N2) and Dhaka Bypass 3D conjunction plan

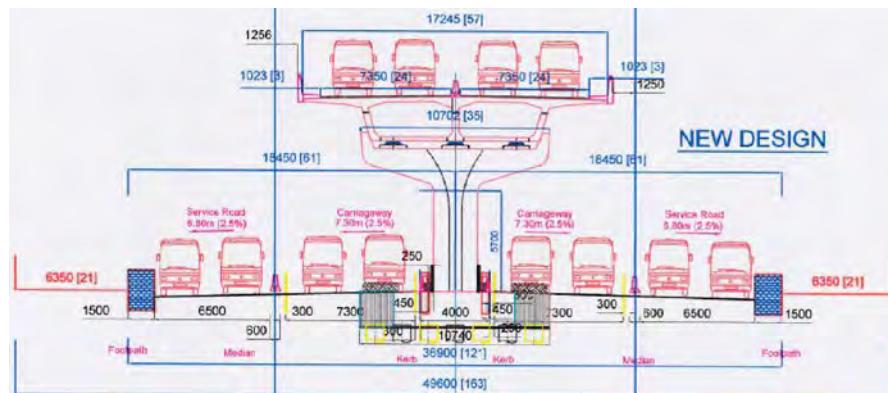


Figure 4.4.3.5 Cross-section of Bhulta Flyover plan

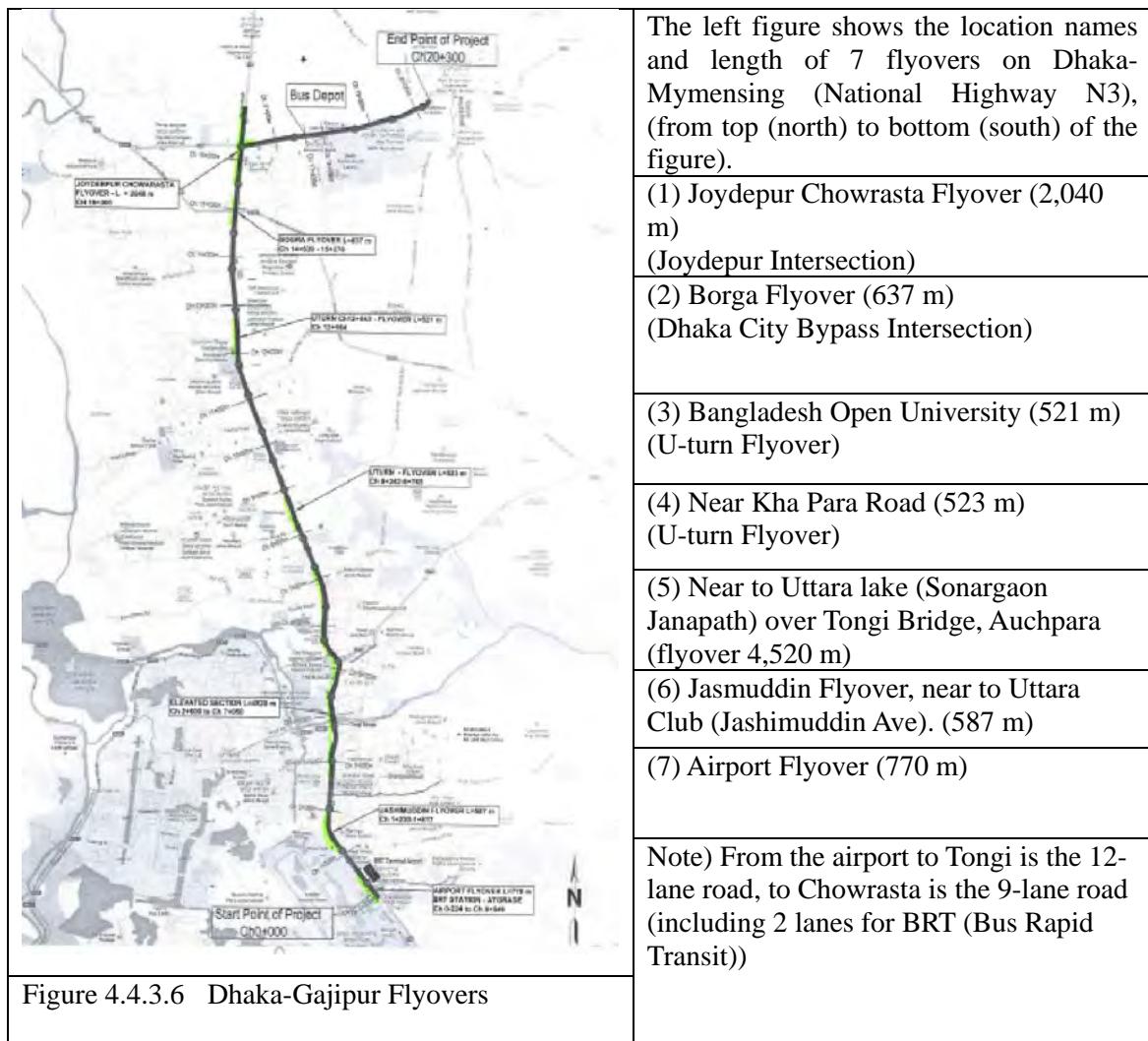
As shown in Figure 4.4.3.2, the Outer Ring Road is planned to be located close to the Araihazar EZ. In conjunction with the improvement of the Dhaka Bypass, the road towards the EZ site will not be affected by the traffic jams, and will be directly connected to the National Road N1.

1)-2 Nayapur Related Road Network (See Figure 4.4.3.2)

At present, access from Dhaka / Gulshan district to Nayapur EZ site are affected by the congestion at some intersections with National Highway N3 (Dhaka Mymensingh Exp. Road). Therefore, the following ongoing or planning road plans are conducted to improve the current situation.

i) Dhaka-Gajipur Flyovers (See Figure 4.4.3.6)

The locations and implementation plans of flyovers (total length: 9,598 m) at the 7 most congested places between the airport and Gajipur on the road from Dhaka center to Nayapur are shown as follows. As for the construction work of these flyovers, the construction is expected to commence in January 2017 and to complete by the end of 2019, according to the RHD. After these flyovers are completed, the transport time from the airport to the Chowrasta (Gajipur) will be reduced to 25~30 minutes. In addition, 4-lane expansion of the route between Chowrasta and Mymensingh, located on the northern side of the flyover construction site was inaugurated in July 2016.



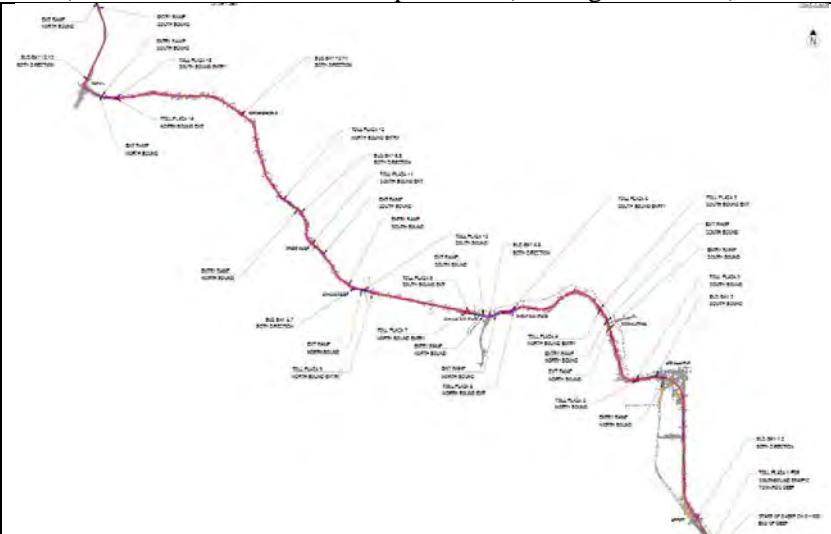
ii) Dhaka Elevated Exp. Way (See Figure 4.4.3.7)



The figure at left indicates the plan for the Elevated Expressway that starts from the airport, then crosses the Dhaka city center in a south-north direction. The Expressway goes near the center railway station of Kamlapur and railway ICD, then connects to National Road N1. Some routes around the airport are already under construction.

Figure 4.4.3.7 Dhaka Elevated Exp road

iii) Dhaka Ashlia Elevated Exp. Roads (See Figure 4.4.3.8)



The left figure is the plan for the flyover from Tongi to Ashlia, Dhaka northwest suburbs. It is pre-construction stage for contract agreement. It is planned to proceed by PPP. (RHD)

Figure 4.4.3.8 Dhaka-Ashlia Elevated Exp. Road

2) Railways

In the total of 2,835 km length of railway, there are 659 km of broad gauge, 1,801 km of M (meter) gauge, and 375 km of dual gauge (combination). The western region of the country uses the broad gauge and the eastern regions mainly use M gauge. There are 261 passenger trains and 55 cargo trains running daily. There are three daily container trains running back and forth between Dhaka and Chittagong. Container wagons are 230 freight flat deck type. The railway ICD (Inland Container Depot) are located at Kamlapur (Dhaka Central Station, Figure 4.4.3.9) and inside Chittagong Port and handling container cargo. Both ICDs have RMGs (Rail Mounted Gantry Cranes) but they haven't been used. Container cargo is mainly handled by reach stackers (Kamlapur ICD) and Straddle Carriers (Chittagong Port) (See Figure 4.4.3.10). It is suggested to implement the railway ICD construction plan at Dhirasram Station near Tongi (Dhaka North, see Figure 4.4.3.11).



Figure 4.4.3.9 RMG of Kamlapur ICD (Dhaka Central Station)



Reach-stacker Source : Ferrari



Straddle-carrier

Source: Niigata International Trade Terminal

Figure 4.4.3.10 Examples of Container Yard Cargo-Handling Equipment

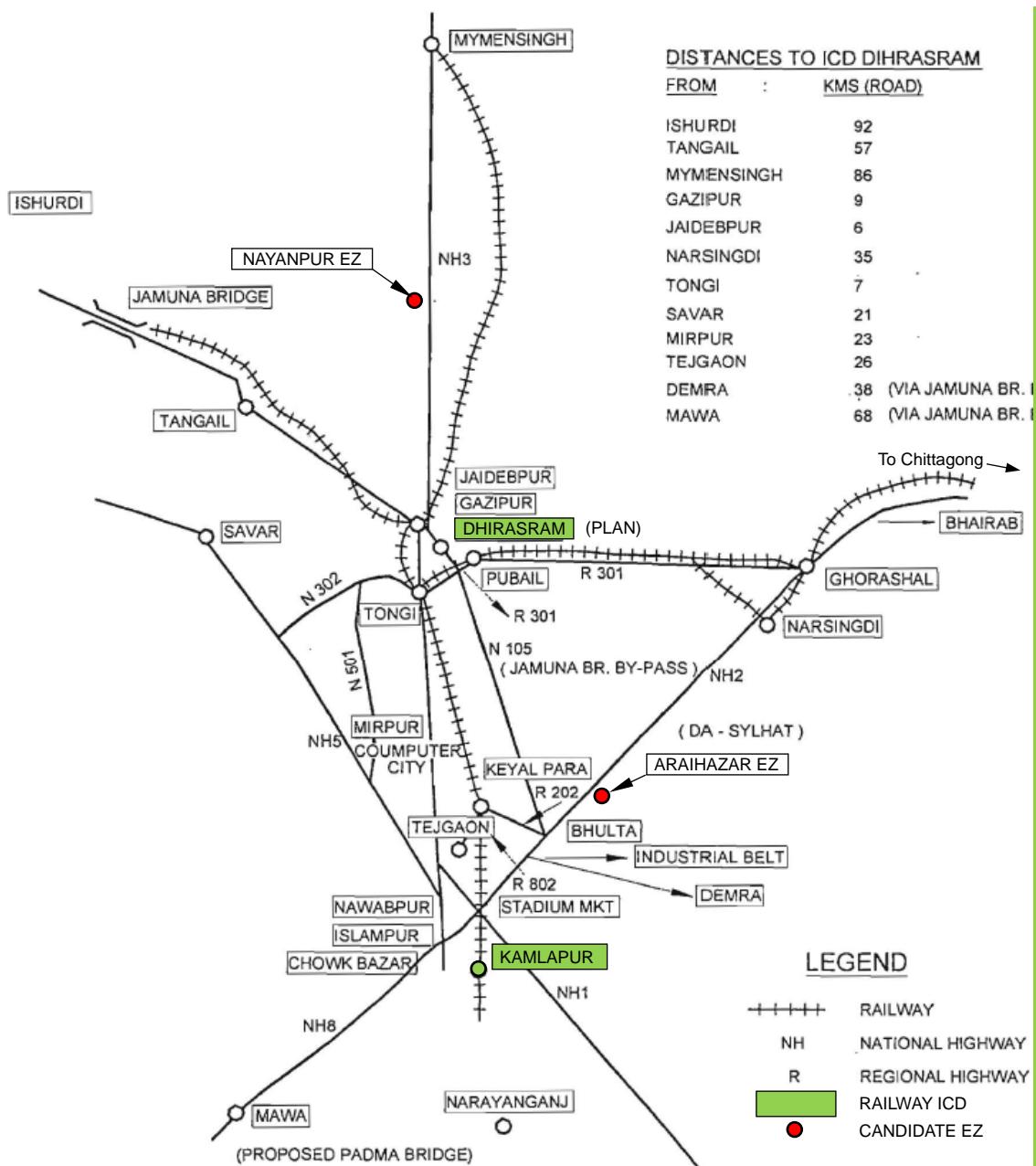


Figure 4.4.3.11 Location of Dhirasram Station (Planned Railway ICD) and EZ candidate site

Double-tracking of the 321 km route between Dhaka - Chittagong (Figure 4.4.3.12) is under construction. However, 72 km of the route between Laksam and Akhaura Stations (Figure 4.4.3.13) have not been completed yet. According to BR (Bangladesh Railway), construction of double line tracks between Dhaka-Chittagong will be completed by 2019. Currently, the container cargo-handling volume of the railroad between Dhaka - Chittagong is about 60,000 TEU per year. This amount is less than 4% of the annual container-handling capacity of Chittagong (1.73 million TEU / year: 2014)

If the double tracks of all lines between Dhaka-Chittagong are completed, the railway container transport volume is expected to increase. However, railway container transport capacity is not increasing simply because there still remain issues such as the large proportion of passenger trains to the total number of working trains, the financial deficit of BR (national subsidy is essential), the lack of locomotives and freight cars for containers, the need for signal (safety) system development,

and the lack of skilled staff such as drivers.



Figure 4.4.3.12 Bangladesh Railway Map

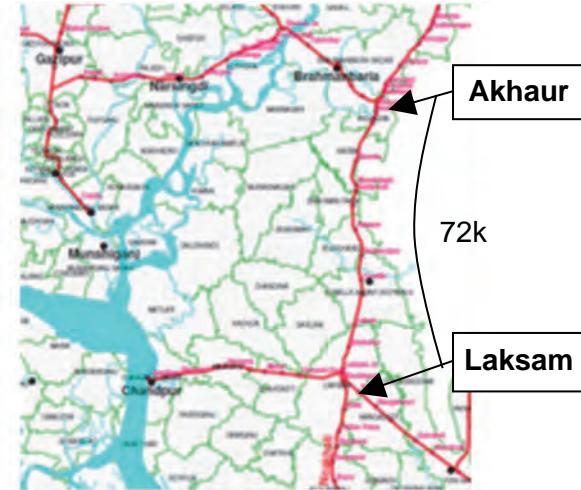


Figure 4.4.3.13 Laksam-Akhaura Route

3) Inland Waterway Transport

3)-1 Development Plan of Inland Waterway Transport

Bangladesh inland waterway transport is divided into four levels (see Figure 4.4.3.14~15). The Dhaka-Chittagong route (Pangaon ICT, 160 nautical miles: about 290 km), including a part of a coastal shipping route, is classified as a first-level waterway with 3.6~3.9 m water depth. Bangladesh Inland Water Transport Authority (BIWATA) manages the navigability of these inland water routes by conducting waterway depth surveys, maintenance dredging, and so on.

The number of registered ships using inland waterways was 9852 as of the end of 2014. As for vessel type, there were 3988 sand barges, 2755 cargo ships, and 928 dredging vessels. The number of container ships for inland waterways and coastal shipping appears to be small.

The ICT (Inland Container Terminal) Port, which handles container cargo around Dhaka, started business in Pangaon under CPA's (Chittagong Port Authority) jurisdiction as a public body in 2014. Then, in May 2015, Summit ICT Port was completed as a private body (See Table 4.4.3.2) but they are waiting for BIWATA approval for their operating permit. In addition, Rupayan ICT and Palash ICT of AK.Khan are under preparation.

Table 4.4.3.2 ICT Port Development Situation Around Dhaka

Project Owner	Name of ICD Port	Location	Planned Capacity	Land Area	Berthing facilities	Expected date of Operation	Status of Operation
Public	Pangaon (CPA)	Right bank of Beriganga River (Dhaka 15km south)				Started May, 2014	
Private	Summit Group (SAPL)	Mirkadim Munshiganj (Dhaka 20km south) Adjacent to the Muktagar Bridge, Left bank of Dhaleshwari River	Phase 1: 60,000 TEU Phase 2: 60,000 TEU	Phase 1: 15.15 Acres Phase 2: 4.5 m to 5 m draft	80m Quay, -	Started May, 2015	
Private	Rupayan Group	Bandar Narayanganj	Phase 1: 375,000 TEU	Phase 1: 30 Acres	2 x 90m Quay	1st Q of 2016	Construction 40% completed
Private	Ananda Group	Sonargaon Narayanganj					Pre-construction
Private	AK Khan Group	Palash, Narsingdi	Phase 1 140,000 TEU Phase 2 70,000 TEU	Phase 1 30 Acres, Total 50 Acres	90 m x 2Jetties	Partial Operation Sep 2016	Design completed, pre-construction
Private	Kumundini Group	Narayanganji, Sadar					Land acquired, pre-construction
						Source: IWTA	

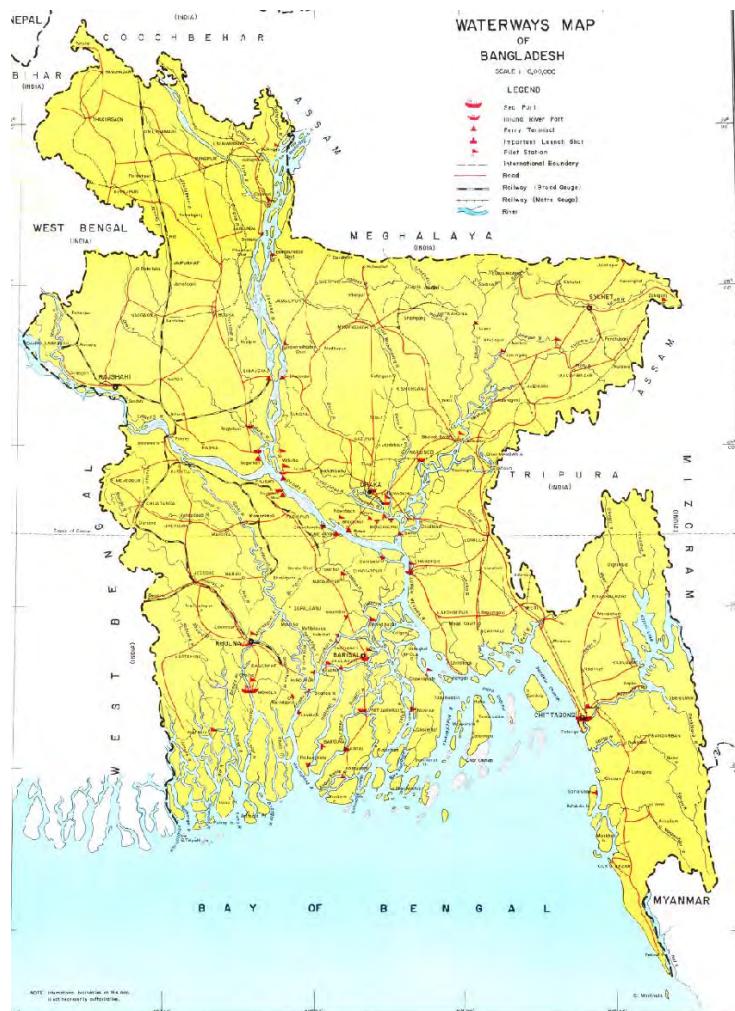


Figure 4.4.3.14 Inland Waterways of Bangladesh

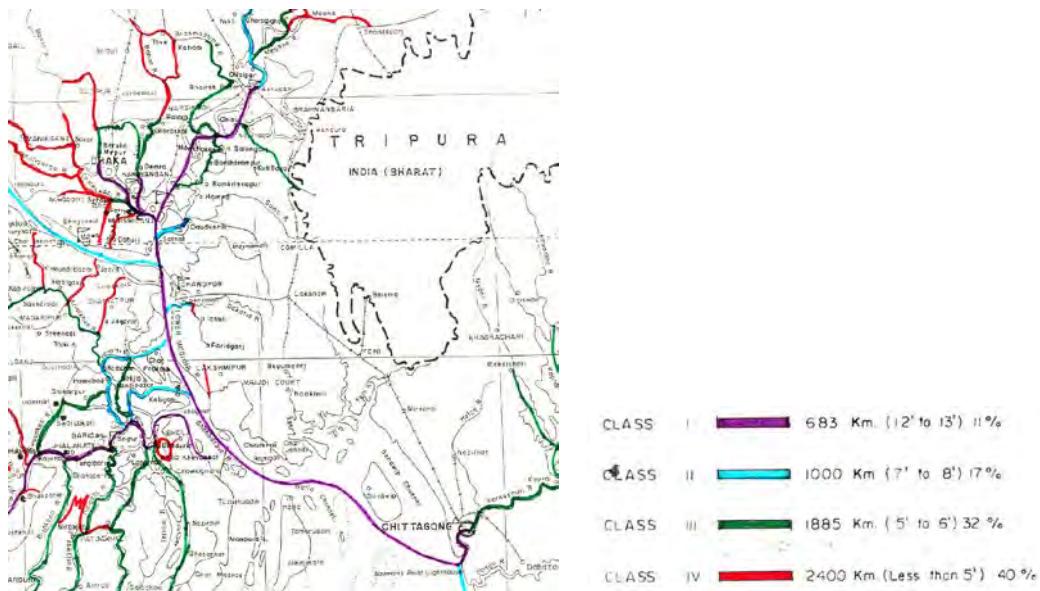


Figure 4.4.3.15 Classification of Dhaka Inland Water Transport Waterway and Chittagong Coastal Route

3)-2 Activities of Inland Waterway Transport

According to calculated results in 2014, the handling volume of sea shipping in Pangaon ICT (Inland Container Terminal) is only 1,300 TEU per year (See Table 4.4.3.3). However, its handling capacity is 150,000 TEU per year.

Table 4.4.3.3 Cargo-Handling Volume in Pangaon ICD

Year	Import	Export	Total	(TEU)	Yearly growth rate (%)
2010	-	-	-	-	-
2011	-	-	-	-	-
2012	-	-	-	-	-
2013	-	-	-	-	-
2014	419	323	742	-	-

Source: CPA

The business of Pangaon ICT started in the second quarter of 2014 and is operated by CPA (Chittagong Port Authority). CPA plans to build and allocate a coastal container fleet with 120 ~ 130 TEU load capacity in order to create a strong competitive port in terms of transport cost and port service in the future. The business has just started in operation, hence many unknown factors still exist, such as how to be competitive with road transport.

On the other hand, Summit ICT harbor (Figure 4.4.3.16), which is located on the downstream side of the Pangaon ICT (see Figure 4.4.3.2), is waiting for approval of its operation permit.



Source : Summit

Figure 4.4.3.16 Completed Summit ICT Port (Briganga River Left Bank)

Summit Inc. utilizes Pangaon ICT facility and barge to start the water transport business to the Chittagong port while waiting for the pending approval of their ICT facilities. The container-handling volume was 1,300 TEU in about one month, from the end of September to October 2015.

4) Transport Fee of Dhaka-Chittagong Route Depends on Different Transportation Modal Sprit

Cargo from Dhaka occupies 70% of the total cargo-handling volume of Chittagong Port (general, container), and cargo from the surrounding area of Chittagong occupies 30%. Furthermore, as for cargo from Dhaka, 80~85% is road transport, 10% is railway transport. As described above, the handling volume of inland waterway shipping appears to be small.

Comparison of the transportation fees of land transportation (truck), railway (Kamalapur ICD Transit), and inland water transport (Transit at ICT Port) is summarized in Table 4.4.3.4 ~ 4.4.3.6.

Table 4.4.3.4 Land Transport Fee of Chittagong-Dhaka Route by Truck

Season	Transport Fee (US\$/Truck)
Peak Season (Christmas etc.)	385
Rainy Season	450
Lean Season	200

Note 1) Truck size equivalent 20' , 2) Source: Trucking Co.

Table 4.4.3.5 Transport Fee of Chittagong-Dhaka Route by ICD Railway

Cost Items	Cost (US\$/Box: 20')
Railway wagon Fee	146
ICD Transit charge	10
Transport charge from ICD to Consignee's warehouse	100
合計	256

Notes) 1) Handling in ICD is free of charge (subsidy) , 2) Source: BR

Table 4.4.3.6 Container Transport Costs of the Inland Waterway (Chittagong Port - Dhaka Factory)

Cost Item	Container Size			
	20'	40'	40' HC	45' HC
Barge fee Chittagong to Dhaka ICT	150.00	300.00	300.00	300.00
Handling charge Dhaka ICT	82.50	97.50	107.50	107.50
Transportation from ICT to Consignee Warehouse	72.50	82.50	82.50	82.50
Total	305.00	480.00	490.00	490.00

Notes) 1) HC :High Container, 2) cost unit US\$/Box, 3) Source ICT Terminal

Because the conditions of each transport model are different, it is difficult to evaluate based only on fee comparison. Truck transport is relatively easy for door-to-door transport but the risk of cargo damage and pilferage are high because container-bonded transport has not generalized. Compared to other Southeast Asian countries, the container-bonded transport does not penetrate is unique in terms of Bangladesh. High deposit charges for empty container boxes, the truck ban in the Dhaka City area, as well as the lack of official customs staff, and prevalence of small trucking companies carrying break-bulk cargos but not caontainer cargos around Dhaka can all be considered as the reasons for this fact.

In addition, the argument about the increasing cost of inland water transport between ICT terminal operators and users at the end of 2015 attracted the attention of people concerned. As described above, some of the ICT will be built in Dhaka city. Therefore, inland waterway transport costs can be expected to decrease due to the competition of investors, including the private sector.

As for inland water barge transport, handling costs will increase if handling facilities are not

improved in Chittagong Port. However, at present, barge cargo handling is provided at the quay inside Chittagong harbor of NCT (new container terminal). According to CPA, the double handling, therefore, will not be necessary between the barge quay (NCT) and the port marshalling yard, since a single yard trailer/chassis can transfer the container within the port yard.

Among the aforementioned three transport modals , truck transport on the Chittagong-Dhaka route is not considered as bonded container transport but as breakbulk (general goods) transport because the customs clearance and de-banning/staffing of containers (container unpacking, loading) from truck transport are conducted inside Chittagong Port or at Off Dock Terminal at 17 locations around Chittagong.

Although bonded transport is carried out in customs clearance procedures at the railway container terminal (Kamlapur ICD) and the inner water transportation (Pangaon ICT), it is still necessary to transport from each terminal to the EZ. OSS (one stop service) inside existing EPZ is not currently set up.

5) Maritime Shipping

There are only two international ports in Bangladesh: Chittagong Port and Mongla Port in western Bangladesh. Chittagong port does 95% of total cargo handling volume. Figure 4.4.3.7~8 shows the volumes of import and export products and the volume of handled cargo.

Table 4.4.3.7 Import and Export Products Volume of Chittagong Port

Year	Import	Export	Total	(Unit million ton)
				Yearly growth rate (%)
2010	36.67	4.51	41.18	18.19
2011	38.27	4.87	43.14	4.75
2012	37.04	4.89	41.93	(-) 2.8
2013	39.08	5.19	44.27	5.58
2014	44.24	5.69	49.93	12.80

Source: Chittagong Port Authority (CPA)

Table 4.4.3.8 Cargo Handling Volume of Chittagong Port

Import	Export	Total	(Unit 1,000TEUs)
			Yearly growth rate (%)
677.3	666.1	1,343.4	15.66
691.7	700.5	1,392.1	3.62
708.4	698.0	1,406.5	1.03
772.5	769.1	1,541.5	9.60
871.0	860.3	1,731.2	12.30

Source: Chittagong Port Authority (CPA)

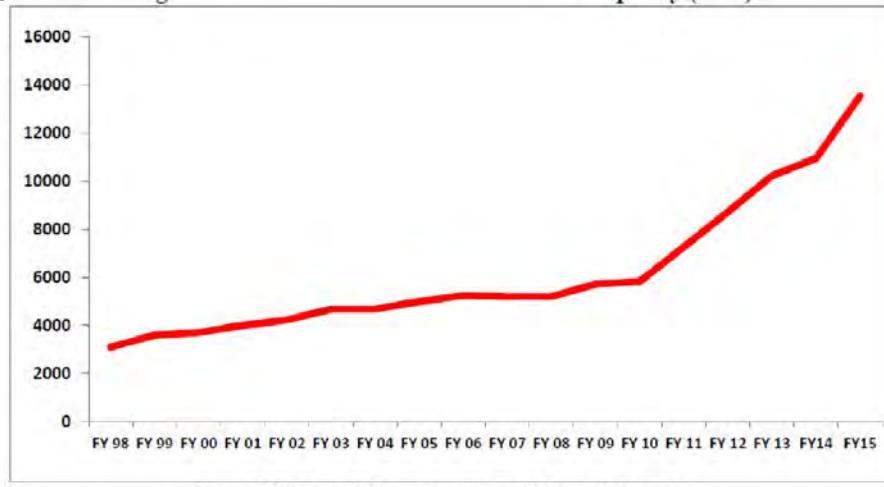
The limited vessel size at Chittagong Port is 190 m total length and 9.5 m draft (load capacity is about 1,500 TEU). According to CPA, if expansion of the QGC (quay crane) and enhancement of the container yard or cargo handling yard equipment are implemented, handling volume can be increased from 1700 thousand TEU to 2700 thousand TEU in the future. Because only feeder vessels can arrive to dock due to limitation of water depth, it might proceed to construct a deep water port in the future.

Recently, the development of the Pyra deep-sea port has been planned on the western bank of Rabnabad Channel, located in the southwest of Dhaka. A huge amount of dredging is anticipated in order to construct an access channel to Pyra Port due to the distance of more than 50 km between the planned construction site of Pyra Port and the offshore area with water deeper than 10 m. Therefore, the future direction of this development plan should be followed.

(2) Electric Power

The electric power supply of Bangladesh was lacking in capacity around 2010. However, trunk (grid) capacity, which was 5,800 MW in 2010, has seen a more than twofold increase in 2015 with a capacity of 13,500 MW (see Figure 4.4.3.17). Hence, the power shortage has been improved in the last few years. The year 2020 is the final year of the Seventh Five-Year Plan, and electric supply

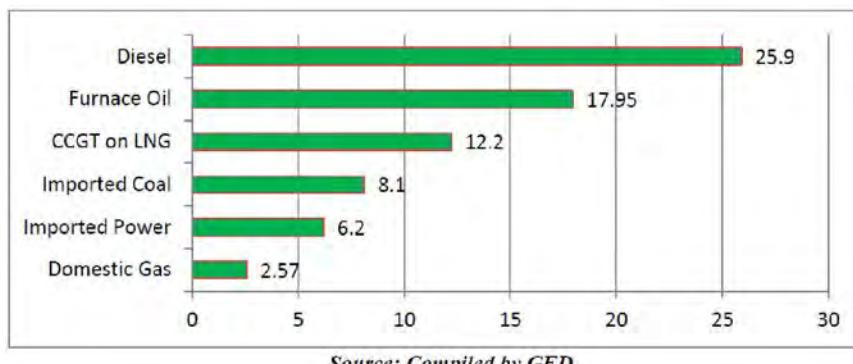
capacity is planned to increase to 23,000 MW.



Source: The Seventh 5 years plan

Figure 4.4.3.17 Annual Increasing Transmission Capacity (Unit MW)

Figure 4.4.3.18 shows the unit cost of electric power generation depending on different kinds of fuel. The same figure indicates that the least expensive option is domestic natural gas and the most expensive is diesel.

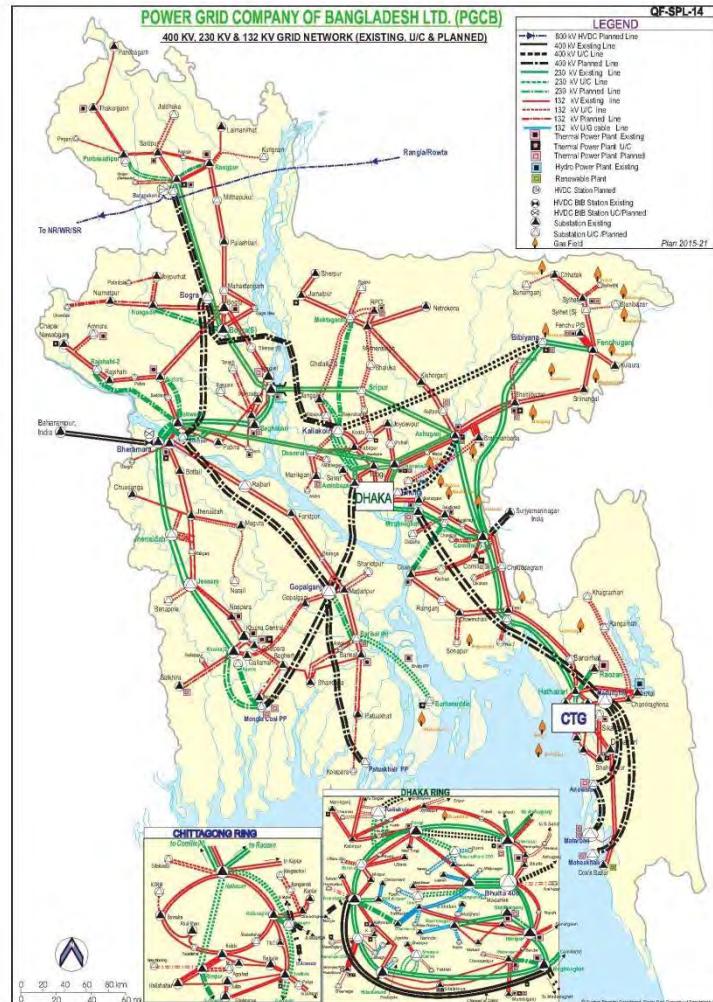


Source: The Seventh 5 years plan

Figure 4.4.3.18 Comparison of electric power generation cost depend on different kind of fuel (Unit: Tk/kWh)

The electricity rate was Tk6 / kWh in 2013, and is estimated to reach Tk8 ~ 9 / kWh between 2014 and 2020.

Electric power in Bangladesh is transmitted by a main line distribution network of the Power Grid Company of Bangladesh Ltd. (PGCB) (See Grid in Figure 4.4.3.19) affiliated with the Ministry of Power, Energy and Mineral Resources electric company. Then the electricity is transformed to 33kV at a substation near the planned area, to distribute to a local power distribution company, REB (Rural Electrification Board).



Source : PGCB

Figure 4.4.3.19 Main line grid electricity of PGCB

After that, the REB transforms the electricity to 11kV at substations inside or near the EZ to distribute to each EZ, and to tenants in the final stage of electricity distribution.

Table 4.4.3.9 shows the electric supply capacity of each EZ and the main line grid near those EZs. Data were confirmed with PGCB by the Study Team. All EZs have the potential to receive electric power at 33kV. Hearings were also conducted at each EZ's REB. The results showed that power supply at 11 kV is possible for all REBs. It is expected that the facility capacity, cost sharing, and electricity prices with PCG and REB should be readjusted and reconfirmed in cooperation with the executing agency, BEZA, in the next stage of this study, after the electricity demand and the implementation process of the projects are clearly defined.

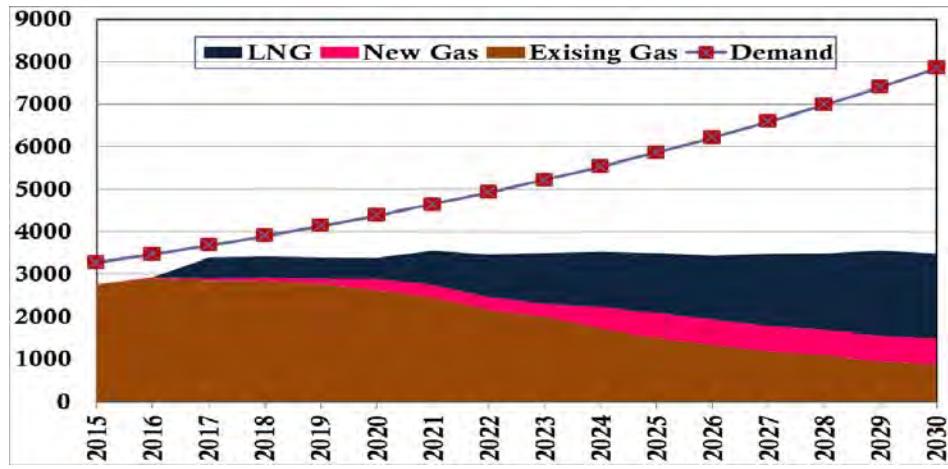
Table 4.4.3.9 Electric Supply Capacity of Each Planned EZ According to PGCB

SN	EZ Name	Nearest PGCB Substation	Substaion Status	Expected Completion Year	Voltage Level	Latitude	Longitude	Aerial Distance
1	Nayanpur	Sreepur	Under Construction	2017	230/132/33 kV	24°13'17.80"N	90°23'25.17"E	4.85 km
2	Araihazar-1	Bhulta	Existing	-	132/33 kV	23°48'13.61"N	90°35'8.61"E	5.23 km
3	Araihazar-2	Bhulta	Existing	-	132/33 kV	23°46'16.89"N	90°36'40.51"E	4.50 km
		Araihazar	Upcoming	2019	132/33 kV	23°47'19.99"N	90°38'56.71"E	4.23 km
4	Sonargaon	Sonargaon	Existing	-	132/33 kV	23°38'28.96"N	90°35'25.78"E	6.54 km
		Bhulta	Under Construction	2017	400/230/132 kV	23°45'47.08"N	90°34'23.35"E	9.63 km
5	Narsinghdi	Narsinghdi	Existing	-	132/33 kV	23°54'49.07"N	90°42'17.08"E	3.20 km
		Madobdi	Upcoming	2019	132/33 kV	23°52'31.00"N	90°41'10.61"E	1.61 km
6	Alipur (Keraniganj)	Hemayetpur	Upcoming	2019	132/33 kV	23°46'12.84"N	90°14'58.89"E	1.29 km
7	Hizla	Keraniganj	Under Construction	2017	132/33 kV	23°42'17.95"N	90°20'32.25"E	1.61 km
8	Kaliakoir	Kaliakoir	Under Construction	2017	400/230/132 kV	24° 5'38.40"N	90°11'51.64"E	3.12 km
		Mirzapur	Under Construction	2017	132/33 kV	24° 5'52.09"N	90° 9'30.68"E	4.36 km
9	Matarbari	Matarbari	Under Construction	2017	132/33 kV	21°34'0.03"N	91°56'60.00"E	16.01 km

Source: PGCB

(3) Gas and Water Supply

As shown in Figure 4.4.3.20, the gas supply, due to the limited gas reserves of Bangladesh, will reach its peak in 2018. In the future, LNG imported from Qatar and coal are predicted to become alternative fuels. In addition, gas and electricity costs might increase due to the increase of imported fuel ratio.



Unit mmcfd (Million cubic feet/month)

Source: Petrobangla

Figure 4.4.3.20 Gas Supply and Demand Forecast

Table 4.4.3.10 shows the comparison of gas prices before and after the revision of gas prices in September 2015. The most conspicuous point is the doubling of unit cost for Captive (Captive Power Producers). According to TITAS, since domestic gas production is estimated to decrease, the Captive price is increased twice to set bounds to private gas power generation. Maybe gas supply will also decrease, in addition to the price increasing.

Table 4.4.3.10 Bangladesh Government Gas Cost Revised Table

September 2015 Revision Reflected (Unit Tk/m³)		
Customer types	Before Revision	After Revision
Electricity Producers	2.82	2.82 (No change)
Captive Power Producers	4.18	8.36
Fertilizer factories	2.58	2.58 (No change)
Industrial units	5.86	6.74
Tea producers	5.86	6.45
Commercial users	9.47	11.36
CNG users	30	35
Meter-based users	5.16	7
Single Burners (Fixed/month)	400	600
Double Burner (Fixed/month)	450	650

Hearings were conducted in order to understand the current supply capacity of gas supply companies. Same as electric power, a national gas supply grid was constructed and supplied by GTCL (Gas Transmission Co., Ltd.). Then gas is delivered to the consumers through the local gas company TITAS (Titas Gas Distribution and Transmission Co., Ltd). A summary of the hearing results is shown in Table 4.4.3-11.

A large-scale gas supply line by GTCL and the metering manifold are under construction using ODA funds in Nayanpur, near the candidate site. Moreover, the existing gas pipelines of TITAS are constructed along with National Road N3 (Dhaka Mymensingh road), so gas supply can be implemented without problems.

As for Araihazar, there are existing gas pipelines constructed along the Dhaka - Sylhet Highway. However, gas supply to the local areas is a priority. Hence, it is necessary to reconfirm with TITAS after the amount of gas supply for candidate EZ sites is decided.

Table4.4.3.11 Current Status of Gas Supply Facilities at Planned EZ

	Candidate EZ Site	Existing Gas- Sta					Remarks
		Name	Dist. From EZ Site (km)	Pipe Diameter ("")	Pressure (psi)	Rate (TK/ m ³ incl.Tax)	
1	Nayanpur	Existing TITAS	Along N3	12			
		Dhanua metering manifold: GTCL	Under const. (J ICA fund) completion 2017	30			GTCL: Gas Transmission Co., Ltd.
			2 lines 1) 100 mm scfd 2) 200 mm scfd		800		
2	Araihaazar	Existing Dia. 8" 150 psi for domestic use.. Dia 4" 50 psi Rappanj, Tarabo Dia 20", 1,000 psi. Sonargaon, Dia 30", 1,000 psi					

Source : GTCL, TITAS

As for water supply, there are no existing public water supply systems in the candidate EZ areas. Therefore, it is necessary to collect water from nearby wells or rivers. In future research, adopting a system in accordance with the water supply demand should be considered.

4.4.4. Study of Water Level Height of Planned EZ Around Dhaka

1) Basic Study of Water Level Height

The probable high water levels at existing gauge stations of Bangladesh are calculated for each defined return period. Then the high water level of each candidate EZ site was calculated by the weighted average method, based on the calculated probable high water levels of nearby water stations (3 locations for each EZ site). The position of the water gauge stations are shown in Figure 4.4.4-1. An enlarged view of the positions of the EZ candidate sites around Dhaka and vicinity water level stations is shown in Figure 4.4.4-2.

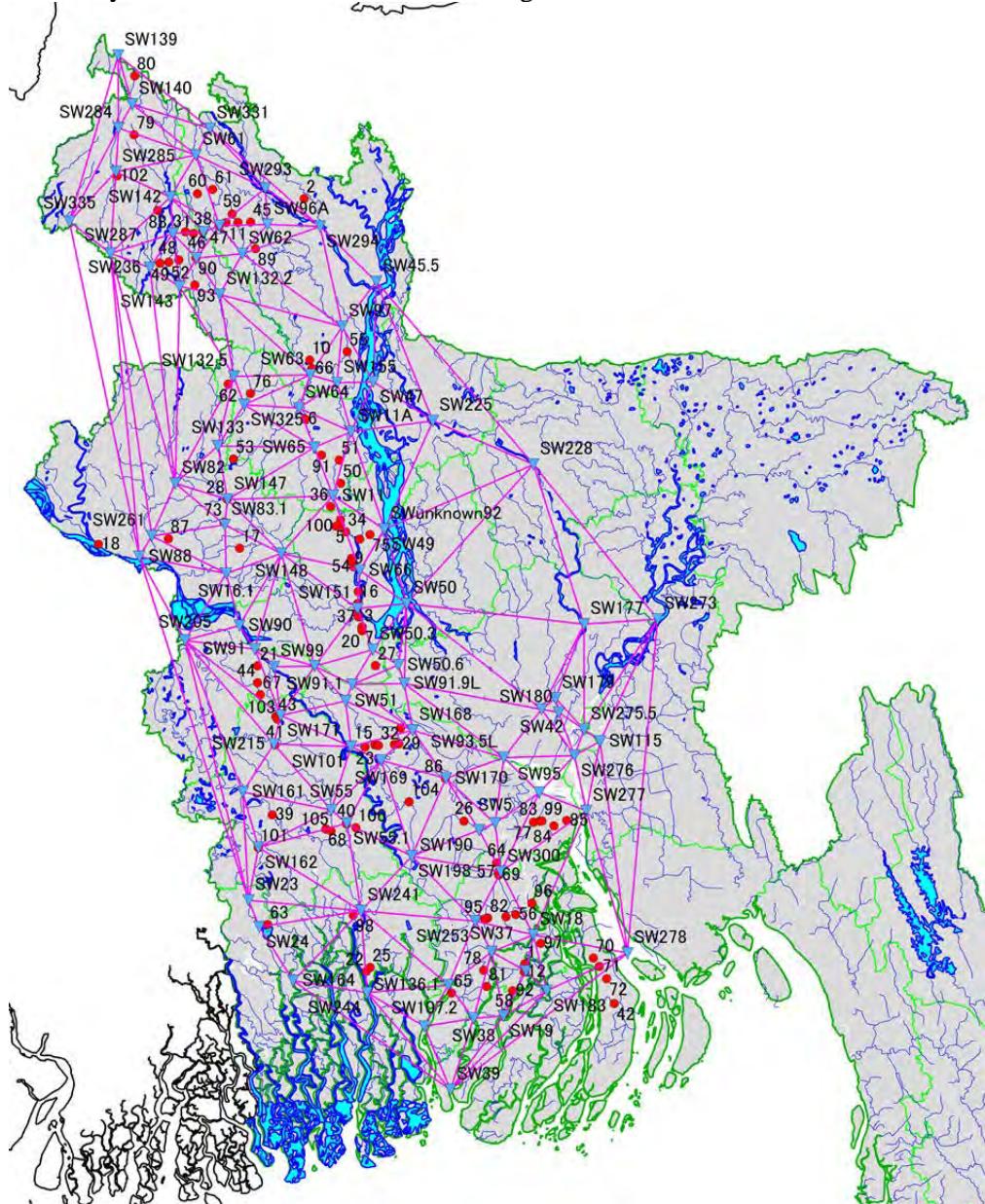


Figure 4.4.4-1 Position of Water Gauge Stations

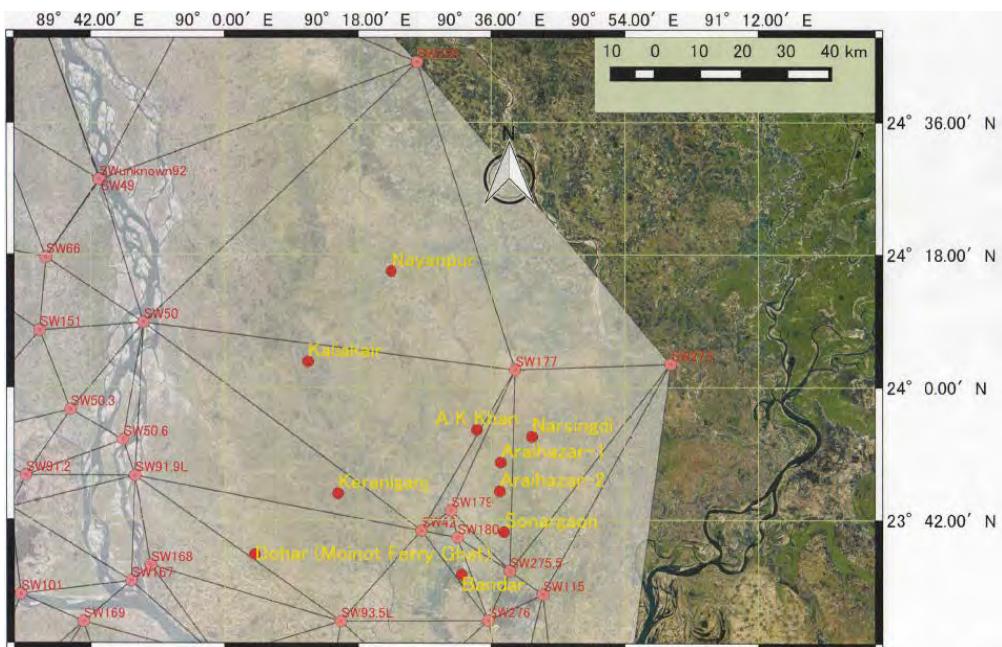


Figure 4.4.4-2 Diagram of Relationship Between Candidate EZ Sites Around Dhaka and Water Gauge Stations

The high water level of each EZ candidate site was calculated for 4 types of return period: 10-year, 50-year, 100-year, and 200-year. As an example, the contour map of high water level in the case of the 100-year return period for the area surrounding Dhaka is shown in Figure 4.4.4-3. These results are summarized in Table 4.4.4-1

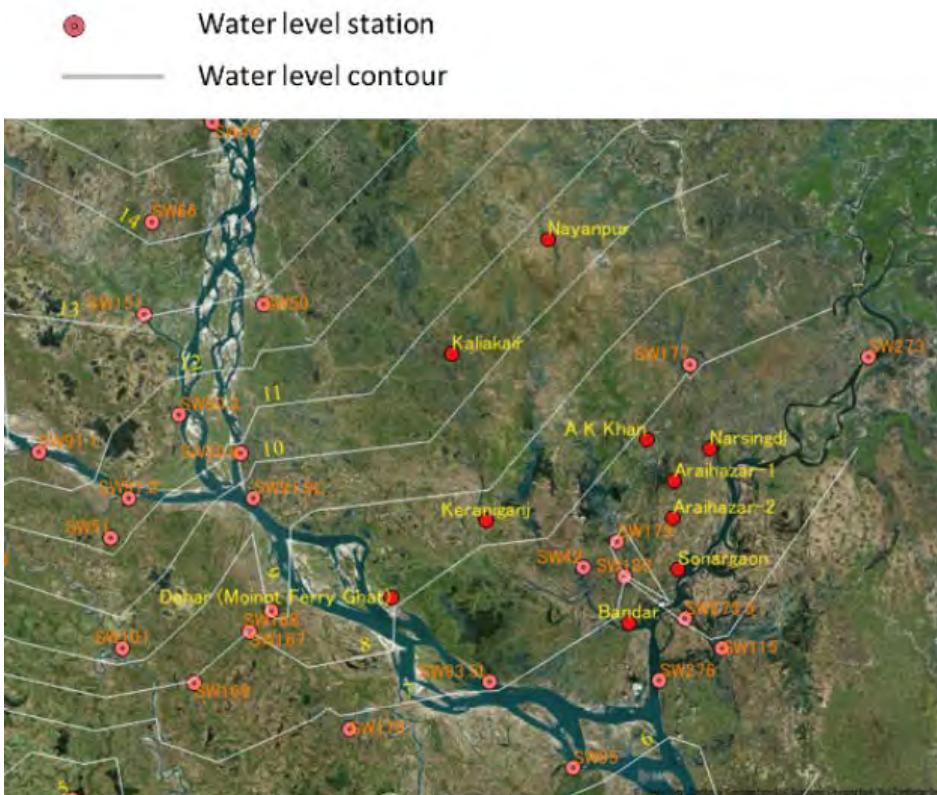


Figure 4.4.4-3 Distribution of High Water Level Contours in the Dhaka Surrounding Area and the Planned EZ Sites (100-Year Return Period)

The result of the 100-year rough probability calculation shows that the water level is 10.72 m at Nayapur, and 7.52 m at Araihazar 1. Although it is necessary to conduct further study about which

return period should be chosen. The difference between calculated probability water level and the terrain elevation obtained by other methods, such as digital mapping, is the minimum value of land-filling height (thickness). The final site formation height is the sum of land filling height, margin height for rainwater drainage, and freeboard.

Table 4.4.4-1 High Water Level of Planned EZ Sites Corresponding to Each Return Period

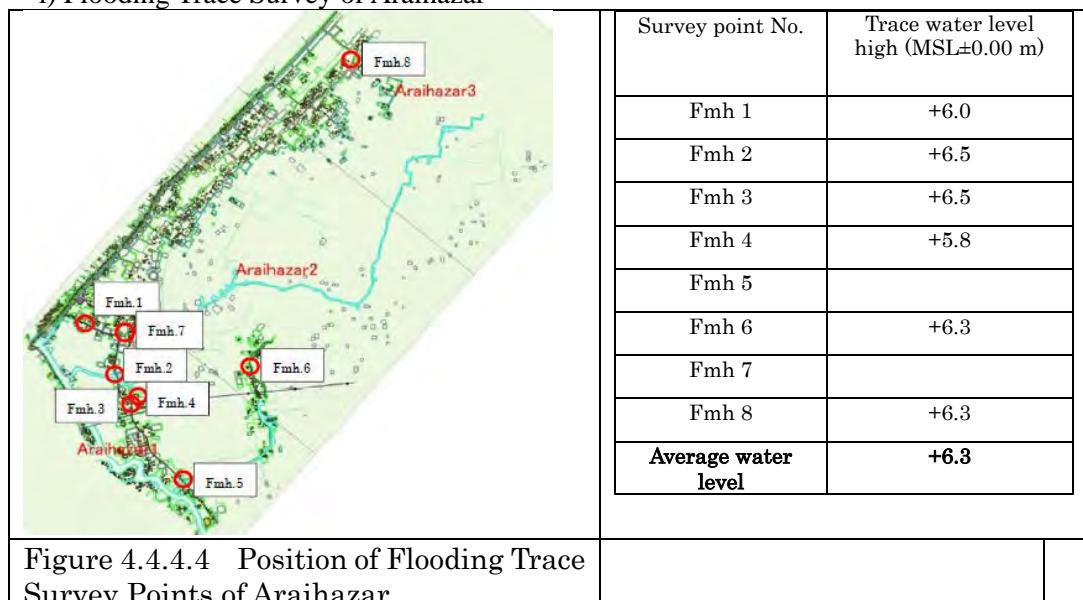
No.	Candidate EZ site	Name of Upazila	Name of District	Main river	Latitude	Longitude	Water level corresponding to return period (m)			
							200-year	100-year	50-year	10-year
1	Bandar	Bandar	Narayangonj	Shitalakshya	23°34'34.46"N	90°32'0.51"E	7.21	6.88	6.53	5.73
2	Dohar	Dohar	Dhaka	Padma	23°37'17.27"N	90° 4'3.99"E	9.05	8.11	7.74	7.07
3	Nayanpur	Sreepur	Gazipur	Shitalakshya	24°15'45.87"N	90°22'28.19"E	11.03	10.72	10.44	9.89
4	Narsingdi	Narsingdi Sadar	Narsingdi	Meghna	23°53'18.22"N	90°41'29.05"E	8.09	7.64	7.28	6.51
5	A K Khan	Palash	Narsingdi	Meghna	23°54'15.00"N	90°34'4.84"E	8.22	7.88	7.44	6.58
6	Araihaazar-1	Araihaazar	Narayangonj	Shitalakshya/Meghna	23°49'47.6"N	90°37'17.2"E	7.84	7.52	7.15	6.36
7	Araihaazar-2	Araihaazar	Narayangonj	Meghna/Shitalakshya	23°45'52.9"N	90°37'09.4"E	7.69	7.36	7.00	6.22
8	Sonargaon	Sonargaon	Narayangonj	Meghna	23°40'21.9"N	90°37'42.8"E	7.53	7.19	6.82	6.02
9	Keraniganj	Keraniganj	Dhaka	Dhaleshwari	23°45'34.5"N	90°15'14.6"E	8.86	8.51	8.04	7.23
10	Kaliakair	Kaliakair	Gazipur	Dhaleshwari	24°03'28.80"N	90°11'12.7"E	10.65	10.56	10.29	9.71

Source of water level data: BWDB (Bangladesh Water Development Board)

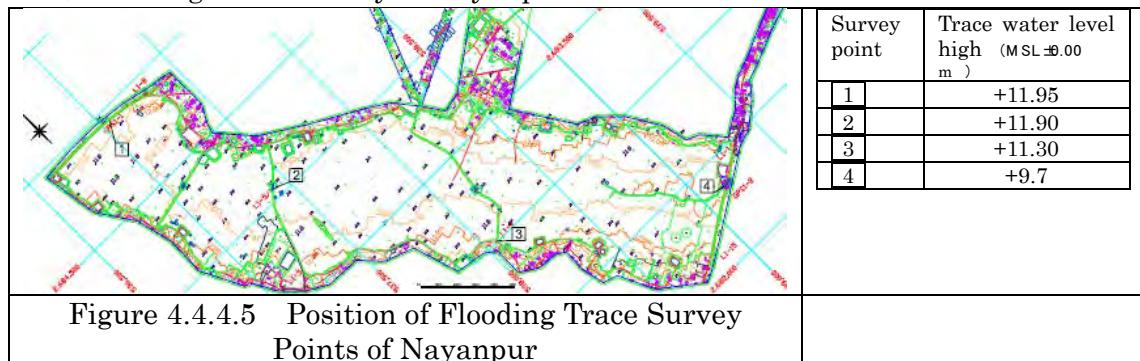
2) Flooding Area Trace Survey

In order to confirm the real site flood levels of Araihaazar and Nayanpur, hearing surveys have been conducted for residents and upazilas of both candidate sites. The main target high water levels are obtained from hearing surveys of local residents (patriarchs) who experienced the 1988 and 1998 floods, then converted to the altitude of digital mapping. According to the results of these surveys, the past average flood water level of Araihaazar was + 6.3 m (see Figure 4.4.4.4). The past flood water levels of Araihaazar was affected by the high water level of the nearby rivers, and can be treated as a static water surface for simplicity's sake. In contrast, Nayanpur was not influenced by the neighboring rivers but affected by the surface outflow of surrounding catchment during heavy rain and it is considered to be a dynamic water surface (See Figure 4.4.4.5).

i) Flooding Trace Survey of Araihaazar



ii) Flooding Trace Survey of Nayanpur



3) Scrutiny of Araihazar High Water Level

As described above, the high water level of Araihazar was affected by the flooding of surrounding large rivers. Therefore, as a basic datum of Araihazar high water level calculation, the most recent water level of three observation points (SW177, SW179, and SW275.5) of the past 30 years was re-checked and outliers were removed. Moreover, two distribution models, Gumbel distribution and Weibull distribution, were adopted for probability calculation and Weibull distribution was chosen due to its good reproducibility compared to Gumbel distribution.

The parameters of Weibull distribution are as follows:

$$x_R = F^{-1} \left(1 - \frac{1}{R} \right)$$

$$F(x) = 1 - \exp \left[- \left(\frac{x-B}{A} \right)^k \right] \quad B \leq x \leq \infty; k=2$$

R: return period

x_R : Water level of return period R

A: Scale coefficient

B: Location coefficient

A list of the annual highest water levels observed in 30 years for each water level station are shown in Table 4.4.4.2. In addition, the relationship of the return period and that of the water level calculated by the Weibull method of each station are shown in Figures 4.4.4.6 ~ 4.4.4.8.

Table 4.4.4.2 Annual Maximum Water Level of 30 Years at Each Nearby Water Station (m)

Station No.	275.5	179	177
1981	4.94	5.19	
1982	4.73	4.89	
1983	5.1	5.35	6.17
1984	5.27	5.58	6.61
1985	4.98	5.11	6.16
1986	4.57	4.68	5.8
1987	5.53	5.92	6.87
1988	6.09	6.46	7.38
1989	4.76	4.88	5.71
1990	4.83	4.82	5.85
1991	5.05	5.36	6.32
1992	3.98	4.9	4.95
1993	4.99	5.34	6.25
1994	4.6	4.61	4.79
1995	5.44	5.67	
1996	5.26	5.42	6.07
1997	5.07	5.25	5.92
1998	6.3	6.65	7.41
1999	5.47	5.57	6.36
2000	5.22	5.39	6.31
2001	4.87	5.09	5.96
2002	5.44	5.47	5.64
2003	5.28	5.65	5.64
2004	6.14	6.4	5.67
2005	5.02	5.54	5.55
2006		4.66	4.81
2007			5.74
2008	5.19	5.48	
2009	4.66	4.96	
2010	4.6	4.84	6.03

Source (Water Level) BWDB

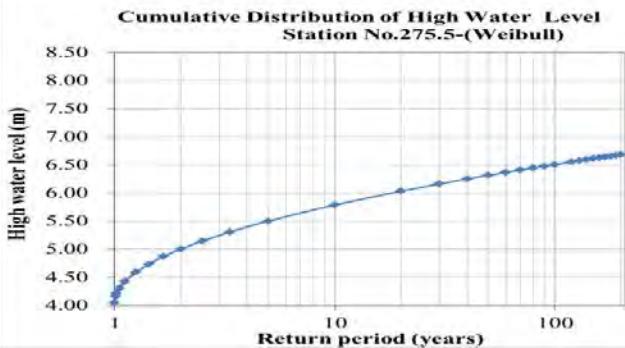


Figure 4.4.4.6 Water Level of SW275.5 - Return Period

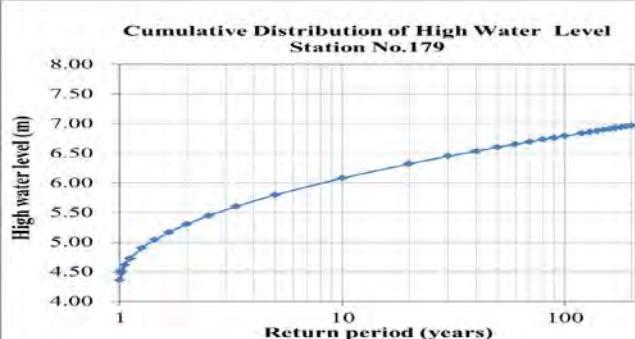


Figure 4.4.4.7 Water Level of SW1797 - Return Period

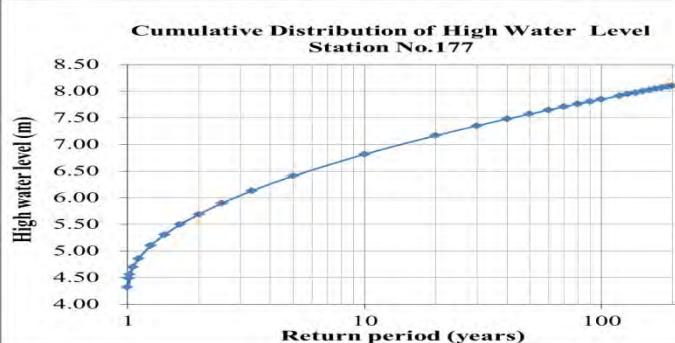


Figure 4.4.4.8 Water Level of SW177 - Return Period

Conclusion : The highest water levels and relevant return periods of the three nearest stations are shown in Table 4.4.4.3. The highest water level of Araihazar EZ candidate site was calculated based on an irregular triangular network (TIN) by the weighted average method. The water level of a 100-year return period is 7.21 m.

Table 4.4.4.3 Maximum Water Level at Nearby Water Level Stations and Estimated Maximum Water Level of Araihazar Candidate Sites

Vicinity water level station and EZ candidate site	Return period and relevant maximum water level (m)			
	10year	50year	100year	200year

SW 177	6.82	7.57	7.85	8.10
SW 179	6.08	6.60	6.79	6.97
SW 275.5	5.79	6.31	6.51	6.69
Araihaazar	6.34	6.97	7.21	7.42

4) The quality of underground water

We have to take note of the commingling of arsenic with underground water in Bangladesh. The extent of contamination of arsenic is shown in below figure.

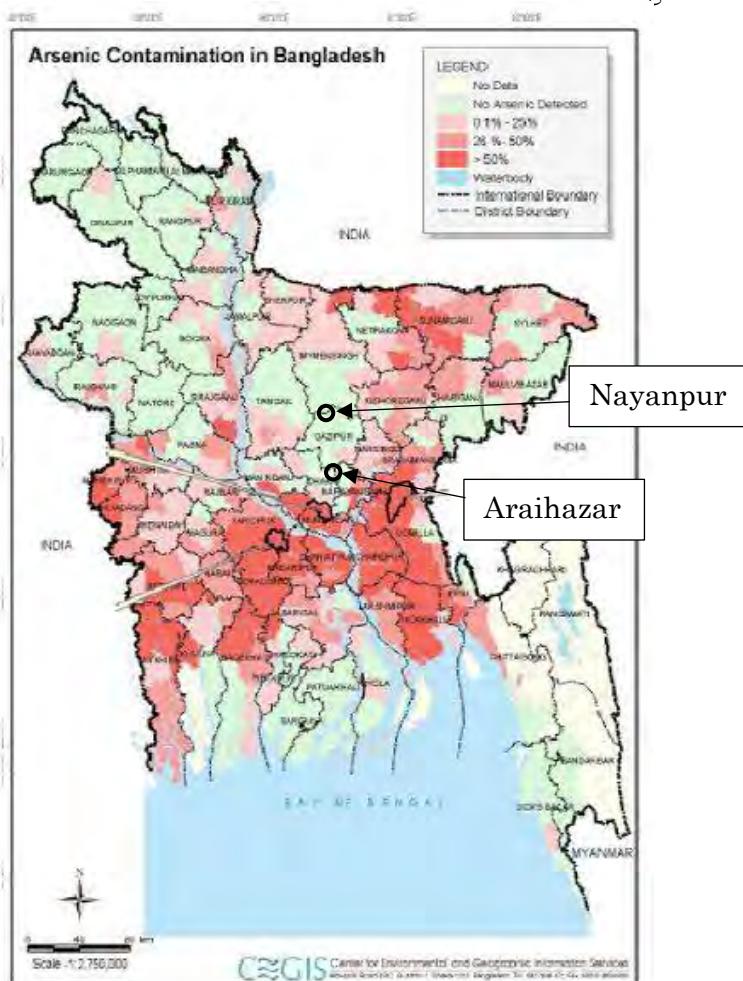


Figure 4.4.4-9 The extent of arsenic contamination and the location of candidate sites of the short term development EZ

And the results of underground water quality analyses that were done at the 51 wells in the existing villages are shown in the below figure.

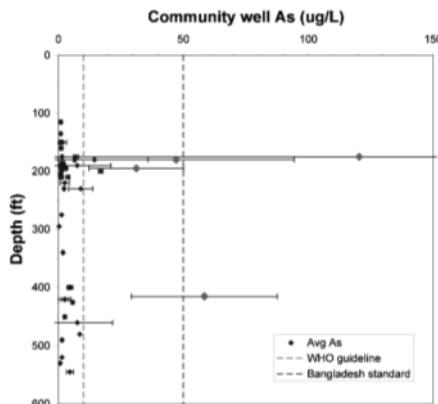


Figure 4.4.4-10 The extent of contamination of arcenic at the existing villages in Araihazar
 (Source: Monitoring 51 community wells in Araihazar, Bangladesh, for up to 5 years: Implications for arsenic mitigation. 2007)

As can be seen from these information, the deep tube well longer than 500 feet is insignificant level in Araihazar, and the Nayanpur site is almost free from the arcenic contamination.

4.4.5. Comparison of Unit Prices of Landfill Materials

The unit price of landfill materials is one of the important factors for evaluating the planned EZ sites. River sand is the main landfill material of the EZ sites. The unit prices of landfill materials at the sites were calculated considering the distance of the sand source and the planned EZ sites. The results of the landfill material unit price calculations are shown in Table 4.4.5.1.

As shown in terms of [Total price ①+②US\$/m³] in the same figure, the unit price changes from 3.56 to 15.54 US\$/m³ due to the distance between the sand source and the planned EZ sites. Moreover, this unit price is collected by onsite trader's hearings survey, so it does not include the contractor's indirect cost.

The unit price of landfill material is the sum of ① sand extraction cost by sand barge or sand pump, transportation cost to sand deposited site (See Figure 4.4.5.1), and ②transportation cost from sand deposited site to candidate EZ sites.

As for the transportation cost from the sand deposited site to the candidate EZ sites ②, if the distance is about 1.8 km, sand can be transported to candidate EZ sites by the deposit site's pump and sand discharging pipe. If the distance is longer, a booster pump will need to be installed for every 1.8 km (See Figure 4.4.5.2).

According to onsite hearings, track record is insufficient for more than two continuous pump stations. In the case in which the transport distance is longer, sand can be temporarily deposited to a sediment pond, then transported by other sand discharge systems. In this case, it is necessary to consider the securing of water for feeding.

As for long transport distances, there is a need to consider land transport by truck rather than by discharge pipes. This method will have more impact on the surrounding environment in comparison to the method of using a sand discharge pipe. It should be kept in mind that the unit price will increase when the distance between the sand deposit site and the candidate EZ sites is longer than a few kilometers.

It should be noted that in the Dhaka area, river sand was chosen as landfill material because other materials, such as mountain soil is difficult to obtain. However, river sand is a uniform fine grain size, hence it may be affected by liquefaction during an earthquake. Therefore, measurements preventing liquefaction at important facilities in the EZ site are vital to consider.

	
<p>Figure 4.4.5.1 Sand booster pump</p>	<p>Source: Study team Figure4.4.5.2 Sand pump boat (front) and sand barge (behind)</p>

An embankment made with mixed soil of river sand and cohesive soil will be constructed on the outer edge of EZ site formation areas to prevent slope failure caused by earthquake.

Table 4.4.5-1 Land Fill Methodology and Relevant Unit Cost of Each Candidate Site

Item	Site-1		Site-2		Site-3		Site-4	Site-5
	Nayanpur		Narsingdi		Bandar		Dohar	Sonargaon
1 Case	Case 1	Case 2	Case 3 (Viyellatex Spinning Mill)	Case 4	Case 5 (Bondhu Trader)	Case 4	Case 6 (Bandar Village)	Case 4
2 Methodology	Sand barge + sand pipe +Booster	Sand barge + Truck	Sand barge + Truck	Sand barge + Sand Pipe	Sand barge + Sand Pipe	Sand barge + Sand Pipe	Sand barge + Sand Pipe	Sand barge + Sand Pipe
3 Source of Information	Estimation based on hearing		On-going Contractor /Supplier hearing	Estimation based on hearing	On-going Contractor hearing	Estimation based on hearing	Local Villager hearing	Estimation based on hearing
4 Source/Landing of fill material	Shitalakshya	Shitalakshya	Shitalakshya	Meghna	Meghna	Padma	Padma	Meghna
5 Distance from river source to landing point ①	10 to 20 km (assumption)		1 to 3 km	1 to 3 km		1 to 3 km	1 to 3 km	1 to 3 km
6 Distance from landing point to EZ site ②	15 km	15 km	12 km	1 to 2 km	1.8 km	1 to 2 km	1 to 2 km	1 to 2 km
7 Unit cost for ① (US\$/m³)	5.00*1)	5.00*1)	2.37	2.37		2.37		2.37
8 Unit cost for ② (US\$/m³)	7.82*2)	10.54*3)	8.78	1.19 *4)		1.19 *4)		1.19 *4)
9 Total Unit cost ① + ② (US\$/m³)	13.82	15.54	11.15	3.56	2.84	3.56	2.76	3.56
10 Target volume of sand fill (1,000 m³)	1,246 (Phase 1)		89					
Item	Site-6(1)		Site-6(2)		Site-7		Site-8	Site-9
	Araihaazar-1		Araihaazar-2		Keraniganj		Kalakair	Palash
1 Case	Case 7	Case 8	Case 9 (US Bangla Housing)	Case 4	Case 10	Case 11	Case 12	Case 13 (AK.Khan)
2 Methodology	Sand barge +Sand pipe +Booster	Sand barge +Sand pipe +Booster	Sand barge +Sand pipe +Booster	Sand barge + Sand Pipe	Sand barge + Sand Pipe + (Booster)	Sand barge +Sand pipe +Booster	Sand barge + truck (pipe/booster)	Sand barge + Sand Pipe
3 Source of Information	Estimation based on hearing	Estimation based on hearing	On-going Contractor hearing	Estimation based on hearing	On-going Contractor hearing	Estimation based on hearing	On-going Contractor hearing	On-going (AKK)
4 Source/Landing of fill material	Shitalakshya River	Shitalakshya River	Old Brahmaputra River (Rainy season only)				Turat/ Jamma	Shitalakshya River
5 Distance from river source to landing point ①	4 to 10 km (Assumption)	4 to 10 km (Assumption)	1 to 3 km	1 to 3 km		4 to 10 km (Assumption)		
6 Distance from landing point to EZ site ②	5 to 6 km	8.5 km	5.4 km	1 to 2 km	1 to (4 km)	4 km	7 km	
7 Unit cost for ① (US\$/m³)	3.50*5)	3.50*5)	2.37	2.37		3.50*5)		
8 Unit cost for ② (US\$/m³)	3.91*6)	5.21*7)	2.37	1.19 *4)		2.37		
9 Total Unit cost ① + ② (US\$/m³)	7.41	8.71	4.74	3.56	2.80 to (4.75)	5.87	4.74 *8)	4.50
10 Target volume of sand fill (1,000 m³)	3,980 (Phase 1)						1,200	

Notes

- *1) Unit cost for 10 to 20 km to landing point
- *2) Unit cost \$2.37/m³ (US Bangle)x 3 Booster groups x transfer ponds (1.1)
- *3) Unit cost \$8.78/m³ x 1.2 (distance adjustment)
- *4) Unit cost \$2.37 x 1/2
- *5) Unit cost \$3.50 for 4 to 10 km to landing point
- *6) Unit cost \$2.37/m³ (US Bangle)x 1.5 Booster groups x transfer ponds (1.1)
- *7) Unit cost \$2.37/m³ (US Bangle)x 2 Booster groups x transfer ponds (1.1)
- *8) Unit cost by truck. In case pipe, advance \$64,000.- for pipe installation. The price of pipe discharge subject to negotiation.

4.4.6. Service of the solid waste treatment

Some services for the solid waste are available in Dhaka city and Chittagong city (according to the company in Dhaka EPZ). But that kind of services are not available in the area of candidate site for the short term development EZ (according to the local consultant). It is necessary for the investor to have some mutual consultation with local government (upazila etc.), and carry out policy measure against the collection, treatment and desposal of solid waste.

4.4.7. Referential standards and regulations for the EZ development

Referential standards and regulations for construction of the infrastructure facilities are shown below.

- Bangladesh National Building Code (BNBC), 2006
- Geometric Design Standards for Roads & Highways Department (Draft ver4), 2000
- The Environment Conservation Rules 1997, Ministry of Environment and Forests, Dhaka.

Table 3.3: National Standards – Waste Discharge Quality Standards for Industrial Units and Projects: Quality at Discharge Point

Parameter	Unit	Location of Final Disposal		
		Inland Surface Water ¹	Public Sewer ¹	Irrigated Land ¹
Ammonia (free ammonia)	mg/L	5	5	15
Ammoniacal Nitrogen (as N)	mg/L	50	75	75
Arsenic (As)	mg/L	0.2	0.5	0.2
BOD ₅ 20°C	mg/L	50	250	100
Boron (B)	mg/L	2	2	2
Cadmium (Cd)	mg/L	0.05	0.5	0.5
Chloride (Cl ⁻)	mg/L	600	600	600
Chromium (hexavalent Cr)	mg/L	0.1	1.0	1.0
Chromium (total Cr)	mg/L	0.5	1.0	1.0
COD	mg/L	200	400	400
Copper (Cu)	mg/L	0.5	3.0	3.0
Cyanide (CN)	mg/L	0.1	2.0	0.2
Dissolved Oxygen (DO)	mg/L	4.5-8	4.5-8	4.5-8
Dissolved Phosphorus (P)	mg/L	8	8	10
Electrical Conductivity	µMho/cm	1200	1200	1200
Fluoride (F)	mg/L	7	15	10
Iron (Fe)	mg/L	2	2	2
Lead (Pb)	mg/L	0.1	0.1	0.1
Manganese (Mn)	mg/L	5	5	5
Mercury (Hg)	mg/L	0.01	0.01	0.01
Nickel (Ni)	mg/L	1.0	1.0	1.0
Nitrate (N molecule)	mg/L	10.0	Undetermined	10.0
Oil and Grease	mg/L	10	20	10
pH		6-9	6-9	6-9
Phenol Compounds (C ₆ H ₅ OH)	mg/L	1.0	5	1
Radioactive Materials		As determined by Bangladesh Atomic Energy Commission		
Selenium (Se)	mg/L	0.05	0.05	0.05
Sulfide (S)	mg/L	1	2	2
Temperature – Summer	°C	40	40	40
Temperature – Winter	°C	45	45	45
Total Dissolved Solids (TDS)	mg/L	2100	2100	2100
Total Kjeldahl Nitrogen (N)	mg/L	100	100	100
Total Suspended Solids (TSS)	mg/L	150	500	200
Zinc (Zn)	mg/L	5.0	10.0	10.0

Notes: (1) *Land Surface Water* refers to any pond, tank, water body, water hole, canal, river, spring or estuary

Public Sewer refers to any sewer connected with fully combined processing plant including primary and secondary treatment

Irrigated Land refers to an appropriately irrigated plantation area of specified crops based on quantity and quality of wastewater

The runoff rate of rain water was set according to the below guideline.

- Construction of road – Guideline of rainwater drainage, Japan road association

1 Evaluation of the existing condition of candidate site for EZ

Because the area is almost used for agricultural land (mainly paddy field), but they don't cultivate in the flood season, the runoff rate was set as dry field. The runoff rate 0.3 (max value for dry field) was applied, in consideration of the following situation that the area is lower than surrounding area and poor drainage.

2) Evaluation of the developed condition of EZ

The main use land of the EZ is mostly industrial use. But it is not the congested industrial park like the existing EPZ. The EZ will mainly have many plots that are about 1-2 ha, and the building coverage ratio of the EZ will be set about 50-65% like Vietnamese industrial park and each plot will ensure the adequate green area. And therefore the runoff rate 0.6 that was lowest value of the congested industrial area was applied.

Reference Basic runoff rate of the ground surface

Kind of ground surface		Runoff rate
Road surface	Pavement	0.70 ~0.95
	Gravel road	0.30 ~0.70
Shoulder, slope etc.	Fine-grained soil	0.40 ~0.65
	Coarse-grained soil	0.10 ~0.30
	Hard rock	0.70 ~0.85
	Soft rock	0.50 ~0.75
Lawn on sandy soil	Gradient 0~2 %	0.05 ~0.10
	" 2~7 %	0.10 ~0.15
	" 7 %~	0.15 ~0.20
Lawn on cohesive soil	Gradient 0~2 %	0.13 ~0.17
	" 2~7 %	0.18 ~0.22
	" 7 %~	0.25 ~0.35
Roof		0.75 ~0.95
Ground		0.20 ~0.40
Lawn, Wooded park		0.10 ~0.25
Low-pitched mountainous land		0.20 ~0.40
High-pitched mountainous land		0.40 ~0.60
Paddy, water		0.70 ~0.80
Cultivation		0.10 ~0.30

Reference Average runoff rate of land use

Kind of land use		Runoff rate
Commercial	Down town	0.70 ~0.95
	Adjacency area of down town	0.50 ~0.70
Industrial	Less congested district	0.50 ~0.80
	Congested district	0.60 ~0.90
Residential	Less ground	0.65 ~0.80
	Apartment area	0.50 ~0.70
	Rich ground	0.30 ~0.50
Green Other	Park, cemetery	0.10 ~0.25
	Playing field	0.20 ~0.35
	Railway yard	0.20 ~0.40
	Plow land, grove etc.	0.10 ~0.30

(Source: Guideline for construction of road and drainage, Japan Road Association)

4.5 Selection of Short-term EZ Development Sites

In this exercise, sites for short-term EZ development are selected. The selection method, the evaluation criteria, and the evaluation result for short-term EZ development are described.

4.5.1. Selection Method for Evaluation of Candidate Sites for EZ Development

The evaluation of candidate EZ sites for short-term EZ development shall be conducted in two steps: 1) qualitative evaluation and 2) quantitative evaluation as shown in Figure 4.5.1-1. Any candidate site which did not pass the qualitative evaluation will not be proceeded to the quantitative evaluation. If any conditions are found unsatisfactory in view of the qualitative evaluation for any site through the quantitative evaluation, the quantitative evaluation for the site shall be terminated.

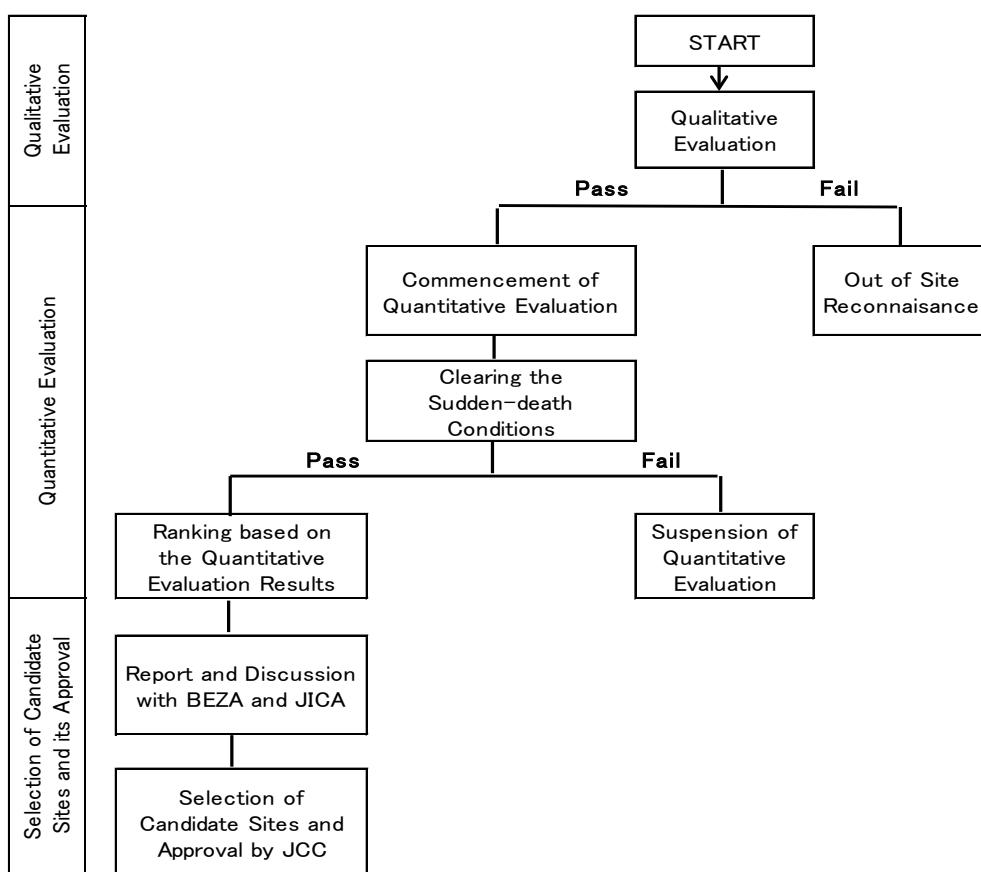


Figure 4.5.1-1 Workflow for the Selection of Short-term EZ Development Sites

4.5.2. Qualitative Evaluation

(1) Qualitative Evaluation Conditions

The conditions of qualitative evaluation are set up as follows.

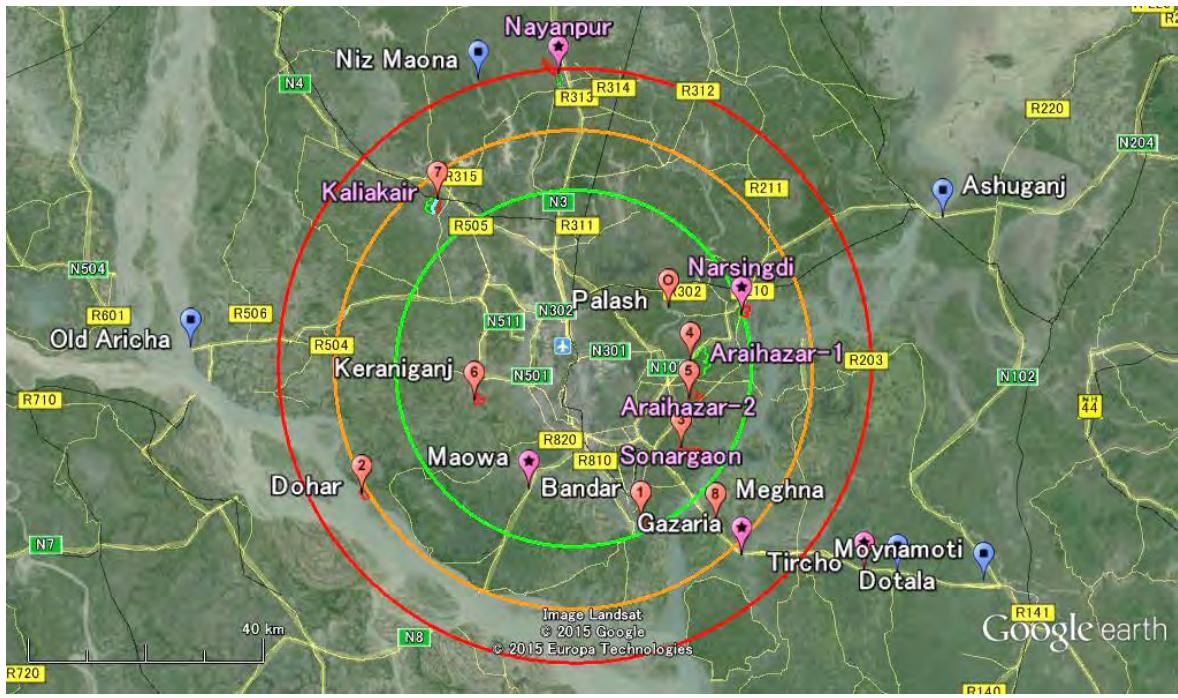
- 1) Land shall be acquired as the responsibility of the Government of Bangladesh (GoB), but compensation costs for the land acquisition shall remain within the range of affordability of Japanese private developers.
- 2) Land acquisition shall be completed by GoB within two years in consideration of the fact that the land is owned by reasonably small number of land owners and the number of squatters living in the candidate site shall be below the level controllable by GoB.
- 3) Land shall not be identified as a case in dispute.
- 4) Potential development sites shall have size appropriate for EZ development with the minimum area of 100 ha.
- 5) Land shall be free from any serious contravention according to the conduct of Strategic Environmental Assessment (SEA).
- 6) Potential development sites shall be commutable either within 60 km direct distance or one and half hours travel by a car from the central Dhaka.

(2) Candidate Sites for Qualitative Evaluation

Candidate EZ development sites for the qualitative evaluation are as follows.

- 1) 10 sites⁸ agreed as contained in the “Annex 4: List of Potential EZ Sites” and Polash Site in R/D: RD-1/2: Nayanpur, RD-3: Narsingdi, RD-4: Tircho, RD-5: Ashuganji, RD-6: Old Aricha, RD-7: Maowa, RD-8: Niz Maona, RD-9: Moynamati, RD-10: Dotala, RD-11: Gazaria, and RD-0: Polash.
- 2) Additional eight (8) candidate sites which were proposed by GoB at the beginning of this Study as described in Appendix2, 6 in R/D: Site-1: Bandar, Site-2: Dohar, Site-3: Sonargaon, Site-4: Araihazar-1, Site-5: Araihazar-2, Site-6: Keraniganj, Site-7: Kaliakair, and Site-8: Meghna These nineteen (19) candidate sites for EZ development are shown in Figure 4.5.2-1.

⁸ Though 11 sites are short-listed in the Annex 4 in R/D, two proposed sites in Nayanpur locate adjoined along access road from Dhaka – Mymensingh Highway in northwest with 223ha and in the southeast with 208ha, and thus they are assessed as one site to make the total 10 sites.



Note ○ 30km distance, ○ 40km distance, ○ 50km distance

Figure 4.5.2-1 Location Map of EZ Candidate Sites

(3) Results of Qualitative Evaluation

These nineteen (19) candidate sites for EZ development have been qualitatively evaluated. The results of qualitative evaluation are shown in Table 4.5.2-1.

Among nineteen (19) candidate sites, six (6) sites have failed through the qualitative evaluation due to the following reasons.

- 1) Miz Maona (RD-8): The development area is limited only to 15 ha.
- 2) Old Aricha (RD-6): The development area is easily submerged by river waters throughout the year. Thus 10 m reclamation is required to keep the land free from floods. The 10-meters reclamation works should involve significant negative impact on environmental and social aspects. This site is, therefore, not suitable for short-term EZ development. Moreover, this site is located in about 65 km distance from Dhaka, exceeding the 60 km limit set by the qualitative evaluation.
- 3) Ashuganji (RD-5), Moynamati (RD-9), Dotala (RD-10): These three (3) sites are located in more than 60 km distance from Dhaka and travelling times are also more than one and a half hours. (Ashuganji: 67 km, Moynamati: 77 km, Dotala: 65 km)
- 4) Meghna (Site-8): The possible development area in the proposed site is limited to less than 65 ha, and the land development cost is assumed not competitive. Moreover, this site is located on the sandbank in the Meghna River, where more than 5m filling is required.

Through the qualitative evaluation conducted as reported above, the following thirteen (13) candidate sites have passed and proceed to the next stage of the quantitative evaluation.

- 1) Five (5) sites agreed in the “Annex 4: List of Potential EZ Sites” and Palash Site in R/D: RD-

1/2: Nayanpur, RD-3: Narsingdi, RD-4: Tircho, RD-7: Maowa, RD-11: Gazaria, and RD-0: Palash.

- 2) Additional seven (7) candidate sites which were proposed by GoB at the beginning of JICA Survey as described in Appendix 2, 6 in R/D: Site-1: Bandar, Site -2: Dohar, Site -3: Sonargaon, Site -4: Araihazar-1, Site -5: Araihazar-2, Site -6: Keraniganj, and Site -7: Kaliakair.

Table 4.5.2-1 Qualitative Evaluation Result

Elements of Qualitative Evaluation	RD-1/2	RD-3	RD-4	RD-5	RD-6	RD-7	RD-8	RD-9	RD-10	RD-11	RD-0	Site-1	Site-2	Site-3	Site-4	Site-5	Site-6	Site-7	Site-8
	Nayanpur	Narsingdi	Tircho	Ashganji	Old Aricha	Maowa	Niz Maona	Moynamati	Dotala	Gazaria	Palash	Bandar	Dohar	Sonargaon	Araihaar-1	Araihaar-2	Keraniganj	Kaliakair	Meghna
1. Land Compensation Cost	○	○	○	—	—	△	—	—	—	△	△	○	○	○	○	○	○	○	✗
Remarks	Government	Government				Private Company				Private Company	Private Company	Government	Government	Government	Government	Government	Government	Government	Private: Land cost is not affordable.
2. Land Acquisition Period	○	○	○	—	—	○	—	—	—	○	○	○	○	○	○	○	○	○	△
Remarks	Confirm to Upazila Office	Confirm to Upazila Office										Confirm to Upazila Office	Confirm to Upazila Office	Confirm to Upazila Office	Confirm to Upazila Office	Not known			
3. Land Dispute	○	○	○	—	—	○	—	—	—	○	○	○	○	○	○	○	○	○	○
Remarks	Confirm to Upazila Office	Confirm to Upazila Office										Confirm to Upazila Office	Confirm to Upazila Office	Confirm to Upazila Office	Confirm to Upazila Office	In the river			
4. Appropriate Land Size	○	○	○	△	△	○	✗	△	△	△	△	○	○	○	○	○	○	○	✗
Proposed EZ Development Size	1st phase: 233ha, Total:441ha	1st phase: 185ha, Total:558ha	1st phase: 100ha, Total:200ha	133ha	1st phase: 50ha, Total:120ha	1st phase: 100ha, Total:700ha	15ha only	156ha	100ha	100ha	1st phase: 60ha, Total:100ha	1st phase: 100ha, Total:155ha	1st phase: 100ha, Total:133ha	1st phase: 230ha, Total:552ha	1st phase: 100ha, Total:1,050ha	1st phase: 132ha, Total:223ha	1st phase: 100ha, Total:195ha	1st phase: 132ha, Total:485ha	Less than 65ha
5. SEA Issue	○	○	○	—	✗	○	—	—	—	○	○	○	○	○	○	○	○	△	
Remarks					Reclamation in the River: Large Impact in SEA														Sandbank in the river need to be filled.
6. Within Commuting Distance	△	○	△	✗	✗	○	—	✗	✗	○	○	○	△	○	○	○	○	△	○
Linear Distance from Dhaka / Travelling Time	Distance:50km, Time:1h 42m	Distance:30km, Time:1h 03m	Distance:59km, Time:1h 50m	Distance:67km	Distance:65km	Distance:22km	Distance:52km	Distance:77km	Distance:65km	Distance:42km	Distance:19km, Time:0h 56m	Distance:20km, Time:1h 10m	Distance:31km, Time:1h 42m	Distance:22km, Time:0h 58m	Distance:20km, Time:0h 37m	Distance:19km, Time:0h 46m	Distance:17km, Time:0h 57m	Distance:38km, Time:1h 38m	Distance:35km, Time:1h 24m
Evaluation	Pass	Pass	Pass	Fail	Fail	Pass	Fail	Fail	Fail	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Fail	

Notes:

- 1) ○ : Good Enough, △ : Fair, ✗ : Failed
- 2) RD-5 (Ashuganj), RD-6 (Old Aricha), RD-9 (Moynamati) and RD-10 (Dotala) have been failed due to long distance more than 60 km from Dhaka.
- 3) RD-6 (Old Aricha) have been failed due to the large impact by river reclamation on SEA.
- 4) RD-8 (Niz Moana) have been failed due to too much small land area with 15 ha.
- 5) Site-8 (Meghna) have been failed due to small land area with 65 ha and not affordable land price.

4.5.3. Quantitative Evaluation

(1) Quantitative Evaluation Conditions

Thirteen (13) candidate sites which have passed the qualitative evaluation are to be examined by the quantitative evaluation in this step. Evaluation criteria for the quantitative evaluation are tabulated in Table 4.5.3-1 for rating with five (5) evaluation ranks.

These evaluation criteria have been established based on the results of review on the criteria which were proposed and used during the conduct of FDI study, in addition to the past experience of the consultant members of this Study Team in similar projects for economic zone and industrial estate development in other countries. These criteria are assumed to be important for Japanese developers to examine the possibility of investment to EZ in Bangladesh.

The elements of assessment for the quantitative evaluation are as follows.

A. Location

- 1) Distance from Dhaka
- 2) Access to main highway
- 3) Access to inland container terminal/river port⁹
- 4) Access to international airport (Dhaka)
- 5) Access to major town

B. Basic land information

- 6) Initial development area
- 7) Current land use (cropping pattern)
- 8) Land ownership
- 9) Expandability of land
- 10) Land development cost

C. Surrounding context

- 11) Availability of social/commercial facilities
- 12) Availability of labor force (population of Upazila)
- 13) Ongoing/future development projects in adjacent area
- 14) Industrial cluster (industry % in economic income in Upazila)

D. Social and environmental assessment

- 15) Number of resettlements (householders)

E. Infrastructure

- 16) Distance of access road
- 17) Distance to water supply resources
- 18) Distance to power sub-station (132/33kV)
- 19) Distance to gas pipeline

⁹ Railway terminals are Dhaka and Tongi, river terminals are Pangaon, Summit and AK. Khan.

F. Natural disaster (especially countermeasures for flood and inundation)

20) Risk of land erosion by flood

5: "Very Low" means that there is hardly fear of erosion by flood.

4: "Low" means that the site might be flooded and there is a little possibility of erosion by flood when decreasing water level.

3: "Normal" means that there is a possibility of erosion by flood.

2: "High" means that the site is protected by the bank or road from large or middle river but it is fear of erosion by flood when overtopping the bank or road.

1: "Very high" means that the site is located facing large or middle size river and it is greater fear of direct erosion by flood.

21) Risk of flood (Flood level from current ground elevation)

G. Government land price

22) Average price of land acquisition.

The land acquisition costs (US\$/m²) is evaluated by assuming from interview survey and a peripheral market price with the following points:

5: "P=0\$" means that the government owns the land.

4: "0\$<P 5\$" means that Upazila office has concerned the land acquisition.

3: "5\$<P 10\$" means that Upazila office will concern the land acquisition.

2: "10\$<P 20\$" means that private developer(s) may concern the land acquisition.

1: "20\$<P" means that one private developer owns or will own the land.

When the land acquisition cost is uncertain, it shall be evaluated by the following assumption.

- If the Upazila office has already a specific land acquisition plan according to the cadastral map, it is estimated at 1-5\$/m², because it will be fixed by the government price adjustment plan.

- If the Upazila office has a specific land acquisition plan and the land acquisition is partially undertaken by the real estate agency, it is estimated as 5-10\$/m² considering the government price and the market price are much different at the moment.

- If a real estate agency is going to acquire most of the land, it is assumed to be 20\$/m² or higher judging from catching market price (20-40\$).

Table 4.5.3-1 Assessment Criteria and Score for Quantitative Evaluation

Elements of Assessment		Unit	Evaluation Score				
			5	4	3	2	1
A. LOCATION							
1	Distance from Dhaka	Distance (km)	D≤20km	20km<D≤25km	25km<D≤30km	30km<D≤40km	40km>D
2	Access to Main Highway	Distance (km)	D≤1km	1km<D≤3km	3km<D≤5km	5km<D≤10km	10km>D
3	Access to Inland Container Terminal/River Port	Distance (km)	D≤5km	5km<D≤10km	10km<D≤20km	20km<D≤50km	50km>D
4	Access to International Airport (Dhaka)	Distance (km)	D≤30km	30km<D≤40km	40km<D≤50km	50km<D≤60km	60km>D
5	Access to Major Town	Distance (km)	D≤5km	5km<D≤10km	10km<D≤15km	15km<D≤20km	20km>D
B. BASIC LAND INFORMATION							
6	Initial Development Area	Size (ha)	D≥200ha	200ha>D≥150ha	150ha>D≥100ha	100ha>D≥50ha	50ha>D
7	Current Land Use	Count	C=0	C=0.5	C=1	C=2	C=3
8	Land Ownership	Number	Government	N=1	1<N≤50	50<N≤100	100>N
9	Expandability of Land	Size (ha)	D≥400ha	400ha>D≥300ha	300ha>D≥200ha	200ha>D≥100ha	100ha>D
10	Land Development Cost	US\$/m ²	P≤5\$	5\$<P≤10\$	10\$<P≤15\$	15\$<P≤20\$	20\$>P
C. SURROUNDING CONTEXT							
11	Availability of Social/Commercial Facilities	-	Excellent	Very Good	Good	Poor	Very Poor
12	Availability of Labor Force (Upazila)	Population	P≥500,000	500,000>P≥300,000	300,000>P≥100,000	100,000>P≥50,000	50,000>P
13	Ongoing/Future Development Projects in Adjacent Area	-	Excellent	Very Good	Good	Poor	Very Poor
14	Industrial Cluster (Industry % in economic structure)	%	P≥20%	20%>P≥15%	15%>P≥10%	10%>P≥5%	5%>P
D. SOCIAL & ENVIRONMENT ASSESSMENT							
15	Number of Resettlements (Householders)	Number	N=0	0<N≤50	50<N≤100	100<N≤200	200>N
E. INFRASTRUCTURE							
16	Distance of Access Road	Distance (km)	L≤500m	500m<L≤1km	1km<L≤3km	3km<L≤5km	5km>L
17	Distance to Water Supply Resources	Distance (m)	Inside the Area	L≤200m	200m<L≤500m	500m<L≤1km	1km>L
18	Distance to Power Sub-station (132/33kV)	Distance (km)	L≤500m	500m<L≤1km	1km<L≤3km	3km<L≤5km	5km>L
19	Distance to Gas Pipeline	Distance (km)	L≤500m	500m<L≤1km	1km<L≤3km	3km<L≤5km	5km>L
F. NATURAL DISASTER (FLOOD MEASURES)							
20	Risk of Land Erosion by Flood	-	Very Low	Low	Normal	High	Very High
21	Risk of Flood (Flood level from current ground elevation)	Height (m)	H≤1m	1m<H≤2m	2m<H≤3m	3m<H≤5m	5m>H
G. GOVERNMENT LAND PRICE							
22	Average Price of Land	US\$/m ²	P=0\$	0\$<P≤5\$	5\$<P≤10\$	10\$<P≤20\$	20\$>P

Note) 3: Railway terminal: Dhaka, Tongi, River terminal: Pangaon, Summit, AK. Khan

(2) Results of Quantitative Evaluation

In accordance with the assessment criteria and score for quantitative evaluation in Table 4.5.3-1, evaluation results are tabulated in Table 4.5.3-2.

Based on the quantitative evaluation, following six (6) sites have been selected with more than 70 points out of the maximum 110 points.

1st rank: Araihazar-1 site:	87 points
2nd rank: Narsingdi site:	74 points
3rd rank : Nayanpur site:	73 points
3rd rank : Kaliakair site:	73 points
5th rank : Araihazar-2 site :	72 points
6th rank : Sonargaon site:	71 points

At first, Araihazar-1 site with the score of 87 points is recommendable for the first candidate site for the preparation of a short-term basic plan.

Since the difference is small for five candidate sites with the score of 74 points (2nd rank) to 71 points (6th rank), a supplementary evaluation shall be done with the additional investigation. However, since Araihazar-2 site is located in the same Upazila of the first rank (Araihazar-1 site), it is to be dropped from the site selection for the formulation of a short-term basic plan.

Table 4.5.3-2 Result of Assessment Evaluation on EZ Candidate Sites

Elements of Assessment		RD-1/2	RD-3	RD-4	RD-7	RD-11	RD-0	Site-1	Site-2	Site-3	Site-4	Site-5	Site-6	Site-7
		Nayapur	Narsingdi	Tircho	Maowa	Gazaria	Palash	Bandar	Dohar	Sonargaon	Araihazar-1	Araihazar-2	Keraniganj	Kaliakair
A. LOCATION		14	18	10	22	16	17	19	10	17	22	18	20	16
1 Distance from Dhaka		1	3	1	4	1	5	5	2	4	5	5	5	2
2 Access to Main Highway		4	4	5	5	5	1	4	1	3	5	3	4	4
3 Access to Inland Container Terminal/River Port		2	3	1	3	2	5	2	1	2	3	2	2	2
4 Access to Major Airport		2	3	1	5	3	4	4	2	4	5	4	5	3
5 Access to Major Town		5	5	2	5	5	2	4	4	4	4	4	4	5
B. BASIC LAND INFORMATION		12	15	10	13	13	10	12	12	15	17	11	12	13
6 Initial Development Area		5	4	3	3	2	2	3	3	3	5	3	3	4
7 Current Land Use (Crop pattern)		2	3	2	3	5	4	4	4	3	3	3	4	4
C=2	C=1	C=2	C=1	C=2	C=1	C=0	C=0.5	C=0.5	C=0.5	C=1	C=1	C=1	C=0.5	C=0.5
8 Land Ownership		1	1	1	1	4	1	1	1	1	1	1	1	1
100<N	100<N	100<N	100<N	N=1	100<N	100<N	100<N	100<N	100<N	100<N	100<N	100<N	100<N	100<N
9 Expandability of Land		3	4	2	5	1	1	1	1	1	5	5	2	3
10 Land Development Cost		208 ha	373 ha	100 ha	600 ha	0 ha	40 ha	55 ha	33 ha	552 ha	820 ha	123 ha	63 ha	295 ha
		1	3	2	1	1	2	3	3	3	3	2	3	1
		23.3 \$/m ²	10.7 \$/m ²	-	-	-	18.0 \$/m ²	14.2 \$/m ²	14.2 \$/m ²	14.2 \$/m ²	14.8 \$/m ²	17.4 \$/m ²	14.2 \$/m ²	23.5 \$/m ²
C. SURROUNDING CONTEXT		15	14	10	9	9	13	13	9	14	16	16	13	16
11 Availability of Social/Commercial Facilities		4	4	2	2	2	3	3	2	4	3	3	3	4
Very Good	Very Good	Poor	Poor	Poor	Good	Good	Poor	Very Good	Good	Good	Good	Good	Very Good	
12 Availability of Labor Force (Upazila population)		4	5	4	3	3	3	3	4	3	4	4	4	4
493,000	708,000	350,000	288,000	138,000	213,000	313,000	226,000	400,000	377,000	377,000	794,000	483,000		
13 Ongoing/Future Development Projects in Adjacent Area		5	3	2	2	2	4	3	2	3	4	4	2	4
Excellent	Good	Poor	Poor	Poor	Very Good	Good	Poor	Good	Very Good	Very Good	Poor	Very Good		
14 Industrial Cluster (Industry % in Economic Structure)		2	2	2	2	2	3	3	2	3	5	5	3	4
5.2%	6.8%				13.8%	12.0%	5.6%	13.8%	24.8%	24.8%	14.3%	16.1%		
D. SOCIAL & ENVIRONMENT ASSESSMENT		5	5	5	5	5	5	1	5	5	5	5	5	5
15 Number of Resettlements (Householders)		5	5	5	5	5	5	1	5	5	5	5	5	5
N=0	N=0	N=0	N=0	N=0	N=0	N=0	N>200	N=0						
E. INFRASTRUCTURE		13	14	17	14	16	8	9	8	12	18	11	10	14
16 Distance of Access Road		3	3	5	5	5	1	1	1	3	5	2	2	3
1.2 km	2.5 km	0 m	0 m	0 m	12 km	11 km	30 km	2.5 km	200 m	4 km	4 km	3 km		
17 Distance to Water Supply Resources		5	5	5	5	5	5	5	5	5	5	5	5	5
Inside	Inside	Inside	Inside	Inside	Inside	Inside	Inside	Inside	Inside	Inside	Inside	Inside	Inside	Inside
18 Distance to Power Sub-station (132/33kV)		2	3	3	3	3	1	1	1	1	3	2	1	3
3.4 km	1.5 km	3 km	3 km	3 km	10 km	10 km	10 km	9 km	2.5 km	5 km	8 km	3 km		
19 Distance to Gas Pipeline		3	3	4	1	3	1	2	1	3	5	2	2	3
1.5 km	3 km	1 km	10 km	2 km	10 km	10 km	10 km	3 km	200 m	4 km	4 km	3 km		
F. NATURAL DISASTER (FLOOD MEASURES)		10	5	7	3	2	3	3	3	4	7	7	4	6
20 Risk of Land Erosion by Flood		5	2	4	2	1	1	1	1	2	4	4	2	4
Very Low	High	Low	High	Very High	Very High	Very High	Very High	High	Low	Low	High	High	Low	
21 Risk of Flood (Flood level from current ground elevation)		5	3	3	1	1	2	2	2	3	3	2	2	2
0 m	2 - 3 m	3 m	6 m	5 m	3 - 5 m	3 - 5 m	3 - 5 m	3 - 5 m	2 - 3 m	2 - 3 m	3 - 5 m	3 - 5 m		
G. GOVERNMENT LAND PRICE		4	3	1	1	1	1	4	4	4	2	4	3	3
22 Average Price of Land (\$/m ²)		1 - 5 \$	5 - 10 \$	20 \$ < P	1 - 5 \$	1 - 5 \$	16.2 \$/m ²	1 - 5 \$	5 - 10 \$	5 - 10 \$				
TOTAL SCORE		73	74	60	67	62	57	61	51	71	87	72	67	73
RESULT		Pass	Pass								Pass	Pass	Pass	Pass

(3) Outline of Possible Candidate Sites for Short-term EZ Development

The locations of six (6) candidate sites which have passed the qualitative and quantitative evaluation are shown in Figure 4.5.3-1. Details of each site are presented in Appendix-5

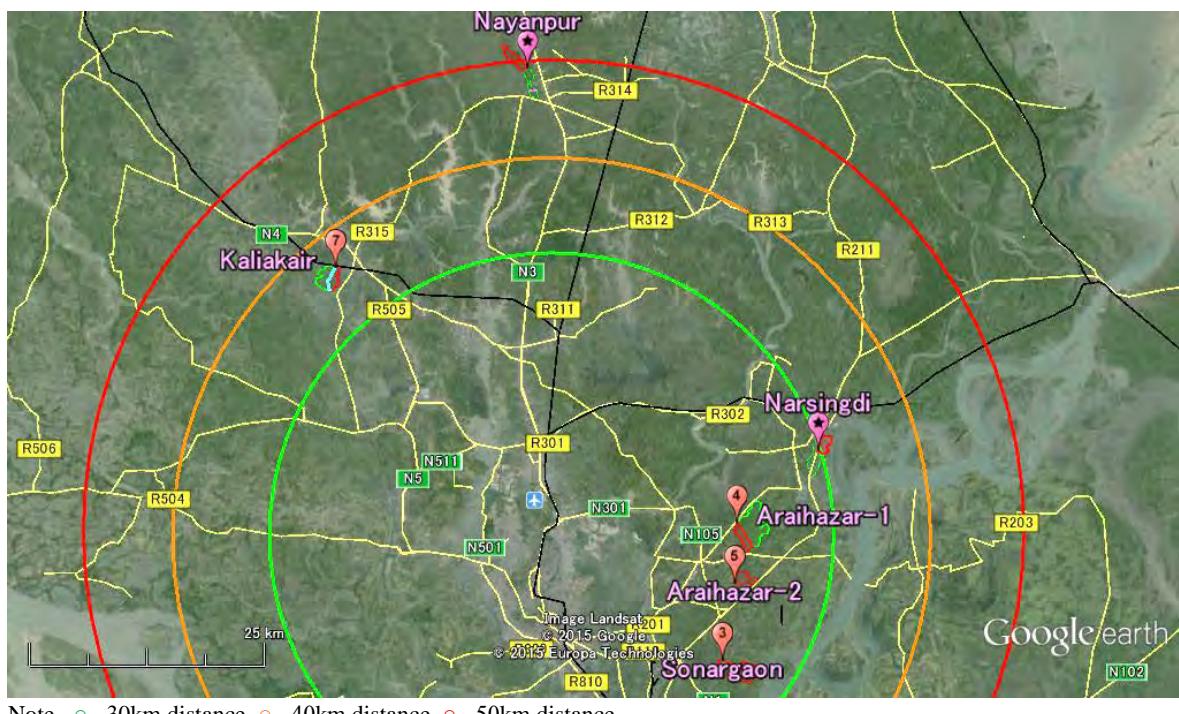


Figure 4.5.3-1 Location Map of 6 EZ Candidate Sites for Basic Plan

4.5.4. Supplementary Evaluation

(1) Supplementary Evaluation Conditions

Following the qualitative and quantitative evaluation, a supplementary evaluation shall be carried out to select the candidate sites ranked between 2nd and 5th rank, for formulation of short-term basic plan.

Supplementary surveys are to be done in order to select the candidate sites based on the most important issues for Japanese developers for the investment to EZ such as “(1) risk of flood”, “(2) convenience from Dhaka” and “(3) land development cost” as follows. In the addition, preparation for, and/or intention to proceed with the EZ development by the Bangladesh side are to be confirmed as follows.

1) Risk of flood (20 points)

As for the risk of flood, this is one of most important issues and concerns for Japanese developer(s) and investor(s) who examine their foreign investment for promotion to special economic zones or industrial estates in the southeast or south Asian countries recently. Therefore, maximum of 20 points are allocated to this element.

Regarding the risk of flood, additional evaluation is done with the following detailed investigation.

Risk of flood erosion

Risk of flood inundation

The score for the risk of flood is put by the following condition based on the detailed analysis on each site;

20 points: Excellent There is no fear of erosion with the flood water of the river, and the site is also low the fear of the inundation by the flood, only seeing the storm water from a peripheral catchment.

10 points: Good There is a fear of the inundation by the flood water from the river reaches, but little fear of erosion by the flood.)

5 points: Fair There is a fear of the inundation by the flood water from the river reaches, also a fear of erosion by the flood.)

0 points: Very Poor There is a large fear of the inundation by flood due to the site facing large or middle size river, also a large fear of direct erosion by the flood.)

2) Convenience from Dhaka (10 points)

The score for the convenience from Dhaka is put by the following condition based on the expectation of the improved travel time in the near future considering the prospect and the possibility of surrounding infrastructure development for each site.

10 points: Excellent Travel time “T” 30 min.

8 points: Very Good 30 min.<T 45 min.

6 points: Good 45 min.<T 60 min

4 points: Fair 60 min.<T 75 min.

2 points: Poor 75 min.<T 90 min.

0 points: Very Poor 90 min.<T

3) Land development cost (10 points)

The score for the land development cost is put by the following condition based on the estimation of the construction cost per square meter for land filling works confirming the fill volume, the distance to the nearest sand deposit, and transporting method for each site;

10 points; Excellent \square Construction cost per square meter for filling “C” 5\$

8 points: Very Good $5\$ < C \leq 10\$$

6 points: Good $10\$ < C \leq 15\$$

4 points: Fair $15\$ < C \leq 20\$$

2 points: Poor $20\$ < C \leq 25\$$

0 points: Very Poor $C > 25\$$

4) Preparatory condition to proceed the EZ development by Bangladesh side (10 points)

The score for the preparatory condition to proceed the EZ development by the Bangladesh side is put by the following condition based on the confirmation of the progress for EZ development of each site by BEZA;

10 points: Excellent The candidate site has been approved by BEZA

6 points: Good Upazila office or the private developer has prepared the cadastral map for EZ recognized by BEZA.

3 points: Poor Upazila office or the private developer is under preparation of the plan.

5) Industrial cluster and promotion with main domestic industries in Upazila (5 points)

The score for the industrial cluster and relation/promotion with main domestic industries in Upazila is put by the following condition based on the numbers of textile industries in Upazila as main industries in Bangladesh having much potentiality of relation/promotion with the foreign investment to EZ;

5 points: Excellent Number of textile industries “N” $1,500$

4 points: Very Good $1,000 < N \leq 1,500$

3 points: Good $500 < N \leq 1,000$

2 points: Fair $200 < N \leq 500$

1 points: Poor $N \leq 200$

(2) Results of Supplementary Evaluation

The supplementary evaluation has been done based on the above elements with the evaluation criteria for four (4) candidate sites (Narsingdi, Nayanpur, Kaliakair and Sonargaon), and its result is tabulated in Table 4.5.4-1.

Table 4.5.4-1 Result of Supplementary Evaluation

Elements	RD-3: Narsingdi	RD-1/2: Nayapur	Site-7: Kaliakair	Site-3: Sonargaon
Supplement Evaluation (1): Risk of Flood (20)	<input type="checkbox"/> Fair: (There is a fear of erosion and inundation by the flood, since it is only 400 m far from the branch of Meghna river.)	<input type="checkbox"/> Excellent: (There is no influence of erosion and inundation by the flood from Padma and Meghna rivers, since the altitude of low ground with El. 14-16m is higher than the 100-year flood level of El. 10.72m)	<input type="checkbox"/> Fair: (There is a fear of erosion and inundation by the flood, since the small branch of Dhaleshwari river flows in the site.)	<input type="checkbox"/> Fair: (There is a fear of erosion and inundation by the flood, since it is only 500 m far from the branch of Meghna river.)
	5	20	5	5
Supplement Evaluation (2): Convenience from Dhaka (10)	<input type="checkbox"/> (Present) Travel distance: 39.7km, 1h 04min. <input type="checkbox"/> (Future) Improved travel time is reduced at 55min. with 3km access shortening by highway widening and N301 bypass extension.	<input type="checkbox"/> (Present) Travel distance: 60.8km, 1h 51min. <input type="checkbox"/> (Future) Improved travel time is reduced at 1h 25min. with 4km access shortening by highway widening, intersection improvement and flyover construction.	<input type="checkbox"/> (Present) Travel distance: 54.5km, 1h 47min. <input type="checkbox"/> (Future) Improved travel time is reduced at 1h 25min. with 5km access shortening by highway widening, flyover construction and access road construction.	<input type="checkbox"/> (Present) Travel distance: 35.8km, 1h 01min. <input type="checkbox"/> (Future) Improved travel time is reduced at 54min. by highway widening and N301 bypass extension.
	6	2	2	6
Supplement Evaluation (3): Land development cost (10)	<input type="checkbox"/> Altitude of low ground: El. 5-7m, 100-year flood level: El. 7.64m, Average filling level: El. 8.7m <input type="checkbox"/> 1.7-3.7 m filling (Average height: 2.7m) <input type="checkbox"/> 3.56\$/m ³ x 2.7m = 9.6\$/m ²	<input type="checkbox"/> Altitude of low ground: El. 14-16m, 100-year flood level: El. 10.72m, Average filling level: El. 16.5m <input type="checkbox"/> 0.5-2.5 m filling (Average height: 1.5m) <input type="checkbox"/> 13.82\$/m ³ x 1.5m = 20.7\$/m ²	<input type="checkbox"/> Altitude of low ground: El. 6-8m, 100-year flood level: El. 10.56m, Average filling level: El. 11.6m <input type="checkbox"/> 3.6-5.6 m filling (Average height: 4.6m) <input type="checkbox"/> 5.87\$/m ³ x 4.6m = 27.0\$/m ²	<input type="checkbox"/> Altitude of low ground: El. 6-7m, 100-year flood level: El. 7.19m, Average filling level: El. 8.2m <input type="checkbox"/> 1.2-2.2 m filling (Average height: 1.7m) <input type="checkbox"/> 3.56\$/m ³ x 1.7m = 6.1\$/m ²
	8	2	0	8
Supplement Evaluation (4): Pre-condition by Bangladesh side (10)	<input type="checkbox"/> This site has been approved by BEZA.	<input type="checkbox"/> This site has been approved by BEZA.	<input type="checkbox"/> Upazila Office has prepared the cadastral map.	<input type="checkbox"/> Upazila Office has prepared the cadastral map.
	10	10	6	6
Supplement Evaluation (5): Industrial Cluster in Upazila (5)	<input type="checkbox"/> Income ratio of secondary industry: 6.8% <input type="checkbox"/> Number of Textile industries; 1,900	<input type="checkbox"/> Income ratio of secondary industry: 6.0% <input type="checkbox"/> Number of Textile industries; 44	<input type="checkbox"/> Income ratio of secondary industry: 9.8% <input type="checkbox"/> Number of Textile industries; 86	<input type="checkbox"/> Income ratio of secondary industry: 8.5% <input type="checkbox"/> Number of Textile industries; 114
	5	1	1	1
Total (50)	34	35	14	26

Note The running speed for Kaliakair is assumed to be improved from about 30km/h to 35km/h, the others are assumed to be improved from about 35km/h to 40km/h.

The result of the supplementary evaluation (55 full marks) are as follows.

1st Rank	Nayanpur site:	35 points
2nd Rank	Narsingdi site	34 points
3rd Rank	Sonargaon site:	26 points
4th Rank	Kaliakair site:	14 points

On the selection of the candidate sites for short-term EZ development to formulate basic development plans, attracting Japanese developers and investors is a main objective. It is, therefore, recommendable to formulate a basic development plan on the top two (2) in the quantitative evaluation with the supplementary evaluation.

Araihaazar-1 site at the 1st rank through the quantitative evaluation and Nayanpur site at the 1st rank through the supplementary evaluation are to be recommended for the short-term EZ candidate sites for basic plan formulation.

Narsingdi site at the 2nd rank through the quantitative evaluation and the 2nd rank through the supplementary evaluation is to be the alternative site for the basic plan. The following two (2) sites and the alternative site are recommended as the potential candidate sites for short-term basic development plan formulation by the reasoning above.

1st rank	Araihaazar-1 site
2nd rank	Nayanpur site
Runner up	Narsingdi site

4.5.5. Decision of Candidate Sites for Short-term EZ Development

When JCC meeting for selection of candidate sites for short-term EZ development was held on August 19th, 2015, it has been agreed that Araihaazar-1 site and Nayanpur site were decided as the candidate sites for short-term EZ development. (Refer to MM of JCC meeting)

4.6 Environmental and Social Consideration

4.6.1 Bangladeshi Environmental Laws, Rules and Regulations

(1) Environmental-related Acts and Ordinances

Table 4.6.1-1 shows Bangladeshi Environmental Laws, Rules and Regulations which have been stipulated in acts, ordinances, etc. to be applied in Bangladesh.

**Table 4.6.1-1
Bangladeshi Environmental Legislation**

No.	Description
1.	Environmental Preservation and Conservation Bangladesh Environmental Preservation Ordinance, 1989 The Environmental Conservation Rules, 1997
2.	Air quality Environmental Pollution Control Ordinance, 1977 Factories Act, 1965
3.	Water quality including water and sanitation Environmental Pollution Control Ordinance, 1977 Factories Act, 1965
	National Policies for Safe Water Supply and Sanitation, 1998 National Water Policy, 1999 National Water Management Plan, 2004 National Sanitation Strategy, 2005 National Policy for Arsenic Mitigation, 2004
4.	Noise and vibration Motor Vehicles Ordinance, 1983 Environmental Pollution Control Ordinance, 1977
5.	Land use Local Government Ordinance, 1982 Pourashava Ordinance, 1977 Town Improvement Ordinance, 1953
6.	Harmful matters Pesticides Ordinance, 1982 Environmental Pollution Control Ordinance, 1977
7.	Solid wastes Pourashava Ordinance, 1977 Environmental Pollution Control Ordinance, 1977
8.	Forest prevention Forest Act, 1990
9.	Wild Prevention Wild (Prevention) Order, 1973
10.	Marine resources Environmental Pollution Control Ordinance, 1977 Territory Water and Maritime Zones Act, 1974 Factories Act, 1955 Town Improvement Act, 1953
11.	Resources Management Mines Act 1923 Petroleum Act, 1934
12.	Cultural properties Antiquities Act, 1963 Antiquities (Amendment) Ordinance
13.	Biological species

No.	Description
Forest Act, 1990	
Environmental Pollution Control Ordinance, 1977	
Bangladesh Environmental (Preservation) Ordinance, 1989	
14. Soil	
Forest Act, 1990	
Bangladesh Water and Power Development Boards Ordinance, 1972	
15. Sea and Ocean	
Environmental Pollution Control Ordinance, 1977	
Territorial Water and Maritime Zone Act, 1974	
16. Occupational safety	
Factories Act, 1965	
The Factory Rules, 1979	
17. Industries	
Environmental Guidelines for Industries	
18. Ecological critical areas (ECA), and classification of industries and projects	
Environmental Conservation Rules, 1997	
19. Official information disclosure and community participation	
The Right To Information Act, 2009	
20. Land acquisition and compensation	
Acquisition and Requisition of Immovable Property Acts, 1994 and so on	
21. Climate change	
The Environmental Conservation Act, 1995	
Water Supply and Sanitation Act, 1996	
The environmental Conservation Rules, 2003	
Draft Wetland Policy, 1998	
The Natural Water Policy, 1999	
Environmental Court Act, 2002	
Renewable Energy Policy of Bangladesh, 2008	
Bangladesh Climate Change Strategy and Action Plan, 2009	
Environmental Conservation Act, 1995	
Environmental Conservation Rules, 1997	
National Environment Management Action Plan, 1995 – 2005	
Urban Management Policy Statement, 1998	
National Policy for Water Supply and Sanitation, 1998	
National Clean Development Mechanism (CDM) Strategy, 2004	

Source: Prepared by JICA Study Team

(2) Bangladeshi Environmental Criteria

Table-4.6.1-1 shows Bangladeshi environmental criteria, etc. Noise, exhausted gases, and discharged waste are stipulated by areas, vehicles, plants &facilities, industries, etc. In addition, Not so many environmental parameters in ambient air and water qualities are stipulated in Bangladesh. Therefore, ICA's reference parameters have been also added to the following table.

Table 4.6.1- 2 Environmental and Emission/Discharge Criteria in Bangladesh

No.	Parameter	Remarks (Criteria, etc. to be complied with, etc.)
1.	大気 (環境基準)	
	SO ₂ ^{a),b)}	Standards for Air: Schedule-2 (Environmental Conservation Rules 1997)
	NO ₂ ^{a),b)}	Standards for Air: Schedule-2 (Ditto.)

	CO a),b)	Standards for Air: Schedule-2 (Ditto.)
	O ₃ a)	
	Dust and soot a)	
	Suspended particulate mattes (PM _{2.5}) a), SPM b)	Standards for Air: Schedule-2 (Ditto.)
	Coarse particulate a)	

2.	Water quality^{c)}	
	pH a)	Standards for Inland Surface Water: Schedule-3(A) (Ditto.)
	SS(Suspended matters) a), b)	
	BOD a), b)/COD a)	Standards for Inland Surface Water: Schedule-3(A) (Ditto.)
	DO a),b)	
	Total nitrogen a)	
	Total phosphorus a)	
	Heavy metals a)	
	Hydrocarbons a)/mineral oils a)	
	Phenols a)	
	Cyanogen compound a)	
	Water temperature a)	
	Total coliform b)	Standards for Inland Surface Water: Schedule-3(A) (Ditto.)

3.	Emitted gasses	
	Exhausted/emitted gasses from construction sites, vehicles, vessels and plants & facilities within EZ sites	Standards for Emission from Motor Vehicles: Schedule-6, Standards for Emission from Mechanized Vessels: Schedule-7, Standards for Gaseous Emission From Industries or Projects: Schedule-11, and Standards for Sector-wise Industrial Effluent or Emission: Schedules-12(A),(D), (E)& (F) (Ditto.)
4.	Discharged waste water	
	Discharged waste water from construction sites and plants & facilities within EZ sites	Standards for Sound from Motor Vehicles or Vessels: Schedule-10, and Standards for Sector-wise Industrial Effluent or Emission Effluent: Schedules-12(A), (B), (G), (H), (L), &d (J) (Ditto.)
	Sewage from EZs	Standards for Sewage Discharge: Schedule-9 (Ditto.)

5.	Wastes	
	Types/kinds, quantities, disposal and treating systems, etc.	---

6.	Noise and vibration	
	Noise level	Standards for Sounds: Schedules-4 (Environmental Criteria) (Ditto.) and Standards for Sound from Motor Vehicles or Vessel: Schedule-5 (Vessels and Vehicles) (Ditto.)
	Vibration level	

7.	Offensive smells	
	Odors	Standards for Odor: Schedule-8 (Ditto.)

8.	Natural environment^{c)}	
	Groundwater level, water qualities and subsistence of sites due to banking and pumping of water.	Standards for Drinking Water: Schedule-3(B)(Ditto)

(Notes) a) JICA's items of monitoring (Only for reference), b) Items in Bangladeshi environmental criteria, c) No environmental criteria for water qualities in marines and oceans, d) It is not always applicable in all EZ development project, e) All Bangladeshi environmental and emission/discharge criteria are compiled in "Environmental Assessment Guidelines for LGD Project, October 2008".

(Source: JICA Study Team)

Table 4.6.1-2 shows the minimum requirement for environmental monitoring items and locations during construction and operation of projects. However, detailed parameters, sampling points and frequencies, methods of analysis, etc. shall be discussed with Bangladeshi DOE and local governments to be determined based on the basic design after the F/S study on EZ development project before the application of ECC.

- Monitoring items;
- Monitoring locations/sampling points;
- Monitoring frequencies (Periodically, unannounced, as required, etc.) ;
- Methods of chemical analyses (if requires), etc.

In addition, not so many parameters are stipulated in Bangladeshi environmental criteria. Therefore, JICA's reference parameters will be referred to monitor JICA's reference ones. The monitoring parameters shall be determined by industries of tenants which will move into EZ because Bangladeshi emission/discharge criteria of exhausted gasses and discharged waste water are governed by kinds of industries.

The EZ constructors, EZ operators and tenants moved into the EZ shall report the results of environmental monitoring to Bangladeshi competent agents and authorities who must give administrative advices and guidance to.

(3) Discrepancies between JICA Guidelines and Bangladeshi Environmental Legislations

The gaps between JICA Guidelines (2010) and Bangladeshi are shown the following table (See Appendix 6). Bangladesh shall be advised to implement projects in accordance with the JICA Guidelines because the Bangladeshi legislation does not stipulate many provisions .

Table 4.6.1- 1 Discrepancies between JICA Environmental & Social Guidelines and Bangladeshi Environmental Legislations

Item	JICA Environmental and Social Consideration Guidelines	Bangladeshi Environmental Legislations
Discussion with stakeholders	It is a principle that recipient countries proactively discuss with local stakeholders. However, JICA will, as required, assist recipient countries through assistance and cooperation.	It is documented that information disclosure, explanation to communities and community are very important. However, there are no provisions.
Information disclosure	JICA encourages recipient countries, etc. to disclose and provide environmental and social information to local stakeholders.	There are no provisions on information disclosure.
Monitoring	Principally, JICA must check results of monitoring of significant environmental parameters in Category A, B and F1 projects which recipient countries carry out.	Monitoring and assessment on ECC (Environmental Clearance Certificate) are scheduled to be stipulated in, however, there is no stipulations at present.
Involuntarily	Involuntarily resettlement and lost means	No stipulation in 1989's acts and

resettlement	of livelihood shall be avoided by any means.	ordinances on involuntarily resettlement.
Compensation	People to be resettled shall be fully supported and compensated to improve or recover their previous standards of life and incomes.	Only lost and damaged assets will be compensated. There is no legislation on compensation and support for damaged houses and resettlement.
Resettlement plan	In case that a large-scale involuntarily resettlement occurs in a project, the resettlement plan shall be prepared to disclose it.	There is no legislations in Bangladesh, however, compensation (land prices, etc.) is stipulated in acts and ordinances.
Indigenous people	Affection on indigenous people must be avoided in any mean.	There is no legislation on indigenous peoples.

Source: JICA Study Team

(4) Bangladeshi EIA System

Projects are classified into the following four (4) categories:

a. Projects and Categories

In Bangladesh, projects are classified into 4 categories as shown on the following table:

Table 4.6.1- 2 Project Categories and Types of Industries

Project Category	Industries, etc.
① 「Green」 Category	22 types of manufacturing industries such as TV, Radio, Clocks and Watches, etc.
② 「Orange A」 Category	26 type of agriculture such as Dairy farm, Poultry, etc.
③ 「Orange B」 Category	69 types of manufacturing industries such as PVC item, Artificial Fiber, etc.
④ 「Red」 Category	69 types of industries such as Tannery, Formaldehyde, etc.

Source: Bangladeshi DOE

In Bangladesh, the project of economic zone (EZ) is categorized as “Red”. The project shall be applied to the competent authority of DOE H for obtaining environmental approvals with reports of F/S and IEE studies (See **Figure 4.6.3-1**). In addition, relating to Bangladeshi environmental legislation, environmental criteria, effluent discharge criteria, emission criteria of exhausted gasses, etc. “Environmental Assessment Guidelines for LGED Projects, issued by GOB, LGED, October, 2008” shall be made reference to.

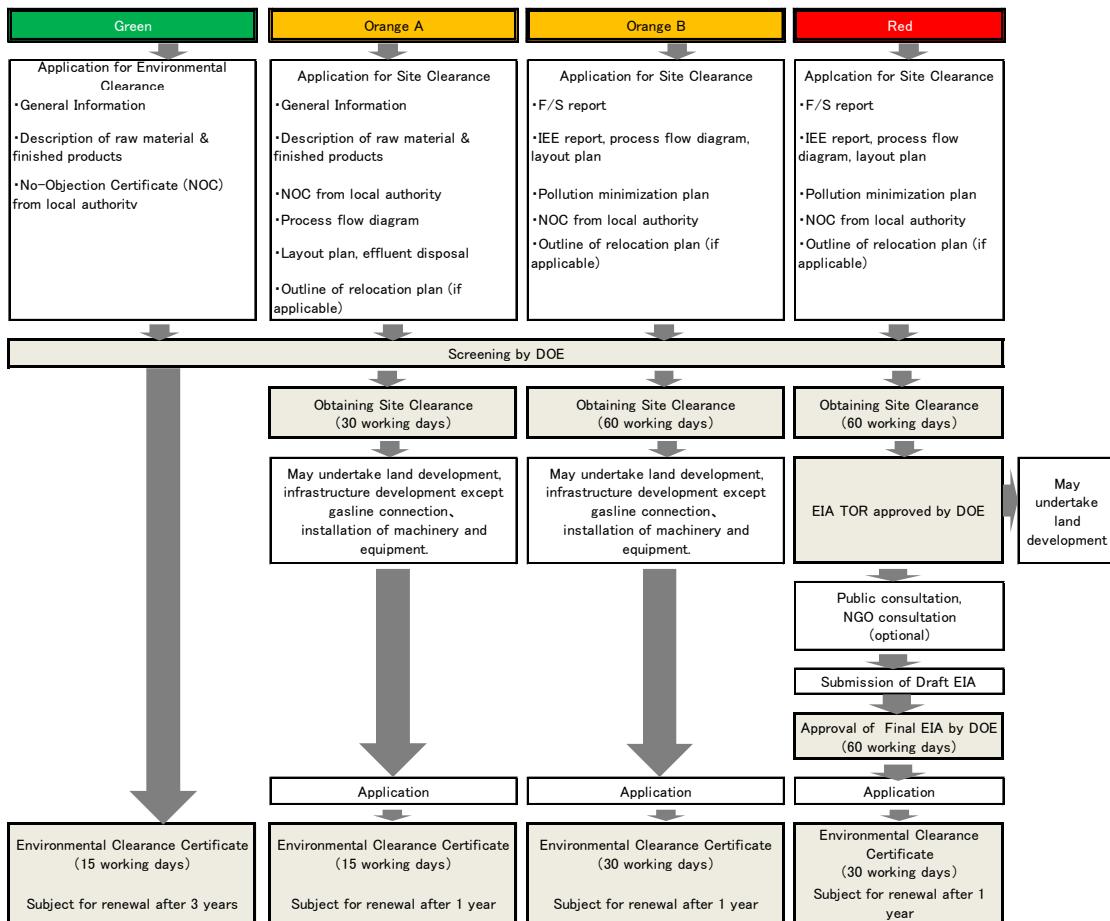


Figure 4.6.3-1 Bangladeshi EIA System

Source: JICA Study Team

The EZ development projects such as industrial estates, etc. belong to “Red” category and an application shall be submitted with F/S report, IEE report, etc. to the Bangladeshi DOE (See the following table). For Bangladeshi environmental legislation, EIA system, environmental criteria, etc. , refer to Environmental Assessment Guidelines for LGED Projects, issued by GOB, LGED, October, 2008[or Appendix 7.

b. Terms of Reference (TOR) for Full-scale EIA

In accordance with “**Environmental Assessment Guidelines**” issued by Local Government Engineering Department (LGED), Ministry of Local Government, Rural Development and Cooperatives (MoRD, RD&C), the “TOR” or its “table of contents for the report” is stipulated as follows:

When full scale EIAs are carried out, in each case, the details of EIA needs to be discussed with the competent authority (Bangladeshi DOE).

In the EIA or F/S studies, to grasp environmental impacts in details, numerical simulation studies for diffusion of pollutants, noise, etc. shall be done to suggest

mitigations, check plan and design of EZs and prepare miscellaneous specifications for construction, plants, equipment, etc.

Executive Summary

(1) **Introduction** (including objective of EIA, scope of work, time frame, composition of EIA team, etc.)

- Purpose of the report:
 - a. Identification of the project and its proponents;
 - b. Brief description of nature, size, and location of the project and its importance to the country; and;
 - c. Any other pertinent background information
- Stage of the project preparation (i.e., pre-feasibility study, feasibility study, detailed engineering design preparation)
- Extent of the EIA study including the scope of the study, magnitude of effort, and persons/expertise or agency performing the study and corresponding persons months
- Brief outline of the contents of the reports including any special techniques or methods used for identifying issues assessing impacts and designing environmental protection measures

(2) **Description of the Project**

The project should be described in terms of its basic activities, location, layout and schedule (in terms of the project cycle). The EIA report should provide sufficient details of the followings:

- Type of project
- Need for project
- Location (Use maps showing general location, specific location, project boundary and project site layout)
- Size or magnitude of operation including any associated activities required by or for the project
- Proposed schedule for approval and implementation
- Description of the project including drawings showing project layout, components of project, etc. This information should be of similar type and extent as is indicated in feasibility reports for proposed project in order to give a clear picture of the project and its operations

(3) **Description of the Existing Environment in the Study Area** (Environmental background conditions including socioeconomic aspects) w/ clear pictures, impactive values on the environment, detailed methodology to gather information and date sources

The baseline environmental information area should include:

- Physical Resources:
 - a. Atmosphere (e.g. Air quality and climate);
 - b. Topography and soils:

- c. Surface water;
- d. Ground water; and
- e. Geology/seismology
- Ecological resources:
 - a. Fisheries;
 - b. Aquatic biology;
 - c. Wildlife;
 - d. Forests;
 - e. Rare endangered species
 - f. Protected area; and
 - g. Coastal resources
- Economic Development
 - a. Industries;
 - b. Infrastructure facilities (e.g. Water supply, sewerage, flood control);
 - c. Transportation (Roads, harbor, airport and navigation);
 - d. Land use (e.g. Dedicated area uses;
 - e. Power source and transmission; and
 - f. Agricultural development, mineral development and tourism facilities
- Social and Cultural Resources:
 - a. Population and communities (e.g. numbers, location, composition, employment);
 - b. Health facilities;
 - c. Education facilities;
 - d. Socio-economic conditions (e.g. Community structure, family structure, social wellbeing, road safety);
 - e. Physical and cultural heritage;
 - f. Current use of lands and resources for traditional purposes by indigenous people;
 - g. Structures or sites that are of historical, archaeological, paleontological or architectural significance; and
 - h. Road safety

(4) Alternatives

Analysis of alternative for mitigation in economic, social and environmental terms as well as their workability and acceptability.

- What are the alternatives?
- What are the environmental impacts associated with each alternative?
- What is the rationale for selecting the preferred alternatives?

(5) Anticipated Environmental Impacts and Mitigation Measures

The project impacts on environment (in comparison to the baseline environment) and how these impacts were identified and predicted. A discussion of options for mitigation for adverse impacts and sharing the project to suit its proposed environment.

- Characteristics of each environmental impact as quantified as possible
- Mitigating adverse effects
- Irreversible and irretrievable impacts
- Temporary effects during project construction

(6) Economic Assessment

- Costs and benefits of environmental impacts
- Costs, benefits and cost-effectiveness of mitigation measures
- Impacts that have not been expressed in monetary values (e.g. weight of volume estimates of pollutants)

(7) Environmental Management Plan (EMaP)

- Implementation of mitigation measures during project design
- Implementation of mitigation measures by contractors and how impact prevention will be incorporated in the material procurement
- Social improvement program (e.g. Resettlement plan, community training)
- Contingency response plan for natural or other disasters and project contingencies
- Environmental management and monitoring costs including mitigation costs
- Present capacity of the executing agency to implement EMaP and implementation costs

(8) Public Consultation and Information Disclosure

- Process undertaken to involve the public in project design and recommended measures for continuing public participation
- Major components received from beneficiaries, local officials, community leaders, NGOs and others and how these comments were addressed
- Milestones in public involvement (e.g. Dates, attendance, topic of public meetings) and recipients of the report and other project related documents
- Compliance with relevant regulatory requirements for public participation
- Public acceptance or opinion on the proposed project
- Other related materials of activities (e.g. Press releases, notification) as part of the effort to gain public participation
- Additional section on the extent to which the suggestions from the public on the proposed or draft designs which have been considered in the final package sent out for bidding

(9) Conclusion with the key EIA findings in relation to decision making

- Gains which justify project implementation
- How adverse effects could be minimize or offset b
- Recommendation for the design team to ensure effective mainstreaming of environmental considerations into project document
- Provisions for follow-up surveillance and monitoring

On the other hands, the full-scale EIA (or F/S study) will require numerical simulation studies and countermeasures to predict grades, ranges, intensities, etc. of environmental impacts and prepare miscellaneous manuals as shown below, but not limited to: The study will be done together with experts, specialists, etc.

4.6.2 Short-term EZ Development Candidates and their Site Conditions

(1) Definitions of SEA, IEE, EIA and Other Studies

This study aims at contributing to Bangladeshi economic development by planning and design of EZ development in Bangladesh and establishment of development guidelines to promote EZ plans and projects. The purposes and targets of the environmental and social consideration study are to identify significant impacts on EZ projects to take countermeasures into consideration in advance. Main purposes for each environmental study is shown below: However, SEA and IEE-level studies in this study and full-scale/due EIA studies will be done by project proponents, etc. on the bases of the subsequent further detailed F/S studies, etc.

The above-mentioned studies are described below and illustrated on **Figure 4.6.2-1** and **Figure 4.6.3-1**.

- **SEA study:** The study aims mainly at predicting strategic, i.e. regional/national/global and mid-to long-term environmental issues at the stage of superordinate plans to escape from environmental risks or envisage countermeasures such as mitigations, etc. in advance. The depth of the study will be governed by study periods and budgets, however, it will be basically a qualitative study based on existing date and information. In this study, final development candidates will be selected based on policies and purposes of SEA¹⁰.
- **IEE Study:** The IEE study aims mainly at determine TOR or S/W for EIA study to grasp its budgets and periods for EIA study based on the existing data and information available from literatures, internets, interview, etc. In this study, the finally selected EZ development candidates will be studied as an IEE-level study.
- **EIA Study:** The study will be often subcontracted to local environmental expert consultants often in developing countries based on TOR or S/W prepared in the previous IEE studies and so on to obtain environmental approvals from competent authorities (Hereinafter, called full-scale or due EIA).
- **Quantitative and Qualitative Studies :** The quantitative study in the environmental and social consideration study means predicting magnitude range and limitation of environmental impacts from general experience and knowledge without survey and study by scientists, experts and specialists. However, environmental impacts arisen from resettlement and relocation in EZ development can be quantitatively predicted by grasping a number of people to be resettled and relocated. In addition, the quantitative study means grasping absolute numerical quantities (e.g. number of people to be resettled/relocated involuntarily, areas (ha) of tidalands to be reclaimed, etc.) It is so difficult to compare and evaluate each project and project site from overall impactiveness (i.e. environmentally friendliness) by numerical marking, ranking, weighting of environmental impactiveness (i.e. environmentally friendliness).. Accordingly, site selections (siting) of EZ development candidate sites will be done by means of sudden death conditions in accordance with SEA ideas.

¹⁰ First of all, a donors' environmental guideline shall be respected in environmental and social consideration. Guidelines such as WB, ADB, JICA, etc. are not so much different. However, if there should not be a certain criteria in a certain guideline, other criteria shall supplement to by another environmental guideline. For comparison of each donor's guideline, refer to Appendix 6.

Status of Project	Stage of Plan and Design	Type of Assessment	Scopes and Contents of Assessment			
	<table border="1"> <tr> <td>M/P (B/P)</td> </tr> <tr> <td>M/P < Pre-F/S <F/S (C/D)</td> </tr> <tr> <td>F/S (B/D)</td> </tr> </table>	M/P (B/P)	M/P < Pre-F/S <F/S (C/D)	F/S (B/D)	<p>Strategic Environmental Assessment (SEA)</p> <p>IEE and/or EIA</p>	<p>The SEA will be a quantitative assessment/study. In Bangladesh, the SEA is not obliged.</p> <p>The due IEE and EIA shall be done by BEZA, Japanese investors and/or others apart from the JICA's IEE-level studies.</p>
M/P (B/P)						
M/P < Pre-F/S <F/S (C/D)						
F/S (B/D)						

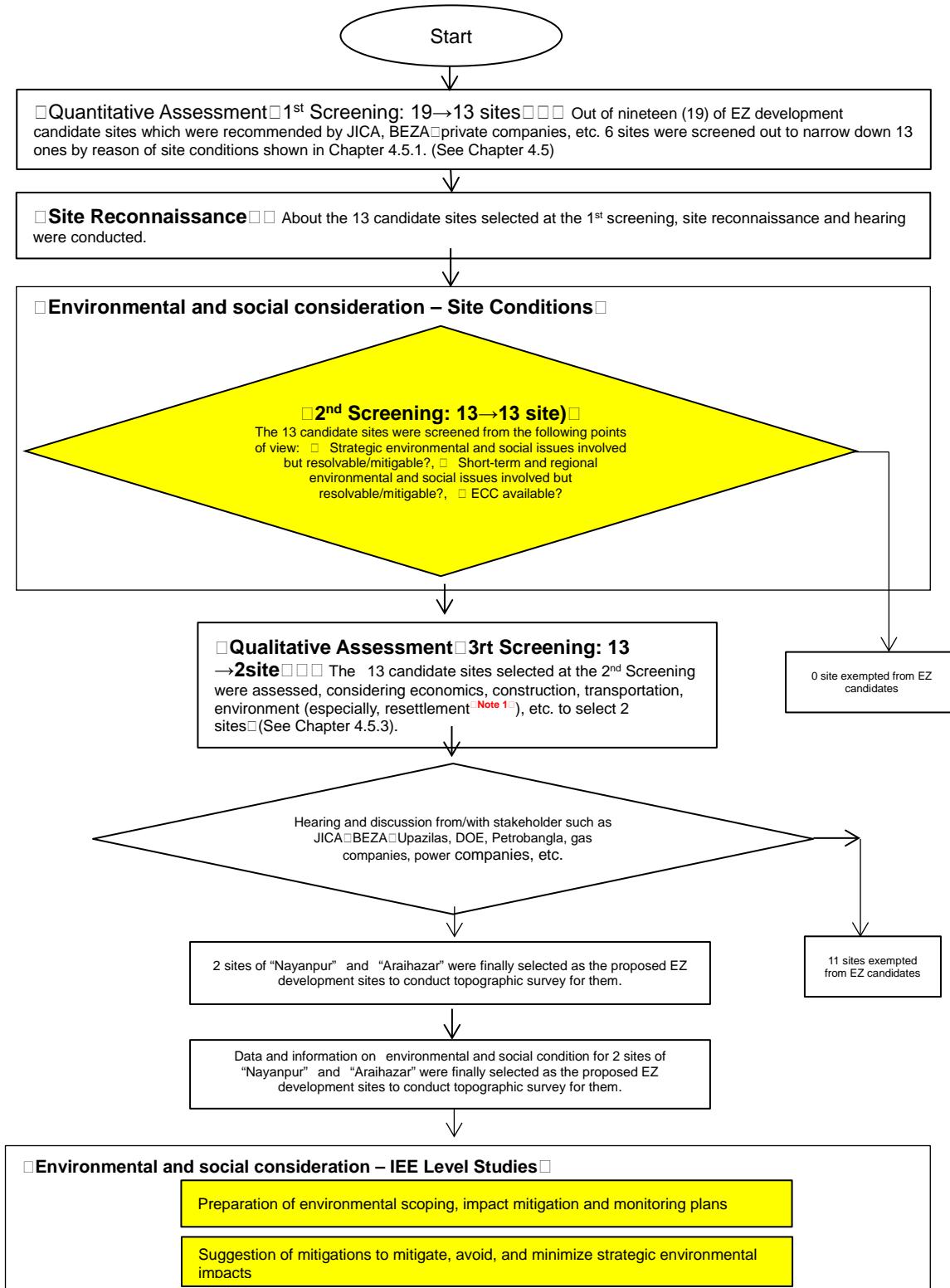
(Notes) B/P: Basic Plan, M/P: Master Plan, C/D : Conceptual Design, F/S: Feasibility Study, B/D: Basic Design

Figure 4.6.2-1 SEA, IEE and EIA Studies

Source: JICA Study Team

(2) Process of Screening of Short-term EZ Development Candidate Sites

The figure shows the process and position of environmental and social consideration for screening of short-term EZ development candidates in the study.



(Note 1) : The selected candidate sites are non-residential areas such as rice paddy, farmlands, waste lands, etc. In addition, the ECC will not be obtained without taking enough mitigations and compensation for people and properties (PAPs) affected by pollutions, etc. arisen from construction and operation of EZs. Therefore, in the screening of candidate sites, a magnitude of resettlement were taken into consideration as an environmental and social parameter in the 3rd Screening in the study because it will be the most impactful in environmental & social consideration parameter.

Figure 4.6.2-2 Process of EZ Development Site Selection and Environmental & Social Consideration

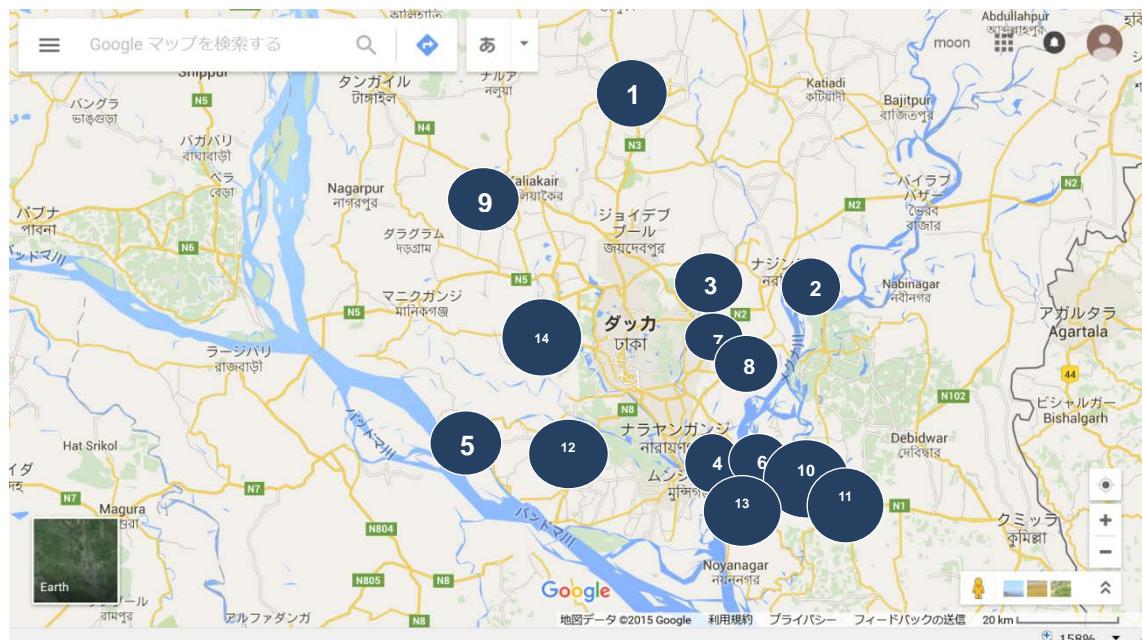
(3) EZ Development Candidate Site narrowed down in Qualitative Assessment (1st Screening) (13sites)

The short-termed projects mean that developers will decide to invest in them within 1 to 2 years to start their operation in 5 to 10 years.

In this SEA study, the candidate sites shown on **Figure 4.6.4-1** have been picked up as plural alternative cases. At the stage of “Environmentally Siting of the place to be developed as EZs”, they have been evaluated on the following bases of SEA ideas and concepts (See **Table 4.6.2-1**):

- Not only within the site of EZ but also from regionally/nationally/globally points of view
- From viewpoints of mid- to long-term projects

The Meghna EZ candidate has been exempted from objects in this environmental and social consideration study due to small available land areas



(Notes)

- ① Nayapur
- ② Narsingdi
- ③ Polash
- ④ Bandar
- ⑤ Dohar
- ⑥ Sonargaon
- ⑦ Araihaazar-1
- ⑧ Araihaazar-2
- ⑨ Kaliakair
- ⑩ Meghna
- ⑪ Tricho
- ⑫ Maowa
- ⑬ Gazaria
- ⑭ Keraniganj

Figure 4.6.4-1
Locations of Short-term EZ Development Candidates (in Dhaka)

Source: JICA Study Team

(4) EZ Development Candidate Site narrowed down in Qualitative Assessment (2nd Screening) (13sites)

It is so difficult to screen out plural (more than 10) EZ development candidate sites by quantifying and weighting impacts by environmental and social parameters. Therefore, the screening will be done by sudden death conditions. The sudden death conditions¹¹ will be being more impactive than Category A such as large scale natural destroys of marshes, mangroves, reserves, involuntarily resettlement, etc. In such cases, they will be exempted from EZ development candidate sites.

- ① Insoluble significant, fatal and strategical(global and mid- to- long termed) environmental and social issues (e.g. global warming, climate changes, air pollution, etc.) ;
- ② Insoluble significant, fatal and strategical(global and mid- to- long termed) environmental and social issues (e.g. global warming, climate changes, air pollution, etc.) ;
- ③ That is to say, by taking enough countermeasures against environmental and social impacts, competent authorities can approve their EIAs

Table 4.6.2-1 shows the process and position of environmental and social consideration for screening of EZ development sites.

As the results of that, the 13 EZ development candidate sites are not envisaged as significant and fatal impactive sites. Therefore, in the Qualitative Assessment (3rd Screening) carried out in Chapter 4.5, the 13 sites have been screened out, taking policies, economics, constructional abilities, available transportation, operability (available utilities, etc.), serious environmental & social issues (resettlement¹², etc.) and so on.

¹¹ When site screening is done among many candidates, from environmental, social, economic, geographical and technical points of view, environmental and social impacts to be considered shall be limited to some criteria. If there are quantitative and qualitative judgement criteria in environmental and social consideration is not so much different among them. When site screening is done on the basis of ideas of SEA from points, sudden death (or killer) method have been applied to this study because of difficulty of application of weighting method in such items of environmental and social impacts.

¹² If similar sizes, types and tenant industries move into EZs in similar environment and topography, magnitude of resettlement may be one of most impactive parameters .be one of the most impactive items of environmental and social impacts.

Table 4.6.2-1 Site Conditions on Short-term EZ Development Candidate EZ Sites in Dhaka Division (SEA Study)

Item/Parameter	Location/Name of Candidate Economic Zone (EZ)														
	(1) Nayanpur	(2) Narsingdi	(3) Polash (To be developed by SK Khan & Co., Ltd.)	(4) Bandar	(5) Dohar	(6) Sonargaon	(7) Sraihaazar-1	(8) Araihazar-2	(9) Kaliakair	(10) Megna	(11) RD-4: Tricho	(12) RD-7:Maow	(13) RD-11: Gazaria	(14) Karaniganji	(15) Zero Option
1. Location and Site Conditions of the Project															
1.1 Scale, Shape and Magnitude of Economic Zone (EZ) – Site land area (Phase-1/Phase-2), private and/or khash land	228ha/208 ha	185ha/373ha	45 ha	200~ 400 ha	100 ha/133 ha (140 to 280 ha of khash land available)	185 ha/373 ha	230 ha/820 ha	100 ha/120 ha	100 ha/123ha (Private land adjacent to South Chittagong Integrated Development Project site)	--- (Khash and private lands, 200 ha available, Suitable for heavy and petrochemical industries)	100ha	100ha	100 ha/123ha (Private land adjacent to South Chittagong Integrated Development Project site)	--- (Khash and private lands, 200 ha available, Suitable for heavy and petrochemical industries)	
1.2 Access to existing main roads and distance from main cities and towns	1.2 km from Dhaka-Mymensingh Highway/61 km from Dhaka	2.5 km from Dhaka-Sylhet Highway/42 km from Dhaka	12 km from a main road/ 19 km from Dhaka	2 km from a main road/ 20 km from Dhaka	25 km from a main road/ 31km from Dhaka	2.5 km from Dhaka-Chittagong Highway/36 km from Dhaka	Along Dhaka-Chittagong Highway/26 km from Dhaka	33 km from Dhaka-Sylhet Highway/4 km from Dhaka	70 km from Dhaka/3 km from Aricha Highway	2 km from Dhaka-Chittagong Highway/20 km from Dhaka, Large cargo ships can approach (Draft of channel: 12 m)	59km from Dhaka	21km from Dhaka	70 km from Dhaka/3 km from Aricha Highway	2 km from Dhaka-Chittagong Highway/20 km from Dhaka, Large cargo ships can approach (Draft of channel: 12 m)	
1.3 Nearest Rives and Seas – Potential of water logging, proximity to sand dredging/unloading points, etc.	Turaga R. and Sitalakhaya R.	Meghna R.	Sitalakhaya R.	Meghna R. and Sitalakhaya R.	Padma R.	Meghna R. and Bramaputra R.	Sitalakhya R. and Brahmaputra R.	Sitalakhya R. and Brahmaputra R.	Turaga R.	Meghna R.	Padama R.	Madma R.	Turaga R.	Meghna R.	
1.4 Other Site Conditions – Climate, terrain, geology, flood & water logging, storm surge by cyclone, geography, neighborhood population, fishery rights & peccaries, reserves, protected species and properties, etc.	Hot tropical (Rice paddy (Double cropping))	Hot tropical (Farmland (Single crop))	Hot tropical (Riverside (Uncultivated))	Hot tropical (Riverside)	Hot tropical (Farmland (Single crop))	Hot tropical (Rice paddy (Single crop))	Hot tropical (Rice paddy (Single crop))	Hot tropical (Rice paddy (Single crop))	Hot tropical (Sand bar in Meghna R., Non-industrial area with power plants)	Hot tropical (Rice paddy (Double crop))	Hot tropical (Rice paddy (Single crop))	Hot tropical (?)	Hot tropical (?)	Hot tropical (?)	
1.5 Annual average revenue from fields such as rice paddies and farmlands (Tk/acre/year)	Approx.80,000 Tk/acre/year	Approx.30,000 Tk/acre/year,	---	---	---	---	Approx.50,000 Tk/acre/year,	Approx.45,000 Tk/acre/year	Approx.60,000 Tk/acre/year,	---	Approx.70,000 Tk/acre/year,	(Approx.30,000 Tk/acre/year	(Approx.15,000 Tk/acre/year	(Approx.100,000 Tk/acre/year	
1.6 Numbers of schools, hospitals and factories within a radius of 5 km	11,295 人 (School : 8, Hospital : 2)	21,430 人 (School : 5, Hospital : 1)	8,712 人 (School : 7, Hospital : 3)	7,325 人 (School : 9, Hospital : 2)	3,874 人 (School : 2, Hospital : 1)	11,094 人 (School : 5, Hospital : 2)	6,694 人 (School : 3, Hospital : 1)	4,218 人 (School : 5, Hospital : 1)	1,994 人 (School : 5, Hospital : 2)	---	3,228 人 (School : 2, Hospital : 0)	2,461 人 (School : 4, Hospital : 2)	20,237 人 (School : 2, Hospital : 1)	11,560 人 (School : 2, Hospital : 1)	
2. Plants & facilities envisaged in the project site and needed infrastructures															
2.1 Onsite plants and facilities	Storm drain & retention basin, sewage treatment & sewer lines, water wells, power generation and cable lines, buildings, roads, etc.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	
2.2 Offsite facilities and infrastructures – Access roads and utilities such as power, gas, water, etc.	Needed infrastructures and utilities for EZs will be access roads to EZs and utilities such as electricity, natural gas, industrial water, etc. (Utilities will be supplied)	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	

Item/Parameter	Location/Name of Candidate Economic Zone (EZ)														
	(1) Nayanpur	(2) Narsingdi	(3) Polash (To be developed by SK Khan & Co., Ltd.)	(4) Bandar	(5) Dohar	(6) Sonargaon	(7) Sraibazar-1	(8) Araibazar-2	(9) Kaliakair	(10) Megna	(11) RD-4: Tricho	(12) RD-7: Maow	(13) RD-11: Gazaria	(14) Karaniganji	(15) Zero Option
	from the existing plants and facilities.)														
3. Contribution to Bangladeshi Economics and Social Life (Wide area and mid-to-long term environmental and social impacts)															
3.1 Industrial development and employment promotion	Highly developed and increased.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	(No industrial promotion and no impact to environment)	
3.2 Enhanced standards of life	Highly enhanced	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	(No impact to environment)	
3.3 National land and regional development	Highly enhanced	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	(No impact to environment)	
3.4 International contribution - Global warming protection, etc.	Because of promoted industries, CO ₂ emission in Bangladesh will increase to accelerate global warming. Therefore, not only Bangladesh but also other countries in the world shall head to low carbon society, and energy saving.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Global warming will be depressed if EZ development projects are no realized. → Therefore, zero option is the most environmental friendly option.	
4. Environmental and social impacts)															
4.1 Pollution – Envisaged tenants which emit and discharge pollutants, etc. (Light industries and/or heavy industries)	Light industries such garments, fabrics, food processing, electronics, machinery parts, etc.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	Same as in the left.	(Pollution will be limited.)	
4.2 Natural environment – Rice paddy, tideland, marsh, mangroves, chorai, etc. (Disaster risks such as erosion & siltation, flood & water logging, adverse natural environmental impacts, etc.)	Rice paddy (Low risk for erosion and water logging)	Farmland (High risk for erosion and water logging)	Uncultivated land (High risk for erosion and water logging)	Uncultivated land (High high risk for erosion and water logging)	Riverside (High risk for erosion and water logging)	Farmland (High risk for erosion and water logging)	Rice paddy (Low risk for erosion and water logging)	Rice paddy (Low risk for erosion and water logging)	Rice paddy (Low risk for erosion and water logging)	Sandbank in river (High risk for erosion and water logging)	(Low risk for erosion and water logging)	(High risk for erosion and water logging)	Rice paddy (Low risk for erosion and water logging)	Sandbank in river (High high risk for erosion and water logging)	(No impact to environment)
4.3 Social environment – Involuntary resettlement & relocation of people and houses, ethnic minorities, etc.	No squatters and inhabitants to migrate to other places	No squatters and inhabitants to migrate to other places	No squatters and inhabitants to migrate to other places	Some squatters and inhabitants to migrate to other places	No squatters and inhabitants to migrate to other places	No squatters and inhabitants to migrate to other places	No squatters and inhabitants to migrate to other places	No squatters but some inhabitants to migrate to other places	No squatters and inhabitants to migrate to other places	Same as in the left.	Same as in the left.	Same as in the left.	No squatters and involuntary resettlement.	Same as in the left.	(No impact to environment)
4.4 Others – Environmental impacts during construction such as nuisance to residents, etc.	Pumping and pipelining dredged materials for sand filling and banking - Noise, dust, traffic obstacles, etc. due to	Same as in the left.	Same as in the left.	Same as in the left.	Pumping and pipelining dredged materials for sand filling and banking - Noise, dust, traffic obstacles, etc. due to	Same as in the left.	Same as in the left.	Pumping and pipelining dredged materials for sand filling and banking - Noise, dust, traffic obstacles, etc. due to	Pumping and pipelining dredged materials for sand filling and banking - Noise, dust, traffic obstacles, etc. due to	Same as in the left.	Same as in the left.	Pumping and pipelining dredged materials for sand filling and banking - Noise, dust, traffic obstacles, etc. due to	Same as in the left.	(No impact to environment)	

Item/Parameter	Location/Name of Candidate Economic Zone (EZ)													
	(1) Nayanpur	(2) Narsingdi	(3) Polash (To be developed by SK Khan & Co., Ltd.)	(4) Bandar	(5) Dohar	(6) Sonargaon	(7) Sraihazar-1	(8) Araihazar-2	(9) Kaliakair	(10) Megna	(11) RD-4: Tricho	(12) RD-7:Maow	(13) RD-11: Gazaria	(14) Karaniganji
	<i>transporting a large volume of sand by pipelines for site filling and embanking.</i>				<i>transporting a large volume of sand by pipelines for site filling and embanking.</i>			<i>transporting a large volume of sand by pipelines for site filling and embanking.</i>				<i>transporting a large volume of sand by pipelines for site filling and embanking.</i>		

<Notes> a) : Finally selected EZ development candidates

In the siting, if any sudden death conditions¹³ such as wetlands, tidal lands, mangroves, natural reserves, involuntary resettlement and so on, such sites shall be exempted from objective candidate sites to be studied here.

Fata/crucial strategic (regional/national/global and mid- to long-term) impacts would not be anticipated in 13 sites of EZ development candidates. Thus, 13 objective candidate sites to be studied further shall be evaluated from political and economic, and environmental (especially resettlement¹⁴) viewpoints in **Chapter 4.5**.

(5) EZ Development Candidate Site narrowed down in Qualitative Assessment (3st Screening) (2 Sites)

In the Qualitative Screening (3rd Screening) in Chapter 4.5, two candidate sites of “Nayanpur” and “Araihaazar” have been selected as proposed short-term EZ development sites.

¹³ When site screening is done among many candidates, from environmental, social, economic, geographical and technical points of view, environmental and social impacts to be considered shall be limited to some criteria. If there are quantitative and qualitative judgement criteria in environmental and social consideration is not so much different among them. When site screening is done on the basis of ideas of SEA from points, sudden death (or killer) method have been applied to this study because of difficulty of application of weighting method in such items of environmental and social impacts.

¹⁴ If the scale, kind and surrounding nature of EZ are almost same, resettlement and relocation will be one of the most impactive items of environmental and social impacts.

4.6.3 IEE Level Studies

For two mid-term EZ development projects in “Nayanpur” and “Araihaazar-1” (Hereinafter called “Araihaazar”) , IEE level studies have been carried out as shown below.

(1) Natural environments and Social/Economic Infrastructures around the proposed mid-term EZ development projects

Natural environments and social/economic infrastructures around “ Nayanpur” and “Araihaazar” have been described as shown below. For the further detailed data and information, refer to Appendix 7.

a. Propose Short-term EZ Development Project Description

The following table shows the project description for finally selected project sites of “Nayanpur EZ” and “Araihaazar-1 EZ”

Table 4.6.3-1 Project Description of Nayanpur EZ and Araihaazar EZ

	Nayanpur EZ	Araihaazar EZ
1. Map and Photo	 	 

	Nayanpur EZ	Araihaazar EZ
2. Site	<p> ■ : Phase-1 (100+133 ha), ■ : Phase-2 (208 ha), Total: 441ha (1,013 acres) , — Power transmission line \Rightarrow 100 ha (250 acres) and less (Phase-1) </p>	<p> ■ : Phase-1(100+ 130 ha) , ■ : Phase-2(820 ha). Total: 1,050 ha(2,625 acres) \Rightarrow 100 ha (250 acres) and less (Phase-1) </p>
3. Location and district	50 km from Dhaka in direct distance, Sreepur Upazila, Gazipur District	20 km from Dhaka in direct distance, Araihaazar Upazila, Narayanganj District.
4. Development area	Phase-1 development: 233 ha(north), Phase-2 development: 208 ha(south, by FDI survey), Total: 441 ha(1,103 acres)	Phase-1 development: 230 ha(south of national highway No. 9, Phase-2 development: 820 ha Total: 1,050 ha(2,635 acres)
5. Access	60.8km from Dhaka in road distance (1 hour 51minutes), 1.2 km Dhaka from Mymensingh Highway(National Highway No.3)	26.0km from Dhaka in road distance (37 minutes), Along Dhaka- Sylhet Highway
6. Infrastructures.	4 km away from 132kV/33kV substation(Sreepur Sub-Sta.1) , 3.4 km from site. 12 inches gas pipeline along National Highway No.3, 1.5km east away from site.	132kV/33kV substation, 2.5 km from site
7. Land use	Farmland, single cropping	Farmland, double cropping
8. Site preparation	Embankment: 0.5- 2.5m(avg. 1.5m), Land elevation: Approx. 14-16m above MSL, Flooding: Not affected by Padma and Meghna Rivers, Avg. height of elevation: 16.5m above MSL considering rainwater gradient, Borrow pit in Barmi Bazar 17km east away from site	Embankment: 0.6- 2.6m (Avg.1.6m), Land elevation: Approx.6-8m above MSL, Flood water level due to rivers of Shitalakshya and Meghna: Approx. 7.52m (1/100), Elevation of land preparation: 8.6m.
9. Environmental and social conditions	No squatters, no resettlement of houses and people; Small river crossing NW to SE; No precious ecology and cultural heritages exist.	No squatters, no resettlement of houses and people; Small river crossing NW to SE; No precious ecology and cultural heritages exist.

b. Natural Environment

■ Ambient Air Quality

Nayanpur site under Gazipur district is situated near the urban settlement area of Gazipur and adjacent to the Dhaka-Mymensingh highway. Araihazar site under Narayanganji district is situated along the Dhaka-Sylhet highway. The main sources of air pollutant emissions in adjacent are small and large industries, domestic biomass burning (such as wood, dung, and straw) and brick kilns. Other contributors to air pollution include vehicular traffic, re-suspended road dust to make bricks. Upon consultation with the local people informed that they did not have feeling for bad air quality and people of the area have not wear masks like some of the people in Dhaka city(See the following table).

Table 4.6.3-2 Ambient Air Quality

Parameter	unit	NAAQS	Summary	Dhaka	Gazipur	Narayanganji
SO ₂ -24 hr	ppb	140	Average	DNA*	DNA*	DNA*
			Maximum	DNA*	DNA*	DNA*
			Minimum	DNA*	DNA*	DNA*
			Data Capture (%)	DNA*	DNA*	DNA*
NO ₂ - 24 hr	ppb	53 (annual)	Average	DNA*	DNA*	10.3
			Maximum	DNA*	DNA*	19.9
			Minimum	DNA*	DNA*	3.55
			Data Capture (%)	DNA*	DNA*	80
CO- 1 hr	ppm	35	Average	1.73	DNA*	0.62
			Maximum	5.4	DNA*	1.31
			Minimum	0.05	DNA*	0.34
			Data Capture (%)	74	DNA*	80
CO-8hr	ppm	9	Average	1.78	DNA*	0.61
			Maximum	4.29	DNA*	1.12
			Minimum	0.23	DNA*	0.37
			Data Capture (%)	71	DNA*	76
O ₃ - 1hr	ppb	120	Average	4.87	2.07	DNA*
			Maximum	18.8	16.8	DNA*
			Minimum	0.57	0.09	DNA*
			Data Capture (%)	89	94	DNA*
O ₃ -8hr	ppb	80	Average	4.89	2.05	DNA*
			Maximum	11.3	10.3	DNA*
			Minimum	1.09	0.15	DNA*
			Data Capture (%)	89	96	DNA*
PM _{2.5} -	µg	65	Average	39.4	31.8	26.7

24hr	/m ³		Maximum	49.2	60.0	39.3
			Minimum	29.3	13.6	13.7
			Data Capture (%)	46	83	40
PM ₁₀ - 24hr	μg /m ³	150	Average	58.1	60.8	98.9
			Maximum	84.6	98.2	134
			Minimum	34.4	34.5	59.7
			Data Capture (%)	30	83	75

(Note) : CAMS= Continuous Air Monitoring Station, PM= Particulate Matter, NAAQS=National Ambient Air Quality Standard, *=DNA due to malfunction of the analyzer/sensor or poor data capture rate

(Source: Bangladeshi DOE)

■ Climate (Air Temperature)

The climate of Bangladesh is subtropical and influenced by the annual south west monsoon. The both project areas lie in the South-central climate zone of the country and shows tropical monsoon climate with three prominent seasons - Summer/Pre-monsoon - March to May; Rainy season/monsoon - June to October; and winter season - November to February (See the following table).

The annual average temperature is 26°C to reach 34°C on the average in monsoon season. The average minimum and maximum range of temperature in winter (dry season) is 13°C to 29°C (See the following table).

March and April consider as pre-monsoon season when highest temperature reached, average 34°C.

Table 4.6.3-3 Maximum and Minimum Temperature in 2015 (°C)

Station Name	January		February		March		April		May		June	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
Bangladesh	25.2	12.5	27.8	15.1	31.6	19.6	33.2	23.1	32.9	24.5	31.9	25.6
Dhaka	25.4	12.7	28.1	15.5	32.5	20.4	33.7	23.6	32.9	24.5	32.1	26.1
Nayanpur (Mymensingh)	24.7	11.8	27.1	14.1	31.0	18.3	32.3	22.2	31.4	23.6	31.5	25.5
Araihaazar (Comilla)	25.4	12.1	27.7	15.2	31.0	19.7	32.2	22.8	32.2	24.2	31.6	25.3
	July		August		September		October		November		December	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
Bangladesh	31.1	25.6	31.4	25.7	31.5	25.4	31.5	23.6	29.5	19.2	26.4	14.2
Dhaka	31.4	26.2	31.6	26.3	31.8	25.9	31.6	23.8	29.6	19.2	26.4	14.1
Nayanpur (Mymensingh)	31.1	25.8	31.7	26.0	31.3	25.4	31.5	23.4	29.5	18.4	26.3	13.3
Araihaazar (Comilla)	30.9	25.4	31.3	25.4	31.6	25.2	31.4	23.4	29.6	18.7	26.6	13.3

(Source: Bangladesh Meteorological Department)

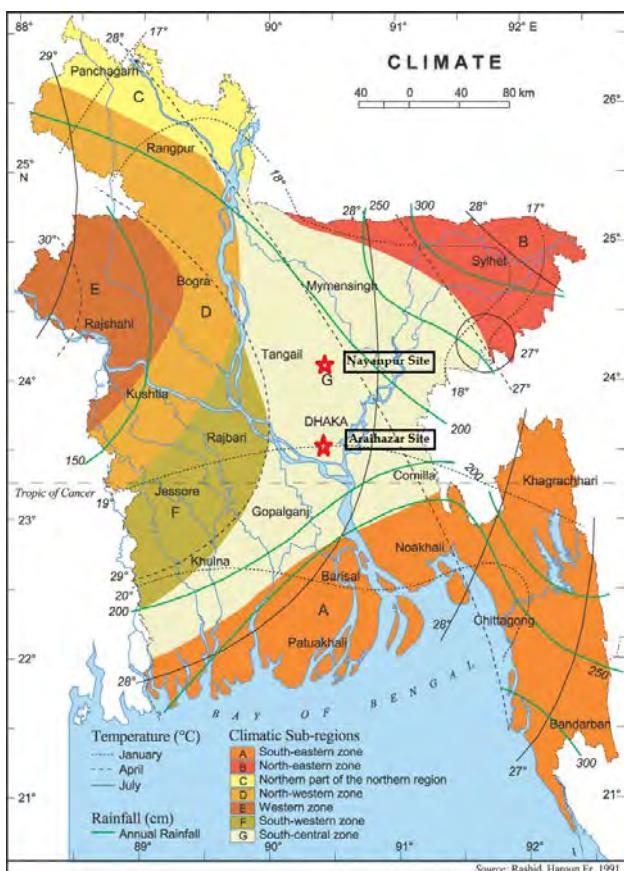


Figure 4.6.3-1 Climates in Bangladesh

(Source: Bangladeshi PMO)

■ Climate (Rainfall)

Rainfall is prominent in monsoon in Bangladesh and 85% of annual rainfall were recorded during June and October. 508 mm rainfall recorded in Mymensingh station in 26 September 1971 that was extreme for that station. The monthly normal rainfall for the stations adjacent to the Nayanpur & Araihaazar site is shown in the table below.

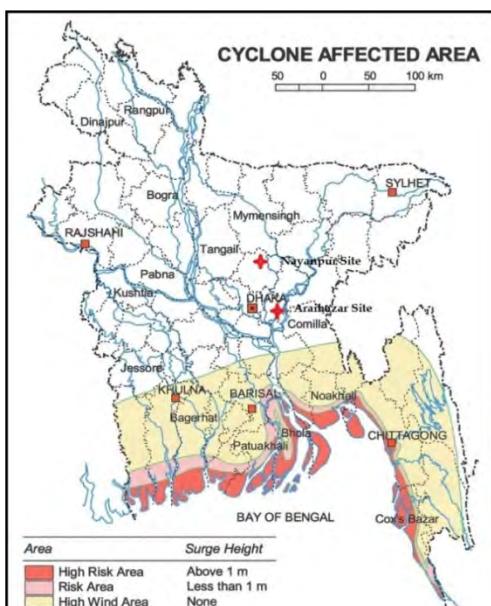
Table 4.6.3-4 Rainfall in 2015 (mm)

Station	Jan	Feb	Mar	Apr	May	June
Bangladesh	9.0	25.5	52.4	130.2	277.3	459.4
Dhaka	7.7	28.9	65.8	156.3	339.4	340.4
Nayanpur (Mymensingh)	10.0	20.5	35.8	128.6	356.9	394.3
Araihaazar (Comilla)	7.5	28.8	66.2	153.9	329.6	329.8
Station	July	Aug	Sep	Oct	Nov	Dec
Bangladesh	523.0	420.4	318.2	160.3	42.3	9.6
Dhaka	373.1	316.5	300.4	172.3	34.4	12.8
Nayanpur (Mymensingh)	436.3	318.1	335.3	190.9	17.5	8.7
Araihaazar (Comilla)	415.5	316.0	226.6	141.6	41.6	8.6

Source: Bangladesh Meteorological Department)

■ Climate (Cyclone)

Due to the geographical setting of our country, Storm surge and cyclones are more frequent in the coastal region of Bangladesh but not in the project sites. But the central region of the country faced some severe local seasonal storms, popularly known as Nor'westers (kalbaishakhi) in almost every year (May – May). Severe nor'westers are generally associated with tornadoes to give damages to human lives and crops (See the figure below).



**Figure 4.6.3-2 Cyclone Prone Region of Bangladesh (Left)
and Billboard destroyed by Nor'wester (Right)**

(Source : SPARSO and The Daily Star)

■ Geology and Soils

Nayampur site is comparatively low land area and soil is red brown clayish loam. Soil in Araihaazar is clayish and dark grey silty clay in riversides.

■ Water Quality (Surface Water)

There are a few rivers namely old Brahmaputra, Shitalakshya, Turag, Bangshi, Balu, Banar and plenty of rivulets flowing through the Gazipur district. The nearest river is Shitalakhaya is about 20 km far from the site. However, within the site a canal crossed the site from the north to the south direction and this canal is the only drainage system that also carries the effluents of the adjacent industries, (dying, knitting, chemical, plastic, agro and food processing) and household wastewater. Irrigation is mostly done from by adding deep tube well/ shallow pumps. Water is available for construction activities. Site is not affected by the flood water, whereas during heavy rainfall water logged on the site for few days.

■ Water Quality (Groundwater)

Groundwater is the main source of water for drinking and irrigation in Bangladesh and most of cases people relies on groundwater for industrial purposes also. Due to the dependency on groundwater and excessive withdrawal the level of groundwater table is decreasing day by day in the central region especially in Dhaka region. On the other hand the groundwater of coastal region is seriously affected by salinity. Also the ground water is affected by arsenic contamination and at some places it found many times higher than the threshold limit (WHO standards) (See the following table).

But fortunately, Araihazar and Nayanpur site area is not affected by salinity and there is little possibility of salinity intrusion in the near future. Ground water is the main source of domestic, irrigation and industrial water supply in the project area. The level of arsenic was found in the project area was below the 10 microgram per litter for average 150 m deep tube well.

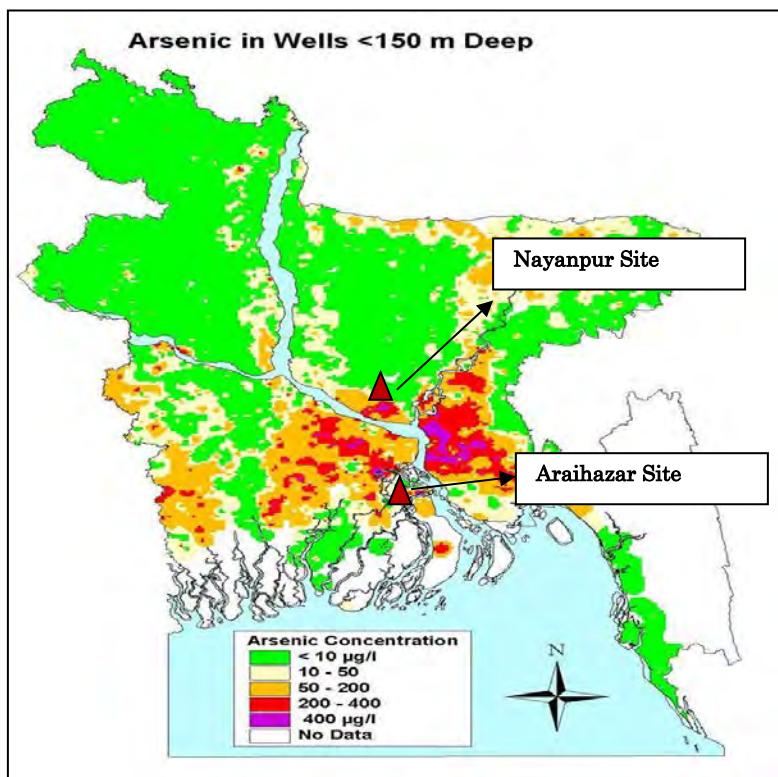


Figure 4.6.3-3 Distribution of Arsenic (As) in Groundwater

(Source: Bangladeshi DOE)

■ Protected areas such tidal flats, Primitive Forests, Bird Sanctuaries, Game Reserves, National parks, Historic sites & ruins

Bangladesh has nineteen nationally designated protected areas comprising approximately 2,458 km², which is 1.66 percent of land area of the country. These include ten national parks, eight wildlife sanctuaries and one game reserve (CBD, 2010). There is no protected area in 15 km radius of project sites. However the nearest protected area is the Bhawal National Park that located 21 km to the south of the Nayanpur project area.

Table 4.6.3-5 Bangladeshi Natural Reserves

Name of Protected Areas	Habitat Types	Area (ha.)	Year of Notification
National Parks			
1. Ramsagar National Park	Wetland	28	2001
2. Himchari National Park	Mixed Evergreen	1,729	1980
3. Bhawal National Park	Deciduous Forest	5,022	1974/1982
4. Madhupur National Park	Deciduous Forest	8,436	1962/1982
5. Lawachara National Park	Mixed Evergreen	1,250	1996
6. Kaptai National Park	Wetland	5,464	1999
7. Nijhum Dweep National Park	Mangrove Forest	16,352	2001
8. Meda Kacchapia National Park	High Hill Mixed Forest	396	2004
9. Shatchari National Park	Evergreen	243	2006
10. Khadim Nagar National Park	Mixed Evergreen	679	2006
Wildlife Sanctuary			
11. Char Kukri-Mukri Wildlife Sanctuary	Char land & Mangrove Forest	40	1981
12. Pabkhali Wildlife Sanctuary	High Hill Mixed Forest	42,087	1962/1983
13. Chunati Wildlife Sanctuary	Mixed Evergreen Forest	7,764	1986
14. Sundarban East Wildlife Sanctuary *	Mangrove Forest	31,227	1960/1996
15. Sundarbans South Wildlife Sanctuary *	Mangrove Forest	36,970	1996
16. Sundarbans West Wildlife Sanctuary *	Mangrove Forest	71,502	1996
17. Rema-Kalenga Wildlife Sanctuary	Mixed Evergreen forest	1,796	1996
18. Fasiakhali Wildlife Sanctuary	Mixed Forest	1302	2007
Game Reserve			
19. Teknaf Game Reserve	Mixed forest	11,615	1983

(Source : Convention on Biological Diversity (CBD), Bangladesh)

c. Social environment and social & economic infrastructures

■ Population and demography

The Nayanpur EZ Site is located under Sreepur Upazila in Gazipur District and

Araihaazar EZ site is located under Araihaazar Upazila in Narayanganj District.

According to censuses, the populations and literacy rates are as shown on the following table:

Table 4.6.3-6 Population and Literacy in 1981, 1991, 2001and 2011

	人口 (1,000人)				識字率 (%)			
	1981	1991	2001	2011	1981	1991	2001	2011
Sreepur Upazila	238	320	337	513	21.0	30.3	47.7	54.8
Gazipur District	1,173	1,618	2,030	3,546	26.5	35.7	56.4	62.6
Araihaazar Upazila	232	300	331	377	17.9	23.0	37.4	41.0
Narayanganj District	1,356	1,755	2,174	2,948	30.4	39.8	51.7	57.1

(Source: Population and Housing Census, 2011, Bangladesh Bureau of Statistics (BBS)

■ Aboriginal/indigenous peoples

Populations and maps showing areas which such peoples are living.

Indigenous communities such as Santal, Koch, Rajbangshi, Mandi, Nunia and Bhanger belong to this Sreepur Upazila however, the proposed EZ site is free from indigenous people.

■ Land use

The Nayanpur site is used for agriculture and produces 2 to 3 crops. Main crop is rice and lowland is submerged about 2 to 3 times a year in rainy season. There are factories, houses and cultivated land within 15 km.

The Araihaazar site is mainly marshes and is submerged for 4 months a year. At present, the site is used for agriculture and produces 2 crops a year. In rainy season, fishing is carried out. Jute and rice are main crops and vegetables are produces. Within 15 km from the site, there are some factories.

■ Rural economic activities

The rural economy of Narayanganj is agricultural. Out of total 532,415 holdings of the district 22.44 % holdings are farms that HYV paddy (Aus, Aman, Boro), vegetables, spices, cash crops, pulses and others. Various fruits like banana, guava are grown and fish of different varieties abound in this district. Varieties of fishes are caught from rivers, channels, creeks and from paddy fields during rainy season (See the following table).

Table 4.6.3-7 Number of Factories by industry located around each site

	Textile	Clothing	Rice Polis	Mach	Steel	Alumi num	Jute	Sugar	Other	Total
Sreepur Upazila	19	25	42	0	0	2	0	0	85	173
Gazipur District	127	898	390	2	29	12	3	0	312	1,773
Araihaazar Upazila	1,120	0	63	0	1	0	0	0	0	1,184
Narayanganj District	1,338	8,408	195	0	29	39	5	5	66	10,085

(Source) Population and Housing Census, 2011, Bangladesh Bureau of Statistics (BBS)

■ Houses and people to be resettled including involuntarily resettlement

Estimated nos. of houses and people to be resettled by each EZ project. Any other compensation assets except lands.

No settlement has been identified within the project site. The identified EZ site would be excluded existing settlements. However, a resettlement plan shall be provided in donor's financed projects because land acquisition and compensation are not well regulated in Bangladesh.

d. Plans, Facilities and Earthworks in the Proposed EZ Development Projects

Table 4.6.3-9 shows plants, facilities and earthworks in the both proposed EZ development projects. Captive power generation plants will not installed in the both projects.

Table 4.6.3-8 Plants, Facilities and Earthworks in the Proposed EZ Development Projects

No.	Plants, Facilities and Earthworks	Nayanpur EZ (100 ha)	Araihaazar EZ (100 ha)
<i>(Offsite facilities)</i>			
1.	Site preparation (EZ and access roads)	1,240,000 m ³ (11.5km トラック運搬)	3,980,000 m ³ (5.5kmm 排砂管)
2.	Access road paving	43,200 m ²	18,000 m ²
3.	Access road lighting and cables	2,160 m	600 m
4.	Natural gas pipelines, 100mm diameter	350 m	400 m
5.	Block fencing, H=2.5m	4,400 m	7,750 m
<i>(Onsite facilities)</i>			
1.	Grading and asphalt paving	85,800 m	61,230 m
2.	Storm drainage and regulating ponds (RC gutters)	11,330 m	11,320 m
3.	Pumps and sewerage (RC pipes)	7,640 m	10,630 m
4.	Water supply and waste water treating system control buildings (RC structures)	3,500 m	3,500 m
5.	Water supply and hydrants (HDPE pipes)	8,220 m	13,820 m
6.	Septic tanks, elevated tanks and pump room (RC structures)	2,600 t	2,600 t

No.	Plants, Facilities and Earthworks	Nayanpur EZ (100 ha)	Araihaazar EZ (100 ha)
7.	Road lighting and cabling (11kVA, 400 V)	10,500 m	11,170 m
8.	Natural gas pipelines (75mm diameter)	7,920 m	6,400 m
9.	Administration buildings (RC structure, 3 stories)	1,350 m ²	1,350 m ²
10.	Commercial buildings (RC structure, 3 stories)	850 m ²	850 m ²
11.	Rental factories (Steel structure)	20,000 m ²	20,000 m ²
12.	Plantation	50,385 m ²	50,660 m ²

(Source: JICA Study Team)

In the study, environmental scoping has been carried out on the base as shown on the following tables:

Table 4.6.3-9 Environmental Scoping Criteria

<A> or <Major> : Clearly and heavily impactive to environments and societies. However, projects and activities shall be reviewed or reconsidered. Or by taking enough countermeasures, it enables environmental and social impacts to be depressed to small or natural remediable and recoverable impacts. For example, more impactive than JICA's Screening Category A (e.g. people to be resettled (**About 200 and more**), deforesting (**About 100 ha and more**), reclamation (**About 50 ha and more**) and any other loss of abundant natural environments such as mangroves, tidal lands, etc.);

** or <Small>** : Smaller impactive than <A>. Slight environmental and social impacts and within a naturally remediable and recoverable range. Even if not remediable and recoverable, it shall be limited to within a certain range as mentioned in Category A. By taken conventional proper countermeasures, it can be limited within ranges of environmental criteria and exhaust gas/waste water emission/discharge criteria.

<C> or <Unclear> : Magnitudes and extents of impacts are unclear and needed to clarify them in the subsequent full-scale EIA by detailed field surveys, numerical simulation studies, etc. by specialists, experts and scientists.

<D> or <None> : Not impactive or nil

Source: JICA Study Team

(3) Environmental Scoping, Impact Mitigations and Monitoring of Short-term EZ Development Projects

a. Nayapur EZ

“Prediction and Evaluation of environmental impacts”, “Mitigation (Avoidance, Minimization, Compensation)”, and “Environmental Impact Monitoring” are, as an environmental matrix, shown on Table 4.6.3-10, 4.6.3-11 and 4.6.3-12 respectively.

Table 4.6.3-10 Environmental Scoping Matrix (Prediction and Evaluation of Environmental Impacts) for Nayampur EZ Project

(Nayapur EZ)

Classification	N o.	Environmental Item	Significance of Environmental Impacts		Reasons for Evaluation
			Before construction /During construction	During operation	
Pollution	1	Air Quality	B-	B-	<p>(Before and during construction) Temporary air pollution due to exhaust gasses and dusts arisen from constructional machines and vehicles will be anticipated.</p> <p>(During operation) Air is anticipated to be polluted by vehicles in and out to EZ and tenant industries in EZ.</p>
	2	Water Quality	B-	B-	<p>(Before and during construction) Rivers and channels are anticipated to be polluted by rain water and waste water issued from construction sites.</p> <p>(During operation) Polluted effluent issued from tenant factories and industries are anticipated.</p>
	3	Wastes	B-	B-	<p>(Before and during construction) Construction waste soils, wastes arisen from removal of existing structures are produced. In addition, wastes produced from construction camps are anticipated.</p> <p>(During operation) Wastes produced from tenant factories and industries are anticipated.</p>
	4	Soil Contamination	B-	B-	<p>(Before and during construction) The project site almost in salt farms, therefore, soil pollution by heavy metals, pesticides, human wastes, etc. Are not anticipated.</p> <p>(During operation) Soil is anticipated to be polluted by heavy metals, etc. in wastes issued from tenant factories and industries.</p>
	5	Noise and Vibration	B-	B-	<p>(Before and during construction) Noise and vibration are anticipated when constructional equipment and vehicles operated and driven.</p> <p>(During operation) Noise and vibration generated by tenant factories and industries are anticipated.</p>

(Nayanpur EZ)

Classification	N o.	Environmental Item	Significance of Environmental Impacts		Reasons for Evaluation
			Before construction /During construction	During operation	
	6	Subsidence	B-	B-	<p>(Before and during construction) The project site is almost in salt farms, therefore, large subsidence due to operation of constructional vehicles, etc. is anticipated.</p> <p>(During operation) Large subsidence is anticipated to be caused by thick and large soil filling, heavy structures installed, pumping a large amount of ground water, and so on. In addition, soil liquefaction is anticipated when a large earthquake happens.</p>
	7	Odor	B-	B-	<p>(Before and during construction) Odor is anticipated during construction. If happen, localized and temporary.</p> <p>(During operation) Odor issued from EZ tenants is anticipated, however, can be mitigated to a minimum.</p>
Natural Environment	8	Protected Areas	D-	D-	There is no national parks, reserved areas near the project area. However, there is the Sonadia island exists about 10 km away south from the site, it is designated as an ECC (Ecological Critical Area) which should be protected from effluent issued from the construction and project sites.
	9	Ecosystem and Biota	C-	C-	The proposed EZ site locates in salt farms. There will be no special and valuable flora and fauna. However, ecosystem and biota will be changed because of earthworks in/out of the EZ.
	10	Hydrology	D-	D-	A large volume of earthwork is anticipated, however, proper countermeasures will be taken to be able to minimize environmental impacts.
	11	Topography and Geology	D-	D-	Ditto.
Social Environment	12	Resettlement and Land Acquisition	A-	D-	Before and during construction : There is no relocation or resettlement of people and houses in the project. However, some houses, sheds, etc. are spotted near the access road to the proposed EZ
	13	Living and Livelihood	B-	B-	As far as EPC contractors, EZ operators and tenant factories and industries comply with environmental and emission/discharge criteria, impacts on inhabitants are not anticipated. However, they must be fully compensated.
	14	Heritage	D-	D-	There are no heritages in and near the project site.
	15	Landscape	D-	D-	A lot of clean and calm shorelines and salt farms are lost for the EZ development.
	16	Ethnic Minorities and Indigenous Peoples	D-	D-	There are no ethnic minorities and indigenous peoples in the project site.

(Nayanpur EZ)

Classification	N o.	Environmental Item	Significance of Environmental Impacts		Reasons for Evaluation
			Before constructi on /During constructi on	During operation	
	17	Labor Environment	D-	D-	As far as EPC contractors, EZ operators and tenanted factories and industries comply with law and environmental laws and rules, harsh and poor working environments and situations are not anticipated.
Other	18	Project includes access roads, railways, bridges	D-	D-	In the project, large roads, railways, bridges, etc. are not envisaged, however, short roads to trunk roads are envisaged. Trunk roads and railways will be provided by other projects.
	19	Project includes telecommunication cables, electric power transmission & distribution lines and oil & gas pipelines, etc.	D-	D-	In the project, large scaled power transmission and distribution plants and facilities are no envisaged.
	20	Impacts to transboundary or global environmental issues such as transboundary wastes, acid rain, destruction ozone layers and global warming	D-	D-	Operation of EZs needs a large amount of fossil fuels and electric power. It leads to accelerate global warning indirectly so far as proper countermeasures are not taken. As a result, Bangladesh vulnerable to climate change may lose a lot of land due to sea level rise. Factories and industries advance to Bangladesh, energy consumption in Bangladesh to increase greenhouse gasses (GHC) such as CO ₂ , etc.

Notes:

- a) +/- : Significant positive and negative impact is expected;
 - b) B+/- : Positive/negative impact is expected to some extent;
 - c) C+/- : Extent of positive/negative impact is unknown (A further explanation is needed, and the impact could be clarified as the study progresses); and
 - d) D: No impact is expected
- Explanatory Notes:

Table 4.6.3-11 Environmental Scoping Matrix (Mitigation (Avoidance, Minimization, Compensation) for Nayampur EZ Project

(Nayampur EZ)

Classification	No.	Environmental Item	Significance of Environmental Impacts		Mitigations and countermeasures to be envisaged	
			Before construction /During construction	During operation	Before construction /During construction	During operation
Pollution	1	Air Quality	B-	B-	<u>Dust arisen from operation by constructional vehicles, etc.</u> : Spraying water, temporary road paving, <u>Exhausted gas from constructional equipment and vehicles:</u> Complying with environmental criteria and emission criteria exhausted gas to treat exhausted it.	<u>Air pollutants emitted from tenant factories and industries:</u> Tenant entities shall treat exhausted gas to emit it to ambient.
	2	Water Quality	B-	B-	<u>Polluted and turbidity water from construction sites:</u> Treating settling basins, etc. to discharge it to public waters such as seas, rivers, and channels. In addition, protected areas such as ECA (Ecological Critical Areas), it may need to deploy silt fences to protect such areas from turbidity water.	<u>Harmful substances in waste water from tenant factories and industries:</u> The tenants shall remove harmful substances to discharge the treated water to public waters.
	3	Wastes	B-	B-	<u>Constructional wastes:</u> Reuse or disposal of wastes in disposal site, etc.	<u>Solid wastes from tenant factories and enterprises:</u> The tenants shall treat it by themselves or subcontract it to the specialists.
	4	Soil Contamination	B-	B-	<u>Polluted soils with heavy metals, etc. in exiting soil:</u> To remove heavy metals, etc. to dispose in disposal sites.	---
	5	Noise and Vibration	B-	B-	<u>Noise and vibration by constructional equipment and vehicles:</u> Sound insulation panels and sheets, operation and application of low noise and vibration constructional equipment and construction methods.	<u>Noise and vibration generated by tenant factories and industries:</u> Installation of soundproof walls and vibration absorption foundations, and enclosure in soundproof wall buildings and rooms.

Classification	No.	Environmental Item	Significance of Environmental Impacts		Mitigations and countermeasures to be envisaged	
			Before construction /During construction	During operation	Before construction /During construction	During operation
	6	Subsidence	B-	B-	Enough safety countermeasures shall be taken against the subsidence during the construction.	<u>Subsidence due to pumping a large amount of ground water:</u> Do not pumping a large amount of water and widen well spacing, <u>Subsidence due to soil liquefaction:</u> Soil replacement and pile foundation for structures and buildings.
	7	Odor	B-	B-	---	To be treated by tenanted factories and industries.
Natural Environment	8	Protected Areas	D-	D-	---	-
	9	Ecosystem and Biota	C-	C-	<u>Impacts on ecosystem and biota:</u> <i>Ecosystem and biota shall be, if possible, transplanted or immigrated to other places.</i>	<u>Impacts on ecosystem and biota:</u> <i>Ecosystem and biota transplanted and mitigated shall be, if possible, maintained well..</i>
	10	Hydrology	D-	D-	---	---
	11	Topography and Geology	D-	D-	---	---
	12	Resettlement and Land Acquisition	A-	D-	At present, resettlement of people and houses are not envisaged, however, land acquisition shall be done in accordance with rules and regulation of the Ministry of Land.	S---.
Social Environment	13	Living and Livelihood	B-	B-	Ditto.	D---
	14	Heritage	D-	D-	---	---
	15	Landscape	D-	D-	---	In the EZ project site, greenbelts and parks shall be provided.
	16	Ethnic Minorities and Indigenous Peoples	D-	D-	---	---
	17	Labor Environment	D-	D-	---	---
	18	Project includes access roads, railways, bridges	D-	D-	---	---

(Nayanpur EZ)

Classification	No.	Environmental Item	Significance of Environmental Impacts		Mitigations and countermeasures to be envisaged	
			Before construction /During construction	During operation	Before construction /During construction	During operation
	19	Project includes telecommunication cables, electric power transmission & distribution lines and oil & gas pipelines, etc.	D-	D-	---	---
	20	Impacts to transboundary or global environmental issues such as transboundary wastes, acid rain, destruction ozone layers and global warning	D-	D-	---	By implementing plans and countermeasures as shown in Chapters 4.6 and 5.3, global warming can be reduced and mitigated.

Notes:

- a) +/- : Significant positive and negative impact is expected;
- b) B+/- : Positive/negative impact is expected to some extent;
- c) C+/- : Extent of positive/negative impact is unknown (A further explanation is needed, and the impact could be clarified as the study progresses); and
- d) D: No impact is expected ¥Explanatory Notes:

Table 4.6.3-12 Environmental Scoping Matrix (Environmental Impact Monitoring)
for Nayampur EZ Project

(Nayampur EZ)

Classification	N.o.	Environmental Item	Significance of Environmental Impacts		Environmental Impact Monitoring	
			Before construction /During construction	During operation	Before construction /During construction	During operation
Pollution	1	Air Quality	B-	B-	<ul style="list-style-type: none"> ① Dust and air pollutants in exhausted gas from constructional vehicles; ② Construction sites and routes of transportation materials, etc. ; ③ As required by EPC contractors/ employers and unannounced by competent authorities; and ④ EPC contractors/ employers and unannounced by competent authorities; 	<ul style="list-style-type: none"> ① Air pollutants issued from EZ; ② Within and around the EZ site; ③ Periodically and unannounced.; and ④ Tenants in the EZ/Operators of the EZ and competent authorities.
	2	Water Quality	B-	B-	<ul style="list-style-type: none"> ① Harmful substances in waste water discharged from construction sites; , ② Outlet of water treating facilities such as settling basins, near protected areas such as ECA, etc. ; , ③ As required and unannounced; and ④ EPC contractors/Employers and competent authorities. 	<ul style="list-style-type: none"> ① Human wastes, sewage, harmful substances in waste water discharged from tenanted factories and industries; ② Outlets of all waste effluents discharged from tenants in the EZ; ③ Periodically by EZ tenants/and EZ operators and unannounced by competent authorities; and ④ EZ tenants/and EZ operators and unannounced by competent authorities.

(Nayanpur EZ)

Classification	N.o.	Environmental Item	Significance of Environmental Impacts		Environmental Impact Monitoring	
			Before construction /During construction	During operation	Before construction /During construction	During operation
	3	Wastes	B-	B-	<ul style="list-style-type: none"> ① Constructional wastes, wastes, harmful substance in human wastes, sewage from camps and site offices; ② Construction sites, offices, camps, etc.; ③ As required and unannounced; and ④ EPC contactors/employers and competent authorities 	<ul style="list-style-type: none"> ① Harmful substances in solid wastes, waste waters, etc. generated in tenants in the EZ; ② Outlets of treating plants and facilities in tenants; ③ Periodically and unannounced; and ④ EPC contactors/employers and competent authorities.
	4	Soil Contamination	B-	B-	<ul style="list-style-type: none"> ① Harmful substances such as heavy metals, pesticides, oils, etc. in disposed in-situ soils , imported soils, etc. ; ② Construction sites, borrow pits, etc. ; ③ As required and unannounced; and ④ EPC contactors/employers and competent authorities. 	<ul style="list-style-type: none"> ① Harmful substances such as heavy metals, pesticides, oils, etc. in soils within tenanted factories and industries in the EZ; a ② Within tenanted factories and industries; ③ Periodically and unannounced; and 拔打ち ④ EPC contactors/employers and competent authorities.
	5	Noise and Vibration	B-	B-	<ul style="list-style-type: none"> ① Noise and vibration; ② Construction sites and route of transportation of materials, etc.; ③ As required and unannounced; and ④ EPC contactors/employers and competent authorities. 	<ul style="list-style-type: none"> ① Noise and vibration; ② Within tenants in the EZ; ③ As required and unannounced; and ④ EZ tenants/operators and competent authorities.

(Nayanpur EZ)

Classification	N.o.	Environmental Item	Significance of Environmental Impacts		Environmental Impact Monitoring	
			Before construction /During construction	During operation	Before construction /During construction	During operation
	6	Subsidence	B-	B-	① Subsidence; ② Construction sites and route of transportation of materials, etc.; ③ As required; and ④ EPC contactor/employers.	① Subsidence and ground water levels; ② Within and around the EZ; ③ Periodically; and ④ EZ tenants/operators and competent authorities.
	7	Odor	B-	B-	① Odor; ② Construction sites and route of transportation of materials, etc.; ③ As required and unannounced; and ④ EPC contractors/employers and competent authorities.	① Odor; ② Within and around the EZ; ③ Periodically and unannounced; and ④ EZ tenants/operators and competent authorities.
Natural Environment	8	Protected Areas	D-	D-	---	---
	9	Ecosystem and Biota	C-	C-	--	--
	10	Hydrology	D-	D-	---	---
	11	Topography and Geology	D-	D-	---	---
Social Environment	12	Resettlement and Land Acquisition	A-	D-	① Inhabitant' living environments, conditions and their changes; ② Inhabitants around the EZ; ③ As required and unannounced; and ④ EPC contractors/employers and competent authorities.	--

(Nayanpur EZ)

Classification	N.o.	Environmental Item	Significance of Environmental Impacts		Environmental Impact Monitoring	
			Before construction /During construction	During operation	Before construction /During construction	During operation
	13	Living and Livelihood	B-	B-	① Inhabitant' living environments, conditions and their changes; ② Inhabitants around the EZ; ③ As required and unannounced; and ④ EPC contactors/employers and competent authorities..	① Inhabitant' living environments, conditions and their changes; ② Inhabitants around the EZ; ③ As required and unannounced; and ④ EPC contactors/employers and competent authorities.
	14	Heritage	D-	D-	---	---
	15	Landscape	D-	D-	---	---
	16	Ethnic Minorities and Indigenous Peoples	D-	D-	---	---
	17	Labor Environment	D-	D-	① Working environment ; ② Construction sites; ③ As required and unannounced; and ④ EPC contactors/employers and competent authorities	① Working environment; ② Tenants' factories, etc. ③ As required and unannounced; and ④ EZ tenants, EZ operators and competent authorities
Others	18	Project includes access roads, railways, bridges	D-	D-	---	---
	19	Project includes telecommunication cables, electric power transmission & distribution lines and oil & gas pipelines, etc.	D-	D-	---	---

(Nayanpur EZ)

Classification	N o.	Environmenta l Item	Significance of Environmental Impacts		Environmental Impact Monitoring	
			Before constructi on /During constructi on	During operation	Before construction /During construction	During operation
	20	Impacts to transboundar y or global environmental issues such as transboundar y wastes, acid rain, destruction ozone layers and global warning	D-	D-	---	<ul style="list-style-type: none"> ① Greenhouse Gasses (GHG) such as CO₂, etc. generated in Bangladesh; ② Within Bangladesh; ③ As required; and ④ Government of Bangladesh (GoB) /United Nation (UN).

Notes:

- a +/- : Significant positive and negative impact is expected;
 - b) B+/- : Positive/negative impact is expected to some extent;
 - c) C+/- : Extent of positive/negative impact is unknown (A further explanation is needed, and the impact could be clarified as the study progresses); and
 - d) D: No impact is expected
- Explanatory Notes:

b. Araihazar-2 EZ

“Prediction and Evaluation of environmental impacts”, “Mitigation (Avoidance, Minimization, Compensation)”, and “Environmental Impact Monitoring” are, as an environmental matrix, shown on Table 4.6.3-13, 4.6.3-14 and 4.6.3-15 respectively.

Table 4.6.3-13 Environmental Scoping Matrix (Prediction and Evaluation of Environmental Impacts) for Araihaazar EZ Project

(Araihaazar EZ)

Classification	N o.	Environmental Item	Significance of Environmental Impacts		Reasons for Evaluation
			Before construction /During construction	During operation	
Pollution	1	Air Quality	B-	B-	<p>(Before and during construction) Temporary air pollution due to exhaust gasses and dusts arisen from constructional machines and vehicles will be anticipated.</p> <p>(During operation) Air is anticipated to be polluted by vehicles in and out to EZ and tenant industries in EZ.</p>
	2	Water Quality	B-	B-	<p>(Before and during construction) Rivers and channels are anticipated to be polluted by rain water and waste water issued from construction sites.</p> <p>(During operation) Polluted effluent issued from tenant factories and industries are anticipated.</p>
	3	Wastes	B-	B-	<p>(Before and during construction) Construction waste soils, wastes arisen from removal of existing structures are produced. In addition, wastes produced from construction camps are anticipated.</p> <p>(During operation) Wastes produced from tenant factories and industries are anticipated.</p>
	4	Soil Contamination	B-	B-	<p>(Before and during construction) The project site almost in salt farms, therefore, soil pollution by heavy metals, pesticides, human wastes, etc. are not anticipated.</p> <p>(During operation) Soil is anticipated to be polluted by heavy metals, etc. in wastes issued from tenant factories and industries.</p>
	5	Noise and Vibration	B-	B-	<p>(Before and during construction) Noise and vibration are anticipated when constructional equipment and vehicles operated and driven.</p> <p>(During operation) Noise and vibration generated by tenant factories and industries are anticipated.</p>

(Araihaazar EZ)

Classification	N o.	Environmental Item	Significance of Environmental Impacts		Reasons for Evaluation
			Before construction /During construction	During operation	
	6	Subsidence	B-	B-	<p>(Before and during construction) The project site is almost in salt farms, therefore, large subsidence due to operation of constructional vehicles, etc. is anticipated.</p> <p>(During operation) Large subsidence is anticipated to be caused by thick and large soil filling, heavy structures installed, pumping a large amount of ground water, and so on. In addition, soil liquefaction is anticipated when a large earthquake happens.</p>
	7	Odor	B-	B-	<p>(Before and during construction) Odor is anticipated during construction. If happen, localized and temporary.</p> <p>(During operation) Odor issued from EZ tenants is anticipated, however, can be mitigated to a minimum.</p>
Natural Environment	8	Protected Areas	D-	D-	There is no national parks, reserved areas near the project area. However, there is the Sonadia island exists about 10 km away south from the site, it is designated as an ECC (Ecological Critical Area) which should be protected from effluent issued from the construction and project sites.
	9	Ecosystem and Biota	C-	C-	The proposed EZ site locates in salt farms. There will be no special and valuable flora and fauna. However, ecosystem and biota will be changed because of earthworks in/out of the EZ.
	10	Hydrology	D-	D-	A large volume of earthwork is anticipated, however, proper countermeasures will be taken to be able to minimize environmental impacts.
	11	Topography and Geology	D-	D-	Ditto.
Social Environment	12	Resettlement and Land Acquisition	A-	D-	Before and during construction : There is no relocation or resettlement of people and houses in the project.
	13	Living and Livelihood	B-	B-	As far as EPC contractors, EZ operators and tenant factories and industries comply with environmental and emission/discharge criteria, impacts on inhabitants are not anticipated. However, they must be fully compensated.
	14	Heritage	D-	D-	There are no heritages in and near the project site.
	15	Landscape	D-	D-	A lot of clean and calm shorelines and salt farms are lost for the EZ development.
	16	Ethnic Minorities and Indigenous Peoples	D-	D-	There are no ethnic minorities and indigenous peoples in the project site.

(Araihaazar EZ)

Classification	N o.	Environmental Item	Significance of Environmental Impacts		Reasons for Evaluation
			Before construction /During construction	During operation	
	17	Labor Environment	D-	D-	As far as EPC contractors, EZ operators and tenanted factories and industries comply with law and environmental laws and rules, harsh and poor working environments and situations are not anticipated.
Other	18	Project includes access roads, railways, bridges	D-	D-	In the project, large roads, railways, bridges, etc. are not envisaged, however, short roads to trunk roads are envisaged. Trunk roads and railways will be provided by other projects.
	19	Project includes telecommunication cables, electric power transmission & distribution lines and oil & gas pipelines, etc.	D-	D-	In the project, large scaled power transmission and distribution plants and facilities are no envisaged.
	20	Impacts to transboundary or global environmental issues such as transboundary wastes, acid rain, destruction ozone layers and global warming	D-	D-	Operation of EZs needs a large amount of fossil fuels and electric power. It leads to accelerate global warning indirectly so far as proper countermeasures are not taken. As a result, Bangladesh vulnerable to climate change may lose a lot of land due to sea level rise. Factories and industries advance to Bangladesh, energy consumption in Bangladesh to increase greenhouse gasses (GHC) such as CO ₂ , etc.

Notes:

- a) +/- : Significant positive and negative impact is expected;
 - b) B+/- : Positive/negative impact is expected to some extent;
 - c) C+/- : Extent of positive/negative impact is unknown (A further explanation is needed, and the impact could be clarified as the study progresses); and
 - d) D: No impact is expected
- Explanatory Notes:

Table 4.6.3-14 Environmental Scoping Matrix (Mitigation (Avoidance, Minimization, Compensation) for Araihazar EZ Project

(Araihazar EZ)

Classification	No.	Environmental Item	Significance of Environmental Impacts		Mitigations and countermeasures to be envisaged	
			Before construction /During construction	During operation	Before construction /During construction	During operation
Pollution	1	Air Quality	B-	B-	<u>Dust arisen from operation by constructional vehicles, etc.</u> : Spraying water, temporary road paving, <u>Exhausted gas from constructional equipment and vehicles:</u> Complying with environmental criteria and emission criteria exhausted gas to treat exhausted it.	<u>Air pollutants emitted from tenant factories and industries:</u> Tenant entities shall treat exhausted gas to emit it to ambient.
	2	Water Quality	B-	B-	<u>Polluted and turbidity water from construction sites:</u> Treating settling basins, etc. to discharge it to public waters such as seas, rivers, and channels. In addition, protected areas such as ECA (Ecological Critical Areas), it may need to deploy silt fences to protect such areas from turbidity water.	<u>Harmful substances in waste water from tenant factories and industries:</u> The tenants shall remove harmful substances to discharge the treated water to public waters.
	3	Wastes	B-	B-	<u>Constructional wastes:</u> Reuse or disposal of wastes in disposal site, etc.	<u>Solid wastes from tenant factories and enterprises:</u> The tenants shall treat it by themselves or subcontract it to the specialists.
	4	Soil Contamination	B-	B-	<u>Polluted soils with heavy metals, etc. in exiting soil:</u> To remove heavy metals, etc. to dispose in disposal sites.	---
	5	Noise and Vibration	B-	B-	<u>Noise and vibration by constructional equipment and vehicles:</u> Sound insulation panels and sheets, operation and application of low noise and vibration constructional equipment and construction methods.	<u>Noise and vibration generated by tenant factories and industries:</u> Installation of soundproof walls and vibration absorption foundations, and enclosure in soundproof wall buildings and rooms.

(Araihaazar EZ)

Classification	No.	Environmental Item	Significance of Environmental Impacts		Mitigations and countermeasures to be envisaged	
			Before construction /During construction	During operation	Before construction /During construction	During operation
	6	Subsidence	B-	B-	Enough safety countermeasures shall be taken against the subsidence during the construction.	<u>Subsidence due to pumping a large amount of ground water:</u> Do not pumping a large amount of water and widen well spacing, <u>Subsidence due to soil liquefaction:</u> Soil replacement and pile foundation for structures and buildings.
	7	Odor	B-	B-	---	To be treated by tenanted factories and industries.
Natural Environment	8	Protected Areas	D-	D-	---	---
	9	Ecosystem and Biota	C-	C-	<u>Impacts on ecosystem and biota:</u> <i>Ecosystem and biota shall be, if possible, transplanted or immigrated to other places.</i>	<u>Impacts on ecosystem and biota:</u> <i>Ecosystem and biota transplanted and mitigated shall be, if possible, maintained well.</i>
	10	Hydrology	D-	D-	---	---
	11	Topography and Geology	D-	D-	---	---
	12	Resettlement and Land Acquisition	A-	D-	At present, resettlement of people and houses are not envisaged, however, land acquisition shall be done in accordance with rules and regulation of the Ministry of Land.	---
Social Environment	13	Living and Livelihood	B-	B-	Ditto.	---
	14	Heritage	D-	D-	---	---
	15	Landscape	D-	D-	---	In the EZ project site, greenbelts and parks shall be provided.
	16	Ethnic Minorities and Indigenous Peoples	D-	D-	---	---
	17	Labor Environment	D-	D-	---	---
	18	Project includes access roads, railways, bridges	D-	D-	---	---

Classification	No.	Environmental Item	Significance of Environmental Impacts		Mitigations and countermeasures to be envisaged	
			Before construction /During construction	During operation	Before construction /During construction	During operation
	19	Project includes telecommunication cables, electric power transmission & distribution lines and oil & gas pipelines, etc.	D-	D-	---	---
	20	Impacts to transboundary or global environmental issues such as transboundary wastes, acid rain, destruction ozone layers and global warning	D-	D-	---	By implementing plans and countermeasures as shown in Chapters 4.6 and 5.3, global warming can be reduced and mitigated.

Notes:

- a) +/- : Significant positive and negative impact is expected;
- b) B+/- : Positive/negative impact is expected to some extent;
- c) C+/- : Extent of positive/negative impact is unknown (A further explanation is needed, and the impact could be clarified as the study progresses); and
- d) D: No impact is expected ¥Explanatory Notes:

Table 4.6.3-15 Environmental Scoping Matrix (Environmental Impact Monitoring)
for Araihazar EZ Project

(Ataihazar EZ)

Classification	N.o.	Environmental Item	Significance of Environmental Impacts		Environmental Impact Monitoring	
			Before construction /During construction	During operation	Before construction /During construction	During operation
Pollution	1	Air Quality	B-	B-	<ul style="list-style-type: none"> ① Dust and air pollutants in exhausted gas from constructional vehicles; ② Construction sites and routes of transportation materials, etc. ; ③ As required by EPC contractors/ employers and unannounced by competent authorities; and ④ EPC contractors/ employers and unannounced by competent authorities; 	<ul style="list-style-type: none"> ① Air pollutants issued from EZ; ② Within and around the EZ site; ③ Periodically and unannounced.; and ④ Tenants in the EZ/Operators of the EZ and competent authorities.
	2	Water Quality	B-	B-	<ul style="list-style-type: none"> ① Harmful substances in waste water discharged from construction sites; , ② Outlet of water treating facilities such as settling basins, near protected areas such as ECA, etc. ; , ③ As required and unannounced; and ④ EPC contactors/Employers and competent authorities. 	<ul style="list-style-type: none"> ① Human wastes, sewage, harmful substances in waste water discharged from tenanted factories and industries; ② Outlets of all waste effluents discharged from tenants in the EZ; ③ Periodically by EZ tenants/and EZ operators and unannounced by competent authorities; and ④ EZ tenants/and EZ operators and unannounced by competent authorities.
	3	Wastes	B-	B-	<ul style="list-style-type: none"> ① Constructional wastes, wastes, harmful substance in human wastes, sewage from camps and site offices; ② Construction sites, offices, camps, etc.; ③ As required and unannounced; and ④ EPC contactors/employers and competent authorities 	<ul style="list-style-type: none"> ① Harmful substances in solid wastes, waste waters, etc. generated in tenants in the EZ; ② Outlets of treating plants and facilities in tenants; ③ Periodically and unannounced; and ④ EPC contactors/employers and competent authorities.

(Ataihazar EZ)

Classification	N o.	Environmenta l Item	Significance of Environmental Impacts		Environmental Impact Monitoring	
			Before constructi on /During constructi on	During operation	Before construction /During construction	During operation
Natural Environment	4	Soil Contaminatio n	B-	B-	<ul style="list-style-type: none"> ① Harmful substances such as heavy metals, pesticides, oils, etc. in disposed in-situ soils , imported soils, etc. ; ② Construction sites, borrow pits, etc. ; ③ As required and unannounced; and ④ EPC contactors/employers and competent authorities. 	<ul style="list-style-type: none"> ① Harmful substances such as heavy metals, pesticides, oils, etc. in soils within tenanted factories and industries in the EZ; a ② Within tenanted factories and industries; ③ Periodically and unannounced; and ④ EPC contactors/employers and competent authorities.
	5	Noise and Vibration	B-	B-	<ul style="list-style-type: none"> ① Noise and vibration; ② Construction sites and route of transportation of materials, etc.; ③ As required and unannounced; and ④ EPC contactors/employers and competent authorities. 	<ul style="list-style-type: none"> ① Noise and vibration; ② Within tenants in the EZ; ③ As required and unannounced; and ④ EZ tenants/operators and competent authorities.
	6	Subsidence	B-	B-	<ul style="list-style-type: none"> ① Subsidence; ② Construction sites and route of transportation of materials, etc.; ③ As required; and ④ EPC contactor/employers. 	<ul style="list-style-type: none"> ① Subsidence and ground water levels; ② Within and around the EZ ; ③ Periodically; and ④ EZ tenants/operators and competent authorities.
	7	Odor	B-	B-	<ul style="list-style-type: none"> ① Odor; ② Construction sites and route of transportation of materials, etc.; ③ As required and unannounced; and ④ EPC contactors/employers and competent authorities. 	<ul style="list-style-type: none"> ① Odor; ② Within and around the EZ; ③ Periodically and unannounced; and ④ EZ tenants/operators and competent authorities.
	8	Protected Areas	D-	D-	---	---
	9	Ecosystem and Biota	C-	C-	--	--
	10	Hydrology	D-	D-	---	---

(Ataihazar EZ)

Classification	N.o.	Environmental Item	Significance of Environmental Impacts		Environmental Impact Monitoring	
			Before construction /During construction	During operation	Before construction /During construction	During operation
	11	Topography and Geology	D-	D-	---	---
Social Environment	12	Resettlement and Land Acquisition	A-	D-	<ul style="list-style-type: none"> ① Inhabitant' living environments, conditions and their changes; ② Inhabitants around the EZ; ③ As required and unannounced; and ④ EPC contactors/employers and competent authorities. 	---
	13	Living and Livelihood	B-	B-	<ul style="list-style-type: none"> ① Inhabitant' living environments, conditions and their changes; ② Inhabitants around the EZ; ③ As required and unannounced; and ④ EPC contactors/employers and competent authorities.. 	<ul style="list-style-type: none"> ① Inhabitant' living environments, conditions and their changes; ② Inhabitants around the EZ; ③ As required and unannounced; and ④ EPC contactors/employers and competent authorities.
	14	Heritage	D-	D-	---	---
	15	Landscape	D-	D-	---	---
	16	Ethnic Minorities and Indigenous Peoples	D-	D-	---	---
	17	Labor Environment	D-	D-	<ul style="list-style-type: none"> ① Working environment ; ② Construction sites; ③ As required and unannounced; and ④ EPC contactors/employers and competent authorities 	<ul style="list-style-type: none"> ① Working environment; ② Tenants' factories, etc. ③ As required and unannounced; and ④ EZ tenants, EZ operators and competent authorities
Others	18	Project includes access roads, railways, bridges	D-	D-	---	---

Classification	N.o.	Environmental Item	Significance of Environmental Impacts		Environmental Impact Monitoring	
			Before construction /During construction	During operation	Before construction /During construction	During operation
	19	Project includes telecommunication cables, electric power transmission & distribution lines and oil & gas pipelines, etc.	D-	D-	---	---
	20	Impacts to transboundary or global environmental issues such as transboundary wastes, acid rain, destruction ozone layers and global warming	D-	D-	---	① Greenhouse Gasses (GHG) such as CO ₂ , etc. generated in Bangladesh; ② Within Bangladesh; ③ As required; and ④ Government of Bangladesh (GoB) /United Nation (UN).

Notes:

- a) +/- : Significant positive and negative impact is expected;
- b) B+/- : Positive/negative impact is expected to some extent;
- c) C+/- : Extent of positive/negative impact is unknown (A further explanation is needed, and the impact could be clarified as the study progresses); and
- d) D: No impact is expected
- Explanatory Notes:

4.6.4 Strategic (Global and Mid-and-Long Term)‘Environmental Impacts and their Mitigations – Power Sources and CO₂ Emission Reduction

Bangladesh is one of the most climate change vulnerable countries. In 2009, an international partnership of the Climate Vulnerable Forum (CVF) was established by these 20 countries to lead the world for low carbon society.

New EZ development and promoting of many industries in Bangladesh arises a large amount of CO₂ emission causing global warming. Dependence on fossil fuel-fired power plants such as coal-fired ones, etc. whose power generation cost is said cheap should avoid. Power generation cost (in a narrow sense) is said cheap. Especially, large coal-fired power plants which emit a large amount of CO₂ are obliged to be equipped with CCS (Carbon dioxides capture and storage) in European and Western developed countries. In developing countries, CCS shall be obliged to be equipped with. At the end of 2015, the Paris Agreement has been adopted in the COP21. The agreement states that all countries must try to reduce CO₂ emission in their own countries.

In addition, considering shutdown of electricity from grids, captive power plants (20 to 50 MW) by fossil fuels shall be equipped with CCS. Or renewable energy such as solar power, wind power, etc. which emit no CO₂, shall be considered for supply electricity to EZs.

In the Dhaka area, electricity will be supplied from the Bangladesh Power Development Board (BPDB) grids and in the Matabari and Moheshkhali areas, it will be supplied from grids of newly planned coal-fired power plants. However, considering electricity shutdown frequently happened, captive power plants (c.a. 50 MW) by fossil fuels such as natural gas, heavy oil, light oil, etc. will be considered. As ,in Bangladesh, natural gas pipeline networks are well developed, natural gas is most preferable because of more environmentally friendliness. Gas turbines and gas engines can run with not only natural gas buts also liquid petroleum (Dual fuel). Natural gas has recently start declining production of natural gas. Thus, it is desired to explore new gas wells or import LNG as soon as possible.

When it is determined which power is the cheapest among fossil fuel-fired power plants (Coal, LNG and petroleum), the power generation cost in a narrow sense is used. “Power generation cost in a narrow sense” includes only expenses by power producers and power transmission loss, power transmission cost, etc. will not be considered. It will not represent actual power cost from power generation to delivery to consumers. For example, generation cost by coal-fired power plant is said cheaper than that of LNG-fired ones, however, LNG-fired ones may become cheaper than coal-fired ones taking the following items into consideration:

- **Transmission Loss of Power:** The sales amount of electricity at power receiving end will be decreased by the loss. Power at large scale and remote power plants such as coal-fired and nuclear ones will be transmitted through long distance cables to consuming areas. Therefore, loss of power become large and large investment to transmission cable lines will be needed. So, electricity price per kWh will rise higher.
- **Wheeling charge of electric power(or usage fee of power cables)**
- **Capacity factor of power plants:** For example, coal-fired and nuclear power plants is operated at base load and fossil fuel-fired power plants such as CCGT power plants are operated at middle and peak loads. The smaller of capacity factor, the higher of power generation cost.
- **Price variation of price of fossil fuel such as coal, LNG, etc.**
- **Carbon dioxides capture and storage (CCS), carbon taxes, etc.**

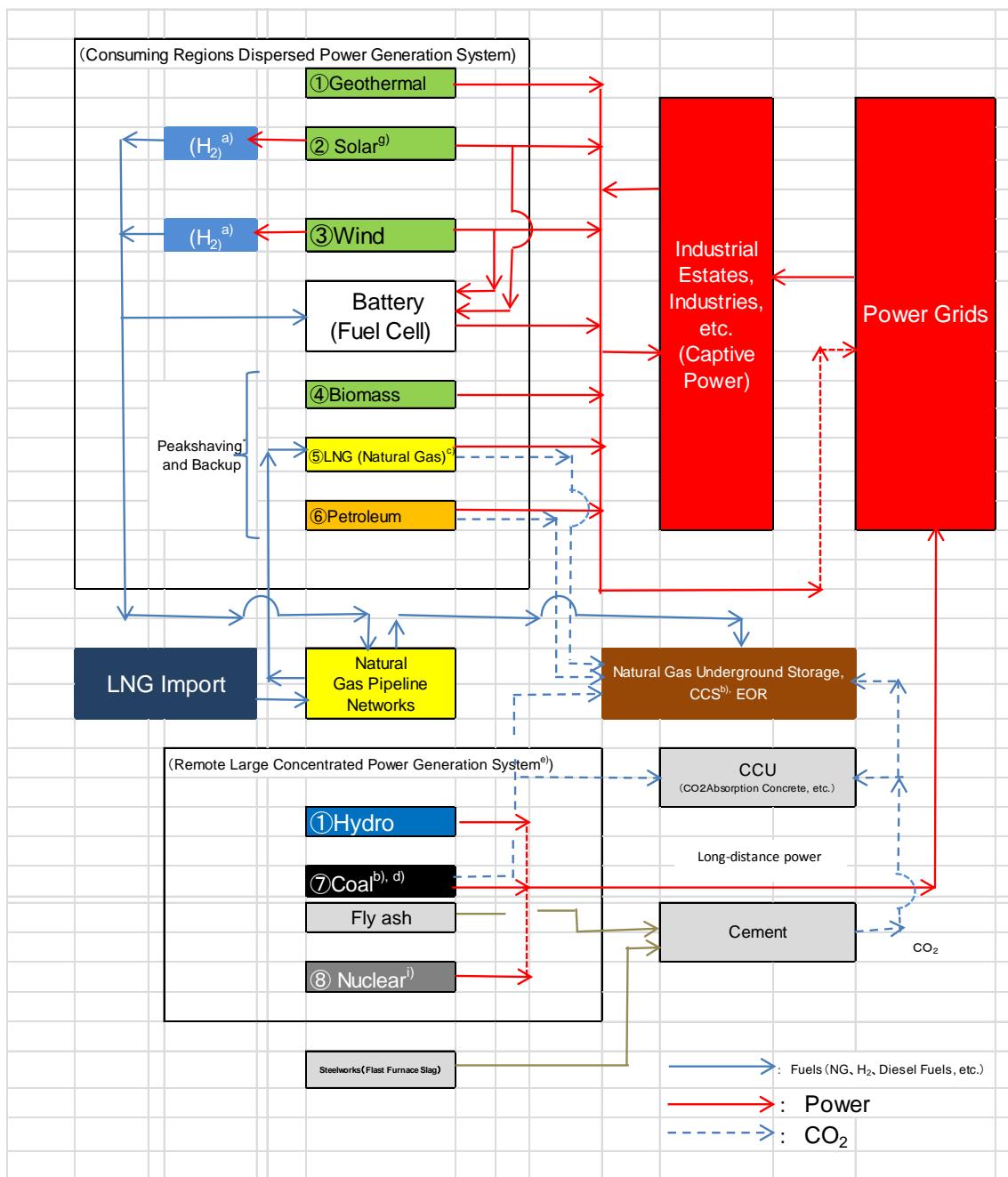
By reason of difficulty of estimation of actual power costs taking the above-mentioned power transmission loss, wheeling charge of power, etc. into consideration, power generation cost at power generation end are frequently used to compare with various power generation costs.

It is a double investment to two power sources to secure stable available electric power by another backup power source and capacity factor for the backup power source power plants decreases. In addition, surplus electricity may not be able to sell to grid. In the large scale Thilawa SEZ in Myanmar, there are captive power plants installed but it is not back-up power source. In less land Bangladesh, renewable energies such as solar power floating on lakes, water logging areas, remained saltpans, etc. may be preferable rather than fossil fuel-fired power plants emitting a large amount of CO₂. For reference, Figure 4.6.4-1 (next page) shows low carbon society-oriented renewable energy-preferred dispersed power system which Bangladesh should also head for.

From a conclusion, power for short-term EZs around the Dhaka area should be supplied from the nearest grids and backup power should not be considered from economic reasons. Power supply to EZs shall be guaranteed by/through BEZA. If power supply from grids is unstable, backup power source should not be considered but captive power plants shall be installed in EZs. It should be renewable energies¹⁵ such as solar, wind, etc. from environmental and economical points of view.

Like Philippines, Sri Lanka, island countries in the Pacific Ocean, etc. which will suffer from lost land, disaster, etc. due to global warming, seawater level rise, etc. arisen by CO₂ emission, Bangladesh is one of climate change vulnerable countries and must make an effort at CO₂ reduction and energy saving in all industries including power, cement, etc. not only at promotion of industries.

¹⁵ Gas-fired power plant is the most environmentally-friendly one among fossil fuels power plants such as coal, petroleum, etc. while it emits the least CO₂. The installed cost (Capex) is about US\$ 1 MM/MW. 50 MW of power plants is about US\$ 50 MM in total. At present, electricity is about 10 US ¢/kkWh in Bangladesh. However, the price will vary with LNG price, subsidiary, etc. Solar power plants require about 1 ha/MW and its Capex are about US\$ 2 MM/MW.



(Note): The number in ○ means an order of priority for applicable energies.

Figure 4.6.4-1
Low Carbon Society-oriented, Renewable Energy-preferred and Consuming Sites
Dispersed Power Generation System

Source: JICA Study Team

4.7 Formulation of EZ Development Concept for short-term candidate sites

4.7.1 Recognition of the characteristics of candidate sites

The followings are the results of hearing conducted by survey team in local area of candidate sites.

Sreepur Upazila (Nayanpur is located in Sreepur Upazila)

- 1) In-migration into Gazipur district is increasing in recent years, and Sreepur is also in-migration area.
- 2) The ratio of female population to the total population is higher than the ratio of male population (sex ratio was 104 in 2011).
- 3) Literacy rate has been increasing steadily (54.8% in 2011).
- 4) There exist about 500 establishments in Sreepur, of which about 350 are operational at present (354 establishments operational in 2011).
- 5) Sreepur used to be covered by forests, and there exist 137 wooden furniture factories at present.
- 6) Major manufacturing industries existing in Sreepur are RMG garment and accessories, textile, spinning, ovens, earthen pottery, plastic products, agro- and aqua-processing, cables and wires, bicycles and chemical products.
- 7) A project financing by World Bank known as National Agriculture Technology Project Phase II and the Safe Meat Production (antibiotic) project are currently implemented.
- 8) Sreepur is exporting poultry and dairy products to neighboring regions (annual milk production at 30,000ton, and daily production of 160,000 eggs), and potentials are high for these activities.
- 9) There are nine fish feed industries, of which the one by Chanese capital is the largest in Southeast Asia; 5,000 fish farmers and 1,000 registered fishermen engage in fishery related activities; establishment of fish processing in the EZ is expected.
- 10) Water supply is based on groundwater; groundwater tables are at 15-20m, and water supply from a well covers 10 households; water quality is good and arsenic concentration is 0.001~0.02 mg/liter
- 11) Sreepur Upazila achieved 100% coverage by sanitary latrine in 2007.

Araihaazar Upazila

- 1) In Araihaazar Upazila, 70-80% of those employed are in textile industries with the rest engaging in agriculture, fishery, wooden furniture manufacturing and others.
- 2) EZ development is expected to ensure employment opportunities for the growing population.
- 3) Literacy rate in Araihaazar has been improving rapidly (41% in 2011).
- 4) Other than rice, pulses and vegetables are cultivated in Araihaazar; agricultural production can be increased by utilizing unused land and fallow as well as applying modern technology.

- 5) Small fishermen engage in subsistence fishery in the Meghna River, and very few fishermen are also involved in aquaculture in small ponds or ditches; fish processing in small scale could be a possible sector in the proposed EZ.
- 6) Livestock is also practices in small scale together with animal feed industry, and an opportunity is there to introduce livestock processing industries in the EZ.
- 7) Mechanization of textile and related upstream and downstream industries are expected to locate in the EZ.
- 8) Small scale wooden furniture manufacturing is practiced with raw materials mostly procured from outside the Upazila.
- 9) Small numbers of steel re-rolling mills are operating in Araihazar and the neighboring Upazila of Rupganj; steel mills could be a possible sector for the proposed EZ.
- 10) Water supply for 90% of Araihazar residents is by wells; depth is 180-210m for deep wells and about 60m for shallow wells.
- 11) Sanitary toilets are available for 75% of residents, and planned to realize 100% coverage by the end of 2015.

4.7.2 EZ development concept at short-term development candidate site

The development concept (draft) at short-term development sites (Araihazar, Nyanpur) consists of (1) The objectives of EZ development, (2) Development model, (3) Development method, (4) Development Target, (5) EZ function, facility and equipment, (6) Industrial sectors to be potentially attracted to EZ, and (7) Improvement of off-site infrastructure. The contents are shown as below. The EZ development concept are basically common among two candidate site.

(1) The objectives of EZ development

- The objectives of EZ development in short-term development candidate site are as follows:
- (a) Bangladesh Vision 2021 and the objectives of BEZA

Policy of Vision 2021	BEZA's Objectives
Ensuring broad-based growth	Develop 100 EZs over next fifteen year Create employment opportunities for 10 million people Establish backward linkage industries in Economic Zones to meet requirements of local company
Addressing Globalization and regional cooperation	Attract foreign investors for development and operation of EZs Encourage PPP in development and operation of Economic Zones Foster to make exports worth USD 40 billion from only the EZs by 2030
Creating a caring society	Initiatives towards poverty reduction program Steps to implement social and economic commitments Establish social rights of workers and creating conductive employer-employee relationship
Ensuring effective governance	Monitoring of activities of its own and of economic zone developers to ensure infrastructure development Encourage efficient management and monitor programs for implementing commitment on environment and other matters
Mitigating impacts of climate change	Encourage business organizations to relocate polluting and unplanned industries from metropolitan cities through establishing separate EZs for different industries

- (b) The policy of Japanese government (Japan-Bangladesh Public and Private Joint Conference in 2014)

Japanese government and Bangladesh government encourage the investment and provide the site for the effective production activity. Both governments shall build up long term partnership based on friendship and mutual benefits, thus contributing to sustainable economic growth and industrial development.

- (c) In order to materialize the above (a) and (b), it shall be directed to competitive EZ with EZ in competing surrounding countries, meeting global standard (which is the standard that Japanese investor require such as improved infrastructure, business environment, one-stop-service and convenience to the investors, environment and social consideration, low cost operation, etc.)

(2) Development Model

The development of EZ shall be made based on Hybrid EPZ model where mostly export oriented industries as well as domestic industries are located. The EZ also is the industrial park having function of commercial services to the tenant industries/investors within. In view of sustainable growth of industry and economy, the EZ shall, in relation to EZ development, cooperate with formulating developing plan of local community and urban development, thus contributing local area development.

(3) Development Method

Government to government development shall be applied: Bangladesh government acquire and provide the land, while Japanese private enterprise (or joint venture of private and public) takes initiatives to develop EZ, by attracting and promoting FDI based on Japanese industries.

In the aspect of raising fund for EZ development, it is expected that ODA assistance (yen loan) will be available. In such finance assistance scheme, there are three components:

- a) **Two Step Loan (TSL)**: Refinancing scheme to provide medium-to-long term credit for foreign enterprises and Bangladeshi enterprises which has any relationship with Japanese enterprises to do business in EZs. Financing is made at local currency through local financial institutes.
- b) **Equity Back Finance (EBF)** for Bangladesh Government Agencies to develop EZs, which subscribes to the establishment of Special Purpose Company (SPC) which may attract private sector investment and FDI. ODA loan to SPC is available and financial support by Bangladesh government through BIFFL will be available.
- c) **Project Sector Loan (PSL)** : to develop off site infrastructure for the EZ (such as access road to connect EZ and trunk line road, bridge, transforming station to be newly built, electric distribution line to be connected from existing facility, etc.)

(4) Development Target (Scale, conditions at site, etc.)

- a) Dimension of development: Phase 1 100ha, Expansion at Phase 2 100ha Total 200ha
- b) Scheduled time to commence sales for the land at Phase 1: assumed to be around 2018
- c) At Phase 1, the zone will be developed mainly for the tenant which are export oriented.
- d) The investment will be made along with the phase and progress of development, thus lightening the initial investment costs.
- e) Land use will be planned in consideration of sufficient flood protection and low cost development.
- f) The EZ will be a good model as a pioneer of EZ development to be supported by Japan, targeting EZ pursuant to global standard to promote FDI from worldwide.

(5) EZ function, facilities and equipment

The EZ developer shall plan and execute to furnish EZ functions, facilities and/or equipment as below:

Bangladesh government and/or BEZA shall provide the followings:

- a) Acquiring the land for EZ site
- b) On-site infrastructure (transformer station, etc.)
- c) Off-site infrastructure (access road to EZ, etc.)

d) One-stop-service, etc.

The EZ developer shall plan and execute to furnish EZ functions, facilities and/or equipment as below:

- a) EZ management office: Developer's management office is set up within EZ.
- b) Service provided: Management office provide consulting service to the investor/tenant about how to apply for various procedures and how to use one-stop-service provided by BEZA.
- c) Countermeasure protecting from flood: To avoid flood damage, necessary ground level height is maintained, regulating pond being digged and drain pump being installed.
- d) Environmental Protection: EZ shall be developed, managed and operated in conformity with environmental rules and criteria¹⁶ of Bangladesh. Sewage and effluent system to meet the requirement of environment criteria. Further final treatment of sludge shall be monitored. In case of EPZ, tenant industry final treatment of industrial waste (solid form) asked outside waste disposer for final treatment. In case of EZ, the similar way of final treatment to EPZ case will be applied.
- e) Fire and disaster protection measure: Fire hydrant shall be placed in conformity with Fire protection law. In case of fire breaking, early firefighting operation shall be made inside EZ.
- f) Security: Security officer shall be placed at the entrance of EZ site.
- g) Customs¹⁷: In EPZ custom officers are not resident. In EZ Custom officers are to be stationed in EZ management to achieve smooth and efficient custom operation in future. (BEZA/developer and custom office shall discuss.)
- h) Clinic: Small clinic is placed in a room of management office to provide medical service to those working in EZ site.
- i) Commercial service¹⁸: Bank offices and ATM will be placed to provide monetary service such as foreign currency exchange, money exchange, remittance, deposit and drawing. Insurance service, tax accounting service and retail shops will be available.
- j) Convenience to tenants: It will be considered to furnish meeting and training room, provide training service to the employees in industry in EZ, service apartment, club for the tenant members, restaurant and availability of food services. (within the section of "Service Facilities")
- k) Logistic Center¹⁹: In future, it will be considered to place logistic center in

¹⁶ As to the system of law to which it is referable as environmental criteria, please refer to "4.6 Environment and social consideration".

¹⁷ Whether custom officers can be stationed at resident office inside EZ depends upon the customs organization, system and policy. It is necessary that BEZA and customs office discuss about this issue as a part of one stop service of EZ. However, it would not be feasible in case that bonded transportation by container between EZ and Chittagong port should be unavailable.

¹⁸ As to i) Commercial service and j) convenience to tenants, contents are up to business policy of developer, while d) environment protection, e) fire protection and g) customs are regulated more or less in relation to law, regulation and rules.

¹⁹ In Thailand and Vietnam, bonded container transport is popular between sea port and industrial park, in which case custom clearance is made at industrial park, bonded area of either logistic center or factory site, causing efficient transportation, safety of cargo, and decrease of lead time. In Bangladesh, container transportation is available by railway between Dhaka station and Chittagong but transport capacity by railway is limited. Bonded container transportation by road is not popular

EZ or near EZ so that rapid and high quality logistic services in the process of distribution such as packing, storage, consolidation, custom clearance and combined intermodal transportation.

(6) Industrial sectors to be potentially attracted to EZ

Industrial Sectors	Portion of dimension to be used for each industry
RMG, apparel, textiles	15%
Apparel accessories	25%
Motorcycle assembling	9%
Automobile and parts (including wire harness)	5%
Metal and Iron products and processing	10%
Electric and electronic appliance and parts	10%
Machinery and parts	5%
General assembling	5%
Plastics products and parts	5%
Agro processing, products, food	5%
Medical products, healthy food	5%
Total of available dimension	100%

(7) Offsite infrastructures

In order to improve function and value of EZ, the development of offsite infrastructure (such as access road construction, bridge construction, connection of electricity and gas pipe line) are important. Offsite development shall be developed in consideration of public nature and economic efficiency.

4.7.3 Assessment of promising industries at EZ around Dhaka

A list of industries considered promising in Bangladesh has been prepared as part of development planning for the medium term EZ development. These industries are examined to see if they are promising in the Upazilas of proposed EZ development in view of the characteristics of the respective Upazilas analyzed in (4) and (5) above. The hearings from the Upazila offices reported in (6) are also taken into account.

Prospect of indigenous and export industries for location at the proposed Nayanpur EZ is assessed as shown in Table 4.7.3-1.

due to poor road traffic condition. Under the circumstances, there would be less requirement for custom clearance at EZ site, as it is no use. However, when road condition is improved in future, container bonded transport will prevail as in Thailand and Vietnam. In that case, it would be indispensable to establish bonded logistic center and warehouse inside EZ, which will strengthen EZ function and advance added value of EZ.

Table 4.7.3-1 Prospect of Indigenous and Export Industries for Location at Proposed Nayanpur EZ

Promising industries in Bangladesh	Prospect for location at Nayanpur EZ*	Explanation
Processed vegetables	○	Possible to expand raw materials; close to urban market
Other food and beverages	○	Possible to expand raw materials; close to urban market
Edible oils	×	Difficult to procure raw materials
Textile & fabrics	△	Harsh competition with imported textile & fabrics
Some non-metallic mineral products	×	Difficult to procure raw materials
Some machinery and parts	△	Easy to procure semi-skilled labor; close to urban market
Some electric & electronic products & parts	△	Easy to procure semi-skilled labor; close to urban market
Chemical products & plastics	○	Increasing domestic demand; expansion of existing industries
Garment & textile products	○	Expansion of existing industries
Ship breaking & building	×	Unfavorable geographic conditions
Frozen food	△	Possible as part of agro-processing
Leather & leather products	×	Difficult to procure raw materials
Pharmaceuticals, health products and cosmetics	△	Subject to procurement of additional raw materials
Steel & re-rolling	△	Close to urban market; subject to procurement of raw materials
Iron manufacturing	×	Difficult to access deep sea port
Earthenware & pottery	×	Difficult to procure raw materials
Gas chemistry	×	Unfavorable locational conditions
ICT related industries	○	Easy to procure English speaking human resources
R & D	△	High demand for advanced industrial structure close to the capital city
Furniture & woodworks	△	Demand increase expected but difficult to procure raw materials
Breeding & fattening of cattle, goats & poultry	○	Responding to fast growing urban demand
Halal industry of meat and dairy products	△	Promising urban & export markets

Note*: ○Promising; △Possible; ×Not recommended

Similarly, prospect of indigenous and export industries for location at the proposed Araihazar EZ is assessed by criteria examined above. Results are summarized in Table 4.7.3-2

Table4.7.3-2 Prospect of Indigenous and Export Industries for Location at Proposed Araihazar EZ

Promising industries in Bangladesh	Prospect for location at Araihazar EZ*	Explanation
Processed vegetables	○	Possible to expand raw materials; close to urban market
Other food and beverages	△	Possibility of processed root crops
Edible oils	△	Subject to procurement of raw materials from neighboring regions
Textile & fabrics	△	Harsh competition with imported textile & fabrics
Some non-metallic mineral products	△	Subject to procurement of additional raw materials
Some machinery and parts	○	Easy to procure semi-skilled labor; existing industries as base
Some electric & electronic products & parts	△	Easy to procure semi-skilled labor; close to urban market
Chemical products & plastics	△	Close to urban market; subject to procurement of raw materials
Garment & textile products	○	Expansion of existing industries
Ship breaking & building	△	Easy to procure semi-skilled labor; favorable locational conditions
Frozen food	△	Fish processing promising
Leather & leather products	×	Difficult to procure raw materials
Pharmaceuticals, health products and cosmetics	×	Difficult to procure raw materials
Steel & re-rolling	○	Possible to expand existing industries; subject to raw materials procurement
Iron manufacturing	×	Difficult to access deep sea port
Earthenware & pottery	△	Easy to procure semi-skilled labor; responding to urban demand
Gas chemistry	×	Unfavorable locational conditions
ICT related industries	○	Easy to procure English speaking human resources
R & D	△	High demand for advanced industrial structure close to the capital city
Furniture & woodworks	○	Responding to increasing demand by import of additional raw materials
Breeding & fattening of cattle, goats & poultry	×	Small livestock population
Halal industry of meat and dairy products	△	Promising urban & export markets

Note*: ○Promising; △Possible; ×Not recommended

4.8 Formulation of Basic Plan for Short-term EZ Development

4.8.1 Preparation of Topographic Map by Digital Mapping

(1) Digital Mapping

Digital mapping of candidate sites surrounding Dhaka City was carried out through subcontract works. The existing aerial photographs, taken from an altitude of about 8,000 m in 2010, were used as input data for the digital mapping process. Then a topographical map was prepared by using xy-coordinates and elevation of ground control points collected by ground survey.

Among 3 temporary EZ candidate sites, digital mappings were carried out for two sites (Araihaazar and Nayanpur) which were concurred by BEZA (Bangladesh Economic Zone Authority) for JCC.

(2) Survey Area

The target areas of each EZ development candidate site were determined not only by EZ development plan areas, but also by considering the following two points.

- a) Making an infrastructure improvement plan based on ensuring consistency of ground elevation and a deployment plan of infrastructure facilities after the expansion of the EZ development plan area.
- b) Understanding the relationship between the connection of EZ development candidate sites and the national highway as well as the surrounding environment, such as rainwater drainage to surrounding rivers.

1) Araihaazar

The survey area of Araihaazar in Figure 4.8.1-1 includes the EZ target area and the area required for other infrastructure (within the yellow line). The survey area was a total of 450 ha in accordance with the following items.

- a) EZ survey area : 300 ha within red line
- b) Others : Total 150 ha of the following areas are required for infrastructure project
 - Area from national highway No. 2 to EZ candidate area
 - Area on southwest side (including the river), which is the area for rainwater and sewage drainage.

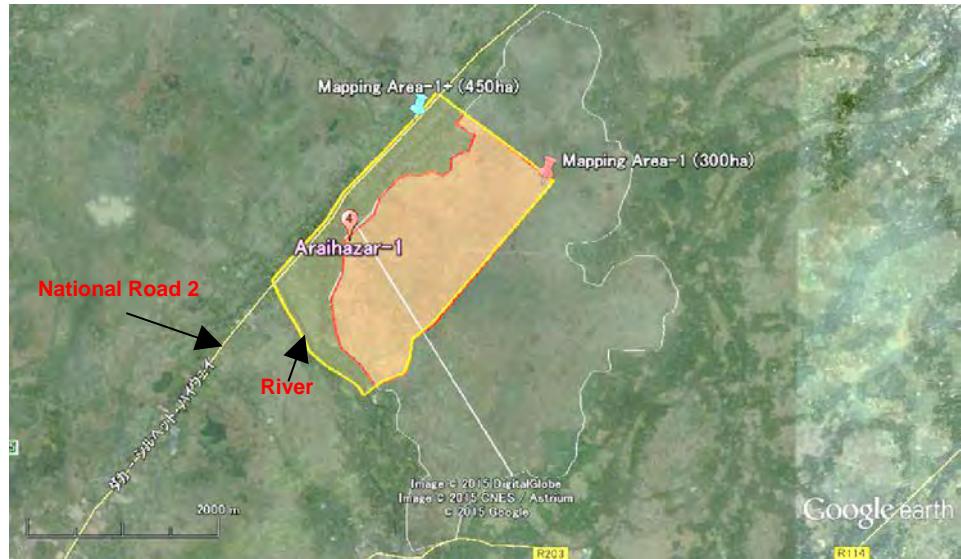


Figure4.8.1.1 Araihaazar candidate site

2) Nayanpur

The survey area of Nayanpur in Figure 4.8.1-2 is the EZ target area, the area including the planned site of the access road (within yellow line) and the additional area near access roads. Survey areas are as follows, with the total area of 370 ha.

- a) EZ target area : Basic survey area (within red line) is the area expanding 50 m outside of candidate site area (233 ha within the red lines)

$$233 \text{ ha} \times 1.2 = 280 \text{ ha}$$
- b) Access road planned site 1 & 2 and northern addition area : $10 \text{ ha} + 60 \text{ ha} + 20 \text{ ha} = 90 \text{ ha}$

In addition to the above digital mapping target areas, the approximate altitude along the existing roads around the candidate sites was confirmed in order to grasp the general land configuration of the surrounding rainwater catchment area.



Figure 4.8.1.2 Nayanpur candidate site

(3) Work Process

The field works, such as installation of the benchmark (BM), GPS surveying, leveling and map digitizing or generation of digital terrain data, were carried out in the period from the second half of August to the end of November 2015. Then data were summarized in the topographic map with the scale of 1: 2,000.

(4) Ground Configuration of Candidate Sites

1) Araihazar

The Araihazar candidate site is flat agricultural land (paddy field) with an elevation of MSL + 2.5 m, and is submerged in the rainy season. Small water channels a few meters lower than the surrounding agricultural ground elevation exist. The channels have been used for transportation of agricultural products and fertilizers by small boat. The area on the northwestern side of the candidate site, along National Road N2 and along the southwestern side of the river are MSL + 4 ~ + 5.5 m higher than the agricultural land with scattered village roads, houses, and water ponds. The pavement elevation of the National Highway N2 is higher than local land. It has dropped from MSL + 10 m at the southwestern side of the bridge to about MSL + 7 m at the northeastern side. Rainwater inside the EZ candidate site flows from the northeast to the southwest and drains into the southwestern side of the river, connecting to the Meghna River.

The elevation of the candidate site is lower than past flood levels of surrounding large rivers such as the Meghna River and the Shitalakshya River. Hence, it is necessary to ensure surface water diversion around the candidate site after site formation.

2) Nayanpur

This EZ candidate site extends northwest to southeast, and is 500 ~ 800 m wide in the east-west direction and 4 km long in the north-south direction. This EZ site has been used for agricultural land such as rice paddy fields. Elevation is approximately MSL + 11.3 m to + 11.5 m, i.e. it is a substantially flat area.

The highest point is about MSL + 11.8 m, located in the second phase expansion planned site of the EZ candidate site. This point becomes the dividing ridge of the waters and there is a creek (about 1 m to a few meters wide) that diverts to the north and south.

The southern stream joins the Buriganga River located south of Dhaka City, downstream. The northern stream joins the Shitalakshya River. This candidate site forms a divide of north and south direction on the broad watershed of Dhaka City and the northern suburbs.

The east-west end of the candidate site has a stair-step topography, a few meters high. The eastern side of the candidate site has elevation from MSL + 13 to 17 m with scattered low-density forest, houses, farmlands and reservoirs (fish ponds). Above the eastern side is the highest area of National Road N3 and is the catchment basin of rainwater from the national highway to the eastern side. The western part of the candidate site also has stair-step topography of few meters high, forming a hilly topography of less than + 13 to 20 m. The hilly topography area is 1 km from the west end and became the dividing ridge of the water. Western rainwater beyond the ridge does not flow onto the candidate site but to the sides. Hence, the largest width of the catchment basin on the east-west direction is about 3~5 km.

Because ground elevation of the candidate site is higher than the past flood level of the Padma River, Buriganga River, and Shitalakshya River, it is not affected by these rivers' floods. However, this site is affected by the rainwater flowing out of the previously mentioned area of hilly topography. Current farmland of 500~800 m width on the EZ candidate site is working as a drainage ditch. However, this farmland will be filled up during project implementation. Hence, it is necessary to ensure the canals' locations for rainwater on the east and west sides of the candidate site.

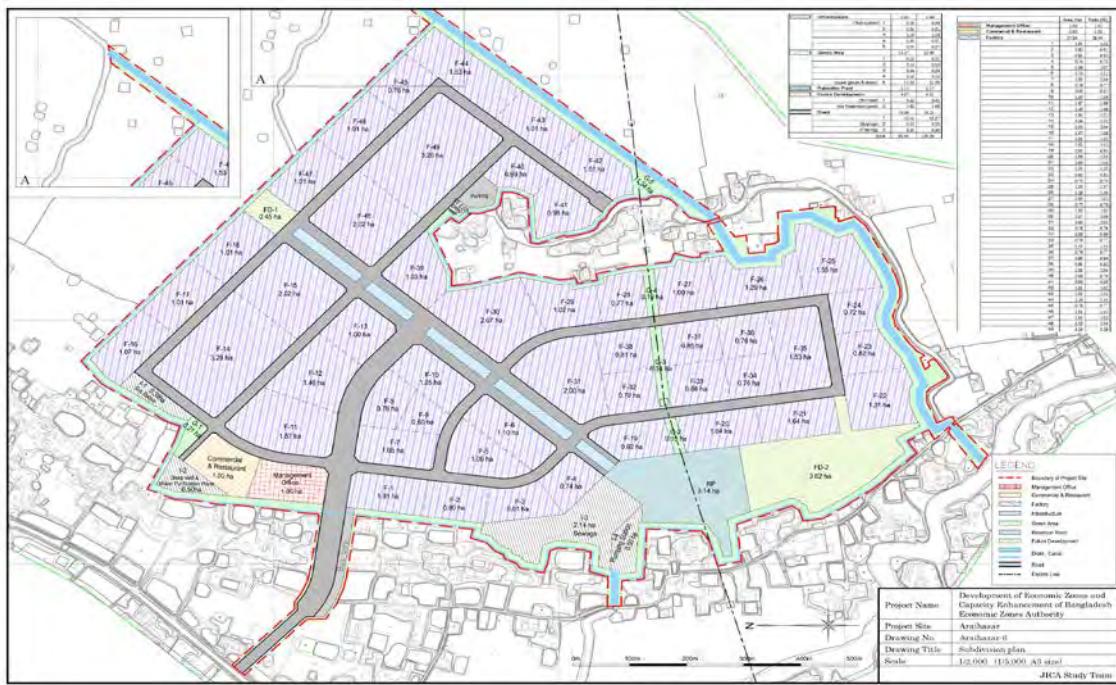
4.8.2 Basic Plan for Short-term EZ Development (Araihazar)

Outlines of Araihazar EZ Development Plan

Development Method	To be developed as one of the G to G EZs initiated by the Governments of Bangladesh and Japan under a PPP scheme by participating Japanese Developer
Development Concept and Advantages	Development concept of the Project focuses a Multiple Export-oriented EZ but domestic-market oriented industries shall also be pursued. The EZ shall be developed as a competitive EZ against the similar facilities in the neighboring countries and equipped with a full line of the infrastructures of global standard, competitive business environment, highest investors satisfaction by One-stop-services (OSS), due consideration to environment and society, and low-cost operations.
Major Functions	A comprehensive support services to all the affairs required to invest and operate within the EZ premises shall be provided by OSS, in addition to all the key facilities such as custom house, security and guard, custom services, commercial and logistic services.
Industries to be promoted	Apparel and RMG, Garment Accessory, Textile and Knit-wares, Home-textile, Motor-cycle and its parts, Automobile and its parts including Wire-harness, Metal and Nonferrous Metal, Electric and Electronic, Machinery, Assembling, Plastic Processing, Agro-processing, Medical and Pharmaceutical, Health Foods, Cosmetics, among many others.
Implementation Schedule	Implementation Schedule is tentatively set to commence the site construction at the end of 2016 and to accepting investment at the end of 2018.
Development of Off-site Infrastructure	All the off-site infrastructures such as power and gas supplies shall be developed by capitalizing ODA funds.

Land-use and Plotting Plan

With due consideration to the natural conditions at the site and future extension plans to phase-II, the land-use and plotting plans are developed in order to maximize the salable land within the premises by placing an access road and other infrastructures keeping the future extension of the Project in mind. As to the plotting plan in the phase-I, more than half of the salable area are allotted to 1.0ha – 2.0ha of plot which are easily combined and or divided depending upon the market demands.



(1) Summary of Basic Plan

Araihazar candidate site for short-term EZ development has been comprehensively selected as the first priority development site through selection procedure for short-term EZ development sites.

In the view points of the storm water drainage plan and the infrastructure plan, the EZ planned area has been specified that the 100ha downstream side is developed as the first phase EZ development and remaining 100ha upstream side will be developed as the second phase EZ development. The first phase of Araihazar EZ development has been formulated.

As for the infrastructure planning for the first phase EZ development, the access road from the national highway, the internal road network, storm water drainage network, flood retention pond including pumping system, water supply system, waste water treatment system, sub-station, gas supply system, etc. have been planned in the EZ area.

Because the flood retention pond, water supply system, waste water treatment system, sub-station, gas supply system shall be arranged in the first phase area considering demand forecasting for the second phase development, the ratio for factory lots for the first phase is less reduced. However, in the second phase development, the ratio for factory lots become relatively increased, since the infrastructure facilities except the internal road and the storm water drainage system are need not to be arranged.

The land use plan for the first phase of Araihazar EZ development is illustrated in Figure 4.8.2-1.

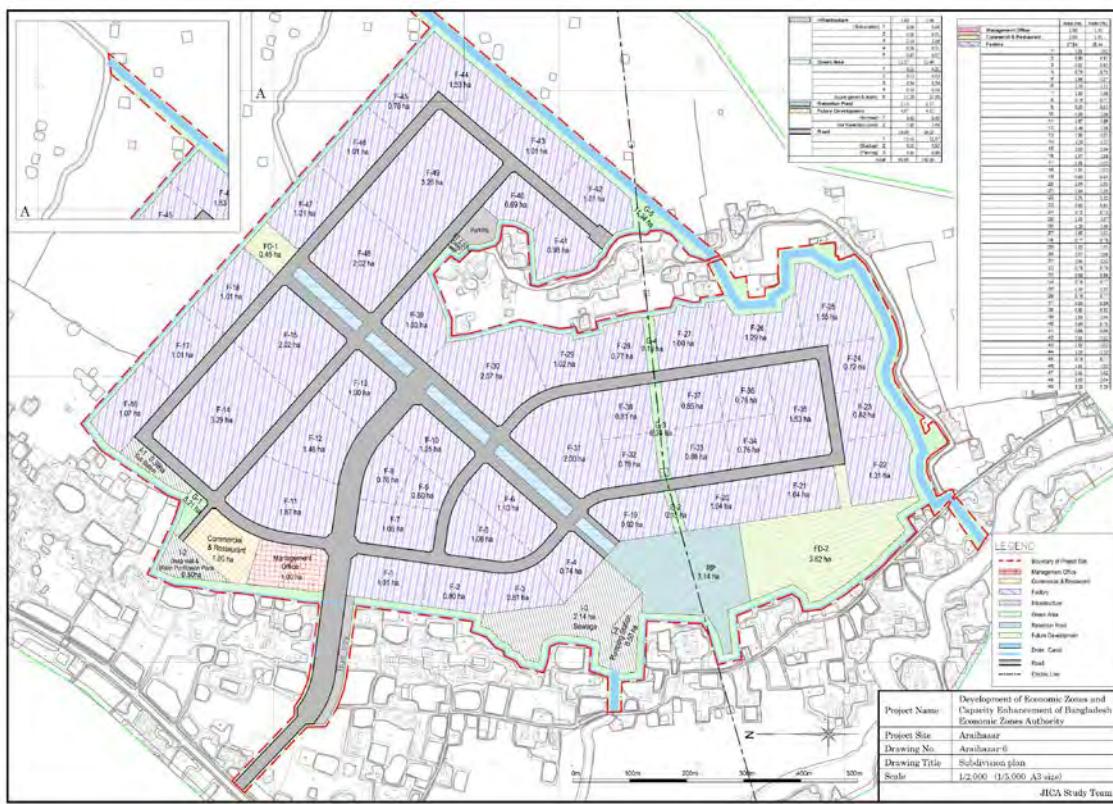


Figure 4.8.2-1 Land Use Plan for First Phase of Araihaazar EZ Development

(2) Site Natural Condition

In Araihaazar short-term EZ development area, 100ha as the first phase in the downstream side and remaining 100ha as the second phase in the upstream side are specified for planned area, and prepared for topographic map shown in Figure 4.8.2-2.



Figure 4.8.2-2 Topographic Map of Araihaazar Site

The Araihaazar candidate site is flat agricultural land (paddy field) with an elevation of MSL + 2.5 m, and is submerged in the rainy season. Small water channels a few meters lower than the surrounding agricultural ground elevation exist. The channels have been used for transportation of agricultural products and fertilizers by small boat. The area on the northwestern side of the candidate site, along National Road N2 and along the southwestern side of the river are MSL + 4 ~ + 5.5 m higher than the agricultural land with scattered village roads, houses, and water ponds. The pavement elevation of the National Highway N2 is higher than local land. It has dropped from MSL + 10 m at the southwestern side of the bridge to about MSL + 7 m at the northeastern side. Rainwater inside the EZ candidate site flows from the northeast to the southwest and drains into the southwestern side of the river, connecting to the Meghna River.

The elevation of the candidate site is lower than past flood levels of surrounding large rivers such as the Meghna River and the Shitalakshya River. Hence, it is necessary to ensure surface water diversion around the candidate site after site formation.

(3) Land Use Plan

As for 100ha area for the first phase EZ development, the land use plan has been prepared so as to allocate suitable sailable factory lots as large as possible over planning arrangement of proper access road and infrastructure facilities in consideration of the shape of the area, altitude and inclination of the land, existing land use, integration with the second phase, etc.

The land use allocation of the phase-1 of Araihazar EZ development is shown in Table 4.8.2-1. The ratio of sailable factory lots in the Phase-1 is relatively smaller than those in the phase-2, because service facilities, such as the management building, and infrastructure facilities, such as the retention pond, water supply, waste water treatment facilities, etc. for both the phase-1 and the phase-2 are allocated. It is noted that the land use allocation of the phase-2 is provisionally assumed from the land use allocation of the phase-1 for provisional reference.

Table 4.8.2-1 Land Use Plan Allocation of Araihazar EZ Development

	LAND USE PLAN	Phase-1		Phase-2		Total (Phase 1 + 2)	
		Area (ha)	Ratio (%)	Area (ha)	Ratio (%)	Area (ha)	Ratio (%)
A.	Factory Lots	57.84	58.44%	81.60	81.60%	139.44	70.08%
B.	Service Facilities	2.00	2.02%	—	0.00%	2.00	1.01%
C.	Road/Bus Bay/Parking	16.06	16.23%	15.40	15.40%	31.46	15.81%
D.	Retention Pond	3.14	3.17%	—	0.00%	3.14	1.58%
E.	Other Infrastructures	3.60	3.64%	—	0.00%	3.60	1.81%
F.	Green Area	12.27	12.40%	3.00	3.00%	15.27	7.67%
G.	Future Development	4.07	4.11%	—	0.00%	4.07	2.05%
	TOTAL	98.98	100.00%	100.00	100.00%	198.98	100.00%

Plot Plan

The plot plan of factory lots in the phase-1 land use plan has been assigned based on the attracting industries in the development concept, as shown in Table 4.8.2-2 as follows:

Table 4.8.2-2 Factory Lot Plot Plan for Araihazar Phase-1 Development

PLOT PLAN		Area (ha)	Ratio (%)
A.	Factory Lot (45 lots + 4 lots)	57.84	100.00%
	0.5ha~1.0ha (15 lots)	11.76	20.33%
	1.0ha~2.0ha (24 lots)	28.04	48.48%
	2.0ha~3.0ha (4 lots)	8.11	14.02%
	3.0ha~ (2 lots)	6.55	11.32%
	Rental Factory (F-2, 3 & 4)	2.35	4.06%
	Logistic Center (F-39)	1.03	1.78%

The number of 1.0 ha – 2.0 ha plots allocated in Araihazar phase-1 development is more than half among 49 lots. It is noted that the plot plan of factory lots can be divided or combined flexibly in accordance with actual market demand.

In Araihazar phase-1 development, 2.35 ha and 1.0 ha are arranged for the Rental Factory (total floor area is 20,000 m²) and the Logistic Center respectively. However, it is possible to arrange it as the factory lots when the market demand is a little. Total floor area of the Rental Factory in the phase-2 development is assumed 30,000 m².

Land Grading Plan

The land grading elevation for Araihazar EZ development has been decided as follows:

The probable high water levels at existing gauge stations of Bangladesh are calculated for each defined return period. Then the high water level of each candidate EZ site was calculated by the weighted average method, based on the calculated probable high water levels of nearby water stations (3 locations for each EZ site).

The difference between calculated probability water level and the terrain elevation obtained by other methods, such as digital mapping, is the minimum value of land grading height (thickness). The final site formation height is the sum of land grading height, margin height for rainwater drainage, and freeboard (Further explanation will be made in the next report).

<Planning Policy>

- Maximum flood level is EL. 6.5m and 100 year flood level is EL. 7.4m.
- The standard land grading level is set at EL. 6.5m, where factory lot is not flooded even if maximum flood occurs or drain pumps not working.
- The top elevation of the bank is set at EL. 8.0m which is 100 year flood level plus 0.5m freeboard. When the water level is higher than the water level inside, water is drained by pumps.
- Surplus water shall be retained in the retention pond with the balance between runoff coefficients after the development (0.6) and before the development (0.3).

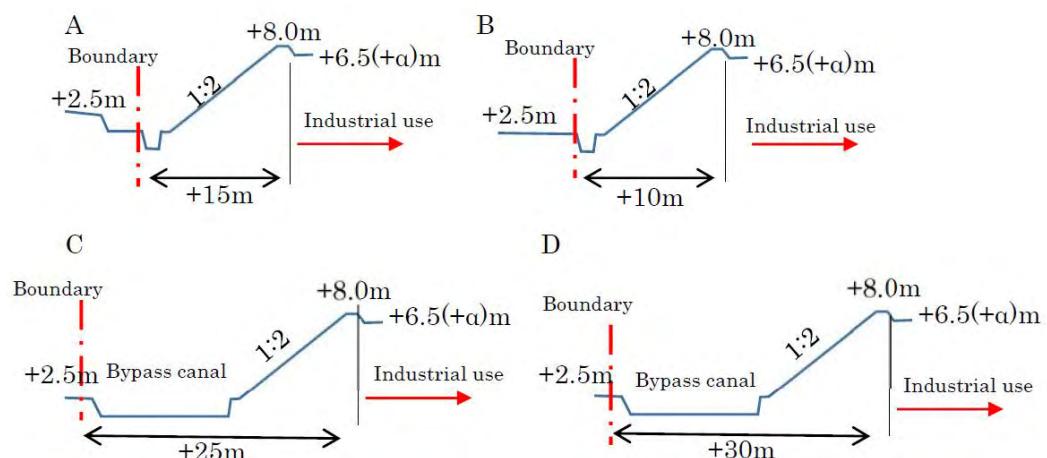
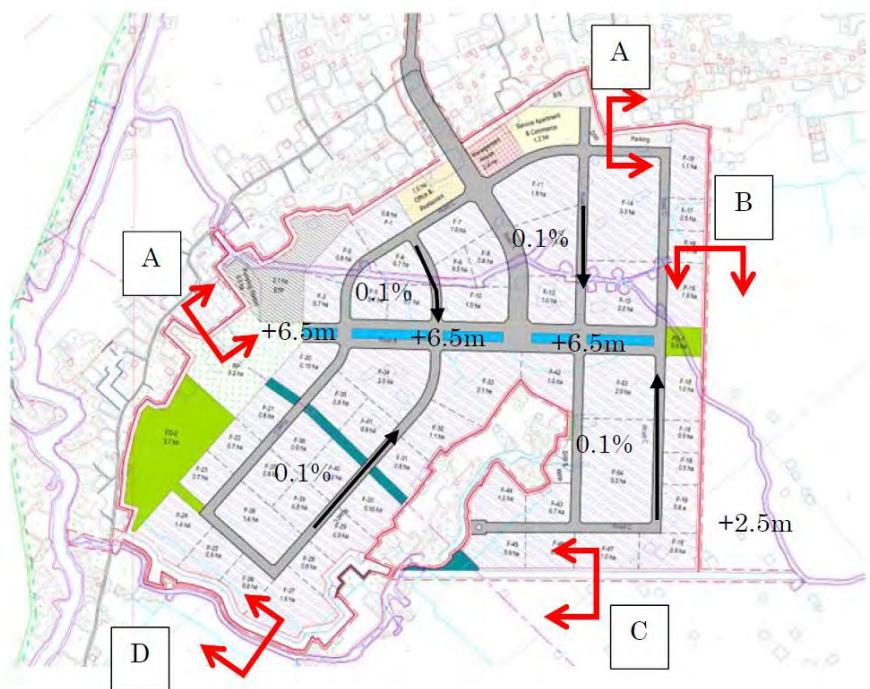


Figure 6.8.1-3 Land Grading Plan for Araihazar Phase-1 Development

(4) Onsite Infrastructure Planning

1) Road plan

Access road

An access road was planned connecting to the industrial park from N2 (Dhaka – Sylhet Highway) as its private use road.

A bus terminal for public transport (bus) to the industrial park from outside will be located outside the gate.

Internal roads

Inside the industrial park, a road starting at the gate and passing through the center of EZ will be the internal main road and will have four lanes. And the internal roads from the main road to each block will have 2 lanes. All internal roads will be planned to ensure width of 2.5m as the shoulders on their sidewalk sides so that accidents and trucks etc. parking while waiting will not obstruct traffic.

Road areas

Table 4.8.2 (4)-1 Araihaazar Road Areas

Road section	Road width (m)	Road area (m ²)
A	60m (including 20m canal)	Road 28,400 Water surface 11,200
B	40m (including 20m canal)	Road 1,600 Water surface 1,600
C□F	40m (excluding bus terminal)	24,800
D□G	20m	85,700
E	10m	800
Total		154,100

Bus terminal 3,500m²

Internal parking area for waiting vehicles 3,000m²

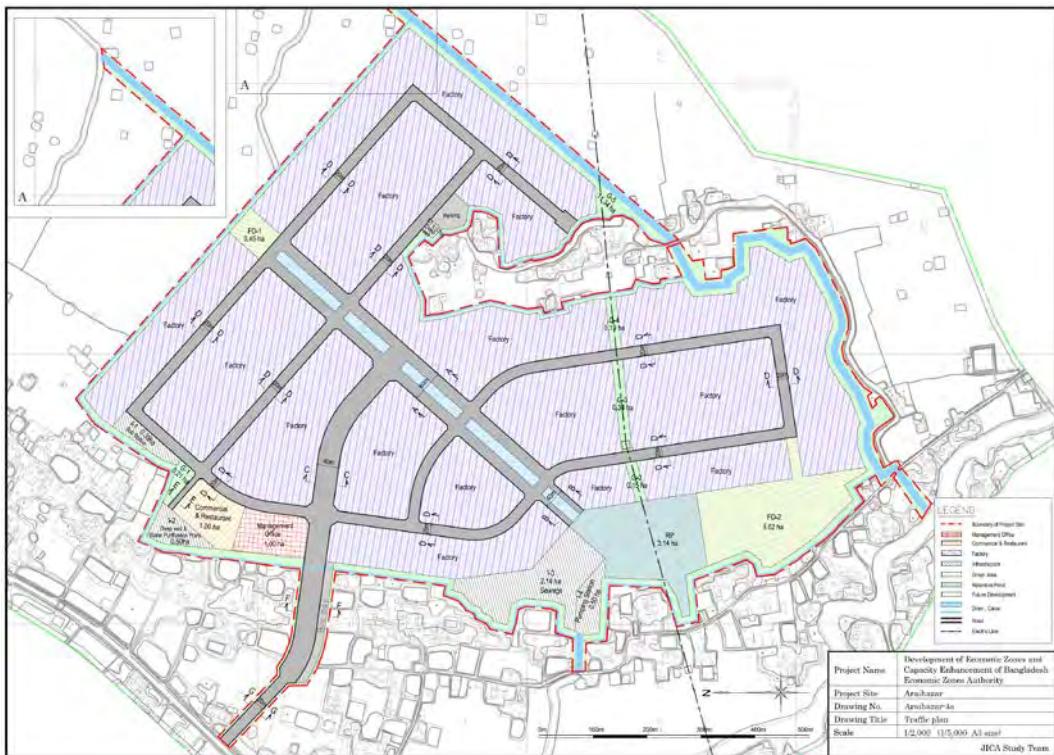


Figure 4.8.2 (4)-1 Araihaazar Road Plan

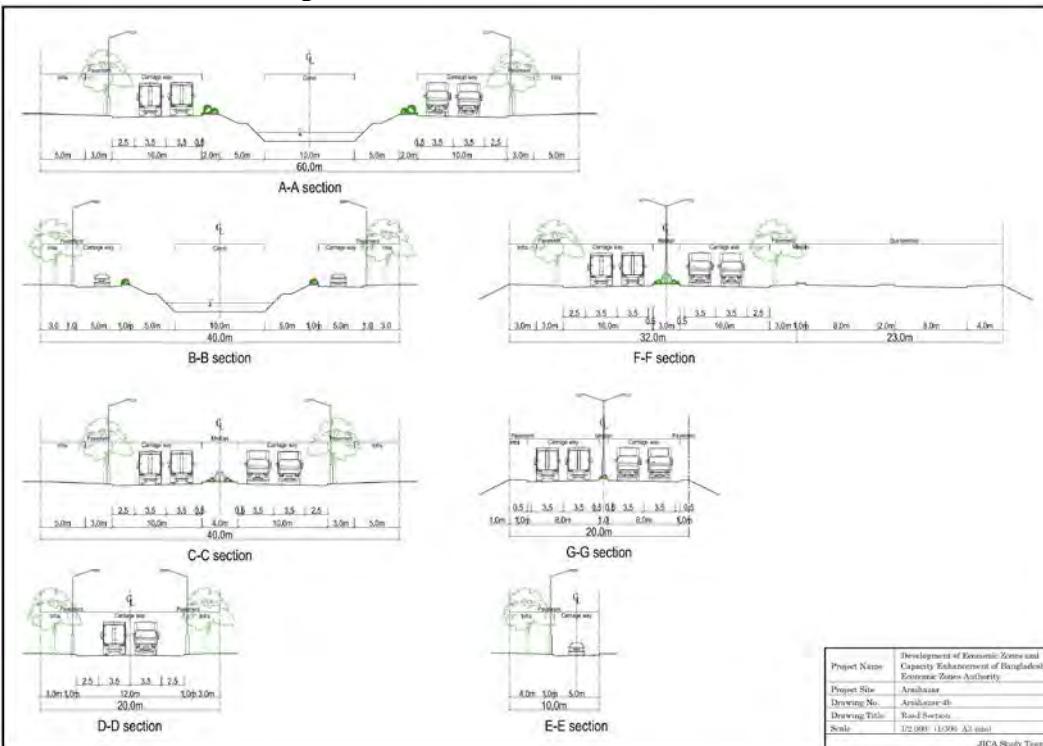


Figure 4.8.2 (4)-2 Araihaazar road cross-section plan

2) Rainwater drainage plan Rainwater drainage facilities

Rainwater drainage ditches will be located on both sides of internal roads and will drain rainwater to the canal located along the 60m main road. A retention pond will be located at the terminal of the canal, and it will have storage functions enabling it to perform the function, preventing the impact of the change of the runoff rate accompanying land preparation, and part of the pump drainage functions during flooding.

The rainwater drainage facility plan will apply the 10-year return period rainfall intensities shown on the following table. The runoff rate from the site of each factory etc., is planned as 0.6, hypothesizing a building coverage ratio from 50 to 60%. The rainwater drainage facility gradient is planned as 0.1%.

Table 4.8.2 (4) -2 Rainfall intensity in Dhaka

TABLE- 08A: SHORT DURATION RAINFALL DATA FOR DHAKA

Return Period	Rainfall Intensity (mm/hr) in given duration							
	15 min	30 min	1 hour	2 hour	3 hour	6 hour	12 hour	
1.1	73.50	59.90	39.60	22.00	14.00	7.10	4.30	
2	92.40	78.60	56.20	36.70	27.00	15.40	9.40	
5	109.70	95.70	71.40	50.10	39.00	23.00	14.10	
10	121.10	107.00	81.40	58.90	46.90	28.00	17.30	
25	135.60	121.30	94.10	70.10	56.90	34.30	21.20	
50	146.30	132.00	103.50	78.40	64.30	39.00	24.10	

(Source: Drainage Master Plan, Gazipur Pourashava, Final Report. LGED, UGII Project, January 2006)

Table 4.8.2 (4)-3 Araihazar rainfall drainage facility specifications

	Item	数量
1.	Concrete drain Type-A, – 0.5m x 1.0m size	4,200m
2.	Concrete drain Type-B, – 1.0m x 1.0m size	5,400m
3.	Concrete drain Type-C, – 1.2m x 1.5m size	600m
4.	Brick masonry Manholes complete diff. size (approx. at 30m interval)	330 places

Discharge point

The rainwater failed in EZ is planned to be discharged to the southern small river as current. The small river merges into Brahmaputra River.

Canal

An expanded area of about 100ha is hypothesized on the north side of the main planned site, and the plan calls for rainwater drainage of about 200ha overall.

The flow rate to be carried downstream is the 50-year return period rainfall, and the concentration time from the furthest location for the completed 200ha plan is hypothesized to be 1 hour, and the rainfall intensity is calculated as about 100mm/hour.

The planned flow rate is about 33.3m³/s according to the following formula.

$$Q=1/3.6 \cdot f \cdot r \cdot A \quad (\text{rational formula})$$

Q: flow rate (m³/s)

f: runoff coefficient
 r: rainfall intensity
 A: catchment area (km^2)

The flow capacity of the planned canal is, assuming the roughness coefficient is 0.035 and the water surface gradient is 0.02%, about $34.3\text{m}^3/\text{s}$ when the water depth is 3.6m (if the canal bottom elevation is considered to be 2.5m, water surface elevation of 6.1m), and it can carry the planned flow rate.

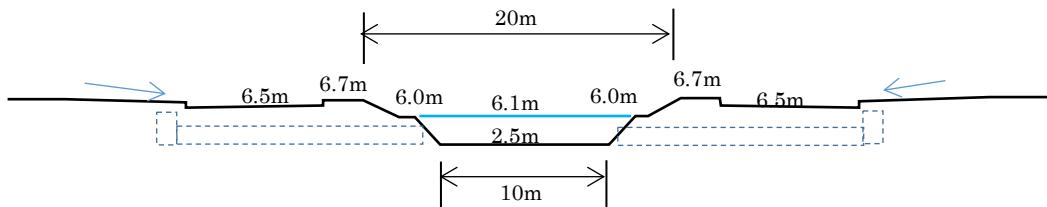


Figure 4.8.2 (4)-3 Plan for the Araihaazar main road canal

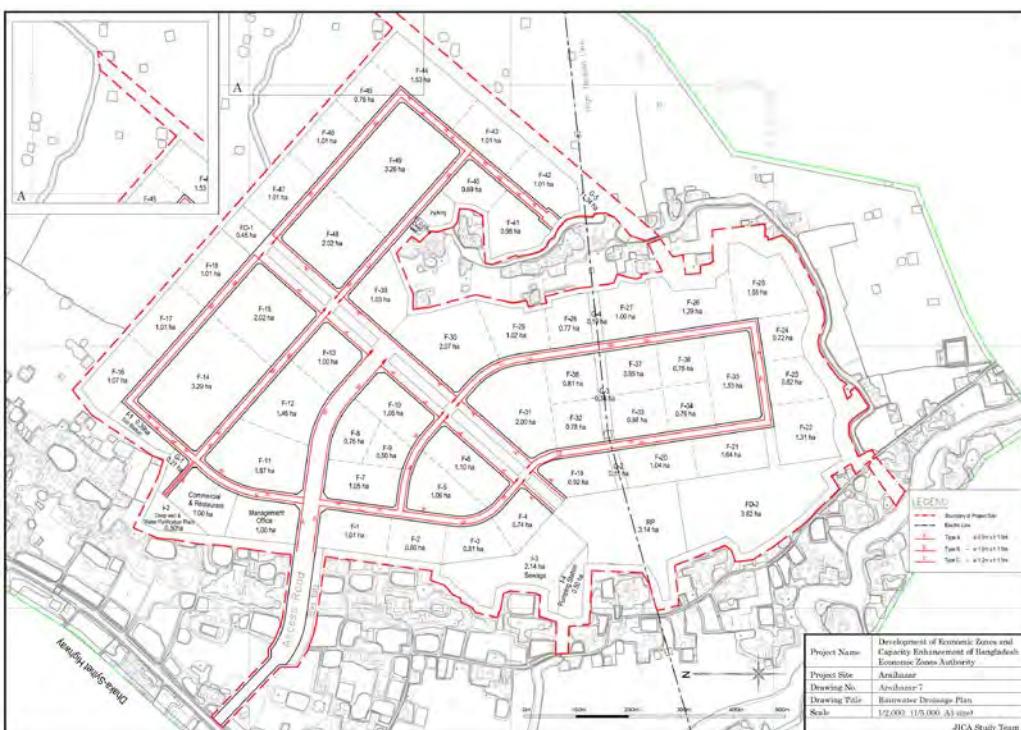


Figure 4.8.2 (4)-4 Araihaazar rainwater drainage plan

Retention pond

In the land use plan, the retention pond use land is planned as 3.14ha in the case of development of 100ha, and 3.62ha in the case of total development, and it will regulate the amount of increase of the runoff rate (factory use land 0.6 from agricultural field 0.3).

Table 4.8.2 (4)-4 Araihaazar retention pond data - 1

	Average water surface area (m^2)	Effective depth of retention pond (m)	Retention capacity (m^3)

Retention pond for 100ha development	24,000	2	48,000
Retention pond for total development	24,000+30,000	2	108,000

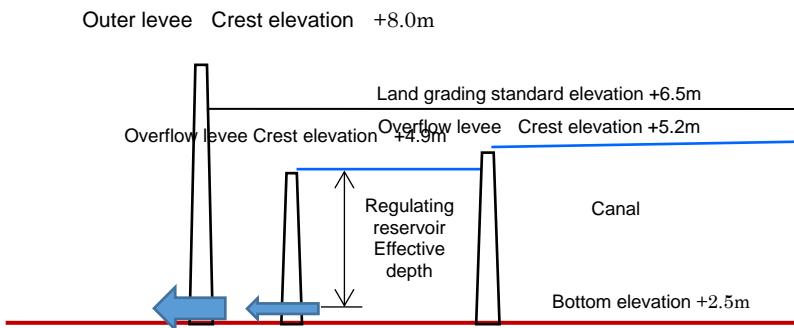


Figure 4.8.2 (4)-5 Cross-section of Araihaazar regulating reservoir

Table 4.8.2 (4)-5 Araihaazar retention pond data -2

	Concentration time (min)	Rainfall intensity (mm/hour)	Pre-development runoff (Runoff rate: 0.3)	Post-development runoff (Runoff rate: 0.6)
100ha development	30	130	10.8	21.6
Total development	60	100	16.7	33.4

Retention function

As shown below, if the concentration time from the furthest location during each level of development is added, the retention function will be one hour or more, even in the event of the 50-year probability rainfall.

100ha development

$$\text{Orifice discharge rate: } Q = (21.6 \cdot 10.8/2) = 16.3 \text{ (m}^3/\text{s)}$$

$$\text{Retention capacity } t = 48,000(\text{m}^3) / 16.3 (\text{m}^3/\text{s}) = 2,945(\text{sec}) \text{ about 49 minutes}$$

Total development

$$\text{Orifice discharge rate: } Q = (33.4 \cdot 16.7/2) = 25.1 \text{ (m}^3/\text{s)}$$

$$\text{Retention capacity } t = 108,000(\text{m}^3) / 25.1 (\text{m}^3/\text{s}) = 4,303(\text{sec}) \text{ about 72 minutes}$$

If the water level outside the surrounding levee is nearly 5m, discharge by natural flow will be difficult, so the gate of the surrounding levee will be closed and the system switched over to pump drainage.

Table 4.8.2 (4)-6 Araihaazar regulating reservoir data -3

	Retention pond		Canal		Total stored (m ³)
	Storage use depth	Stored (m ³)	Storage use depth	Stored (m ³)	
100ha development	1.5m	36,000	1.0m	6,000	42,000
Total development	(6.5~5.0m)	81,000	(6.5~5.5m)	16,000	97,000

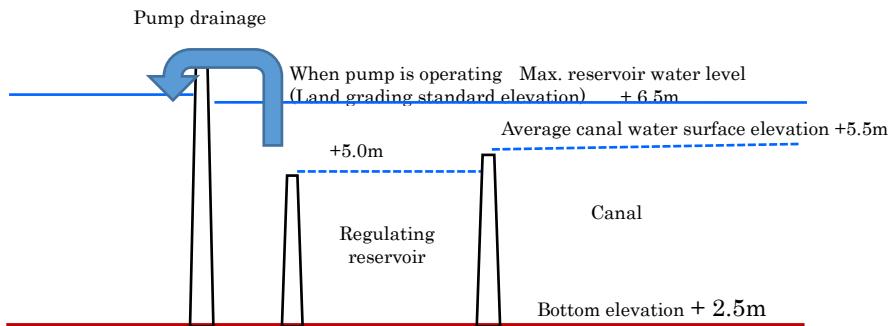


Figure 4.8.2 (4)-6 Retention pond and canal water levels during outer water flood (when pump is operating) at Araihazar

The study of pump capacity assumed the scale able to withstand 115mm/3 hours of the largest past rainfall of July 18, 2005 (source: SherpurEZ final Report).

Table 4.8.2 (4)-7 Data for pump capacity required at Araihazar

	3-hour runoff (m ³)	Storage capacity (m ³)	Required drainage quantity (m ³)	Pump capacity (m ³ /s)
100ha development	69,000	42,000	27,000	2.5
Total development	138,000	97,000	41,000	3.8

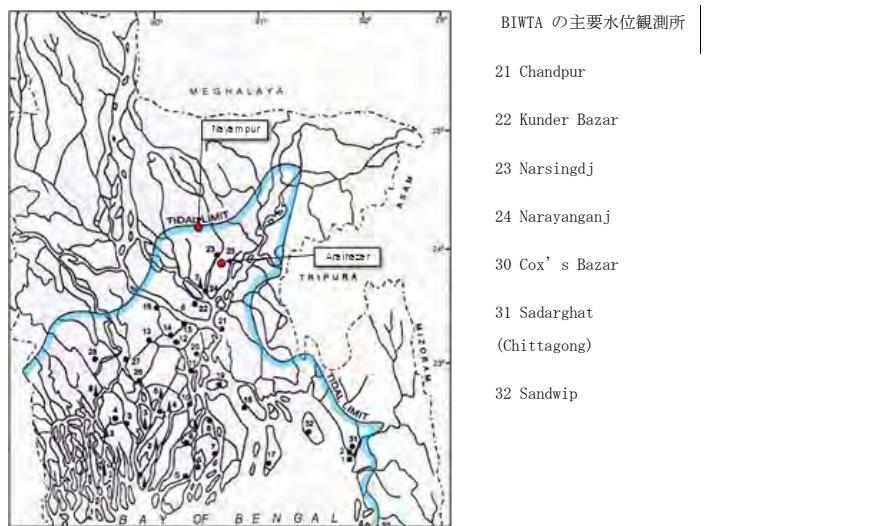
(Pump capacity is assumed to be the scale permitting three hours of drainage.)

3) Water supply plan

Water Sources

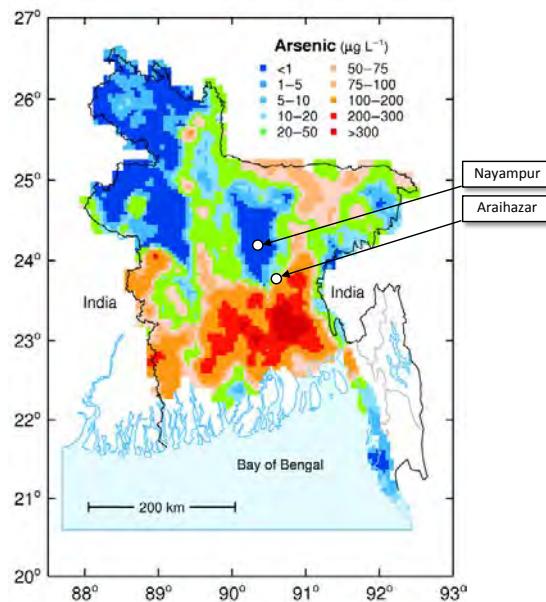
Since Araihazar EZ candidate sites do not have existing public water supply facilities, it is necessary to utilize the nearby rivers or wells as water sources. It is important to bear in mind the following points when using these water sources. In the case of river water, there is saltwater intrusion. In the case of groundwater, water intake capacity of underground aquifer and water quality should be confirmed (especially the presence of arsenic).

Position of Araihazar EZ site and the seawater intrusion region of rivers around Dhaka are shown in Figure 4.8.2(4)-7. Underground water regions that are possibly affected by arsenic are shown in Figure 4.8.2(4)-8. As can be seen from these figures, the nearby rivers of Araihazar EZ (the Shitalaksha River and the Meghna River) are likely to be affected by seawater, and the effect becomes stronger especially in the dry season. The area is located on the boundary line of an arsenic influence area (<10µg/Liter). It is necessary to confirm the possibility of a method of collecting groundwater from the aquifer that has low arsenic content.



Source: BIWTA

Figure 4.8.2(4)-7 Relationship of Seawater Intrusion Area of River Near Dhaka and EZ Candidate Site



Source: AAN

Figure 4.8.2(4)-8 Positional Relationship of Arsenic Contamination Distribution in Groundwater of Dhaka Surrounding Area and EZ Candidate Site

Well testing should be conducted before the implementation stage. The position, the depth, and the interval of wells should be determined based on the confirmation of the water supply capacity, the water level recovery time, and the change of groundwater level, which were confirmed by using the value of the aquifer depth, the water quality, and pumping test that were collected during well testing. Moreover it is necessary to prevent excessive depletion of wells due to excess water usage and the subsidence of surrounding ground.

The water source will be 200m deep wells. A past survey estimated the arsenic contamination concentration to be low enough to not be a problem. Wells used to pump up groundwater will be constructed at 2 places inside the 100ha initial development, 1 place inside the water supply

facility site, and 1 more on the opposite side of the main road. In the future, trial pumping must be done to confirm the quantity that can be pumped up and its impact on surrounding groundwater. To supply water to the future expanded area, it is presumed that it will be necessary to install pumping-up use wells in the expanded area.

Quantity of water supplied

The predicted attracted industries are assumed to be mainly manufacturing industries that use relatively little water, assembling and sewing for example, and the basic unit of the quantity of water used is considered to be $35\text{m}^3/\text{day}/\text{ha}$ for the total development area. And the total quantity is $3,500\text{m}^3/\text{day}$ for the initial 100ha development. In fact, the area of factory use land will be about 60ha, so it is about $58\text{m}^3/\text{day}/\text{ha}$. The water supply facility will be close to N2 so that construction is possible from the first stage at a location where it is expected to supply water to the future expanded area.

The basic unit of the quantity of water supply was set referring the forecasted demand that was described in 4.9.2.

Supplying water to fire hydrants

Assuming that one fire hydrant will cover an area with a radius of about 100m, fire hydrants will be installed at intervals of about 150m.

Water supply facility

The water storage tank scale will be equivalent to one day's requirement of $3,500\text{m}^3$. An elevated water tank will ensure capacity for about 1 hour.

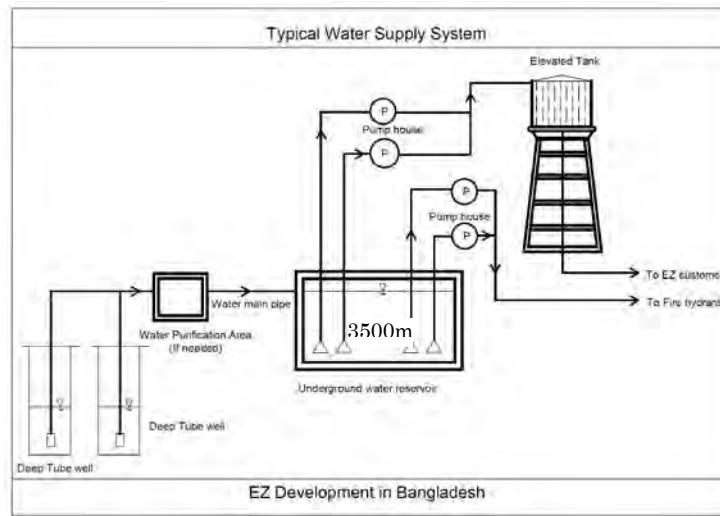


Figure 4.8.2 (4)-9 Outline of the water supply facility at Araihazar

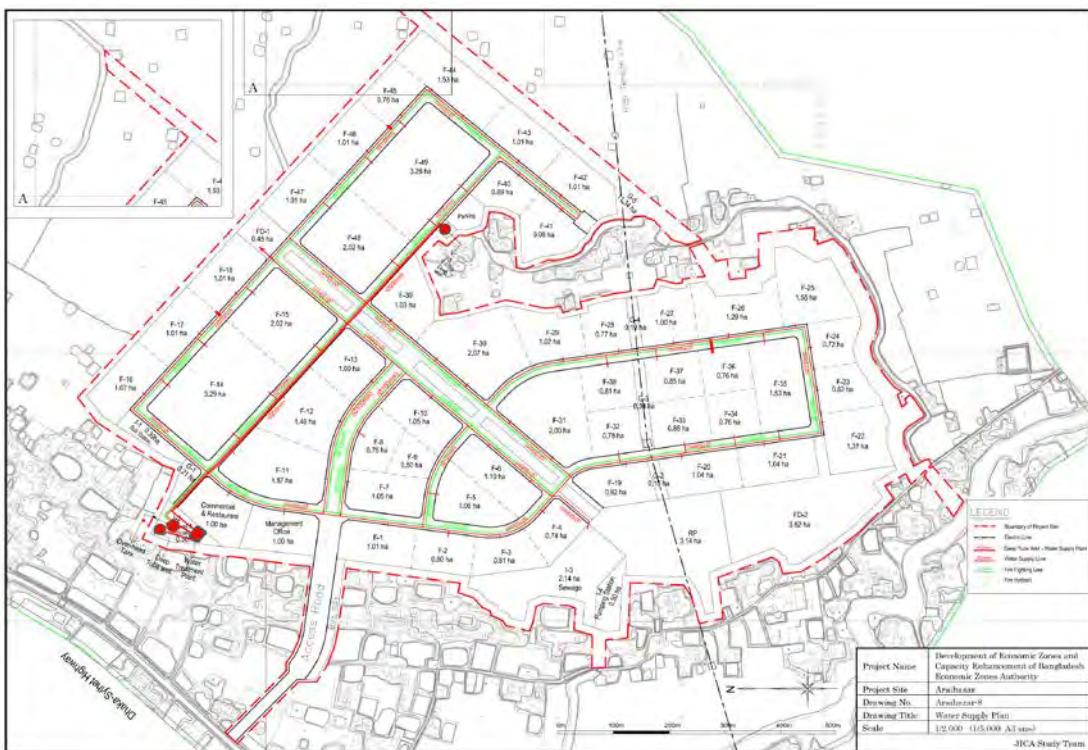


Figure 4.8.2 (4)-10 Araihaazar water supply plan

Table 4.8.2 (4)-8 Araihaazar water supply facility data

	Water supply facility	Data
1.	PVC Water-supply Pipes – 200 mm dia	1,150 m
2.	PVC Water-supply Pipes – 150 mm dia	4,700 m
3.	PVC Water-supply Pipes – 100 mm dia	1,200 m
4.	High pressure PVC Pipes, for hydrant – 100 mm dia	6,250 m
5.	Water connection terminal points (blank/sealed)	62 places
6.	Fire Hydrants on internal roads	65 places
7.	Underground Reservoir Tank	3,500m ³
8.	Overhead Reservoir Tank	150m ³
9.	Pumping Facilities (Water Supply, Fire hydrant)	2 systems, 4 pumps

4) Sewerage plan

Waste water treatment facilities

The scale of the waste water treatment facilities will be set to treat 80% of the quantity of water supplied, and in the future, will also treat the waste water from the expanded area. The waste water transport pipes on one side of the canal will be large enough to carry all the waste water from the expanded area. But the waste water from the expanded area will be pumped up by a relay pump at the end of the flow in the expanded area, and connected to the waste water pipe for the initial development.

The waste water treatment process will be the activated sludge method or other that can ensure treated water quality allowing it to be discharged.

Waste water discharged from each factory will be treated until it satisfies the wastewater reception standards shown in 4.4.7, then discharged through the waste water pipes.

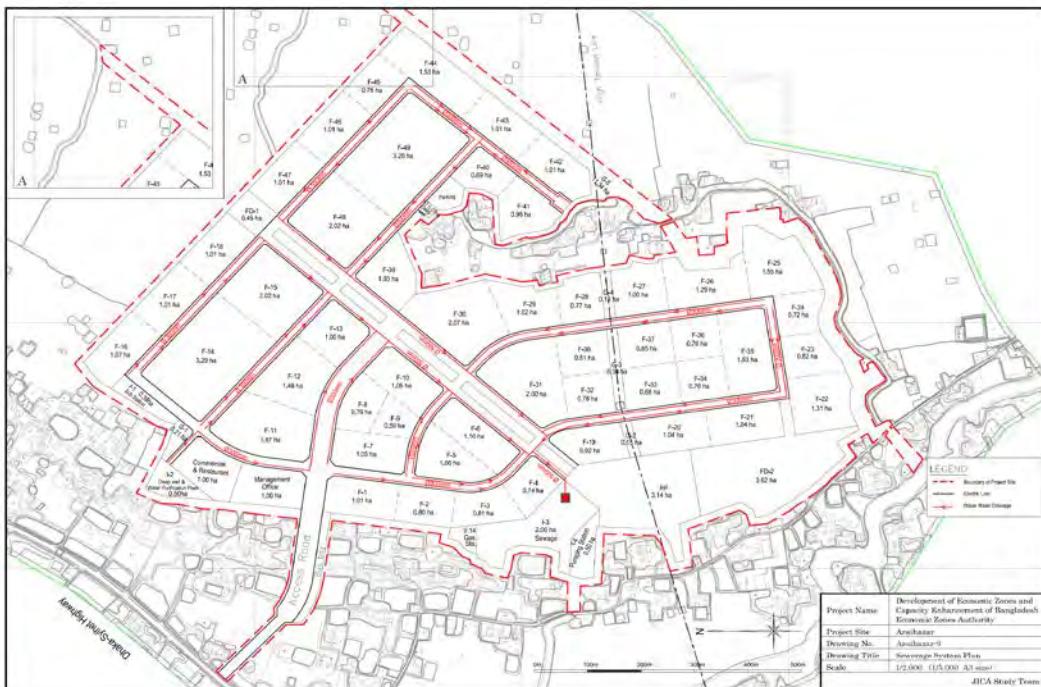


Figure 4.8.2 (4)-11 Araihaazar waste water treatment plan

Waste water pipes

Minimum diameter of 300mm, gradient of 0.3%, flow rate of at least 0.6m/s, and soil cover of at least 0.5m will be ensured.

Table 4.8.2 (4)-9 Araihaazar waste water pipe data

	Waste water pipe	Data
1.	Concrete Pipes – 300 mm dia.	8,250 m
2.	Concrete Pipes – 500 mm dia.	1,450 m

5) Electric power supply plan

Quantity of electric power supplied

The predicted attracted industries are assumed to be mainly manufacturing industries that use relatively little electric power, assembling and sewing for example, and the basic unit of the quantity of electric power used is considered to be 300kVA/ha for the entire development area. And for the initial 100ha development, a 30MW electric power transformer will be installed.

The basic unit quantity of electric power supply was set referring the forecasted demand that was described in 4.9.2.

To install the electric generation plant for that will supply electric power to the surrounding area will be a superior condition for attracting investors.

Transformer facility

It is assumed that 33kV will be received from outside, then converted to 33/11kV by a transformer in the EZ and supplied inside the EZ. The transformer will be close to N2 so it can be constructed at the initial stage at a location permitting it to supply electric power to the expanded area in the future.

Electric power supply lines inside the EZ will be buried underground along the main road considering the landscape of the EZ, while along the 20m wide road sections, they will be elevated considering costs.

Street lighting

Street lights able to ensure road surface luminance, 250W sodium lamps for example, will be installed.

Emergency power supply

An emergency power supply for street lighting, water supply facilities, waste water treatment facilities, and others requiring power during a power failure will be constructed on the transformer site.

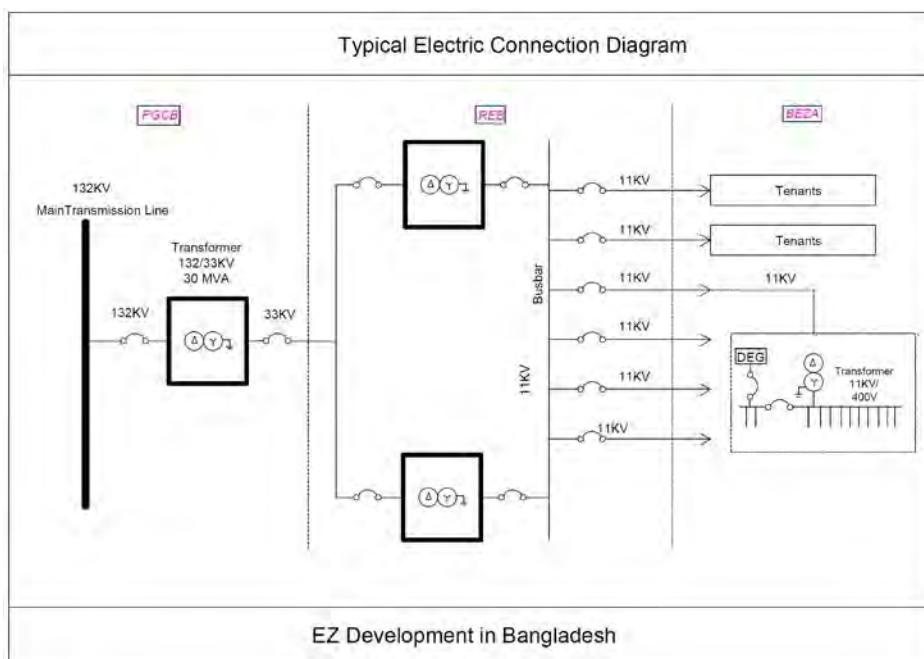


Figure 4.8.2 (4)-12 Outline of electric power reception/transformer plan for Araihazar

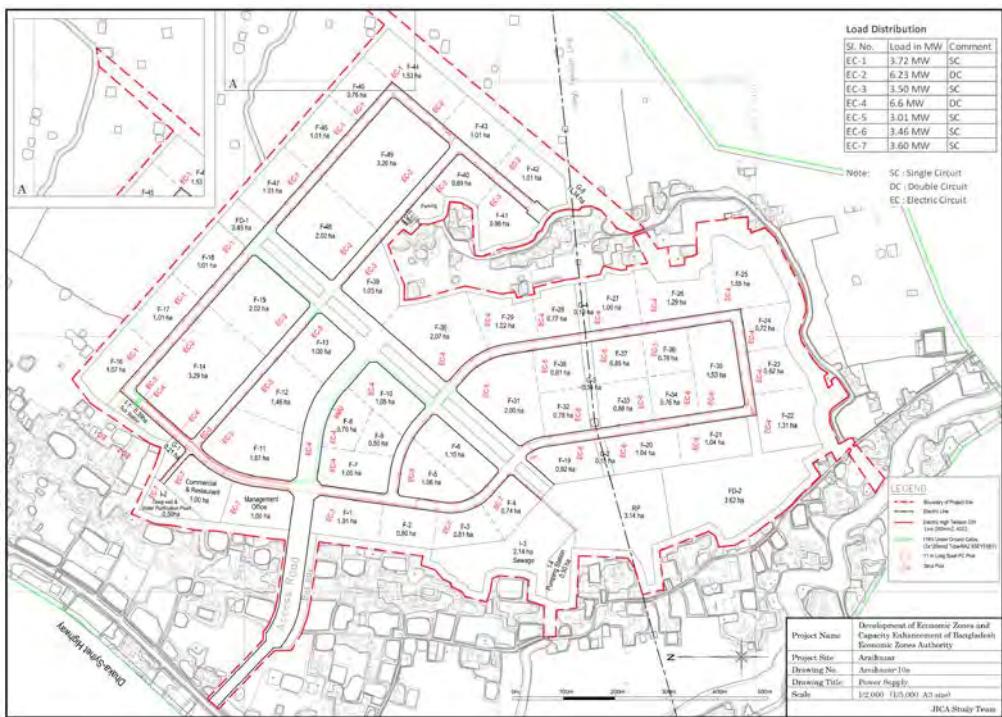


Figure 4.8.2 (4)-13a Araihaazar electric power supply plan

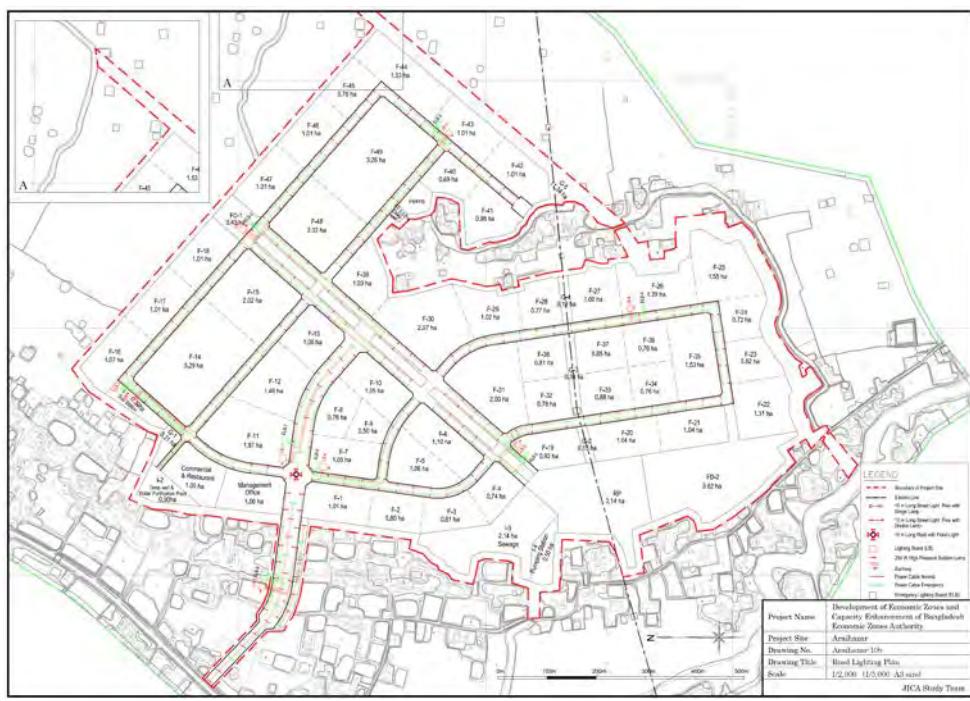


Figure 4.8.2 (4)-13b Araihaazar road lighting plan

Table 4.8.2 (4)-10 Araihazar electric power supply facility data

Reception/transformer equipment

	Type of facility	Data
1	33 KV Power Cable, 1C 400mm ² ,Type N2XHSY	900 m
2	33 KV Power Cable, 1C 240mm ² ,Type N2XHSY	330 m
3	33KV High Voltage Meter Cubicle	1
4	33/11KV Power Transformer 15 MVA	2
5	11KV Cable, Type N2XHSY,3 x 1C 240 mm ²	400 m
6	11KV Cable, Type NA2XSEYFGbY (3 x 120 mm ²)	2300 m
7	11 KV Ring Main Unit (RMU) with 3 nos. outgoings	1
8	Diesel Generator of different capacity	3

11KV elevated power supply line

	Type of facility	Data
1	11/12 m Long Spun PC Pole with Cross arm	186
2	Strut Pole	46
3	Stranded All Aluminum Conductor (AAC),3000mm ²	35000 m
4	11/.04 KV, 3 phase 15 KVA Transformer	3
5	11/.04 KV, 3 phase 20 KVA Transformer	3
6	11/.04 KV,3 phase 25 KVA Transformer	2
7	Power Cable Type NY _Y 4x16 mm 2	250 m

Street lights

	Type of facility	Data
1	10m Long GI Pole	374
2	15 m long Mast	1
3	High Pressure Sodium Lamp 250W	402 places
4	Metal halide Lamp 1000W	4 places
5	Light Distribution board	16 places
6	Power Cable	30,000 m
7	Service Cable	4400 m

6) Gas supply plan

The plan calls for gas supply pipes from a nearby gas station to be connected under the N2 road and the access roads. The gas pressure to be supplied and the pipes will be set according to the distance from the gas station and the quantity supplied, but it is assumed the gas will be supplied at 1,000 psi through pipes with diameter of 20 inches or smaller.

The following are considered as the nearby gas station.

Tarabo Municipality Sta.(Rupganj Upazila)

Meghna Ghat Sta. (along the Dhaka Chittagong highway)

In the EZ, gas supply facility use land will be ensured adjoining the waste water treatment facility use land. And use in the EZ is predicted to be general use rather than industrial use or power generation use, so gas will be supplied in 75mm diameter pipes.

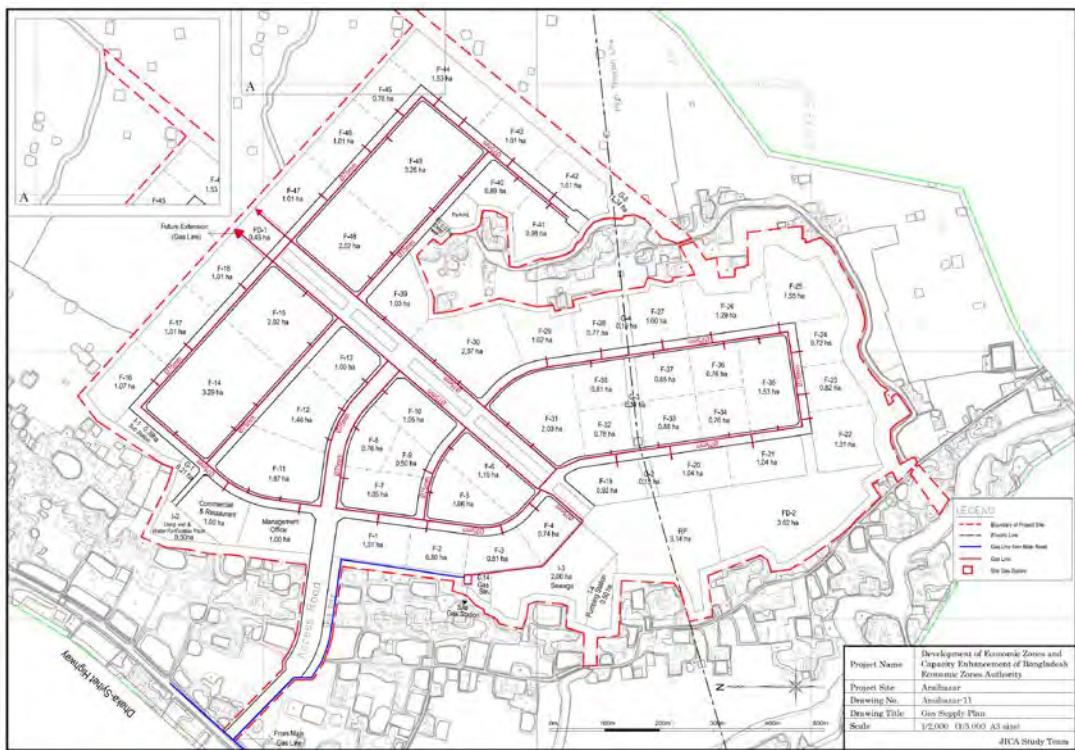


Figure 4.8.2 (4)-14 Araihazar gas supply plan

7) Solid waste treatment policy

At Araihazar EZ, solid waste (ordinary waste (kitchen garbage etc.), industrial waste) will be treated and disposed of by local treatment and disposal companies under contracts entered into separately with each attracted enterprise.

Therefore, the EZ will not construct solid waste collection plants and treatment/disposal plants.

8) Communication service policies

At Araihazar EZ, communication services will be provided by installing wire (optical fiber etc.) feed cables to provide services under contracts completed by each attracted enterprise with local service providers. The wires will be installed on electric power supply poles or in underground communication line use conduits following consultations with EZ management.

In Bangladesh, it is possible to obtain service from the following three kinds of communication companies.

Public switched telephone network (PSTN)

Mobile phone operators

Long distance operators (as per ILDTS Policy 2007)

International Gateway (IGW) operators

Interconnection Exchange (ICX) operators

International Internet Gateway (IIG) operator

Internet Protocol Telephone Service Provider (IPTSP) operators

International Terrestrial Cable (ITC) operator

The largest PSTN in Bangladesh is the Bangladesh Telecommunication Company Ltd. Mobile phone operators, which in this region include Grameen Phone, Teletalk, Robi Axiata, and Bharti Airtel, Banglalink, supply internet communication and call services.

As for IPTSP, there are more than 40 companies that supply internet communication services.

They offer both high-speed internet communication services and IP call services.

9) Logistics Center

Future manufacturing industries are assumed to be the following 11 kinds. AThe typical ratio of common medium-sized industrial zone in the ASEAN countries is adopted. About 57 ha of saleable lot area is estimated as the average factory site area of each advanced manufacturing industry in ASEAN and the cargo volume (container quantity) per site area, which was collected in a hearing with the manufacturing industry. Table 4.8.2(4)-11 shows the areas and import and export cargo volumes of relevant industries and relevant attractive ratio.

Table 4.8.2(4)-11 Number of EZ Tenants Companies and Estimate of Freight Volume

Manufacturing industries	Ratio (%)	Area (ha)	Area/Company (ha)	Number of company	Estimated generating unit		Estimated generation cargo volume			Estimated cargo volume per company (TEU/company/month)
					Import	Export	Total	Import	Export	
textile	15	8.5	1-1.5	8	28	33	511	234	277	64
Garment Accessories	26	14.8	14.8	1	28	33	886	406	480	886
Motorcycle assembly manufacturing	9	5.1	5.1	1	20	28	245	102	143	245
Automobile and motorcycle parts	5	2.8	0.8-1	3	20	28	136	57	80	45
Metal and non-ferrous processing	10	5.7	1.7-2	3	13	22	199	75	124	66
Electrical and electro	10	5.7	1.7-2	3	11	19	171	64	107	57
Machinery parts	5	2.8	1-1.8	2	22	28	142	62	80	71
General assembly	5	2.8	2.8	1	15	18	95	43	52	95
Plastic processing	5	2.8	1-1.8	2	20	40	170	57	114	85
Agricultural products	5	2.8	1-1.8	2	17	43	170	47	123	85
Pharmaceutical prod	5	2.8	0.8-2	2	11	19	85	32	53	43
Total	100	56.8			28		2,812	1,180	1,632	
					Annual handling capacity		33,739	14,160	19,579	

Source: Study team

The total annual import volume is about 14,200 TEU, and the total export volume is about 19,600 TEU. Hence, the estimated total volume is 33,800 TEU.

Non-domestic shipping cargo is expected to be imported and exported via the Chittagong port. EZ cargo transportation, temporary storage and containers for necessary cargo inside the EZ, and the area of empty containers are assumed to be implemented together with a customs clearance business by a logistics center responsible for attracting investments and planning in the EZ. The area of the logistic center site will be set as follows.

- Export container cargo warehouse: Total export volume / 360 days x 2 days (customs clearance days) x 15 m² / box = about 1,630 m² (35 m x 50 m).
- Empty container yard: (Total export volume - total import volume) / 360 days x 10 days (temporary storage period) = about 150 boxes / day / (2 stacks) = space of 80 boxes, 80 x 30 m² (15 m² / box + working space 15 m² / box) = about 3,000 m².
- Truck space in front of and behind warehouse: trailer loading width 20 m, truck unloading width 15 m, total 35 m x 50 m = about 2,000 m².
- Parking space of trailer and cargo-handling machinery: trailer 10 units x 18 m x 3.5 m + cargo handling machinery 2 unit (200 m²) = 850 m²;
- Office + parking space: 350 m² (Office 150 m², parking space 200 m²) Total: 1,200 m²
- Other necessary area, such as inside roads: about 40% of the total = 3,000 m²
- Total about 11,000 m² (minimum requirement)

The area of the logistics base is assumed to be about 2.0 ha, including the abovementioned required area, 9,000 m² required area for future logistic center site associated with EZ

expansion by private capital and the site of future Phase 2.

For the "transportation logistics infrastructure" section described in the previous chapter, the establishment of a Bangladeshi bonded transport system is the prerequisite for the establishment of a logistic center inside the EZ and the implementation of OSS. Therefore, it is important to keep step with preparation and planning of a bonded transport establishment.

(5) Basic Infrastructure Development Plan for Surrounding Area of Each Short-Term Planning EZ Candidate Site

As the Infrastructure Development Plan for the Surrounding Area of Araihazar, the following terms are thought to be the works of the Government of Bangladesh (GOB: EZ implementing agency). ①Access road connecting the EZ candidate site and the nearby national highways, ②gas supply piping, ③provision of land used for middle voltage to low voltage substation facilities as for power supply, ④provision of land used for logistic center facilities inside the EZ site. As for the business items, the responsible division of implementing terms, and the implementation method shown in table, more discussion is required among related entities including BEZA to ensure the smooth implementation of the project in the future.

Table 4.8.2 (5).1 Overview of Short-Term EZ Site Access Roads, Utility Facilities Planning

Facility items	Araihazar EZ
①Access Road	500 m access road connects the nearby national road N2 to EZ candidate site is Bangladesh side work of Government of Bangladesh (GOB) side.
②Sewerage System (On site infra.)	Living wastewater of each tenant factory (kitchen and toilet waste water) is treated by the central processing facility in the EZ candidate site. Industry wastewater from each tenant factory should be processed to an acceptable drainage level at each plant.
③Electric Power	PGCB responses for the transformers and transmission facilities of high voltage to medium voltage (132 / 33kV). Medium voltage to low voltage (33KV / 11kV) transformers / transmission facilities are conducted by REB. Additional cost maybe added to power cost in conjunction with the PGCB range. REB substation facilities are prepared in the EZ land. However, as for the power demand plan (including Phase 2 and later) the consultation and negotiation between BEZA and REB·PCGB based on the factories' tenant plans are required. In case backup power generation system for entire power demand of EZ was required, separate power plant by IPP will be established. BEZA will provide the lot area with similar incentives given to EZ As for the direct power transforming system from high to low Voltage (132/11 kV), if it was required, further confirmation and negotiation will be made among PGCB/REB and BEZA.
④Gas	Piping installation of 500 m length along the National Road N2 from the existing main pipes until EZ site is expected to be used for such as kitchen and steam boilers. (GOB side work). Gas supply unit cost needs to be decided based on the consultation and negotiation between the local gas company TITAS and BEZA.
⑤Communication	Carriers and tenants make contract directly, the communication line is installed by carriers
⑥Waste Treatment	Processing by contract with the outsourcing of waste disposal company with improvement of local government policies.

<p>⑦ Connection with the Dhaka Road Network Plan</p>	<p>The Bhulta Flyover will be started soon. In addition, the widening/improvement of the Dhaka bypass and National Road N2 will also be implemented by RHD. BEZA has an intention to connect between Dhaka Bypass and N2 directly with 4km road.</p>
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The current status and content for each item in the table from ① to ⑨ are shown below.

① Access Roads

The access road connecting Araihazar EZ candidate site and nearby National Highway N2 (Dhaka-Sylhet Expressway) is approximately 500 m long. The access road connecting Nayapur EZ candidate site and nearby National Highway N3 (Dhaka-Mymensingh Expressway) is approximately 2000 m long. Both of them are included in the project.

Access roads are designed with two lanes on each side. They also have space for a median strip, parking zones, sidewalks and utilities (power supply, gas, communication, etc.). The standard cross-section is shown in Figure 4.8.2 (5).1. Right of Way (RW) is assumed to be about 50 m including slope section. The following figure shows an example of the Nayapur EZ. In the case of Araihazar, because the road length is shorter, the parking zone width is wider than that of Nayapur.

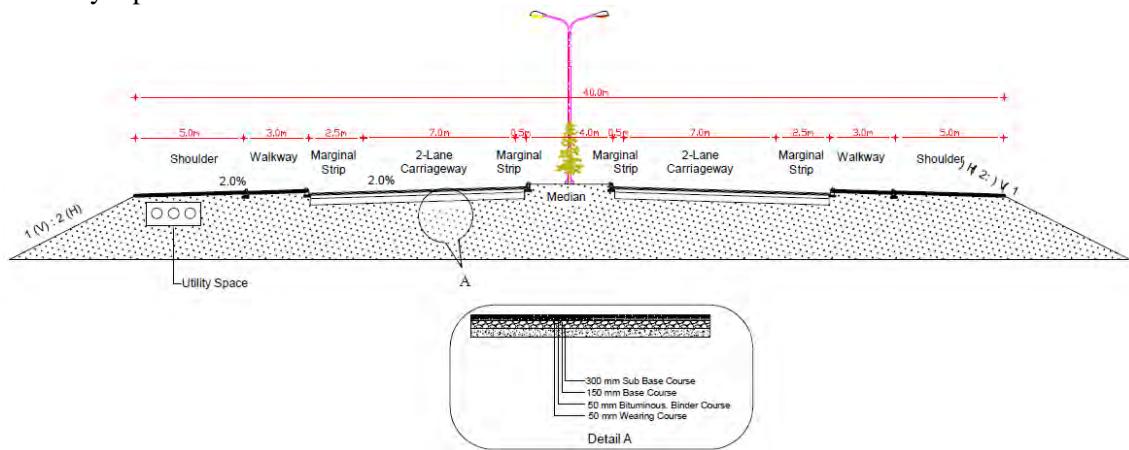


Figure 4.8.2 (5)-1 Standard Cross-Section of the Access Road

② Sewerage System

The living wastewater of each tenant factory (kitchen and toilet waste water) is dealt with by an internal infrastructure in the EZ candidate site and treated by the central treatment facility. As for industrial wastewater, each tenant factory should handle it to an acceptable emission level based on environmental regulatory standards.

③ Electric Power

Medium piezoelectric output of 33kV will be supplied to REB after being transited to a 132kV / 33kV transformer and transmission facilities by PGCB who controls the backbone network grid of Bangladesh. In addition, 11kV will be supplied to the consumers (BEZA) after being transited to a 33kV / 11kV medium / low voltage substation. BEZA supplies the power

of 11kV for the tenants of the EZ, then each tenant will transform 11kV to 220V / 440V. Electric power transformation and transmission systems up to 11kV are under PGCB and REB control, and the construction costs are to be reflected in the electricity cost. A diagram of the voltage/substation supply power distribution system management area is shown in Figure 4.8.2 (5).-2. The possibility of the power supply and substations of Araihazar and Nayanpur included in the short-term plan, has already been confirmed through a hearing with PGCB - REB by the study team. According to the REB of both sites, they will provide a transformer system of 33kV / 11kV if the land in the EZ is provided. In addition, BEZA has submitted to REB the power supply approval as shown in the following Table 4.8.2 (5).2. Assuming that, Araihazar and Nayanpur have the same scale.

Table 4.8.2 (5).2 Annual Plan of Power Usage Application that BEZA Submitted to REB

Application number	Name of EZ	Area ha (Acre)	Year					
			2016	2017	2018	2021	2023	2025
2	Sreepur (Nayanpur) EZ	206 (510)	5	60	100	105	110	115

Source:BEZA (May 2015)

Unit: MW

Substations of REB will be prepared inside each EZ site by REB. However, more detailed consultation and negotiation between the BEZA and REB - PCGB need to be conducted based on the specific power demand forecast, such as the power demand plan (including Phase 2 and later) and the tenant promotion plan to confirm and adjust the following terms: the possibility of power unit price, power priority supply (considered as exempt from blackout plans or not), cost allocation of substation facilities and land, and idle substation facilities cost allocation until tenants complete the movement.

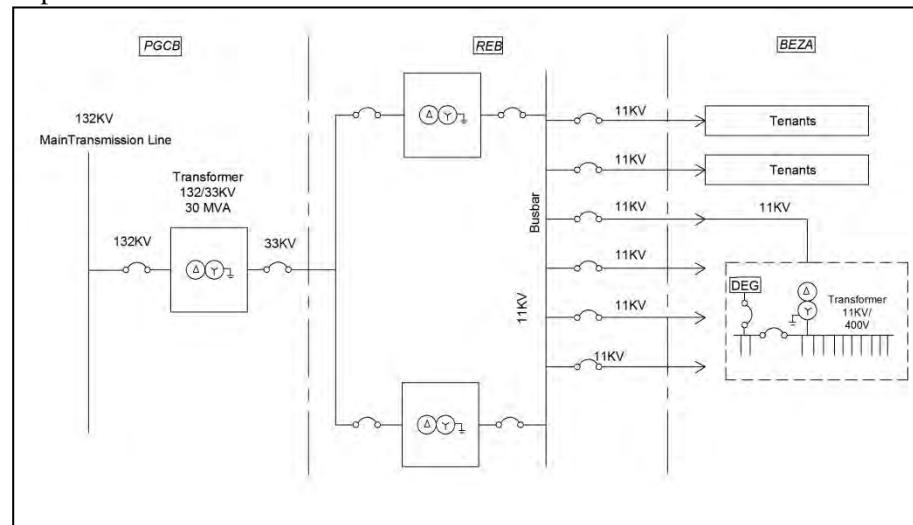


Figure 4.8.2 (5).2 Diagram of Electric Distribution and Substation Systems, and the Responsibility Areas and Voltage Divisions of Each Electric Power Company and BEZA

High Voltage Power Sub-Station:

In case that the direct power transformer system from high (132kV) to low (11 kV) voltage was provided in or nearby area of EZ site, confirmation and

coordination between PGCB, REB, and BEZA will be required. The possibility of individual power supply by PGCB and REB, however, were already confirmed including location of the power sub-station through previous hearing, the negotiation on the possibility of the system, cost share, implementation schedule and etc. would be conducted among the parties concerned.

Backup Power Generation System

Regarding the entire power demand of the EZ, as shown in the Figure 4.4.3 18 of the previous Chapter 4.4.3, if backup power supply is implemented (assumed to be about 50 MW/site for Araihaazar and Nayapur including Phase 2), domestic gas generation has the cheapest power generation unit price. Therefore, the power unit price will be cheapest if it is possible to receive gas supplied from TITAS. However, since TITAS' policy does not encourage private power generation, the possibility of gas power generation is considered to be low. Thus, normally the EZ will receive power from the grid of PGCB / REB, and the backup power supply should be used during power outage only. Backup power generation facilities are expected to be operated in July-September when power shortage occurs. It should be considered to establish a business in which backup power generation facilities are run as an IPP (independent power producer) for financially self-supporting in other idle periods. In summary, backup power generation facilities will preferentially supply to the EZ during power outage period while selling power to the mains grid of PGCB.

Although it is necessary to conduct a further detailed examination based on the adjustment of power companies and BEZA, usually in the scale of 20MW ~ 50MW, gas turbines or diesel engine power generation is main stream.

The power generation unit cost of coal power generation is lower than imported LNG. However, the difficulty of supplying coal fuel to the inland EZ sites, and the future trend of CO₂ processing might lead to an increase in the power generation unit price.

In past similar projects, construction costs of diesel oil-fired power generation are about \$800/kW. Simple calculation shows that approximately \$40 million is required for the scale of 50 MW.

BEZA provides an area of 20 ~ 30 Acres (8 ~ 12 ha) for the power plant construction site and gives it the same incentives as EZ land.

④ Gas Supply

The amount of gas usage in the sewing industry, food processing industry, and kitchens at Araihaazar, Nayapur is assumed to be about 1% of the total electric power energy including the expected power usage of Phase 2. Annual gas consumption is assumed to be about 26MMCFT / year / site (about 700,000 m³ / year / site). BEZA has submitted to TITAS the following gas utilization planning application (see Table 4.8.2 (5).3).

Table 4.8.2 (5).3 Gas Utilization Planning Applications that BEZA Submitted to TITAS

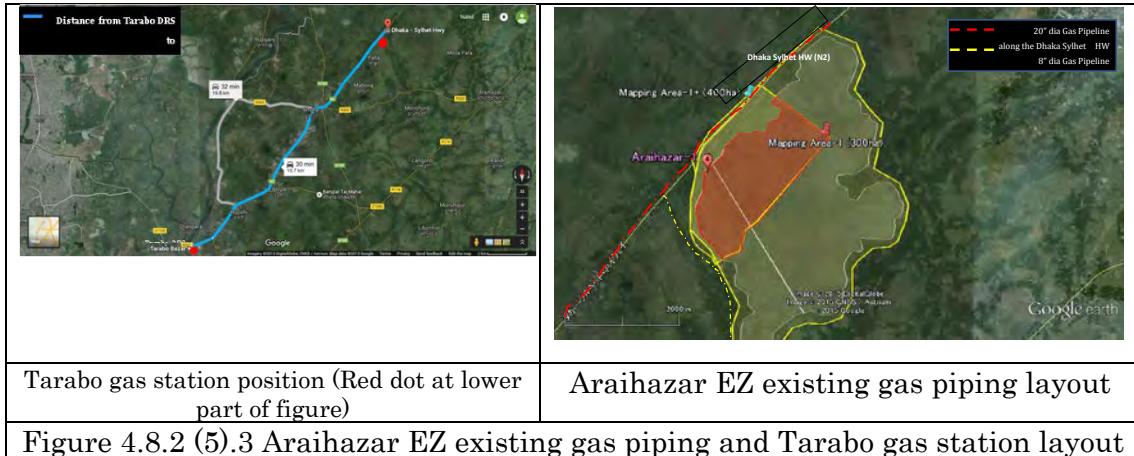
Application number	Name of EZ	Area ha (Acre)	Year									
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
2	Nayapur (Sreepur) EZ	206 (510)	-	10	12	15	20	23	24	25	25	26

Source:BEZA (May 2015)

Unit: MMCFT/year

The existing gas piping of Araihaazar EZ candidate site (main lines) is shown in Figure 4.8.2 (5).3. Araihaazar's gas piping uses φ20" and φ8" pipes. In order to connect to these existing

pipes, the φ8" mounting pipe will be installed along 500 m of the access road to the EZ site. Consultation and negotiation between BEZA and TITAS about installation time, gas supply pressure, and gas supply unit cost are required in the future. As for Araihazar, because the existing pipes have supplied gas for surrounding local people, it is necessary to consider the connection to the Tharabo gas station which is located at National Highway N2 and 16 km southwest of the EZ site.



⑤ Communication

Tenants should make contract directly to carriers. Communication lines are installed by carriers.

⑥ Waste Treatment

Waste disposal methods are thought to be a) special capping systems in the earth or b) high temperature incinerator processing. Both a) and b) reveal high initial costs for construction of EZ internal processing facilities. In addition, a) requires a large land area. a) and b) also receive claims from tenants in terms of environment and there is a tendency to hesitate to use these methods. These initial construction costs are often not implemented by developers because of the large burden on developers as well as the high management and operation cost requirements.

Therefore, it is also necessary to ensure consistency between the cost share of developers and the local government policy as providing the processing and disposal sites outside the EZ. At the present Pre-FS level stage, with the improvement of local government solid waste processing, disposal policies and plans due to construction of the EZ have not been implemented yet. However, it is thought that it is possible to process in direction that the local government and the private traders will response for the improvement. It is assumed that measures will be decided in the embodying stage of EZ development, and outsourcing contraction will be adopted at the present stage..

⑦ Connection and Traffic Capacity of the Dhaka Road Network Plan

The following Table 4.8.2 (5)-4 shows the summary table of the main roads that are excerpted from RSTP (Strategic Transport Plan for Dhaka, JICA). As mentioned in the previous chapters, this table also shows the widening and improvement of the Dhaka Bypass around Araihazar, the Bhulta Flyover, the National Highway N2 widening, the flyover connecting Nayapur and Dhaka, the widening and improvement of the National Highway N3 up to Mymensingh and their budgets. Some of those have been implemented. In addition, in the 2035 demand planning, one-way traffic with daily traffic volume of 50,000-100,000 units (pcu: in terms of the number

of passenger car units) is estimated.

In addition, the number of daily transported containers for the EZ candidate site is about 50-100 units / day of 40' container. As for commuting of employees who occupy a large part of the EZ traffic volume, assuming that the number of employees is about ten thousand people, then it about 500 to 1,000 units / day, i.e. 2,000 units / day in pcu, so it is considered to be sufficient in terms of traffic capacity.

Table 4.8.2 (5)-4 Overview of Dhaka Surrounding Main Road Project

Sl No	Description	Main Area	Road Category	Type of Project	Lane Number (Existing)	Lane Number (Proposed)	Length (km)	Road Specification	Project Cost (Tk Crore)	2035 Traffic Flow (pcu/day per both directions)
E1	Dhaka Elevated Expressway	DCC	Expressway	New Road	0	4	19.7	Expressway (Toll Road)	8,940	96,500 A
E2	Dhaka - Ashulia Elevated Expressway	RAJUK	Expressway	New Road	0	4	38.2	Expressway (Toll Road)	13,654	83,500 B
E3	Dhaka - Chittagong Access Controlled Highway (Kutubkhali - Outer Ring Road)	RAJUK	Expressway	New Road	0	4	15.6	Expressway (Toll Road)	1,501	63,000 B
E4	Dhaka - Sylhet Expressway (N1 - Outer Ring Road)	RAJUK	Expressway	New Road	0	8	15.7	Expressway (Toll Road)	795	47,600 C
E5	Dhaka - Mawa Expressway	RAJUK	Expressway	New Road	0	4	17.7	Expressway (Toll Road)	5,169	76,000 B
E6	Dhaka - Mymensingh Expressway	RAJUK	Expressway	New Road	0	4	19.4	Expressway (Toll Road)	983	83,100 B
P1-1	N1 / 2nd Kauchpur Bridge and rehabilitation of existing Bridge	DMA	Primary Road	Widening (Bridge)	4	8	0.4	Bridge	-	84,000 B
P1-2	N1 / 2nd Mehdia Bridge and rehabilitation of existing Bridge	Outside RAJUK	Primary Road	Widening (Bridge)	2	6	0.9	Bridge	-	Unknown
P1-3	N1 / 2nd Gomtai Bridge and rehabilitation of existing Bridge	Outside RAJUK	Primary Road	Widening (Bridge)	2	6	1.4	Bridge	-	Unknown
P2	N2 / 4-Lane Flyover at Bhulua - Sylhet National Highway	RAJUK	Primary Road	Grade Separation	0	4	-	Grade Separation	-	Unknown
P3	N3 / Improvement of Joydehpur - Mymensingh Highway	Outside RAJUK	Primary Road	Widening	2	4	87.2	Type 2a	1,931	74,800 B
P4-1	N4 / 4-Lanning of Joydehpur-Chandna-Tangail Road (National Road -4) under SASEC	Outside RAJUK	Primary Road	Widening	2	4	13.7	Type 2a	657	67,800 B
P4-2	N4 / 4-Lanning of Joydehpur-Chandna-Tangail Road (National Road -4) under SASEC	Outside RAJUK	Primary Road	Widening	2	4	56.3	Type 2a	2,698	Unknown
P5	N8 / Improvement into 4-lane: from 1st Buriganga Bridge to Padma Bridge Mawa link	Outside RAJUK	Primary Road	Widening	2	4	25.8	Type 2a	359	72,200 B
P6	N105 / Upgrading of Dhaka Bypass to 4 Lane (Joydehpur - Debogram - Bhulua - Madanpur)	RAJUK	Primary Road	Widening	2	4	7.0	Type 2a	219	59,400 C

Source: RSTP

Connection with the Dhaka Road Network Plan

As for an initial implementation of the Dhaka Metropolitan Area Road Improvement Plan (Chapter 4.4.3, Figure 4.4.3.2), BEZA showed an intention of constructing a road connecting the area near the Kanchan Bridge of Dhaka Bypass and the National Highway N2, which directly connects to Araihazar (See Fig 4.8.2 (5).4).

This road has an approximately 4 km length, 1.5 m wide median strip, 5.5 m wide driving lanes on both sides and 1.5 m wide shoulders. The average embankment height is estimated to be about 3 m. The construction cost is 190 million Taka / km and about 760 million Taka for 4 km.



Figure 4.8.2 (5).4 Proposal of Dhaka Bypass and National Road N2 Connection Road that Directly Connects to Araihazar EZ



Figure 4.8.2 (5).5: Perspective Drawing for Araihazar EZ Project

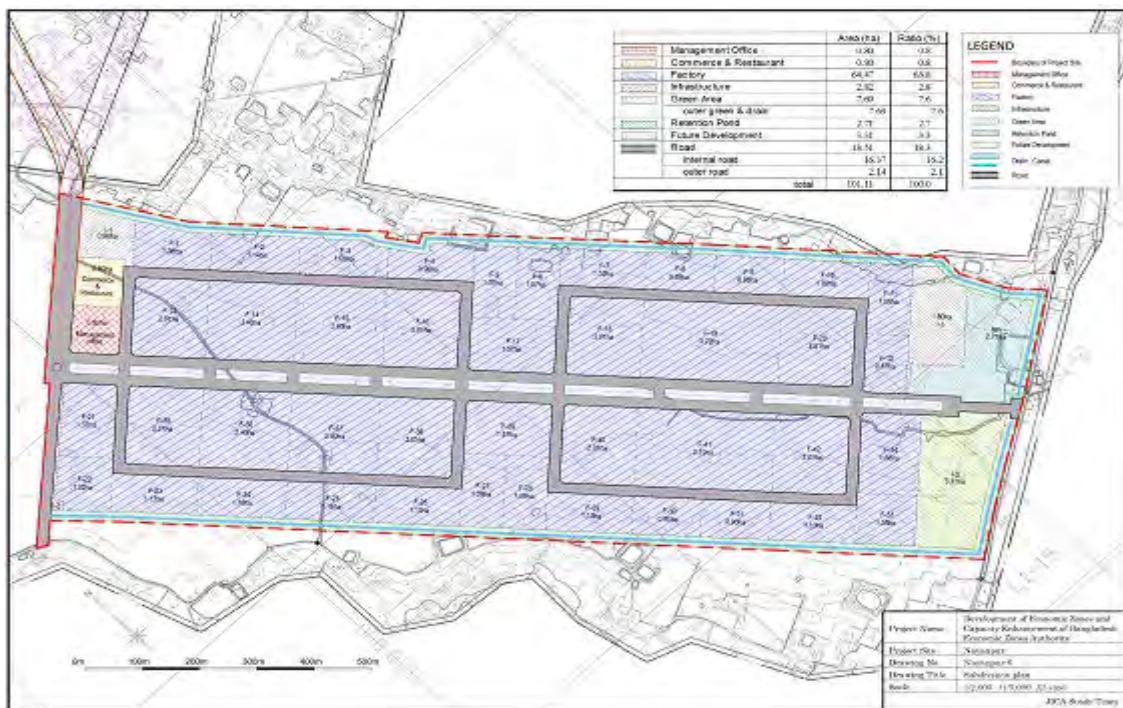
4.8.3 Basic Plan for Short-term EZ Development (Nayanpur)

Outlines of Araihazar EZ Development Plan

Development Method	To be developed as one of the G to G EZs initiated by the Governments of Bangladesh and Japan under a PPP scheme by participating Japanese Developer
Development Concept and Advantages	Development concept of the Project focuses a Multiple Export-oriented EZ but domestic-market oriented industries shall also be pursued. The EZ shall be developed as a competitive EZ against the similar facilities in the neighboring countries and equipped with a full line of the infrastructures of global standard, competitive business environment, highest investors satisfaction by One-stop-services (OSS), due consideration to environment and society, and low-cost operations.
Major Functions	A comprehensive support services to all the affairs required to invest and operate within the EZ premises shall be provided by OSS, in addition to all the key facilities such as custom house, security and guard, custom services, commercial and logistic services.
Industries to be promoted	Apparel and RMG, Garment Accessory, Textile and Knit-wares, Home-textile, Motor-cycle and its parts, Automobile and its parts including Wire-harness, Metal and Nonferrous Metal, Electric and Electronic, Machinery, Assembling, Plastic Processing, Agro-processing, Medical and Pharmaceutical, Health Foods, Cosmetics, among many others.
Implementation Schedule	Implementation Schedule is tentatively set to commence the site construction at the end of 2016 and to accepting investment at the end of 2018.
Development of Off-site Infrastructure	All the off-site infrastructures such as power and gas supplies shall be developed by capitalizing ODA funds.

Land-use and Plotting Plan

With due consideration to the natural conditions at the site and future extension plans to phase-II, the land-use and plotting plans are developed in order to maximize the salable land within the premises by placing an access road and other infrastructures keeping the future extension of the Project in mind. As to the plotting plan in the phase-I, more than half of the salable area are allotted to 2.0ha – 3.0ha of plot which are easily combined and or divided depending upon the market demands.



(1) Summary of Basic Plan

Nayanpur candidate site for short-term EZ development has been comprehensively selected as the second priority development site through selection procedure for short-term EZ development sites.

In the view points of the storm water drainage plan and the infrastructure plan, the EZ planned area has been specified that the 100ha downstream side is developed as the first phase EZ development and remaining 100ha upstream side will be developed as the second phase EZ development. The first phase of Nayanpur EZ development has been formulated.

As for the infrastructure planning for the first phase EZ development, the access road from the national highway, the internal road network, storm water drainage network, flood retention pond including pumping system, water supply system, waste water treatment system, sub-station, gas supply system, etc. have been planned in the EZ area.

Because the flood retention pond, water supply system, waste water treatment system, sub-station, gas supply system shall be arranged in the first phase area considering demand forecasting for the second phase development, the ratio for factory lots for the first phase is less reduced. However, in the second phase development, the ratio for factory lots become relatively increased, since the infrastructure facilities except the internal road and the storm water drainage system are need not to be arranged.

The land use plan for the first phase of Nayanpur EZ development is illustrated in Figure 4.8.3-1.

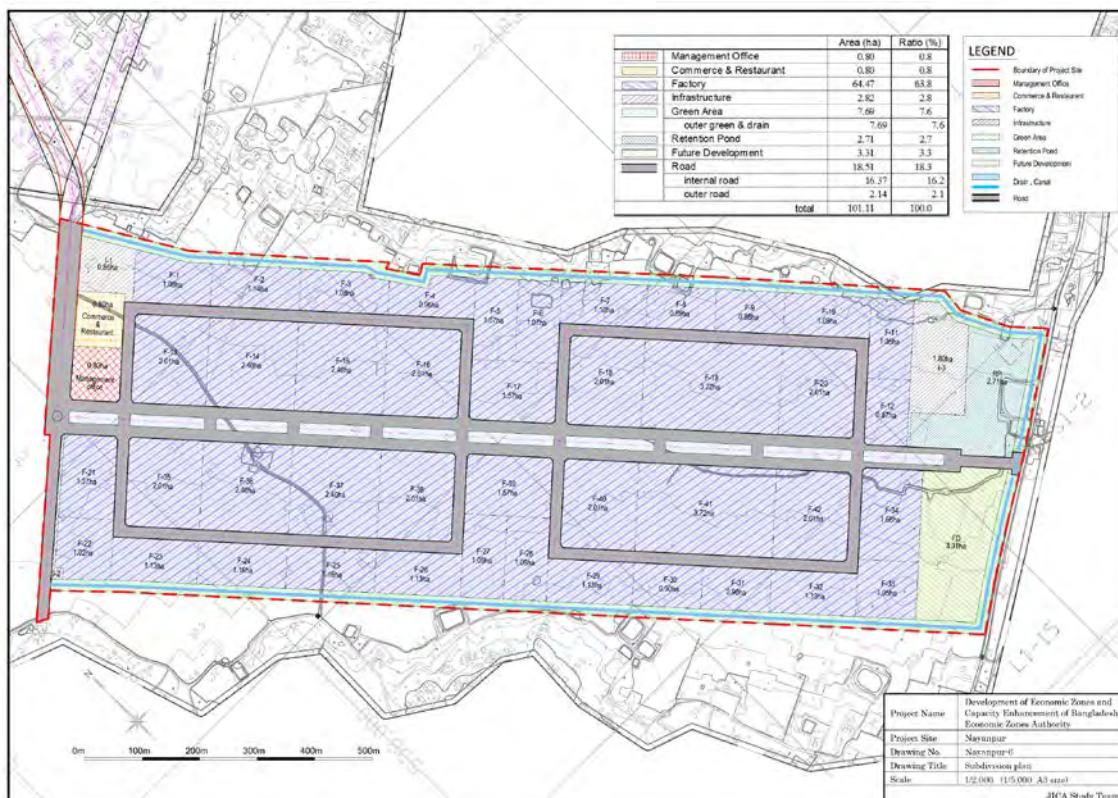


Figure 4.8.3-1 Land Use Plan for First Phase of Nayanpur EZ Development

(2) Site Natural Condition

In Nayanpur short-term EZ development area, 100ha as the first phase in the downstream side and remaining 100ha as the second phase in the upstream side are specified for planned area, and prepared for topographic map shown in Figure 4.8.3-2.

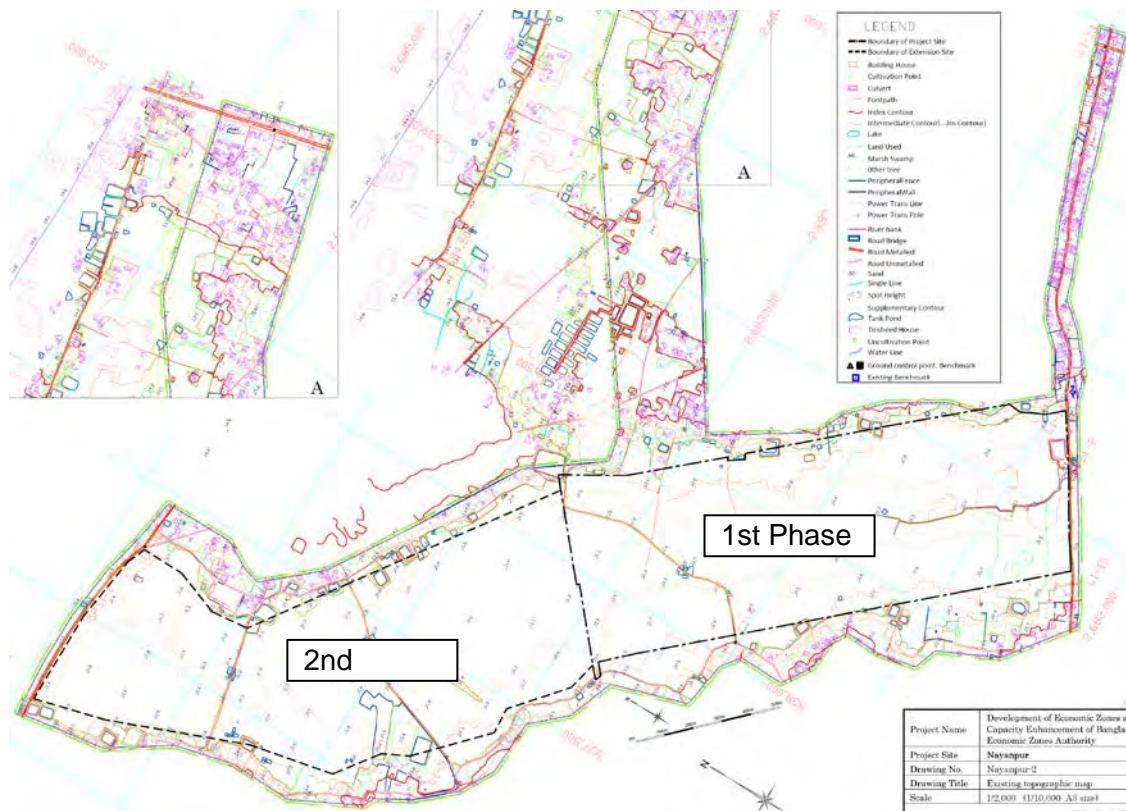


Figure 4.8.3-2 Topographic Map of Nayanpur Site

This EZ candidate site extends northwest to southeast, and is 500 ~ 800 m wide in the east-west direction and 4 km long in the north-south direction. This EZ site has been used for agricultural land such as rice paddy fields. Elevation is approximately MSL + 11.3 m to + 11.5 m, i.e. it is a substantially flat area.

The highest point is about MSL + 11.8 m, located in the second phase expansion planned site of the EZ candidate site. This point becomes the dividing ridge of the waters and there is a creek (about 1 m to a few meters wide) that diverts to the north and south.

The southern stream joins the Buriganga River located south of Dhaka City, downstream. The northern stream joins the Shitalaksha River. This candidate site forms a divide of north and south direction on the broad watershed of Dhaka City and the northern suburbs.

The east-west end of the candidate site has a stair-step topography, a few meters high. The eastern side of the candidate site has elevation from MSL + 13 to 17 m with scattered low-density forest, houses, farmlands and reservoirs (fish ponds). Above the eastern side is the highest area of National Road N3 and is the catchment basin of rainwater from the national

highway to the eastern side. The western part of the candidate site also has stair-step topography of few meters high, forming a hilly topography of less than + 13 to 20 m. The hilly topography area is 1 km from the west end and became the dividing ridge of the water. Western rainwater beyond the ridge does not flow onto the candidate site but to the sides. Hence, the largest width of the catchment basin on the east-west direction is about 3~5 km.

Because ground elevation of the candidate site is higher than the past flood level of the Padma River, Buriganga River, and Shitalakshya River, it is not affected by these rivers' floods. However, this site is affected by the rainwater flowing out of the previously mentioned area of hilly topography. Current farmland of 500~800 m width on the EZ candidate site is working as a drainage ditch. However, this farmland will be filled up during project implementation. Hence, it is necessary to ensure the canals' locations for rainwater on the east and west sides of the candidate site.

(3) Land Use Plan

As for 100ha area for the first phase EZ development, the land use plan has been prepared so as to allocate suitable sailable factory lots as large as possible over planning arrangement of proper access road and infrastructure facilities in consideration of the shape of the area, altitude and inclination of the land, existing land use, integration with the second phase, etc.

The land use allocation of the phase-1 of Nayanpur EZ development is shown in Table 4.8.3-1. The ratio of sailable factory lots in the Phase-1 is relatively smaller than those in the phase-2, because service facilities, such as the management building, and infrastructure facilities, such as the retention pond, water supply, waste water treatment facilities, etc. for both the phase-1 and the phase-2 are allocated. It is noted that the land use allocation of the phase-2 is provisionally assumed from the land use allocation of the phase-1 for provisional reference.

Table 4.8.3-1 Land Use Plan Allocation of Nayanpur EZ Development

	LAND USE PLAN	Phase-1		Phase-2		Total (Phase 1 + 2)	
		Area (ha)	Ratio (%)	Area (ha)	Ratio (%)	Area (ha)	Ratio (%)
A.	Factory Lots	64.47	65.14%	75.60	75.60%	140.07	70.40%
B.	Service Facilities	1.62	1.64%	–	0.00%	1.62	0.81%
C.	Road	16.42	16.59%	17.00	17.00%	33.42	16.80%
D.	Retention Pond	2.71	2.74%	–	0.00%	2.71	1.36%
E.	Other Infrastructures	2.75	2.78%	–	0.00%	2.75	1.38%
F.	Green Area	7.69	7.77%	7.40	7.40%	15.09	7.58%
G.	Future Development	3.31	3.34%	–	0.00%	3.31	1.66%
TOTAL		98.97	100.00%	100.00	100.00%	198.97	100.00%

Plot Plan

The plot plan of factory lots in the phase-1 land use plan has been assigned based on the attracting industries in the development concept, as shown in Table 4.8.3-2 as follows:

Table 4.8.3-2 Factory Lot Plot Plan for Nayanpur Phase-1 Development

PLOT PLAN		Area (ha)	Ratio (%)
A.	Factory Lot (39 lots + 3 lots)	64.47	100.00%
	0.5ha~ 1.0ha (5 lots)	4.44	6.89%
	1.0ha~ 2.0ha (20 lots)	23.56	36.54%
	2.0ha~ 3.0ha (12 lots)	25.68	39.83%
	3.0ha~ (2 lots)	7.44	11.54%
	Rental Factory (F-21 & 22)	2.39	3.71%
	Logistic Center (F-4)	0.96	1.49%

It results that the number of 2.0 ha – 3.0 ha plots allocated in Nayanpur phase-1 development is more than those of Araihazar, because of better shape of land of Nayanpur. It is noted that the plot plan of factory lots can be divided or combined flexibly in accordance with actual market demand.

In Nayanpur phase-1 development, 2.4 ha and 1.0 ha are arranged for the Rental Factory (total floor area is 20,000 m²) and the Logistic Center respectively. However, it is possible to arrange it as the factory lots when the market demand is a little. Total floor area of the Rental Factory in the phase-2 development is assumed 30,000 m².

Land Grading Plan

The land grading elevation for Nayanpur EZ development has been decided as follows:

The probable high water levels at existing gauge stations of Bangladesh are calculated for each defined return period. Then the high water level of each candidate EZ site was calculated by the weighted average method, based on the calculated probable high water levels of nearby water stations (3 locations for each EZ site).

The difference between calculated probability water level and the terrain elevation obtained by other methods, such as digital mapping, is the minimum value of land grading height (thickness). The final site formation height is the sum of land grading height, margin height for rainwater drainage, and freeboard (Further explanation will be made in the next report).

<Planning Policy>

- Maximum flood level is EL. 11.95m.
- The standard land grading level is set at EL. 12.5m against EL. 11.5m existing ground level, where factory lot is not flooded even if maximum flood occurs or drain pumps not working.
- The top elevation of the bank is set at EL. 14.0m which is surrounding local ground level. When the water level is higher than the water level inside, water is drained by pumps.
- Surplus water shall be retained in the retention pond with the balance between runoff coefficients after the development (0.6) and before the development (0.3).

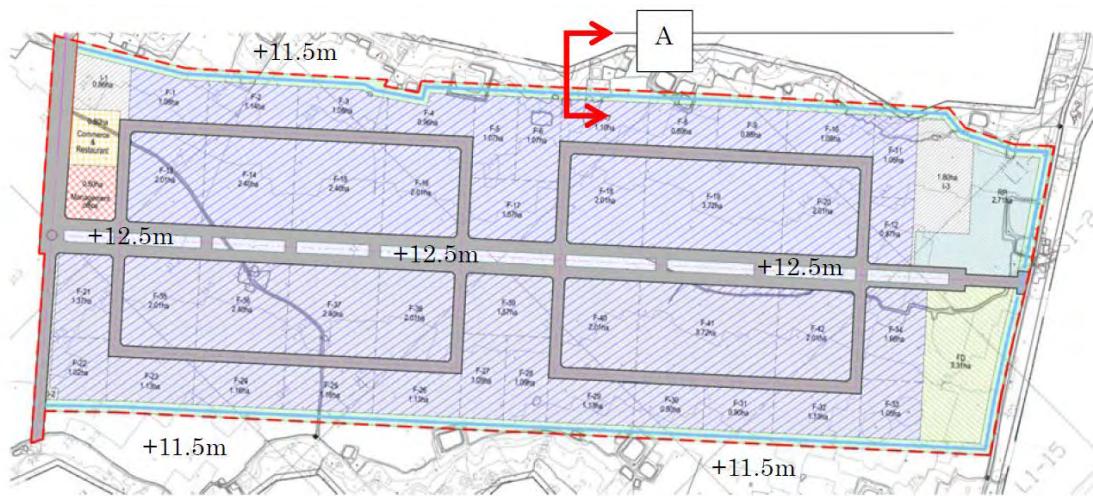


Figure 4.8.3-3 Land Grading Plan for Nayanpur Phase-1 Development

(4) Onsite Infrastructure Planning

1) Road plans

Access roads

An access road was planned connecting to the industrial park from N3 (Dhaka – Mymensingh Highway). This access road will be a public road instead of a private road. The following map shows 2 options. This project is planned based on a proposal to build a new road directly from N3 in op-1.

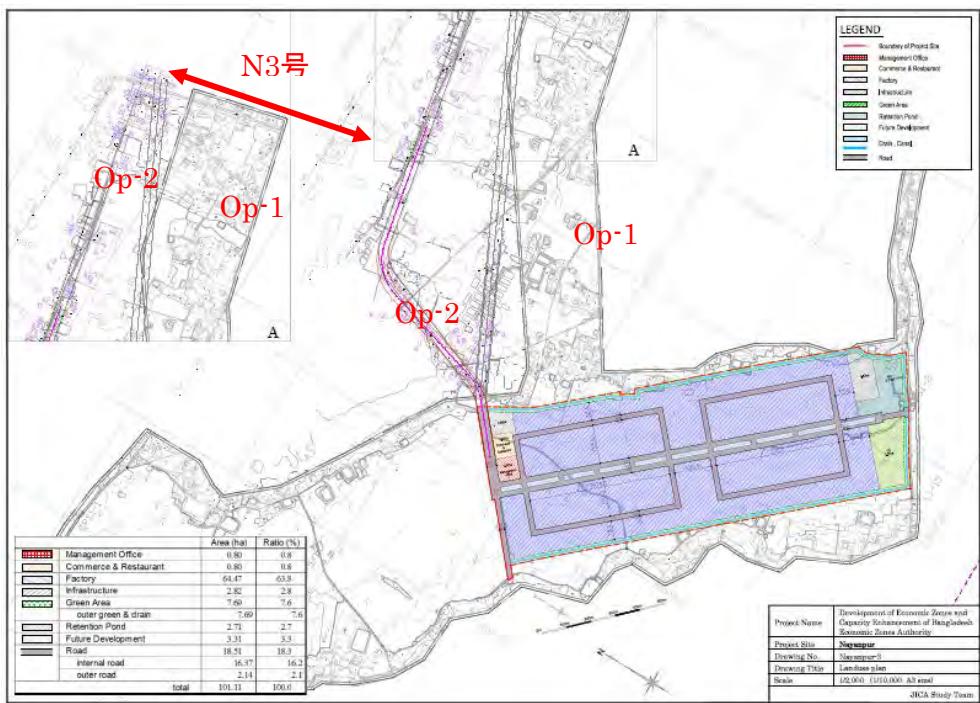


Figure 4.8.3 (4)-1 Nayapur access road plan

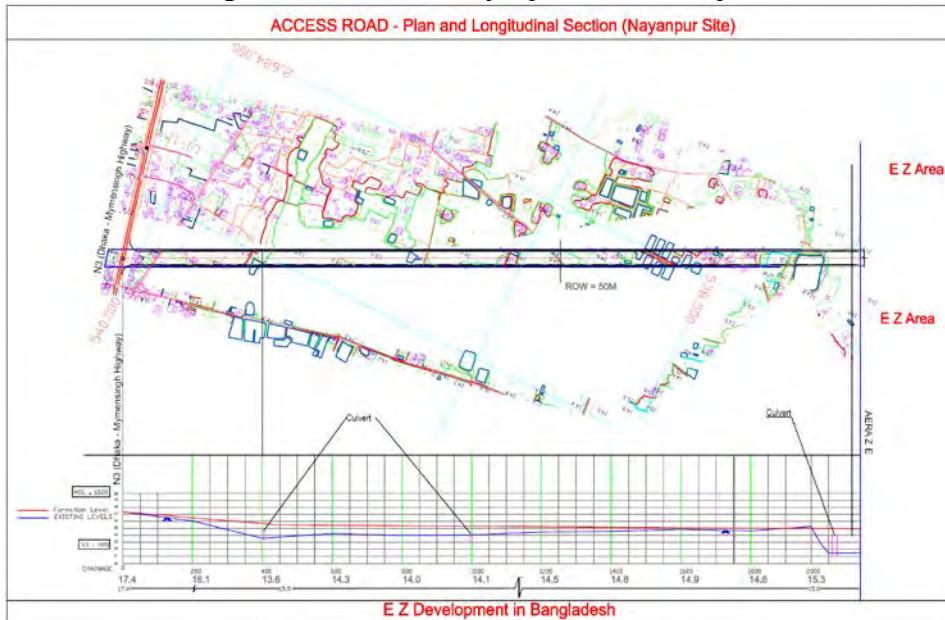


Figure 4.8.3 (4)-2 Planned section of the Nayapur access road (op-1)

Internal roads

Inside this EZ, a road from the gate across the center of EZ will be the internal main road and will have four lanes. And the internal roads from the main road to each block will have 2 lanes. All internal roads will be planned to ensure width of 2.5m as the shoulders on the sidewalk side of each road so that accidents and trucks etc. parking while waiting will not obstruct traffic.

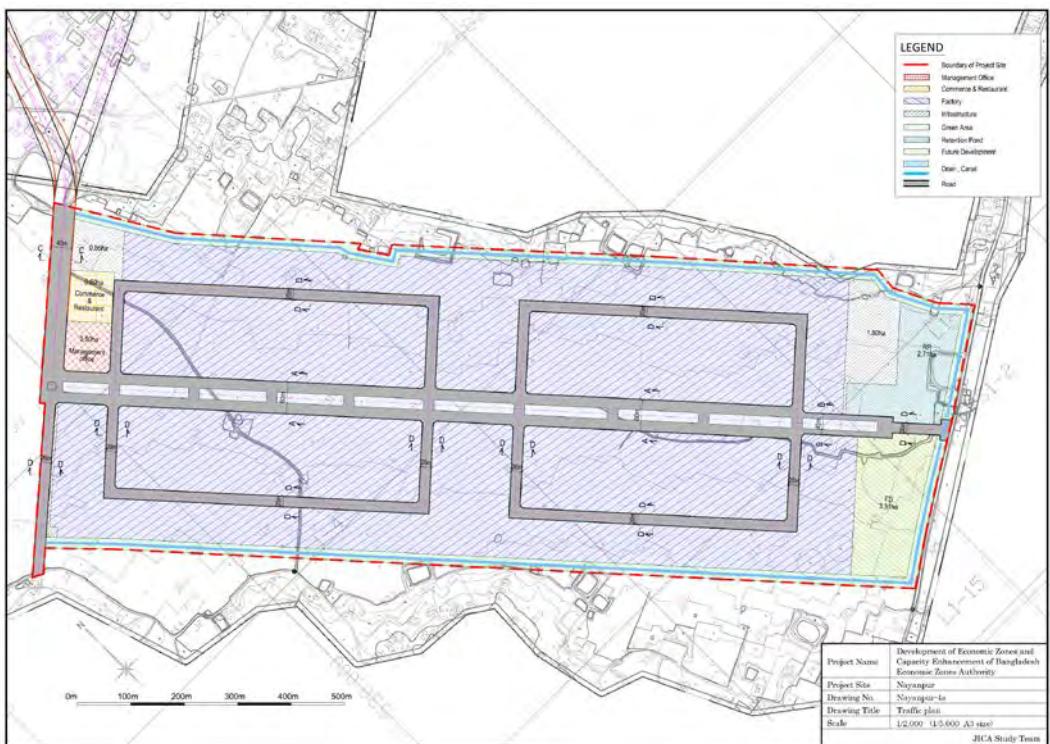


Figure 4.8.3 (4)-3 Nayanpur road plan

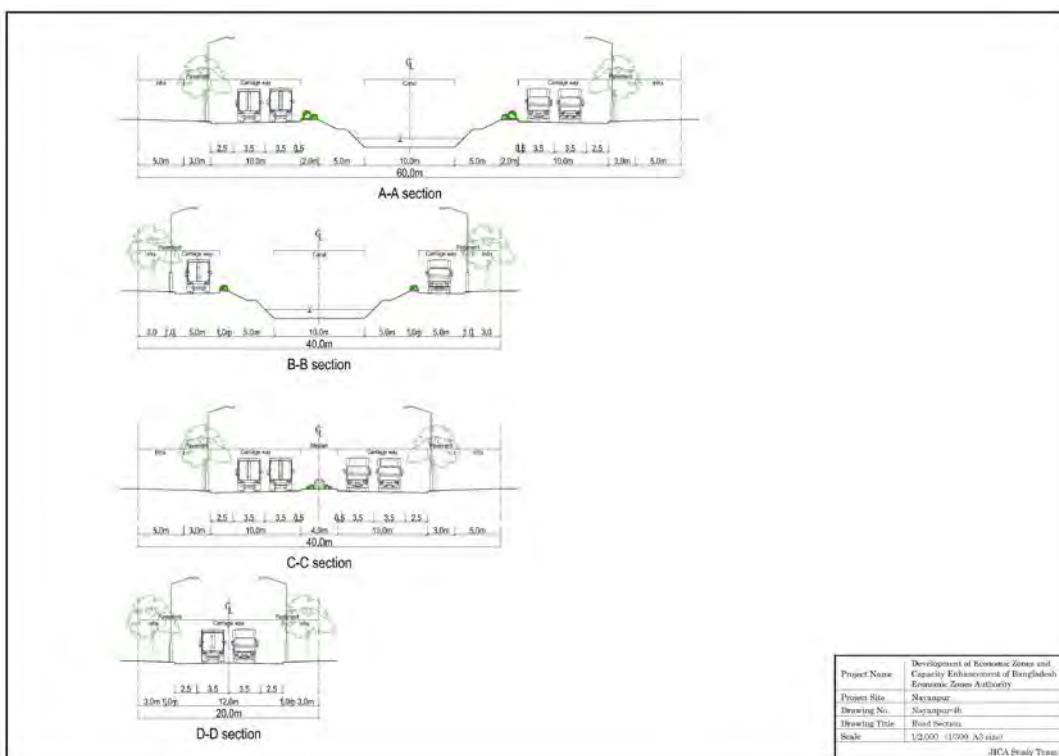


Figure 4.8.3 (4)-4 Nayanpur road section plan

Road areas

Table 4.8.3 (4)-1 Nayanpur road areas (internal)

Road section	Road width (m)	Road area (m ²)
A	60m (including 20m canal)	Road 59,100 Water surface 24,100
B	40m (including 20m canal)	Road 4,000 Water surface 2,800
C	40m	500
D	20m	73,200
	Total	163,700

2) Rainwater drainage plan

Rainwater drainage facilities

Rainwater drainage ditches will be located on both sides of internal roads and will drain rainwater to the canal located along the 60m main road. A retention pond will be located at the terminal of the canal, and it will have storage functions enabling it to perform the function, preventing the impact of the change of the runoff rate accompanying land preparation, and part of the pump drainage functions during flooding.

The rainwater drainage facility plan will apply the 10-year probability rainfall intensities shown on the following table. The runoff rate from the site of each factory etc., is planned as 0.6, hypothesizing a building coverage ratio from 50 to 60%. The rainwater drainage facility gradient is planned as 0.1%.

Table 4.8.3 (4)-2 Rainfall intensity in Gazipur

TABLE- 08B : SHORT DURATION RAINFALL DATA FOR GAZIPUR							
Conversion Factor:	1						
Return Period	Rainfall Intensity (mm/hr) in given duration (Converted from Dhaka)						
	15 min	30 min	1 hour	2 hour	3 hour	6 hour	12 hour
1.1	73.50	59.90	39.60	22.00	14.00	7.10	4.30
2	92.40	78.60	56.20	36.70	27.00	15.40	9.40
5	109.70	95.70	71.40	50.10	39.00	23.00	14.10
10	121.10	107.00	81.40	58.90	46.90	28.00	17.30
25	135.60	121.30	94.10	70.10	56.90	34.30	21.20
50	146.30	132.00	103.50	78.40	64.30	39.00	24.10

(Source: Drainage Master Plan, Gazipur Pourashava, Final Report. LGED, UGII Project, January 2006)

Table 4.8.3 (4)-3 Nayanpur Rainfall drainage facility data

	Item	Data
1.	Concrete drain Type-A, – 0.5m x 1.0m size	4,250m
2.	Concrete drain Type-B, – 1.0m x 1.0m size	3,200m
3.	Concrete drain Type-C, – 1.2m x 1.5m size	2,800m
4.	Brick masonry Manholes complete	340 places

diff. size (approx. at 30m interval)	
---	--

Discharge point

The rainwater fallen in EZ is planned to be discharged to the southern channel as current. The channel is called Labandha River in downstream.

Canal

An expanded area of about 100ha is hypothesized on the north side of the main planned site, and the plan calls for rainwater drainage of about 200ha overall.

The flow rate to be carried downstream is the 50-year probability rainfall, and the concentration time from the furthest location for the completed 200ha plan is hypothesized to be 1 hour, and the rainfall intensity is calculated as about 100mm/hour. The planned flow volume is $33.3\text{m}^3/\text{s}$ according to the following formula.

$$Q=1/3.6 \cdot f \cdot r \cdot A \quad (\text{rational formula})$$

Q: flow rate (m^3/s)

f: runoff coefficient

r: rainfall intensity

A: catchment area (km^2)

The flow capacity of the planned canal is, assuming the roughness coefficient is 0.035 and the water surface gradient is 0.02%, about $34.3\text{m}^3/\text{s}$ when the water depth is 3.6m (if the canal bottom elevation is considered to be 8.5m, water surface elevation is 12.1m), and it can carry the planned flow rate.

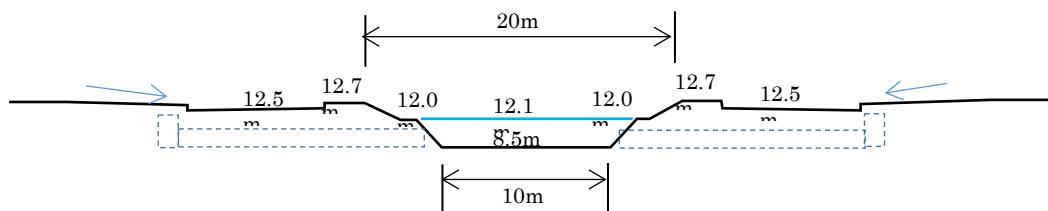


Figure 4.8.3 (4)-5 Plan for the Nayanpur main road canal

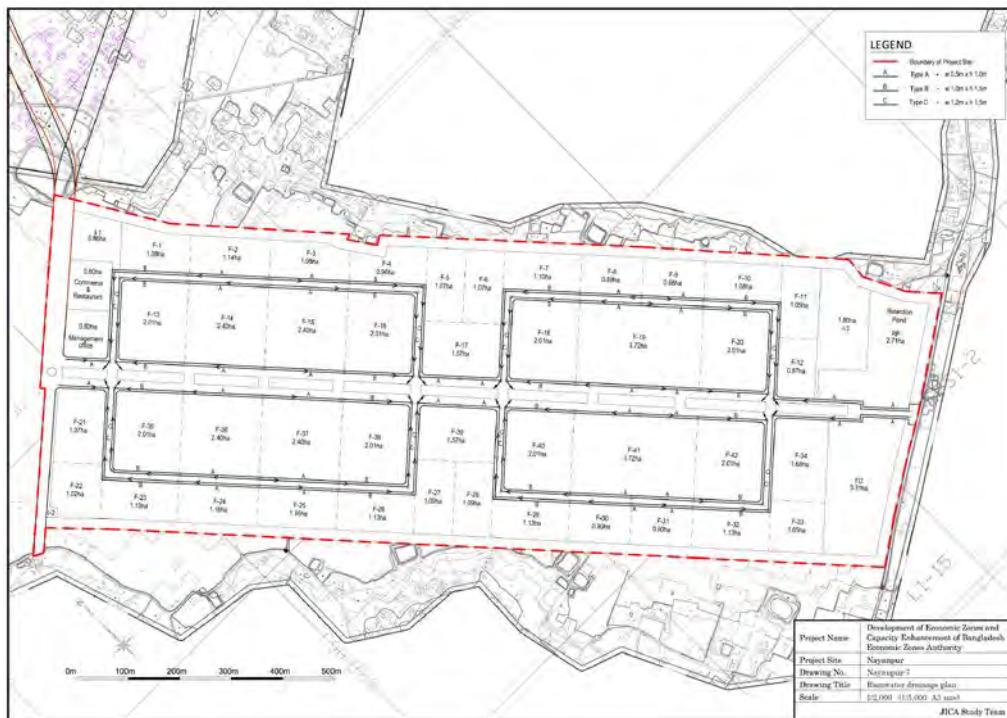


Figure 4.8.3 (4)-6 Nayanpur rainwater drainage plan

Retention pond

In the land use plan, the retention pond use land is planned as 2.71ha in the case of development of 100ha, and 3.31ha in the case of total development. It will regulate the amount of increase of the runoff rate (factory use land 0.6 from dry field 0.3).

At the reteintion pond of the Nayanpur EZ, pump drainage will lower the normal water level to prepare for torrential rainfall.

Water will be guided into the reteintion pond by gate control, diverting the part above the present runoff volume to the retention pond.

Table 4.8.3 (4)-4 Nayanpur retention pond data-1

	Average water surface area (m^2)	Effective depth of retention pond (m)	Retention capacity (m^3)
Retention pond for 100ha development	20,000	2	40,000
Retention pond for total development	$20,000+26,000$	2	92,000

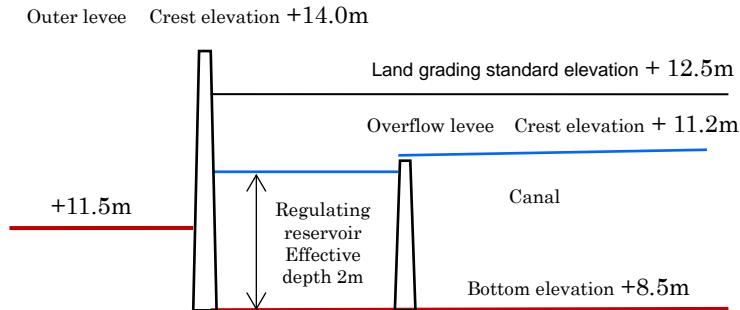


Figure 4.8.3 (4)-7 Cross-section of Nayanpur regulating reservoir and canal

Table 4.8.3 (4)-5 Nayanpur Regularing Reservoir Data -2

	Concentration time (min)	Rainfall intensity (mm/hour)	Pre-development run-off (Runoff rate: 0.3)	Post-development run-off (Runoff rate: 0.6)
100ha development	30	130	10.8	21.6
Total development	60	100	16.7	33.4

Retention function

As shown below, if the concentration time from the furthest place during each level of development is added, the regulating function will be one hour or more, even in the event of the 50-year probability rainfall.

100ha development

$$\text{Overflow regulation discharge: } Q = (21.6 - 10.8/2) = 16.3 \text{ (m}^3/\text{s)}$$

$$\text{Retentin capacity } t = 40,000(\text{m}^3) / 16.3 (\text{m}^3/\text{s}) = 2,454(\text{sec}) \\ \text{about 41 minutes}$$

Total development

$$\text{Overflow regulation discharge: } Q = (33.4 - 16.7/2) = 25.1 \text{ (m}^3/\text{s)}$$

$$\text{Retentin capacity } t = 92,000(\text{m}^3) / 25.1 (\text{m}^3/\text{s}) = 3,665(\text{sec}) \\ \text{about 61 minutes}$$

If the water level outside the external levee is nearly 11.5m, discharge by natural flow will be difficult, so the gate of the external levee will be closed and the system switched over to pump drainage.

In order to plan so that the pump drainage capacity is economical, it is necessary to premise the plan on lowering the water level in advance by pump drainage to ensure storage capacity.

Table 4.8.3 (4)-6 Nayanpur regulating reservoir data-3

	Retention pond		Canal		Total stored (m ³)
	Storage use depth	Stored (m ³)	Storage use depth	Stored (m ³)	
100ha development	2.0m (12.5~10.5m)	40,000	1.0m (12.5~11.5m)	13,000	53,000
Total development		92,000		23,000	115,000

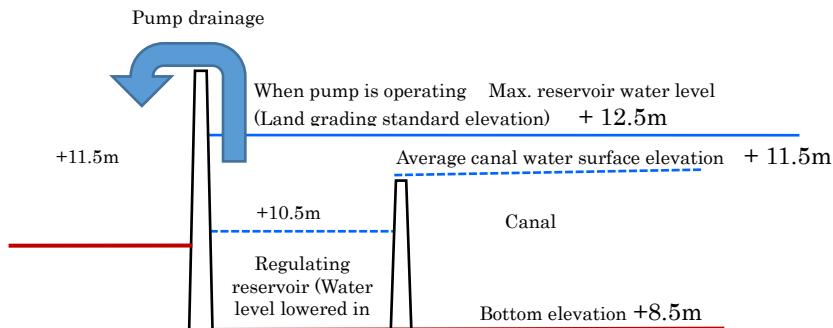


Figure 4.8.3 (4)-8 Retention pond and canal water levels during outer water flood (when pump is operating) at Nayanpur

The study of pump capacity assumed scale able to withstand 115mm/3 hours of the largest past rainfall of July 18, 2005 (source: SherpurEZ final Report).

Table 4.8.3 (4)-7 Data for pump capacity required at Nayanpur

	3-hour runoff (m ³)	Storage capacity (m ³)	Required drainage quantity (m ³)	Pump capacity (m ³ /s)
100ha development	69,000	53,000	16,000	1.5
Total development	138,000	115,000	23,000	2.2

(Pump capacity is assumed to be the scale permitting three hours drainage.)

3) Water supply plan

Water Sources

Since Nayapur EZ candidate site do not have existing public water supply facilities, it is necessary to utilize the nearby rivers or wells as water sources. It is important to bear in mind the following points when using these water sources. In the case of river water, there is saltwater intrusion. In the case of groundwater, water intake capacity of underground aquifer and water quality should be confirmed (especially the presence of arsenic).

The nearest river of Nayanpur (Shitalaksha river) is not greatly affected by seawater, the distance to the river is quite far (about 15 km). However, since the influence of arsenic in the groundwater is small, use of a well is possible. But if in case the results of prior well drilling testing before the implementation stage, if the intervals as well as the number of deep wells are increased, it should be kept in mind that land outside the EZ for deep well installation needs to be secured.

Wells used to pump up groundwater will be constructed at 2 places inside the 100ha initial development, 1 place inside the water supply facility site, and 1 more on the opposite side of the main road. In the future, trial pumping must be done to confirm the quantity that can be pumped up and its impact on surrounding groundwater. To supply water to the future expanded area, it is presumed that it will be necessary to install pumping-up use wells in the expanded area.

Quantity of water supplied

The predicted attracted industries are assumed to be mainly manufacturing industries that use relatively little water, assembling and sewing for example, and the basic unit of the quantity of water used is considered to be 35m³/day/ha for the total development area. And the total

quantity is 3,500m³/day for the initial 100ha development. In fact, the area of factory use land will be about 65ha, so it is about 54m³/ day/ha. The water supply facility will be close to the gate so that construction is possible from the first stage at a location where it is expected to supply water to the future expanded area.

The basic unit of the quantity of water supply of Nayanpur EZ was set at the same level as Araihazar EZ, referring the forecasted demand of Araihazar EZ that was described in 4.9.2.

Supplying water to fire hydrants

Assuming that one fire hydrant will cover an area with a radius of about 100m, fire hydrants will be installed at intervals of about 150m.

Water supply facility

The water storage tank scale will be equivalent to one day's requirement of 3,500m³. An elevated water tank will ensure capacity for about 1 hour.

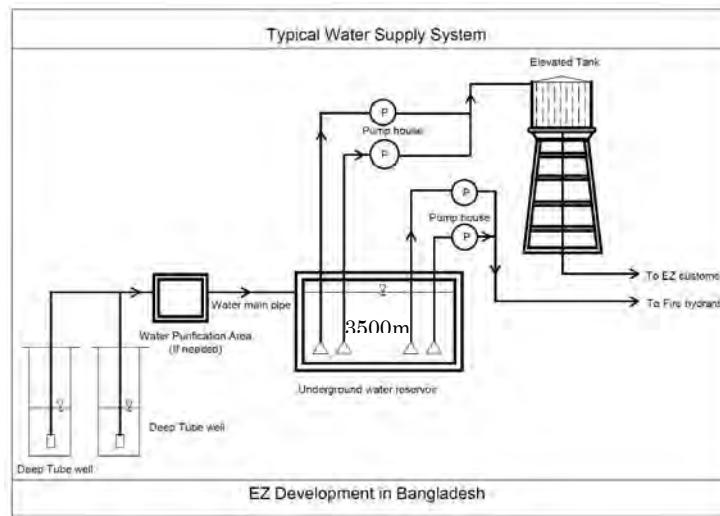


Figure 4.8.3 (4)-9 Outline of water supply facilities in Nayanpur

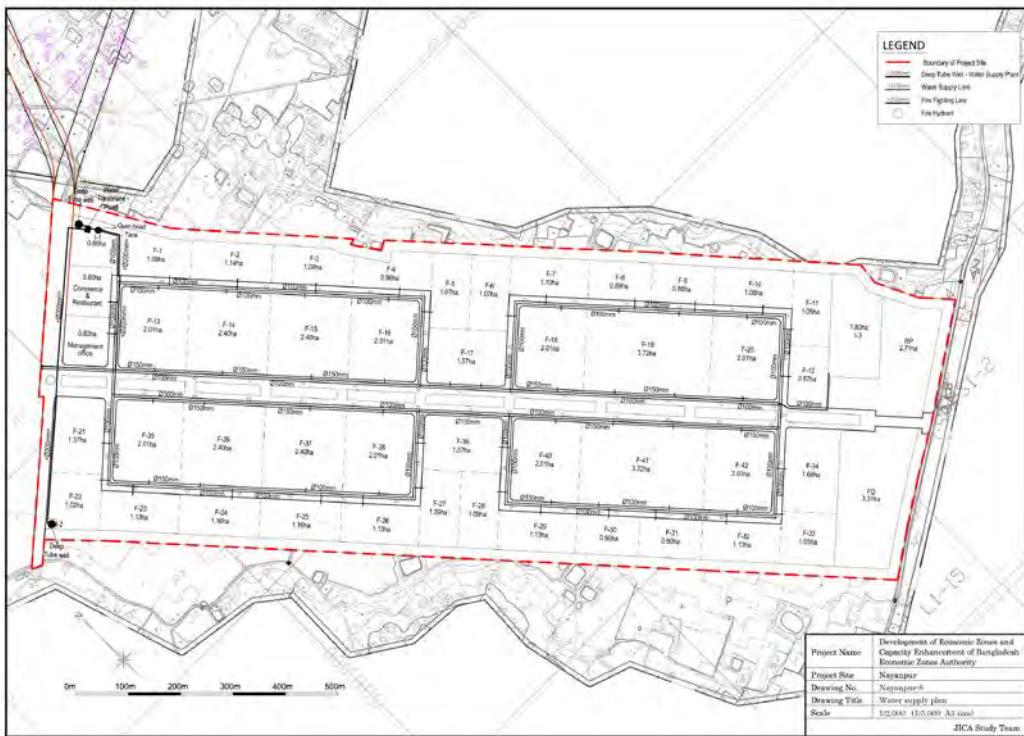


Figure 4.8.3 (4)-10 Nayanpur water supply plan

Table 4.8.3 (4)-8 Nayanpur water supply facility data

	Water supply facilities	Data
1.	PVC Water-supply Pipes – 200 mm dia	1,000 m
2.	PVC Water-supply Pipes – 150 mm dia	2,500 m
3.	PVC Water-supply Pipes – 100 mm dia	3,700 m
4.	High pressure PVC Pipes, for hydrant – 100 mm dia	6,450 m
5.	Water connection terminal points (blank/sealed)	63 places
6.	Fire Hydrants on internal roads	45 places
7	Underground Reservoir Tank	3,500m ³
8	Overhead Reservoir Tank	150m ³
9	Pumping Facilities (Water Supply, Fire hydrant)	2 systems 4 pumps

4) Sewerage plan

Waste water treatment facilities

The scale of the waste water treatment facilities will be set to treat 80% of the quantity of water supplied, and in the future will also treat the waste water from the expanded area. The waste water transport pipes on one side of the canal will be large enough to carry all the waste water from the expanded area. But the waste water from the expanded area will be pumped up by a relay pump at the end of flow in the expanded area, and connected to the waste water pipe placed during the initial development.

The waste water treatment process will be the activated sludge method or other that can ensure treated water quality allowing it to be discharged.

Waste water discharged from each factory will be treated until it satisfies the wastewater reception standards shown in 4.4.7, then discharged through the waste water pipes.

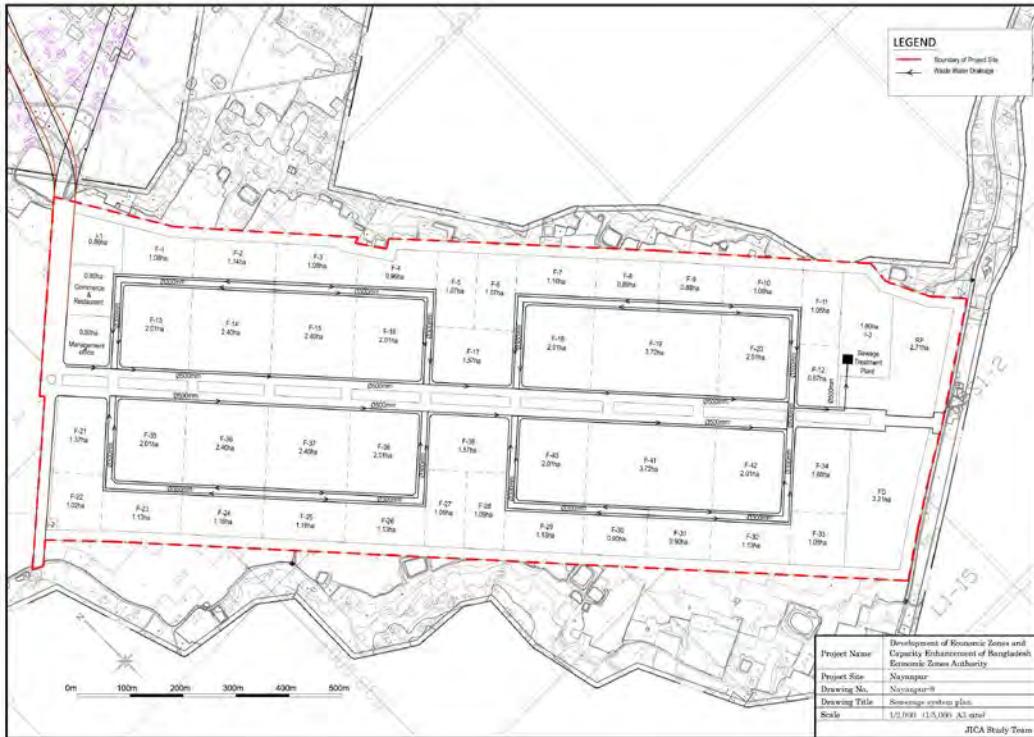


Figure 4.8.3 (4)-11 Nayanpur waste water treatment plan

Waste water pipes

Minimum diameter of 300mm, gradient of 0.3%, flow rate of at least 0.6m/s, and soil cover of at least 0.5m will be ensured.

Table 4.8.3 (4)-9 Nayanpur waste water pipe data

	Waste water pipe	Data
1.	Concrete Pipes – 300 mm dia.	3,000 m
2.	Concrete Pipes – 500 mm dia.	7,100 m

5) Electric power supply plan

Quantity of electric power supplied

The predicted attracted industries are assumed to be mainly manufacturing industries that use relatively little electric power, assembling and sewing for example, and the basic unit of the quantity of electric power used is considered to be 300kVA/ha for the total development area. And for the initial 100ha development, transformer equipment with capacity of 30MW will be installed.

The basic unit quantity of electric power supply was set referring the forecasted demand that was described in 4.9.2.

To install the electric generation plant for that will supply electric power to the surrounding area will be a superior condition for attracting investors.

Transformer facility

It is assumed that 33kV will be received from outside, then converted to 33/11kV by a

transformer in the EZ and supplied inside the EZ. The transformer facility will be close to the gate so it can be constructed at the initial stage, and placed at a location that anticipates supplying electric power to the expanded area in the future.

Electric power supply lines inside the park will be buried underground along the main road considering the appearance of the park, and in the 20m wide road sections, they will be elevated considering costs.

Street lighting

Street lights capable of ensuring road surface luminance, 250W natrium lamps for example, will be installed.

Emergency power supply

An emergency power supply for street lighting, water supply facilities, waste water treatment facilities, and others requiring power during a power failure will be installed on the transformer facility site.

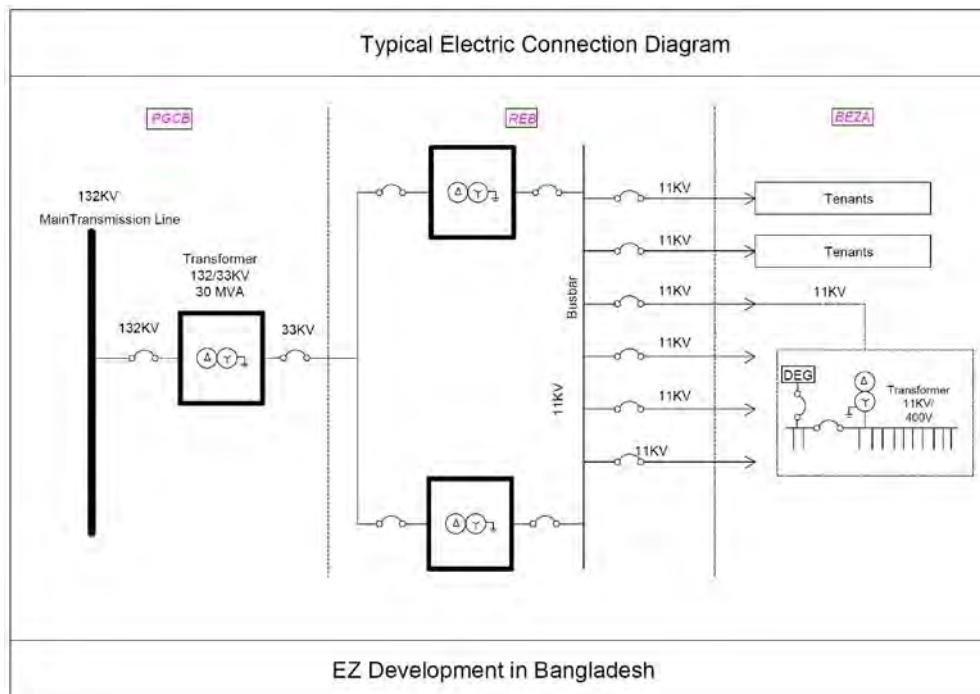


Figure 4.8.3 (4)-12 Outline of electric power reception/transformer plan for Nayanpur

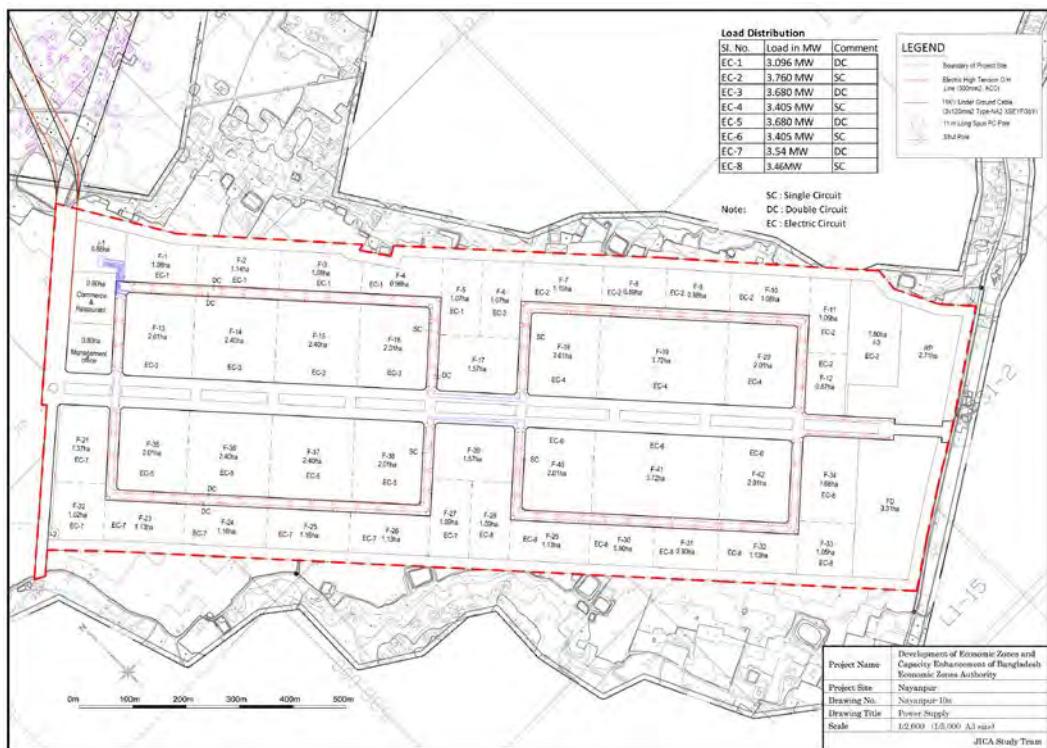


Figure 4.8.3 (4)-13a Nayanpur electric power supply plan

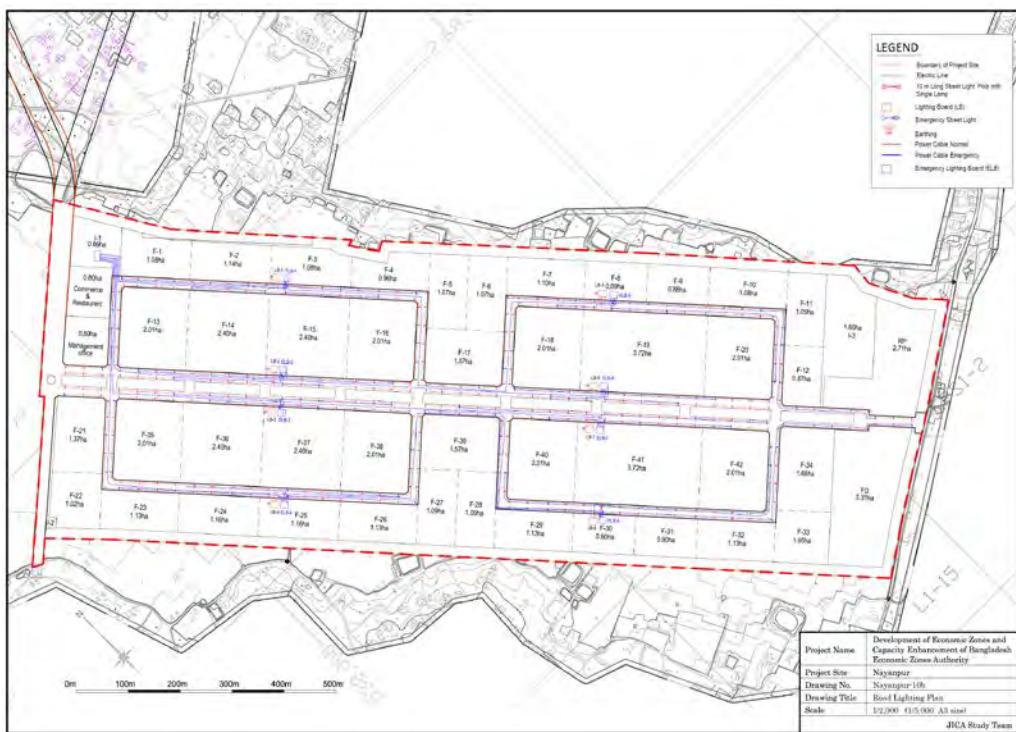


Figure 4.8.3 (4)-13b Nayanpur road lighting plan

Table4.8.3 (4)-10 Nayanpur electric power supply facility data

Reception/transformer equipment

	Type of Facility	Data
1	33 KV Power Cable, 1C 400mm ² ,Type N2XHSY	900 m
2	33 KV Power Cable, 1C 240mm ² ,Type N2XHSY	330 m
3	33KV High Voltage Meter Cubicle	1
4	33/11KV Power Transformer 15 MVA	2
5	11KV Cable, Type N2XHSY,3 x 1C 240 mm ²	400 m
6	11KV Cable, Type NA2XSEYFGbY (3 x 120 mm ²)	1800 m
7	Diesel Generator	1

11KV elevated electric power lines

	Type of facility	Data
1	11/12 m Long Spun PC Pole with Cross arm	193
2	Strut Pole	42
3	Stranded All Aluminum Conductor (AAC),3000mm ²	36000 m
4	11/.04 KV, 3 phase 15 KVA Transformer	2
5	11/.04 KV, 3 phase 20 KVA Transformer	4
6	11/.04 KV,3 phase 25 KVA Transformer	2
7	11/.04 KV,1 phase 10 KVA Transformer	1
8	Power Cable Type NY _Y 4x16 mm 2	300 m

Street lighting

	Type of facility	Data
1	10m Long GI Pole	388
3	High Pressure Sodium Lamp 250W	388 places
5	Light Distribution board	9 places
6	Power Cable	32,300 m
7	Service Cable	4300 m

6) Gas supply plan

The plan calls for gas supply pipes from a nearby gas station to be connected under the N3 road and the access roads. The gas pressure to be supplied and the pipes will be set according to the distance from the gas station and the quantity supplied, but it is assumed the gas will be supplied at 1,000 psi through pipes with diameter of 20 inches or smaller pipes.

The adjoining gas station is assumed to be a station on the pipeline that is scheduled to be constructed between Dhanua and Elenga between 2016 and 2021 by the JICA.

In the EZ, gas supply facility use land will be ensured in the infrastructure facility use land. And use in the EZ is predicted to be general use rather than industrial use or electric power generation use, so gas will be supplied in 75mm diameter pipes.

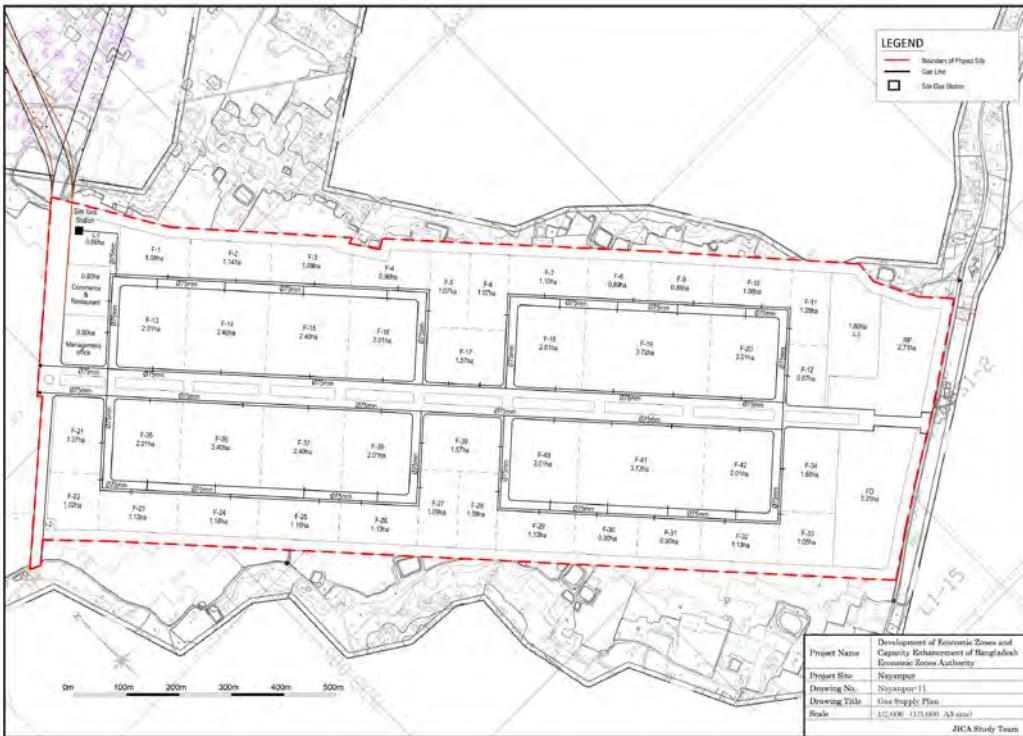


Figure 4.8.3 (4)-14 Nayanpur gas supply plan

7) Solid waste treatment

At Nayanpur EZ, solid waste (ordinary waste (kitchen garbage etc.), industrial waste) will be treated and disposed of by local treatment and disposal companies under contracts entered into separately with each attracted enterprise.

Therefore, the EZ will not construct solid waste collection plants and treatment/disposal plants.

8) Communication service

At Naranyar EZ, communication services will be provided by installing wired (optical fiber etc.) feed cables to provide services under contracts completed by each attracted enterprise with local service providers. The wires will be installed on power supply poles or in underground communication line use conduits following consultations with EZ management.

In Bangladesh, it is possible to obtain service from the following three kinds of communication companies.

Public switched telephone network (PSTN)

Mobile phone operators

Long distance operators (as per ILDTS Policy 2007)

International Gateway (IGW) operators

Interconnection Exchange (ICX) operators

International Internet Gateway (IIG) operator

Internet Protocol Telephony Service Provider (IPTSP) operators

International Terrestrial Cable (ITC) operator

The largest PSTN in Bangladesh is the Bangladesh Telecommunication Company Ltd. Mobile phone operators, which in this region include Grameen Phone, Teletalk, Robi Axiata, and Bharti Airtel, Banglalink, supply internet communication and call services.

As for IPTSP, there are more than 40 companies that supply internet communication services.

They offer both high-speed internet communication services and IP call services.

9) Logistics Center

Future manufacturing industries are assumed to be the following 11 kinds. AThe typical ratio of common medium-sized industrial zone in the ASEAN countries is adopted. About 57 ha of saleable lot area is estimated as the average factory site area of each advanced manufacturing industry in ASEAN and the cargo volume (container quantity) per site area, which was collected in a hearing with the manufacturing industry. Table 4.8.3(4)-11 shows the areas and import and export cargo volumes of relevant industries and relevant attractive ratio.

Table 4.8.3 (4)-11 Number of EZ Tenants Companies and Estimate of Freight Volume

Manufacturing industries	Ratio (%)	Area (ha)	Area/Company (ha)	Number of company	Estimated generating unit		Estimated generation cargo volume			Estimated cargo volume per company (TEU/company/month)
					Import	Export	Total	Import	Export	
textile	15	8.5	1-1.5	8	28	33	511	234	277	64
Garment Accessories	26	14.8	14.8	1	28	33	886	406	480	886
Motorcycle assembly manufacturing	9	5.1	5.1	1	20	28	245	102	143	245
Automobile and motorcycle parts	5	2.8	0.8-1	3	20	28	136	57	80	45
Metal and non-ferrous processing	10	5.7	1.7-2	3	13	22	199	75	124	66
Electrical and electro	10	5.7	1.7-2	3	11	19	171	64	107	57
Machinery parts	5	2.8	1-1.8	2	22	28	142	62	80	71
General assembly	5	2.8	2.8	1	15	18	95	43	52	95
Plastic processing	5	2.8	1-1.8	2	20	40	170	57	114	85
Agricultural products	5	2.8	1-1.8	2	17	43	170	47	123	85
Pharmaceutical prod	5	2.8	0.8-2	2	11	19	85	32	53	43
Total	100	56.8			28		2,812	1,180	1,632	
					Annual handling capacity		33,739	14,160	19,579	

Source: Study team

The total annual import volume is about 14,200 TEU, and the total export volume is about 19,600 TEU. Hence, the estimated total volume is 33,800 TEU.

Non-domestic shipping cargo is expected to be imported and exported via the Chittagong port. EZ cargo transportation, temporary storage and containers for necessary cargo inside the EZ, and the area of empty containers are assumed to be implemented together with a customs clearance business by a logistics center responsible for attracting investments and planning in the EZ. The area of the logistic center site will be set as follows.

- Export container cargo warehouse: Total export volume / 360 days x 2 days (customs clearance days) x 15 m² / box = about 1,630 m² (35 m x 50 m).
- Empty container yard: (Total export volume - total import volume) / 360 days x 10 days (temporary storage period) = about 150 boxes / day / (2 stacks) = space of 80 boxes, 80 x 30 m² (15 m² / box + working space 15 m² / box) = about 3,000 m².
- Truck space in front of and behind warehouse: trailer loading width 20 m, truck unloading width 15 m, total 35 m x 50 m = about 2,000 m².
- Parking space of trailer and cargo-handling machinery: trailer 10 units x 18 m x 3.5 m + cargo handling machinery 2 unit (200 m²) = 850 m²; Office + parking space: 350 m² (Office 150 m², parking space 200 m²) Total: 1,200 m²
- Other necessary area, such as inside roads: about 40% of the total = 3,000 m²
- Total about 11,000 m² (minimum requirement)

The area of the logistics base is assumed to be about 2.0 ha, including the abovementioned required area, 9,000 m² required area for future logistic center site associated with EZ

expansion by private capital and the site of future Phase 2.

For the "transportation logistics infrastructure" section described in the previous chapter, the establishment of a Bangladeshi bonded transport system is the prerequisite for the establishment of a logistic center inside the EZ and the implementation of OSS. Therefore, it is important to keep step with preparation and planning of a bonded transport establishment.

(5) Basic Infrastructure Development Plan for Surrounding Area of Each Short-Term Planning EZ Candidate Site

As the Infrastructure Development Plan for the Surrounding Area of Araihazar, the following terms are thought to be the works of the Government of Bangladesh (GOB: EZ implementing agency). ① Access road connecting the EZ candidate site and the nearby national highways, ② gas supply piping, ③ provision of land used for middle voltage to low voltage substation facilities as for power supply, ④ provision of land used for logistic center facilities inside the EZ site. As for the business items, the responsible division of implementing terms, and the implementation method shown in table, more discussion is required among related entities including BEZA to ensure the smooth implementation of the project in the future.

Table 4.8.3 (5).1 Overview of Nayanpur EZ Site Access Roads, Utility Facilities Planning

Facility items	Nayanpur EZ
①Access Road	2000 m access road connects the nearby national road N3 to EZ candidate site is GOB side works The National Road 3 (N3) is arterial road connecting between Dhaka City center and Nayanpur candidate site. RHD is improving the congested section from Airport to Gajipur by constructing 7 flyovers which will shorten trip time to 25 to 30 minutes.
②Sewerage System (On site infra.)	Living wastewater of each tenant factory (kitchen and toilet waste water) is treated by the central processing facility in the EZ candidate site. Industry wastewater from each tenant factory should be processed to an acceptable drainage level at each plant.
③Electric Power	PGCB responses for the transformers and transmission facilities of high voltage to medium voltage (132 / 33kV). Medium voltage to low voltage (33KV / 11kV) transformers / transmission facilities are conducted by REB. Additional cost maybe added to power cost in conjunction with the PGCB range. REB substation facilities are prepared in the EZ land. However, as for the power demand plan (including Phase 2 and later) the consultation and negotiation between BEZA and REB· PCGB based on the factories' tenant plans are required. In case backup power generation system for entire power demand of EZ was required, separate power plant by IPP will be established. BEZA will provide the lot area with similar incentives given to EZ As for the direct power transforming system from high to low Voltage (132/11 kV), if it was required, further confirmation and negotiation will be made among PGCB/REB and BEZA.
④Gas	Piping installation of up to 2km length along the National Road N3 from the existing main pipes until EZ site is expected to be used for such as kitchen and steam boilers. (GOB side work). Gas supply unit cost needs to be decided based on the consultation and negotiation between the local gas company TITAS and BEZA.

⑤Communication	Carriers and tenants make contract directly, the communication line is installed by carriers
⑥Waste Treatment	Processing by contract with the outsourcing of waste disposal company with improvement of local government policies.
⑦Connection with the Dhaka Road Network Plan	Dhaka Exp. Roads from Dhaka city center to Tongi have been constructed. A group of flyovers from Tongi to the intersection of Gajipur (Chowarasta) (7 locations) is expected to be completed by the end of 2018. (According to RHD). Widening/improvement from Gajipur to Northern National highway from N3 is in progress. (Both projects will be implemented by RHD)

The current status and content for each item in the table from ① to ⑦ are shown below.

① Access Roads

A longitudinal view and layout of the Nayapur access road is shown in Figure 4.8.3 (5).1 as a reference. The rainwater in the area between National Highway N3 and the EZ site flows from the south side to the north side (from the upper side to the lower side, below plain view) of the access road. Hence, the installation of cross-road culverts or bridges for rainwater drainage is required. In the implementation stage following the present study, it is necessary to consider drainage facilities in accordance with the outflow rain volume to understand more detail of the terrain surrounding access roads.



Noted) Left –side (east side) of above figure is National Highway N3, right side (west side) is EZ candidate site

Figure 4.8.3 (5).1 Cross-Section of Access Road to Nayapur EZ Candidate Site and Longitudinal Section

② Sewerage System

The living wastewater of each tenant factory (kitchen and toilet waste water) is dealt with by an internal infrastructure in the EZ candidate site and treated by the central treatment facility. As for industrial wastewater, each tenant factory should handle it to an acceptable emission level based on environmental regulatory standards.

③ Electric Power

Medium piezoelectric output of 33kV will be supplied to REB after being transited to a 132kV / 33kV transformer and transmission facilities by PGCB who controls the backbone network grid of Bangladesh. In addition, 11kV will be supplied to the consumers (BEZA) after being transited to a 33kV / 11kV medium / low voltage substation. BEZA supplies the power of 11kV for the tenants of the EZ, then each tenant will transform 11kV to 220V / 440V. Electric power transformation and transmission systems up to 11kV are under PGCB and REB control, and the construction costs are to be reflected in the electricity cost. A diagram of the voltage/substation supply power distribution system management area is shown in Figure 4.8.3 (5). 2 . The possibility of the power supply and substations of Nayapur included in the short-term plan, has already been confirmed through a hearing with PGCB - REB by the study team. According to the REB of both sites, they will provide a transformer system of 33kV / 11kV if the land in the EZ is provided. In addition, BEZA has submitted to REB the power supply approval as shown in the following Table 4.8.3 (5). 2 .

Table 4.8.3 (5).2 Annual Plan of Power Usage Application that BEZA Submitted to REB

Application number	Name of EZ	Area ha (Acre)	Year					
			2016	2017	2018	2021	2023	2025
2	Sreepur (Nayapur) EZ	206 (510)	5	60	100	105	110	115

Source:BEZA (May 2015)

Unit: MW

Substations of REB will be prepared inside each EZ site by REB. However, more detailed consultation and negotiation between the BEZA and REB - PCGB need to be conducted based on the specific power demand forecast, such as the power demand plan (including Phase 2 and later) and the tenant promotion plan to confirm and adjust the following terms: the possibility of power unit price, power priority supply (considered as exempt from blackout plans or not), cost allocation of substation facilities and land, and idle substation facilities cost allocation until tenants complete the movement.

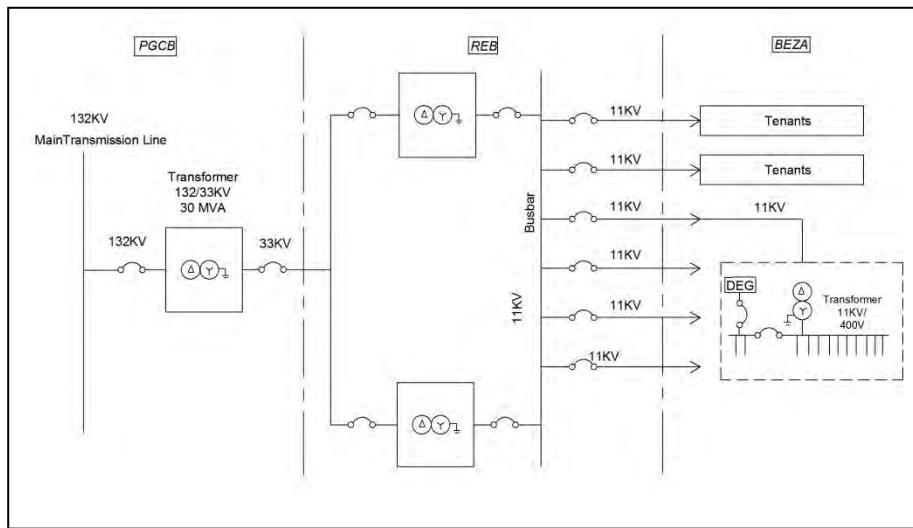


Figure 4.8.3 (5)-2 Diagram of Electric Distribution and Substation Systems, and the Responsibility Areas and Voltage Divisions of Each Electric Power Company and BEZA

High Voltage Power Sub-Station:

In case that the direct power transformer system from high (132kV) to low (11 kV) voltage was provided in or nearby area of EZ site, confirmation and coordination between PGCB, REB, and BEZA will be required. The possibility of individual power supply by PGCB and REB, however, were already confirmed including location of the power sub-station through previous hearing, the negotiation on the possibility of the system, cost share, implementation schedule and etc. would be conducted among the parties concerned.

Backup Power Generation System

Regarding the entire power demand of the EZ, as shown in the Figure 4.4.3.18 of the previous Chapter 4.4.3, if backup power supply is implemented (assumed to be about 50 MW/site for Araihazar and Nayapur including Phase 2), domestic gas generation has the cheapest power generation unit price. Therefore, the power unit price will be cheapest if it is possible to receive gas supplied from TITAS. However, since TITAS' policy does not encourage private power generation, the possibility of gas power generation is considered to be low. Thus, normally the EZ will receive power from the grid of PGCB / REB, and the backup power supply should be used during power outage only. Backup power generation facilities are expected to be operated in July-September when power shortage occurs. It should be considered to establish a business in which backup power generation facilities are run as an IPP (independent power producer) for financially self-supporting in other idle periods. In summary, backup power generation facilities will preferentially supply to the EZ during power outage period while selling power to the mains grid of PGCB.

Although it is necessary to conduct a further detailed examination based on the adjustment of power companies and BEZA, usually in the scale of 20MW ~ 50MW, gas turbines or diesel engine power generation systems are main stream.

The power generation unit cost of coal power generation is lower than imported LNG. However, the difficulty of supplying coal fuel to the inland EZ sites, and the future trend of CO₂ processing might lead to an increase in the power generation unit price.

In past similar projects, construction costs of diesel oil-fired power generation are about \$800/kW. Simple calculation shows that approximately \$40 million is required for the scale of

50 MW.

BEZA provides an area of 20 ~ 30 Acres (8 ~ 12 ha) for the power plant construction site and gives it the same incentives as EZ land.

④ Gas Supply

The amount of gas usage in the sewing industry, food processing industry, and kitchens at Araihazar, Nayanpur is assumed to be about 1% of the total electric power energy including the expected power usage of Phase 2. Annual gas consumption is assumed to be about 26MMCFT / year / site (about 700,000 m³ / year / site). BEZA has submitted to TITAS the following gas utilization planning application (see Table 4.8.3 (5).13).

Table 4.8.3 (5)-3 Gas Utilization Planning Applications that BEZA Submitted to TITAS

Application number	Name of EZ	Area ha (Acre)	Year									
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
2	Nayanpur (Sreepur) EZ	206 (510)	-	10	12	15	20	23	24	25	25	26

Source:BEZA (May 2015)

Unit: MMCFT/year

The existing gas piping of Nayanpur EZ candidate site (main lines) is shown in Figure 4.8.3 (5).3 .Nayanpur also installed 4 km of φ8" mounting pipe. Consultation and negotiation between BEZA and TITAS about installation time, gas supply pressure, and gas supply unit cost are required in the future.

Nayanpur EZ is connected to φ8" mounting pipe of the Dhonua gas station along the National Highway N3 (about 3.2 km).



Figure 4.8.3 (5).3 Diagram of Gas Station, replacement tube (light blue), and existing main lines at Nayanpur EZ and Dhonua

⑤ Communication

Tenants should make contract directly to carriers. Communication lines are installed by carriers.

⑥ Waste Treatment

Waste disposal methods are thought to be a) special capping systems in the earth or b) high temperature incinerator processing. Both a) and b) reveal high initial costs for construction of EZ internal processing facilities. In addition, a) requires a large land area. a) and b) also receive claims from tenants in terms of environment and there is a tendency to hesitate to use these methods. These initial construction costs are often not implemented by developers because of the large burden on developers as well as the high management and operation cost requirements.

Therefore, it is also necessary to ensure consistency between the cost share of developers and the local government policy as providing the processing and disposal sites outside the EZ. At the present Pre-FS level stage, with the improvement of local government solid waste processing, disposal policies and plans due to construction of the EZ have not been implemented yet. However, it is thought that it is possible to process in direction that the local government and the private traders will response for the improvement. It is assumed that measures will be decided in the embodying stage of EZ development, and outsourcing contraction will be adopted at the present stage.

⑦ Connection and Traffic Capacity of the Dhaka Road Network Plan

The following Table 4.8.3 (5)-4 shows the summary table of the main roads that are excerpted from RSTP (Strategic Transport Plan for Dhaka, JICA). As mentioned in the previous chapters, this table also shows the widening and improvement of the Dhaka Bypass around Araihaazar, the Bhulta Flyover, the National Highway N2 widening, the flyover connecting Nayanpur and Dhaka, the widening and improvement of the National Highway N3 up to Mymensingh and their budgets. Some of those have been implemented. In addition, in the 2035 demand planning, one-way traffic with daily traffic volume of 50,000-100,000 units (pcu: in terms of the number of passenger car units) is estimated.

In addition, the number of daily transported containers for the EZ candidate site is about 50-100 units / day of 40' container. As for commuting of employees who occupy a large part of the EZ traffic volume, assuming that the number of employees is about ten thousand people, then it about 500 to 1,000 units / day, i.e. 2,000 units / day in pcu, so it is considered to be sufficient in terms of traffic capacity.

Table 4.8.3 (5)-4 Overview of Dhaka Surrounding Main Road Project

Sl. No.	Description	Man Area	Road Category	Type of Project	Lane Number (Existing)	Lane Number (Proposed)	Length (km)	Road Specification	Project Cost (Tk. Crore)	2035 Traffic Flow (pcu/day per both directions)
E1	Dhaka Elevated Expressway	DCC	Expressway	New Road	0	4	19.7	Expressway (Toll Road)	8,940	96,500 A
E2	Dhaka - Ashulia Elevated Expressway	RAJUK	Expressway	New Road	0	4	38.2	Expressway (Toll Road)	13,654	83,500 B
E3	Dhaka - Chittagong Access Controlled Highway (Kutubkhali - Outer Ring Road)	RAJUK	Expressway	New Road	0	4	15.6	Expressway (Toll Road)	1,501	63,000 B
E4	Dhaka - Sylibpur Expressway (NI - Outer Ring Road)	RAJUK	Expressway	New Road	0	8	15.7	Expressway (Toll Road)	795	47,600 C
E5	Dhaka - Mawa Expressway	RAJUK	Expressway	New Road	0	4	17.7	Expressway (Toll Road)	5,169	76,000 B
E6	Dhaka - Mymensingh Expressway	RAJUK	Expressway	New Road	0	4	19.4	Expressway (Toll Road)	983	83,100 B
P1-1	N1 / 2nd Kauchipur Bridge and rehabilitation of existing Bridge	DMA	Primary Road	Widening (Bridge)	4	8	0.4	Bridge	-	84,000 B
P1-2	N1 / 2nd Modra Bridge and rehabilitation of existing Bridge	Outside RAJUK	Primary Road	Widening (Bridge)	2	6	0.9	Bridge	-	Unknown
P1-3	N1 / 2nd Gorai Bridge and rehabilitation of existing Bridge	Outside RAJUK	Primary Road	Widening (Bridge)	2	6	1.4	Bridge	-	Unknown
P2	N2 / 4-Lane Flyover at Bhulta - Sylibpur National Highway	RAJUK	Primary Road	Grade Separation	0	4	-	Grade Separation	-	Unknown
P3	N3 / Improvement of Joydevpur - Mymensingh Highway	Outside RAJUK	Primary Road	Widening	2	4	87.2	Type 2a	1,951	74,800 B
P4-1	N4 / 4-Lanning of Joydevpur-Chandra-Tangail Road (National Road -4) under SASEC	Outside RAJUK	Primary Road	Widening	2	4	13.7	Type 2a	657	67,800 B
P4-2	N4 / 4-Lanning of Joydevpur-Chandra-Tangail Road (National Road -4) under SASEC	Outside RAJUK	Primary Road	Widening	2	4	56.3	Type 2a	2,698	Unknown
P5	N8 / Improvement into 4-lane from 1st Buriganga Bridge to Padma Bridge Mawa Link	Outside RAJUK	Primary Road	Widening	2	4	25.8	Type 2a	359	72,200 B
P6	N105 / Upgrading of Dhaka Bypass to 4 Lane (Joydevpur - Debogram - Bhulta - Madagapur)	RAJUK	Primary Road	Widening	2	4	7.0	Type 2a	219	59,400 C

Source: RSTP



Figure 4.8.3 (5).4: Perspective Drawing for Nayapur EZ Project

4.9 Project Implementation Plan

4.9.1. Rough Estimation of Project Cost

(1) Conditions of Rough Project Cost Estimation

Rough Project Cost is estimated to divide into the offsite infrastructure construction executed by the public works of Bangladesh government using Japan's ODA Loan and the onsite infrastructure construction executed by the SPC. Both of project cost is estimated based on the following conditions.

- 1) Project Cost is consisted of Mobilization/Demobilization Cost, Direct Construction Cost, Cost of Temporary Works, Site Expenses (%) and General Expenses (%). For the Mobilization/Demobilization of the construction equipment, it is not import special equipment to utilize in the project. All of the equipment would be secured in Bangladesh. Then, these costs are determined on the transportation, assembling/disassembling of the equipment and these hire cost to be prepared onto the site.
- 2) Unit cost of the construction works is based on the unit price of the manpower fee, material cost and equipment rental cost determined on the unit cost of public works issued by Ministry of Public Works in 2014. The unit cost is taken about 8% inflation into account. If there were no unit rate of the imported materials in the index, the materials is referred the imported unit cost from Thai land. (Determined unit costs are summarized and shown in Appendix 9)
- 3) Foreign exchange rate is adopted from the bank in Bangladesh as of the November 2015, which is (1US\$ = 78.15 Taka).
- 4) Price escalation for the construction cost is adopted 6% (considering past three years escalation of construction materials and manpower) of the direct construction cost.
- 5) Physical contingency is applied 4% of the direct construction cost for the public works project and 5% of the direct construction cost for the SPC project.
- 6) For the public works project, the managing expenses of the projects are adopted 5% of the direct construction cost for the site managing expenses and 10% of the direct construction cost for the general managing expenses. For the SPC project, the managing expenses of the projects are adopted 5% of the direct construction cost for the site expenses and 15% of the direct construction cost for the general expenses.
- 7) Land acquisition fee is not included into the project cost due to the budget of the land acquisition is applied on a national budget.
- 8) For the public works project, the consultant fee (detailed design and construction supervision) of the projects is adopted 6% of the direct construction cost. For the SPC project, the consultant fee (detailed design and construction supervision) of the projects is adopted 8% of the direct construction cost. The contingency of the consultant cost is adopted 5% of the consultant fee for the both projects.
- 9) Others 1 (Item of unfitness for ODA Loan)
 - a) Land Acquisition Fee : It is not adopted to the project cost due to the explained in 7) above. The concession fee for the SPC as the PPP is set about 4% to 7% of the long term leasing fee of the land of EZ for the tenants. Maintenance cost for the infrastructure of EZ for the SPC project is adopted 3% per year of the onsite infrastructure construction cost.
 - b) Import and Export duties、VAT, Company Tax and Personal Income Tax is based on the incentive for the EZ planned by BEZA. A part of the VAT is imposed to the imported materials excluding electrical goods. Therefore, it is adopted 15% VAT for the 30% of the foreign cost portion of the projects.
 - c) Office Expenses of the project for BEZA. : Managing cost and office expense of the projects for BEZA is estimated and applied into the project cost.

(2) Task Share of EZ Development

Based on the “Project Implementation Scheme” (3) above, necessary development works of the offsite infrastructure and the onsite infrastructure for the EZ is divided into the following demarcation of the project implementation.

- 1) Government of Bangladesh executes to be constructed as the offsite infrastructure project by using Japan’s ODA Loan. (Public Works)
- 2) SPC formed between BEZA and Japan’s developer as the PPP project executes to construct the onsite infrastructure of the EZ (SPC Private Works)
- 3) The state operator or the special private companies for the infrastructure provides and executes as the onsite and offsite specific infrastructures development for commercial purpose.

Above categories of the EZ development are summarized in Table 4.9.1-1.

Table 4.9.1-1 Task Share of EZ Development

Field	Work Task	Infrastructure / Facilities	Phase I Project Scale (Each Site)				
			Unit	Araihazar (100Ha)		Nayanpur (100Ha)	
				Scale	Remarks	Scale	Remarks
Offsite Infrastructure	Public Works (ODA Loan)	Embankment/ Reclamation for EZ and Access Road	m3	3,980,000	Flood Management, Pump Filling (5.5km)	1,246,000	Flood Management, Dump Track Filling (5.5km)
		Access Road Construction (Pavement and Drainage)	m2	18,000	Asphalt C. Pavement, Drainage Ditch along the road	43,200	Asphalt C. Pavement, Drainage Ditch along the road
		Access Road Lighting and Cabling works	m	600	20m Interval	2,160	20m Interval
		Gas Piping Works of Access Road	m	400	100mm Pipes	364.56	100mm Pipes
		Boundary Fence of EZ	m	7,750	2.5m height Block fence	4,440	2.5m height Block fence
		Temporary Works, Contingencies and Consultants works	L.S	1		1	
		Electric Power Plant (Back-up)	MW	30	Necessity to be studied by Related sector	30	Necessity to be studied by Related sector
Onsite Infrastructure	Works by State Operator/ Specific Private Operator	Power Sub-station (133kv~33kv), High Voltage Line	L.S	1	Sub-station installation and line distribution from the grid by PGCB	1	Sub-station installation and line distribution from the grid by PGCB
		Industrial Waste Final Disposal Site	L.S	1	Considering to be constructed/ provided by Public works	1	Considering to be constructed/ provided by Public works
		Telecommunication, Internet Distribution Line	L.S	1	to be provided by Private Telecomm and Internet	1	to be provided by Private Telecomm and Internet
		Upgrading Surrounding National Road	L.S	1	New road is requested to connect from Kanchan Bridge to N2 for RHB	1	To request earlier to construct the Gazipur Flyovers for RHB
Onsite Infrastructure	SPC (Private Works)	EZ Site leveling, Onsite Road Pavement	m2	61,230	Asphalt C. Pavement	85,800	Asphalt C. Pavement
		Drainage Facilities, Reservoir Pond	m	11,320	RC drainage ditch, RC Pipe	11,330	RC drainage ditch, RC Pipe
		Sewerage Piping , Sewerage Pump /House	m	10,630	RC pipes	7,640	RC pipes
		Sewer Treatment Plant, Maintenance Office	ton	3,500	RC Structure	3,500	RC Structure
		Water Piping, Fire Fighting Piping, Hydrant	m	13,820	HDPE Pipes	8,220	HDPE Pipes
		Water Treatment Tank, Elevated Tank, Pump/Pump House	ton	2,600	RC Structure	2,600	RC Structure
		Electrical Cable • Road Lighting	m	11,170	high Voltage 11Kv, Low voltage 400V	10,550	high Voltage 11Kv, Low voltage 400V
		Gas Piping	m	6,400	75mm under ground	7,920	75mm under ground
		EZ Administration Building (including Rental Office, Bank)	m2	1,350	RC structure 3F(Floor Area)	1,350	RC structure 3F(Floor Area)
		Commercial Building (Restaurant, Clinic, Supermarket, etc.)	m2	800	RC structure 3F(Floor Area)	800	RC structure 3F(Floor Area)
		Rental Factories Construction	m2	20,000	Structural Steel (Floor Area)	20,000	Structural Steel (Floor Area)
		Green and Planting Trees	m2	55,660		50,385	
		Temporary Works, Contingencies, Consultants Works	L.S	1		1	
Onsite Infrastructure	Works by State Operator/ Specific Private Operator	Power Sub-station(133kv~33kv, Consideration onsite works)	L.S	1	Sub-station installation and line distribution from the grid by PGCB	1	Sub-station installation and line distribution from the grid by PGCB
		Power Sub-station (33kv~11kv)	L.S	1	Second Power Sub-station provided onsite of EZ by REB	1	Second Power Sub-station provided onsite of EZ by REB
		Waste Collection and Transportation	L.S	1	To be collected waste by Private Company	1	To be collected waste by Private Company
		Telecommunication, Internet distribution Line	L.S	1	To be Provided by Private Telecomm, Internet Company	1	To be Provided by Private Telecomm, Internet Company

Source : Study Team

(3) Rough Project Cost Estimation

Based on the Land Use Plan and Infrastructure Plan mentioned in the previous chapter and (3), (4) and (5) above, the construction quantities for Public project and SPC project are calculated for the Phase I and Phase I &II projects respectively for Araihazar site and

Nayanpur site. The project costs for both of sites with the phase I (100 ha) and Phase I&II (200ha) are summarized in Table 4.9.1-2.

Table 4.9.1-2 Summery of Short Term EZ Development Project Cost EZ

Field	Work Task	Infrastructure / Facilities	Each Site EZ Project Cost (US\$)			
			Araihazar EZ		Nayanpur EZ	
			Phase I (100Ha)	Phase I (100ha)+Phase II (200Ha)	Phase I (100Ha)	Phase I (100ha)+Phase II (200Ha)
Offsite Infrastructure	Public Works (ODA Loan)	Embankment/ Reclamation for EZ and Access Road	17,738,584	35,477,169	16,843,429	32,895,250
		Access Road Construction (Including necessary utilities)	695,169	1,370,902	3,602,696	3,602,696
		Boundary Fence of EZ	271,250	420,000	155,400	310,800
		Temporary Works, Contingencies	3,798,446	7,209,105	4,229,332	7,291,127
		Indirect Cost (Site and General Expenses)	2,857,141	5,647,241	3,148,801	5,596,384
		Total of Project Cost	25,360,590	50,124,417	27,979,658	49,696,257
	Electric Power Plant (Back-up)	24,720,000	41,200,000	24,720,000	41,200,000	
Onsite Infrastructure	Onsite and Offsite Works by State Operator/ Specific Private Operator	Power Sub-station (133kv~33kv), High Voltage Line, Industrial Waste Disposal Site, Telecomm & Internet Line		7,000,000		7,000,000
		Upgrading Surrounding National Road		13,403,500	RHD Estimated	
		Power Sub-station (33kv~11kv) West Clection and Transport, Telecomm & Internet on site line		1,500,000		1,500,000
	SPC (Private Works)	EZ Site leveling, Onsite Road Pavement	5,859,419	11,511,517	7,997,468	14,755,009
Onsite Infrastructure	SPC (Private Works)	Drainage, Sewerage, Water pipeline and Electric Powert Distribution	6,255,092	11,672,318	5,779,500	10,147,538
		Water Treatment Tank, Sewer Treatment Plant, Elevated Tank and Pump/Pump House	5,325,000	10,400,000	5,325,000	10,300,000
		All necessary Buildings (Adomi Building, Commercial Building, Rental)	8,870,000	19,370,000	8,870,000	19,370,000
		Temporary Works, Contingencies	6,395,713	12,102,606	6,734,987	12,426,231
		Indirect Cost (Site and General Expenses)	5,361,902	10,758,767	5,694,394	11,084,509
		Total of Project Cost	38,067,126	75,815,208	40,401,349	78,083,287

Source : Study Team

1) Araihazar EZ Development Project Cost (Bangladesh Government Project)

For the Araihazar EZ Development Project, Project Cost for the Bangladesh Government (Planned Japan's ODA Loan) is shown its breakdown in Table 4.9.1-3

Table 4.9.1-3 Araihaazar EZ Project Cost (by Bangladesh Government)

No	Description	Phase I (100Ha)					unit : US\$	Phase I+Phase II (200Ha)					unit : US\$		
		Unit	Quantity	Unit Price	Local Portion	Foreign Portion		Unit	Quantity	Unit Price	Local Portion	Foreign Portion			
A	Construction Cost				11,245,680	7,801,923	19,047,604					22,285,223	15,383,047	37,648,271	
1	Preparation Works														
1.1	Mobilization/Demobilization	L.s	1	300,000	180,000	120,000	300,000	L.s	1	320,000	192,000	128,000	320,000		
1.2	Temporary Works	L.s	1	30,000	21,000	9,000	30,000	L.s	1	35,000	24,500	10,500	35,000		
1.3	Site Clearance/Grading Access Road	m2	18,000	0.70	11,340	1,260	12,600		36000	0.70	22,680	2,520	25,200		
2	Embankment Filling (Access Road and Site)														
2.1	Sand Extraction	m3	3,980,000	1.16	2,773,915	1,849,277	4,623,191		m3	7,960,000	1.16	5,547,830	3,698,553	9,246,383	
2.2	Sand Transportation by Barge	m3	3,980,000	1.02	2,437,043	1,624,696	4,061,739			7,960,000	1.02	4,874,087	3,249,391	8,123,478	
2.3	Sand Filling to Site (by Pump)	m3	3,980,000	2.10	5,013,384	3,342,256	8,355,640		m3	7,960,000	2.10	10,026,768	6,684,512	16,711,281	
2.4	Grading and Compaction	m3	989,000	0.70	482,744	206,890	689,635		m2	1,978,000	0.70	965,489	413,781	1,379,270	
2.5	Access Road Slope Protection Green S	m2	8,120	0.45	3,305	367	3,672		m2	16,240	0.45	6,610	734	7,345	
2.6	Boundary Canal Excavation	m3	3,500	1.34	3,765	941	4,706		m3	7,000	1.34	7,530	1,883	9,413	
3	Access Road Construction													0	
3.1	Drainage & Culvert	m	70	630	17,640	26,460	44,100	Box culvert 2mx1.5m	Nos	140	630	35,280	52,920	88,200	Box culvert 2mx1.5m
3.2	Top soil slope	m2	3650	0.45	1,321	330	1,651		m2	7300	0.45	2,641	660	3,301	
3.3	Sub-Grade Grading and Compaction	m2	18,000	0.48	5,210	3,473	8,683		m3	36000	0.48	10,420	6,947	17,367	
3.4	Base Coarse	m2	8,384	27.58	138,715	92,476	231,191	300mm+150mm	m3	16768	27.58	277,429	184,953	462,382	300mm+150mm
3.5	Surface Coarse	m2	8,384	38.05	3,190	255,183	258,372	50mm+40mm	m2	16768	38.05	6,380	510,365	516,745	50mm+40mm
3.6	Concrete Curb	m	2,400	15.52	14,896	22,343	37,239		m	4800	15.52	29,791	44,687	74,478	
3.7	Green Sodding Top of Access Road	m2	4,600	0.45	1,872	208	2,080		m2	9,200	0.45	3,745	416	4,161	
3.8	Trees Planting (Land Landscape Work)	m2	4,600	1	4,679	520	5,199		m2	9,200	1	9,358	1,040	10,398	
3.9	Storm water drainage	L.S	1	3,000	1,200	1,800	3,000		Nos	1	6,000	2,400	3,600	6,000	
3.10	Walkway paving	m2	1,640	14.83	9,725	14,588	24,313		m2	3,280	14.83	19,450	29,176	48,626	
3.11	Gas Pipeline Installation and Connection	m	400	24.30	1,944	7,775	9,718								
4	Access Road Lighting and Cabling work													0	
4.1	Low Voltage Line	m	600	46	24,797	2,755	27,552		m	1200	46	49,593	5,510	55,103	
4.2	Lighting Pole and Fixture (single)	Nos	25	746	5,594	13,053	18,647		Nos	50	746	11,188	26,106	37,295	
4.3	Lighting Pole and Fixture (Twin)	Nos	15	1,001	4,503	10,506	15,009		Nos	30	1,001	9,006	21,013	30,018	
4.4	Transformer + Switch Gear	Nos	1	8,414	2,524	5,890	8,414		Nos	2	8,414	5,049	11,780	16,828	
5	Other Facilities														
5.1	Boundary Fencing	m	7750	35.00	81,375	189,875	271,250			12,000	35.00	126,000	294,000	420,000	
B	Other Expenses and Profit				952,380	1,904,760	2,857,141					1,857,206	3,714,413	5,571,819	
1	Site Expenses	%	5		380,952	571,428	952,380		%	5		742,883	1,114,324	1,857,206	
2	General Expenses & Profit	%	10		571,428	1,333,332	1,904,760		%	10		1,114,324	2,600,089	3,714,413	
C	Contingency and Taxes				1,124,568	1,131,279	2,255,847					2,228,522	2,230,542	4,457,064	
1	Physical Contingency	% of A	4		449,827	312,077	761,904		% of A	4		890,609	615,322	1,505,931	
2	Price Escalation	% of A	6		674,741	468,115	1,142,856		% of A	6		1,335,913	922,983	2,258,896	
3	TAX and Duties (VAT for Import Goods excluding Electrical Goods)	% of A	0		0	351,087	351,087		% of A	0		0	692,237	692,237	
D	Consultants Services				360,000	839,999	1,199,999					711,552	1,860,289	2,371,841	
1	Detailed Design	% of A	3		171,428	400,000	571,428		% of A	3		338,834	790,614	1,129,448	
2	Construction Supervision	% of A	3		171,428	400,000	571,428		% of A	3		338,834	790,614	1,129,448	
3	Contingency	% of (C1+C2)	5		17,143	40,000	57,143		% of (C1+C2)	5		33,883	79,061	112,945	
	Total Project Cost (A+B+C+D)				13,682,628	11,677,982	25,380,590					27,080,505	22,988,291	50,048,795	

Source : Study Team

2) Araihaazar EZ Project Cost (the SPC Project)

For the Araihaazar EZ Development Project, Project Cost for the SPC (Private investment) is shown its breakdown in Table 4.9.1-4

Table 4.9.1-4 Araihaazar EZ Project Cost (by SPC Investment)

No	Description	Phase I (100Ha)					unit US\$	Phase I+Phase II (200Ha)					unit : US\$		
		Unit	Quantity	Unit Price	Local Portion	Foreign Portio		Remarks	Unit	Quantity	Unit Price	Local Portion	Foreign Portio		
A	Construction Cost				11,372,444	15,437,067	26,809,511					22,673,010	30,920,881	53,793,891	
	1 Preparation Works				200,000	300,000	500,000					322,000	516,000	840,000	
	1.1 Mobilization/Demobilization	L.s	1	400,000	120,000	280,000	400,000		L.s	1	700,000	210,000	490,000	700,000	
	1.2 Temporary Works	L.s	1	100,000	80,000	20,000	100,000		L.s	1	140,000	112,000	28,000	140,000	
	2 Road Construction				2,993,207	1,981,163	4,974,370					5,878,150	3,900,116	9,779,268	
	2.1 Excavation and Land Fill for Canal	m3	16,800	1.34	13,555	9,036	22,591		m3	33,600	1.34	27,109	18,073	45,182	
	2.2 Canal Culvert (large Triple Box)	m	120	4,200	302,400	201,600	504,000		m	250	4,200	630,000	420,000	1,050,000	
	2.4 Sub-Grade Grading & Compaction	m2	61,320	0.70	43,339	8,585	42,924		m2	120,120	0.48	46,357	11,589	57,946	
	2.5 Base Coarse	m3	61,320	27.58	1,014,548	676,366	1,690,914		m3	120,120	27.58	1,987,403	1,324,935	3,312,338	
	2.6 Surface Coarse	m2	61,320	38.05	1,399,791	933,194	2,332,985		m2	120,120	38.05	2,742,056	1,828,037	4,570,093	
	2.7 Concrete Curb	m	12,800	15.52	119,165	79,443	198,609		m	25,000	15.52	232,744	155,163	387,907	
	2.8 Walkway Paving Work	m2	12,300	14.83	109,409	72,839	182,348		m2	24,000	14.83	213,480	142,320	355,800	
	(2) Land Scaping Work				108,039	27,010	135,049					185,800	46,450	232,250	
	2.9 Green Sodding Top and Slope	m2	159,520	0.45	57,714	14,429	72,143		m2	241,150	0.45	87,248	21,812	109,060	
	2.10 Trees Planting (Land Landscape Work)	m2	55,660	1.13	50,325	12,581	62,906		m2	109,000	1.13	98,552	24,638	123,190	
	3 Storm Water Drainage Works				754,678	503,118	1,257,796					1,478,341	985,561	2,463,902	
	3.1 U-Ditch with RC Cover 400mm ~1000m	m	10,720	96.60	621,331	414,221	1,035,552		m	20,999	96.60	1,217,128	811,419	2,028,547	
	3.2 RC Pipe Culvert 500mm	m	200	102.34	12,280	8,187	20,467		m	392	102.34	24,056	16,037	40,093	
	3.3 RC Pipe Culvert 800mm	m	400	202.82	48,876	32,451	81,126		m	784	202.82	95,351	63,568	158,919	
	3.4 RC Manhole 1000x1000	Nos	94	903.20	50,940	33,960	84,901		Nos	184	903.20	99,788	66,525	166,813	
	3.5 RC Manhole 1500 x 1500	Nos	20	1787.49	21,450	14,300	35,750		Nos	39	1787.49	42,018	28,012	70,030	
	4 Sewer Water Drainage Works				731,455	487,637	1,219,092					1,432,851	952,234	2,388,084	
	4.1 RC Pipe Culvert 300mm	m	2640	72.20	114,367	76,245	190,611		m	5,172	72.20	224,034	149,356	373,390	
	4.2 RC Pipe Culvert 400mm	m	6390	83.21	319,011	212,674	531,685		m	12,517	83.21	624,912	416,608	1,041,520	
	4.3 RC Pipe Culvert 600mm	m	750	144.27	64,921	43,280	108,201		m	1,469	144.27	127,173	84,782	211,956	
	4.4 RC Pipe Culvert 800mm	m	850	202.82	103,436	68,957	172,394		m	1,665	202.82	202,622	135,081	337,703	
	4.5 RC Manhole 600x600	Nos	180	903.20	97,546	65,030	162,576		Nos	353	903.20	191,082	127,388	318,471	
	4.6 RC Manhole 1500 x 1500	Nos	30	1787.49	32,175	21,450	53,625		Nos	59	1787.49	63,027	42,018	105,045	
	5 Water Distribution Line & Fire Fitting Line				117,599	470,398	587,897					230,366	921,464	1,151,830	
	5.1 HDPE Pipe 150 dia	m	12800	34.16	87,458	349,834	437,292		m	25,074	34.16	171,323	685,291	856,613	
	5.2 HDPE Pipe 100 dia	m	720	22.79	3,281	13,125	16,406		m	1,410	22.79	6,428	25,711	32,138	
	5.3 HDPE Pipe 75 dia	m	300	19.00	1,140	4,559	5,699		m	588	19.00	2,233	8,930	11,163	
	5.4 Fire Hydrant and Fire-hose Box	Nos	26	2600	13,520	54,080	67,600		Nos	51	2600	26,484	105,938	132,422	
	5.5 Fitting Valves and Pit 300mm	Nos	100	610	12,200	48,800	61,000		Nos	196	610	23,899	95,595	119,493	
	6 Electric Power Distribution & Lighting/ pumping				803,591	2,414,383	3,017,854					1,068,215	4,264,860	5,331,075	
	6.1 11KV cable Distribution Under Grand	m	2650	25.35	13,435	53,738	67,173		m	5,191	25.35	26,317	105,268	131,585	
	6.2 11KV cable Distribution Surface	m	8520	15.91	27,116	108,463	135,579		m	16,690	15.91	53,117	212,469	265,587	
	6.3 Electrical Pole Installation	Nos	340	763.10	51,891	207,564	259,455		Nos	666	763.10	101,650	406,598	508,248	
	6.4 Street Lighting and Pole Installation	Unit	750	1,000.61	150,092	600,369	750,461		Unit	1,469	1,000.61	294,016	1,176,064	1,470,080	
	6.5 Transformer with Switch Gear (100 KV)	Unit	10	8,414.24	16,828	67,314	84,142		Unit	20	8,414.24	32,965	131,861	164,827	
	6.6 Transformer with Switch Gear (200KVA)	Unit	3	12,480.26	7,488	29,953	37,441		Unit	6	12,480.26	14,669	58,674	73,343	
	6.7 Transformer with Switch Gear (400KVA)	Unit	5	20,566.74	20,567	82,267	102,834		Unit	10	20,566.74	40,288	161,153	201,441	
	6.8 Low voltage cable Distribution 16sqmm	m	11000	26.99	59,388	237,550	296,938		m	21,548	26.99	116,334	465,338	581,672	
	6.9 Low voltage cable Distribution 150sqmm	m	500	167.86	16,786	67,146	83,932		m	800	167.86	26,858	107,433	134,292	
	6.10 Emergency Generator (1000 KVA x 1)	Unit	2	600,000	240,000	960,000	1,200,000		Unit	3	600,000	360,000	1,440,000	1,800,000	
	6.11 Discharge Pumps and Gate for Reservoir	Unit	3	250,000	150,000	600,000	750,000		Unit	6	250,000	300,000	1,200,000	1,500,000	
	7 Gas Pipe line Distribution				35,875	136,378	172,253					70,287	267,196	337,483	
	7.1 Gas Pipeline 100mm dia	m	6400	24.30	31,098	124,393	155,491		m	12,537	24.30	60,930	243,719	304,649	
	7.2 Gas Pipeline connection Pit	Nos	55	64.75	2,137	1,425	3,561		Nos	108	64.75	4,186	2,791	6,977	
	7.3 Gas supply control Valve	Nos	110	120	2,640	10,560	13,200		Nos	215	120	5,172	20,686	25,658	
	8 Common Plant for water and sewer				2,130,000	3,195,000	5,325,000					4,160,000	6,240,000	10,400,000	
	8.1 Water Treatment Plant (180m3)	L.s	1	975,000	390,000	585,000	975,000		L.s	2	975,000	780,000	1,170,000	1,950,000	
	8.2 Water Distribution Elevated Tank with P	L.s	1	350,000	140,000	210,000	350,000		L.s	2	350,000	280,000	420,000	700,000	
	8.3 Sewage Treatment Plant (1500m3)	L.s	1	3,500,000	1,400,000	2,100,000	3,500,000		L.s	2	3,500,000	2,800,000	4,200,000	7,000,000	
	8.4 Deep Well and Pump House 200m	L.s	1	250,000	100,000	150,000	250,000		L.s	2	250,000	200,000	300,000	500,000	
	8.5 Fire Fighting Pump and House (200m3)	L.s	1	250,000	100,000	150,000	250,000		L.s	1	250,000	100,000	150,000	250,000	
	9 Common Buildings				3,548,000	5,322,000	8,870,000					7,748,000	11,622,000	19,370,000	
	9.1 Park Center Administration Building	m2	1350	800	432,000	648,000	1,080,000		m2	1350	800	432,000	648,000	1,080,000	
	9.2 Rental Office, Clinic and Restaurant Buil	m2	800	800	256,000	384,000	640,000		m2	800	800	256,000	384,000	640,000	
	9.3 Utility Maintenance Shop	m2	300	500	60,000	90,000	150,000		m2	300	500	60,000	90,000	150,000	
	9.4. Rental Factory	m2	20,000	350	2,800,000	4,200,000	7,000,000		m2	50,000	350	7,000,000	10,500,000	17,500,000	
	B Other Expenses				1,340,476	4,021,427	5,381,902					2,688,695	8,069,084	10,758,778	
	1 Site Expenses	%	5		536,190	804,285	1,340,476		%	5		1,075,878	1,613,817	2,689,695	
	2 General Expenses and Profit	%	15		804,285	3,217,141	4,021,427		%	15		1,613,817	6,455,267	8,069,084	
	C Contingency and Taxes				1,250,969	2,392,745	3,643,714					2,516,031	4,792,737	7,308,788	
	1 Physical Contingency	% of A	5		568,622	771,853	1,340,476		% of A	5		1,143,650	1,546,044	2,689,695	
	2 Price Escalation	% of A	6		682,347	926,224	1,608,571		% of A	6		1,372,381	1,855,253	3,227,633	
	3 TAX and Duties (VAT for Import Goods excluding Electrical Goods)	% of A	15		0	694,668	694,668		% of A	15		0	1,391,440	1,391,440	
	D Consultants Services				675,600	1,576,399	2,251,999					1,186,155	2,767,696	3,953,851	
	1 Detailed Design	% of A	4		321,714	750,666	1,072,380		% of A	3		484,145	1,129,672	1,613,	

3) Nayanpur EZ Development Project Cost (Bangladesh Government Project)

For the Nayanpur EZ Development Project, Project Cost for the Bangladesh Government (Planned Japan's ODA Loan) is shown its breakdown in Table 4.9.1-5

Table 4.9.1-5 Araihaazar EZ Project Cost (by Bangladesh Government)

No	Description	Phase I (100Ha)					Remarks	Phase I+Phase II (200Ha)					unit : US\$		
		Unit	Quantity	Unit Price	Local Portion	Foreign Portion		Unit	Quantity	Unit Price	Local Portion	Foreign Portion			
A	Construction Cost				11,721,801	9,270,105	20,992,006						21,548,270	15,780,957	37,309,226
1	Preparation Works														
1.1	Mobilization/Demobilization	Ls	1	300,000	180,000	120,000	300,000	Ls	1	400,000	240,000	160,000	400,000		
1.2	Temporary Works	Ls	1	30,000	21,000	9,000	30,000	Ls	1	40,000	28,000	12,000	40,000		
1.3	Site Clearance/Grading Access Road (2160x40)	m2	86,400	0.70	54,432	6,048	60,480		86,400	0.70	54,432	6,048	60,480		
2	Embankment Filling (Access Road and Site)														
2.1	Sand Extraction	m3	1,246,000	1.16	868,417	578,944	1,447,361	m3	2,432,000	1.16	1,695,015	1,130,010	2,825,026		
2.2	Sand Transportation by Barge	m3	1,246,000	1.02	762,954	508,636	1,271,590		2,432,000	1.02	1,489,168	992,779	2,481,947		
2.3	Sand Filling to Site (by Truck)	m3	1,246,000	10.69	7,988,638	5,325,758	13,314,396	m3	2,432,000	10.69	15,592,590	10,395,060	25,987,650		
2.4	Grading and Compaction	m3	1,096,400	0.70	535,168	229,358	764,525	m2	2,192,800	0.70	1,070,336	458,715	1,529,051		
2.5	Access Road Slope Protection Green Sodding	m2	43,200	0.45	17,583	1,954	19,537	m2	43,200	0.45	17,583	1,954	19,537		
2.6	Boundary Canal Excavation (3870x5m3)	m3	19,350	1.34	20,816	5,204	26,020	m3	38,700	1.34	41,632	10,408	52,040		
3	Access Road Construction														
3.1	Drainage & Culvert (2 units)	m	100	630	25,200	37,800	63,000	Box culvert 2mx1.5m	Nos	100	630	25,200	37,800	63,000	Box culvert 2mx1.5m
3.2	Drainage Culvert Large Size	m	50	4,200	84,000	126,000	210,000			50	4,200	84,000	126,000	210,000	
3.2	Top soil slope	m2	6500	0.45	2,352	588	2,940	m2	6500	0.45	2,352	588	2,940		
3.3	Sub-Grade Grading and Compaction	m2	43,200	0.48	12,504	8,336	20,840	m3	43,200	0.48	12,504	8,336	20,840		
3.4	Base Coarse	m2	43,200	27.58	714,750	476,500	1,191,251	300mm=150mm	m3	43,200	27.58	714,750	476,500	1,191,251	300mm=150mm
3.5	Surface Coarse	m2	43,200	38.05	16,436	1,314,872	1,331,308	50mm+40mm	m2	43,200	38.05	16,436	1,314,872	1,331,308	50mm+40mm
3.6	Concrete Curb	m	8,640	15.52	53,624	80,436	134,061		m	8,640	15.52	53,624	80,436	134,061	
3.7	Green Sodding Top of Access Road	m2	50,240	0.45	20,449	2,272	22,721	m2	50,240	0.45	20,449	2,272	22,721		
3.8	Trees Planting (Land Landscape Work)	m2	50,240	1	51,102	5,678	56,781	m2	50,240	1	51,102	5,678	56,781		
3.9	Storm water drainage	Ls	1	14,400	5,760	8,640	14,400		Nos	1	14,400	5,760	8,640	14,400	
3.10	Walkway paving	m2	12,960	14.83	76,853	115,279	192,132	m2	12,960	14.83	76,853	115,279	192,132		
3.11	Gas Pipeline Installation and Connection	m	2,160	24.30	10,496	41,983	52,478		2,160	24.30	10,496	41,983	52,478		
4	Access Road Lighting and Cabling work														
4.1	Low Voltage Line	m	2160	46	89,267	9,919	99,186		m	2160	46	89,267	9,919	99,186	
4.2	Lighting Pole and Fixture (single)	Nos	216	746	48,334	112,780	161,114		Nos	216	746	48,334	112,780	161,114	
4.4	Transformer + Switch Gear	Nos	6	8,414	15,146	35,340	50,485		Nos	6	8,414	15,146	35,340	50,485	
5	Other Facilities														
5.1	Boundary Fencing	m	4440	35.00	46,620	108,780	155,400			8880	35.00	93,240	217,560	310,800	
B	Other Expenses and Profit				1,049,800	2,099,201	3,148,801						1,865,461	3,730,923	5,596,304
1	Site Expenses	%	5		419,840	629,760	1,049,600		%	5		746,185	1,119,277	1,865,461	
2	General Expenses & Profit	%	10		629,760	1,469,440	2,099,201		%	10		1,119,277	2,611,646	3,730,923	
B	Contingency and Taxes				1,172,190	1,344,165	2,516,355						2,154,827	2,285,338	4,440,166
1	Physical Contingency	% of A	4		468,876	370,804	839,680		% of A	4		861,931	630,438	1,492,369	
2	Price Escalation	% of A	6		703,314	556,206	1,259,520		% of A	6		1,292,896	945,657	2,238,554	
3	TAX and Duties (VAT for Import Goods excluding Electrical Goods)	% of A	0		0	417,155	417,155		% of A	0		0	709,243	709,243	
C	Consultants Services				398,749	925,747	1,322,496						705,144	1,845,337	2,350,401
1	Detailed Design	% of A	3		188,928	440,832	629,760		% of A	3		335,783	783,494	1,119,277	
2	Construction Supervision	% of A	3		188,928	440,832	629,760		% of A	3		335,783	783,494	1,119,277	
3	Contingency	% of (C1+C2)	5		18,893	44,083	62,976		% of (C1+C2)	5		33,578	78,349	111,928	
	Total Project Cost (A+B+C)				14,340,440	13,839,218	27,979,858						26,273,702	23,422,555	49,696,257

Source : Study Team

4) Nayanpur EZ Project Cost (the SPC Project)

For the Nayanpur EZ Development Project, Project Cost for the SPC (Private investment) is shown its breakdown in Table 4.9.1-6

Table 4.9.1-6 Nayapur EZ Project Cost (by SPC Investment)

No	Description	Phase I (100Ha)					unit: US\$	Phase I+Phase II (200Ha)					unit : US\$
		Unit	Quantity	Unit Price	Local Portion	Foreign Portion		Unit	Quantity	Unit Price	Local Portion	Foreign Portion	
A	Construction Cost			12,462,513	16,009,455	28,471,968					24,173,810	31,248,737	55,422,547
1	Preparation Works			200,000	300,000	500,000					330,000	520,000	850,000
1.1	Mobilization/Demobilization	Ls	1	400,000	120,000	280,000	400,000	Ls	1	700,000	210,000	490,000	700,000
1.2	Temporary Works	Ls	1	100,000	80,000	20,000	100,000	Ls	1	150,000	120,000	30,000	150,000
2	Road Construction			4,307,403	2,851,582	7,158,988					7,871,873	5,223,033	13,095,006
2.1	Excavation and Land Fill for Canal	m3	23,000	1.34	18,557	12,371	30,928	m3	46,000	1.34	37,114	24,742	61,856
2.2	Canal Culvert (large Triple Box)	m	220	4,200	554,400	369,600	924,000	m	440	4,200	1,108,800	739,200	1,848,000
2.4	Sub-Grade Grading & Compaction	m2	85,800	0.70	48,048	12,012	60,060	m2	155,154	0.48	59,877	14,969	74,847
2.5	Base Course	m3	85,800	27.58	1,419,574	946,382	2,365,956	m3	155,154	27.58	2,567,041	1,711,361	4,278,401
2.6	Surface Coarse	m2	85,800	38.05	1,958,611	1,305,741	3,264,352	m2	155,154	38.05	3,541,793	2,361,195	5,902,988
2.7	Concrete Curb	m	15,230	15.52	141,788	94,525	236,313	m	27,541	15.52	256,398	170,932	427,329
2.8	Walkway Paving Work	m2	18,710	14.83	166,426	110,950	277,376	m2	33,834	14.83	300,951	200,634	501,584
(2)	Land Scaping Work			70,788	17,898	88,482					128,000	32,001	160,003
2.9	Green Sodding Top and Slope	m2	69,735	0.45	25,230	6,308	31,538	m2	126,103	0.45	45,624	11,406	57,030
2.10	Trees Planting (Land Landscape Work)	m2	50,385	1.13	45,556	11,389	56,944	m2	91,112	1.13	82,379	20,595	102,974
3	Storm Water Drainage Works			719,820	479,747	1,199,367				0	1,307,704	871,802	2,179,508
3.1	U-Ditch with RC Cover 400mm ~1000mm Width	m	10,630	96.60	616,115	410,743	1,026,858	m	19,222	96.60	1,114,132	742,754	1,856,886
3.2	RC Pipe Culvert 500mm	m	250	102.34	15,350	10,324	25,584	m	452	102.34	27,758	18,506	46,264
3.3	RC Pipe Culvert 800mm	m	450	202.82	54,760	36,507	91,267	m	814	202.82	99,024	66,016	165,040
3.4	RC Manhole 1000x1000	Nos	26	903.20	14,090	9,393	23,483	Nos	52	903.20	28,180	18,787	46,966
3.5	RC Manhole 1500 x 1500	Nos	18	1787.49	19,305	12,870	32,175	Nos	36	1787.49	38,610	25,740	64,350
4	Sewer Water Drainage Works			628,985	419,330	1,048,325				0	1,158,133	772,089	1,930,222
4.1	RC Pipe Culvert 300mm	m	2220	72.20	96,172	64,115	160,287	m	4,014	72.20	173,910	115,940	289,850
4.2	RC Pipe Culvert 400mm	m	2640	83.21	131,798	87,865	219,663	m	4,774	83.21	238,333	158,888	397,221
4.3	RC Pipe Culvert 600mm	m	1290	144.27	111,664	74,442	186,106	m	2,333	144.27	201,923	134,616	336,539
4.4	RC Pipe Culvert 800mm	m	1490	202.82	181,318	120,878	302,196	m	2,694	202.82	327,880	218,587	546,467
4.5	RC Manhole 600x600	Nos	140	903.20	75,869	50,579	126,448	Nos	280	903.20	151,738	101,158	252,896
4.6	RC Manhole 1500 x 1500	Nos	30	1787.49	32,175	21,450	53,825	Nos	60	1787.49	64,350	42,900	107,249
5	Water Distribution Line & Fire Fitting Line			72,443	289,773	362,216				0	134,662	538,647	673,308
5.1	HDPE Pipe 150 dia	m	7080	34.16	48,375	193,502	241,877	m	12,803	34.16	87,478	349,913	437,391
5.2	HDPE Pipe 100 dia	m	840	22.79	3,828	15,313	19,141	m	1,519	22.79	6,922	27,690	34,612
5.3	HDPE Pipe 75 dia	m	300	19.00	1,140	4,559	5,699	m	542	19.00	2,061	8,244	10,305
5.4	Fire Hydrant and Fire-hose Box	Nos	25	2600	13,000	52,000	65,000	Nos	50	2600	26,000	104,000	130,000
5.5	Fitting Valves and Pit 300mm	Nos	50	610	6,100	24,400	30,500	Nos	100	610	12,200	48,800	61,000
6	Electric Power Distribution & Lighting/ pumping			595,464	2,381,854	2,977,318				0	1,003,362	4,013,447	5,016,809
6.1	11KV cable Distribution Under Grand	m	3470	25.35	17,592	70,367	87,958	m	6,275	25.35	31,811	127,245	159,057
6.2	11KV cable Distribution Surface	m	7080	15.91	22,533	90,132	112,664	m	12,803	15.91	40,747	162,987	203,733
6.3	Electrical Pole Installation	Nos	290	763.10	44,260	177,040	221,300	Nos	524	763.10	80,036	320,144	400,181
6.4	Street Lighting and Pole Installation	Unit	740	1,000.61	148,091	592,364	740,455	Unit	1,338	1,000.61	267,795	1,071,182	1,338,977
6.5	Transformer with Switch Gear (100 KVA)	Unit	9	8,414.24	15,146	60,582	75,728	Unit	18	8,414.24	30,291	121,165	151,456
6.6	Transformer with Switch Gear (200KVA)	Unit	3	12,480.26	7,488	29,953	37,441	Unit	6	12,480.26	14,976	59,905	74,882
6.7	Transformer with Switch Gear (400KVA)	Unit	5	20,566.74	20,567	82,267	102,834	Unit	10	20,566.74	41,133	164,534	205,667
6.8	Low voltage cable Distribution 16sqmm	m	10550	26.99	56,958	227,832	284,790	m	19,078	26.99	102,998	411,993	514,991
6.9	Low voltage cable Distribution 150sqmm	m	680	167.86	22,830	91,318	114,148	m	1,000	167.86	33,573	134,292	167,864
6.10	Emergency Generator (1000 KVA x 1)	Unit	2	600,000	240,000	980,000	1,200,000	Unit	3	600,000	360,000	1,440,000	1,800,000
6.11	Discharge Pumps and Gate for Reservoir Tank	Unit	3	250,000	150,000	600,000	750,000	Unit	6	250,000	300,000	1,200,000	1,500,000
7	Gas Pipe line Distribution			39,802	152,472	192,274				0	71,874	275,719	347,663
7.1	Gas Pipeline 75mm dia	m	7290	24.30	35,429	141,718	177,147	m	13,183	24.30	64,068	256,271	320,338
7.2	Gas Pipeline connection Pit	Nos	52	64.75	2,020	1,347	3,367	Nos	94	64.75	3,653	2,436	6,089
7.3	Gas supply control Valve	Nos	98	120	2,352	9,408	11,760	Nos	177	120	4,253	17,013	21,266
8	Common Plant for water and sewer			2,130,000	3,195,000	5,325,000					4,120,000	6,180,000	10,300,000
8.1	Water Treatment Plant (3500m3)	Ls	1	975,000	390,000	585,000	975,000	Ls	2	975,000	780,000	1,170,000	1,950,000
8.2	Water Distribution Elevated Tank with Pump (150m3)	Ls	1	350,000	140,000	210,000	350,000	Ls	1	350,000	140,000	210,000	350,000
8.3	Sewage Treatment Plant (2600m3)	Ls	1	3,500,000	1,400,000	2,100,000	3,500,000	Ls	2	3,500,000	2,800,000	4,200,000	7,000,000
8.4	Deep Well and Pump House 200m	Ls	1	250,000	100,000	150,000	250,000	Ls	3	250,000	300,000	450,000	750,000
8.5	Fire Fighting Pump and House (200m3)	Ls	1	250,000	100,000	150,000	250,000	Ls	1	250,000	100,000	150,000	250,000
9	Common Buildings			3,548,000	5,322,000	8,870,000					7,748,000	11,622,000	19,370,000
9.1	Park Center Administration Building	m2	1350	800	422,000	648,000	1,080,000	m2	1350	800	432,000	649,000	1,080,000
9.2	Rental Office, Clinic and Restaurant Building	m2	800	800	256,000	384,000	640,000	m2	800	800	256,000	384,000	640,000
9.3	Utility Maintenance Shop	m2	300	500	60,000	90,000	150,000	m2	300	500	60,000	90,000	150,000
9.4	Rental Factory	m2	20,000	350	2,800,000	4,200,000	7,000,000	m2	50,000	350	7,000,000	10,500,000	17,500,000
B	Other Expenses			1,423,598	4,270,795	5,694,394					2,771,127	8,313,382	11,084,509
1	Site Expenses	%	5	5	569,439	854,159	1,423,598	%	5	5	1,108,451	1,662,676	2,771,127
2	General Expenses and Profit	%	15	15	854,159	3,416,636	4,270,795	%	15	15	1,662,676	6,650,706	8,313,382
C	Contingency and Taxes			1,370,876	2,481,466	3,852,342					2,859,119	4,843,554	7,502,673
1	Physical Contingency	% of A	5	5	623,126	800,473	1,423,598	% of A	5	5	1,208,690	1,562,437	2,771,127
2	Price Escalation	% of A	6	6	747,751	960,567	1,708,318	% of A	6	6	1,450,429	1,874,924	3,325,353
3	TAX and Duties (VAT for Import Goods excluding Electrical Goods)	% of A	15	0	720,425	720,425	0	% of A	15	0	1,406,193	1,406,193	
D	Consultants Services			717,494	1,074,152	2,391,845					1,222,067	2,851,460	4,073,557
1	Detailed Design	% of A	4	4	341,664	797,215	1,138,879	% of A	3	3	498,803	1,163,873	1,662,676
2	Construction Supervision	% of A	4	4	341,664	797,215	1,138,879	% of A	4	4	665,071	1,551,831	2,216,902
3	Contingency	% of (C1+C2)	5	5	34,166	79,722	113,888	% of (C1+C					

4.9.2. Preliminary Financial and Economic Analysis

Based on the development plan and the cost estimation of offsite and onsite infrastructure, the financial and economic analyses for the Phase I of 100ha and Phase I+II of 200ha of the two short-term EZ candidate sites (Araihaazar, Nayapur) were carried out.

(1) Financial Analysis

The financial analyses related to the development and operation of the onsite infrastructure of the two EZ candidate sites were conducted.

1) Assumptions

- BEZA/the Bangladesh government will acquire the land and develop the offsite infrastructure as well as land embankment of the onsite and offsite areas of EZs. A SPC (Special Purpose Company), a development entity of the EZs, will develop and operate the onsite infrastructure of EZs except for land embankment, power plants and high voltage substations. The cost sharing breakdown is shown in Table 4.9.2-1.

- A SPC will make a concession agreement with BEZA.

2) Project Schedule

The EZs are scheduled to start operation in 2017, and the project schedule of 30 years is projected (Phase I: construction period of 4 years and operational period of 26 years; Phase I+II: construction period of 6 years and operational period of 24 years). The schedule of construction period, lease sales period and utility demand is shown in Table 2.7.8-1.

Table 4.9.2-1 Project Schedule

Construction+Sales Schedule -Phase I (100Ha)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Construction Fees Disbursement		1%	3%	44%	100%						
Land Sales Schedule				20%	50%	100%					
Rental Factory Sales Schedule					20%	40%	80%	100%			
Utility Demand Forecast						20%	40%	80%	100%		

Construction+Sales Schedule -Phase I+II (200Ha)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Construction Fees Disbursement		1%	2%	24%	56%	80%	100%				
Land Sales Schedule				8%	12%	41%	53%	70%	100%		
Rental Factory Sales Schedule					8%	16%	44%	64%	88%	100%	
Utility Demand Forecast						8%	12%	41%	53%	70%	100%

(Source) JICA Project Team

3) Plot Plan

The salable lease land size described in the land use plan is shown below. Out of the total development area, the ratio of the salable lease land is 59% for Phase I and 70% for Phase I+II (Araihaazar) and 65% for Phase I and 70% for Phase I+II (Nayapur).

Table 4.9.2-2 Salable Lease Land Size of EZs

	Araihaazar Phase I	Araihaazar Phase I+II	Nayanpur Phase I	Nayanpur Phase I+II
PLOT PLAN	Area (ha)	Area (ha)	Area (ha)	Area (ha)
Factory Lot	54.46	133.06	61.12	133.72
Logistics Center	1.03	1.03	0.96	0.96
Rental Factory	2.35	5.35	2.39	5.39
Commercial Area	1.00	1.00	0.80	0.80
Total	58.84	140.44	65.27	140.87
Salable Ratio	59%	70%	65%	70%

(Source) JICA Project Team

4) Industry Mix

The industry mix and the size of the plot in salable lease land is projected in Table 4.9.2-3. The EZs are expected to be sold out in three years for Phase I and six years for Phase I+II.

Table 4.9.2-3 Industry Mix of Phase I (left) and Phase I+II (right)

Industry	Ratio	Industry	Ratio
Textile, Garment	15%	Textile, Garment	5%
Textile, Accessory	26%	Textile, Accessory	0%
Motorcycle Assembly	9%	Motorcycle Assembly	10%
Automobile Assembly	5%	Automobile Assembly	10%
Metal, Nonferrous Metal	10%	Metal, Nonferrous Metal	15%
Electronics	10%	Electronics	15%
Machinery Parts	5%	Machinery Parts	10%
General Assembly	5%	General Assembly	10%
Plastic Processing	5%	Plastic Processing	10%
Agriculture Processing, Food	5%	Agriculture Processing, Food	5%
Pharmaceuticals	5%	Others	10%
Total	100%	Total	100%

Table 4.9.2-4 Size of the Plot in Industry Breakdown

Industry	Araihaazar Phase I Area (ha)	Araihaazar Phase I+II Area (ha)	Nayanpur Phase I Area (ha)	Nayanpur Phase I+II Area (ha)
Textile, Garment	8.17	12.10	9.17	12.80
Textile, Accessory	14.16	14.16	15.89	15.89
Motorcycle Assembly	4.90	12.76	5.50	12.76
Automobile Assembly	2.72	10.58	3.06	10.32
Metal, Nonferrous Metal	5.45	17.24	6.11	17.00
Electronics	5.45	17.24	6.11	17.00
Machinery Parts	2.72	10.58	3.06	10.32
General Assembly	2.72	10.58	3.06	10.32
Plastic Processing	2.72	10.58	3.06	10.32
Agriculture Processing, Food	2.72	6.65	3.06	6.69
Pharmaceuticals	2.72	2.72	3.06	3.06
Others	0.00	7.86	0.00	7.26
Total	54.46	133.06	61.12	133.72

(Source) JICA Project Team

5) Utility Demand

a. Unit Rate

The average utility unit rates in economic zones in Cambodia, Vietnam and Philippines are applied to estimate the utility demand.

Table 4.9.2.-5 Utility Unit Rates in ASEAN's Economic Zones

Type of Industry	Land (ha)	Employees (persons/ha)	Industrial Water (m3/day/ha)	Electric Power (MWh/y/ha)
1. Food processing	0.5~2	107.9	50	1,192
2. Textiles	1~5	115.7	156	879
3. Garment	1~2	228.8	38	596
4. Furniture	1~3	65	25	492
5. Chemicals	5~10	46.8	262	763
6. Plastics	1~2	67.6	162	1,689
7. Rubber product	1~100	89.7	145	1,565
8. Ceramics	5~10	40.3	80	937
9. Non-ferrous metal	1~5	52	99	1,389
10. metal procesing	1~10	61.1	54	718
11. Machinery	1~5	68.9	71	743
12. Electrical	1~5	150.8	111	1,663
13. Electronic	1~5	150.8	111	1,663
14 Transport	5~20	78	65	1,383
15 Precision	1~2	146.9	91	1,130
16 Others	--	91	50	1,000

(Source) JICA Project Team based on the data of economic zones in ASEAN

b. Power Demand

The power demand is expected to be up to 30MW for Phase I and 60MW for Phase I+II.

Table 4.9.2-6 Power Demand Projection by Industry (Araihazar Phase I)

Industry	ha	MWh/y/ha	MWh/y
Textile, Garment	8.17	738	6,025
Textile, Accessory	14.16	879	12,447
Motorcycle Assembly	4.90	743	3,641
Automobile Assembly	2.72	743	2,021
Metal, Nonferrous Metal	5.45	1,389	7,570
Electronics	5.45	1,663	9,063
Machinery Parts	2.72	743	2,021
General Assembly	2.72	743	2,021
Plastic Processing	2.72	1,689	4,594
Agriculture Processing, Food	2.72	1,192	3,242
Pharmaceuticals	2.72	763	2,075
Service Facilities	4.39	5,000	21,950
Total	58.84		76,671
Total (MW; 300dx8hrs)			31.95

(Source) JICA Project Team

c. Water Demand

The water demand is expected to be up to 3,250 ton/day for Phase I and 6,500 ton/day for Phase I+II. The unit rates applied in Table 4.9.2-7 are estimated to be lower than the average amount of water used in economic zones in ASEAN. The 11 industries to be attracted in EZs are focused on labor intensive procedure such as assembling and packaging rather than manufacturing procedure, therefore, the unit rates of labor intensive industries such as garment, sewing and furniture have been applied. The water demand of 50-60 ton/ha/day in each industry has been assumed.

Table 4.9.2-7 Water Demand Projection by Industry (Araihazar Phase I)

Industry	ha	m3/ha/d	m3/d
Textile, Garment	8.17	60.00	490.2
Textile, Accessory	14.16	60.00	849.6
Motorcycle Assembly	4.90	60.00	294
Automobile Assembly	2.72	50.00	136
Metal, Nonferrous Metal	5.45	50.00	272.5
Electronics	5.45	50.00	272.5
Machinery Parts	2.72	50.00	136
General Assembly	2.72	50.00	136
Plastic Processing	2.72	50.00	136
Agriculture Processing, Food	2.72	50.00	136
Pharmaceuticals	2.72	60.00	163.2
Service Facilities	4.39	50.00	219.5
Total	58.84		3,242

(Source) JICA Project Team

6) Revenue Items

The main revenue items of EZs are collected from the tenants; namely 1) industrial land lease fee,

2) rental factory fee, 3) utility (power, water supply and waste water) usage and 4) service fee. In order to attract foreign investors, the fees are expected to be competitive in comparison with economic zones in neighboring countries of ASEAN and India.

a. Comparison of lease and utility fees in economic zones of ASEAN and India

The lease and utility fees in private economic zones of ASEAN and India, to be a benchmark in EZ development in Bangladesh, are listed as follows.

Table 4.9.2-8 Comparison of lease and utility fees in economic zones of ASEAN and India

Country	Economic Zone	Lease period (years)	Land lease price(USD/sqm)	Rental factory fee (USD/sqm/month)	Electricity tariff (USD/kWh)	Industrial water tariff (USD/m3)	Wastewater tariff (USD/m3)
Vietnam	Vietnam Singapore Industrial Park I	50	55	5.0	0.06	0.46	-
Thailand	Amata Nakorn Industrial Park	sales	144	6.0	0.15	0.6	0.18-0.24
Indonesia	MM2100 Industrial Park	30+20	200	7.0	0.07	1.26	-
Cambodia	Phnom Penh Special Economic Zone	50	65	2.5	0.19	0.3	0.26
India	Mahindra World City	99	140	NA	0.11	0.8	-

(Source) JICA Project Team based on interviews and various reports

b. Revenue Items Assumption

Based on the cases of other economic zones in neighboring countries and BEPZA, the revenue items are estimated as shown in Table 4.9.2-9.

Table 4.9.2-9 Revenue Items

	Phase I (100ha)	Phase I+II (200ha)
Industrial Land Lease Fee	2019 USD55/m ² /50 years 2020 USD65/m ² /50 years 2021 USD75/m ² /50 years	2019 USD55/m ² /50 years 2020 USD65/m ² /50 years 2021 USD65/m ² /50 years 2022 USD70/m ² /50 years 2023 USD75/m ² /50 years 2024 USD80/m ² /50 years
Commercial Land Lease Fee	USD100/m ² /50 years (Salable Land Area: 1ha)	Same as Phase I
Rental Factory Fee	USD3.5/m ² /month, USD42/m ² /year (Rental Size: 20,000m ²)	USD3.5/m ² /month, USD42/m ² /year (Rental Size: 20,000m ²) USD4.0/m ² /month, USD48/m ² /year (Rental Size: 30,000m ²)
Power Tariff Charge	Maximum demand of 30MW Supplied to tenants by 10% addition to the current retail power tariff of Tk7.57/kWh, and 10% will be a revenue for a SPC (based on the case of BEPZA)	Maximum demand of 60MW Charge is same as Phase I
Water Supply	Maximum demand of 3,250/m ³ /day USD0.3/m ³ (based on the case of other countries)	Maximum demand of 6,500/m ³ /day Charge is same as Phase I
Waste Water Treatment	Maximum demand of 2,600/m ³ /day USD0.4/m ³ (based on the case of other countries)	Maximum demand of 5,200/m ³ /day Charge is same as Phase I
EZ	USD0.8/m ² /year (based on the case of	Charge is same as Phase I

Management Fee	other countries)	
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(Source) JICA Project Team

7) Project Cost Estimation

a. Development Cost

The development cost of onsite infrastructure for a SPC is shown in the previous section.

b. Other Project Cost Estimation

- O&M Cost

Referring to the cases of other countries, 0.3% of the construction cost is estimated as annual O&M costs.

- Employment

A total of 23 staff including one Japanese manager for Phase I and 37 staff for Phase I+II is assumed to be employed. A foreign staff is only a Japanese manager, and others are local staff.

The number of staff is expected to be increased in accordance with the progress of the EZ development, and the detail staff allocation and their salary is shown in the following table.

Table 4.9.2-10 Araihazar/Nayanpur EZ Staff Allocation

Phase I (100ha)				
#	Sections	No.	Annual Salary Unit Rate (USD)	Annual Salary (USD)
1	Managing Director	1	100,000	100,000
2	Director	1	18,000	18,000
3	Deputy Director	1	12,000	12,000
4	Chief Accountant	1	12,000	12,000
5	Accountant Staff	2	6,000	12,000
6	Technical Manager	1	12,000	12,000
7	Engineer	3	9,600	28,800
8	Marketing Manager	1	12,000	12,000
9	Marketing Staff	3	6,000	18,000
10	Security Manager	1	9,600	9,600
11	Security Staff	5	3,000	15,000
12	Driver & Others	3	3,000	9,000
	Total	23		258,400

Phase I & II (200ha)				
#	Sections	No.	Annual Salary Unit Rate (USD)	Annual Salary (USD)
1	Managing Director	1	100,000	100,000
2	Director	1	18,000	18,000
3	Deputy Director	1	12,000	12,000
4	Chief Accountant	1	12,000	12,000
5	Accountant Staff	3	6,000	18,000
6	Technical Manager	1	12,000	12,000
7	Engineer	6	9,600	57,600
8	Marketing Manager	1	12,000	12,000
9	Marketing Staff	5	6,000	30,000
10	Security Manager	1	9,600	9,600
11	Security Staff	10	3,000	30,000
12	Driver & Others	6	3,000	18,000
Total		37		329,200

(Source) JICA Project Team

• Concession Fee

The EZ land will be acquired by its own budget of BEZA, and the concession fee to be paid from SPC to BEZA is assumed to be specified in a concession agreement. In this Pre-F/S, 7% of the land lease sales revenue is projected as a concession fee, and the payment will be made for three years for Phase I and six years for Phase I+II. The bidding documents for a developer selection of BEZA show the following four options of concession fee payment. In this Pre-F/S, the option 2. “An annual land lease payment in USD per square meter of released land from the date the land is released to the Developer” has been applied, and the concession fee will be determined by negotiation between SPC and BEZA.

1. Revenue sharing arrangement
2. An annual land lease payment in USD per square meter of released land from the date the land is released to the Developer
3. A one-time up-front payment (non-refundable) in USD payable upon signature of contract
4. An escalation formula ensuring that the annual lease payments described above are regularly adjusted according to the rate of inflation, changing land values and currency fluctuations.

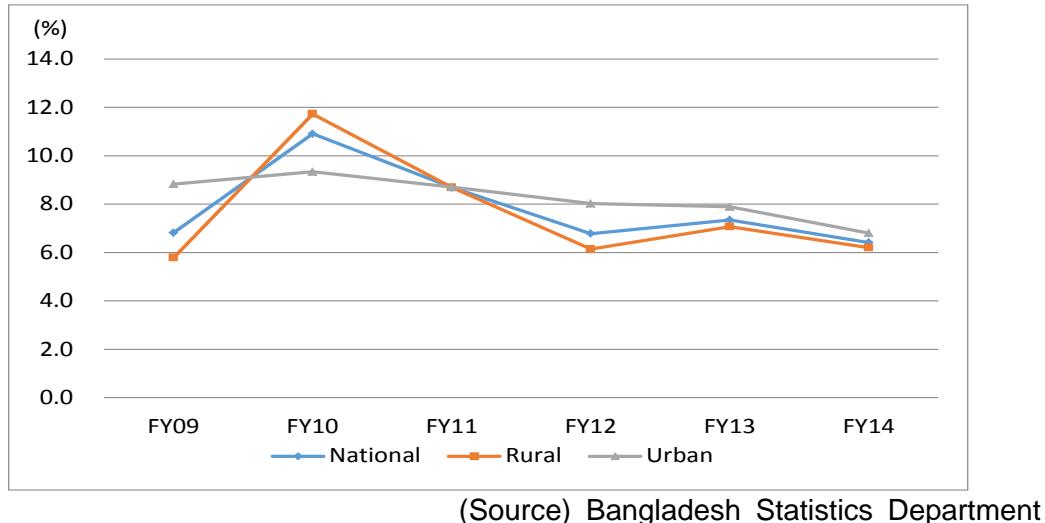
8) Other Conditions

a. Inflation

Although the pressure of the Bangladesh’s Consumer Price Index (CPI) has declined after a peak in FY2010, the CPI has recorded 7.8% in the average of the past six years in the whole country and 8.2% in the urban area. A rise in CPI will lead to a rise of construction cost, O&M cost and labor cost. The total project cost will increase with the inflation, however, the construction material cost increase rate is not as high as the average CPI, therefore, the inflation rate of 4.5%

has been assumed and incorporated in the case 1 of the sensitivity analysis. The cost increase will be offset by increasing revenue assumptions of 10% in every five years.

Figure4.9.2 1 CPI Trend in Bangladesh



b. Depreciation

A depreciation of 30 years has been assumed as an entire infrastructure of the EZs.

c. Discount Rate

The discount rate of 12% used in the Bangladesh ADB projects has been applied.

d. Corporate Tax

The corporate tax of 35% for non-listed companies in Bangladesh has been applied.

e. Incentives

The incentives for EZ developers announced by BEZA have been applied.

a. Income tax exemption on income derived from the business development of EZ in a block of 10 years in 15 years. After expiry of 10th year tax exemption will be 70% in 11th year and 30% in 12th year. But the tax exemption will not be applicable from 13th year.

b. Exemption of VAT on electricity or taxes on sale, of self generated or purchased electric power for use of processing area of EZ (for 10 years).

c. All purchase excluding petroleum product from Domestic Tariff Area (DTA) shall be exempted from VAT, sales tax etc.

d. One time capital subsidy up to 50% of cost incurred for setting up Central

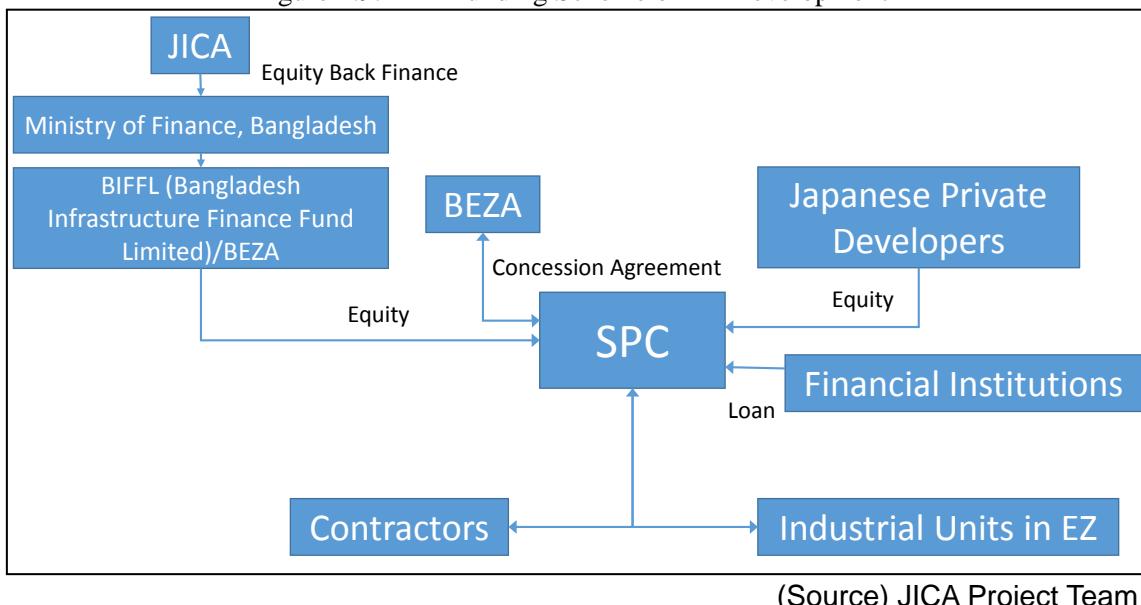
Effluent Treatment Plant (CETP).¹

- e. Exemption from custom/excise duties for development of EZs.
- f. Exemption of stamp duty and registration fees for registration of EZ land but limited to first transaction only.
- g. Exemption from dividend tax
- h. Exemption of income tax on service charges

9) Funding Scheme

A special purpose company (SPC), the development and operation entity for EZ development, will procure funding for the project. The SPC will be established by equity investment of a Japanese Consortium and various Bangladesh government institutions. The equity share is assumed to be 70% for the Japanese side and 30% for the Bangladesh side as a base case. The equity investment of the Bangladesh side will be financed through JICA's equity back finance. It will be invested to SPC through the Ministry of Finance, Bangladesh and Bangladesh Infrastructure Finance Fund Limited (BIFFL)/BEZA. The financial analysis results show that the initial investment of 25 million USD to 45 million USD will be required as a base case. Considering the equity ratio of 30% for the Bangladesh side, the equity back finance through JICA can cover the initial investment. All of the initial investment will be financed by equity finance, and debt finance is not assumed. However, if the initial investment cost will increase by increasing the share of SPC portion or the equity ratio between the Japan side and the Bangladesh side will change, the borrowing from financial institutions (local financial institutions or other international organizations) can be considered.

Figure 4.9.2-2 Funding Scheme of EZ Development



(Source) JICA Project Team

¹ Base on the discussion with BEZA and the JICA Project Team, subsidy for initial investment of setting up CETP has not been finalized among the government stakeholders, therefore, 100% of the initial investment is assumed to be covered by SPC in this Pre-F/S.

10) Results of Financial Analysis and Sensitivity Analysis

a. Result of Financial Analysis (Initial Base Case)

Table 4.9.2-11 Araihaazar EZ Financial Analysis Result

Phase I (100ha)	Phase I+II (200ha)
<ul style="list-style-type: none"> • Equity 25 million USD For BEZA: 7.5 million USD (30%) For Developer: 17.5 million USD (70%) • FIRR=18.11% (base case) • NPV=4.16 million USD (Discount Rate @12%) 	<ul style="list-style-type: none"> • Equity: 35 million USD For BEZA: 10.5 million USD (30%) For Developer: 24.5 million USD (70%) • FIRR=21.93% (base case) • NPV=15.3 million USD (Discount Rate @12%)

(Source) JICA Project Team

Table 4.9.2- 11 Araihaazar EZ Phase I Cash Flow

Year	1. COST			2. INCOME	3. BALANCE
	a. Capital cost	b. Annual cost	c. Cost Total		
0 2016	0.00	0	0.0	0	0.0
1 2017	439.68	193.6	633.3	0	-633.3
2 2018	675.60	253.6	929.2	0	-929.2
3 2019	15,687.01	672.9	16,360.0	6,660	-9,699.9
4 2020	21,264.84	1,055.0	22,319.8	10,788	-11,532.1
5 2021	0.00	1,850.6	1,850.6	21,109	19,258.8
6 2022	0.00	525.0	525.0	2,374	1,848.9
7 2023	0.00	475.0	475.0	2,244	1,768.8
8 2024	0.00	543.0	543.0	2,595	2,051.8
9 2025	0.00	577.0	577.0	2,595	2,017.8
10 2026	0.00	577.0	577.0	2,595	2,017.8
11 2027	0.00	577.0	577.0	2,595	2,017.8
12 2028	0.00	577.0	577.0	2,595	2,017.8
13 2029	0.00	577.0	577.0	2,595	2,017.8
14 2030	0.00	577.0	577.0	2,595	2,017.8
15 2031	0.00	577.0	577.0	2,595	2,017.8
16 2032	0.00	577.0	577.0	2,595	2,017.8
17 2033	0.00	577.0	577.0	2,595	2,017.8
18 2034	0.00	577.0	577.0	2,595	2,017.8
19 2035	0.00	825.8	825.8	2,595	1,769.1
20 2036	0.00	577.0	577.0	2,595	2,017.8
21 2037	0.00	577.0	577.0	2,595	2,017.8
22 2038	0.00	577.0	577.0	2,595	2,017.8
23 2039	0.00	577.0	577.0	2,595	2,017.8
24 2040	0.00	577.0	577.0	2,595	2,017.8
25 2041	0.00	577.0	577.0	2,595	2,017.8
26 2042	0.00	577.0	577.0	2,595	2,017.8
27 2043	0.00	577.0	577.0	2,595	2,017.8
28 2044	0.00	577.0	577.0	2,595	2,017.8
29 2045	0.00	577.0	577.0	2,595	2,017.8
30 2046	0.00	577.0	577.0	2,595	2,017.8
Total			56,580	102,856	46,276
IRR					18.11%

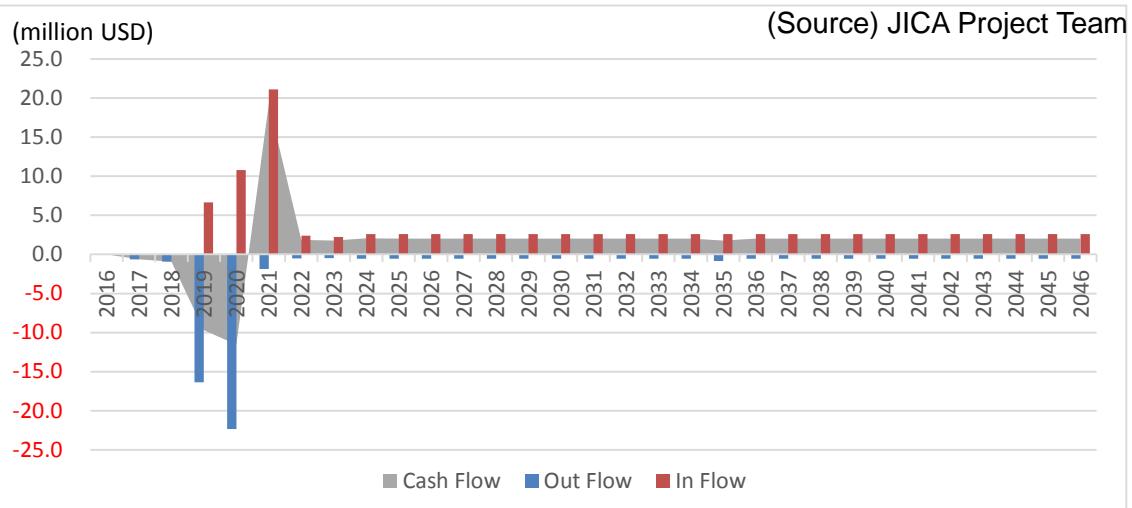


Table4.9.2-13 Araihaazar EZ Phase I+II Cash Flow

Year	1. COST			2. INCOME	3. BALANCE
	a. Capital cost	b. Annual cost	c. Cost Total		
0 2016	0.00	0	0.0	0	0.0
1 2017	664.35	224.8	889.2	0	-889.2
2 2018	1,005.95	319.6	1,325.5	0	-1,325.5
3 2019	16,206.28	738.9	16,945.2	6,660	-10,285.1
4 2020	24,413.03	1,017.8	25,430.8	9,971	-15,460.0
5 2021	18,531.71	1,808.9	20,340.6	18,337	-2,003.4
6 2022	14,741.97	1,424.8	16,166.8	13,718	-2,448.3
7 2023	0.00	1,976.0	1,976.0	20,610	18,633.8
8 2024	0.00	2,972.9	2,972.9	35,376	32,403.5
9 2025	0.00	823.1	823.1	4,878	4,054.6
10 2026	0.00	908.2	908.2	5,967	5,058.3
11 2027	0.00	908.2	908.2	5,967	5,058.3
12 2028	0.00	908.2	908.2	5,967	5,058.3
13 2029	0.00	908.2	908.2	5,967	5,058.3
14 2030	0.00	908.2	908.2	5,967	5,058.3
15 2031	0.00	908.2	908.2	5,967	5,058.3
16 2032	0.00	908.2	908.2	5,967	5,058.3
17 2033	0.00	908.2	908.2	5,967	5,058.3
18 2034	0.00	908.2	908.2	5,967	5,058.3
19 2035	0.00	1,152.7	1,152.7	5,967	4,813.9
20 2036	0.00	908.2	908.2	5,967	5,058.3
21 2037	0.00	908.2	908.2	5,967	5,058.3
22 2038	0.00	908.2	908.2	5,967	5,058.3
23 2039	0.00	908.2	908.2	5,967	5,058.3
24 2040	0.00	908.2	908.2	5,967	5,058.3
25 2041	0.00	908.2	908.2	5,967	5,058.3
26 2042	0.00	908.2	908.2	5,967	5,058.3
27 2043	0.00	908.2	908.2	5,967	5,058.3
28 2044	0.00	908.2	908.2	5,967	5,058.3
29 2045	0.00	908.2	908.2	5,967	5,058.3
30 2046	0.00	908.2	908.2	5,967	5,058.3
Total		106,187		234,847	128,661
IRR					21.93%

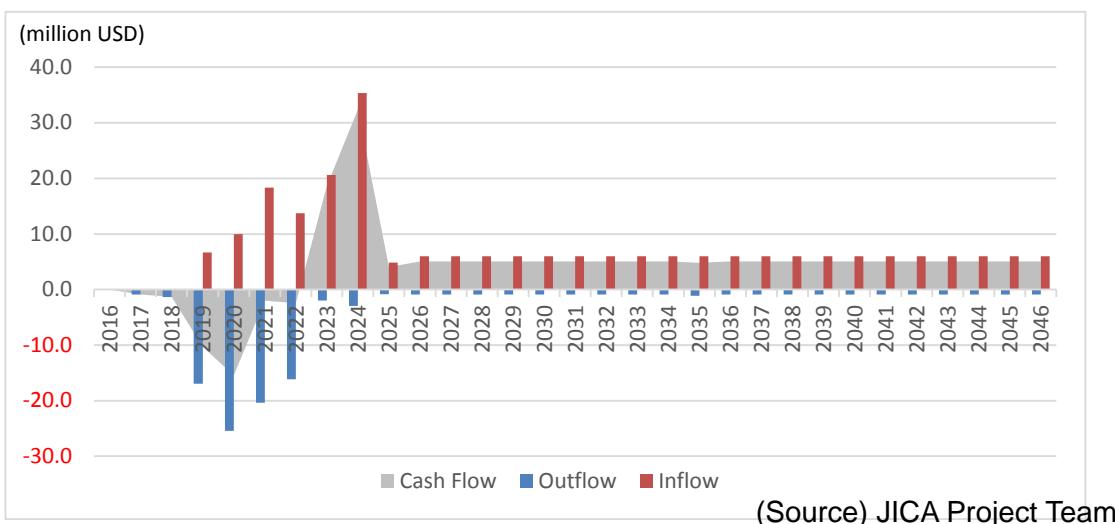
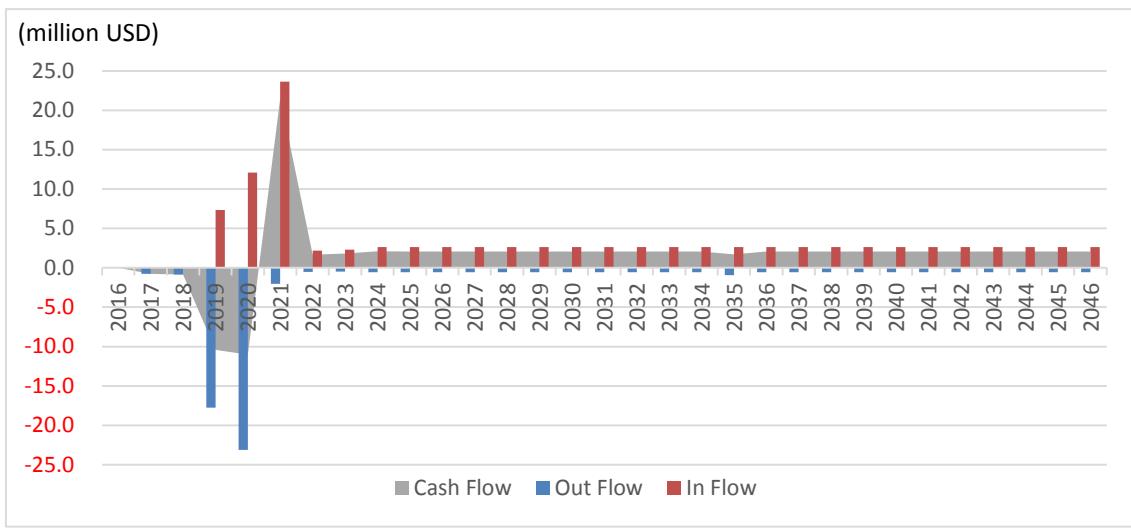


Table 4.9.2-14 Nayanpur EZ Financial Analysis Result

Phase I (100ha)	Phase I+II (200ha)
<ul style="list-style-type: none"> • Equity 25 million USD For BEZA: 7.5 million USD (30%) For Developer: 17.5 million USD (70%) • FIRR=19.96% (base case) • NPV=5.29 million USD (Discount Rate @12%) 	<ul style="list-style-type: none"> • Equity 45 million USD For BEZA: 13.5 million USD (30%) For Developer: 31.5 million USD (70%) • FIRR=18.89% (base case) • NPV=12.4 million USD (Discount Rate @12%)

Table 4.9.2-15 Nayanpur EZ Phase I Cash Flow

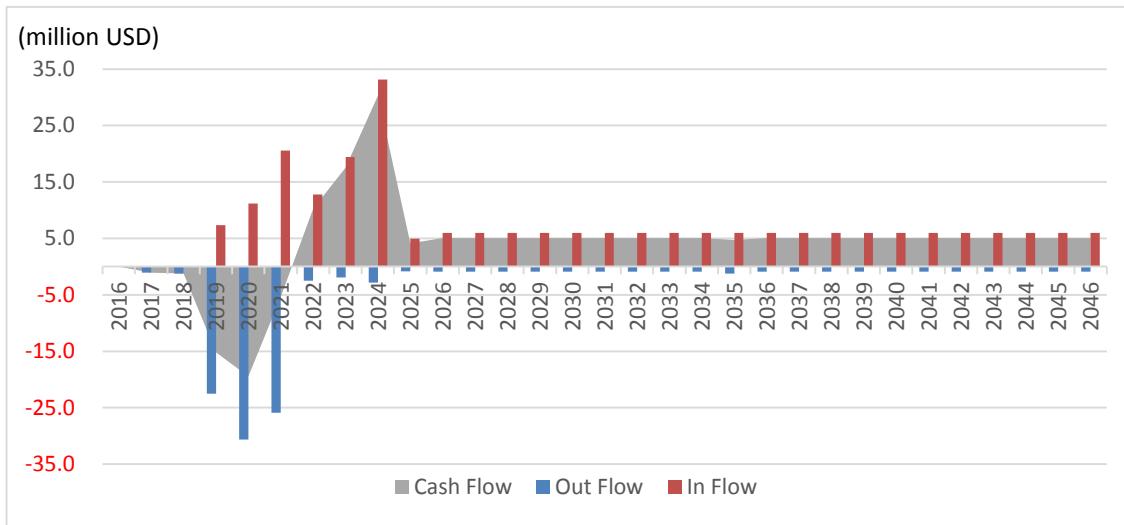
Year	1. COST			2. INCOME	3. BALANCE
	a. Capital cost	b. Annual cost	c. Cost Total		
0 2016	0.00	0	0.0	0	0.0
1 2017	580.83	194.2	775.0	0	-775.0
2 2018	603.61	252.4	856.0	0	-856.0
3 2019	17,241.82	521.3	17,763.2	7,347	-10,416.0
4 2020	21,984.09	1,126.7	23,110.8	12,086	-11,024.4
5 2021	0.00	2,030.9	2,030.9	23,617	21,586.3
6 2022	0.00	530.5	530.5	2,194	1,663.9
7 2023	0.00	480.5	480.5	2,285	1,804.3
8 2024	0.00	548.5	548.5	2,646	2,097.5
9 2025	0.00	582.5	582.5	2,646	2,063.5
10 2026	0.00	582.5	582.5	2,646	2,063.5
11 2027	0.00	582.5	582.5	2,646	2,063.5
12 2028	0.00	582.5	582.5	2,646	2,063.5
13 2029	0.00	582.5	582.5	2,646	2,063.5
14 2030	0.00	582.5	582.5	2,646	2,063.5
15 2031	0.00	582.5	582.5	2,646	2,063.5
16 2032	0.00	582.5	582.5	2,646	2,063.5
17 2033	0.00	582.5	582.5	2,646	2,063.5
18 2034	0.00	582.5	582.5	2,646	2,063.5
19 2035	0.00	940.4	940.4	2,646	1,705.5
20 2036	0.00	582.5	582.5	2,646	2,063.5
21 2037	0.00	582.5	582.5	2,646	2,063.5
22 2038	0.00	582.5	582.5	2,646	2,063.5
23 2039	0.00	582.5	582.5	2,646	2,063.5
24 2040	0.00	582.5	582.5	2,646	2,063.5
25 2041	0.00	582.5	582.5	2,646	2,063.5
26 2042	0.00	582.5	582.5	2,646	2,063.5
27 2043	0.00	582.5	582.5	2,646	2,063.5
28 2044	0.00	582.5	582.5	2,646	2,063.5
29 2045	0.00	582.5	582.5	2,646	2,063.5
30 2046	0.00	582.5	582.5	2,646	2,063.5
Total			59,267	108,387	49,119
IRR					19.96%



(Source) JICA Project Team

Table 4.9.2-16 Nayanpur EZ Phase I+II Cash Flow

Year	1. COST			2. INCOME	3. BALANCE
	a. Capital cost	b. Annual cost	c. Cost Total		
0 2016	0.00	0	0.0	0	0.0
1 2017	850.74	225.4	1,076.1	0	-1,076.1
2 2018	889.53	317.2	1,206.7	0	-1,206.7
3 2019	21,740.69	787.8	22,528.5	7,347	-15,181.3
4 2020	29,526.10	1,099.3	30,625.4	11,170	-19,455.8
5 2021	23,934.27	1,967.2	25,901.5	20,537	-5,364.2
6 2022	1,141.96	1,376.9	2,518.9	12,767	10,248.3
7 2023	0.00	1,899.3	1,899.3	19,437	17,538.1
8 2024	0.00	2,819.9	2,819.9	33,119	30,299.1
9 2025	0.00	834.0	834.0	4,968	4,134.0
10 2026	0.00	912.2	912.2	5,970	5,057.4
11 2027	0.00	912.2	912.2	5,970	5,057.4
12 2028	0.00	912.2	912.2	5,970	5,057.4
13 2029	0.00	912.2	912.2	5,970	5,057.4
14 2030	0.00	912.2	912.2	5,970	5,057.4
15 2031	0.00	912.2	912.2	5,970	5,057.4
16 2032	0.00	912.2	912.2	5,970	5,057.4
17 2033	0.00	912.2	912.2	5,970	5,057.4
18 2034	0.00	912.2	912.2	5,970	5,057.4
19 2035	0.00	1,239.6	1,239.6	5,970	4,730.0
20 2036	0.00	912.2	912.2	5,970	5,057.4
21 2037	0.00	912.2	912.2	5,970	5,057.4
22 2038	0.00	912.2	912.2	5,970	5,057.4
23 2039	0.00	912.2	912.2	5,970	5,057.4
24 2040	0.00	912.2	912.2	5,970	5,057.4
25 2041	0.00	912.2	912.2	5,970	5,057.4
26 2042	0.00	912.2	912.2	5,970	5,057.4
27 2043	0.00	912.2	912.2	5,970	5,057.4
28 2044	0.00	912.2	912.2	5,970	5,057.4
29 2045	0.00	912.2	912.2	5,970	5,057.4
30 2046	0.00	912.2	912.2	5,970	5,057.4
Total			108,895	234,708	125,814
IRR					18.89%



(Source) JICA Project Team

b. Sensitivity Analysis

The sensitivity analysis was conducted by changing the assumptions from the base case; 1) consideration of inflation, 2) 10% increase of project cost, 3) 10% decrease of project cost, 4) land lease fee of 60 USD/m² as a base case, 5) land lease fee of 55 USD/m² as a base case, and 6) one year delay in land lease sales period. The FIRR after carrying out the sensitivity analysis is shown below.

Table 4.9.2-17 Araihaazar EZ Sensitivity Analysis Results

Phase I (100ha)		Phase I+II (200ha)	
Base Case	18.11%	Base Case	21.92%
Case 1: Including Inflation	19.65%	Case 1: Including Inflation	22.77%
Case 2: 10% Increase in Project Cost	13.90%	Case 2: 10% Increase in Project Cost	18.01%
Case 3: 10% Decrease in Project Cost	24.28%	Case 3: 10% Decrease in Project Cost	27.08%
Case 4: Land Lease Fee of 60 USD/m ²	15.46%	Case 4: Land Lease Fee of 60 USD/m ²	19.42%
Case 5: Land Lease Fee of 55 USD/m ²	13.26%	Case 5: Land Lease Fee of 55 USD/m ²	17.16%
Case 6: One Year Delay in Land Sales Period	15.87%	Case 6: One Year Delay in Land Sales Period	19.93%

Table 4.9.2-18 Nayapur EZ Sensitivity Analysis Results

Phase I (100ha)		Phase I+II (200ha)	
Base Case	19.96%	Base Case	18.89%
Base Case	20.76%	Base Case	19.87%
Case 1: Including Inflation	15.12%	Case 1: Including Inflation	15.59%
Case 2: 10% Increase in Project Cost	27.10%	Case 2: 10% Increase in Project Cost	23.19%
Case 3: 10% Decrease in Project Cost	16.76%	Case 3: 10% Decrease in Project Cost	16.83%
Case 4: Land Lease Fee of 60 USD/m ²	14.14%	Case 4: Land Lease Fee of 60 USD/m ²	14.97%
Case 5: Land Lease Fee of 55 USD/m ²	16.45%	Case 5: Land Lease Fee of 55 USD/m ²	17.18%

(2) Economic Analysis

The economic analysis was conducted by assuming economic costs and benefits of EZ

development projects.

1) Assumptions

The financial analysis covered the costs and benefits of SPC, the development entity of the EZ development, however, the economic analysis covered the entire costs and benefits of the project including BEZA/the Bangladesh government.

2) Standard Conversion Factor: SCF

By using the ADB's Standard Conversion Factor estimation method of applying the trade statistics, SCF was projected. SCF will adjust the distortions at the border of the market price and the economic analysis can be made by applying the economic prices.

$$SCF = \frac{M + X}{(M + Tm) + (X - Tx)}$$

M : CIF value of imports
X : FOB value of exports
Tm : all taxes (duties) on imports
Tx : all taxes (duties) on exports

The calculation of SCF by applying the recent trade statistics to the above equation is as follows.

(unit: Crore Taka)

$$SCF = \frac{252,310 + 1,958,209}{(252,310 + 31,407) + (1,958,209 - 39)} \\ = 0.98$$

3) Project Schedule

The EZs are scheduled to start operation in 2017, and the project schedule of 30 years is assumed (Phase I: construction period of 4 years and operational period of 26 years; Phase I+II: construction period of 6 years and operational period of 24 years).

4) Economic Costs

The economic costs include the total project cost of offsite and onsite infrastructure development as well as land acquisition fees of the EZ development. They were calculated by multiplying the SCF to the Local Costs and subtracting the various tariffs and taxes. The economic costs were divided by Local Costs (LC) and Foreign Costs (FC) with each direct construction costs and indirect construction costs shown in Table 4.9.1-2 Short Term EZ Development Project Cost Summary. The Local Costs were multiplied by SCF to convert to the international market trading prices. The backup power plant, substation, waste treatment plant and telecommunication facility, considered as options of the economic costs, are not included.

Table 4.9.2-19 Economic Costs

(unit: '000 USD)

#	Items	Araihaazar		Nayanpur	
		Phase I	Phase I+II	Phase I	Phase I+II
1	Off-Site Capital Cost	20,015	39,560	22,072	39,214
1.1	Construction Cost (FC)	7,802	15,383	9,270	15,761
1.2	Construction Cost (LC)	11,021	21,820	11,487	21,117
1.3	Engineering Cost (FC)	840	1,660	926	1,645
1.4	Engineering Cost (LC)	353	697	389	691
2	On-Site Capital Cost	37,774	75,230	40,091	77,467
2.1	Construction Cost (FC)	21,851	43,783	22,762	44,406
2.2	Construction Cost (LC)	13,685	27,517	14,952	29,012
2.3	Engineering Cost (FC)	1,576	2,768	1,674	2,851
2.4	Engineering Cost (LC)	662	1,162	703	1,198
3	Land Acquisition Cost	31,850	63,700	49,490	98,980
3.1	Land Acquisition Cost (LC)	31,850	63,700	19,190	98,980
	Total	89,640	178,490	111,653	215,661

(Source) JICA Project Team

5) Economic Benefits

The direct and indirect benefits to the government by the EZ development are as follows and the each economic benefits were calculated.

a. Direct Benefit

The revenue items used in the financial analysis; i.e. industrial land lease fee, commercial land lease fee, rental factory fee, electricity charge fee, water supply fee, waste water treatment fee and EZ management fee, were included as direct benefits.

b. Increase in Direct Employment

The direct employment of 10,000 for Phase I and 20,000 for Phase I+II is estimated. The annual labor cost of a worker (general engineering staff) is projected as USD 1,235 (Bangladesh Bureau of Statistics).

c. Increase in Indirect Employment

Increasing direct investment will lead to a regional development surrounding the EZs, and the employment in construction, logistics and services industries will increase. The indirect employment creation of 2.3 times of direct employment will be expected (referring to the case of economic zone in Thailand).

d. Increase in Tax Revenue

The income tax payment of 35% by tenants will be revenue to the government. Based on the marketing survey, the number of tenants in EZs will be 28 in Phase I and 56 in Phase I+II. The annual sales and the net sales per company are projected as 10 million USD and 0.8 million USD respectively.

6) Economic Analysis Results

The results of the economic analysis in EIRR are shown in the following table. The EIRR of Phase I+II has been deteriorated as the funding recovery will take time; the land acquisition will be completed in two years after the project starts whereas the land lease revenue will be generated after 4-9 years from the project commencement.

Table 4.9.2-20 Economic Analysis Results

Arihazar EZ		Nayanpur EZ	
Phase I	Phase I+II	Phase I	Phase I+II
28.86%	26.03%	24.50%	21.91%

(Source) JICA Project Team

The EZ development will develop spill-over effects to the economy such as indirect employment creation, industrial agglomeration and technology transfer, therefore, the effect of the EZ development to the economy is considered to be large.

4.9.3. Deliberation of Project Implementation Plan

(1) Concept of Project Implementation Plan for Short Term Development

For the candidate project sites for the short term development, it is planned to develop based on the participation of the Japanese developers as the PPP scheme to be appropriated the Japan's ODA Loan Cooperation. The development of the EZ would be executed as following schemes, 1) Investment of the EZ development and 2) ODA Yen Loan to be appropriated for the development of the out side infrastructure for the EZ such as (Access road development, Substation of electrical power, water and sewerage surrounding area of the EZ and Embankment /Reclamation for the counter measures for flood)

(2) Index of Offsite Infrastructure of EZ and Financial Points for Japanese EZ Developer and Operator

As the results of the hearing survey for Japanese EZ Developers, prospective points for the EZ to be developed and operated by Japanese Firms are as follows.

- 1) To be provided enough capacity of the electrical power and to be installed an electric power sub-station by the Government.
- 2) To be provided the countermeasures for flood disaster by the Government, of which the large scale of embankment fill as the measures is expensive for the developer.
- 3) To be provided an access road for the EZ by the Government
- 4) To secure more than 200 ha area including expansion for the EZ
- 5) Long term land leasing price shall be set lower than US\$ 65/m²
- 6) To secure more than 15% of FIRR for Financial Analysis
- 7) To consider the mitigation measures for the traffic congestion around the EZ

(3) Project Implementation Scheme

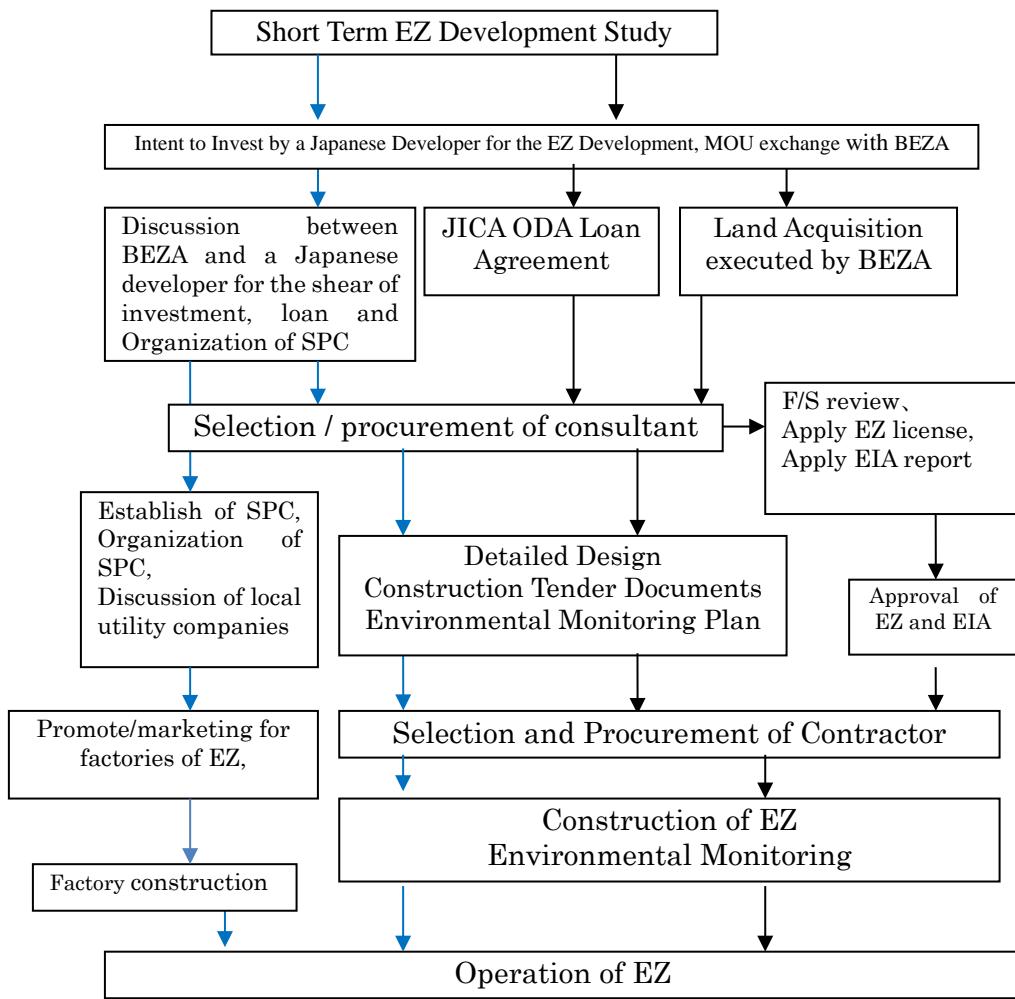
In the short term development for two candidate sites of EZ ensured in the previous chapter (Arihazar site and Nayanpur site), one candidate site or/and both sites would be developed and operated by the SPC formed between BEZA and Japanese Developer as the PPP project. Based on the Index of Offsite Infrastructure of EZ and Financial Points for Japanese EZ Developer

and Operator mentioned in (2) above, the project is planned as following procedures.

- 1) Enough capacity of electric power shall be provided preferentially to the EZ by PGCB. A necessary initial sub-station (132kv~33kv) nearby the EZ would be provided by PGCB. Then, REB would provide second sub-station (33kv~11kv) in the EZ by their cost. In case that the necessity of the back-up power plant would be confirmed by the Government, the power plant would be constructed by the Government.
- 2) Embankment and reclamation of the EZ for the measures of flood is about 40% of the total development cost of the EZ. The embankment and filling work shall be a part of the offsite infrastructure development as the government project by using Japan's ODA loan to ensure the profitability of the SPC.
- 3) Access road construction of the EZ is used as a temporary road for the EZ construction as well. Therefore, the access road is required to construct ahead of the EZ construction as the offsite infrastructure developed by the Government using Japan's ODA loan. (The Access road is included related other infrastructures such as water and gas pipelines to the EZ, drainages, road lighting work and etc).
- 4) EZ development is assumed to be expanded to 200ha in future. Hence, the development is taken to divide into two cases, Phase I for 100ha development and Phase II plus Phase II for 200ha development.
- 5) Long term leasing fee for the tenants (Factories) of the EZ is set as US\$ 65/m² on the average (All the leasing agreement with the tenants is completed for three years).
- 6) The target FIRR is set from 15% to 20% for the share of scope of the development work between the SPC and the Government.
- 7) To cope with the traffic congestion around the EZ area, it is large scale development to improve the system of the roads which is not only for the EZ but also for the national road development. Therefore, necessary improvement and its cost are only mentioned in the report for the reference purpose.

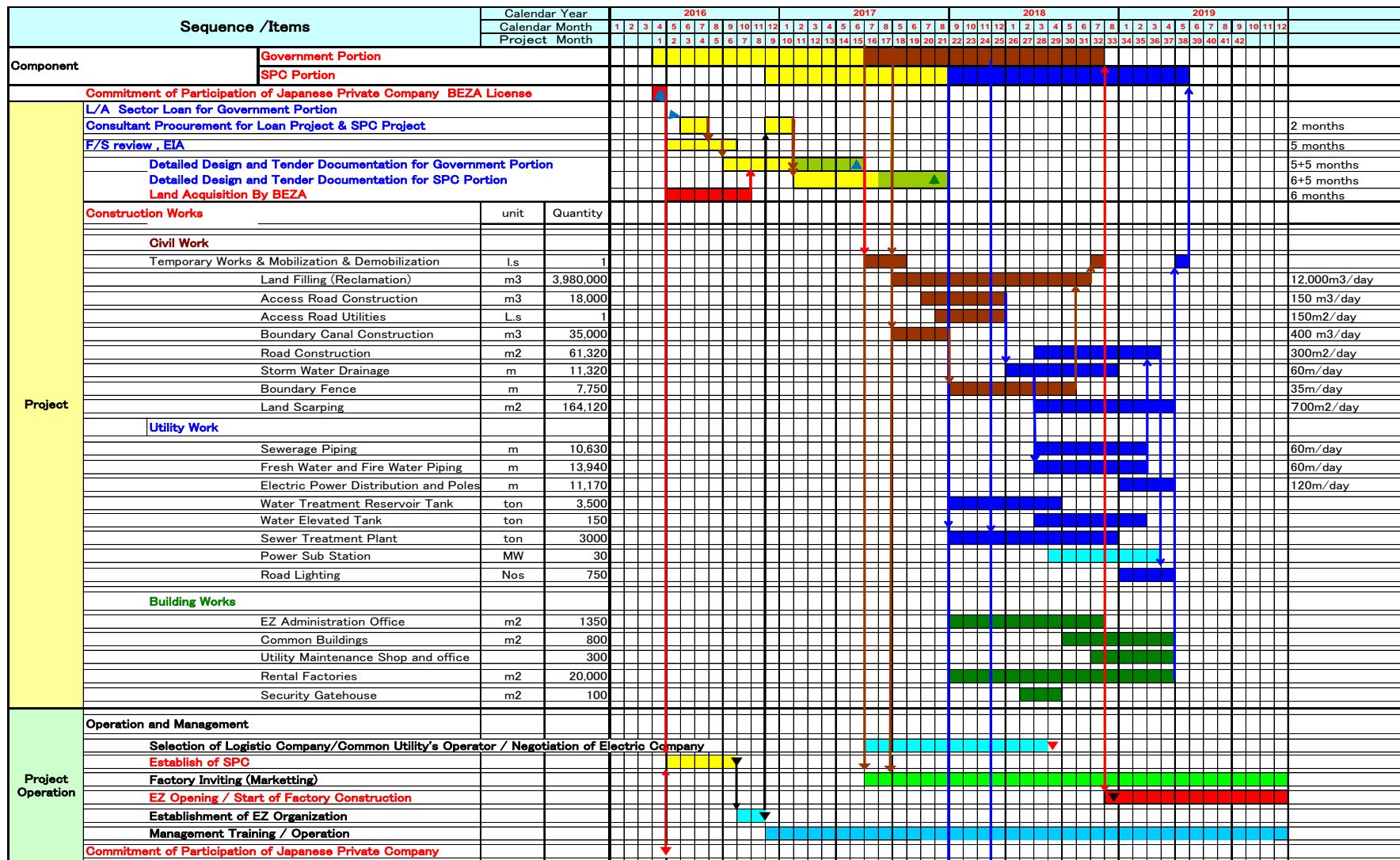
(4) Implementation Schedule of Short Term EZ Development

The foreign direct investment (FDI) is indispensable in order to achieve the economic growth of Bangladesh. This project is aimed pushing that the EZ development could be urgent tasks to be accepted the foreign factory's investment as the FDI. BEZA is a implementation agency of EZ . However, BEZA has not enough experience to promote the factories and operate of the EZ. Therefore, a Japanese developer of EZ having much experience to promote and operate for the EZ in order to take joint operation (concessionaire or establish SPC) with BEZA would be based on the project. Upon confirmation to invest for the EZ by the Japanese developer, the project implementation flowchart is shown in Figure 4.9.3-1 to be divided into Bangladesh government side (planned by Japan's ODA loan) project and the SPC side project. The implementation schedule including construction schedule for the both side, Araihaazar and Nayapur for Phase I project are shown in Figure 4.9.3-2 and Figure 4.9.3-3 respectively. (Phase II project will be continued after completion of the Phase I project, therefore the schedule of Phase II is omitted in the figures)



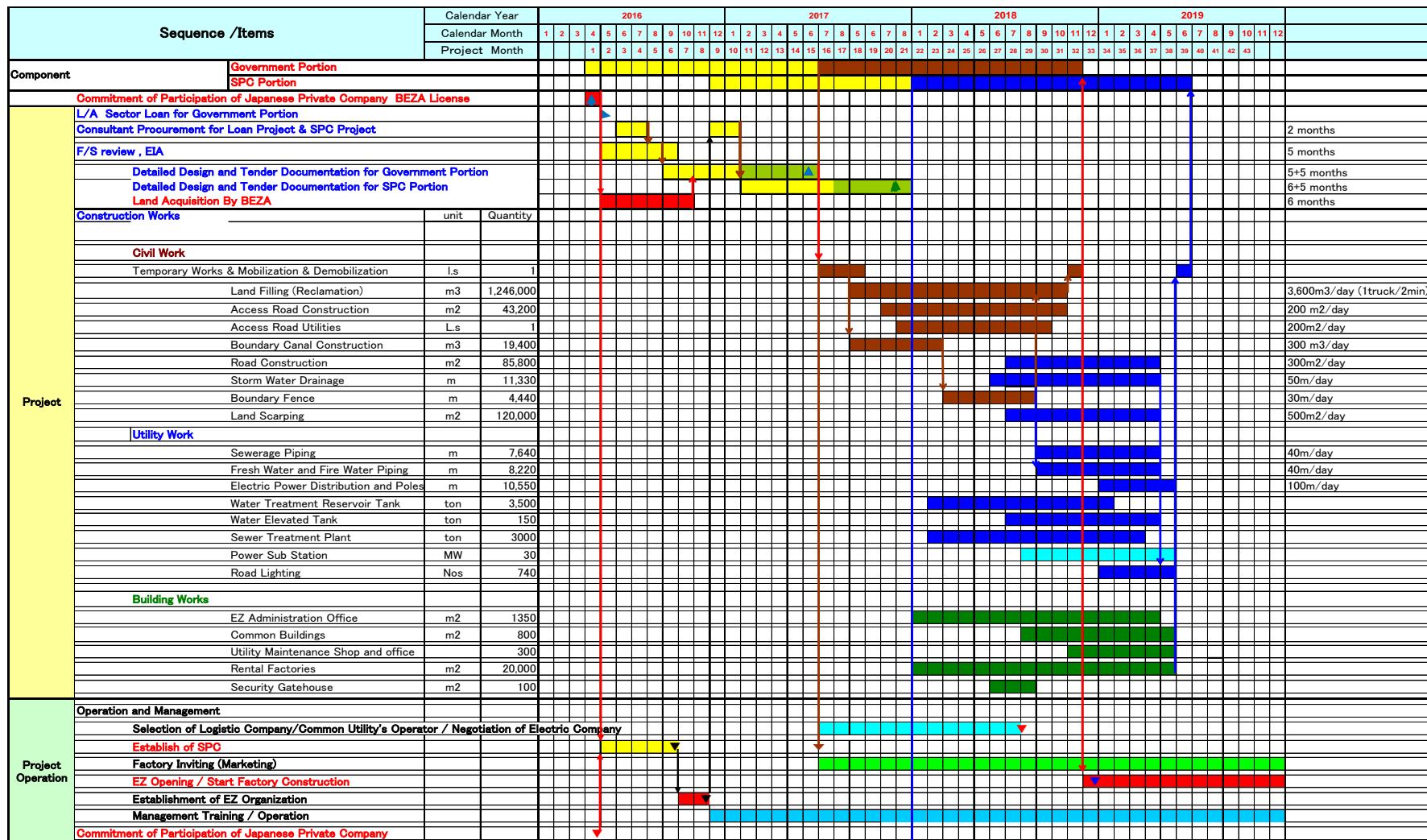
Source: Study Team

Figure 4.9.3-1 Flowchart of EZ Development



Source: Study Team

Figure 4.9.3-2 Implementation Schedule for Araihazar EZ Phase I



Source: Study Team

Figure 4.9.3-3 Implementation Schedule for Nayanpur EZ Phase I