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Submitted to:
**Department of
Environment**
The People's Republic of
Bangladesh



Environmental Impact Assessment (EIA) Report

On

Maheshkhali Economic Zone-III

Dhalghata, Maheshkhali, Cox's Bazar



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Table of Contents	
Chapter1: Executive Summary.....	1
1.1 Introduction.....	1
1.2 Project Background	1
1.3 Project Description	1
1.4 Description of Project site	2
1.5 Connectivity.....	3
1.6 Policy, Legal and Administrative Framework.....	4
1.7 Project Activities and Area Statement.....	4
1.8 Project Schedule.....	5
1.9 Resources and Utilities Requirement	5
1.10 Environmental and Social Baseline.....	11
1.11 Identification and Analysis of Key Environmental Issues.....	12
1.12 Environmental and Social Impacts.....	14
1.12.1 Impact on Air Quality and Noise.....	14
1.12.2 Impact on Water Resources	15
1.12.3 Impact on Land Resources.....	15
1.12.4 Impact on Agriculture Resources.....	17
1.12.5 Impact on Fisheries.....	17
1.12.6 Impact on Ecosystem.....	17
1.12.7 Socio-economic Impact	19
1.13 Stakeholder Engagement Plan.....	21
1.14 Environmental Management Plan	22
Chapter 2: Introduction.....	31
2.1. Prelude	31
2.2. Project Background	32
2.3. Project Description	32
2.4. Description of the Project Site.....	32
2.5. Connectivity.....	34
2.6. Need for the Proposed Project.....	34
2.7. Need of the Study.....	35
2.8. Scope of the Study.....	35
2.9. Methodology of the Study.....	35
2.10. ToR Compliance Matrix	38
2.11. Structure of the Report	40
2.12. EIA Team.....	41
2.13. References.....	42
Chapter 3: Legislative, Regulation and Policy Considerations.....	43
3.1 Policy, Legal and Administrative Framework.....	43
3.2 Legal Enforcement Agencies.....	43
3.3 Applicable Environmental and Social Laws, Regulations and Policies	47
3.4 World Bank’s Operational Policies and Guidelines	60
3.4.1 Applicability.....	60
3.4.2 Categorization of Projects	62
3.4.3 Applicability of IFC Performance Standards.....	63

3.5	Applicable World Bank Group EHS Guidelines.....	66
3.6	Asian Development Bank (ADB) Safeguard Principles and Policies	71
3.6.1	Safeguard Policy Statement (SPS), 2009	71
3.6.2	Social Protection Strategy, 2001	73
3.6.3	Public Communications Policy 2011	74
3.6.4	Categorization of Projects	74
3.7	Equator Principle Financial Institutions (EPFIS) Guidelines.....	74
3.8	International and National Environment Standards/ Guidelines.....	76
3.8.1	Ambient Air quality standards	76
3.8.2	Water quality standards	77
3.8.3	Liquid Effluent Discharges	78
3.8.4	Ambient Noise Standards	80
3.8.5	Applicable International Conventions	81
Chapter 4: Project Description.....		82
4.1	Introduction.....	82
4.2	Project Area and Study Area.....	82
4.3	Site Description	83
4.4	Accessibility to Site	84
4.5	Project Overview	85
4.5.1	Project Objectives.....	85
4.5.2	SWOT Analysis of MEZ-III.....	86
4.5.3	Project Activities and Area Statement.....	88
4.5.4	Division of Economic Zones	88
4.5.5	Key Elements of Master Planning.....	89
4.6	Project Schedule.....	92
4.7	Project Operation	93
4.7.1	Employment Potential	93
4.8	Resource Requirement.....	93
4.8.1	Labor during Construction.....	93
4.8.2	Construction Material during Construction	93
4.8.3	Utility Demand	93
4.8.4	Solid Waste Management	95
4.8.5	Sewage and Wastewater Infrastructure	96
4.8.6	Street Lighting	97
4.8.7	Telecommunications	97
4.8.8	Surface drainage.....	97
4.8.9	Fire Station	98
4.9	Planning Framework.....	98
Chapter5: Environmental and Social Baseline		99
5.1	Introduction.....	99
5.2	Meteorology	101
5.2.1	Temperature.....	102
5.2.2	Humidity	103
5.2.3	Rainfall.....	104
5.2.4	Evaporation	104

5.2.5	Wind Speeds.....	104
5.2.6	Sun Shine Hours.....	109
5.3	Air Quality and Noise.....	109
5.3.1	Ambient Air Quality of the project site with respect to Standard of ECR, 1997	109
5.3.2	Ambient Noise Level of the Project Site with respect to Standard of Noise Pollution (Control) Rules, 2006.....	110
5.3.3	Air Pollution and Noise Sources from existing and known sources	110
5.4	Water Resources	111
5.4.1	Surface Water System	111
5.4.2	Tropical Cyclones and Tidal Flooding.....	113
5.4.3	Salinity	117
5.4.4	Drainage Congestion and Water Logging	118
5.4.5	Erosion and sedimentation.....	119
5.4.6	River Morphology.....	119
5.4.7	Navigation	120
5.4.8	Ground Water System	120
5.5	Land Resources.....	122
5.5.1	Agro-ecological regions	122
5.5.2	Land Types.....	123
5.5.3	Soil Texture.....	124
5.5.4	Land Use	125
5.6	Agricultural Resources.....	126
5.6.1	Farming Practice.....	126
5.6.2	Cropping Pattern and Intensity.....	128
5.6.3	Cropped Area	128
5.6.4	Crop Production	128
5.6.5	Crop Damage.....	129
5.6.6	Main Constraints of Crop Damage.....	129
5.7	Livestock and Poultry	129
5.7.1	Feed and Fodder Shortage	130
5.7.2	Livestock/Poultry Diseases	130
5.8	Fisheries	131
5.8.1	Introduction.....	131
5.8.2	Problems and Issues	131
5.8.3	Habitat Description.....	132
5.8.4	Fish Production and Effort.....	132
5.8.5	Fish Migration.....	132
5.8.6	Fish Biodiversity.....	133
5.8.7	Fisheries Management	135
5.9	Ecological Resources	135
5.9.1	Bio-ecological Zones	135
5.9.2	Ecologically valuable habitats.....	135
5.9.3	Common Flora and Fauna.....	136
5.9.4	Ecosystem Services and Function	141
5.10	Socio-Economic Condition.....	142

5.10.1	Socio-Economic Condition	142
5.10.2	Quality of Life Indicators.....	143
5.10.3	Income and Poverty.....	144
5.10.4	Gender and Women	145
5.10.5	Common Property Resources	145
5.10.6	Conflict of Interest and Law and Order Situation	146
5.11	Historical, Cultural and Archaeological Sites	146
Chapter 6: Identification and Analysis of Key Environmental Issues.....		147
6.1	Environmental Sensitivity Investigation	147
6.2	Natural Hazards	147
6.2.1	Seismicity.....	148
6.2.2	Flooding, Cyclone and River Bank Erosion	148
6.2.3	Change of Meteorology.....	148
6.3	Environmental Asset.....	148
6.3.1	Fertile Soil.....	148
6.3.2	Water Resources	148
6.3.3	Fishery and aquaculture	148
6.3.4	Air	149
6.3.5	Agriculture.....	149
6.3.6	Environmental Hotspot	149
6.4	Likely Beneficial Impact	149
6.4.1	Socio-Economic Benefits	149
6.4.2	Infrastructural Development	149
6.4.3	Industrial Decentralization	149
6.4.4	Community Recommendations	150
6.5	Alternate Analysis.....	150
6.5.1	Scope of Alternative Location.....	150
6.5.2	Alternative Technology and Raw Materials	150
6.5.3	'Non-Project' Consideration	150
6.6	Environmental and Social Impacts Assessment Methodologies.....	151
6.6.1	Magnitude	151
6.6.2	Sensitivity	152
6.6.3	Assigning Significance.....	152
6.6.4	Mitigation Measures	153
6.6.5	Assessment of Residual Impacts.....	153
6.6.6	Impact Screening.....	153
Chapter 7: Environmental and Social Impacts		156
7.1	Introduction.....	156
7.2	Impact on Air Quality and Noise.....	156
7.2.1	Pre-construction phase	156
7.2.2	Construction Phase.....	156
7.2.3	Post-construction phase.....	157
7.3	Impact on Water Resources	158
7.3.1	Pre-construction phase	158
7.3.2	Construction Phase.....	158

7.3.3	Post Construction Phase	159
7.4	Impact on Land Resources.....	160
7.4.1	Pre-Construction phase	160
7.4.2	Construction Phase.....	160
7.4.3	Post Construction Phase	160
7.5	Impact on Agriculture Resources.....	161
7.5.1	Construction phase.....	161
7.5.2	Post Construction phase.....	161
7.6	Impact on Fisheries	161
7.6.1	Pre-Construction and Construction phase.....	161
7.6.2	Post Construction Phase	161
7.7	Impact on Ecosystem.....	161
7.7.1	Pre-Construction and Construction Phase.....	161
7.7.2	Post Construction Phase	162
7.8	Socio-economic Impact	163
7.8.1	Pre-Construction Phase	163
7.8.2	Construction Phase.....	163
7.8.3	Post-Construction Phase	164
Chapter 8: Public Consultation and Disclosure		166
8.1	Introduction.....	166
8.2	Objectives of Public Consultation and Disclosure Meeting	166
8.3	Approach and Methodology of Public Consultation and Disclosure Meeting	166
8.3.1	Approach of PCM and PD for EIA.....	166
8.3.2	Methodology of PCM and PD for EIA.....	167
8.3.3	Stakeholder Engagement Plan.....	167
8.4	Public Consultation Meetings (PCMs).....	168
8.5	Proceedings of Public Hearing	169
8.6	Public Disclosure Meetings (PDMs)	171
Chapter 9: Environmental Management Plan and Monitoring Indicators		172
9.1	Introduction.....	172
9.2	Mitigation Plan	172
9.3	Corporate Social and Environmental Responsibility (CSER).....	197
9.4	Mitigation and Management Plan for Threatened Species of Concern	198
9.5	Enhancement Plan.....	199
9.6	Contingency Plan	199
9.7	Compensation Plan.....	202
9.8	Monitoring Plan.....	202
9.9	Monitoring Indicators.....	205
Chapter 10: Cost Estimation for Environmental Mitigation Measures and Monitoring		207
10.1	Budget Plan for Environmental Management	207
10.2	Budget Plan for Environmental Monitoring.....	207
Chapter 11: Conclusion and Recommendations		209
11.1	Conclusion	209
11.2	Recommendations.....	210

List of Table

Table 1: Coordinates and surroundings of the EZ Site.....	33
Table 2: Compliance of Terms of References (ToR) points.....	38
Table 3: EIA Team	41
Table 4: References used for EIA study.....	42
Table 5: Relevant legal enforcement agencies and their functions	43
Table 6: Applicable environmental, health and safety and social laws, regulations and policies	47
Table 7: Key permits required to be obtained by MEZ-III	59
Table 8: Potential World Bank environmental safeguard policies and applicability to project.....	60
Table 9: World Bank’s categorization for projects	62
Table 10: Key requirements as per EHS guidelines of IFC	67
Table 11: Ambient air quality guidelines.....	76
Table 12: Air quality standards of Bangladesh (2005).....	77
Table 13: Standards for inland surface water	77
Table 14: Standards for drinking water.....	77
Table 15: Standards for liquid effluent discharge	79
Table 16: Treated sewage discharge guideline values of IFC	80
Table 17: Noise level guidelines as per IFC.....	80
Table 18: Ambient noise standards as per DOE	80
Table 19: Applicable international conventions.....	81
Table 20: Key Details of the Project	82
Table 21: Distribution of the Project Land Area	82
Table 22: Geographical Co-ordinates outlining the Site.....	83
Table 23: Co-ordinates and Surroundings of the Site.....	84
Table 24: Strength, Weakness, Opportunity and Threats of Upcoming MEZ-III.....	86
Table 25: Details of On-site Facilities	88
Table 26: Divisions of Economic Zone as per BEZA Act	88
Table 27: Distribution of Industrial Plots.....	89
Table 28: Potential Industries for Establishment of MEZ-III.....	90
Table 29: Classification of Road Types	90
Table 30: Proposed Land Use Summary of MEZ-III	91
Table 31: Proposed Project Development Schedule	92
Table 32: Proposed Employment Opportunity	93
Table 33: Utility Demand Forecast for the MEZ-III.....	95
Table 34: Details of STP and CETP proposed at the MEZ-III	96
Table 35: Existing environmental settings of MEZ-III	100
Table 36: Important features of the MEZ-III at a glance	101
Table 37: Average maximum and minimum temperature of two stations in the year of 2016	103
Table 38: Monthly variation of relative humidity in the year of 2015.....	104
Table 39: Monthly total rainfall in Cox’s Bazar and Kutubdia station (2016)	104
Table 40: Annual rainfall for Cox’s Bazar and Kutubdia station (2007-2016).....	104
Table 41: Determination of air quality of the project area	110
Table 42: Noise level in the project area.....	110
Table 43: Surface water quality near the project site	113

Table 44: List of major cyclonic storms in project area	114
Table 45: Water level data near the project site.....	117
Table 46: Occurrence of river erosion in various Upazilas of Cox' Bazar district (2008-2011)	119
Table 47: Ground water quality data of the project site	122
Table 48: Land area based on utilization (area in acres and production in metric ton)	127
Table 49: Production of Rice in the Project Area (Area in acre and production in metric ton)	128
Table 50: Status of livestock and poultry at the project area.....	129
Table 51: Fish production in Maheshkhali Upazila of Cox's Bazar district.....	131
Table 52: List of aquatic species recorded in river and sea	133
Table 53: List of some terrestrial flora around the project site.....	137
Table 54: List of some terrestrial fauna around the project site	138
Table 55: Demographic conditions of the project area	142
Table 56: Number and types of different educational institutions in the project area	143
Table 57: The health and social welfare situation of the project area	144
Table 58: Common property resources of the project area	145
Table 59: Parameters for determining magnitude of impacts	151
Table 60: Criteria for determining sensitivity of receptors	152
Table 61: Assessment of potential impact significance.....	152
Table 62: Environmental and social impacts screening matrix- construction phase.....	153
Table 63: Environmental impact identification matrix- operational phase.....	154
Table 64: Checklist of potential environmental impacts	155
Table 65: Stakeholder engagement plan	167
Table 66: Concerns rose by PAPs during public hearing and response from the authority.....	169
Table 67: Environmental mitigation and management plan (construction phase)	174
Table 68: Environmental mitigation and management plan (operation phase).....	185
Table 69: Recommended management plans.....	198
Table 70: Proposed Mitigation and Management Measures on Threatened Species.....	198
Table 71: Threatened Species proposed by Bangladesh Scientist Groups in the project area	199
Table 72: Monitoring plan (construction phase).....	202
Table 73: Monitoring plan (operation phase)	204
Table 74: Cost for main mitigation measures	207
Table 75: Estimated annual costs for monitoring in the construction and operation phases	207
Table 76: Estimated annual cost for manpower for supervising environmental management and monitoring activities	208

List of Figure

Figure 1: Location map of MEZ-III	33
Figure 2: Route Map of Environmental Impact Assessment (EIA)	37
Figure 3: Percentage of Land types area of MEZ-III.....	83
Figure 4: Geographical Co-ordinates of the delineated MEZ-III	84
Figure 5: Fire Service and Civil Defense Station at Chakaria (left) and Satkania (right) of Cox's bazar district	98
Figure 6: Location map of the project area	99
Figure 7: 10 km radius map of MEZ-III	100
Figure 8: Climatic sub-regions of Bangladesh indicating the MEZ-III.....	102
Figure 9: Average maximum and minimum temperature in the year of 2016	103
Figure 10: Monthly wind rose	108
Figure 11: Average monthly sunshine hours in the project area.....	109
Figure 12: River system map	112
Figure 13: Position of MEZ-III at cyclone affected areas of Bangladesh	114
Figure 14: Position of MEZ-III at flood prone areas of Bangladesh	116
Figure 15: Salinity condition in coastal area (for base condition)	118
Figure 16: Salinity condition in coastal area (for 2050).....	118
Figure 17: Simulated time series maps of erosion-sedimentation in the Kohelia River with the Delft 3D model.....	120
Figure 18: Simplified geology and geomorphology of Bangladesh.....	121
Figure 19: Agro-ecological regions of Bangladesh.....	123
Figure 20: Land types map of Bangladesh indicating the project site	124
Figure 21: Soil classification map of Bangladesh	125
Figure 22: Agricultural land use map of Bangladesh	126
Figure 23: Cropped area in the project site.....	128
Figure 24: Bio-ecological zones of Bangladesh.....	135
Figure 25: Poverty map of Bangladesh indicating the project site	145
Figure 26: Natural disaster-prone areas of Bangladesh indicating the project area	147
Figure 27: Public consultation meeting at Dhalghata Union	171

Abbreviation and Acronym

ADB	Asian Development Bank
APHA	American Public Health Association
AIDS	Acquired Immune Deficiency Syndrome
AAQM	Ambient Air Quality Monitoring
As	Arsenic
ASL	Above sea level
BBS	Bangladesh Bureau of Statistics
BARC	Bangladesh Agriculture Research Council
BTCL	Bangladesh Telecom Company Limited
BIWTA	Bangladesh Inland Water Transport Authority
BERC	Bangladesh Energy Regulatory Commission
BBA	Bangladesh Bridge Authority
bfd	Bangladesh Forest Department
BPDB	Bangladesh Power Development Board
BRRRI	Bangladesh Rice Research Institute
BEZA	Bangladesh Economic Zone Authority
BITWA	Bangladesh Inland Water Transportation Authority
BMD	Bangladesh Meteorological Department
BARC	Bangladesh Agriculture Research Council
BWDB	Bangladesh Water Development Board
BOI	Board of Investment
BDT	Bangladeshi Taka
BOD	Biochemical Oxygen Demand
CAA	Civil Aviation Authority
C₆H₅OH	Phenolic Compounds
CO	Carbon Monoxide
CN⁻	Cyanide
CP	Contracting Party
CRC	Convention on the Rights of the Child
CETP	Central Effluent Treatment Plant
CFCs	Chlorofluorocarbons
Cd	Cadmium
Cr	Chromium
Cu	Copper
CBOs	Community Based Organizations
CSR	Corporate and Social Responsibilities
CESR	Corporate Environmental and Social Responsibilities
CFU	Colony Forming Unit
CNG	Compressed Natural Gas
CO₂	Carbon
COD	Chemical Oxygen Demand
°C	Degree Celsius
cm	Centimeter
DO	Dissolved Oxygen
DMB	Disaster Management Bureau

DDM	Department of Disaster Management
DAE	Department of Agriculture Extension
DPHE	Department of Public Health and Engineering
DoE	Department of Environment
DoF	Department of Fisheries
DC	District Commissioner
DTA	Domestic Tariff Area
ECNWRC	Executive Committee of the National Water Resources Council
EZs	Economic Zones
EPZ	Export Processing Zone
EIA	Environment Impact Assessment
ECA	Environment Conservation Act
ECR	Environmental Conservation Rules
ECC	Environmental Clearance Certificate
ESIA	Environmental and Social Impact Assessment
EHS	Environment, Health and Safety
ETP	Effluent Treatment Plant
EA	Environmental Assessment
ESMP	Environmental and Social Management Plan
EMMP	Environmental Monitoring and Management Plan
EMP	Environmental Management Plan
EPFIS	Equator Principle Financial Institutions
ESMS	Environmental and Social Management System
ESMP	Environmental and Social Management Plan
ERP	Emergency Response Plan
ERT	Emergency Response Team
EPFIS	Equator Principle Financial Institutions
ECA	Ecologically Critical Areas
EC	Electrical Conductivity
FC	Fecal Coliform
FCPS	Fellow of the College of Physicians and Surgeons
FGDs	Focused Group Discussions
Ft.	Feet
FY	Fiscal Year
F	Fluoride
FDI	Foreign Direct Investment
Fe	Iron
FAO	Bangladesh Food & Agriculture Department
GoB	The Government of Bangladesh
GSB	Geological Survey of Bangladesh
GDP	Gross Domestic Product
HIV	Human Immune deficiency Virus
HCN	Hydrogen Cyanide
HYV	High Yielding Variety
HHs	Households
Hg	Mercury
HTW	Hand tube well

IEE	Initial Environment Examination
ILO	International Labor Organization
IFC	International Finance Cooperation
IUCN	International Union for Conservation of Nature
Km	Kilometer
kg	Kilograms
LC	Least Concern
LGED	Local Government and Engineering Department
LCC	Location Clearance Certificate
MEZ	Maheshkhali Economic Zone
MoEF	Ministry of Environment and Forests
MoS	Ministry of Shipping
MIS	Information Management System
MoLE	Ministry of Labour and Employment
MoFL	Ministry of Fisheries and Livestock
MSDS	Compilation of Material Safety Data Sheets
MEAs	Multilateral Environmental Agreements
µc/cm	Mico Simens Per Centimeter
MBBS	Bachelor of Medicine Bachelor of Surgery
MT	Metric Ton
mm	Mili Meter
mg	Miligram
mg/L	Miligram per liter
µg	Micor gram
Mn	Manganese
NGOs	Non-Government Organizations
NOx	Nitrogen Oxides
NWMP	National Water Management Plan
NWRD	National Water Resources Database
NWRC	National Water Resources Council
NOC	No Objection Certificate
N	Nitrogen
Ni	Nickel
NO⁻	Nitrate
OPs	Operating Procedures
O₃	Ozone
OHS	Occupational Health Safety
PMO	Prime Minister's Office
PM	Particulate Matter
PS	Policy Statement
PCMs	Public Consultation Meetings
PDMs	Public Disclosure Meetings
PSMP	Power System Master Plan
PGCB	Power Grid Company of Bangladesh
Pb	Lead
PCP	Public Communications Policy
P	Phosphorus

PPE	Personal Protective Equipment
PM₁₀	(Particulate Matter) ₁₀
PM_{2.5}	(Particulate Matter) _{2.5}
PAHs	Poly Aromatic Hydrocarbons
PCM	Public Consultation Meeting
PD	Public Disclosure
PDM_s	Public Disclosure Meetings
PRA	Participatory Rapid Assessment
PAPs	Project Affected Persons
REB	Rural Electrification Board
RMGs	Readymade Garments
RAP	Resettlement Action Plan
SSC	Secondary School Certificate
Selenium	Se
SO₂	Sulfur Dioxide
SMS	Safety Management System
SPM	Suspended Particulate Matter
SPS	Safeguard Policy Statement
SPS	Social Protection Strategy
S	Sulphur
SW	Solid waste
SS	Suspended Solids
SO_x	Oxides of Sulfur
STP	Sewage treatment plant
SWM	Solid Waste Management
SRDI	Soil Research Development Institutes
SS	Suspended Solids
SPM	Suspended Particulate Matter
SIA	Social Impact Assessment
TDS	Total Dissolved Solids
TC	Total Coliform
TSS	Total Suspended Solids
ToR	Terms of Reference
UNEP	United Nations Environment Programme
UNCED	United Nations Conference on Environment and Development
UP	Union Parishad
VOCs	Volatile organic compounds
WB	World Bank
WARPO	Water Resources and Planning Organization
WTP	Wastewater treatment plant
Zinc	Zn
%	Percentages

Chapter 1: Executive Summary

1.1 Introduction

The Bangladesh Economic Zone Act, 2010, has been introduced by the Government of Bangladesh to facilitate development of Economic Zones (EZs) in the potential regions of the country, aiming to boost up the country's economic development and ensure standard, eco-friendly industrial zone that would encourage more foreign investment. Under this Act, the Bangladesh Economic Zone Authority (BEZA) has been established under the Prime Minister's Office (PMO) and governed by a Board chaired by the Prime Minister. The law provides legal coverage for attracting and leveraging private investment in the development of zones as zone developers or operators, and in the provision of tailored infrastructure services, such as private provision of power, effluent treatment, etc.

As the government vision to established Maheshkhali as the economic and industrial hub, BEZA took the initiative to developed Maheshkhali Economic Zone-III ('Hereinafter MEZ-III) at the Dhalghata Union of Maheshkhali Upazila of Cox's Bazar District in an area of 1,270.12 acres. Taking into consideration the site location, available infrastructure, existing industries, infrastructure and logistic requirement of the proposed industries, Maheshkhali Economic Zone-III (MEZ-III) is planned to establish LNG, Garments, IT, Pharmaceuticals, Food and Beverage, Ceramics, Electrical Machineries, Leather Goods, Steel manufacturing industries, etc.

1.2 Project Background

The project proponent shall develop the land and the following on-site infrastructures:

- Site preparation & development
- Administrative Building
- Boundary Wall

Off-site facilities and industrial area development will be planned by prospective PP developers on later stage. BEZA has appointed Shahidul Consultant, a fastest growing research based environmental and management consultancy firm, to provide transaction advisory services for this project including Environment and Social Impact Assessment study.

MEZ-III is considered as one of the priority industrial project by the Government. BEZA, as a result, applied to DOE for the exemption of Initial Environment Examination (IEE) Report and approval of Terms of Reference (ToR) for the preparation of Environment Impact Assessment (EIA) report. Afterward, ToR was granted by DoE Memo No. 22.02.0000.018.72.31.18.113 dated 4th March, 2018.

1.3 Project Description

BEZA has developed MEZ-III site at Dhalghata Union of Maheshkhali Upazila, Cox's Bazar District under Chittagong Division. Upcoming EZ will cover the total area of 1270.12 acres of land. This area will be developed by BEZA itself and with the aim targeting non-polluting industries for example LNG, Garments, IT, Pharmaceuticals, Food and Beverage, Ceramics, Electrical Machineries, Leather Goods, Steel manufacturing industries, etc. At present MEZ-III intends to develop on-site and off-site facilities for the EZ so that "ready to develop" land is available for establishing industries and developing EZ. A developer will be appointed for EZ development as per EZ Act, 2010. Developer will be responsible for developing the EZ.

1.4 Description of Project site

The proposed MEZ-III will be developed at Dhalghata Union of Maheshkhali Upazila of Cox’s Bazar District under Chittagong Division. The project is approximately 18.03km away from Maheshkhali Municipality and 12.10km and 16.85km from the Kutubdia and Sonadia Island. The Matarbari coal fired power plant is approximately 3.61km and Deilpara road and Janatabazar-Gorokghata road are about 12km and 5.18km away from the project site. The Kutubdia channel is within the 10km radius of the project site and Maheshkhali channel is adjacent to the project site.

The location map of the EZ site is presented in Figure I. EZ site covers an area of 1270.12 acres with no rural habitations within the zone but have a minimum beside the zone. The MEZ-III is approximately 4-5m from above mean sea level (MSL).

Table I: Coordinates and surroundings of the EZ Site

Side	Object	GPS Points	Coordinate	Distance
North	Kutubdia Island and Matarbari Coal fired power plant.	NE Corner	21°48'32.84"N 91°51'23.75"E	12.10 km and 3.61 km away from the project site.
South	Bay of Bengal and Sonadia Island	SW Corner	21°25'05.72"N 91°56'04.71"E	Sonadia Island is 16.85 km away from the project site.
East	Bay of Bengal	NE Corner	21°39'04.97"N 91°47'46.76"E	Adjacent to boundary.
West	Moheshkhali Channel	NW Corner	21°39'01.95"N 91°58'46.24"E	Adjacent from the boundary

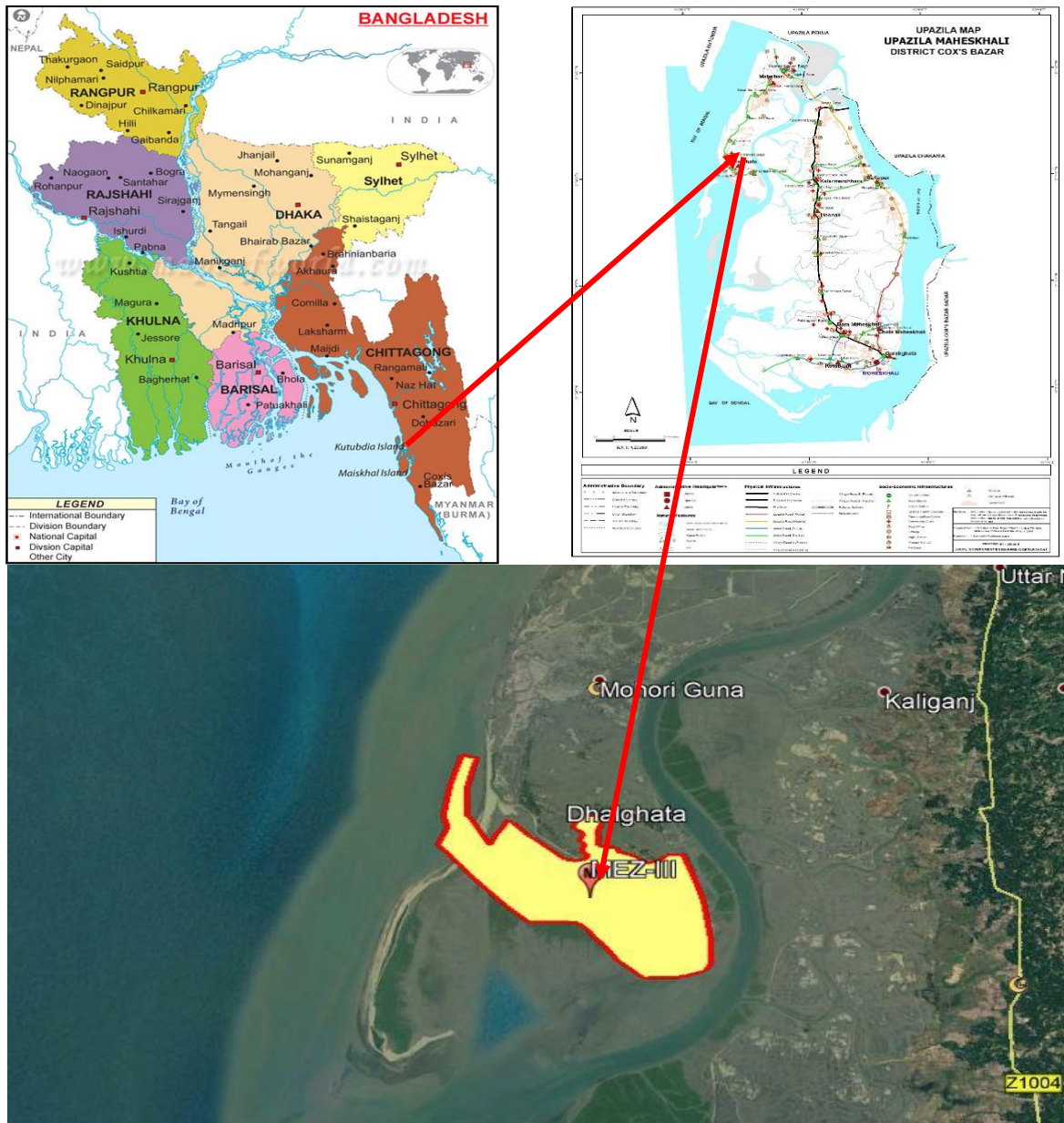


Figure 1: Location map of MEZ-III

1.5 Connectivity

Currently, there is no significant road connectivity to MEZ-III with other parts of the country but the proposed EZ is well connected in terms of Sea/River transportation facilities. Chittagong Sea Port is about 70km and Payra Sea Port is about 167 km from the site. BEZA has a planned to establish industries which can easily transported through sea/river transportation system such as LNG, Garments, IT, Pharmaceuticals, Food and Beverage, Ceramics, Electrical Machineries, Leather Goods, Steel manufacturing industries, etc. Kohelia River is very adjacent to the project which can also be used as transportation of raw materials and finished products. However, BEZA would facilitate necessary access road and other off-site infrastructures for the EZ.

1.6 Policy, Legal and Administrative Framework

The legal issue provides a description of the regulatory framework applicable to the MEZ-III. It highlights environmental, health & safety and social regulations with applicable permits and standards in association with the Project. It broadly focuses on the:

- Legal Enforcement Agencies at National Level;
- Applicable national and local Environmental and Social Laws, Regulations and Policies;
- World Bank Environmental Safeguard Policies and expected trigger ability;
- World Bank (WB) Environmental Impact Assessment Guidelines;
- International & National Environment Standards/ Guidelines; and
- Applicable International Conventions/Protocols.

1.7 Project Activities and Area Statement

Area of the site considered for development is 1270.12 acres. At present only, on-site developments will be carried out by BEZA. Details of off-site facilities are given in table below-

TableII: Details of On-site Facilities

SN	Proposed Infrastructure	Details
1	Administrative Building	Administrative including custom building will be constructed within the zone. There is a total of 12,000 sft area has been allocated for this purpose.
2	Site Preparation and Land Development	Site is low land except few areas are medium and requires leveling. It is required to fill the area of the proposed site is about 7-9m (land development required). Total quantity of the sand required for filling is 41,119,946 cum. Source of the sand will come from nearby Kohelia River and Bay of Bengal through dredging by legal authorization of BIWTA. Even, MEZ-III would comply with Balu Mahal and Soil Management Act, 2010.
3	Boundary Wall	A compound wall all along the EZ boundary to a height of 9 feet above NGL is proposed to be constructed and provided with 3 feet height barbed wire fencing on top as per BEZA rule. The length of the boundary wall would be 14,870m.
4	Shore Protection Bank	To protect the site from erosion, BEZA would construct shore bank using geo-textile, blocks and RCC materials on their own land of about 20ft slopes. Bangladesh Water Development Board (BWDB) has planned to construct embankment on the bank of Kohelia River.

TableIII: Proposed Land Use Summary of MEZ-III

Land Use	Plot	Area (Acres)	%
Commercial Building	3	2.326	0.183
Residential Building	9	1.006	0.079
Sub-station	1	0.058	0.005
Generator	1	0.058	0.005
Hospital & Medical College	1	1.150	0.091
Medical Centre	1	0.061	0.005
Entry Mosque	1	0.092	0.007
Play ground	1	2.581	0.203
Post office & Union Building	1	0.217	0.017
School & College	1	0.932	0.073

Land Use	Plot	Area (Acres)	%
Police Station	1	0.217	0.017
Day Care Centre	1	0.217	0.017
Shopping Complex	1	0.537	0.042
Hawker Market Kacha Bazar	1	0.702	0.055
Community Centre	1	0.438	0.034
Auditorium	1	0.430	0.034
Security Shed/ Ansar Camp	2	0.133	0.010
Multipurpose Commercial Building	1	0.117	0.009
Central Mosque	1	0.378	0.030
Officers Residence	3	0.736	0.058
Admin & Custom Building	2	0.275	0.022
Dormitory	3	0.688	0.054
Fire Station	2	0.151	0.012
Car Hub-1	1	1.159	0.091
Car Hub-2 (Port)	1	9.923	0.781
Bus Stand	1	1.619	0.127
Central Overhead Water Tank	1	0.236	0.019
Solid Storage	1	0.264	0.021
CETP	2	0.275	0.022
WTP (Desalination Plant)	1	0.138	0.011
STP	1	0.172	0.014
Resorts	3	0.220	0.017
Hotel	1	0.321	0.025
Training Complex	1	0.096	0.008
PGCB	1	0.068	0.005
Helipad	1	0.550	0.043
Open Space	-	10.350	0.185
Green	-	62.58	4.927
Industrial Plot Area		1141.39	89.865
Road Area		27.26	2.214
Total Area for MEZ-III		1270.12	100

Source: Study Team

1.8 Project Schedule

The total project area is 1270.12 acres. Staged construction and rolling development mode will be adopted in this project for carrying out all the development, construction and operation activities.

In construction phase, the project finance will be drawn down and the supply, construction contractors and sub-contractors, engaged by BEZA. BEZA will complete construction, testing and commissioning of the different components of the project by December 2023. Operation and Maintenance (O & M) phase will be effective from Commercial Operation Date (COD). In this phase, BEZA will operate the business as per the contract. It will be started from June 2018

1.9 Resources and Utilities Requirement

Water

The water requirement for the construction phase will include water for construction activities such as curing and formation of concrete mixtures and water for domestic consumption. For construction camp housing approx. 500 workers, about 42 m³/day of water will be required @ 60 liters per person per day (lpcd)¹. Water supply from nearby canal and ground water will be the main source of water during construction phase.

For construction activities, tankers will be provided and adequate water allocations will be made by the MEZ-III. It is estimated that about 10.3m³ of water will be required per acre per day for total zone.

Water Supply/Storage

Water might be a problem as there is scarcity of fresh water sources although there is a river named Kuhelia is passes nearby the site and Bay of Bengal is on the other side of the site. The water is saline and need desalination before use it. Another source of the water would be the ground water and it would be most effective and suitable source of water for the site. Water will be transmitted from the source to the area of use through a closed conduit, mainly ductile iron pipes with proper protection against corrosion. The pipeline carrying raw water to the project site is proposed to run parallel to line laid as per Master Plan. A Water Treatment Plant (WTP) has been suggested in project master plan an area of total 6000 sft. The treated water from WTP will be stored into Over Head Tanks/ underground tanks for further supply.

In addition, MEZ-III would set up modern technology to harvest and use rain water during rainy season aim to reduce the pressure on ground water and water treatment cost.

Power Requirement

Power will be primarily required for operation of heavy construction machinery and equipment. Power requirement during construction phase will be sourced from 2 dual fuel power plant which capacity would be 45MW and 35MW respectively. In addition, HFO based generator would be used during construction phase. Residential areas have been categorized into HIG, MIG and LIG housing for worker’s accommodation and premium, high-end, mid & affordable housing for additional accommodation. Power requirement for residential, industries, commercial, amenities, green areas proposed within the development have been considered based on studies carried in past for similar projects to calculate power demand for operation phase is 381 MW. Power requirement during operation phase will be sourced from national grid and also from above mentioned sources

Gas Requirement

Though there is no gas connection but the site is nearby the LNG terminal. So, it is expected that the required gas would be sourced from the LNG. It is estimated demand of gas for the project will be 64 MMCFD. Gas supply system is proposed to be developed by Petro-Bangla.

TableIII: Utility Demand Forecast for the MEZ-III

Utility	Demand	Remark
Water	25400 m ³ /day	Assumption: 20 m ³ /acre/day ²
Electricity	381 MW	Assumption: 300 KV /acre

¹Environmental Impact Assessment of Bidkin Industrial Area, District Aurangabad, Maharashtra

²<http://dnr.wi.gov/topic/WaterUse/documents/Waukesha/TechMemoWaukeshaResponse2014-02-19.pdf>

Gas	64 MMCFT	Assumption: 5MMCFD/100 acre
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Street Lighting

All the roads and streets would be provided with street lighting. This would serve the dual purpose of assisting pedestrians and traffic and increasing safety and security. It is suggested to use solar street lighting in some areas to utilize renewable energy and reduce usage of electricity. Solar street lights should be proposed in ratio of 1:2. Average illumination of 20 lux should be maintained on the access road.

Telecommunications

Maheshkhali has mobile connectivity from almost all mobile companies. Moreover, there is an established BTCL (Bangladesh Telecom Company Limited) network as fixed Phone Network located almost 12km away from EZ at Gorakghata Municipality. BEZA would develop WIFI zones within the project area.

Surface drainage

The drainage system has been planned to cater for the entire EZ through gravity flow. Drains are proposed to be on both sides of the roads. The rain water/surface water would be dispersed through several points from the EZ. The network would be built using conduit pipe. There would be surface opening via HUM/conduit pipe in specific intervals for intake of surface water.

Sewage treatment plant (STP)

Sewage treatment is the process of removing contaminants from wastewater, comprising of storm runoff, domestic sewage and primary treated effluent. It includes physical, chemical and biological processes to remove various contaminants. Sewage would be managed through soak well and depending on requirement would be developed to full scale plant. There is a total 0.23 acres of land have been allocated for the establishment of STP in the zone.

Solid Waste Management

The waste generation during construction phase will include construction waste and residential waste from labor colonies. The construction waste will largely comprise of earth, stones, concrete, bricks, lumber, roofing materials, plumbing materials, electrical wires etc.

It is envisaged that approximately 40 to 60 Kg. per sqm of C&D (Construction & Demolition) waste shall be generated during construction. The construction activities will also entail generation of hazardous wastes such as waste oil. Such waste shall be handled and managed as per the requirements of Hazardous Waste (Handling and Management) guidelines of DOE.

It is estimated that about 210 kgs of municipal waste will be generated daily from the labour colony. The waste from the labour colonies will mainly comprise of municipal waste and sewage from the toilets. Utmost efforts shall be made to reduce, re-use and recycle waste generated at site.

The quantities of waste likely to be generated during operational phase of MEZ-III have been estimated on the basis of population and land use characteristics. Apart from municipal waste and industrial waste, solid waste in the form of dried sludge will also be generated from Sewage Treatment Plant (STP) and Central Effluent Treatment Plant (CETP). It is expected that about 61.85 TPD (tones per day) of municipal solid waste (MSW) shall be generated from various areas planned in MEZ-III during operation phase.

Industrial areas proposed within MEZ-III will also generate solid waste, liquid waste and/or gases, which might be hazardous and non-hazardous waste in nature. Non-hazardous industrial wastes will be recycled and reused or will be handled and managed like municipal waste. It is estimated that about 103.3 tons of industrial waste will be generated daily from industrial clusters planned in MEZ-III. It has been assumed that about 15% (15.5 TPD) of the total waste produced shall be hazardous in nature and shall require special treatment and disposal.

Biomedical waste generated from the planned hospitals/ clinics/ medical facilities in the BIA will be managed as Medical Waste (Management and Handling) Management Rules, 2008.

Green waste collected from landscaped areas will be shredded and processed using a biological treatment technology such as composting or bio-methanation to produce compost/ manure.

Sludge from STP shall be de-watered and used as manure or will be pressed into bricketts after testing their physico-chemical properties. C/ETP sludge shall be tested for its toxicity. If found non-hazardous, shall be pressed into bricketts, else shall be disposed into secured landfill site.

There is a Central Solid Storage Station has been proposed in the upcoming MEZ-III with an area of total 0.264 Acres. Besides, national 3R strategy for industrial solid waste management would be adopted by BEZA during construction and operation phases.

Sewage & Effluent Treatment

It is expected that during construction phase, approximately 34m³ (for about 500 laborers) of sewage will be generated at camp site. The labor camp will be provided with adequate number of soak pits and septic tanks for disposal of sewage. Expected wastewater generation during operation from various usages is estimated to be approximately 7MLD nature of industry, number of population and geography of the site.

The wastewater from industries and sewage from residential areas will be treated separately in Central/Effluent Treatment Plants (C/ETP) and Sewage Treatment Plants (STP), respectively. There are two (02) CETP and one (01) STP has been proposed in the MEZ-III with a total area of 0.275 acres and 0.172 acres respectively.

TableIV: Details of STP and CETP proposed at the MEZ-III

Treatment Plant	Area (sqm)	Capacity (m ³ /day)	Total (m ³ /day)
CETP	557	550	1100
	558	550	
STP	697	1400	1400

Green Space

The green areas will be provided in the form of green belt areas surrounding and within the zone. The width of green belt areas should range according to the area of the zone. In addition, green areas can also be provided within the industrial plots, the rooftops of the buildings and alongside the roads and canal/river channel. There is a total of 62.58 acres of land has been allocated for green space. Suitable species considering industrial activity, soil and topographical conditions, pollution mitigation and river erosion would be preferred and prioritized in the development of Green Belt of the zone. However, Nal Khagra (*Eriochloea procera*) species can also be planted as bio-filter and agent of pollution control along river side the zone.

Storm Water Management System

There is a river named kohelia passing southern and western and Bay of Bengal is on the western part of the project site. There is also some small canal that is used as the discharge path of rain water

naturally of the project area. Normally water is available round the year in this canal. The storm water will be discharged through the adjacent canal. In addition, the project area will be divided into various rain water drainage zones considering the natural topography, internal and external contributory areas. All the drainage channels and ponds will be designed for 100 years flood. The runoff storm water would be stored in underground rainwater collection tank/s for treatment before use for industrial and other watering issues of the zone.

Roads Network

It is planned that within the Zone, there will be two types of roads. Type A (80 ft) and Type B (35 ft). BEZA would construct access road from Upazila to the main gate of EZ. BEZA would also construct internal road networks and 27.26 acres of land allocate for the internal road construction. Highest priority has been provided in suggesting paths for pedestrian. Aesthetically designed walkways are designed along with green environment on either side of the roads. Pedestrian walkways are to be provided on all categories of roads. All services for drains, sewers, water, power, energy and telecom are maintained within the road right of way. Necessary signage, street name boards, zone guiding maps and visitor's guidance map etc. are planned to be positioned at necessary locations, such as intersections and at various Strategic locations in each zone. No access is planned to be allowed near the road junctions and it is recommended that ingress / egress points will be with a set back from the road junction.



Figure I: Map showing location of site and existing facilities

1.10 Environmental and Social Baseline

The environmental and social baseline is the existing status of environment and society around the proposed project site. It has been analyzed through assessment of environmental components like air, water, land, noise, soil, etc. and environmental characteristics like physical, biological and socio-economic status of the study area, within the 10 km radial zone of the project site. Physical environment includes topography, land, soil, meteorology, air, water, noise, etc. and the biological environment includes flora and fauna. Socio-economic environment of the study area includes demography, ethnicity, religion, education and employment opportunity, occupation, income, poverty, social relations, etc. Baseline environmental conditions are based on the data collected from various related agencies and the secondary documents from published sources and websites. The baseline provides the basis for assessment of impact (potential changes in the baseline conditions) due to the development of proposed Moheshkhali Economic Zone-III. Mainly, the MEZ-III site falls under Moheshkhali Upazila of Cox's Bazar District under Chittagong Division.

Table V: Existing environmental settings of MEZ-III

Particulars	Details
Location	Moheshkhali Upazila of Cox's Bazar District under Chittagong Division.
Total Area	1270.12 Acres
Site Elevation	Average 4-5m from MSL
Land Type	Medium high land
Nearest Airport	Cox's Bazar International Airport is about 25.81 km away from the site
Nearest Railway Station	Chittagong Railway Station is about 70.73 km away from the site
Nearest Port	Chittagong Sea Port is about 70.34 km and Payra Sea Port is about 167.30 km away from the site
Climatic conditions	Temperature: The annual average temperature varies maximum 34.8°C to minimum 16.1°C. Humidity: Average humidity is around 75.5% throughout the year. Rainfall: The average annual rainfall is recorded approximately 4285 mm.
Seismic Zone	Zone II (Seismic co-efficient is 0.05g)
Forests / National Parks	None within 10 km.
Archaeological Site	The Adinath temple is nearest and the most of famous historical place of this Island.
Water Bodies	Matamuhuri, Bakkhali, Reju Khal, Naf, Uzantia, Kohelia, Masgona, Maheshkhali channel and Kutubdia channel are main rivers and channels of this district.

Table VI: Important features of the MEZ-III at a glance

Parameters	Description
Climate	Project is situated at south-eastern climatic sub region of Bangladesh. Annual average temperature and rainfall varies from maximum 34.8°C to minimum 16.1°C. The annual average rainfall is 4285 mm. The district having been a coastal region often fall victim to sea storm, tidal bore, hurricane and cyclone.
Ecologically Critical Area	No ecologically critical areas were found within the study area. Kutubdia island is around 12.70 km and Sonadia island is 17.89 km away from the project site.
Reserve/Protected Forests	No reserve or protected forests area were found within the study area.
Predominant Geological Formations	Project area falls under Chittagong coastal plain. The geological formation of this area is alluvium, stream deposits, delta plain deposits, flood plain deposits.
Topography	The topography of the project area is predominantly medium high land.
Major Physiographic Units	The proposed MEZ-III is located in Chittagong coastal Plain.
Major Soil Type	The project survey area falls in the soil tract group 3, 10, 17a & 17b which are acid Sulphate soil; Grey Piedmont Soils; Mainly Deep, Brown (some red), Soils on low hills and Deep and Shallow Brown soils on very steep, high hill ranges respectively.
Major crops	Paddy, potato, pulse, onion, garlic, ginger, betel leaf, betel nut, wheat, sugarcane, ground nut, tobacco, rubber and vegetables are main crops of the district.
Flooding	The proposed project area falls under coastal tidal flood porn area.

Parameters	Description
Seismicity	The project area falls in the earthquake Zone-II of the seismic map of Bangladesh. This zone refers comparatively medium intensity of seismic effects.
Environment and Social Hotspots	Sea, River, Canals, Homestead forests and vegetation, School, College, Madrasha, Mosjid, Mandir, Math etc.
Major Settlement	Residential area, Commercial area, Industrial Area, Bus terminals, Institutional structures, etc.
Major Industries/ Business Entrepreneurs	Manufacturing industries of the district are rice mill, salt mill, ice factory, flour mill, fish processing industry, fish feed mill, saw mill, printing press.

Source: BBS, 2011; Banglapedia and Field Visit

1.11 Identification and Analysis of Key Environmental Issues

Table VII: Environmental and social impacts screening matrix- construction phase

Parameter	Physical Environment					Ecological Environment			Social Environment				
	Topography	Hydrology	Water Quality	Air Quality	Noise	Vegetation	Fauna	Aquatic Environment	Displacement	Employment	Service	Health	Culture
Possession of Land													
Site development	P			T		P				T		T	
Civil and Structural Work			T	T	T					T		T	
Mechanical and Electrical Work				T	T					T			
Water Requirement			T										
Transport				T	T								
Immigration													
Employment			T							T	T		T

Here, P= Permanent, T= Temporary

Table VIII: Environmental impact identification matrix- operational phase

Parameter	Physical Environment					Ecological Environment			Social Environment				
	Topography	Hydrology	Water Quality	Air Quality	Noise	Vegetation	Fauna	Aquatic Environment	Displacement	Employment	Service	Health	Culture
Water Requirement													
Liquid Effluent			T					T				T	
Gaseous effluent				P		T						T	
Solid Waste												T	
Hazardous Waste													
Transport				T	T							T	
Operational noise					P							P	
Immigration			T							P	P		P
Employment										P			

Here, P= Permanent, T= Temporary

Source: EIA Team

Table X: Checklist of potential environmental impacts

Project phases	Actions affecting environmental resources	SEI, without mitigation measures				Type		Comments
		None	Minor	Medium	Major	Adverse	Beneficial	
Construction phase	Land value depreciation	x					x	Land value change: Positive impact
	Loss of and displacement from homestead land	x						No displacement: No impact
	Loss of and displacement from agricultural land	x						Primary economic activity to secondary activity
	Damage to nearby operation	x						No impact anticipated as no major installation
	Disruption of drainage pattern	x				x		Take care of local drainage pattern
	Encroachment into precious ecology	x						No precious ecological issues: no impact
	Runoff Erosion		x					Take care of local drainage pattern
	Worker accident		x			x		Take care by good housekeeping
	Sanitation diseases hazard		x			x		Concentration of laborers may cause unhygienic health condition
	Noise/ Vibration hazard			x		x		Pilling/ equipment installation may cause noise
	Traffic congestion				x	x		Preventive measure will be undertaken
	Employment				x		x	Good employment opportunity
Operation phase	Encroachment into precious ecology	x						No precious ecological issues: No impact
	Depreciation of environmental aesthetics		x					Local community prefer employment generation activities
	Erosion/Silt runoff	x						Having boundary wall: no impact
	Pollution from liquid discharge		x					Preventive measure will be undertaken
	Pollution from solid wastes		x			x		Preventive measure will be undertaken
	Air quality	x						No major impact; if happen necessary preventive measure will be undertaken
	Occupational health hazard			x		x		Reduce by good management practice
	Odor hazard		x					Preventive measure will be undertaken
	Traffic congestion		x					Preventive measure will be undertaken
	Noise hazard		x					Moderate impact
Employment			x			x	Good employment opportunity.	

1.12 Environmental and Social Impacts

1.12.1 Impact on Air Quality and Noise

Pre-construction phase

Air Quality

Generation of dust is expected by land preparation, and generation of air pollutants (SO_x and NO_x, etc.) is anticipated from the operation of heavy machinery and trucks, but the impact will be limited only to the development stage. Watering the area, especially in the dry season, and using cover sheets on trucks for the transportation of soil/sand will be undertaken to reduce dust generation. Periodic maintenance and management of all the land filling machinery and vehicles will be conducted to reduce exhaust gas discharged from the machinery and vehicles.

Noise and Vibration

The impact of noise caused by the operation of heavy land filling machinery and trucks is predicted but will be limited to the surrounding area.

Construction Phase

Air Quality

Dust emissions and gaseous emissions can adversely affect air quality and cause environmental nuisance to surrounding areas. The construction activities that will take place onsite are expected to result in considerable quantities of gaseous emissions. The contaminants of potential concern (COPC) during the construction phase may include: NO_x, SO_x, CO and Particulate Matter.

Noise and Vibration

The operation of heavy machinery and trucks are predicted to create vibration, but this will be limited to the surrounding area. In the actual construction work, schedule management will be performed to maintain constant amounts of construction work and to ensure that low vibration equipment will be used as much as possible. Construction work will be performed during daytime, especially piling works. Measures for reducing generation of noise, such as speed reduction of vehicles in residential areas, will be taken, whereby vehicle noise impact will be minimized. Thus, all efforts will be taken to minimize the noise impact.

Post-construction phase

Air Quality

Volatile Organic Compounds (VOCs), nitrogen oxides (NO_x), carbon monoxide (CO), sulphur dioxide (SO₂) and particulate matter (PM₁₀) were identified as Contaminants of Potential Concern (COPC). The impacts affecting air quality in the project area could result from the following environmental aspects:

- Complex equipment testing and start-up;
- Complex operations;
- Raw material Transport/Use of Trucks and Vehicles; and
- Operation of the marine terminal
- Process furnaces, boilers and gas turbines

Particulate matter and gaseous emission also concern for air quality deterioration.

Noise and Vibration

Noise generation due to operation of pumps & compressors, boilers, cooling tower etc. The VR of noise in the operation phase is considered as medium. These activities will happen throughout the operation phase, although the magnitude and extent are low, the impact of noise can be considered as Moderate.

1.12.2 Impact on Water Resources

Pre-construction phase

The area is a coastal area and located on the bank of Bay of Bengal, and Kohelia River is adjacent to the project site. Earth filling activities on the course, water level and quality of the river is anticipated; though the hydrological and morphological change is not significant for the development of MEZ-III.

Construction Phase

Surface run offs from construction material storage area, construction waste storage areas, hazardous waste (waste oil, used oil etc.) and chemical storage areas may lead to pollution of receiving natural drainage channels etc. As the slope of the area is towards Bay of Bengal, these surface run offs are likely to reach the Bay of Bengal. During the process of earth work (excavation and stacking of soil) will be required; the surface runoff from disturbed sites may lead to pollution of receiving water bodies. This situation is likely to be more pronounced considering high rainfall received in these areas. The surface run offs may contain the high sediment load, oil residues, organic wastes, etc. This may adverse impact on water quality, which ultimately leads to impacts on aquatic ecology. Generally, the project area may affect by flooding by the river during wet season. But there is no significant river erosion along the zone. Furthermore, it is generally expected that the effect of the proposed project on regional hydrologic and hydraulic conditions would be minimum. Indeed, the comparison of flood levels between the proposed and baseline conditions indicated that there would not be any significant impact on flood level and hence on drainage through the Kohelia River. The situation is unlikely to aggravate further from its current state. The average height of the site is about 4-5 m above mean sea level.

Post Construction Phase

There may be soil runoff from the exposed soil of the land development, loading unloading and cut slopes, and water pollution of the upstream area of the surrounding river is predicted. Since the project area is mainly low-lying area, soil runoff and turbid water generation will not be significant. In addition, concrete wastewater generated from industrial operation and from the sewage to have effects. Anti-diffusion membranes will be installed around the construction site to prevent diffusion of turbidity, and these measures will minimize the impact of effluent contamination of river water and underground water. Runoff of exposed soil surfaces into rivers is expected. Adequate measures to prevent erosion will be taken. Sewerage Treatment Plant (STP) and Effluent Treatment Plant (ETP) shall be installed in operations phase of the project to reduce wastewater pollution in the nearby water bodies. In order to reduce the pressure on ground water MEZ-III authority should install Desalination plant for treating sea water for drinking water as well as potable water.

1.12.3 Impact on Land Resources

Pre-Construction phase

It is expected that no soil erosion occurred from the project site as it will be well protected by embankment constructed by the proponent as part of the zone development. Earth filling would be

required, and from its activities the quality of the soil as well as the structure of the soil can be destroyed. Filling materials' quality must be tested before using as filling materials. At the proposed site where the project will be developed, no households will be directly affected by the project implementation who own land within the proposed alignment site. So, replacement and resettlement are not necessary. But, through proper consultation with the community people indirectly affected people should be considered and involved in the implementation of the project.

Topography and Geology

The topography of project site is low flat land. The land filling may affect the topography and geology of the area around the proposed site. Filling will cause change of land types. Some protection measures against slope sliding or erosion especially in rainy season need to be considered.

Drainage congestion

Land filling can disrupt the natural drainage pattern and cause drainage congestion which can affect the land resource. Protecting natural storm water drainage network and/or creating more drainage network could be a solution.

Construction Phase

Topography and Geology

The construction of the access road may affect the topography and geology of the area around the proposed site. Construction of infrastructures will cause change of land types and the entire topography of project site. Some protection measures against slope sliding or erosion especially in rainy season need to be considered.

Soil

Soil pollution at the construction site will be occurred possibly by leakages of oil and chemical materials from vehicles, vessels and construction machineries. Vehicles and machineries will be maintained regularly, oil and chemical materials will be stored at an appropriate storage site to prevent any permeation into the ground. These measures will minimize the impact of any soil contamination.

Sediment

Sediment pollution may occur in case of construction wastewater flows into the river. Channels, ditches and temporary settling ponds will be dug and constructed around the construction area. Wastewater treatment facilities for workers, such as septic tanks and oil separators for oily run-off water, will be installed in the workers' camp and the construction area. Oil and chemical materials will be stored in an appropriate storage site to prevent any permeation into the ground. These measures will minimize the impact of sediment contamination of river water.

Drainage congestion

Construction of infrastructures can disrupt the natural drainage pattern and cause drainage congestion which can affect the land resource. Protecting natural storm water drainage network and/or creating more drainage network could be a solution.

Post Construction Phase

Soil pollution at the zone will be occurred possibly by leakages of oil and chemical materials from vehicles and industries. Regular maintenance and supervision can minimize the incidence.

1.12.4 Impact on Agriculture Resources

Construction phase

The proposed project area is used only for salt cultivation. In construction phase after land development, existing land will be converted into industrial land use with construction of different on-site and off-site infrastructure. It will require different amount of temporary construction labor and will absorb from different sectors. It can create seasonal scarcity of such labor.

Post Construction phase

Different industries will require different amount of permanent semi-skilled and unskilled labor and will absorb from different sectors of industries. It can create scarcity of such labor and boost their wage up. As per national policy low productive agricultural land could be used for industrial development. Project affected community (land owners) should get job in the project with a priority basis.

1.12.5 Impact on Fisheries

Pre-Construction and Construction Phase

The proposed EZ area is mainly saltpan. The local residents earn their livelihood by cultivating salt. Moreover, significant number of them also does fishing six months in a year in the project area. Land development work converted low lying area into flood free area, where fisheries (seasonal) habitat may reduce. Construction of jetty facilities may destruct natural habitat of fisheries. Dredging activities in the sea may reduce the quantity of fishes. Dredging materials, oil and chemical materials of heavy machines, vehicles, etc. will be stored in an appropriate storage site to prevent any release into the water body. These measures will minimize the impact on fisheries. During construction period construction materials may be released to the nearby river, and ditches. This may damage the fisheries ecosystem of the respective water body. Construction materials, oil and chemical materials of heavy machines, vehicles, etc. will be stored in an appropriate storage site to prevent any release into the water body. These measures will minimize the impact of fisheries.

Post Construction Phase

During operation, runoff of exposed soil surfaces and drainage of wastewater from industrial operation and sewage drainage into river and ocean is expected which can lead to the contamination of the water body from unexpected substances and it can destroy fisheries ecosystem. Sea/River traffic may produce heavy noise which will disturb fish habitat. Appropriate protection measure from waste water contamination (if any) to the river by functioning CETP and STP will be established to control the pollution, save the fisheries and other aquatic resources of the project area. Appropriate monitoring system will be devised for desired standard of CETP outlet parameters.

1.12.6 Impact on Ecosystem

Pre-Construction and Construction Phase

Terrestrial Ecology and Biodiversity

The site is considered as 'no trees area', so, there is no vegetation within the zone except some herbs. Some fauna lived and depended on food from the area will lose the habitat and source of sustenance. Plantation will provide them new home and source of sustenance by the project. The impact on flora and fauna will not be significant for this reason. Although, some scattered mangrove species are located in the west bank of Kohelia River. During construction period a large number of

migrant people will be temporarily reside in the area. Wastes generated from the construction work will include waste plastics, waste glasses and waste oil. Furthermore, household wastes discarded from the camping ground of the workers will include cans, bottles and garbage. If such wastes are not adequately handled, flora and fauna can be affected. Segregating waste at collection, recycling and reusing waste will be promoted and non-recyclable waste will be disposed at appropriate sites according to related regulations. Hazardous waste will also be treated accordingly. To reduce the amount of solid waste discharged from the workers during the construction work, efforts will be taken to employ local workers wherever possible, so that the amount of household waste at the workers camp will be minimized. These measures will be taken to ensure protection of aquatic and terrestrial ecosystem. The major impacts during construction phase on terrestrial ecosystem and biodiversity are-

- Vegetation clearance;
- Fugitive emission and deposition on vegetation; and
- Noise and vibration.

Embedded control measures for protecting terrestrial ecosystem and biodiversity are as follows-

- Vegetation removal to be minimal and limited to the zone;
- Water sprinkling for dust suppression; and
- Provision of dust curtains to reduce the dust emission
- Plantation of local species for stabilization of the filled in material and plantation in surrounding areas; and
- Additional plantation at other identified areas such as all unpaved vacant spaces throughout the zone.

Aquatic Ecology and Biodiversity

The impacts on aquatic ecology and biodiversity during construction phase are as follows-

- Surface runoff from construction site, discharge of hydro-testing water, spillage & leakage of oil and lubricate, from construction site;
- Noise and vibration due to piling activities in the sea;
- Move of ship and vessels and
- Illumination.

Olive Ridley's Turtle (*Lepidochelys olivacea*) IUCN listed Vulnerable 2016.3 species. Olive Ridley turtles have been reported nesting in the Coast of Moheshkhali Island. Besides, *Caretta caretta* (Logger head turtle), *Chelonia mydas* (Green turtle), *Eretmochelys Imbricate* (Hawksbill turtle) are also found in the Moheshkhali Island.

These species are likely to get impacted due to various construction activities of the project such as. The surface runoff from construction site, generation of suspended solid during piling, spillage & leakage of oil and lubricate, etc., may cause perceptible changes in water quality and also can affect the aquatic habitat and fauna.

Post Construction Phase

Terrestrial Ecology and Biodiversity

During post-construction period, the major impacts on terrestrial ecology shall arise from

- Emission from operation of different industrial units and
- Illumination, noise and vibration at site

A thick green belt of 15-20 m within and outside the project boundary will help in reducing the impacts from air emissions and noise and vibration impacts. During post-construction period residential workers shall live in the area. Household wastes discarded from the residence of the workers will include cans, bottles and garbage which can contaminate water and soil. Moreover, hazardous waste from industries can pollute the terrestrial eco-system. It is claimed according to the type and nature of unit industries that, no wastewater or liquid waste will be generated from the EZ. If any industry produces such waste, will be treated according to the regulations of DOE before disposal. Segregating waste at collection, recycling and reusing waste will be promoted and non-recyclable waste will be disposed at appropriate sites according to related regulations.

Aquatic Ecology and Biodiversity

The major impacts sources of aquatic ecology and biodiversity during operation phase of the project include-

- Spillage & leakage of fuel & lubricant;
- Move of ship and vessels and
- Illumination, noise and vibration.

Some mitigations measures can be positioning of illumination lights land ward side and not sea side, restricted and limited movement of vessels during the nesting period, establishment of turtle nesting locations through Forest Department and local NGO's, support local Forest Department and local NGOs for in situ turtle nesting activities etc.

1.12.7 Socio-economic Impact

Pre-Construction Phase

❖ Land Acquisition

The land required for proposed MEZ-III is the combination of Government's Khash land and private land. Bangladesh Economic Zones Authority (BEZA) will acquired the land. Since no displacement of settlement occurred resettlement and rehabilitation are not relevant.

❖ Disturbance to Existing Social Infrastructure and Services

Material, equipment and worker transportation may disturb existing road traffic including public transport using the highway and commercial vessels of nearby industries. For movement of vehicles, traffic management system should be developed. Also, during construction period, a lot of construction labour would gather in those areas that may lead the gathering of excess peoples.

❖ Local Conflicts of Interest

No conflicts will occur with local residents. Moreover, a number of consultations with local residents have been conducted in preparing the EIA Report. Local people should be employed for the construction works to the maximum extent possible, and any workers from other places/countries should be taught to respect local customs in order to facilitate good relationships with local people. The lodgings of the project workers should be equipped with sufficient living facilities to keep workers at the project site as much as possible.

Construction Phase

✧ Infectious Diseases such as HIV/AIDS

A temporary influx of migrant labor during the construction period may increase the risk of sexual transmitted diseases (STDs). Local people should be recruited for simple work as much as possible so to minimize the risk of infectious diseases being transmitted from external workers. Pre-employment and periodic medical check-ups should be conducted for external workers.

✧ Work Environment (including Work Safety)

A high-risk rate of accidents is predicted for the construction work. Construction companies should establish work safety plans and implement them. Work safety plans should stipulate mitigation measures on soft aspects (safety training, etc.) and hard aspects (provide workers with appropriate protective equipment, etc.).

✧ Accidents

Land traffic accidents during construction work may occur. As prevention measures for land traffic accidents, observation of traffic regulations, and training and education on safe driving will be implemented.

✧ Livelihood

The land parcels that will potentially go for land acquisition during the construction phase are salt cultivation fields as assessed from satellite imagery and from the field survey for the proposed MEZ-III. The impacts on different stakeholder groups, as envisaged are as follows

Though the salt cultivation is profitable livelihood option, local people who are engaged in salt cultivation, are also not entirely dependent on salt cultivation as this activity is restricted only for six months in a year. Due to establishment of the project, the sharecroppers and lessee farmers (if any) cultivating within the project area would have to discontinue their practice in the project area once the construction activities start. The project will influence the sharecroppers to search for other land parcels in the vicinity in order to continue their practice. Restriction on use of land in project area may lead to impact their livelihood and income. This impact may be temporary i.e. loss of income during the transition phase and could be mitigated once the sharecropper, lessee farmers find a new site for cultivation and renews his sharecropping practice. However, the impacts could also be long term and in some instances lead to change in occupational pattern (like cultivator to agricultural or wage labor, contract worker etc.) if any sharecropping family is unable to find alternate land.

Similar impacts, as in case of the sharecroppers, are envisaged for the salt pan owners (usually the salt pan owners take land on lease from the land owners for salt cultivation) and its laborers. Restriction on use of land parcels due to acquisition (for land-based facility) may lead to impact livelihood and income of the salt pan workers/ laborers. However, this impact may be temporary, till the salt pan owners find other parcel of land to take on lease and the workers find salt cultivation work at other salt pans in neighboring areas. The impacts could also be long term and in some instances lead to change in occupational pattern if any laborers working in salt pans is unable to find alternate place of work or land.

✧ Traffic

Due to the establishment of proposed EZ, the River/Sea traffic volume will be increased significantly in the project area which may affect local community. MEZ-III authority should establish a Traffic management plan to control excess Sea/River traffic.

Post-Construction Phase

✧ Disturbance to Rights on Water Resource

Withdrawal of ground water for EZ's operation may affect the ground water level and availability of water for the local people.

✧ Disturbance to the Existing Social Infrastructure and Service

The road route of the local residence may shift as project area will be fenced. It also can alter the existing roadways. Traffic volume and traffic jams can be increased in the road, community road and road around the project plant area. Mitigation measures to decrease traffic volume will be taken, such as development of alternative roads, traffic management plans etc.

✧ Distribution of Benefits and Compensation

People who live in other areas may have limited access or be prevented from accessing the school and medical facility along the road, which may cause grievances. The road shall be open to all local people to the maximum extent possible in order to improve peoples' life.

✧ Local Conflicts of Interest

Local conflicts of interest may occur among employers, employees of local community, local mass people and local political leaders. There may be feelings of resentment and reconciliation, as people living around the project will benefit. However, conflicts among local residents may occur if such benefits were unfairly distributed.

✧ Accidents

The risk of traffic accident may be increased. Observation of traffic regulations, installation of traffic signs, and training and education on safe driving shall be conducted for land traffic vehicles.

✧ Livelihood

The proposed EZ establishment will generate huge employment opportunities for the local people. The salt pans shall have converted into industrial land and the land price will increase in the nearby areas; as a result, overall livelihood condition of the Project Affected Peoples (PAPs) will be improved.

✧ Traffic

Development of access road, loading/unloading of goods requires huge traffic volume both in land River/Sea transportation system. Generation of Noise from the excess traffic is expected which will cause disturbances to the local people. Development of other projects in the nearby areas like Moheshkhali Economic Zone –I, Moheshkhali Economic Zone-II, Matharbari Coal Fired Power Plant etc. shall increase both road and River/Sea Traffic volume to a greatest extent. Excess traffic will cause traffic jam, accidents, damaging effects on marine ecosystems, disturbances/ nuisance to local people.

1.13 Stakeholder Engagement Plan

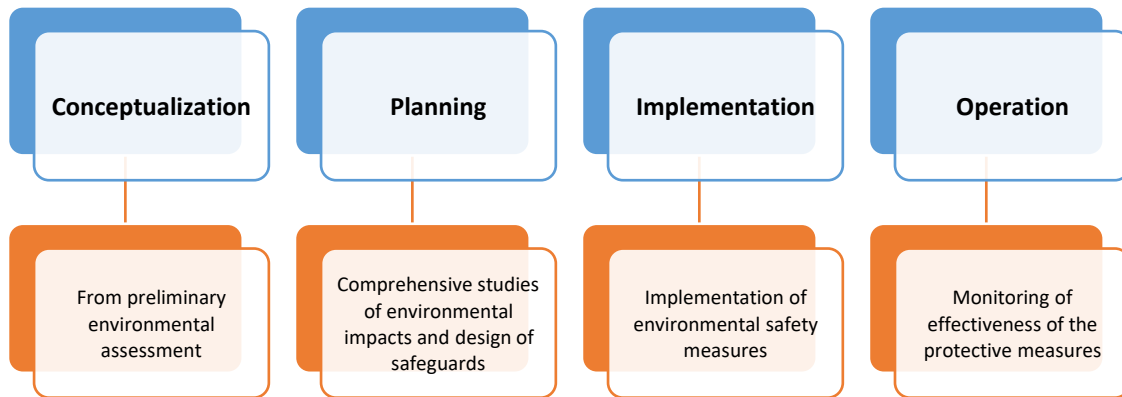
In order to ensure effective engagement and open, frequent and honest dialogue with local communities and other key stakeholders, a stakeholder engagement plan is designed throughout the life of the project. This plan is to be developed and implemented in order to identify stakeholder and their issues of concern, establishes the methods for consultation, and provides a specific action plan for stakeholder engagement throughout the life of the project.

Table XI: Stakeholder engagement plan

Key Stakeholders	
Project Proponent	Maheshkhali Economic Zone-III
Related organizations/ Local government	Union Parishad (UP member-male and female).
Local people	Land owners, Businessmen, Fishermen, Day Labor, Teacher, Religious people, women etc.
Private business	Private companies/ factories around the zone.
Non-Governmental Organizations	Community Based Organizations (CBOs).
Engagement methods	
EIA phase	Organizing consultation meetings inviting key stakeholders above at draft scoping report and draft EIA report.
Pre-construction/ Construction phase/ Regular operation Phase	<ul style="list-style-type: none"> – Regular communication with local community through personal contact; – Meeting with the representative of village on the quarterly basis; – Participatory meeting with villagers; – Interview survey with villagers.
Information disclosure	
EIA phase:Pre-construction/ Construction phase/ Regular operation Phase	Disclosures of draft scoping report and draft EIA report.
Grievance mechanism process and complaints register	
All phase	<ul style="list-style-type: none"> – Receiving complaints and opinions from the public on regular basis through the engagement method; – Meeting with the representative of villages; – Participatory meeting with villagers.

1.14 Environmental Management Plan

Environmental Management Plan (EMP) is a site-specific plan developed to ensure that all necessary measures including mitigation and monitoring activities are identified and implemented in order to preserve and protect the environment and to avoid and manage the negative impacts of the project and comply with environmental legislation. The primary objective of the EMP is to provide a guideline for proper management and monitoring of the identified environmental and other impacts due to the project and to offer document to the implementers for accomplishing the institutional requirements of the authority. It will identify the residual impacts and unavoidable impact and its management. As GoB is committed to ensure sound environmental condition, preparation and execution of EMP is mandatory for preparation, implementation and monitoring of environmental protection measures during and after commissioning of the Project. EMP indicates how various measures are proposed to be undertaken during different phases of the Project including cost components. It consists of various steps including:



The present study clarifies the following proposed EMP:

- The mitigation measures that needs to be taken during construction and operation phases of the project to eliminate or offset adverse environmental impacts, or reduce to acceptable limits;
- The actions needed to implement these measures; and
- A monitoring plan consists of concrete monitoring indicator require to assess the effectiveness of the mitigation measures employed.

Similarly, integrated EMP is a necessary requirement for implementation of the MEZ-III, which will be a guide for the environmental protection activities. A comprehensive measure for mitigation and monitoring of possible environmental hazards has been enlisted for ensuring safety measures and minimizing the risks and hazards due to implementation of the project in the study.

Mitigation Plan

The establishment and execution of proposed MEZ-III is believed to have a positive impact for sustainable economic growth of the country as well as provision of employment to the local people. However, the project may also have some impacts on the existing local environment, eco-system and socio-cultural activities including land use, soil quality, pollution of water, air, noise, etc. Therefore, a mitigation mechanism has to be established to the affected communities regarding various harmful impacts including the effects on livelihoods, environment, agriculture, water bodies, and surrounding social infrastructures. A detail EMP including health & safety measures has been described in the following table. The Project Proponent will be responsible for accomplishing the proposed safety measures mentioned in the proposed EMP.

Following are the main advantages of the environmental mitigation plan:

- Ensure plan for the fulfillment of basic environmental standards essentially required to meet during design, construction, and operation period of the Project;
- Provide plan for the development of compensatory actions especially in the form of compensatory forestation, green zone development and landscaping for minimizing the negative ecological impacts due to the project;
- Reduce the potential environmental impacts, causing the biophysical environment in the area to deteriorate and indirectly slow down the economy of local communities by the project.

The EMP for MEZ-III has been prepared based upon optimum and reasonable costs that are needed for mitigation measures on a “least-cost” basis. Activities that needs to be carried out for the

environmental management and monitoring of the proposed EZ could be divided into two phases: during construction phase, and during operation phase.

Corporate Social and Environmental Responsibility (CSER)

The concept of corporate social responsibility is based on the idea that not only public policy but companies, too, should take responsibility for social issues. In more recent approaches, CSER is seen as a concept in which companies voluntarily integrate social and environmental concerns into their business operations and into the interaction with their stakeholders. The idea of being a socially responsible company means doing more than comply with the law when investing in human resources and the environment.

Under the CSER framework, MEZ-III has proposed action plans for the benefit and welfare of the society as well as environmental sustainability of the project

Mitigation and Management Plan for Threatened Species of Concern

Biological repercussions to nesting turtles do not always occur. Any impact is dependent upon the level of physical disturbance caused by noise and lighting adjacent to the coast. When the levels of physical disturbance appear to be high, effective mitigation measures should be implemented

Enhancement Plan

A detailed EMP with possible mitigation measures during pre-construction, construction and operational phases have been proposed in the present study. So, as a part of enhancement plan, some following measures are proposed to carry out for reducing the potential risks:

- i. The embankment present in the project area needs to be
- ii. Development of green belt by tree plantation of native flora within and around the entire location of the zone;
- iii. To prevent the pollution of water, air and soil, discharging industrial gaseous effluent, solid wastes, waste water before releasing out;
- iv. Maintain national and international environmental, social, health & safety standard to build trust and confidence among workers as well as foreign investors;
- v. All the unpaved open places throughout the zone premises, if have, can be made greener by planting trees in order to enhance the aesthetic view of sites as well as long term environmental sustainability with the aid of CESR fund.

Contingency Plan

A contingency plan is an essential guideline for undertaking the immediate need-based response in a well-designed, organized and coordinated manner for facing any adverse incident during an emergency. Contingency plan will guide to identify the victims at risk (who, what extent, when), responsible authority and the materialistic & natural disruptions (what extent). The Contingency Plan will have the following minimal components:

- Accidents preventions procedures/ measures
- Fire prevention planning and measures
- Fire water storage and foam system
- Accident/emergency response planning procedure
- Communication
- Emergency control center
- Emergency information system with role & responsibility and command structure

- Recovery procedure
- Assessment of damages and rectification
- Evaluation of functioning of disaster management plan
- Accident investigation
- Clean-up and restoration

Compensation Plan

A standard compensation plan has to be developed for securing the legal demand of the individuals or households who are willing to give their land due to development of the proposed EZ Project. It essentially needs to provide necessary compensation as per the law of land. No Resettlement Action Plan (RAP) is required because there is no displacement due to the Project development. Workers who develop any disease/injury during construction or operational phase of the proposed project should be treated accordingly with ensuring necessary compensation by the responsible authority.

Monitoring Plan

The main purpose of a monitoring plan for the potential environmental parameters during the construction and operation phases in this Project is:

- To provide a standard guideline for comparing the baseline environmental conditions (data observed/collected during the study period) and other factors with that of the construction and operational phases.
- To evaluate the effectiveness of the mitigation measures for preservation of the natural environment.
- To detect any disruption of environment according to national standards.

Several environmental components can be affected during the construction and operation of the Project. Following plan has been formulated for monitoring and evaluation of environmental components with potential risk of disruption.

Table XII: Monitoring plan (construction phase)

Category	Issues	Location	Frequency	Responsible Organization
Air Quality	<ul style="list-style-type: none"> • NO_x, SO_x, CO, PM_{2.5}, PM₁₀ etc. 	<ul style="list-style-type: none"> • 3 points in the construction site 	1 week/3 months	BEZA
Water Quality	<ul style="list-style-type: none"> • Water temperature, pH, SS, TDS, EC, DO, BOD₅, COD, Total coliforms, chromium, As etc. 	<ul style="list-style-type: none"> • Outflow of construction • (at least 3 sampling points/mixing point **) • Well near the construction site (1 point) 	Once/2 months	BEZA
Wastes	<ul style="list-style-type: none"> • Amount and kind of solid wastes 	<ul style="list-style-type: none"> • Construction site 	Once/3 months	BEZA
Noise and Vibration	<ul style="list-style-type: none"> • Noise and vibration level • Traffic count 	<ul style="list-style-type: none"> • Preservation area such as residence around the proposed construction site (at least 1 point) 	Once (24 hours)/3 months	BEZA
		<ul style="list-style-type: none"> • Preservation site such as residence along the route for on-site vehicles (1 point for noise and vibration) 	Once (24 hours)/3 months	BEZA
Ecosystem (Endangered)	<ul style="list-style-type: none"> • Species, Number - Bangladesh Wild Life 	<ul style="list-style-type: none"> • Endangered Species 1 point in the 	1) Endangered	BEZA

Category	Issues	Location	Frequency	Responsible Organization
Species)	(Preservation) (Amendment) Act, 1974 - JICA Guideline (2010)	Construction area • Sea turtle 2 lines: Beach in front of the site and the sandbar.	species - Bird: Once a week in migration season - Others: Twice a year in dry and rainy seasons 2) Every 3 days in spawning season	
Ecosystem (Marine Biota)	• Species, Number of Phyto and Zoo Plankton • Benthos (Sea bottom)	• 5 points: Sea area in front of construction area	Twice a year in dry and rainy seasons	BEZA
Ecosystem (Mud Flat, Fish & Nekton)	• Species, Number, and Weight of. • Benthos (Mud flat) • Fish and Nekton	• 1 point: In front of the site	Twice a year in dry and rainy seasons	
Hydrology	• Groundwater level • Ground elevation level • Consumption of groundwater amount	• Well near the construction site	Once/ months	BEZA
Living and Livelihood/ Vulnerable Group/ Misdistribution of Benefit and Damage/ Children's Right	• The implementation status for CSR activities such as community support program	• Around project Site	Once /year	BEZA
Risks for Infectious Disease such as AIDS/HIV	• Awareness of infectious diseases	• Construction site	Once/month	BEZA
Occupational Health and Safety	• Record of accidents and infectious diseases	• Construction site	Once/month	BEZA
Community Health and Safety	• Record of accidents and infectious diseases related to the community	• Around construction site	Once/month	BEZA
	• The implementation status for CSER activities such as community support program	• Around Project Site	Once /year	BEZA

Table XIII: Monitoring plan (operation phase)

Monitoring Category	Environmental and Social Issues	Location	Frequency	Responsible Organization
Air Quality	<ul style="list-style-type: none"> NO_x, SO_x, CO, PM_{2.5}, PM₁₀, VOCs, HAPs etc. 	<ul style="list-style-type: none"> Representative location inside the Project area 	1 week each in the dry and rainy seasons (first 3 years after starting of the operation stage)	BEZA, Tenants
Water Quality	<ul style="list-style-type: none"> Water temperature, pH, SS, DO, BOD₅, COD, color, odor, Total Nitrogen, Total Phosphorus, Sulphide, Chromium, Arsenic, Copper, Mercury, Cadmium, Lead, and Nickel etc. 	<ul style="list-style-type: none"> At least 3 sampling points/mixing point: discharge water, upstream water, and downstream water) 	Every month: Water temperature, pH, SS, DO, BOD ₅ , COD, color and odor, Every 3 months: all parameters	BEZA, Tenants
Wastes	<ul style="list-style-type: none"> Amount of hazardous and non-hazardous wastes in the project site. 	<ul style="list-style-type: none"> Project site 	Twice/year (submission of the environmental report by the tenants)	BEZA, Tenants
Soil Contamination	<ul style="list-style-type: none"> Status of control of solid and liquid waste which causes soil contamination. 	<ul style="list-style-type: none"> Project site 	Twice/year (submission of the environmental report by the tenants)	BEZA, Tenants
Noise and Vibration	<ul style="list-style-type: none"> Source noise emissions (Noise level monitoring in dB (A) near noise generating equipment's, e.g. pumps, flare etc. 	<ul style="list-style-type: none"> Project site 	One time each in the dry and rainy seasons (first 3 years after starting the operation stage)	BEZA, Tenants
Odor	<ul style="list-style-type: none"> Status offensive odor control by the Proponent 	<ul style="list-style-type: none"> Project site 	Twice/year (submission of the environmental report by tenants)	BEZA, Tenants
Ecosystem (Endangered Species)	<ul style="list-style-type: none"> Species, Number - Bangladesh Wild Life (Preservation) (Amendment) Act, 1974 - JICA Guideline (2010) 	<ul style="list-style-type: none"> Endangered Species 1 point in the Construction area Sea turtle 3 lines: Beach in front of the site and the sandbar. 	1) Endangered species - Bird: Once a week in migration season - Others: Twice a year in dry and rainy seasons 2) Every 3 days in spawning season	BEZA, Tenants
Ecosystem (Marine Biota)	<ul style="list-style-type: none"> Species, Number of Phyto and Zoo Plankton Benthos (Sea bottom) 	<ul style="list-style-type: none"> 5 points: Sea area in front of construction area 	Twice a year in dry and rainy seasons	BEZA, Tenants
Ecosystem (Mud Flat, Fish & Nekton)	<ul style="list-style-type: none"> Species, Number, and Weight of. Benthos (Mud flat) Fish and Nekton 	<ul style="list-style-type: none"> 1 point: In front of the site 	Twice a year in dry and rainy seasons	BEZA, Tenants
Living and Livelihood/ Vulnerable Group/ Misdistribution of Benefit	<ul style="list-style-type: none"> The implementation status for CSER activities such as community support program. 	<ul style="list-style-type: none"> Around Project Site 	Once /year	BEZA, Tenants

Monitoring Category	Environmental and Social Issues	Location	Frequency	Responsible Organization
and Damage/Children's Right				
Risks for Infectious Disease such as AIDS/HIV	<ul style="list-style-type: none"> Status of measures against infectious diseases 	<ul style="list-style-type: none"> Project Site 	Twice/year (Submission of the environmental report by the tenants)	BEZA, Tenants
Occupational Health and Safety	<ul style="list-style-type: none"> Record of accidents and infectious diseases 	<ul style="list-style-type: none"> Work sites and offices 	Twice/year (Submission of the environmental report by the tenants)	BEZA, Tenants
Community Health and Safety	<ul style="list-style-type: none"> Record of accidents and infectious diseases related to the community 	<ul style="list-style-type: none"> Around the Project site 	Twice/year (Submission of the environmental report by the tenants)	BEZA, Tenants
	<ul style="list-style-type: none"> The implementation status for CSER activities such as community support program 	<ul style="list-style-type: none"> Around Project Site 	Once /year	BEZA, Tenants
Usage of Chemicals	<ul style="list-style-type: none"> Record of the type and quantity of chemicals and implementation status of control measures through self-inspection 	<ul style="list-style-type: none"> Project Site 	Biannually	BEZA, Tenants

Conclusion

As to the results of the EIA study for the industrial area of MEZ-III Project, the following items are found:

- a) In terms of living environment, most of the impacts are controlled and limited in and around the project area. The key negative impacts such as emission of gas and dust, deterioration of water quality, generation of noise and vibration are expected. However, implementation of appropriate mitigation and management plan, such as to spray water to bare areas for dust prevention, and to avoid the incentive operation of the construction machinery for prevention of emission gas, noise and vibration during construction phase, and to provide the commuter bus by Proponent and to comply with the tentative target value of effluent water flowing out of the wastewater treatment plant during operation phase, will minimize these impacts.
- b) In terms of natural environment, there are some mangrove forest species like Baen (*Avicennia officinalis*), Keora (*Sonneratia apetala*) and Jahu (*Casuarina equisetifolia*) on the char of project area. Similarly, sea adjacent to Haserchar (south-west corner of the project site) is found breeding ground of turtle (*Chelonia mydas*), shark (*Carcharhinus amblyrhynchos*) and dolphin (*Tursiops truncatus*). However, implementation of appropriate mitigation measures, such as planting trees, vegetation and sodding of public spaces as soon as possible, and demarcation of route for vessels navigation, 'no' any discharge into sea will minimize the impact on the surrounding ecosystem.
- c) In terms of social environment, there are a land acquisition and compensation activities during pre-construction, and construction phases of the project. However, BEZA shall ensure the

compliance with provisions of all relevant ordinances relating to compensation and rehabilitation issues properly. On the other hand, some positive impacts of the project such as increase in job opportunity and improvement of social infrastructure are also expected.

- d) In terms of health and safety, some impacts on occupational/community health and safety and increase in number of accidents are expected. However, implementation of appropriate mitigation and management plan, such as to manage working conditions during the construction work and to provide security and maintain safety prevention measures during construction/operation phase will minimize these impacts.
- e) In consideration of the result of the EIA study for the project, the Environmental Management Plans (EMPs) including adequate mitigation measures to reduce the negative impacts and Environmental Monitoring Plan (EMoP) are proposed for each phase of the Project: Pre-Construction Phase, Construction/Closing Phase, and Operation Phase.

It was confirmed that the environmental, social and health impacts of the project were assessed and the EMP was formulated properly. In the process of EIA, opportunity of public involvement was ensured and comments from the public were reflected into the final report. Thus, the EIA was completed in accordance with the requirements of the EIA procedure properly; in that case BEZA will follow EMP accordingly.

Recommendations

Following recommendations are made based on the EIA study for development of the MEZ-III Project:

- a) BEZA should take No Objection Certificate (NOC) from BIWTA for the construction of Marine Jetty, land filling through dredging into sea and construction of coastal bank;
- b) BEZA should take NOC from Department of Forests (DOF) for felling of newly formed mangrove trees of the zone;
- c) BEZA should install and function CETP and CSTP for the treatment of waste water and maintain 'zero' discharge provision for minimizing marine pollution;
- d) National 3R Strategy for Waste Management (Reduce, Reuse, Recycle) should be followed for the management of Solid Waste;
- e) Rain water harvesting should be carried out to reduce the pressure on surface and ground water resources;
- f) Roof top all infrastructures should be managed for the purpose of harvesting rain water, photovoltaic solar energy and gardening;
- g) Proposed EMPs and EMoP should be implemented strictly during construction and operation phase of the project;
- h) OHS Guideline of IFC for workers should be strictly followed to minimize occupational health hazards;
- i) All infrastructures of the zone should be built based on the seismic design consideration to avoid potential hazard risk;
- j) To avoid hazard due to any disaster, warning system, emergency evacuation system, construction of ground flood at an elevated level, provision of emergency equipment should be considered;
- k) Proper training regarding EHS should be provided to Project Management Unit as well as work forces during construction and operation phases;
- l) Development of a mangrove green belt surrounding the area should be considered with due

- importance;
- m) Eligible local people should be considered on priority basis that will be helpful for minimizing the socio-economic disruption.

Chapter 2: Introduction

2.1. Prelude

The economy of Bangladesh has come a long way since the country achieved its independence in 1971. Bangladesh has steadily increased its average decadal growth rate over the last 40 years. The decline in population growth rate has resulted in the growth in per capita income as well. This has resulted in more than 130 percent increase in real per capita income over this period. The increase in per capita income has brought significant changes in many non-income aspects of development as well. In some cases, focused government policies have been crucial in bringing these positive changes while various NGO programmes have complemented these policies. People leaving under the poverty line have also decreased significantly from 83% in 1975 to 24.8% in 2015. Notable progress has been achieved in gender parity in both primary and secondary education. Life expectancy has increased from 46.2 years in 1974 to 70.40 years in 2013 with higher life expectancy for female. The total fertility rate has decreased from 6.3 live births per woman in the mid-1970s to 2.3 live births per woman in 2014. Maternal mortality rate per thousand live births has decreased from 6.48 in 1986 to 1.70 in 2013. Infant mortality rate has similarly decreased from 111 in 1981 to 33 in 2014 (Source: World Bank, Directorate General of Health Services, BBS).

Bangladesh Economic Zone Act, 2010, has been introduced by the Government of Bangladesh to facilitate development of Economic Zones (EZs) in the potential regions of the country, aiming to boost up the country's economic development and ensure standard, eco-friendly industrial zone that would encourage more foreign investment. Under this Act, the Bangladesh Economic Zone Authority (BEZA) has been established under the Prime Minister's Office (PMO) and governed by a Board chaired by the Prime Minister. The law provides legal coverage for attracting and leveraging private investment in the development of zones as zone developers or operators, and in the provision of tailored infrastructure services, such as private provision of power, effluent treatment, etc.

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

As the government vision to established Maheshkhali as the economic and industrial hub, BEZA took the initiative to developed Maheshkhali Economic Zone-III ('Hereinafter MEZ-III) at the Dhalghata Union of Maheshkhali Upazila of Cox's Bazar District in an area of 1,270.12 acres. Taking into consideration the site location, available infrastructure, existing industries, infrastructure and logistic requirement of the proposed industries, Maheshkhali Economic Zone-III (MEZ-III) is planned to establish LNG, Garments, IT, Pharmaceuticals, Food and Beverage, Ceramics, Electrical Machineries, Leather Goods, Steel manufacturing industries, etc.

Options for other industries can also be explored by the developer at the time of development of EZ depending on the interest of BEZA and investors, and availability of resources. At present, on-site infrastructure facilities will be developed by BEZA for the proposed site. This EIA Report, therefore, covers in detail the environmental and social aspects of the proposed on-site and off-site infrastructure for the upcoming MEZ-III. It also covers aspect of industrial area as well based on above broad industrial classification. All necessary permissions and/or decisions by the Government for the establishment of MEZ-II, land legality and Treasury Challan are attached in **Annex-1** of the report.

2.2. Project Background

The project proponent shall develop the land and the following on-site infrastructures:

- Site preparation & development
- Administrative Building
- Boundary Wall

Off-site facilities and industrial area development will be planned by prospective PP developers on later stage. BEZA has appointed Shahidul Consultant, a fastest growing research based environmental and management consultancy firm, to provide transaction advisory services for this project including Environment and Social Impact Assessment study.

MEZ-III is considered as one of the priority industrial project by the Government. BEZA, as a result, applied to DOE for the exemption of Initial Environment Examination (IEE) Report and approval of Terms of Reference (ToR) for the preparation of Environment Impact Assessment (EIA) report. Afterward, ToR was granted by DoE Memo No. 22.02.0000.018.72.31.18.113 dated 4th March, 2018. Copy of the approved ToR by DoE Bangladesh is attached in **Annex 9**.

2.3. Project Description

BEZA has developed MEZ-III site at Dhalghata Union of Maheshkhali Upazila, Cox's Bazar District under Chittagong Division. Upcoming EZ will cover the total area of 1270.12 acres of land. This area will be developed by BEZA itself and with the aim targeting non-polluting industries for example LNG, Garments, IT, Pharmaceuticals, Food and Beverage, Ceramics, Electrical Machineries, Leather Goods, Steel manufacturing industries, etc. At present MEZ-III intends to develop on-site and off-site facilities for the EZ so that "ready to develop" land is available for establishing industries and developing EZ. A developer will be appointed for EZ development as per EZ Act, 2010. Developer will be responsible for developing the EZ.

2.4. Description of the Project Site

The proposed MEZ-III will be developed at Dhalghata Union of Maheshkhali Upazila of Cox's Bazar District under Chittagong Division. The project is approximately 18.03km away from Maheshkhali Municipality and 12.10km and 16.85km from the Kutubdia and Sonadia Island. The Matarbari coal fired power plant is approximately 3.61km and Deilpara road and Janatabazar-Gorokghata road are about 12km and 5.18km away from the project site. The Kutubdia channel is within the 10km radius of the project site and Maheshkhali channel is adjacent to the project site.

The location map of the EZ site is presented in Figure 1. EZ site covers an area of 1270.12 acres with no rural habitations within the zone but have a minimum beside the zone. The MEZ-III is approximately 4-5m from above mean sea level (MSL).

Table 1: Coordinates and surroundings of the EZ Site

Side	Object	GPS Points	Coordinate	Distance
North	Kutubdia Island and Matarbari Coal fired power plant.	NE Corner	21°48'32.84"N 91°51'23.75"E	12.10 km and 3.61 km away from the project site.
South	Bay of Bengal and Sonadia Island	SW Corner	21°25'05.72"N 91°56'04.71"E	Sonadia Island is 16.85 km away from the project site.
East	Bay of Bengal	NE Corner	21°39'04.97"N 91°47'46.76"E	Adjacent to boundary.
West	Moheshkhali Channel	NW Corner	21°39'01.95"N 91°58'46.24"E	Adjacent from the boundary

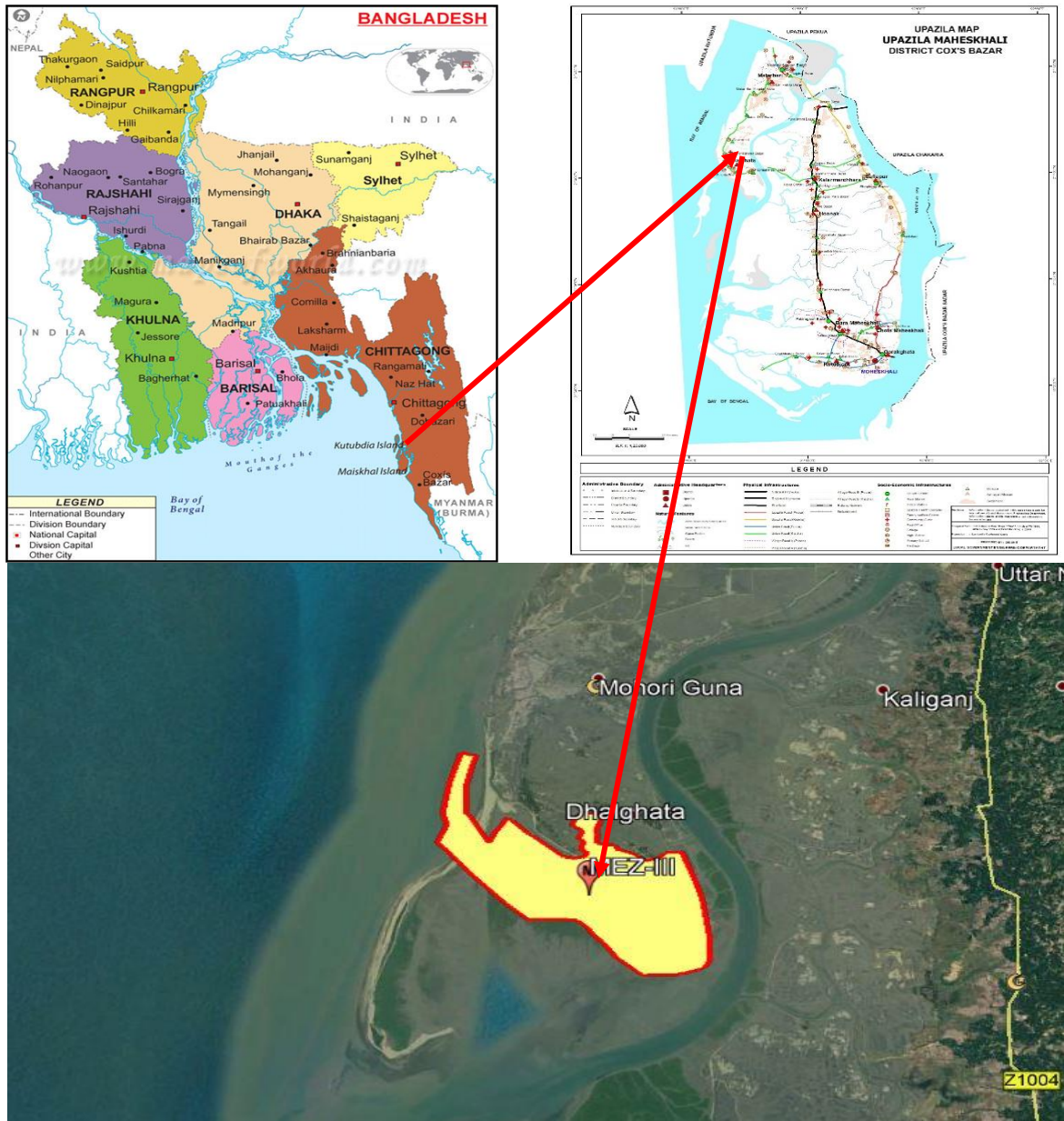


Figure 1: Location map of MEZ-III

2.5. Connectivity

Currently, there is no significant road connectivity to MEZ-III with other parts of the country but the proposed EZ is well connected in terms of Sea/River transportation facilities. Chittagong Sea Port is about 70km and Payra Sea Port is about 167 km from the site. BEZA has a planned to establish industries which can easily transported through sea/river transportation system such as LNG, Garments, IT, Pharmaceuticals, Food and Beverage, Ceramics, Electrical Machineries, Leather Goods, Steel manufacturing industries, etc. Kohelia River is very adjacent to the project which can also be used as transportation of raw materials and finished products. However, BEZA would facilitate necessary access road and other off-site infrastructures for the EZ.

2.6. Need for the Proposed Project

Bangladesh is primarily an agricultural economy with close to 50% of the labor force employed in agriculture. Industry sector contribution to Gross Domestic Product (GDP) has hovered around 25-30% only for past few years. Manufacturing sector of Industry shows predominance of export lead garments and textile industries and comprise of 52% share of total exports in Bangladesh making it the world's second largest garment manufacturer.

But it also reveals relatively low emphasis and export competitiveness of its other items. Therefore, the country needs to booster exports of other indigenous products, which will happen through enhanced industrial infrastructure, capacity building, and policy initiatives. Similarly, the country may choose to substitute imports of capital goods and other items of domestic consumption, provided there is adequate investment in industrial infrastructure to enable domestic manufacturing.

The Government of Bangladesh has, in the past, successfully provided tailored infrastructure services and business environment conditions through EPZs. EPZs were used as a strategic instrument for attracting Foreign Direct Investment (FDI) and dealing with the shortcomings of the overall investment climate, business registration, licensing, etc. which were restricting investments in the Domestic Tariff Area (DTA).

To overcome the limitations of EPZ model, new EZ regime has been adopted by the Government of Bangladesh so as more spill-over can be harnessed by local firms from FDI, additional investments can be encouraged within value chains, more local produce can be procured and better linkages can be established between manufacturing firms and educational institutions.

The EZ development, a zoned industrialization, is required in Bangladesh to maximize the growth benefits of agglomeration and ease the increasing urban congestion. More importantly, the Project will enable new sources of growth, where investor will show their interest.

Dhalghata Union of Moheshkhali Upazila is one of the less developed areas of Bangladesh. The majority of the residents are salt farmer and their economic situation is very poor. Development of EZ in such area will boost not only the industrial development in the area but also the infrastructural facilities like improved power supply, roads, drainage etc. Employment generation for local people will enhance their living standard and quality of life. EZ development will lead to development of allied facilities and related developments in the nearby area. Also, as per requirement for EZ development, location of Maheshkhali Upazila at is suitable. Adequate land is available for development of EZ and no major habitation is present on the combination of private and government khash land.

2.7. Need of the Study

The proposed project comprises of development of land, on-site and off-site facilities for the upcoming MEZ-III with an approximate area of 1270.12 acre. On-site facilities will include development of site, i.e. filling and leveling works, construction of administration building within site and boundary wall to the site. And off-site facilities will include all utilities connection, road network, etc.

The project attracts the applicability of Environment Conservation Act (ECA), 1995 & Environmental Conservation Rules, 1997. The proposed project is classified under red category as per Environmental Conservation Rules, 1997. Thus, it is required to carry out EIA study for the proposed Project as per ECA, 1995 & Environmental Conservation Rules (ECR), 1997 and obtain approval of DoE before taking up any construction activity at the proposed site.

2.8. Scope of the Study

The EIA process ensures that environmental issues are raised when a project or plan is first discussed and that all concerns are addressed as a project gains momentum through to implementation. Recommendations made by the EIA may necessitate the redesign of some project components, require further studies, and suggest changes which alter the economic viability of the project or cause a delay in project implementation. To be of most benefit it is essential that an environmental assessment is carried out to determine significant impacts early in the project cycle so that recommendations can be built into the design and cost-benefit analysis without causing major delays or increased design costs. To be effective once implementation has commenced, the EIA should lead to a mechanism whereby adequate monitoring is undertaken to realize environmental management. An important output from the EIA process should be the delineation of enabling mechanisms for such effective management. To carry out the EIA a series of steps have been conducted. These steps are outlined below and the techniques more commonly used in EIA are described in some detail in the following sections.

2.9. Methodology of the Study

A wide range of environmental issues including physical, chemical, biological, socioeconomic, cultural, landscape values are considered in the EIA processes using methods and techniques to quantify or to qualify those changes to identify the problems, assess negative impacts and recommending integrated environmental management plan for anticipation and mitigation of the potentially harmful or adverse changes and finally ensuring the proposed measures through monitoring and evaluation of the whole EIA process by auditing.

Since identification of the probable adverse impact on surrounding socio-cultural and environmental situation including its magnitude, geographical extension of that impact, duration and frequency, the degree of reversibility, auditing probability of occurrence are critical for, all the issues were addressed in the current EIA study. Assessment of the probability of occurrence of a significant impact was also carried out.

The objectives of methodologies were as follows:

- To understand the nature and location of the Project and possible alternatives;
- To identify factors of analysis and assessment objectives;
- Preliminary identification of impacts and scoping;
- Baseline studies and evolution in the absence of Projects;
- Prediction and assessment of impacts and alternatives;

- Comparison of Mitigation Monitoring and Impacts Management.

For the purpose of environmental assessment, the area within 10 km radial zone of the proposed project has been studied and classified as study area. The 10 km radius map is given in Chapter 5.

Following steps and methodology have been adopted for the EIA study:

- ◆ Review previous studies;
- ◆ Harmonization of environmental safeguard requirements of the government and co-financiers;
- ◆ Scoping, baseline environmental quality monitoring survey and development of the terms of-reference for the EIA study;
- ◆ Screening of environmental impacts including soil, water, atmosphere, flora & fauna as well as social impacts including resources, recreation, cultural and prioritization;
- ◆ Expert consultations with scientific and professional community;
- ◆ Public consultation with affected population, local Government bodies, public representatives, NGOs and business communities to introduce the project components and anticipated impacts; Focus group discussions in project area;
- ◆ Prediction of impacts and prepare mitigation measures by field investigation, data analysis, and mathematical modeling;
- ◆ Integration of environment with engineer's planning and social concerns;
- ◆ Preparation of Draft and Updated EIA Reports, Environmental Management and Monitoring plan and Initial Environmental Examination (IEE)/ Community Environmental Management Plan;
- ◆ Present Draft EIA Report in Stakeholder and Public Consultation Meetings for Public Disclosure;
- ◆ Submit Final EIA Report and EMMP incorporating comments of DoE for Approval;
- ◆ Implement EMMP during construction and operation and maintenance (O/M) stages;
- ◆ Environmental auditing by assessing EIA process and feedback to future EIA Study.

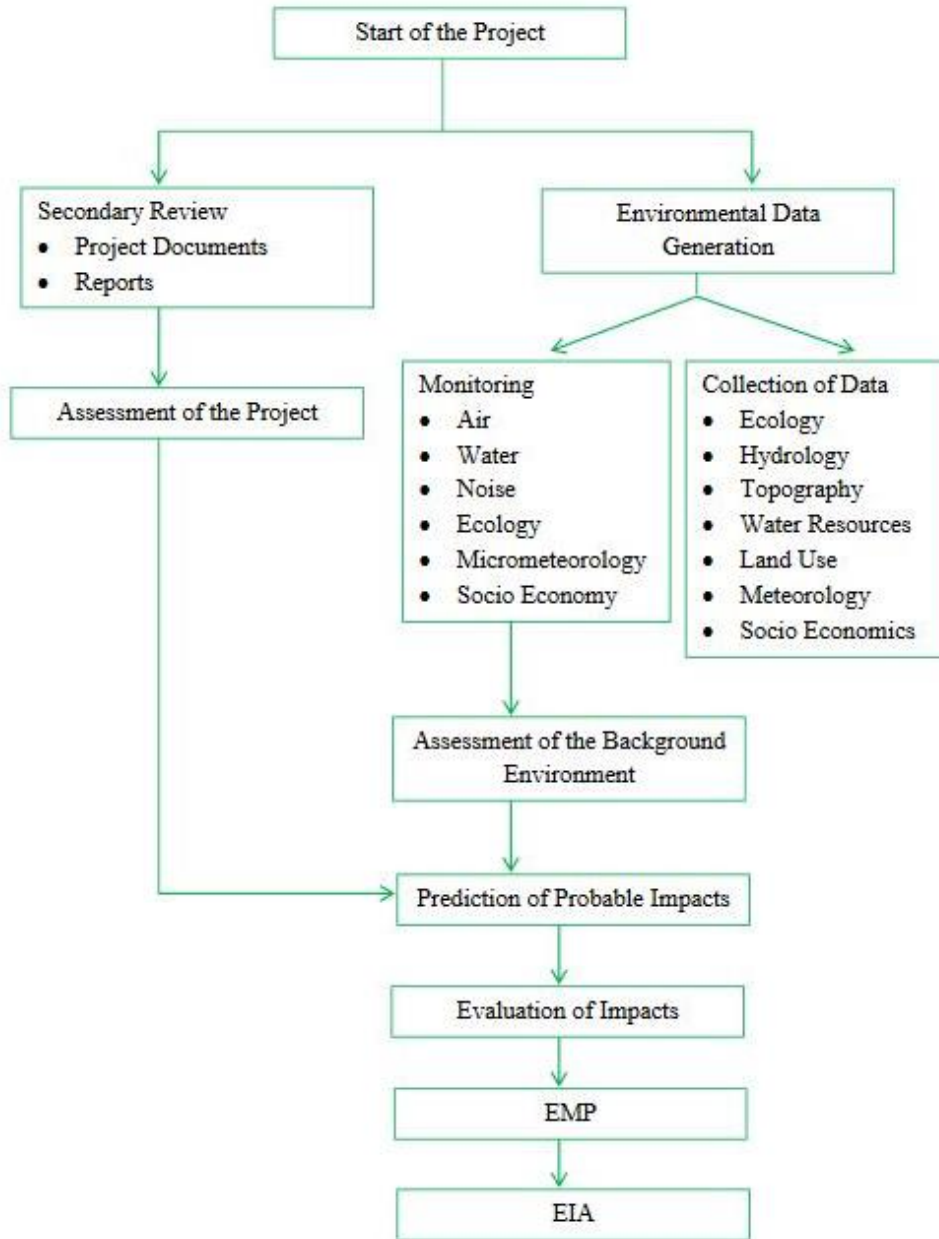


Figure 2: Route Map of Environmental Impact Assessment (EIA)

2.10. ToR Compliance Matrix

The EIA study has been conducted in accordance with the approved ToR issued by DOE (ToR is attached as **Annex 9**). The following table presents the point-wise compliance of the issued ToR.

Table 2: Compliance of Terms of References (ToR) points

SN	ToR Point	Compliance
I	The Project authority shall conduct a comprehensive Environmental Impact Assessment (EIA) study considering the overall activity of the said Project in accordance with the TOR approved by the DOE and additional suggestions provided herein.	EIA study has been carried out in line with the ToR Approved by DoE.
II	The EIA Report should be prepared in accordance with following indicative outlines:	Agreed
1	Executive Summary	Refer Chapter 1
2	Introduction: (background, brief description, rationale of the Project, scope of study, methodology, limitation, EIA team, references)	Refer Chapter 2
3	Legislative, regulation and policy consideration (covering the potential legal, administrative, planning and policy framework within which the EIA will be prepared)	Refer Chapter 3
4	Project Description	Refer Chapter 4
i.	Introduction	Section 4.1
ii.	Project objective	Section 4.2
iii.	Project options	Section 4.3
iv.	Interventions under selected options	Section 4.4
v.	Project activities: A list of the main Project activities to be undertaken during site clearing, construction as well as operation	Section 4.6
vi.	Project schedule: The phase and timing for development of the Project	Section 4.5
vii.	Resources and utilities demand: Resources required to develop the Project, such as soil and construction material and demand for utilities (water, electricity, sewerage, waste disposal and others), as well as infrastructure (road, drains, and others) to support the Project	Section 4.7
viii.	Map and survey information Location map, cadastral map showing land plots (Project and adjacent area), geological map showing geological units, fault zone, and other natural features	Section 4.8
ix.	Project plan, Design, Standard, Specification, Quantification, etc.	Section 4.9
5	Environmental and Social Baseline	Refer Chapter 5
5.1	Meteorology	Section 5.1
5.1.1	Temperature	Section 5.1.1
5.1.2	Humidity	Section 5.1.5
5.1.3	Rainfall	Section 5.1.4
5.1.4	Evaporation	Section 5.1.7
5.1.5	Wind Speed	Section 5.1.6
5.1.6	Sunshine hours	Section 5.1.2
5.2	Water Resources	Section 5.3
5.2.1	Surface Water System	Section 5.3.1
5.2.2	Tropical cyclones and Tidal Flooding	Section 5.3.3
5.2.3	Salinity	Section 5.3.9
5.2.4	Drainage Congestion and Water Logging	Section 5.3.4
5.2.5	Erosion and Sedimentation	Section 5.3.5
5.2.7	Navigation	Section 5.3.6
5.2.8	Ground Water System	Section 5.3.2
5.3	Land Resources	Section 5.2
5.3.1	Agro-ecological Regions	Section 5.2.1
5.3.2	Land Types	Section 5.2.4
5.3.3	Soil Texture	Section 5.2.5
5.3.4	Land Use	Section 5.2.6
5.4	Agriculture Resources	Section 5.4
5.4.1	Farming Practice	Section 5.4.1
5.4.2	Cropping Pattern and Intensity	Section 5.4.2
5.4.3	Cropped Area	Section 5.4.3

SN	ToR Point	Compliance
5.4.4	Crop Production	Section 5.4.4
5.4.5	Crop Damage	Section 5.4.5
5.4.6	Main Constraints of Crop Production	Section 5.4.6
5.5	Livestock and Poultry	Section 5.5
5.5.1	Feed and Fodder Shortage	Section 5.5.1
5.5.2	Livestock/Poultry Diseases	Section 5.5.2
5.6	Fisheries	Section 5.6
5.6.1	Introduction	Section 5.6.1
5.6.2	Problem and Issues	Section 5.6.2
5.6.3	Habitat Description	Section 5.6.3
5.6.4	Fish Production and Effort	Section 5.6.4
5.6.5	Fish Migration	Section 5.6.5
5.6.6	Fish Biodiversity	Section 5.6.6
5.6.7	Fisheries Management	Section 5.6.7
5.7	Ecological Resources	Section 5.7
5.7.1	Bio-ecological Zone	Section 5.7.1
5.7.2	Common Flora and Fauna	Section 5.7.2
5.7.3	Ecosystem Services and Function	Section 5.7.3
5.8	Socio Economic Condition	Section 5.8
5.8.1	Socio Economic Condition	Section 5.8.1
5.8.2	Quality of Life Indicators	Section 5.8.2
5.8.3	Income and Poverty	Section 5.8.3
5.8.4	Gender and Women	Section 5.8.4
5.8.5	Common Property Resources	Section 5.8.5
5.8.6	Conflict of Interest and Law and Order Situation	Section 5.8.6
5.8.7	Historical, Cultural and Archaeological Sites	Section 5.8.7
6	Identification and Analysis of Key Environmental Issues (Analysis shall be presented with Scenarios, Maps, Graphics, etc. for the Case of Anticipated Impacts on Baseline)	Refer Chapter 6
6.1	Environmental Sensitivity Investigation	Section 6.1
6.2	Environmental Asset	Section 6.2
6.3	Environmental Hot Spots	Section 6.3
6.4	Likely Beneficial Impacts	Section 6.4
6.5	Community Recommendations	Section 6.5
6.6	Alternate Analysis	Section 6.6
7	Environmental and Social Impacts	Refer Chapter 7
7.1	Introduction	Section 7.1
7.2	Impact on Water Resources	Section 7.2
7.2.1	Pre-construction Phase	Section 7.2.1
7.2.2	Construction Phase	Section 7.2.2
7.2.3	Post-construction Phase	Section 7.2.3
7.3	Impact on Land Resources	Section 7.3
7.3.1	Pre-construction Phase	Section 7.3.1
7.3.2	Construction Phase	Section 7.3.2
7.3.3	Post-construction Phase	Section 7.3.3
7.4	Impact on Agriculture Resources	Section 7.4
7.4.1	Pre-construction Phase	Section 7.4.1
7.4.2	Construction Phase	Section 7.4.2
7.4.3	Post-construction Phase	Section 7.4.3
7.5	Impact on Fisheries	Section 7.5
7.5.1	Pre-construction Phase	Section 7.5.1
7.5.2	Construction Phase	Section 7.5.2
7.5.3	Post-construction Phase	Section 7.5.3
7.6	Impact on Ecosystem	Section 7.6
7.6.1	Pre-construction Phase	Section 7.6.1
7.6.2	Construction Phase	Section 7.6.2
7.6.3	Post-construction Phase	Section 7.6.3
7.7	Socio Economic Impact	Section 7.7
7.7.1	Pre-construction Phase	Section 7.7.1

SN	ToR Point	Compliance
7.7.2	Construction Phase	Section 7.7.2
7.7.3	Post-construction Phase	Section 7.7.3
8.	Public Consultation and Disclosure	Refer Chapter 8
8.1	Introduction	Section 8.1
8.2	Objectives of Public Consultation and Disclosure Meeting	Section 8.2
8.3	Approach and Methodology of Public Consultation and Disclosure Meeting	Section 8.3
8.4	Public Consultation Meetings (PCMs)	Section 8.4
8.5	Public Disclosure Meetings (PDMs)	Section 8.5
9.	Environmental Management Plan and Monitoring Indicators	Refer Chapter 9
9.1	Introduction	Section 9.1
9.2	Mitigation Plan	Section 9.2
9.3	Enhancement Plan	Section 9.3
9.4	Contingency Plan	Section 9.4
9.5	Compensation Plan	Section 9.5
9.6	Monitoring Plan	Section 9.6
9.7	Monitoring Indicators	Section 9.7
10.	Cost Estimation for Environmental Mitigation Measures and Monitoring	Refer Chapter 10
11.	Conclusions and Recommendations	Refer Chapter 11
III	Without obtaining approval of EIA report from the Department of Environment, the Project authority shall not be allowed to conduct earth filling or any kind of physical intervention in the proposed Project site and also not be able to start the physical activity of the Project.	Agreed
IV	This approval of the Terms of Reference (ToR) would not mean any acceptance or site clearance of the Project.	Agreed
V	The proposed EIA study would not establish any claim, right in favor of the Proponent for getting site clearance or environmental clearance.	Agreed
VI.	Without obtaining Environmental Clearance, the Project authority shall not be able to start the operation of the Project.	Agreed
VII.	The Project authority shall submit the EIA report along with a filled-in application for Environmental Clearance in prescribed form, the applicable fee. in a treasury chalan, No Objection Certificate (NOC) from Local Authority in prescribed form, NOC from Forest Department (if it is required in case of cutting any forested plant, private or public), NOC from concerned authority for dredging of any river (if it is required) and relevant agencies for operational activity, etc. to the Cox's Bazar District office of DoE with a copy to the Head Office of DoE in Dhaka.	Agreed

2.11. Structure of the Report

This EIA report has been prepared strictly following the report structure desired by DOE as per TOR. The EIA report contains Project features, baseline environmental conditions, assessment of environmental impacts, and formulation of mitigation measures along with environmental management and monitoring plan. The report includes the following chapters:

Chapter 1: Executive Summary

The executive summary gives the synopsis of the EIA Report.

Chapter 2: Introduction

This chapter provides background information of the Project Proponent, need for the EIA study as per prevailing legislation, Location and brief description of the Project, methodology adopted for EIA study and structure of the report.

Chapter 3: Legislative, regulation and policy consideration

This chapter deals with the details of the potential legal, administrative, planning and policy framework which have been used in the preparation of the EIA Report.

Chapter 4: Project Description

This chapter deals with the details of the proposed EZ such as location, connectivity, Project requirements, Infrastructure development, environmental consideration, Project cost, implementation schedule, etc.

Chapter 5: Environmental and Social Baseline

This Chapter describes the baseline environmental conditions around the Project site for various environmental attributes, viz. physical, biological and socio-economic, within the 10 km radial zone, which is termed as the study area. Topography, soil, water, meteorology, air, noise, and land constitute the physical environment, whereas flora and fauna constitute the biological environment. Demographic details and occupational pattern in the study area constitute socio-economic environment. Baseline environmental conditions are based on the information collected from the various agencies and the secondary data collected from published sources.

Chapter 6: Identification and Analysis of Key Environmental Issues

This chapter details the analysis of the key environmental issues.

Chapter 7: Environmental and Social Impacts

This chapter details the inferences drawn from the environmental impact assessment of the proposed Project. It describes the overall impacts of the Project activities and underscores the areas of concern, which need mitigation measures.

Chapter 8: Public Consultation and Disclosure Meeting

This Chapter provides an insight into the process & methodology followed for carrying out the public consultation meetings in study area and proceedings of public consultations.

Chapter 9: Environmental Management Plan and Monitoring Indicators

This Chapter provides mitigation and control measures to attenuate and/or eliminate environmental impacts, which are likely to be caused by the proposed Project. An Environmental Management Plan (EMP) has been developed to mitigate the potential adverse impacts and to strengthen the beneficial impacts. This chapter also provides the environmental monitoring plan proposed for the Project.

Chapter 10: Cost Estimation for Environmental Mitigation Measures and Monitoring

This chapter concludes on the findings that emerged from the environmental assessment study and summarizes the key points to be addressed to ensure the environmental sustainability of the Project during the construction and operation phases.

Chapter 11: Conclusions and Recommendations

This chapter concludes on the findings that emerged from the environmental assessment study and summarizes the key points to be addressed to ensure the environmental sustainability of the Project during the construction and operation phases.

2.12. EIA Team

A multidisciplinary team of professionals having experience of conducting Environment & Social Impact Assessment studies for Industrial parks, Industrial cluster, Special Economic Zones, DTA, Economic Zones, Area development, Industrial Corridors etc. were involved in carrying out EIA study for this Project. Details of the professionals are given in the Table 3:

Table 3: EIA Team

SN	Name of the Professionals	Area of Expertise	Position Assigned
1.	Muhammad Abul Foyzal	Environment and Social Impact Assessment & Environment Management Plan	Team Leader-cum-Environmental Expert
2.	Enggr. Md. Shahidul Karim	Land Use, Planning and Architecture	Urban Planner
3.	Md. Shofiul Islam	Environmental and Social Management Framework	Environmental Expert
4.	Md. Mahbub Kabir	Geo-spatial & Remote Sensing, Water, soil/sediment and air quality.	GIS and Laboratory Expert
5.	Sultana Afroze	Social Impact Assessment (SIA)	SIA expert
6.	Sadia Afrine	Ecology, Biodiversity and Environment	Biodiversity Expert

2.13. References

List of secondary data used for carrying out EIA study and preparation of EIA report is given in Table 4.

Table 4: References used for EIA study

SN	Reference
Government Departments	
1.	Bangladesh Economic Zones Authority (BEZA)
2.	Department of Environment (DoE)
3.	Bangladesh Agriculture Research Council (BARC)
4.	Bangladesh Water Development Board (BWDB)
5.	Bangladesh Meteorological Department (BMD)
6.	Bangladesh Forest Department (DoF)
7.	Bangladesh Bureau of Statistics (BBS)
8.	Bangladesh Food & Agriculture Department (FAO, Bangladesh)
9.	Geological Survey of Bangladesh (GSB)
10.	Disaster Management Bureau (DMB)
11.	Department of Disaster Management (DDM)
12.	Department of Agriculture Extension (DAE)
13.	Department of Fisheries (DOF)
14.	Power Grid Company of Bangladesh (PGCB)
15.	Land & Revenue Department
Journals, Books & Existing Studies	
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Chapter 3: Legislative, Regulation and Policy Considerations

3.1 Policy, Legal and Administrative Framework

This chapter provides a description of the regulatory framework applicable to the MEZ-III. It highlights environmental, health & safety and social regulations with applicable permits and standards in association with the project. It broadly focuses on the:

- Legal Enforcement Agencies at National Level;
- Applicable national and local Environmental and Social Laws, Regulations and Policies;
- World Bank Environmental Safeguard Policies and expected trigger ability;
- World Bank (WB) Environmental Impact Assessment Guidelines;
- Asian Development Bank (ADB) Safeguard Principles and Policies;
- International & National Environment Standards/ Guidelines; and
- Applicable International Conventions/Protocols.

3.2 Legal Enforcement Agencies

The responsibility of formulation, implementation and modification of national level environmental laws in Bangladesh lies with the Ministry of Environment and Forests (MoEF). The Department of Environment (DoE) established under the Environmental Pollution Control Ordinance, 1977 which functions under the MoEF. It is responsible for carrying out the purposes and provisions of the Environment Conservation Act, 1995 as amended till 2010 (hereinafter referred as ECA) which is the umbrella legislation regulating environmental issues in the country. A brief description of the relevant legal enforcement agencies has been described in the Table 5.

Table 5: Relevant legal enforcement agencies and their functions

SN	Agency	Functions
1.	Ministry of Environment & Forests (MoEF)	<p>The MoEF is the nodal agency in the administrative structure of the Central Government, for the planning, promotion, co-ordination and overseeing the implementation of environmental and forestry programs. It oversees all environmental matters in the country and is a permanent member of the Executive Committee of the National Economic Council.</p> <p>It plays a pivotal role as a participant of the United Nations Environment Programs (UNEP). Its principal activities include:</p> <ul style="list-style-type: none"> • Conservation & survey of flora, fauna, forests and wildlife; • Prevention and control of pollution; and • Forestation & regeneration of degraded areas and protection of environment in the frame work of legislations.
2.	Department of Environment (DoE)	<p>An Environment Pollution Control Board was setup under the Environment Pollution Control Ordinance, 1977. It underwent a series of subsequent restructuring and was finally renamed as Department of Environment in 1989. It is headed by a Director General appointed by the Government.</p> <p>The DoE through its head, divisional and district level offices conducts the following principal activities:</p> <ul style="list-style-type: none"> • Advising the Government to avoid such manufacturing processes, commodities and substances which are likely to cause environmental pollution;

SN	Agency	Functions
		<ul style="list-style-type: none"> • Advisory and issuing directions to the concerned person regarding the environmentally sound use, storage, transportation, import and export of a hazardous substance or its components; • Conducting inquiries and research activities on conservation, improvement and pollution of the environment and rendering assistance to any other authority/organization regarding the same; • Collection and publication of information about environmental pollution; • Conducting programs for observation of drinking water quality and issuing directives if necessary for adherence to drinking water quality standards; • Formulation of environmental guidelines; • Prescribing and modifying environmental quality standards pertaining to air, water, noise, vehicular emissions etc.; • Issuing Location Clearance and Environmental Clearance Certificates to Projects; and • Implementation of provisions of ECA and rules made there under.
3.	Bangladesh Forest Department (BFD)	It was established under the MoEF and is responsible for identifying and declaring of certain areas as reserved or protected or private forest lands. It implements the provisions of Forest Act, 1927 and National Forestry Policy, 1994. It's also responsible for wildlife preservation and protection through implementation of Wildlife (Preservation & Security) Act, 2012.
4.	Water Resources and Planning Organization (WARPO)	It was established under the Water Resources Planning Act, 1992. Its core functions include: <ul style="list-style-type: none"> • Monitoring the implementation of National Water Management Plan (NWMP); • Upkeep of water resource assessments; • Maintenance, updating and dissemination of the National Water Resources Database (NWRD) and MIS; • Secretariat to the National Water Resources Council (NWRC) and the Executive Committee of the National Water Resources Council (ECNWRC); • Responding to the NWRC/ECNWRC requests for information and advice; • Periodic update of the NWMP; • Assisting other agencies in planning, monitoring, studies and investigations; • Adhoc advice on policy, strategy, institutional and legal issues; • Laying down effluent discharge standards into river in consultation with DoE; and • Special studies and research as required.
5.	Ministry of Shipping (MOS)	The Ministry of Shipping encompasses within its fold shipping and port sectors which also oversee the safety and environmental matters and the regulatory aspects of maritime shipping. It is responsible for: <ul style="list-style-type: none"> • Development and maintenance of waterways, inland water transport, ports, ocean shipping, development and expansion of physical infrastructural facilities, etc. • Managing and maintaining inland, island and inter island ferry-boat and shipping services; • Formulation and implementation of act, rules and policies regarding the aforementioned issues.
6.	Bangladesh Inland Water Transport Authority	It was setup in 1958 under the provisions of East Pakistan Inland Water Transport Authority Ordinance 1958. Its specific functions include:

SN	Agency	Functions
	(BIWTA)	<ul style="list-style-type: none"> Carry out river conservancy works; Disseminate navigational and meteorological information including publication of river charts; Draw up programmers of dredging requirements and priorities for efficient maintenance of existing navigable waterways and for resuscitation of dead or dying rivers, channels, or canals, including development of new channels and canals for navigation; and Develop, maintain and operate inland river ports, landing/ferry Ghats and terminal facilities in such ports or Ghats.
7.	Ministry of Fisheries and Livestock (MOFL)	The main functions of the MOFL include: <ul style="list-style-type: none"> Preservation of fisheries resources; Fulfilling the requirement of animal protein through proper management and planned development; Increasing socio-economic conditions of fishermen; Creating employment opportunities for rural unemployed and landless people; Expanding foreign exchange earnings by exporting fish and fishery products; Developing innovative technologies through research for fisheries development and preservation; and Protection of fishes through implementation of Protection and Conservation of Fish Act, 1950 as amended till date.
8.	Bangladesh Power Development Board (BPDB)	It is a statutory body created in May 1, 1972 and is responsible for major portion of generation and distribution of electricity mainly in urban areas except Dhaka and West Zone of the country. It has undertaken a massive capacity expansion plan to add about 10500 MW generation capacities in next 5 years to achieve 24000 MW Capacity according to Power System Master Plan (PSMP) 2021.
9.	Bangladesh Energy Regulatory Commission (BERC)	It was established under the Bangladesh Energy Regulatory Commission Act, 2003. Some of its key functions include: <ul style="list-style-type: none"> Issue, cancel, amend and determine conditions of licenses, exemption of licenses and determine the conditions to be followed by such exempted persons; Regulation of generation, storage, supply, and transmission of energy; Determine tariff for electricity distribution etc.; Ensure control of environmental standard of energy under existing laws; Extend co-operation and advice to the Government, if necessary, regarding electricity generation, transmission, marketing, supply, distribution and storage of energy.
10.	Ministry of Labor and Employment (MOLE)	It was established with following objectives: <ul style="list-style-type: none"> Creation of employment opportunity; Creation of semi-skilled and skilled manpower; Enhancement of productivity of factories by creating friendly working environment between workers & employers; Ensuring welfare of workers in different industrial areas; Implementation of labor laws; Fixing up minimum wages of labor; and Ensuring justice through Labor Court. It has been divided into four departments, viz: <ul style="list-style-type: none"> Directorate of Labor Chief Inspector of Factory and Establishment Minimum Wages Board

SN	Agency	Functions
		<ul style="list-style-type: none"> • Labor Appeal Tribunal
11.	Ministry of Law and Parliamentary Affairs	<p>This ministry is divided in to the Law and Justice Division and the Parliamentary Affairs Division for functional purposes. The Law and Justice Division of the Ministry of Law, Justice and Parliamentary Affairs has the responsibility of providing legal advisory services to other ministries, divisions, departments, and organizations of the Government.</p> <p>The parliamentary affairs division is assisted by the law commission and the human rights commission and its main function lies in formulating, scrutinizing and preparing legislations. When needed, it provides legal opinions and translations for other ministries.</p>
12.	Ministry of Land	<p>The ministry of land is in charge of land administration, management and development for the overall growth of the nation. The Ministry manages Government owned lands, vested properties and abandoned properties. It is responsible for the collection of land development tax, land surveying and record keeping and updating. Land Acquisition and requisition fall under the responsibilities of this ministry.</p>
13.	Board of Investment (BOI), Bangladesh	<p>The Board of Investment was established in 1989 by the Investment Board Act. The specific functions of board are:</p> <ul style="list-style-type: none"> • Implementation of all provisions as lay down under The Investment Board Act, 1989. • To promote domestic and foreign investment as well to enhance international competitiveness of Bangladesh; • To identify the hindrance of investment and provide necessary facilities and assistance in the establishment of industries.
14.	Civil Aviation Authority (CAA), Bangladesh	<p>The Government of the People's Republic of Bangladesh formed Civil Aviation Authority, Bangladesh in the year of 1985. The main functions of CAA are:</p> <ul style="list-style-type: none"> • It is responsible for registration of aircrafts and issues license to each personnel responsible for flight operations; • To regulate air traffic and provides facilities and services for aeronautical telecommunications and air navigation; • The authority is responsible for construction, maintenance and development of airports and aerodromes.
15.	Union Parishad	<p>Union Parishad (UP) currently is the only elected statutory local government body for the rural Bangladesh. A UP consists of a chairman and twelve members. They are elected on the basis of adult franchise. Each UP has a full-time Secretary, appointed by the Deputy Commissioner (DC). The functions of UP are:</p> <ul style="list-style-type: none"> • Maintenance of law and order and conduction of censuses of all kinds. • Registration of births, deaths, blind people, beggars and destitute. • Planning and implementation of development schemes in the field of agriculture, forestry, fisheries, livestock, education, health, small and micro enterprises, communications, irrigation and flood control. • Protection and maintenance of public property such as roads, bridges, canals, embankments, markets, telephones and electricity lines.

3.3 Applicable Environmental and Social Laws, Regulations and Policies

The relevant Acts and Rules pertaining to the Project have been summarized in Table 6.

Table 6: Applicable environmental, health and safety and social laws, regulations and policies

Summary of Applicable legislation/ Policy	Agency Responsible	Applicable Permit and Requirements
<p>National Environment Policy, 1992 and Action Plan</p> <p>It sets out the framework for establishment of legislations related to 15 sectors including environment, water, agriculture, water resources development, forest & wildlife, fisheries etc. The key provisions of the policy are:</p> <ul style="list-style-type: none"> • Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) of all new public and private sector industrial Projects is mandatory • Adoption of corrective measures by polluting industries in phases. • Prevention of land erosion, and environmentally sound management of newly accreted land. • Conservation of wildlife, bio-diversity, forest, fisheries and livestock. 	<p>Ministry of Environment and Forests, Bangladesh</p> <p>Department of Environment, Bangladesh</p>	<p>BEZA should ensure that Project activities comply with the provisions made under the policy and the legislations made there under for implementing the same.</p>
<p>National Environment Management Action Plan (NEMAP), 1995</p> <p>The National Environment Management Action Plan (NEMAP, 1995) identifies the main national environmental issues, including those related to the water sector. The main water related national concerns include flood damage, riverbank erosion, environmental degradation of water bodies, increased water pollution, shortage of irrigation water and drainage congestion; various specific regional concerns are also identified.</p>	-	<p>BEZA should ensure that Project activities comply with the provisions made under this action plan.</p>
<p>The Environment Conservation Act, 1995 as amended till October 5, 2010 (hereinafter referred as ECA)</p> <p>The Environment Conservation Rules, 1997 as amended till February 16, 2002 (hereinafter referred as ECR)</p> <p>The salient features of the Act are as follows:</p> <ul style="list-style-type: none"> • A Department of Environment (DoE) to be established subsidiary to the MoEF to exercise the provisions of the Act. • The Government of Bangladesh (GoB) will declare Ecologically Critical Areas (ECA) and specify the activities or processes that cannot be initiated or continued in an ECA. • An industrial unit/Project cannot be established without obtaining an 	<p>Ministry of Environment and Forests, Bangladesh</p> <p>Department of Environment, Bangladesh</p>	<p>The proposed Project being an Economic Zone which falls under the Red category as classified under Schedule- I of the ECR.</p> <p>BEZA shall ensure compliance with the applicable provisions of the Act and the Rules made there under.</p> <p>BEZA shall ensure that Location Clearance Certificate (LCC) for the proposed Project site is obtained.</p> <p>Furthermore, MEZ-III shall apply for the Environmental Clearance Certificate (ECC) in the requisite manner along with prescribed documents.</p>

Summary of Applicable legislation/ Policy	Agency Responsible	Applicable Permit and Requirements
<p>Environmental Clearance Certificate (ECC) from the Director General of DoE.</p> <ul style="list-style-type: none"> • Publication of environmental guidelines related to environmental pollution control and mitigation, conservation and improvement of the environment. • Prescription of rules for implementing the provisions of the Act. <p>The provisions under the ECR are summarized as follows: The industries for the purpose of obtaining ECC have been classified into the following 4 categories based on their site and impact on the environment:</p> <ul style="list-style-type: none"> • Green • Orange –A • Orange – B • Red <p>The list of industries falling under each category has been annexed in the Schedule – I to the ECR.</p> <ul style="list-style-type: none"> • For proposed industries falling under the Orange-A & B and Red categories, a Location Clearance Certificate (LCC) needs to be obtained from DoE prior to the issuance of ECC. • The Project entrepreneur shall apply for ECC in prescribed form along with prescribed documents and application fees. • ECC (for Red category) will be valid for 1 year from the issuance date and shall be renewed at least 30 days prior to expiry. • Various environmental quality standards pertaining to air, water, sound, odor etc. have been laid down in the schedules attached to the Act. • Emissions and waste discharge standards have been laid down in Schedules 9-11. <p>The person in charge of facility/unit shall notify the Director General, DoE in case of pollutant emission/ discharge in excess of prescribed standards or where there is a possibility of the same.</p>		<p>The EIA to be submitted along with ECC application shall be as per the TOR provided by the DoE.</p> <p>BEZA shall ensure that pollutant emissions/discharges from various sources etc. during Project activities are well within the standards prescribed in the Schedules 2-12 of the ECR 1997. Some of the standards have been revised by the DoE viz.</p> <ul style="list-style-type: none"> • Ambient Air Quality standard • Vehicular Emission standards • Ambient Noise Standards <p><i>The various applicable standards have been provided in subsequent sections. Compliance to such standards shall be ensured by BEZA.</i></p>
<p>National Industrial Policy, 2010 The policy aims to ensure the industrialization process is compliant with internationally agreed environment, health, and safety and labor standards.</p> <p>The government will ensure assistance for creating alternative employment, keeping the socio-economic backdrop in mind, for any privatization proposal.</p>	Ministries of Industries	BEZA shall ensure that the proposed Project is registered as prescribed by the Act.

Summary of Applicable legislation/ Policy	Agency Responsible	Applicable Permit and Requirements
<p>Investment Board Act (1989) Board of Investment, established under this act, is the principal private investment promotion and facilitation agency of Bangladesh which is responsible for implementation of provisions of above said policy. Under the provision of this act as per Schedule 11, All industries established in non-governmental sectors licensed by the Board shall be registered in the prescribed manner. As per Schedule 15 of this act, any industrial undertaking licensed transgresses any provision of this Act or of any rule made there under or breaks any condition relating to the license, the Board may, in such manner as may be prescribed, cancel the license of the industrial undertaking.</p>	<p>Board of Investment (BOI), Bangladesh</p>	<p>BEZA shall ensure that the proposed Project is registered as prescribed by the Act.</p>
<p>National Water Policy, 1999 Endorsed by the GoB in 1999, the National Water Policy (NWP) aims to provide guidance to the major players in water sector for ensuring optimal development and management of water. According to the policy, all agencies and departments entrusted with water resource management responsibilities (regulation, planning, construction, operation, and maintenance) are required to enhance environmental amenities and ensure that environmental resources are protected and restored in executing their tasks. The policy has several clauses related to water resource development projects for ensuring environmental protection. Some of the relevant clauses are:</p> <ul style="list-style-type: none"> • Clause 4.5b: Planning and feasibility studies of all projects will follow the Guidelines for Project Assessment, the Guidelines for People's Participation (GPP), the Guidelines for Environmental Impact Assessment, and all other instructions that may be issued from time to time by the Government. • Clause 4.9b: Measures will be taken to minimize disruption to the natural aquatic environment in streams and water channels. • Clause 4.9e: Water development plans will not interrupt fish movement and will make adequate provisions in control structures for allowing fish migration and breeding. • Clause 4.10a: Water development projects should cause minimal disruption 	<p>Bangladesh Water Development Board (BWDB)</p>	<p>BEZA shall ensure compliance with this policy.</p>

Summary of Applicable legislation/ Policy	Agency Responsible	Applicable Permit and Requirements
<p>to navigation and, where necessary, adequate mitigation measures should be taken.</p> <ul style="list-style-type: none"> • Clause 4.12a: Give full consideration to environmental protection, restoration and enhancement measures consistent with National Environmental Management Action Plan (NEMAP) and the National Water Management Plan (NWMP). • Clause 4.12b: Adhere to a formal environment impact assessment (EIA) process, as set out in EIA guidelines and manuals for water sector projects, in each water resources development project or rehabilitation program of size and scope specified by the Government from time to time. • Clause 4.12c: Ensure adequate upland flow in water channels to preserve the coastal estuary ecosystem threatened by intrusion of salinity from the sea. • Clause 4.13b: Only those water related projects will be taken up for execution that will not interfere with aquatic characteristics of those water bodies. 		
<p>National Water Management Plan, 2001 (Approved in 2004)</p> <ul style="list-style-type: none"> • The objectives of the Plan are listed below: • To operationalize directives given in National Water Policy and to do in accordance with the Government approved Development Strategy. • To address issues related to harnessing and development of all forms of surface and ground water and management of these resources in an efficient and equitable manner. • Consultation and participation with the direct beneficiaries in the hand over and development of water schemes. 	<p>Water Resource Planning Organization (WARPO)</p>	<p>BEZA should ensure implementation of Flood Protection program with provision of embankment of adjacent Kohelia River and Bay of Bengal.</p>
<p>Bangladesh Water Act, 2013 The key features of the Act are:</p> <ul style="list-style-type: none"> • A National Water Resources Council (NWRC) to be established for implementing the provisions of the Act • A National Water Policy shall be adopted by the Council addressing the following issues: <ul style="list-style-type: none"> a) Purpose and sectors of water use b) Affordability of water users c) Actual cost of water abstraction and distribution 	<p>Water Resource Planning Organization (WARPO)</p>	<p>This Act was implemented in 2013 and the NWRC and Executive Committee are yet to be formulated. Upon formation of the aforementioned bodies, water stress areas and related provisions may be prescribed.</p> <p><i>BEZA shall ensure compliance with legal requirements under such provisions if applicable.</i></p>

Summary of Applicable legislation/ Policy	Agency Responsible	Applicable Permit and Requirements
<p>d) Financial ability and backwardness of water users of any group thereof e) Water demand and supply f) Any other issues considered relevant by GoB.</p> <ul style="list-style-type: none"> An Executive Committee of the Council shall be established or ensuring efficient performance of the Council. The GoB can declare certain areas as Water Stress Areas for the protection of water sources or aquifers. Water zone demarcation (industrial, agricultural, brackish water aquaculture and hatchery water zones) through gazette notification and issuance of protection order for efficient water management in such zones. Declaration of flood control zone and its management. Restriction on abstraction of total water from any water source. 		
<p>Ground Water Management Ordinance, 1985</p> <p>As per the provisions as per schedule 5 of this act, no tube well shall be installed in any place without a license granted by the Union Parishad.</p> <p>Also, no application shall be entertained by the Union Parishad unless it is accompanied by such fee as may be prescribed under the requirements of this ordinance.</p>	<p>Ministry of Environment and Forests, Bangladesh</p>	<p>BEZA should ensure that no tube-well shall be installed in any place without a license granted by the Union Parishad.</p> <p>BEZA should furnish the following information:</p> <ul style="list-style-type: none"> the aquifer condition of the soil where the tube-well is to be installed; The distance of the nearest existing tube-well; The area likely to be benefited by the tube-well; The likely effect on the existing tube-wells including tube wells used for domestic purpose; The suitability of the site for installation of the tube-well; and The conditions on which a license, if any, may be granted.
<p>Coastal Zone Policy, 2005</p> <p>The Government has formulated the Coastal Zone Policy (CZP) that provides a general guidance to all concerned for the management and development of the coastal zone in a manner so that the coastal people are able to pursue their life and livelihoods within secure and conducive environment.</p> <p>The coast of Bangladesh is known as a zone of vulnerabilities as well as opportunities. It is prone to natural disasters like cyclone, storm</p>	<p>-</p>	<p>BEZA shall address some aspects of this Policy.</p>

Summary of Applicable legislation/ Policy	Agency Responsible	Applicable Permit and Requirements
<p>surge and flood. In this regard, for reducing risk, the policy emphasizes the improvement of coastal polders and seeks to enhance safety measures by combining cyclone shelters, multi-purpose embankments, road system and disaster warning system.</p>		
<p>Coastal Development Strategy, 2006 The Coastal Development Strategy (CDS) focuses on the implementation of the coastal zone policy. The CDS was approved at the second meeting of the Inter-Ministerial Steering Committee on ICZMP held on 13 February 2006. Nine strategic priorities, evolved through a consultation process, guide interventions and investments in the coastal zone:</p> <ul style="list-style-type: none"> • Ensuring fresh and safe water availability • Safety from man-made and natural hazards • Optimizing use of coastal lands • Promoting economic growth emphasizing non-farm rural employment • Sustainable management of natural resources: exploiting untapped and less explored opportunities • Improving livelihood conditions of people especially women • Environmental conservation • Empowerment through knowledge management • Creating an enabling institutional environment. 		<p>The proposed project in line with this strategy and shall support most of the listed priorities.</p>
<p>The National Fisheries Policy, 1999 The objectives of the fisheries policy are:</p> <ul style="list-style-type: none"> • Enhancement of the fisheries production; • Poverty alleviation through creation of self-employment and improvement of socio-economic conditions of the fishermen; • Fulfilling the demand for animal protein; • Achieve economic growth through earning foreign currency by exporting fish and fisheries products; and • Maintain ecological balance, conserve biodiversity, ensure public health and provide recreational facilities. <p>The policy broadly aims at fisheries development, regulation of aquaculture, biodiversity conservation and formulation of laws to ban the disposal of any untreated industrial effluents into the water bodies.</p>	<p>Ministry of Fisheries and Livestock (MoFL)</p> <p>Department of Fisheries (DoF)</p>	<p>BEZA shall ensure that during Project operation, no untreated effluent is disposed into the river. The treated effluent shall also meet the standards stipulated under the ECR.</p>
<p>Protection and Conservation of Fish Act, 1950 as amended through February 16, 1995</p>	<p>Ministry of Environment</p>	<p>BEZA shall ensure compliance with provisions mandated under this Act.</p>

Summary of Applicable legislation/ Policy	Agency Responsible	Applicable Permit and Requirements
This Act was promulgated for conservation of fish in Bangladesh and their protection against indiscriminate fishing, poisoning due to industrial effluent disposal into the water, oil spills, etc.	and Forests, Bangladesh Department of Fisheries	
Protection and Conservation of Fish Rules, 1985 The Rules were prescribed under the provisions of Protection and Conservation of Fish Act. It provides the regulations for prohibition of fishing during certain periods, licenses for catching fishes, prevention of fish destruction due to explosives and industrial effluent disposal etc.	Ministry of Environment and Forests, Bangladesh Department of Fisheries	BEZA shall ensure that untreated effluent is not disposed into the river. The treated effluent shall comply with the discharge standards stipulated under the ECR.
National Agriculture Policy, 1999 The overall objective of the National Agriculture Policy is to make the nation self-sufficient in food through increasing production of all crops including cereals and ensure a dependable food security system for all. Although the policy does not emphasize the coastal zone separately, all specific objectives are applicable to the development of coastal zone agriculture. The policy particularly stressed on minor irrigation capturing tidal water in reservoirs in coastal areas and research on the development of improved varieties and technologies for cultivation in coastal, hilly, water-logged and salinity affected areas. The policy also recognizes that adequate measures should be taken to reduce water-logging, salinity and provide irrigation facilities for crop production.	-	The proposed project is expected to contribute to achieve the objectives of the agriculture policy.
National Land Use Policy (MoL, 2001) The National Land Use Policy (NLUP), enacted in 2001, aims at managing land use effectively to support trends in accelerated urbanization, industrialization and diversification of development activities. The NLUP urges that increasing the land area of the country may be not possible through artificial land reclamation process, which is cost-effective only in the long run. Therefore, land use planning should be based on the existing and available land resources. The policy suggests establishing land data banks where, among others, information on accreted riverine and coastal chars will be maintained. Among the 28 policy statements of NLUP, the following are relevant to coastal area: <ul style="list-style-type: none"> • Forests declared by the Ministry of Environment and Forests will remain as forest lands; 		The proposed MEZ-III will be designed in accordance with this Strategy and will comply with the mentioned requirements.

Summary of Applicable legislation/ Policy	Agency Responsible	Applicable Permit and Requirements
<ul style="list-style-type: none"> • Reclassification of forest lands will be prevented; and • Effective green belts will be created all along the coast. 		
<p>National Livestock Development Policy, 2007 The National Livestock Development Policy (NLDP) has been prepared to address the key challenges and opportunity for a comprehensive sustainable development of the livestock sub-sector by creating an enabling policy framework. Among 60 or more policy statements, the following two policy statements address the coastal zone:</p> <ul style="list-style-type: none"> • Specific areas will be identified to implement programs for fattening of cattle and livestock. For this purpose, the Chittagong Hill Tracts, the coastal areas and the islands will be included under the fattening of livestock and cattle program. • Special programs will be taken up for the production of grass in the Chittagong Hill-tracts and the coastal areas. 	-	As livestock is one of the key assets in coastal livelihoods, and protection of livestock from cyclones and tidal surges should be emphasized along with security of human life. The proposed MEZ-III interventions will contribute to the safety of livestock and thus increase livestock productivity in coastal areas.
<p>Standing Orders on Disaster, 2010 The Standing Orders on Disaster is designed to enhance capacity at all tiers of government administrative and social structures for coping with and recovering from disasters. The document contains guidelines for construction, management, maintenance and use of cyclone shelter center. Accordingly, to the guideline, geographical information system (GIS) technology will be applied at the planning stage to select the location of cyclone shelter considering habitation, communication facilities, and distance from the nearest cyclone center. The advice of the concerned District Committee is to be obtained before final decision. The cyclone shelters should have easier communication facilities so that in times of distress delay does not occur to go there. For this reason, the road communication from the cyclone shelters should not only link up with city or main road but also with neighboring village areas. Provision of emergency water, food and sanitation and shelter space for livestock during period should also be kept in view for future construction of shelters.</p>	-	BEZA will provide better communication facilities in the coastal areas, which is crucial for emergency response to disasters.
<p>National Adaptation Program of Action (NAPA) In 2005, the Ministry of Environment and Forest (MOEF), Government of the People’s Republic of Bangladesh has prepared the</p>	-	The proposed project will broadly contribute toward achieving the aims and objectives of the climate change adaptation strategies.

Summary of Applicable legislation/ Policy	Agency Responsible	Applicable Permit and Requirements
<p>National Adaptation Program of Action (NAPA) for Bangladesh, as a response to the decision of the Seventh Session of the Conference of the Parties (COP7) of the United Nations Framework Convention on Climate Change (UNFCCC). The basic approach to NAPA preparation was along with the sustainable development goals and objectives of the country where it has recognized the necessity of addressing climate change and environmental issue and natural resource management. The NAPA is the beginning of a long journey to address adverse impacts of climate change including variability and extreme events and to promote sustainable development of the country. There are 15 adaptation strategies suggested to address adverse effects of climate change. Among the 15 adaptation strategies the following strategies address the coastal region for reducing climate change induced vulnerability.</p> <ul style="list-style-type: none"> • Reduction of climate change hazards through coastal afforestation with community participation. • Providing drinking water to coastal communities to combat enhanced salinity due to sea level rise. • Construction of flood shelter, and information and assistance centre to cope with enhanced recurrent floods in major floodplains • Promotion of research on drought, flood and saline tolerant varieties of crops to facilitate adaptation in future. • Promoting adaptation to coastal crop agriculture to combat increased salinity. • Promoting adaptation to coastal fisheries through culture of salt tolerant fish special in coastal areas of Bangladesh. 		
<p>Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2009</p> <p>The Government of Bangladesh has prepared the Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2009. The BCCSAP is built on six pillars: (i) food security, social safety and health; (ii) comprehensive disaster management; (iii) infrastructure; (iv) research and knowledge management; (v) mitigation and low carbon development; and (vi) capacity building. Five programs have been suggested related to improvement of the water management infrastructures in coastal areas</p>	-	<p>The proposed project with compliance within action plan.</p>

Summary of Applicable legislation/ Policy	Agency Responsible	Applicable Permit and Requirements
of Bangladesh under pillar 3 (Infrastructure) of BCCSAP, including: <ul style="list-style-type: none"> • Repair and maintenance of existing flood embankments • Repair and maintenance of existing coastal polders • Improvement of urban drainage • Planning, design and construction of river training works • Planning, design and implementation of resuscitation of the network of rivers and khals through dredging and de-siltation work. 		
The Building and Construction Act, 1952 <ul style="list-style-type: none"> • As per Section 3A of this act, no owner or occupier of a building shall, without obtaining previous permission from the Authorized Officer or the Committee uses the building for the purpose other than that mentioned in the sanction. • All the construction, re-construction works to be undertaken as per terms or conditions prescribed. 	Authorized Officer or Committee	BEZA shall ensure that no building or tank shall be constructed without prior permission from the Authorized Officer or Committee of the area.
The Vehicle Act, 1927 <ul style="list-style-type: none"> • As per section 4 of this act, no owner or person in charge of a vehicle shall allow any person under the age of eighteen years to drive the same in any public place. • As per section 7, no person shall drive a vehicle in a public place unless he is licensed in the prescribed manner. • Every vehicle must possess a valid registration certificate as per section 11 of this act. 	Bangladesh Road Transport Authority	BEZA shall ensure that every vehicle possess a certification of registration as required under this act.
The Motor Vehicle Ordinance Act, 1983 (as modified on November, 1990) <ul style="list-style-type: none"> • As per section 3 of the ordinance, no person shall drive a motor vehicle in any public place unless he holds an effective driving license. • No person under the age of eighteen years shall drive a motor vehicle in any public place. 	Bangladesh Road Transport Authority	BEZA shall ensure that no person shall drive a motor vehicle in any public place unless he holds an effective driving license issued to himself authorizing him to drive the vehicle.
Fatal Accidents Act, 1855 This Act was promulgated to provide compensation to families for loss occasioned by the death of a person caused by actionable wrong. The company will be liable to pay compensation in case of death of any worker/employee or damages in case death has not ensued but such circumstances could have resulted in death.	Ministry of Labor and Employment	MEZ-III shall ensure compliance to the Rules.
Bangladesh Labor Act, 2006 (as amended through July 22, 2013).	Ministry of Labor and	BEZA shall ensure that all conditions provided in chapters V, VI, VII and VIII

Summary of Applicable legislation/ Policy	Agency Responsible	Applicable Permit and Requirements
<p>The provisions prescribed under chapters pertaining to occupational health and safety, and compensations due to accidents are entailed below.</p> <p>Chapter V: Health and Hygiene The chapter deals with provisions regarding cleanliness of the any facility, drinking water supply, ventilation, lighting, dust bean and spittoons, etc.</p> <p>Chapter VI: Safety This chapter addresses the issues regarding safety of building and machinery, precautions in case of fire, fencing of machinery, work on or near machinery in motion, hoists and lifts protection of eyes, explosive or inflammable dust/gas, etc.</p> <p>Chapter VII: Special Provisions related to Health, Hygiene and Safety This chapter deals with provisions to be taken in case of hazardous operations, notice to be given in accidents, notice of certain dangerous occurrences and diseases etc.</p> <p>Chapter VIII: Welfare This chapter prescribes the provisions to be facilitated in the facility regarding first-aid appliances, safety record books, washing facilities, canteens, shelters, rooms for children, etc.</p> <p>This Act consolidates and amends the laws relating to employment of labor, relations between workers and employers, determination of minimum wages, payment of wages and compensation for injuries to workers, formation of trade unions, raising and settlement of industrial disputes, health, safety, welfare and working conditions of workers, apprenticeship and matters connected therewith.</p> <p>The provisions prescribed under chapters pertaining to labor benefits and entitlements are as follows:</p> <ul style="list-style-type: none"> • Conditions of Service and Employment • Employment of Adolescent • Maternity Benefit • Working Hours and Leave • Wages and Payment • Workmen’s Compensation for Injury by Accidents • Trade Unions and Industrial Relations 	<p>Employment</p>	<p>of the Act, pertaining to Health, hygiene safety and welfare are met in accordance with the amended act.</p> <p>During the construction and operation phases of the proposed Project, BEZA shall ensure the facilitation of the following provisions:</p> <ul style="list-style-type: none"> • Management of workers under service rules as approved by the Chief Inspector. • Provision of Letter of Appointment and ID card (with photograph) for each and every worker. • Maintenance of Service Book with the requisite details. • Retrenchment Policy and conditions of re-employment of retrenched workers, termination of employment etc. • Provisions regarding gratuity, provident fund and other payments at the time of retirement of workers. • Any adolescent employed in any dangerous operation shall be in possession of Certificate of Fitness issued by a registered medical practitioner. • Maternity benefits shall be paid as stipulated in the Act. • Cleanliness of the facility through washing, painting and varnishing etc. for ensuring hygiene. • Ventilation and removal dusts and fumes through adequate number of exhaust systems. • Adequate number of drinking water facilities equipped with cooling systems at convenient places in the unit. Al such places shall be legibly marked ‘Drinking water’ in Bangla. • Separate and adequate number of latrines and urinals for men and women. They shall be maintained in a clean and sanitary condition at all times with suitable detergents and disinfectants. • Leave Policy stating the working hours and the number of leaves

Summary of Applicable legislation/ Policy	Agency Responsible	Applicable Permit and Requirements
		<p>the workers are entitled to under the provisions of the Act.</p> <ul style="list-style-type: none"> • Compensation/wages shall be stated in the Letter of Appointment given to the workers/employees. • MEZ-III shall ensure that there is no policy restricting the association of workers'/trade unions. • Workmen's Compensation Policy stating the compensation to be meted out in case of injury due to accidents. <p>Safety of EZ workers engaged in loading and unloading of industries as per prescribed provisions.</p>
<p>Bangladesh Factories Act, 1965 As per section 6 of the Act, the occupier shall furnish some information to Chief Inspector at least fifteen days before he begins to occupy or use any premises as a factory. As per Section 8, the plans and specifications must be approved by Chief Inspector. Provisions for cleanliness, disposal of effluents, ventilation, lightning, latrines and urinals have been described in Chapter II of the Act. Chapter IV and V prescribe provisions for safety and welfare of the workers.</p>	<p>Chief Inspector of the Area</p>	<p>BEZA shall ensure that approval for plan and specifications has been procured from Chief Inspector of area.</p> <p>BEZA ensures that provisions as prescribed in chapters II, III and IV are complied with.</p>
<p>National Child Labor Elimination Policy, 2010 The National Child Labor Elimination Policy 2010 has been adopted to provide a framework towards eradicating all forms of child labor by 2015. The policy defines and lays guidelines for underage workers, regulation of their working hours, wages, nutrition needs, mental health, education and overall work environment. As per the policy, a child is a person under the age of 14. A person between the ages of 14 and 18 is an adolescent, and should be granted special amendments, if compelled to work due to poor economic status. The policy also entails that a child may not be employed as a regular employee, not be made to work in hazardous settings, provided breaks more frequent than those for regular employees and have enough time left for study.</p>	<p>Ministry of Labor and Employment Ministry of Women and Child Welfare</p>	<p>During all stages concerning employment of labor, BEZA should take the policy as a guidance document for following ethical practices at workplace, in dealing with adolescent workers, if at all.</p>
<p>Children's Act, 2013 (Act No. 24 of 2013). The Act implements the Nation's ratification to the UN Convention on the Rights of the Child (CRC), and replaces The Children's Act of 1974. The main components of the act are as follows:</p>	<p>Ministry of Law, Justice and Parliamentary Affairs.</p>	<p>BEZA must ensure that at through all stages of construction and operation, no juvenile (children between ages 14 and 18) are engaged on site.</p>

Summary of Applicable legislation/ Policy	Agency Responsible	Applicable Permit and Requirements
<ul style="list-style-type: none"> The Act changes the legal definition of a child from being a person under the age of 14 to one under the age of 18. It enforces the national authorities to establish Child Welfare Boards in each district, besides one at the national level. It criminalizes any kind of cruelty inflicted on children while they are working in both the formal and informal sectors. The Act further prescribes stricter punishments for using or exploiting children in begging, in brothels, and in carrying drugs, arms, or other illegal commodities. 	District commissioner's Office.	
<p>The Acquisition and Requisition of Immovable Property Ordinance, 1982</p> <p>The ordinance consolidates and amends the laws relating to acquisition and requisition of immovable property by the government. It lays down the procedures and conditions for acquisition of land and other immovable properties such as common property resources (wells, places of worship, burial grounds, etc.).</p> <p>As per Section 8 of this ordinance, the amount of compensation to be determined taking into consideration market value and decision of Deputy Commissioner.</p>	Ministry of Land, Bangladesh	<p>There is total 1270.12 acres of land comprising Khash and private land. BEZA shall acquire the land on a willing buyer – willing seller basis through land acquisition process.</p> <p>BEZA shall ensure the compliance with provisions of this ordinance relating to compensation.</p>
<p>The Bangladesh Inland Water Transport Corporation Order, 1972 (President's Order)</p> <p>This ordinance has been established for the provision of a Corporation for the purpose of operation, promotion and development of coastal and inland shipping and water transport services.</p>	Bangladesh Inland Water Transportation Authority (BITWA)	BEZA should ensure the compliance with provisions of the orders.
<p>The Civil Aviation Authority Ordinance, 1985</p> <p>As per section 11 of the ordinance, only Civil Aviation Authority have control over:</p> <ul style="list-style-type: none"> All the civil airports and aerodromes in Bangladesh including their planning, construction, operation and maintenance; All air routes in Bangladesh; Air space management of civil airports and aerodromes. 	Civil Aviation Authority, Bangladesh	BEZA shall ensure compliance with rules made under this ordinance.

The key permits required to be obtained by BEZA for the construction and operations of the proposed Economic Zone are set out in Table 7.

Table 7: Key permits required to be obtained by MEZ-III

Permit	Permitting Authority	Relevant Legislation	Role of Permit
Permission for Construction of a Building	Authorized Officer or Committee	The Building and Construction Act, 1952	Authorization to construct the proposed Project

Permit	Permitting Authority	Relevant Legislation	Role of Permit
(construction of buildings)			
Location Clearance Certificate (foreestablishing the Project)	Director General, DoE	Environment Conservation Rules, 1997	Authorization to construct the proposed Project
Environmental Clearance Certificate	DoE, Bangladesh	Environment Conservation Rules, 1997	Authorization to set up the plant with limited environmental effects of development and operation of the proposed Project.
Permit for establishment of Economic Zone	Bangladesh Economic Zones Authority (BEZA)	Bangladesh Economic Zones Act, 2010	Permit from BEZA itself to be procured for erection of Zone
Installation of a tube - well	Ministry of Environment and Forests, Bangladesh Union/ Upazila Parishad	Ground Water Management Ordinance 1985	Installation of tube in any place
No Objection Certificate from Union Parishad	Union/ Upazila Parishad	Environment Conservation Rules, 1997	A consent in form of NOC from respective Union Parishad
Approval of Plans and registration of the proposed Project	Chief Inspector	The Factories Act, 1965	Approval of plans and specifications of the Project

3.4 World Bank's Operational Policies and Guidelines

The World Bank follows an operational policy statement (updated in February, 2011), which stipulates that all operations are carried out in an environmentally responsible manner and that projects must comply with all local environment legal obligations and appropriate World Bank guidelines³. The World Bank sets out its procedures and policies with regard to conducting environmental assessments on Operational Policy 4.1: Environmental Assessment (October, 1991) and its updates and other pertinent Guidelines.

3.4.1 Applicability

World Bank Environmental and Social Safeguard Policies provide ten (10) potential issues that may need to be considered in an EIA, depending on the specific characteristics of each project. Table 8 summarizes the expected applicability of the potential Safeguard Policies for MEZ-III.

Table 8: Potential World Bank environmental safeguard policies and applicability to project

Safeguard Policy	Requirement	Policy Triggered	Applicability/ Compliance
Environment Assessment (OP 4.1)	The Bank requires environmental assessment (EA) of projects proposed for Bank financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making.	Yes	This policy applies to all projects requiring a Category (A) Environmental Assessment under OP 4.1. All environmental and social aspects included in the proposed Project are adequately examined. The Project is likely to have significant potential adverse environmental risks

³ http://www.ifc.org/wps/wcm/connect/4754bd004b812242b7e9ff1a9cb3fd3c/SectorSpecificEHSGuidelines_Applicability.pdf?MOD=AJPERES

Safeguard Policy	Requirement	Policy Triggered	Applicability/ Compliance
			& impacts in its area of influence regarding the natural environment, water, land, human health and safety.
Natural Habitats (OP 4.4)	The Bank requires borrowers to incorporate into their development and environmental strategies analyses of any major natural habitat issues, including identification of important natural habitat sites, the ecological functions they perform, the degree of threat to the sites, priorities for conservation, and associated recurrent-funding and capacity-building needs.	Yes	Ecological study including floral and faunal diversity has been conducted in chapter 5.
Pest Management (OP 4.9)	In appraising a project that will involve pest management, the Bank assesses the capacity of the country's regulatory framework and institutions to promote and support safe, effective, and environmentally sound pest management. As necessary, the Bank and the borrower incorporate in the Project components to strengthen such capacity.	No	Project proponent will ensure that the requirements of the operational policy will be adhered to during procurement of pesticides for the project.
Involuntary Resettlement (OP 4.12)	World Bank recognizes that Involuntary resettlement may cause severe long-term hardship, impoverishment, and environmental damage unless appropriate measures are carefully planned and carried out.	No	The land required for the project has been purchased through negotiated settlements on 'willing buyer-willing seller' through compensation for land acquisition basis between landowners and BEZA. As the land purchase was registered with the land registrar of the locality and the sale deed requires a witness of a local person from the area, the land purchase process has reportedly been transparent.
Indigenes People (OP 4.10)	The Bank recognizes that the identities and cultures of indigenous peoples are inextricably linked to the lands on which they live and the natural resources on which they depend. Hence, A Project proposed for Bank financing must be screened for presence of indigenous people.	No	Census records and public consultations indicate that there are no indigenous populations in the study area.
Forests (OP 4.36)	If a project involves significant conversion or degradation of natural forests or related natural habitats that the Bank determines are not critical, and the Bank determines that there are no feasible alternatives to the Project and its siting, and comprehensive analysis demonstrates that overall	No	The proposed project does not comprise any kind of forest land. But have few mangrove forest on the bank of char.

Safeguard Policy	Requirement	Policy Triggered	Applicability/ Compliance
	benefits from the Project substantially Outweigh the environmental costs; the Bank may finance the Project provided that it incorporates appropriate mitigation measures.		
Physical Cultural Resources (OP 4.11)	The borrower needs to address impacts on physical cultural resources in projects proposed for Bank financing, as an integral part of the environmental assessment (EA) process.	No	No such tangible forms of cultural heritage or objects were found within the Project area.
Safety of Dams (OP 4.37)	When the Bank finances a project that includes the construction of a new dam, it requires that the dam be designed and its construction supervised by experienced and competent professionals.	No	The Project involves the construction and repair of embankment.
Project in Disputed Areas (OP 7.60)	Projects in Disputed Areas may affect the relations between the Bank and its borrowers, and between the claimants to the disputed area. Therefore, the Bank will only finance projects in disputed areas when either there is no objection from the other claimant to the disputed area, or when the special circumstances of the case support Bank financing, notwithstanding the objection.	No	The proposed Project is not situated in a disputed area. Any component likely to be financed as part of the project is not situated in a disputed area.
Projects on International Waterways (OP 7.50)	The Bank recognizes that the cooperation and goodwill of riparian is essential for the efficient use and protection of the waterway. Therefore, it attaches great importance to riparian's making appropriate agreements or arrangements for these purposes for the entire waterway or any part thereof.	No	The adjacent Kohelia River is not recognized as a national and/or international waterway. Also, there is no water abstraction issue in this Project. However, west part of the zone (sea side) can be considered as waterways for navigation of large vessels.

3.4.2 Categorization of Projects

The Bank screens the Private Sector Activity in order to determine the nature and extent of the environmental and social assessment needed, based on the type, location, sensitivity, and scale of the activity, as well as the nature and magnitude of its potential impacts. This screening also identifies any additional information required to complete the Bank's environmental and social review and determine whether to support the activity. The Private Sector Activity is categorized by the Bank as Category A, B, C, depending on the nature of the activity and financing mechanism, as follows:

Table 9: World Bank's categorization for projects

Category	Justification
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Category A	Business activities with potential significant adverse environmental or social risks and/or impacts that are diverse, irreversible, or unprecedented;
Category B	Business activities with potential limited adverse environmental or social risks and/or impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures;
Category C	Business activities with minimal or no adverse environmental or social risks and/or impacts;
Category FI	Business activities that involve investment of Bank funds through a financial intermediary, in sub Projects that may result in adverse environmental impacts.

Box 1: Applicability for World Bank Project Categorization

Since the proposed Project is an Economic Zone aimed to establish different export oriented industries which will have impacts both in its construction and operation phase, the project is classified as a Category A Project as per the Bank's categorization system. As per the information requirements, the applicant i.e., BEZA is required to submit the following documents along with the financing application:

- ◆ *EIA report is to be prepared which will examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without Project" situation), and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.*
- ◆ *Public consultations with Project-affected groups and local non-governmental organizations (NGOs) about the Project's environmental aspects is to be undertaken at least twice; once during preparation of the Terms of Reference (ToR) for the EIA (Scoping), and also after the draft EIA has been prepared.*
- ◆ *The draft EA report is to be made available at a public place accessible to Project-affected groups and local NGOs.*
- ◆ *EMP and/or Action Plans demonstrating the set of mitigation, monitoring, and institutional measures to be taken during implementation and operation to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels.*

3.4.3 Applicability of IFC Performance Standards

The IFC Performance Standards stipulates that any proposed project shall meet the following requirements throughout the life of an investment by IFC or other relevant financial institution:

- Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts;
- Performance Standard 2: Labour and Working Conditions;
- Performance Standard 3: Resource Efficiency and Pollution Prevention;
- Performance Standard 4: Community Health, Safety, and Security;
- Performance Standard 5: Land Acquisition and Involuntary Resettlement;
- Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources;
- Performance Standard 7: Indigenous Peoples; and
- Performance Standard 8: Cultural Heritage

These performance standards and guidelines provide ways and means to identify impacts and affected stakeholders and lay down processes for management and mitigation of adverse impacts.

Performance Standard (PS) 1: Assessment and Management of Environmental and Social Risks and Impacts

PS 1 establishes the importance of:

- Integrated assessment to identify the environmental and social impacts, risks, and opportunities of Projects;
- Effective community engagement through disclosure of project-related information and consultation with local communities on matters that directly affect them; and

- The Project Proponent's management of environmental and social performance throughout the life of the Project;
- PS 1 is applicable to all Projects and associated facilities having environmental and/or social risks and/or impacts. Some of the key environmental and social impacts that the proposed Project can be associated with:
 - Disposal of Dredged material (particularly if the sediments are contaminated and accumulation of hazardous materials);
 - Air emissions in terms of ship's propulsion, engines, fuel storage and transfer (release of SO₂, NO_x and Volatile Organic Compounds);
 - Emission of dust from dry bulk material storage and handling facilities;
 - Discharge of various type of effluents into river-sewage from ship operations, bilge water, vessel cleaning water.
 - Management of solid waste generating from ship activities and hazardous material;
 - Land acquisition and possible resettlement of local population; and
 - Loss of livelihood of local population due to Project operations etc.

Box 2: Applicability to PS1

PS 1 is applicable for the Project and an Environmental and Social Impact Assessment (EIA) study needs to be conducted prior to the commencement of the Project. BEZA also needs to develop and implement an Environmental and Social Management System (ESMS) to manage the identified risks associated with its operations during construction and operation phase of the Project.

Performance Standard 2: Labour and Working Conditions

PS 2 recognizes that the pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers. The objectives of the PS 2 are:

- To promote the fair treatment, non-discrimination, and equal opportunity of workers;
- To establish, maintain, and improve the worker-management relationship;
- To promote compliance with national employment and labor laws;
- To protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the client's supply chain;
- To promote safe and healthy working conditions, and the health of workers; and
- To avoid the use of forced labor.

The applicability of PS 2 will be more important during the construction phase as operation phase will have lesser number of staff. This PS covers not only the main plant employees, but all employees/workers, even indirect workers working through contractors. Migrant workers will be engaged for the Project and they will be provided accommodation in labour camps. Hence, standards pertaining to campsites will be applicable.

Box 3: Applicability to PS2

PS 2 are applicable to the Project and BEZA shall ensure provision of adequate facilities such as access to clean water, sanitary facilities and other necessary facilities at the construction sites. BEZA shall ensure measures to prevent child labor, forced labor, and discrimination are strictly implemented. Freedom of association and collective bargaining shall be provided. Wages, work hours and other benefits shall be regulated as per the national labor and employment laws.

Performance Standard 3: Resource Efficiency and Pollution Prevention

The PS 3 outlines approach to pollution prevention and abatement in line with internationally disseminated technologies and practices with the following objectives:

- Avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from activities; and
- Promote the reduction of emissions that contribute to climate change.

Box 4: Applicability to PS3

The impacts and risks associated with the generation, use, storage, release, and/or disposal of pollutants has been assessed as part of this EIA. MEZ-III shall ensure implementation of the mitigation measures provided in the ESMP. MEZ-III shall also ensure that pollution control measures are planned and implemented right from the Project conception stage. Practices like minimal release of waste/emissions, safe disposal of waste, waste water management etc. shall be considered prior to each project phase. PS 3 is therefore applicable for the proposed Project.

Performance Standard 4: Community Health, Safety and Security

PS 4 recognizes that Project activities, equipment, and infrastructure can increase community exposure to risks and impacts. Its main stress is to ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities.

Box 5: Applicability to PS4

The Applicability of this PS has been extended to construction as well as operational phases of the Project. It will be associated with unloading and loading of activities of different industries, movement of vehicles, noise generation, etc. Community health and safety consideration related to the Project has been addressed while assessing the environmental and social risks and impacts. Security staff will be engaged from local community whereas labor engaged will be both local as well as migrant. A stakeholder engagement process has been formulated as a part of community engagement requirements consistent with the requirements of PS 1 including the informed consultation and participation process of Affected Communities. It will also include dissemination of information pertaining to security arrangements to workers and community. Also, MEZ-III will construct and operate the structural elements of the Project in accordance with GIIP taking into consideration safety risks to the affected community.

Performance Standard 5: Land Acquisition and Involuntary Resettlement

PS 5 recognizes that Project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land. Its main aim is to anticipate and avoid, or where avoidance is not possible, minimize adverse social and economic impacts from land acquisition or restrictions on land use by providing compensation for loss of assets at replacement cost and ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of affected persons and community.

Box 6: Applicability to PS5

A portion of land required for the Project has been purchased through negotiated settlements between landowners and BEZA's land procurement representatives. The procured lands will be reclaimed after filling it up by Sea sand. The land procurement has not resulted in loss of livelihood of the landowners since the land was not being used for any economic activities by the villagers prior to sale (as the land was treated as non-agricultural barren land). There has also not been any physical displacement or resettlement as none of the procured lands were inhabited. Thus PS 5 will not be applicable.

Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

PS6 recognizes that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable

development. This standard is aimed to promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.

Box 7: Applicability to PS6

The proposed Project will involve discharge of various type of wastewater generating from the production activities of different industries like sewage, effluent chemical water etc. This poses risk to aquatic species (especially fishes) present in adjacent River and Sea.

BEZA shall ensure that the discharge of waste water will be undertaken only after suitable treatment of the waste and the limit of the parameters have to be within the standards prescribed by applicable national laws and international guidelines whichever of the two is more stringent. It shall ensure that indiscriminate fishing is prohibited in the Project area as mandated by the national laws. PS 6 will be applicable in addressing the aforementioned issues and managing the risks posed by such Project operations.

The details of this PS have been detailed out in the EIA study, while implementation of the actions necessary to meet the requirements of this PS shall be managed through the suggested mitigation measures. The operation phase of the proposed Project shall ensure protection of fauna and flora of the site and surroundings.

Performance Standard 7: Indigenous Peoples

PS 7 recognizes Indigenous Peoples as social groups with identities that are distinct from mainstream groups in national societies and are often among the most marginalized and vulnerable segments of the population. In many cases, their economic, social, and legal status limits their capacity to defend their rights to, and interests in, lands and natural and cultural resources, and may restrict their ability to participate in and benefit from development.

Box 8: Applicability to PS7

Census records and public consultations indicate that there are no Indigenous populations in the study area. Thus, PS 7 shall not be applicable to this Project.

Performance Standard 8: Cultural Heritage

PS 8 recognizes the importance of cultural heritage for current and future generations. Consistent with the Convention concerning the Protection of the World Cultural and Natural Heritage, this Performance Standard aims to ensure that clients protect cultural heritage in the course of their Project activities. In addition, the requirements of this Performance Standard on a Project's use of cultural heritage are based in part on standards set by the Convention on Biological Diversity.

Box 9: Applicability to PS8

This PS is applicable when tangible forms of cultural heritage, unique natural features or tangible objects that embody cultural values and certain instances of intangible forms of culture are impacted or are proposed to be used for commercial purposes. No such tangible forms of cultural heritage or objects were found in the Project area. Hence this PS is not applicable to the proposed Project.

3.5 Applicable World Bank Group EHS Guidelines

The Equator Principle III requires follow up of the environmental, health and safety requirements as per the following guidelines released by International Finance Cooperation (IFC) on 30th April, 2007. These guidelines ensure that the Projects are developed in a manner that is socially responsible and reflects sound environmental management practices. EHS considerations into the site selection and plant design processes should be considered in order to maximize the range of options available to prevent and control potential negative impacts.

1. Environmental, Health, and Safety General Guidelines;
2. Environmental, Health, and Safety Guidelines for Ports, Harbors and Terminals;
3. Environmental, Health, and Safety Guidelines for Shipping.

The key requirements stated in the EHS guidelines have been discussed in Table 10.

Table 10: Key requirements as per EHS guidelines of IFC

SN	Relevant Requirements as Stated in EHS Guidelines
1.	Air Emissions
A.	Combustion Sources
a)	Combustion sources are characterized by the release of air pollutants typically associated with the combustion of fossil fuels, such as nitrogen oxides (NO _x), sulfur dioxide (SO ₂), carbon monoxide (CO), and particulate matter (PM), as well as other air pollutants including certain volatile organic compounds (VOCs) and metals that may also be associated with a wide range of industrial activities.
b)	The stack height for all point sources of emissions, whether 'significant' or not, should be designed according to GIIP to avoid excessive ground level concentrations due to downwash, wakes, and eddy effects and to ensure reasonable diffusion to minimize impacts.
c)	Avoiding installation of firefighting or refrigeration systems contain chlorofluorocarbons (CFCs), in accordance with applicable phase-out requirements.
B.	Volatile Organic Compounds
a)	Substitution of less volatile substances, such as aqueous solvents;
b)	Collection of vapors through air extractors and subsequent treatment of gas stream by removing VOCs with control devices such as condensers or activated carbon absorption;
c)	Collection of vapors through air extractors and subsequent treatment with destructive control devices such as: <ul style="list-style-type: none"> • Catalytic Incinerators: Used to reduce VOCs from process exhaust gases exiting paint spray booths, ovens, and other process operations • Thermal Incinerators: Used to control VOC levels in a gas stream by passing the stream through a combustion chamber where the VOCs are burned in air at temperatures between 700^o C to 1,300^o C • Enclosed Oxidizing Flares: Used to convert VOCs into CO₂ and H₂O by way of direct combustion
d)	Use of floating roofs on storage tanks to reduce the opportunity for volatilization by eliminating the headspace present in conventional storage tanks
C.	Dust
a)	Use of dust control methods, such as covers, water suppression, or increased moisture content for open materials storage piles, or controls, including air extraction and treatment through a baghouse or cyclone for material handling sources, such as conveyors and bins;
b)	Use of water suppression for control of loose materials on paved or unpaved road surfaces. Oil and oil by-products is not a recommended method to control road dust. Examples of additional control options for unpaved roads.
2.	Wastewater
A.	Discharge to Surface Water
a)	Process wastewater treatment standards consistent with applicable Industry Sector EHS Guidelines. Projects for which there are no industry-specific guidelines should reference the effluent quality guidelines of an industry sector with suitably analogous processes and effluents;
b)	Compliance with national or local standards for sanitary wastewater discharges or, in their absence, the indicative guideline values applicable to sanitary wastewater discharges
c)	Temperature of wastewater prior to discharge does not result in an increase greater than 3°C of ambient temperature at the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use and assimilative capacity among other considerations.
B.	Discharge to Sanitary Sewer Systems
a)	Meet the pre-treatment and monitoring requirements of the sewer treatment system into which it discharges.
b)	Not interfere, directly or indirectly, with the operation and maintenance of the collection and treatment systems, or pose a risk to worker health and safety, or adversely impact characteristics of residuals from wastewater treatment operations.
c)	Be discharged into municipal or centralized wastewater treatment systems that have adequate capacity to meet local regulatory requirements for treatment of wastewater generated from the Project. Pre-treatment of wastewater to meet regulatory requirements before discharge from the

SN	Relevant Requirements as Stated in EHS Guidelines
	Project site is required if the municipal or centralized wastewater treatment system receiving wastewater from the Project does not have adequate capacity to maintain regulatory compliance.
C.	<i>Septic Systems</i>
a)	Properly designed and installed in accordance with local regulations and guidance to prevent any hazard to public health or contamination of land, surface or groundwater.
b)	Well maintained to allow effective operation.
c)	Installed in areas with sufficient soil percolation for the design wastewater loading rate.
d)	Installed in areas of stable soils that are nearly level, well drained, and permeable, with enough separation between the drain field and the groundwater table or other receiving waters
3.	<i>Wastewater Management</i>
A.	<i>Industrial Wastewater</i>
a)	The design and operation of the selected wastewater treatment technologies should avoid uncontrolled air emissions of volatile chemicals from wastewaters. Residuals from industrial wastewater treatment operations should be disposed in compliance with local regulatory requirements, in the absence of which disposal has to be consistent with protection of public health and safety, and conservation and long term sustainability of water and land resources.
B.	<i>Wastewater from Utilities Operations</i>
a)	Use of heat recovery methods (also energy efficiency improvements) or other cooling methods to reduce the temperature of heated water prior to discharge to ensure the discharge water temperature does not result in an increase greater than 3°C of ambient temperature at the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use, potential receptors and assimilative capacity among other considerations;
b)	Minimizing use of antifouling and corrosion inhibiting chemicals by ensuring appropriate depth of water intake and use of screens. Least hazardous alternatives should be used with regards to toxicity, biodegradability, bioavailability, and bioaccumulation potential. Dose applied should accord with local regulatory requirements and manufacturer recommendations;
c)	Testing for residual biocides and other pollutants of concern should be conducted to determine the need for dose adjustments or treatment of cooling water prior to discharge.
C.	<i>Storm water Management</i>
a)	Storm water should be separated from process and sanitary wastewater streams in order to reduce the volume of wastewater to be treated prior to discharge
b)	Surface runoff from process areas or potential sources of contamination should be prevented
c)	Where this approach is not practical, runoff from process and storage areas should be segregated from potentially less contaminated runoff
d)	Runoff from areas without potential sources of contamination should be minimized (e.g. by minimizing the area of impermeable surfaces) and the peak discharge rate should be reduced (e.g. by using vegetated swales and retention ponds);
e)	Where storm water treatment is deemed necessary to protect the quality of receiving water bodies, priority should be given to managing and treating the first flush of storm water runoff where the majority of potential contaminants tend to be present;
f)	When water quality criteria allow, storm water should be managed as a resource, either for groundwater recharge or for meeting water needs at the facility;
g)	Oil water separators and grease traps should be installed and maintained as appropriate at refuelling facilities, workshops, parking areas, fuel storage and containment areas
h)	Sludge from storm water catchments or collection and treatment systems may contain elevated levels of pollutants and should be disposed in compliance with local regulatory requirements, in the absence of which disposal has to be consistent with protection of public health and safety, and conservation and long term sustainability of water and land resources
D.	<i>Sanitary Wastewater</i>
a)	Segregation of wastewater streams to ensure compatibility with selected treatment option (e.g. septic system which can only accept domestic sewage);
b)	Segregation and pre-treatment of oil and grease containing effluents (e.g. use of a grease trap) prior to discharge into sewer systems;

SN	Relevant Requirements as Stated in EHS Guidelines
c)	If sewage from the industrial facility is to be discharged to surface water, treatment to meet national or local standards for sanitary wastewater discharges or, in their absence, the indicative guideline values applicable to sanitary wastewater discharges
d)	If sewage from the industrial facility is to be discharged to either a septic system, or where land is used as part of the treatment system, treatment to meet applicable national or local standards for sanitary wastewater discharges is required
e)	Sludge from sanitary wastewater treatment systems should be disposed in compliance with local regulatory requirements, in the absence of which disposal has to be consistent with protection of public health and safety, and conservation and long term sustainability of water and land resources.
4.	Water Conservation
A.	Process Water Reuse and Recycling
a)	<i>Washing Machines:</i> Many washing machines use large quantities of hot water. Use can increase as nozzles become enlarged due to repeated cleaning and /or wear. Monitor machine water use, compare with specification, and replace nozzles when water and heat use reach levels warranting such work
b)	<i>Water reuse:</i> Common water reuse applications include counter current rinsing, for example in multi-stage washing and rinsing processes, or reusing waste water from one process for another with less exacting water requirements. For example, using bleaching rinse water for textile washing, or bottle-washer rinse water for bottle crate washing, or even washing the floor. More sophisticated reuse Projects requiring treatment of water before reuse are also sometimes practical.
c)	<i>Water jets/sprays:</i> If processes use water jets or sprays (e.g. to keep conveyors clean or to cool product) review the accuracy of the spray pattern to prevent unnecessary water loss
d)	<i>Flow control optimization:</i> Industrial processes sometimes require the use of tanks, which are refilled to control losses. It is often possible to reduce the rate of water supply to such tanks, and sometimes to reduce tank levels to reduce spillage. If the process uses water cooling sprays, it may be possible to reduce flow while maintaining cooling performance. Testing can determine the optimum balance. <ul style="list-style-type: none"> o If hoses are used in cleaning, use flow controls to restrict wasteful water flow o Consider the use of high pressure, low volume cleaning systems rather than using large volumes of water sprayed from hosepipes o Using flow timers and limit switches to control water use o Using 'clean-up' practices rather than hosing down
B.	Water Cooling Systems
a)	Use of closed circuit cooling systems with cooling towers rather than once-through cooling systems;
b)	Limiting condenser or cooling tower blow down to the minimum required to prevent unacceptable accumulation of dissolved solids
c)	Use of air cooling rather than evaporative cooling, although this may increase electricity use in the cooling system
d)	Use of treated waste water for cooling towers
e)	Reusing/recycling cooling tower blow down
B.	Water Heating Systems
a)	Repair of steam and condensate leaks, and repair of all failed steam traps
b)	Return of condensate to the boiler house, and use of heat exchangers (with condensate return) rather than direct steam injection where process permits
c)	Flash steam recovery
d)	Minimizing boiler blow down consistent with maintaining acceptably low dissolved solids in boiler water. Use of reverse osmosis boiler feed water treatment substantially reduces the need for boiler blow down
e)	Minimizing desecrator heating
5.	Hazardous Materials Management
A.	General Hazardous Materials Management
a)	Use of dedicated fittings, pipes, and hoses specific to materials in tanks (e.g., all acids use one type of connection, all caustics use another), and maintaining procedures to prevent addition of hazardous materials to incorrect tanks
b)	Use of transfer equipment that is compatible and suitable for the characteristics of the materials transferred and designed to ensure safe transfer
c)	Regular inspection, maintenance and repair of fittings, pipes and hoses

SN	Relevant Requirements as Stated in EHS Guidelines
d)	Provision of secondary containment, drip trays or other overflow and drip containment measures, for hazardous materials containers at connection points or other possible overflow points.
B.	Management of Major Hazards
a)	Process Safety Information: Procedures should be prepared for each hazardous material and include: <ul style="list-style-type: none"> – Compilation of Material Safety Data Sheets (MSDS) – Identification of maximum intended inventories and safe upper/lower parameters – Documentation of equipment specifications and of codes and standards used to design, build and operate the process
b)	Operating Procedures: SOPs should be prepared for each step of all processes or operations within the Project (e.g., initial startup, normal operations, temporary operations, emergency shutdown, emergency operations, normal shutdown, and start-up following a normal or emergency shutdown or major change). These SOPs should include special considerations for Mazmats used in the process or operations (e.g. temperature control to prevent emissions of a volatile hazardous chemical; diversion of gaseous discharges of hazardous pollutants from the process to a temporary storage tank in case of emergency).
6.	Noise
a.	Sitting facilities with consideration of distances from the noise sources to the receptors (e.g., residential receptors, schools, hospitals, religious places) to the extent possible
b.	Use of noise control techniques such as: using acoustic machine enclosures; selecting structures according to their noise isolation effect to envelop the building; using mufflers or silencers in intake and exhaust channels; using sound-absorptive materials in walls and ceilings; using vibration isolators and flexible connections (e.g., helical steel springs and rubber elements);
c.	Identify and mark high noise areas and require that personal noise protecting gear is used all the time when working in such high noise areas (typically areas with noise levels >85 dBA).
d.	Noise monitoring may be carried out for the purposes of establishing the existing ambient noise levels in the area of the proposed or existing facility, or for verifying operational phase noise levels.
7.	Biodiversity
a.	Special consideration for areas of high biodiversity value or those required for the survival of critically endangered or endangered flora and fauna is to be given.
c.	Cleaning or repair of ballast tanks should be equipped with adequate reception facilities able to prevent the introduction of invasive species
8.	Occupational Health and Safety
<i>i.</i>	Physical Hazards
a.	Separation of people from vehicles and making vehicle passageways one-way, to the extent practical
b.	Constructing the areas to be: of adequate strength to support the heaviest expected loads; level, or with only a slight slope; free from holes, cracks, depressions, unnecessary curbs, or other raised objects; continuous; and skid resistant
d.	Avoiding placing cargo on, or allowing passage of vehicles over, any hatch cover that is not of adequate strength for that purpose
e.	Clearly marking (indicating its own weight) all lifting beams and frames, vacuum lifting, or magnetic lifting device and every other item of loose gear weighing more than 100 kilograms (kg)
f.	Inspecting disposable pallets and similar disposable devices before use and avoiding re-use of such disposable devices
g.	Equipping lifting appliances with means of emergency escape from the driver's cabin and a safe means for the removal of an injured or ill driver
h.	Risk of free fall of materials should be minimized by installing telescoping arm loaders and conveyors;
i.	Materials handling operations should follow a simple, linear layout to reduce the need for multiple transfer points
j.	Ensuring all seafarers is trained to manage the types of hazards applicable to their assigned responsibilities.

SN	Relevant Requirements as Stated in EHS Guidelines
k.	Regular inspection and maintenance of decks areas, including railings, catwalks, stairs, and other walking areas to prevent the existence of cracks, worn or missing parts, and other falling and tripping hazards
l.	Decks and gratings should be kept clear of grease, garbage, and ice to avoid risk of slipping, and any spillage should be cleaned up immediately
m.	Installation of guardrails with mid-rails and toe boards at the edge of any fall hazard area
n.	Use of fall prevention devices, including safety belt and lanyard travel limiting devices to prevent access to fall hazard area
ii.	Chemical Hazards
a.	Consider generation of ammonia on site from urea or use of aqueous ammonia in place of pure liquefied ammonia;
b.	Consider use of sodium hypochlorite in place of gaseous chlorine.
c.	Implementation of engineering and administrative control measures to avoid or minimize the release of hazardous substances into the work environment keeping the level of exposure below internationally established or recognized limits.
d.	Communicating chemical hazards to workers through labeling and marking according to national and internationally recognized requirements and standards.
e.	Training workers in the use of the available information (such as MSDSs), safe work practices, and appropriate use of PPE
f.	Implementation of smoking and naked light regulations during materials transfer activities and hot work permits during ship maintenance
g.	Proper tank cleaning and venting, and operation, maintenance and inspection of inert gas systems
h.	Be equipped with fire extinguishing devices and self-closing doors and constructed of materials made to withstand flame impingement for a moderate period of time.
i.	Workers who are required to handle corrosive, oxidizing, or reactive chemicals should be provided with specialized training and provided with, and wear, appropriate PPE (gloves, apron, splash suits, etc.).
iii.	Confined Spaces
a.	Engineering measures should be implemented to eliminate, to the degree feasible, the existence and adverse character of confined spaces.
b.	Permit-required confined spaces should be provided with permanent safety measures for venting, monitoring, and rescue operations, to the extent possible.
c.	Access hatches should accommodate 90% of the worker population with adjustments for tools and protective clothing.
d.	Mechanical equipment in the space should be disconnected, de-energized, locked-out, and braced, as appropriate.
e.	Appropriate training in confined space hazard control, atmospheric testing, use of the necessary PPE, as well as the serviceability and integrity of the PPE should be verified.
iv.	Community Health and Safety
a.	Operators should implement a Safety Management System (SMS) able to effectively identify and correct unsafe conditions
c.	The Safety Management System should include comprehensive emergency preparedness and response plans that provide a coordinated response based on the port and community resources required to manage the nature and severity of the emergency event.
d.	Visual impacts, including excessive background illumination, should be prevented during the port planning process or managed during operations through the installation of natural visual barriers such as vegetation or light shades, as applicable.
e.	Fire suppression and control includes all automatic and manual fire protection installations

3.6 Asian Development Bank (ADB) Safeguard Principles and Policies

3.6.1 Safeguard Policy Statement (SPS), 2009

Built upon the three previous safeguard policies on the Involuntary Resettlement Policy (1995), the Policy on Indigenous Peoples (1998) and the Environment Policy (2002), the Safeguard Policy

Statement was approved in 2009. The safeguard policies are operational policies that seek to avoid, minimize or mitigate adverse environmental and social impacts including protecting the rights of those likely to be affected or marginalized by the developmental process. ADB's safeguard policy framework consists of three operational policies on the environment, indigenous peoples and involuntary resettlement. A brief detail of all three operational policies have been mentioned below:

Environmental Safeguard: This safeguard is meant to ensure the environmental soundness and sustainability of Projects and to support the integration of environmental considerations into the Project decision making process.

Box 10: Applicability to Environmental Safeguards

The proposed Project is an establishment of Economic Zone with an area of 1270.12 acres and is likely to have significant environmental impacts during construction and operation phase. The impacts and risks associated with the generation, use, storage, release, and/or disposal of pollutants has been assessed as part of this EIA and appropriate mitigation measures have been proposed. Practices like minimal release of waste/emissions, safe disposal of waste, waste water management etc. shall be considered prior to each Project phase. The Environmental Safeguard is thus applicable to the proposed Project.

Involuntary Resettlement Safeguard: This safeguard has been placed in order to avoid involuntary resettlement whenever possible; to minimize involuntary resettlement by exploring Project and design alternatives; to enhance, or at least restore, the livelihoods of all displaced persons in real terms relative to pre- Project levels; and to improve the standards of living of the displaced poor and other vulnerable groups.

Box 11: Applicability to Involuntary Resettlement Safeguards

The land required for the proposed EZ is mainly used for salt cultivation by the people of Dhalghata Union. The sale of land has been undertaken directly on a 'willing buyer-willing seller' basis by BEZA with the landowners. Hence, as no physical and economic displacement in terms of involuntary acquisition of land and involuntary restrictions on land use is triggered, the Involuntary Resettlement Safeguard is not applicable for the proposed Project.

Indigenous Peoples Safeguard: This safeguard looks at designing and implementing projects in a way that fosters full respect for Indigenous Peoples' identity, dignity, human rights, livelihood systems and cultural uniqueness as defined by the Indigenous Peoples themselves so that they receive culturally appropriate social and economic benefits; do not suffer adverse impacts as a result of projects; and participate actively in projects that affect them.

Box 12: Applicability to Indigenous Peoples Safeguards

The proposed Project area does not report any indigenous tribes, minorities or aboriginals. Hence the Indigenous Peoples Safeguard and the requirements there under are not applicable for this Project.

Information, Consultation and Disclosure: Consultation and participation are essential in achieving the safeguard policy objectives. This implies that there is a need for prior and informed consultation with affected persons and communities in the context of safeguard planning and for continued consultation during Project implementation to identify and help address safeguard issues that may arise. The consultation process begins early in the Project preparation stage and is carried out on an ongoing basis throughout the Project cycle. It provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people and is undertaken in an atmosphere free of intimidation or coercion. In addition, it is gender inclusive and responsive

and tailored to the needs of disadvantaged and vulnerable groups and enables the incorporation of all relevant views of affected people and other stakeholders into decision making.

ADB requires the borrowers/clients to engage with communities, groups or people affected by proposed Projects and with civil society through information disclosure, consultation and informed participation in a manner commensurate with the risks to and impacts on affected communities. For Projects with significant adverse environmental, involuntary resettlement or Indigenous Peoples impacts, ADB Project teams will participate in consultation activities to understand the concerns of affected people and ensure that such concerns are addressed in Project design and safeguard plans. A series of consultations were carried out with the land sellers, community and other (direct and indirect) stakeholders involved in the proposed Project by BEZA and Shahidul Consultant. Details pertaining to the consultation process are provided in relevant section of this report.

3.6.2 Social Protection Strategy, 2001

ADB has designed a set of policies and programs for social protection in 2001, that is, to reduce poverty and vulnerability by promoting efficient labor markets, diminishing people's exposure to risks, and enhancing their capacity to protect themselves against hazards and interruption/loss of income. The basic aim of the Social Protection Strategy (SPS) is to assist individuals to break the cycle of poverty and enhance the quality of growth through adequate and developed social protection systems in the member countries of ADB. The type of risks covered through the SPS may be economic, environment or social/governance related.

The proposed Project shall ensure that the requirements of the ADB's SPS are complied with. Priority shall be given to any identified vulnerable groups. Based on the gender analysis and status of women in the Project area, measures for ensuring their overall development shall be taken up by the Project Proponent. BEZA shall comply with applicable labor laws in relation to the Project. BEZA shall also take the following measures to comply with the core labor standards⁴ for the ADB financed portion of the Project;

- a) Carry out its activities consistent with the intent of ensuring legally permissible equal opportunity, fair treatment and non-discrimination in relation to recruitment and hiring, compensation, working conditions and terms of employment for its workers (including prohibiting any form of discrimination against women during hiring and providing equal work for equal pay for men and women engaged by the Borrower);
- b) Not restrict its workers from developing a legally permissible means of expressing their grievances and protecting their rights regarding working conditions and terms of employment;
- c) Engage contractors and other providers of goods and services:
 - i. Who do not employ child labor⁵ or forced labor⁶;
 - ii. Who have appropriate management systems that will allow them to operate in a manner which is consistent with the intent of (A) ensuring legally permissible equal opportunity and fair treatment and non-discrimination for their workers, and (B) not restricting their workers from developing a legally permissible means of expressing their grievances and protecting their rights regarding working conditions and terms of employment; and

⁴The core labor standards are the elimination of all forms of forced or compulsory labor; the abolition of child 73 elimination of discrimination in respect of employment and occupation; and freedom of association and the effective recognition of the right to collective bargaining, as per the relevant conventions of the International Labor Organization.

⁵Child labor means the employment of children whose age is below the statutory minimum age of employment in the relevant country, or employment of children in contravention of International Labor Organization Convention No. 138 "Minimum Age Convention" (www.ilo.org)

⁶Forced labor means all work or services not voluntarily performed, that is, extracted from individuals under threat of force or penalty

- iii. Whose subcontracts contain provisions which are consistent with paragraphs (i) & (ii) above.

3.6.3 Public Communications Policy 2011

The Public Communications Policy (PCP) of ADB, originally formulated in 2005 and revised in 2011, is aimed at promoting improved access to information about ADB's operations related to fund Projects. It endorses greater transparency and accountability to stakeholders involved in a Project. The PCP establishes the disclosure requirements for documents and information related to Projects. It mandates Project-related documents normally produced during the Project cycle to be posted on the web.

3.6.4 Categorization of Projects

As part of its review of a Project's expected social and environmental impacts, ADB uses a classification system. This classification is used to reflect the significance of potential environmental impacts understood as a result of the client's impact assessment and to establish ADB's safeguard requirements. The categories used by ADB are:

- Category A Projects: Projects which are likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented.
- Category B Projects: Projects with potential adverse environmental impacts that are less in number, generally site-specific, mostly reversible and readily addressed through mitigation measures;
- Category C Projects: Projects with minimal or no adverse environmental impacts;
- Category FI Projects: Projects which involve investment of ADB funds to or through a financial investment.

Box 13: Applicability for ADB Project Categorization

Since the proposed Project is an establishment of Economic Zone with an area of 1270.12 acres which will have impacts both in its construction and operation phase, the Project is classified as a 'Category A' Project as per the Bank's categorization system based on Environmental Safeguards. Categorization of the Project as per Involuntary Resettlement and Indigenous Peoples is 'Category C'.

3.7 Equator Principle Financial Institutions (EPFIS) Guidelines

Equator Principles are a set of principles aiming towards promotion of responsible environmental stewardship and socially responsible development, including fulfilling responsibility to respect human rights by undertaking due diligence.

Principle 1: Review and Categorization

Using categorization, the EPFI's environmental and social due diligence is commensurate with the nature, scale and stage of the Project, and with the level of environmental and social risks and impacts. The categories are:

Category A – Projects with potential significant adverse environmental and social risks and/or impacts those are diverse, irreversible or unprecedented;

Category B – Projects with potential limited adverse environmental and social risks and/or impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures; and

Category C – Projects with minimal or no adverse environmental and social risks and/or impacts.

Principle 2: Environmental and Social Assessment

For all Category A and Category B Projects, the EPFI will require the client to conduct an Assessment process to address, to the EPFI's satisfaction, the relevant environmental impacts of the proposed Project. The Assessment Documentation should propose measures to minimize, mitigate, and offset

adverse impacts in a manner relevant and appropriate to the nature and scale of the proposed Project.

Principle 3: Applicable Environmental and Social Standards

The Assessment process should, in the first instance, address compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues. Bangladesh being a Non-Designated Country, the Assessment process evaluates compliance with the then applicable IFC Performance Standards on Environmental and Social Sustainability (Performance Standards) and the World Bank Group Environmental, Health and Safety Guidelines (EHS Guidelines).

Principle 4: Environmental and Social Management System and Equator Principles Action Plan

For all Category A and Category B Projects, the EPFI will require the client to develop or maintain an Environmental and Social Management System (ESMS). Further, an Environmental and Social Management Plan (ESMP) will be prepared by the client to address issues raised in the Assessment process and incorporate actions required to comply with the applicable standards.

Principle 5: Stakeholder Engagement

The EPFI will require the client to demonstrate effective Stakeholder Engagement as an on-going process in a structured and culturally appropriate manner for all Category A and Category B Projects. The client will conduct an Informed Consultation and Participation process. The consultation process will be tailored to the risks and impacts of the Project; the Project's phase of development; the language preferences of the Affected Communities; their decision-making processes; and the needs of disadvantaged and vulnerable groups.

To facilitate Stakeholder Engagement, the client will, commensurate to the Project's risks and impacts, make the appropriate Assessment Documentation readily available to the Affected Communities, and where relevant Other Stakeholders, in the local language and in a culturally appropriate manner.

Principle 6: Grievance Mechanism

For all Category A and, as appropriate, Category B Projects, the EPFI will require the client, as part of the ESMS, to establish a grievance mechanism designed to receive and facilitate resolution of concerns and grievances about the Project's environmental and social performance.

Principle 7: Independent Review

For all Category A and, as appropriate, Category B Projects, an Independent Environmental and Social Consultant, not directly associated with the client, will carry out an Independent Review of the Assessment Documentation including the ESMPs, the ESMS, and the Stakeholder Engagement process documentation in order to assist the EPFI's due diligence, and assess Equator Principles compliance.

Principle 8: Covenants

For all Category A and Category B Projects, the client will covenant the financial documentation:

- To comply with all the relevant host country social and environmental laws, regulations and permits in all material respects;
- To comply with Action Plan (where applicable) during construction and operation of the Project in all material aspects;
- To provide periodic reports in a format agreed with EPFIs (frequency to be agreed, but not less than annually) that documents compliance against APs, as well as against local laws and permits; and

- To decommission the facilities in accordance with an agreed decommissioning plan.

Principle 9: Independent Monitoring and Reporting

To ensure ongoing monitoring and reporting over the life of the Project, the EPFIs will, for all A Category Projects and where appropriate Category B, require appointment of an independent environmental and/or social expert, or require that the borrower retain qualified and experienced external experts to verify its monitoring information, to be shared with the EPFIs.

Principle 10: Reporting and Transparency

Each EPFI is committed to issuing periodic public reports about Project implementation processes and experience with due regard for appropriate Project confidentiality.

3.8 International and National Environment Standards/ Guidelines

Bangladesh and World Bank environmental standards and guidelines relevant to the construction and operation of the MEZ-III cover the following issues⁷:

- Atmospheric emissions and ambient air quality;
- Water Quality;
- Liquid effluent discharges to the marine environment;
- Noise emissions and ambient noise levels.

3.8.1 Ambient Air quality standards

As per IFC EHS Guidelines, “the ambient air quality standards are ambient air quality levels established and published through national legislative and regulatory processes and ambient quality guidelines refer to ambient quality levels primarily developed through clinical, toxicological, and epidemiological evidence (such as those published by the World Health Organization)”. The current Air Quality Guidelines are:

Table 11: Ambient air quality guidelines

Parameter	Averaging Period	Guideline value in µg/m ³
Sulphur Dioxide (SO ₂)	24-hour	125 (Interim target-1)
		50 (Interim target-2)
	10 minutes	20 (guideline)
Nitrogen dioxide (NO ₂)	1-year	500 (guideline)
	1-hour	40 (guideline)
		200 (guideline)
Particulate Matter PM ₁₀	1-year	70 (Interim target-1)
		50 (Interim target-2)
		30 (Interim target-3)
		20 (guideline)
	24-hour	150 (Interim target-1)
		100 (Interim target-2)
Particulate Matter PM _{2.5}	1-year	75 (Interim target-3)
		50 (guideline)
		35 (Interim target-1)
		25 (Interim target-2)
	24-hour	15 (Interim target-3)
		10 (guideline)
		75 (Interim target-1)
		50 (Interim target-2)
Ozone	8-hour daily	37.5 (Interim target-3)
		25 (guideline)
	maximum	160 (Interim target-1)
		100 (guideline)

⁷When host country regulations differ from the levels and measures presented in the EHS Guidelines, Project is expected to achieve whichever is more stringent.

* Interim targets are provided in recognition of the need for a staged approach to achieving the recommended guidelines

As per the provisions of Rules 12 and 13 of the ECR 1997, the MoEF is responsible for laying down environmental quality standards (pertaining to air, water, sound, odour and other components) and standards for discharge and emission of waste. Ambient air quality standards have been stipulated in Schedule 2 (Standards for Air) of the Rules. However, these standards were revised by MoEF in 2005. The revised standards have been illustrated in Table 12.

Table 12: Air quality standards of Bangladesh (2005)

Pollutant	Averaging Time	Concentration
Carbon Monoxide (CO)(mg/m ³)	8 hours	10 (9 ppm)
	1 hour	40 (35 ppm)
Lead (Pb)(µg/m ³)	Annual	0.5
Oxides of Nitrogen(NO _x)(µg/m ³)	Annual	100 (0.053 ppm)
Sulphur dioxide (SO ₂)(µg/m ³)	Annual	80 (0.03 ppm)
	24 hours	365 (0.14 ppm)
Suspended ParticulateMatter (SPM)(µg/m ³)	8 hours	200
Coarse Particulates(PM ₁₀)(µg/m ³)	Annual	50
	24 hours	150
Fine Particulates(PM _{2.5})(µg/m ³)	Annual	15
	24 hours	65
Ozone (O ₃)(µg/m ³)	8 hours	157 (0.08 ppm)
	1 hour	235 (0.12 ppm)

Source: Air Quality Standards, 2005

http://www.case-moef.gov.bd/file_zone/reports_publications/BGD%20AQ%20and%20VES%20standard_BW.pdf

3.8.2 Water quality standards

As per Schedule 12 of the ECR 1997, designated best use classification has been prescribed for inland surface water as given in Table 13.

Table 13: Standards for inland surface water

SN	Best Practice based classification	Parameter			
		pH	BOD (mg/l)	DO (mg/l)	Total Coliform (number/100 ml)
a.	Source of drinking water for supply only after disinfecting	6.5-8.5	2 or less	6 or above	50 or less
b.	Water usable for recreational activity	6.5-8.5	3 or less	5 or more	200 or less
c.	Source of drinking water for supply after conventional treatment	6.5-8.5	6 or less	6 or more	5000 or less
d.	Water usable by fisheries	6.5-8.5	6 or less	5 or more	---
e.	Water usable by various process and cooling industries	6.5-8.5	10 or less	5 or more	5000 or less
f.	Water usable for irrigation	6.5-8.5	10 or less	5 or more	1000 or less

Notes:

1. In water used for pisciculture, maximum limit of presence of ammonia as Nitrogen is 1.2 mg/l.
2. Electrical conductivity for irrigation water – 2250 µ mhos/cm (at a temperature of 25 ° C); Sodium less than 26%; boron less than 0.2%.

The standards for drinking water have been presented in Table 14 as per Schedule 12 of ECR-1997

Table 14: Standards for drinking water

SN	Parameters	DoE Standards (Drinking Water Standards)
1.	pH	6.5 – 8.5
2.	Temperature (in ° C)	20-30° C
3.	Turbidity (in NTU)	10
4.	Color	15 Hazen
5.	TDS (in mg/l)	1000 mg/l
6.	TSS (in mg/l)	10 mg/l
7.	Oil and Grease (in mg/l)	0.01 mg/l

SN	Parameters	DoE Standards (Drinking Water Standards)
8.	Chlorides (in mg/l)	150-600 mg/l
9.	Total Hardness (in mg/l)	200-500 mg/l
10.	Calcium (in mg/l)	75 mg/l
11.	Magnesium (in mg/l)	30-35 mg/l
12.	Sulphate (in mg/l)	400 mg/l
13.	Fluorides (in mg/l)	1.0 mg/l
14.	Nitrate (in mg/l)	10 mg/l
15.	Iron (in mg/l)	0.3-1.0 mg/l
16.	COD (in mg/l)	4 mg/l
17.	BOD (in mg/l)	0.2 mg/l
18.	Ammonia (in mg/l)	0.5 mg/l
19.	Phosphate (in mg/l)	6 mg/l
20.	Copper (in mg/l)	1 mg/l
21.	Mercury (in mg/l)	0.001 mg/l
22.	Balium (in mg/l)	0.01 mg/l
23.	Cadmium (in mg/l)	0.005 mg/l
24.	Arsenic (in mg/l)	0.05 mg/l
25.	Lead (in mg/l)	0.05 mg/l
26.	Zinc (in mg/l)	5 mg/l
27.	Chromium (in mg/l)	0.05 mg/l
28.	Manganese (in mg/l)	0.1 mg/l
29.	Total Coliform (in n/100 ml)	0
30.	Faecal Coliform (in n/100 ml)	0
31.	Chlorophyll (in mg/l)	--
32.	Aluminium (in mg/l)	0.2
33.	Benzene (in mg/l)	0.01 mg/l
34.	Boron (in mg/l)	0.2 mg/l
35.	Chlorinated alkanes	
	Carbontetrachloride(in mg/l)	0.01 mg/l
	dichloroethylene(in mg/l)	0.001 mg/l
	1.2 dichloroethylene(in mg/l)	0.03 mg/l
	Tetrachloroethylene(in mg/l)	0.03 mg/l
36.	Trichloroethylene(in mg/l)	0.09 mg/l
	Chlorinated phenols	
-	pentachlorophenol (in mg/l)	0.03 mg/l
	trichlorophenol (in mg/l)	0.03 mg/l
37.	Chlorine (residual) (in mg/l)	0.2 mg/l
38.	Chloroform	0.09 mg/l
39.	Cyanide	0.1 mg/l
40.	Detergents	0.2 mg/l
41.	DO	6 mg/l
42.	Kjeldhl Nitrogen (total)	1 mg/l
43.	Nickel	0.1 mg/l
44.	Nitrite	<1 mg/l
45.	Odor	Odorless
46.	Phenolic Compounds	0.002 mg/l
47.	Silver	0.02 mg/l
48.	Sodium	200 mg/l
49.	Suspended particulate matters	10 mg/l
50.	Sulfide	400 mg/l
51.	Tin	2 mg/l
52.	Selenium	0.01 mg/l
53.	Potassium	12 mg/l
54.	Radioactive materials (gross alpha activity)	0.01 Bq/l
55.	Radioactive materials (gross beta activity)	0.1 Bq/l

3.8.3 Liquid Effluent Discharges

As per Schedule 10 of ECR 1997, standards for Waste from Industrial Units or Project Waste have been described. The same has been detailed in Table 15:

Table 15: Standards for liquid effluent discharge

SN	Parameter	Unit	Places for determination of standards		
			Inland Surface Water	Public Sewerage System connected to treatment at second stage	Irrigated Land
1.	Ammonical Nitrogen(as elementary N)	mg/l	50	75	75
2.	Ammonia (as free ammonia)	mg/l	5	5	15
3.	Arsenic (as)	mg/l	0.2	0.05	0.2
4.	BOD 5 at 20°C	mg/l	50	250	100
5.	Boron	mg/l	2	2	2
6.	Cadmium (as Cd)	mg/l	0.5	0.05	0.05
7.	Chloride	mg/l	600	600	600
8.	Chromium (as total Cr)	mg/l	0.5	1.0	1.0
9.	COD	mg/l	200	400	400
10.	Chromium (as hexavalent Cr)	mg/l	0.1	1.0	1.0
11.	Copper (as Cu)	mg/l	0.5	3.0	3.0
12.	Dissolved Oxygen(DO)	mg/l	4.5-8	4.5-8	4.5
13.	Electro-conductivity(EC)	Micro mho/ cm	1200	1200	1200
14.	Total Dissolved Solids	mg/l	2100	2100	2100
15.	Fluoride (as F)	mg/l	2	15	10
16.	Sulfide (as S)	mg/l	1	2	2
17.	Iron (as Fe)	mg/l	2	2	2
18.	Total Kjeldahl Nitrogen (as N)	mg/l	100	100	100
19.	Lead (as Pb)	mg/l	0.1	1.0	0.1
20.	Manganese (as Mn)	mg/l	5	5	5
21.	Mercury (as Hg)	mg/l	0.01	0.01	0.01
22.	Nickel (as Ni)	mg/l	1.0	2.0	1.0
23.	Nitrate (as elementary N)	mg/l	10	Not yet Fixed	10
24.	Oil and Grease	mg/l	10	20	10
25.	Phenolic Compounds(as C ₆ H ₅ OH)	mg/l	1.0	5	1.0
26.	Dissolved Phosphorus (as P)	mg/l	8	8	15
27.	Radioactive substance	To be specified by Bangladesh Atomic Energy Commission			
28.	pH	-	6-9	6-9	6-9
29.	Selenium (as Se)	mg/l	0.05	0.05	0.05
30.	Zinc (as Zn)	mg/l	5	10	10
31.	Total Dissolved Solids	mg/l	2100	2100	2100
32.	Temperature	° C	40	40	40-Summer
			45	45	45-Winter
33.	Suspended Solids (SS)	mg/l	150	500	200
34.	Cyanide (as Cn)	mg/l	0.1	2.0	0.2

Notes:

- (1) These standards shall be applicable to all industries or Projects other than those specified under the heading "Standards for sector-wise industrial effluent or emission."
- (2) Compliance with these standards shall be ensured from the moment an industrial unit starts trial production, and in other cases, from the moment a Project starts operation.
- (3) These standards shall be inviolable even in case of any sample collected instantly at any point of time. These standards may be enforced in a more stringent manner if considered necessary in view of the environmental conditions of a particular situation.
- (4) Inland Surface Water means drains/ponds/tanks/water bodies/ditches, canals, rivers, springs and estuaries.
- (5) Public sewerage system means treatment facilities of the first and second stage and also the combined and complete treatment facilities.
- (6) Irrigable land means such land area which is sufficiently irrigated by waste water taking into consideration the quantity and quality of such water for cultivation of selected crops on that land.
- (7) Inland Surface Water Standards shall apply to any discharge to a public sewerage system or to land if the discharge does not meet the requirements of the definitions in notes 5 and 6 above.

As per the IFC EHS guidelines, the treated sanitary sewage discharge is required to meet the following guideline values.

Table 16: Treated sewage discharge guideline values of IFC

SN	Parameters	Guideline Value
1.	pH	6 – 9
2.	BOD	30mg/l
3.	COD	125mg/l
4.	Total Nitrogen	125mg/l
5.	Oil and Grease	10 mg/l
6.	Total Suspended Solids	50 mg/l
7.	Total coliform bacteria	400 MPN/100 ml

IFC Wastewater and Water Quality Monitoring Programme

A wastewater and water quality monitoring program with adequate resources and management oversight should be developed. The following elements to be considered while setting up the programme:

- **Parameters:** The parameters selected for monitoring should be indicative of the pollutants of concern from the process and should include parameters that are regulated under compliance requirements.
- **Monitoring type and frequency:** Wastewater monitoring should take into consideration the discharge characteristics from the process over time. Effluents from highly variable processes may need to be sampled more frequently or through composite methods. Grab samples or, if automated equipment permits, composite samples may offer more insight on average concentrations of pollutants over a 24-hour period.
- **Monitoring locations:** Effluent sampling stations may be located at the final discharge, as well as at strategic upstream points prior to merging of different discharges.
- **Data Quality:** Sampling should be conducted by or under the supervision of trained individuals. Analysis should be conducted by entities permitted or certified for this purpose. QA/QC documentation should be included in monitoring reports.

3.8.4 Ambient Noise Standards

As per IFC EHS Guidelines, noise impacts should not exceed the levels presented in Table 17 or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.

Table 17: Noise level guidelines as per IFC

Receptor	One Hour L_{eq} (dBA)	
	Daytime 07:00 - 22:00	Night time 22:00 - 07:00
Residential; institutional; educational	55	45
Industrial; commercial	70	70

The MoEF under the provisions of ECR, 1997 is responsible for laying down ambient noise standards. Noise Pollution (Control) Rules, 2006 were laid down by the Ministry through a Gazette notification dated September 7, 2006. Ambient noise standards established as per the provisions Rule 5(2) of the aforementioned Rules have been furnished in Table 18:

Table 18: Ambient noise standards as per DOE

SN	Type of Area	Limits in dB(A) L_{eq}	
		Day	Night
1.	Silent Zone	50	40
2.	Residential area	55	45
3.	Mixed area	60	50
4.	Commercial area	70	60

5.	Industrial area	75	70
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Note:

1. dB(A) L_{eq} represents time-weighted average noise level on the Decibel-A scale
2. Day time is from 6am to 9pm, Night time is from 9pm to 6 am
3. Mixed area is mainly residential area, and also simultaneously used for commercial and industrial purposes
4. Area up to a radius of 100 m around hospitals/educational institutions/special institutions/ establishments identified/to be identified by the Government is designated as Silent Zones where use of horns of vehicles or other audio signals, and loudspeakers are prohibited.

3.8.5 Applicable International Conventions

Environmental problems which migrate beyond the jurisdiction (Trans-boundary) require power to control such issues through international co-operation by becoming a Contracting Party (CP) i.e., ratifying treaties or as Signatory by officially signing the treaties and agreeing to carry out provisions of various treaties on environment and social safeguards. Bangladesh, meanwhile, has signed and ratified various Multilateral Environmental Agreements (MEAs), International Labor Organization (ILO) Conventions, and International Maritime Conventions. The relevant international conventions have been summarized in the in the Table 19.

Table 19: Applicable international conventions

Treaty or Convention & holding year	Brief Description
Convention on Protection of birds, Paris, 1950	Protection of birds in wild state
Convention on oil pollution damage (Brussels) 1969	Civil liability on oil pollution damage from ships
Ramsar Convention, 1971	Protection of wetlands
World Cultural and Natural Heritage (Paris), 1972	Protection of major cultural and natural monuments
CITES Convention (Washington), 1973	Ban and restrictions on international trade in endangered species of wild fauna and flora
Bonn Convention, 1979	Convention of migratory species of wild animal
Prevention and Control of Occupational Hazards (Geneva) 1974	Protect workers against occupational exposure to carcinogenic substances and agents
Occupational hazards due to air pollution, noise and vibration (Geneva) 1977	Protect workers against occupational hazards in the working environment
Occupational safety and health in working environment (Geneva) 1981	Prevent accidents and injury to health by minimizing hazards in the working environment
Occupational Health Services (Geneva) 1985	To promote a safe and healthy working environment
Vienna convention, 1985	Protection of ozone layer
Civil liability on transport of dangerous goods (Geneva), 1989	Safe methods for transport of dangerous goods by road, railway and inland vessels
Convention on oil pollution (London), 1990	Legal framework and preparedness for control of oil pollution
London Protocol, 1990	Control of global emissions that deplete ozone layer
UN Framework convention on climate change (Rio de Janeiro), 1992	Regulation of greenhouse gases emissions
Convention on Biological Diversity (Rio de Janeiro), 1992	Conservation of bio-diversity, sustainable use of its components and access to genetic resources
International Convention on Climate Changes (Kyoto Protocol), 1997	International treaty on climate change and emission of greenhouse gases
Protocol on biological safety (Cartagena protocol), 2000	Biological safety in transport and use of bio-products

Chapter 4: Project Description

4.1 Introduction

Maheshkhali Economic Zone-III (MEZ-III) would be developed at the Dhalghata Union of Maheshkhali Upazila under Cox's Bazar District. The delineate region for MEZ-III comprises of an area of 1270.12 acres. The project aims for industrial development and seeks to double the employment potential, triple the industrial output and quadruple exports from the region over every five years. The key features of the project are presented in Table 20.

Table 20: Key Details of the Project

Parameter	Details
District	Cox's bazar
Upazila	Maheshkhali
Development Area	1270.12 acres
Population Size ⁸	2,56,546
Total Affected Households	Null
Direct Employment ⁹	50,000

4.2 Project Area and Study Area

Project Area– Based on availability of land considering economic projections and presence of existing environmentally sensitive features, an area of 1270.12 acres has been identified as developable area/ project area. The local District Office and BEZA played key roles in the process of land acquisition, and compensation for homestead, trees, roads and other lands. The distribution of the project land is presented in Table 21.

Table 21: Distribution of the Project Land Area

Land Types	Area (Acres)	Percentage (%)
Salt Field	226.09	17.80
Sand bed	644.15	50.72
Ditch	24.79	1.95
Null	134.29	10.57
Road	3.69	0.29
Pond	3.85	0.30
Dam	34.1	2.68
Homestead	2.07	0.16
River	12.18	0.96
Trench	169.3	13.33
Khila	13.13	1.03
Others	2.48	0.20
Total	1270.12	100.00

⁸http://en.banglapedia.org/index.php?title=Sirajganj_District

⁹Feasibility report of Sirajganj Economic Zone Ltd. conducted by Shahidul Consultant. September, 2017

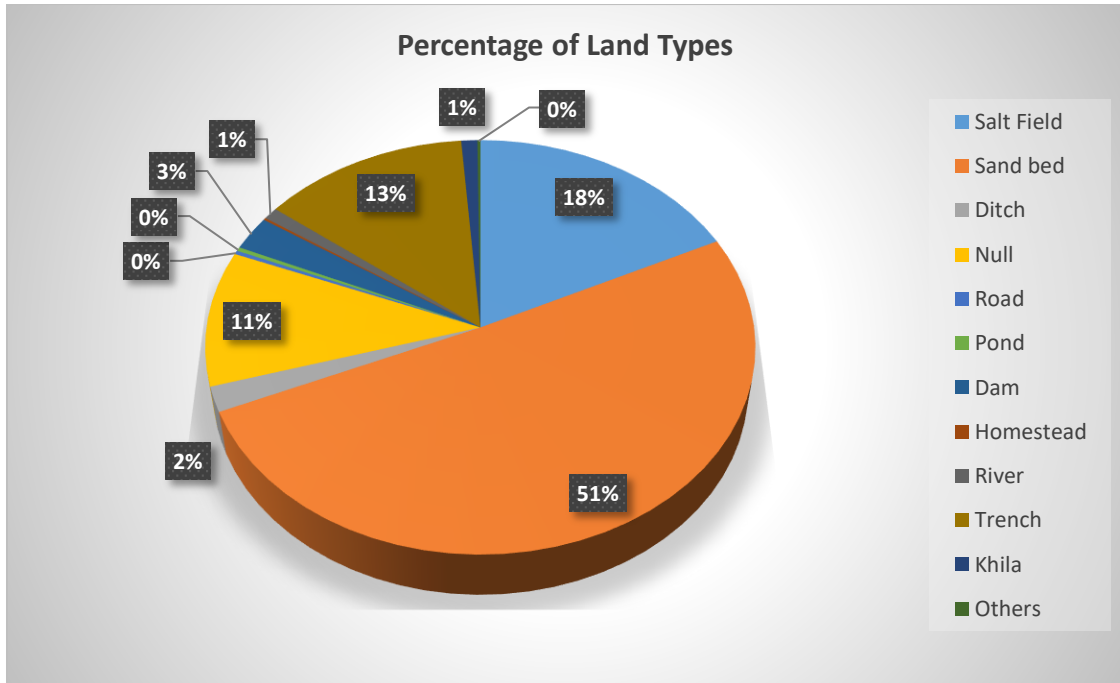


Figure 3: Percentage of Land types area of MEZ-III

Study Area– The study area refers to the delineated MEZ-III and surrounding 10 km radius around its boundary, which is considered for the environment and social impact assessment.

4.3 Site Description

The proposed MEZ-III will be developed in at Dhalghata Union of Maheshkhali Upazila, Cox’s Bazar District under Chittagong Division. The project site is approximately 18.03 km away from Maheshkhali Municipality and is respectively about 12.70km and 17.89km away from the Kutubdia and Sonadia Island. The entire project area is mainly a salt pan that lies near the sea shore of Bay of Bengal. EZ site covers the area of 1270.12 acres of land with elevation of less than 4.5m above mean sea level (MSL). The land is presently used mainly for salt cultivation. In fact, there is no road communication system to connect with adjacent Union/s except waterway connectivity. Matarbari Coal Power Plant is located on the north of the MEZ-III.

The proposed MEZ-III has been planned as a mixed land use development, comprising of residential, commercial, social amenities and industrial land uses and will be spread across 1270.12 acres of land. The geographical coordinates of the MEZ-III project site are provided in Table 22 and Figure 4.

Table 22: Geographical Co-ordinates outlining the Site

Points	Latitude	Longitude
A	21°39'58.00"N	91°52'17.17"E
B	21°39'35.80"N	91°52'57.29"E
C	21°38'36.72"N	91°53'9.20"E
D	21°38'59.49"N	91°52'12.12"E
E	21°39'35.78"N	91°51'13.81"E
F	21°40'30.37"N	91°51'21.95"E



Figure 4: Geographical Co-ordinates of the delineated MEZ-III

The entire project land is mainly used for salt production and shrimp farming and there is no agricultural productivity. People of the surrounding areas are heavily dependent on it and most of them are share farmers. The site and surroundings of the zone is described in Table 23.

Table 23: Co-ordinates and Surroundings of the Site

Side	Object	GPS Points	Coordinate	Distance
North	Kutubdia Island and Matarbari Coal fired power plant.	NE Corner	21°48'32.84"N 91°51'23.75"E	12.70km and 8.46km away from the project site.
South	Bay of Bengal and Sonadia Island	SW Corner	21°25'05.72"N 91°56'04.71"E	Sonadia Island is 17.89 km away from the project site.
East	Bay of Bengal	NE Corner	21°39'04.97"N 91°47'46.76"E	Adjacent to boundary.
West	Maheshkhali Channel	NW Corner	21°39'01.95"N 91°58'46.24"E	11 km away from the project site.

4.4 Accessibility to Site

Though currently there is no road connectivity of project site with other part of the Upazila but there are good waterways communication facilities. Only by road communication is possible up to Maheshkhali Upazila through Badarkhali Bridge. After that new road needs to be constructed to access the site.

Road Connectivity: By road communication is possible up to Matarbai Union but not to the Project site. The MEZ-III is about 120km and 343km respectively from Chittagong District Commissioner Office and Dhaka Zero Point through Cox’s Bazar-Chittagong-Dhaka National Highway.

Air Connectivity: Cox's Bazar Airport is aerial distance of about 25 km from the site. The airport is in process of being upgraded to an international airport, in order to attract more tourists, which will make it the fourth international airport in Bangladesh.

The two phases of upgrading will make the airport able to provide better facilities for parking, landing and take-off for wide-body aircraft. The whole project is a BDT 6 billion project.

The airport's runway currently has been expanded from 6790 feet to 9000 feet, and will be widened from 150 feet to 200 feet. The runway's load capability will be strengthened for wide-body operation, while the runway lighting will also get an upgrade. Equipment such as instrument landing system, distance measuring equipment, AMEDAS and VOR will be installed.

Railway Connectivity: There is no existing railway connectivity with Cox's Bazaar even with project site. The Chittagong-Cox's Bazar 100km dual gauge track Rail-Line Project has already been marked as a fast-track project by the government. The rail link will connect to Myanmar via Teknaf's Gundom border, aiming to ease the travel and trade through the proposed Sonadia deep seaport in future. The Cox's Bazar-Gundom link is yet to be finalised though. The line will begin at Dohazari village of Chittagong and extend southwards to Xilongxa of Cox's Bazar through seven upazilas: Chandanaish, Satkania and Lohagara of Chittagong; and Chakaria, Cox's Bazar Sadar, Ramu and Ukhia of Cox's Bazar.

Sea Port Connectivity: Chittagong Sea Port about 70km north through waterway from the site. The site is approximately 30km from the proposed Sonadia Deep Sea Port and 12km from the Matarbari LNG Terminal.

Land Port Connectivity: Teknaf Private Land Port is about 106km away from the site.

4.5 Project Overview

The proposed project is an industrial area development project and has been planned as a mixed-use development comprising of residential, industrial and commercial land uses. The following sections provide brief description of the project.

4.5.1 Project Objectives

The main objective of the project is to develop economic zone of international standards for promoting investment. The EIA study is also being undertaken with the intent of integrating best environmental management practices in the project design.

BEZA is the only responsible agency for establishment of EZs in all the potential areas of Bangladesh including the backward and undeveloped regions. The potentiality for development of EZs areas identification considering factors such as land use, land ownership, accessibility & connectivity, linkage to economically important towns/cities, infrastructure availability and engineering, environmental and social feasibility of the site. The proposed land site does not lie within any City Corporation, Municipality and Cantonment Board Area as per requirement of sub-section 3 of section 5 of Economic Zone Act, 2010.

The physical, economic, and social development of MEZ-III are based upon the following planning and development objectives.

- To provide adequate light, air, and open space for all investors;

- To ensure safety from fire, flood, panic, and other natural and man-made disasters;
- Preservation, conservation and development of areas of natural scenery and landscape;
- To ensure that development within EZ does not conflict with any development regulation;
- To encourage energy efficient site designs;
- Maintenance of highest standards of environmental planning;
- Protection of natural resources and environmental assets through land use and development regulations.

To achieve these objectives, a series of key guiding principles have been adopted for MEZ-III.

4.5.2 SWOT Analysis of MEZ-III

The Feasibility and EIA team including BEZA and Project Proponents identified strength, weakness, opportunities and possible threats of MEZ-III which would be considered during pre-construction, construction and operation phases are given in Table 24.

Table 24: Strength, Weakness, Opportunity and Threats of Upcoming MEZ-III

Parameters	Strength	Weakness
Location, Contiguity & Surroundings	<ul style="list-style-type: none"> – Does not lies in any City Corporation, Municipality, and Cantonment Area as per requirement of sub-section 3 of section 5 of Economic Zone Act, 2010. – Close proximity to Bay of Bengal; – Land Availability for future expansion; – Low land value and no resettlement issue. 	<ul style="list-style-type: none"> – Requirement of construction of sea bank/boundary wall to protect EZ site; – Scarcity of freshwater sources; – Less communication facilities and heavily depend on waterways for primary transportation; – No education, medical and market facilities within 10km radius of the site.
Accessibility	<ul style="list-style-type: none"> – The site is adjacent proposed Matarbari Deep Sea Port, Matabari Coal Power Plant and Sonadia Island; – In waterway the site is 70 km from Chittagong sea port; – Teknaf Private Land Port is about 106km away from the site; – Navigation is possible throughout the year in Bay of Bengal and Kuhelia River. 	<ul style="list-style-type: none"> – No highway road connectivity. The nearby national highway is 25 km from the site. – Currently, there is no access road to reach the site
Proximity to urban hubs & industrial areas	<ul style="list-style-type: none"> – Upazila headquarters is at distance of 12km east; – Proposed LNG Terminal and deep-sea port is around 12 km from the site. 	<ul style="list-style-type: none"> – No Cargo handling facilities by Rail transport; – No urban facilities like College, University, Hospital; – Currently there is no recognized industry rather than salt farming and dry fishing.
Available Infrastructure Facility	<ul style="list-style-type: none"> – LNG Terminal and Deep-sea port will give extra benefit for the site; – Matarbari coal fired power plant can mitigate the electricity demand for the MEZ-III; – Setting up of all infrastructure facilities will induce setting up of new townships and other developments. 	<ul style="list-style-type: none"> – Current infrastructure facility is not adequate to cope up the running of a large industrial activities and need to be improved – Fire service within 12 km of site located at Upazila Headquarter. – Police station within 12 km of site.

Parameters	Strength	Weakness
	<ul style="list-style-type: none"> – Though there is no telephone network but mobile telecom network is available within the project site. 	
Eco-sensitivity and threat to bio-diversity	<ul style="list-style-type: none"> – The entire area is a salt pan and the local people used it as for salt farming and dry fishing; – No protected areas within 10 km radius of the site; – There are some mangrove species within and nearby the project area that would be preserved; 	<ul style="list-style-type: none"> – During pre-construction phase, existing trees would be felled before land filling. – Industries, if discharge waste/effluent, it may disturb the aquatic ecosystem of nearby river; – Extraction of sand for land filling may causes interruption of aquatic ecology; – Periodic dredging may hamper the benthic organism of the sea and may cause ecological disruption especially for the turtle;
Quality of life & employment generation	<ul style="list-style-type: none"> – Creation of about 50,000 of direct jobs for skilled, semi-skilled and unskilled labor. – Developments in nearby area after development of EZ. – Quality of life will boost with the running of EZ 	<ul style="list-style-type: none"> – Unavailability of adequate skilled labor. – Adequate environment management plan is to be prepared to prevent damage of environment and the health of the residents in nearby area due to discharge of effluents/gases from EZ site
Parameters	Opportunity	Threats
	<ul style="list-style-type: none"> – Favorable customs regulatory policy – Scope for disintegration policy and support for ancillary service – Good country credit rating (at par with Philippines, Vietnam) – Competitive edge of labor market – Steady economic growth of the country – Globally recognized investment destination – Impressive export growth – Government provision of tax holiday – High provision of incentives – Duty free import of capital machinery and other supports – Peoples willingness about the industrial activities – Enough vacant land for infrastructure development – LNG Terminal deep sea port make extra advantage for transportation of goods – No Resettlement Issues – Matarbari Coal fired power plant and Industrial hub is nearby the MEZ-III 	<ul style="list-style-type: none"> – Poor Road Transportation system – Competitive market – High borrowing costs- high interest rates of banks and financial institutions – Risk of natural disasters – Risk of environmental pollution and social disruption

4.5.3 Project Activities and Area Statement

Area of the site considered for development is 1270.12 acres. At present, only on-site developments will be carried out by BEZA. Details of on-site facilities are given in table below-

Table 25: Details of On-site Facilities

SN	Proposed Infrastructure	Details
1	Administrative Building	Administrative including custom building will be constructed within the zone. There is a total of 12,000 sft area has been allocated for this purpose.
2	Site Preparation and Land Development	Site is low land except few areas are medium and requires leveling. It is required to fill the area of the proposed site is about 7-9m (land development required). Total quantity of the sand required for filling is 41,119,946 cum. Source of the sand will come from nearby Kohelia River and Bay of Bengal through dredging by legal authorization of BIWTA. Even, MEZ-III would comply with Balu Mahal and Soil Management Act, 2010.
3	Boundary Wall	A compound wall all along the EZ boundary to a height of 9 feet above NGL is proposed to be constructed and provided with 3 feet height barbed wire fencing on top as per BEZA rule. The length of the boundary wall would be 14,870m.
4	Shore Protection Bank	To protect the site from erosion, BEZA would construct shore bank using geo-textile, blocks and RCC materials on their own land of about 20ft slopes. Bangladesh Water Development Board (BWDB) has planned to construct embankment on the bank of Kohelia River.

4.5.4 Division of Economic Zones

The master plan for the MEZ-III envisions an industrial area that will set precedents for smart economic growth. The MEZ-III will be developed according to a comprehensive land-use framework following Bangladesh Economic Zones Act, 2010. According to this Act, to prepare a master plan for the land connected with economic zone dividing into four major areas which are presented in Table 26.

Table 26: Divisions of Economic Zone as per BEZA Act

Divisions	Criteria	Remark
Export Processing Area (EPA)	Specified for export-oriented industries	Industrial Area
Domestic Processing Area (DPA)	Specified for industries to be establish to meet the demand of the domestic market	
Commercial Area	Specified for business organizations, banks, warehouse, offices or any other organization	Non-Industrial Area
Non-Processing Area	Specified for residence, health, education, amusements, green and open spaces, etc.	

In BEZA Act, there is no area limit for industrial and non-industrial land for economic zone. But there is a building code by BEZA which has been followed to keep open space, green space, plot size, road size, etc. According to Integrated Industrial Area (IIA)¹⁰ and Development Control Regulation (DCR)

¹⁰<https://www.midcindia.org/documents/20182/29054/Integrated+Industrial+Area+DCR+%28IIA+DCR%29.pdf/7fdef874-dee8-487-bbab-cec2a225dad4>

of India, (a) at least 60% of the total area notified as “Integrated Industrial Area” shall be used for industrial development and the remaining area shall be used for the development of support activities including Residential and Commercial activities; (b) Out of the total area earmarked for support activities, not more than one fourth of such area shall be used for purely commercial /economic activities and the remaining area shall be used for residential and other non-residential uses like educational and health facilities, amenity space, public utilities, Gardens/Play Grounds, etc. (c) Development permission for commercial, residential and non-residential activities shall not be given before the development of infrastructure facilities in the area earmarked for industrial development is completed and at least 1/3rd of the area earmarked for Industrial development is disposed of.

4.5.5 Key Elements of Master Planning

The key elements taken into considered for finalizing master plan of MEZ-III are as follows:

Industrial Area: MEZ-III is of 1270.12 acres land, out of which 1,141.39 acres (89.86%) is allocated as industrial plot. This industrial area comprises of 25 different sizes plots. The MEZ-III industrial area will comprise of EPA and DPA with large number of industries. To ensure a sustainable and environmentally conducive development of the region, zoning of areas has been done in the Master Plan. Based on factors such as similarity of infrastructure, energy and space requirements, correlation between supply chain for similar industries and environmental safety and compatibility, industries will be planned in clusters/sectors. No development zones, buffer zones, safe zones for development of industries, as the case may be, will be proposed for various types of industries and residential areas. The distribution of plots is given Table 27.

Table 27: Distribution of Industrial Plots

Description of Plot Size, Area and No.	No. of Plot	Total Area (acres)
Plot No-1 (Power Plant-I)	1	70.47
Plot No-2 (Samuda Chemical)	1	100
Plot No-3 (Super Petro-Chemical)	1	410
Plot No-4 (Power Plant-II)	1	29.94
Plot No-5 (Port)	1	9.92
Plot No-6 (Utilities)	1	9.40
Plot No-7 to 22	16	320
Plot No-23	1	24.86
Plot No-24	1	86.80
Plot No-25	1	80
Total	25	1141.39

The planned industries for MEZ-III comprise of those which have potential to be established in Maheshkhali is presented Table 28. The suggested industries may be changed based on the investor’s interest on that particular land and geography.

Table 28: Potential Industries for Establishment of MEZ-III

SN	Type of Industry
1.	LNG (Liquefied Natural Gas)
2.	Garments
3.	Information Technology
4.	Pharmaceuticals
5.	Food & Beverages
6.	Leather Goods Manufacturing
7.	Electrical Equipment’s
8.	Ceramics

Amenities Zone:It includes Entrance Gate with Security Block, Security-cum- Police center, Fire station; Medical Center, Training Center, university, park, bus stand, Business Club, Mosque, etc. will be developed in the project site.

Utilities Area:The Total zone consists of Gas and Power sub stations, sewer network, communication network, street lighting, wastewater network, power plant, jetty, Central Fire Fighting Station, CETP, WTP, CSTP, etc. and they will be constructed within the site.

Residential Land Use: Depending on the type of employment base the proposed industrial sector is likely to generate, four (4) type of housing is proposed within MEZ-III. There is a total of 1.006 acres of land has been allocated for residential purpose of the zone.

- a) Low Income Group (LIG) –Single Worker Housing
- b) Low Income Group (LIG) –Family Housing
- c) Middle Income Group (MIG) Housing
- d) High Income Group (HIG) Housing

Commercial Zone:in the MEZ-III, there is a total 35.185 acres land has been allocated for commercial, administrative and amenities.It includes Commercial Offices, C&F Agents, Courier Service offices; Banks, Insurance offices, Leasing Company offices; One Stop Service Centre; Stationary offices, Telephone booths, Cyber café, etc.; Utility company offices, like water, electricity, gas offices; Meeting Rooms and Conference Centers and Training Centers.

Road Network: It is planned that within the Zone, there will be two types of roads.

Table 29: Classification of Road Types

Road Type	Road Size (in ft)	Total Area (in acre)
Type-A	80	27.26
Type-B	35	

BEZA would construct access road from Upazila to the main gate of EZ. BEZA would also construct internal road networks and 27.26 acres of land allocate for the internal road construction. Highest priority has been provided in suggesting paths for pedestrian. Aesthetically designed walkways are designed along with green environment on either side of the roads. Pedestrian walkways are to be provided on all categories of roads. All services for drains, sewers, water, power, energy and telecom are maintained within the road right of way. Necessary signage, street name boards, zone guiding

maps and visitor’s guidance map etc. are planned to be positioned at necessary locations, such as intersections and at various Strategic locations in each zone. No access is planned to be allowed near the road junctions and it is recommended that ingress / egress points will be with a set back from the road junction.

Provision of Greenery: The green areas will be provided in the form of green belt areas surrounding and within the zone. The width of green belt areas should range according to the area of the zone. In addition, green areas can also be provided within the industrial plots, the rooftops of the buildings and alongside the roads and canal/river channel. There is a total of 62.58 acres of land has been allocated for green space. Suitable species considering industrial activity, soil and topographical conditions, pollution mitigation and river erosion would be preferred and prioritized in the development of Green Belt of the zone. However, Nal Khagra (*Eriochloea procera*) species can also be planted as bio-filter and agent of pollution control along river side the zone. A list of suitable tree species for Green Belt Development Plan for industrial zone is attached in **Annex-14**.

Table 30: Proposed Land Use Summary of MEZ-III

Land Use	Plot	Area (Acres)	%
Commercial Building	3	2.326	0.183
Residential Building	9	1.006	0.079
Sub-station	1	0.058	0.005
Generator	1	0.058	0.005
Hospital & Medical College	1	1.150	0.091
Medical Centre	1	0.061	0.005
Entry Mosque	1	0.092	0.007
Play ground	1	2.581	0.203
Post office & Union Building	1	0.217	0.017
School & College	1	0.932	0.073
Police Station	1	0.217	0.017
Day Care Centre	1	0.217	0.017
Shopping Complex	1	0.537	0.042
Hawker Market Kacha Bazar	1	0.702	0.055
Community Centre	1	0.438	0.034
Auditorium	1	0.430	0.034
Security Shed/ Ansar Camp	2	0.133	0.010
Multipurpose Commercial Building	1	0.117	0.009
Central Mosque	1	0.378	0.030
Officers Residence	3	0.736	0.058
Admin & Custom Building	2	0.275	0.022
Dormitory	3	0.688	0.054
Fire Station	2	0.151	0.012
Car Hub-1	1	1.159	0.091
Car Hub-2 (Port)	1	9.923	0.781
Bus Stand	1	1.619	0.127
Central Overhead Water Tank	1	0.236	0.019
Solid Storage	1	0.264	0.021

Land Use	Plot	Area (Acres)	%
CETP	2	0.275	0.022
WTP (Desalination Plant)	1	0.138	0.011
STP	1	0.172	0.014
Resorts	3	0.220	0.017
Hotel	1	0.321	0.025
Training Complex	1	0.096	0.008
PGCB	1	0.068	0.005
Helipad	1	0.550	0.043
Open Space	-	10.350	0.185
Green	-	62.58	4.927
Industrial Plot Area		1141.39	89.865
Road Area		27.26	2.214
Total Area for MEZ-III		1270.12	100

Master Plan Layout of MEZ-III is attached in **Annex-3**.

4.6 Project Schedule

The total project area is 1270.12 acres. Staged construction and rolling development mode will be adopted in this project for carrying out all the development, construction and operation activities.

Table 31: Proposed Project Development Schedule

SN	Particulars	2018 to 2023 (6 years)					
		2018	2019	2020	2021	2022	2023
1.	Site development, Land Filling and Land Grading and Boundary Wall						
2.	Admin Building, VIP Office and Investor's Club with Guest House						
3.	Construction of Entrance Gates and Security Block						
4.	Internal Road Development Works and Plot Demarcation						
5.	Off-site infrastructure (connections for Electricity, Gas and Telecom)						
6.	On site infrastructures (Electrical, Gas, Water, Sewerage & Drainage Line, etc.)						
7.	Construction of Utility Sub-station (for Electricity, Gas and Telecom)						
8.	Construction of On-site Common utilities (CETP, WTP, STP, SWTS)						
9.	Fire Station and Medical Center						
10.	Commercial Building						
11.	Construction of Jetty, Helipad						
12.	Project Completion Minor Work						

Construction of Units and Operation Phases: In construction phase, the project finance will be drawn down and the supply, construction contractors and sub-contractors, engaged by BEZA. BEZA will complete construction, testing and commissioning of the different components of the project by December 2023. Operation and Maintenance (O & M) phase will be effective from Commercial

Operation Date (COD). In this phase, BEZA authority will operate the business as per the contract. It will be started from June 2018

4.7 Project Operation

4.7.1 Employment Potential

MEZ-III will involve development of 1270.12 acres of land and will generate vast employment opportunities. It has been estimated that by 2025, the proposed MEZ-III will generate about 50,000 industrial jobs comprising of direct employment.

Table 32: Proposed Employment Opportunity

Type of Employment	1 st Year		5 th Year		Total
	Domestic	Alien	Domestic	Alien	
Managerial	50	25	1500	10	1585
Administrative	50	10	1800	5	1865
Technical	25	15	5340	25	5405
Skilled	1000	20	15000	50	16070
Unskilled	5000	0	10000	0	15000
Women	50	5	10000	20	10075
Total	6175	75	43640	110	50000

Source: EIA Team

4.8 Resource Requirement

4.8.1 Labor during Construction

Land development and reclamation, Construction of infrastructures, residential area, commercial area and basic amenities will be undertaken by the project Proponents. Individual industries will be constructed and commissioned by subsequent project owners/tenants. The construction of various components will include hiring of local laborers and considering the magnitude of development, a temporary influx of population from outside areas is expected. Labour camps will be established various construction contractors with provision of water, power supply and sanitation facilities including toilet facilities along with septic tanks.

4.8.2 Construction Material during Construction

The proposed project will involve large scale construction activities and will involve large quantities of construction materials. The construction materials will be sourced only from authorized quarries in and around the region. The exact quantity of construction material cannot be quantified at this stage as the project is at Master Plan stage.

4.8.3 Utility Demand

Water Demand

The water requirement for the construction phase will include water for construction activities such as curing and formation of concrete mixtures and water for domestic consumption. For construction camp housing approx. 500 workers, about 42 m³/day of water will be required @ 60 liters per person per day (lpcd)¹¹. Water supply from nearby canal and ground water will be the main source of water during construction phase.

¹¹Environmental Impact Assessment of Bidkin Industrial Area, District Aurangabad, Maharashtra

For construction activities, tankers will be provided and adequate water allocations will be made by the MEZ-III. It is estimated that about 10.3m³ of water will be required per acre per day for total zone.

Water Sources

Water might be a problem as there is scarcity of fresh water sources although there is a river named Kuhelia is passes nearby the site and Bay of Bengal is on the other side of the site. The water is saline and need desalination before use it. Another source of the water would be the ground water and it would be most effective and suitable source of water for the site. Water will be transmitted from the source to the area of use through a closed conduit, mainly ductile iron pipes with proper protection against corrosion. The pipeline carrying raw water to the project site is proposed to run parallel to line laid as per Master Plan. A Water Treatment Plant (WTP) has been suggested in project master plan an area of total 6000 sft. The treated water from WTP will be stored into Over Head Tanks/ underground tanks for further supply.

In addition, MEZ-III would set up modern technology to harvest and use rain water during rainy season aim to reduce the pressure on ground water and water treatment cost.

Storm Water Management

There is a river named Koheliapassing southern and western and Bay of Bengal is on the western part of the project site. There is also some small canal that is used as the discharge path of rain water naturally of the project area. Normally water is available round the year in this canal. The storm water will be discharged through the adjacent canal. In addition, the project area will be divided into various rain water drainage zones considering the natural topography, internal and external contributory areas. All the drainage channels and ponds will be designed for 100 years flood. The runoff storm water would be stored in underground rainwater collection tank/s for treatment before use for industrial and other watering issues of the zone.

Power Demand

Power will be primarily required for operation of heavy construction machinery and equipment. Power requirement during construction phase will be sourced from 2 dual fuel power plant which capacity would be 45MW and 35MW respectively. In addition, HFO based generator would be used during construction phase. Residential areas have been categorized into HIG, MIG and LIG housing for worker's accommodation and premium, high-end, mid & affordable housing for additional accommodation. Power requirement for residential, industries, commercial, amenities, green areas proposed within the development have been considered based on studies carried in past for similar projects to calculate power demand for operation phase is 381 MW. Power requirement during operation phase will be sourced from national grid and also from above mentioned sources.

Gas Requirement

Though there is no gas connection but the site is nearby the LNG terminal. So, it is expected that the required gas would be sourced from the LNG. It is estimated demand of gas for the project will be 64 MMCFD. Gas supply system is proposed to be developed by Petro-Bangla.

Table 33: Utility Demand Forecast for the MEZ-III

Utility	Demand	Remark
Water	25400 m ³ /day	Assumption: 20 m ³ /acre/day ¹²
Electricity	381 MW	Assumption: 300 KV /acre
Gas	64 MMCFD	Assumption: 5MMCFD/100 acre

Roof Top Management

Roof top of all infrastructures of MEZ-III would be used for harvesting rain water, photovoltaic solar generation and gardening purposes. The developers appointed by BEZA would design the roof feasible for these installments.

4.8.4 Solid Waste Management

The waste generation during construction phase will include construction waste and residential waste from labor colonies. The construction waste will largely comprise of earth, stones, concrete, bricks, lumber, roofing materials, plumbing materials, electrical wires etc. Major and minor components of construction waste may be categorized as follows:

Major components:

- Cement concrete, Bricks, Cement plaster, rubble
- Steel (from RCC, door/window frames, roofing support, railings of staircase etc.)
- Stone (marble, granite, sand stone)

Minor components:

- Conduits (iron, plastic), Pipes (GI, iron, plastic)
- Electrical fixtures (copper/aluminum wiring, Bakelite/plastic switches, wire insulation)
- Panels (wooden, laminated), Others (glazed tiles, glass panes)

It is envisaged that approximately 40 to 60 Kg. per sqm of C&D (Construction & Demolition) waste shall be generated during construction¹³. The construction activities will also entail generation of hazardous wastes such as waste oil. Such waste shall be handled and managed as per the requirements of Hazardous Waste (Handling and Management) guidelines of DOE.

It is estimated that about 210 kgs of municipal waste will be generated daily from the labour colony. The waste from the labour colonies will mainly comprise of municipal waste and sewage from the toilets. Utmost efforts shall be made to reduce, re-use and recycle waste generated at site.

The quantities of waste likely to be generated during operational phase of MEZ-III have been estimated on the basis of population and land use characteristics. Apart from municipal waste and industrial waste, solid waste in the form of dried sludge will also be generated from Sewage Treatment Plant (STP) and Central Effluent Treatment Plant (CETP). It is expected that about 61.85 TPD (tones per day) of municipal solid waste (MSW) shall be generated from various areas planned in MEZ-III during operation phase.

Industrial areas proposed within MEZ-III will also generate solid waste, liquid waste and/or gases, which might be hazardous and non-hazardous waste in nature. Non-hazardous industrial wastes will

¹²<http://dnr.wi.gov/topic/WaterUse/documents/Waukesha/TechMemoWaukeshaResponse2014-02-19.pdf>

¹³http://www.environmentclearance.nic.in/writereaddata/EIA/17032016E68RFQIPAnnexure_EIA&EMP.pdf

be recycled and reused or will be handled and managed like municipal waste. It is estimated that about 103.3 tons of industrial waste will be generated daily from industrial clusters planned in MEZ-III. It has been assumed that about 15% (15.5 TPD) of the total waste produced shall be hazardous in nature and shall require special treatment and disposal.

Biomedical waste generated from the planned hospitals/ clinics/ medical facilities in the BIA will be managed as Medical Waste (Management and Handling) Management Rules, 2008.

Green waste collected from landscaped areas will be shredded and processed using a biological treatment technology such as composting or bio-methanation to produce compost/ manure.

Sludge from STP shall be de-watered and used as manure or will be pressed into bricketts after testing their physico-chemical properties. C/ETP sludge shall be tested for its toxicity. If found non-hazardous, shall be pressed into bricketts, else shall be disposed into secured landfill site.

There is a Central Solid Storage Station has been proposed in the upcoming MEZ-III with an area of total 0.264 Acres. Besides, national 3R strategy for industrial solid waste management would be adopted by BEZA during construction and operation phases. Solid Management Plan for MEZ-III is attached in **Annex-10**.

4.8.5 Sewage and Wastewater Infrastructure

It is expected that during construction phase, approximately 34m³ (for about 500 laborers) of sewage will be generated at camp site. The labor camp will be provided with adequate number of soak pits and septic tanks for disposal of sewage. Expected wastewater generation during operation from various usages is estimated to be approximately 7MLD nature of industry, number of population and geography of the site.

The wastewater from industries and sewage from residential areas will be treated separately in Central/Effluent Treatment Plants (C/ETP) and Sewage Treatment Plants (STP), respectively. There are two (02) CETP and one (01) STP has been proposed in the MEZ-III with a total area of 0.275 acres and 0.172 acres respectively.

Table 34: Details of STP and CETP proposed at the MEZ-III

Treatment Plant	Area (sqm)	Capacity (m ³ /day)	Total (m ³ /day)
CETP	557	550	1100
	558	550	
STP	697	1400	1400

Assumption Source: Environmental Impact Assessment of Bidkin Industrial Area, District Aurangabad, Maharashtra

According to the estimation of Dhaka Water Supply & Sewerage Authority (DWASA)¹⁴ and opinion of relevant experts, per capita water use for sewerage purpose is found 42 liters per day. If we calculate the total employment (50,000) with capacity of proposed STP, a total of about 1, 03,571 per person can easily use these sewerage plants. However, the proposed size and capacity is enough for operation stage of the zone. Notwithstanding, the developers will further assess the capacity during design and construction phases of STP.

The sewage treatment plant proposed will consist of the following processes:

¹⁴https://en.wikipedia.org/wiki/Water_supply_and_sanitation_in_Bangladesh

- Pretreatment
- Biological treatment
- Tertiary treatment
- Sludge handling

The effluent treatment plant and wastewater treatment plant proposed for MEZ-III will consist of the following processes:

Pretreatment

- Physico-Chemical treatment
- Biological treatment
- Tertiary treatment
- Sludge handling

The treated wastewater from the STP and C/ETP will be recycled to meet the demand for non-potable water. Because various industries will have a variety of types of industrial effluent, only industrial wastewater of a pre-defined quality will be permitted to enter the equalization tank of the effluent treatment plant. For any kind of specific treatment, industries will need to treat industrial wastewater in their own captive wastewater treatment facilities and discharge the wastewater of pre-defined quality into the collection system.

The proposed locations of the Sewage Treatment Plant (STP), Central/Effluent Treatment Plant (C/ETP) and Wastewater Treatment Plant (WTP) MEZ-III are shown in Master Plan Layout. Detail design, specification, layout and zero discharge plans would be finalized in consultation with DOE before installation.

It is proposed to use the treated wastewater for secondary purposes in residential, commercial, industrial area land uses proposed within MEZ-III, thus reducing the fresh water demand. Excess treated water will be stored at ponds/water reservoir within the zone and extra if any, will be sold to farmers in the surrounding area (to be used for irrigation).

4.8.6 Street Lighting

All the roads and streets would be provided with street lighting. This would serve the dual purpose of assisting pedestrians and traffic and increasing safety and security. It is suggested to use solar street lighting in some areas to utilize renewable energy and reduce usage of electricity. Solar street lights should be proposed in ratio of 1:2. Average illumination of 20 lux should be maintained on the access road.

4.8.7 Telecommunications

Maheshkhali has mobile connectivity from almost all mobile companies. Moreover, there is an established BTCL (Bangladesh Telecom Company Limited) network as fixed Phone Network located almost 12km away from EZ at Gorakghata Municipality. BEZA would develop WIFI zones within the project area.

4.8.8 Surface drainage

The drainage system has been planned to cater for the entire EZ through gravity flow. Drains are proposed to be on both sides of the roads. The rain water/surface water would be dispersed through several points from the EZ. The network would be built using conduit pipe. There would be surface opening via HUM/conduit pipe in specific intervals for intake of surface water.

4.8.9 Fire Station

Bangladesh Fire Service and Civil Defense is a department responsible for rescue missions in Bangladesh including fire safety, safety during air raids and any kind of disaster. The MEZ-III would have two own fire stations with an area of 0.151 acres consists of trained manpower. In addition, there are two fire stations near the MEZ-III namely Chakaria Fire Station, located about 25 km from the zone; and Satkania Fire Station, located about 60 km from the zone.



Figure 5: Fire Service and Civil Defense Station at Chakaria (left) and Satkania (right) of Cox's bazar district

4.9 Planning Framework

Objectives:

The proposed EZ will function as an integrated package having the required facilities and service activities with sufficient provision for future growth and expansion. The EZ shall be a self-contained region with a decent surrounding. The master plan proposals for the physical, economic, and social development of MEZ-III are based upon the following planning and development objectives.

- To provide adequate light, air, and open space for all investors.
- To ensure safety from fire, flood, panic, and other natural and man-made disasters.
- Preservation, conservation and development of areas of natural scenery and landscape.
- To ensure that development within the EZ does not conflict with any development regulation.
- To encourage energy efficient site designs.
- Maintenance of highest standards of environmental planning.
- Protection of natural resources and environmental assets through land use and development regulations.

Philosophy:

To enhance and harness the value and maximize returns from the Site whilst ensuring sustainability and good quality of the live-work-learn-play environment

- The non-processing area including the office complexes, health center, mosque, etc. are placed at the front of the zone for easy access.
- Dormitories located in a separate zone far from the industrial plot

Chapter 5: Environmental and Social Baseline

5.1 Introduction

The environmental and social baseline is the existing status of environment and society around the proposed project site. It has been analyzed through assessment of environmental components like air, water, land, noise, soil, etc. and environmental characteristics like physical, biological and socio-economic status of the study area, within the 10 km radial zone of the project site. Physical environment includes topography, land, soil, meteorology, air, water, noise, etc. and the biological environment includes flora and fauna. Socio-economic environment of the study area includes demography, ethnicity, religion, education and employment opportunity, occupation, income, poverty, social relations, etc. Baseline environmental conditions are based on the data collected from various related agencies and the secondary documents from published sources and websites. The baseline provides the basis for assessment of impact (potential changes in the baseline conditions) due to the development of proposed Maheshkhali Economic Zone-III (MEZ-III). Mainly, the MEZ-III site falls under Maheshkhali Upazila of Cox's Bazar District under Chittagong Division. The following figure and table illustrate the summary of various environmental settings considering 10 km radius zone and location map of the project area, respectively.

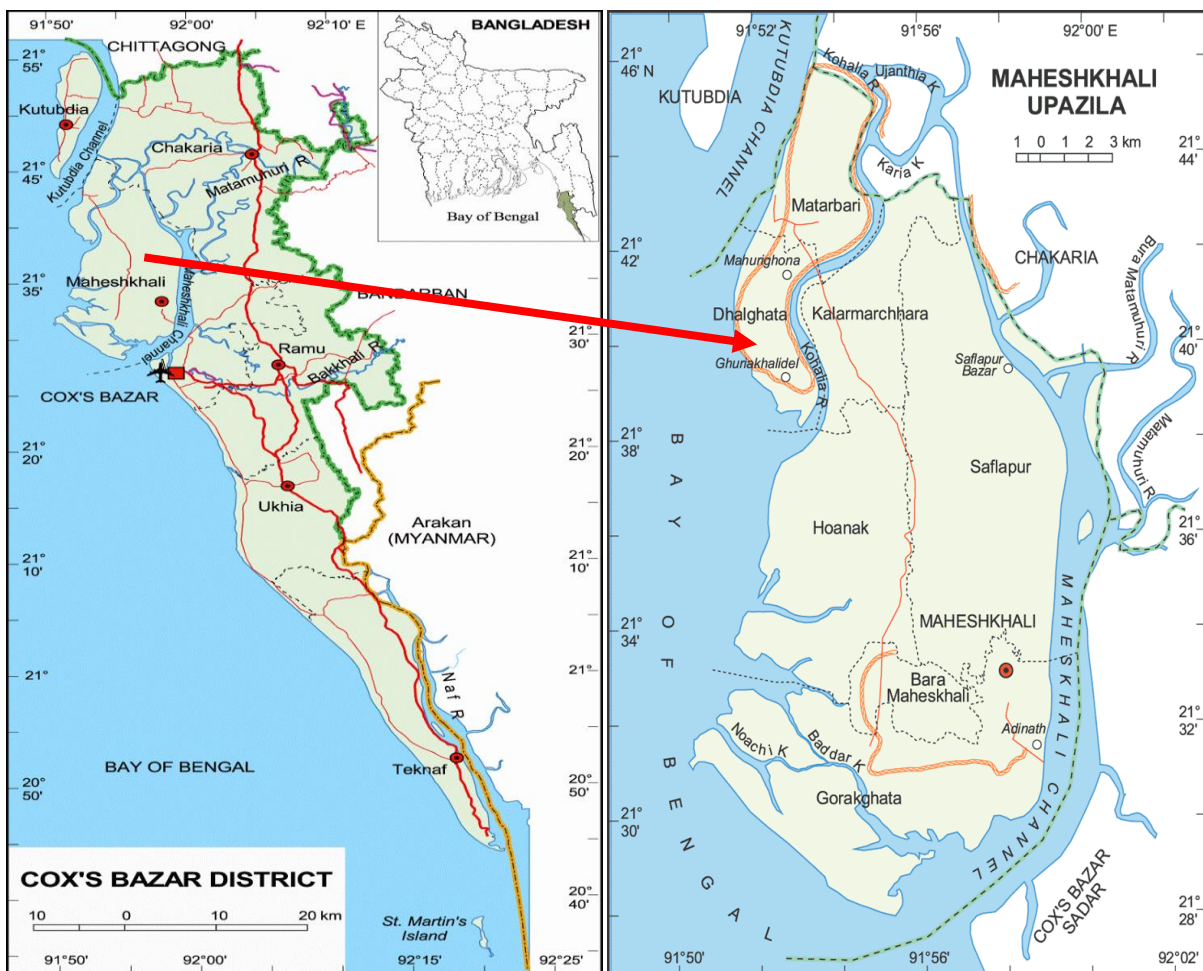


Figure 6: Location map of the project area

Table 35: Existing environmental settings of MEZ-III

Particulars	Details
Location	Maheshkhali Upazila of Cox’s Bazar District under Chittagong Division.
Total Area	1270.12 Acres
Site Elevation	Average 4-5m from MSL
Land Type	Medium high land
Nearest Airport	Cox’s Bazar International Airport is about 25.81 km away from the site
Nearest Railway Station	Chittagong Railway Station is about 70.73 km away from the site
Nearest Port	Chittagong Sea Port is about 70.34 km and Payra Sea Port is about 167.30 km away from the site
Climatic conditions	Temperature: The annual average temperature varies maximum 34.8°C to minimum 16.1°C. Humidity: Average humidity is around 75.5% throughout the year. Rainfall: The average annual rainfall is recorded approximately 4285 mm.
Seismic Zone	Zone II (Seismic co-efficient is 0.05g)
Forests / National Parks	None within 10 km.
Archaeological Site	The Adinath temple is nearest and the most of famous historical place of this Island.
Water Bodies	Matamuhuri, Bakkhali, Reju Khal, Naf, Uzantia, Kohelia, Masgona, Maheshkhali channel and Kutubdia channel are main rivers and channels of this district.

Source: Google Earth, BBS, 2011 & Site Visits



Figure 7: 10 km radius map of MEZ-III

Table 36: Important features of the MEZ-III at a glance

Parameters	Description
Climate	Project is situated at south-eastern climatic sub region of Bangladesh. Annual average temperature and rainfall varies from maximum 34.8°C to minimum 16.1°C. The annual average rainfall is 4285 mm. The district having been a coastal region often fall victim to sea storm, tidal bore, hurricane and cyclone.
Ecologically Critical Area	No ecologically critical areas were found within the study area. Kutubdia island is around 12.70 km and Sonadia island is 17.89 km away from the project site.
Reserve/Protected Forests	No reserve or protected forests area were found within the study area.
Predominant Geological Formations	Project area falls under Chittagong coastal plain. The geological formation of this area is alluvium, stream deposits, delta plain deposits, flood plain deposits.
Topography	The topography of the project area is predominantly medium high land.
Major Physiographic Units	The proposed MEZ-III is located in Chittagong coastal Plain.
Major Soil Type	The project survey area falls in the soil tract group 3, 10, 17a & 17b which are acid Sulphate soil; Grey Piedmont Soils; Mainly Deep, Brown (some red), Soils on low hills and Deep and Shallow Brown soils on very steep, high hill ranges respectively.
Major crops	Paddy, potato, pulse, onion, garlic, ginger, betel leaf, betel nut, wheat, sugarcane, ground nut, tobacco, rubber and vegetables are main crops of the district.
Flooding	The proposed project area falls under coastal tidal floodprone area.
Seismicity	The project area falls in the earthquake Zone-II of the seismic map of Bangladesh. This zone refers comparatively medium intensity of seismic effects.
Environment and Social Hotspots	Sea, River, Canals, Homestead forests and vegetation, School, College, Madrasha, Masjid, Mandir, Math etc.
Major Settlement	Residential area, Commercial area, Industrial Area, Bus terminals, Institutional structures, etc.
Major Industries/ Business Entrepreneurs	Manufacturing industries of the district are rice mill, salt mill, ice factory, flour mill, fish processing industry, fish feed mill, saw mill, printing press.

Source: BBS, 2011; Banglapedia and Field Visit

5.2 Meteorology

Bangladesh is located in the tropical monsoon region and its climate is characterized by high temperature, heavy rainfall, often excessive humidity and fairly marked seasonal variations. From the climatic point of view, three distinct seasons can be recognized in Bangladesh- the cool dry season from November to February, the pre-monsoon hot season from March to May and the rainy monsoon season which lasts from June to September. January is the coolest month with temperature averaging near 26°C and April is the warmest with temperatures from 33 to 36°C. Most places receive more than 1525 mm rainfall in a year and areas near the hills receive 5080 mm. Most rain occurs during the monsoon (June-September) and little in winter (November-February). Moderate rains are also reported in months of March, April and October.

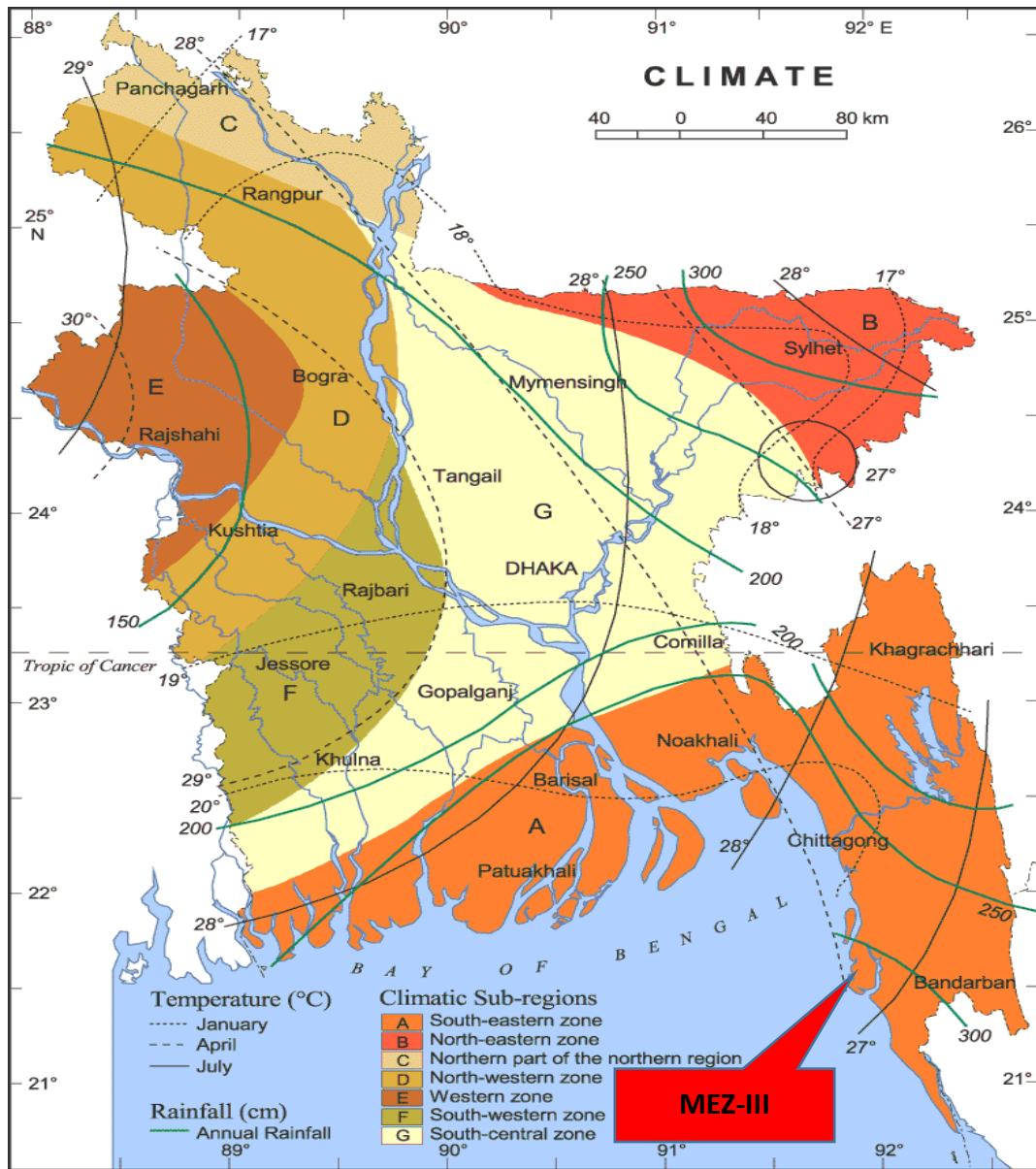


Figure 8: Climatic sub-regions of Bangladesh indicating the MEZ-III

Source: www.thebangladesh.net

The climatic sub-regions of Bangladesh are presented in the following Figure and as per that, the Maheshkhali Upazila falls in climatic sub-region namely South-Eastern Zone. The nearest meteorological station of Bangladesh Meteorological Department (BMD) is at Cox’s Bazar and Kutubdia. The climatic conditions as recorded at Cox’s Bazar and Kutubdia are therefore considered applicable for the proposed MEZ-III. To assess the climatic conditions of the area, climatology data has been collected from BMD.

5.2.1 Temperature

The period from February to March is marked by continuous increase in the temperatures. April is the hottest month of the year. The annual average temperature varies from maximum to 34.8 °C and minimum 16.1 °C, respectively. With the onset of monsoon by mid-May, the temperatures descend slightly. January is the coolest month of the year. The monthly variation of normal maximum and minimum temperatures of the project area from two stations has been given in the Table 37 and figure 9.

Table 37: Average maximum and minimum temperature of two stations in the year of 2016

Month		Station Name	
		Cox's Bazar	Kutubdia
January	Max	26.3	25.3
	Min	15.3	14.9
February	Max	30.3	28.6
	Min	20.3	19.8
March	Max	32.4	33.0
	Min	23.2	22.8
April	Max	32.6	32.6
	Min	26.8	26.3
May	Max	32.9	32.8
	Min	25.9	25.9
June	Max	32.0	32.0
	Min	26.0	26.4
July	Max	30.5	30.2
	Min	25.4	25.9
August	Max	31.4	31.1
	Min	25.3	25.9
September	Max	32.6	32.0
	Min	25.8	26.0
October	Max	31.9	31.9
	Min	25.1	25.2
November	Max	30.3	29.8
	Min	21.4	20.6
December	Max	29.3	28.1
	Min	19.0	18.2

Source: BMD

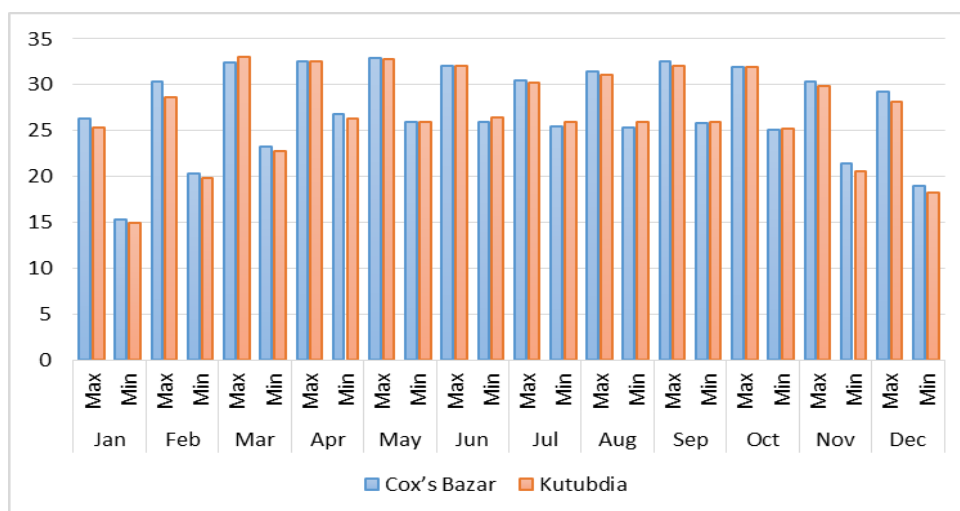


Figure 9: Average maximum and minimum temperature in the year of 2016

Source: BMD

5.2.2 Humidity

Due to heavy rainfall and proximity to Bay of Bengal, the humidity levels in Bangladesh remains high. Annual average relative humidity in the project area is around 80%. Humidity fluctuations are stable every year in both areas in view of seasonal humidity change. The difference in the average humidity between respective months is rather small, in a range of 65 - 90%, while the average is 75 - 90% in the rainy season of May to October and 65 - 85% from November to April where little rain falls. The

monthly variation of humidity patterns from Cox’s bazar and Kutubdia station has been given in Table 38.

Table 38: Monthly variation of relative humidity in the year of 2015

Month Stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cox’s Bazar	76	71	69	80	78	88	91	87	86	84	79	77
Kutubdia	77	71	69	79	77	85	88	84	83	82	77	76

Source: BMD

5.2.3 Rainfall

About 80% of the precipitation occurs during five monsoon months (May to September). Minimum precipitations are recorded during the month of November to February whereas average showering does occur in March, April and October. The monthly total rainfall variation and annual rainfall variation in different years has been given in Table 39 & 40.

Table 39: Monthly total rainfall in Cox’s Bazar and Kutubdia station (2016)

Month Stations	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cox’s Bazar	0	0	28	19	359	563	1114	472	283	418	41	0
Kutubdia	9	4	65	13	318	342	912	551	362	261	102	0

Source: BMD

Table 40: Annual rainfall for Cox’s Bazar and Kutubdia station (2007-2016)

Year Stations	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Cox’s Bazar	4006	4603	3283	3438	4440	4123	4059	2483	4716	3297
Kutubdia	3162	3171	2658	2702	3894	4677	4203	2960	4253	2939

Source: BMD

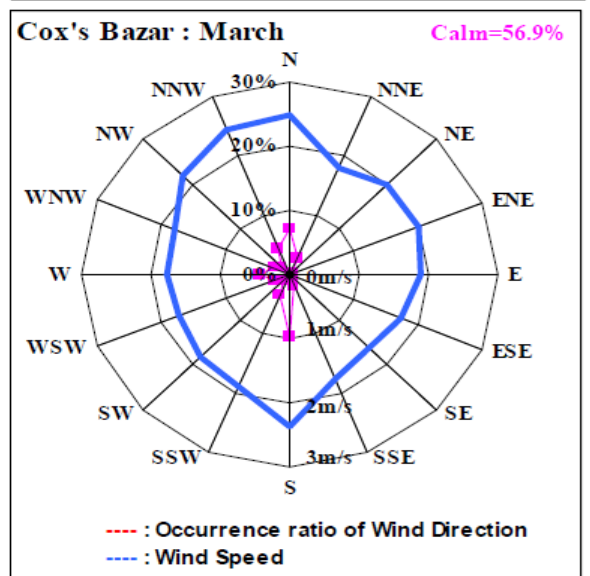
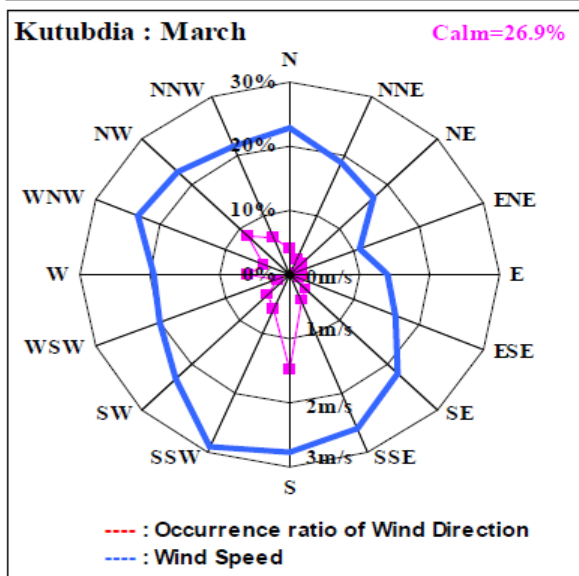
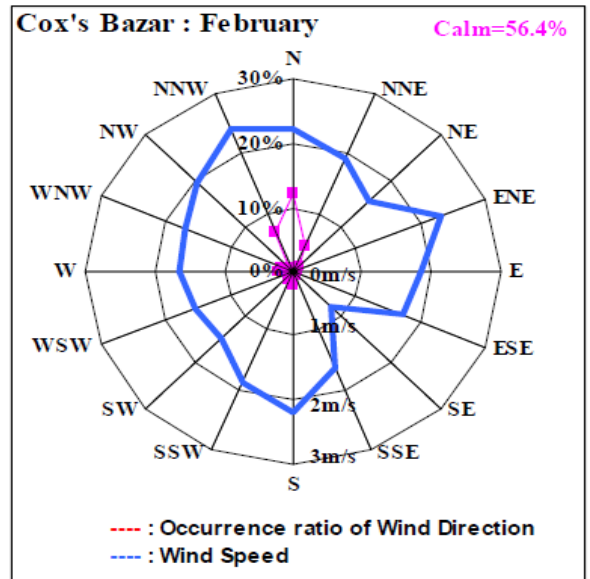
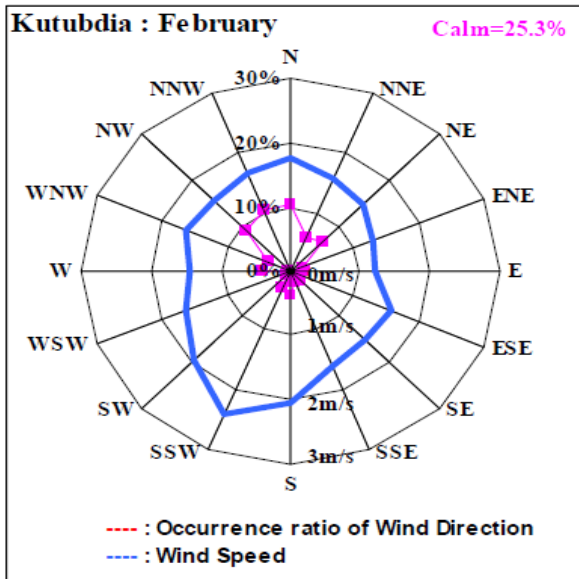
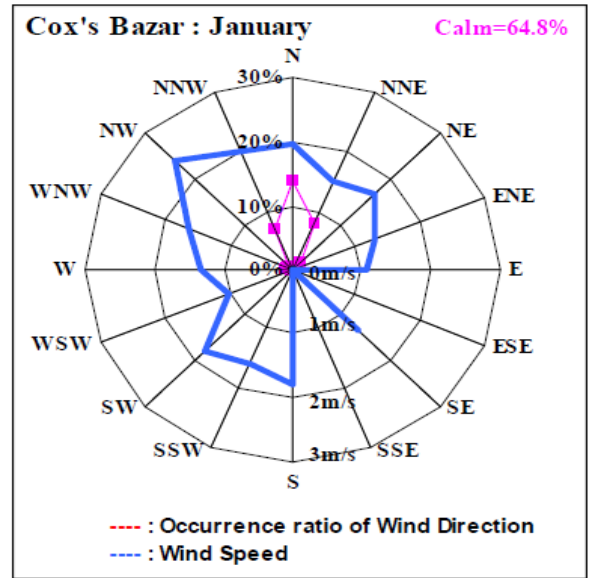
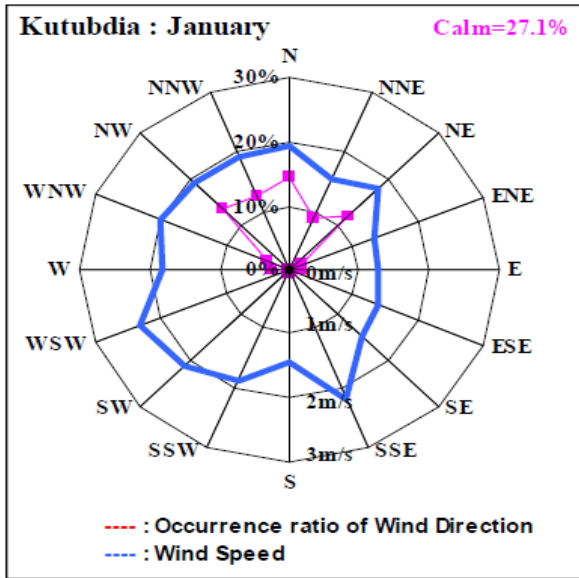
5.2.4 Evaporation

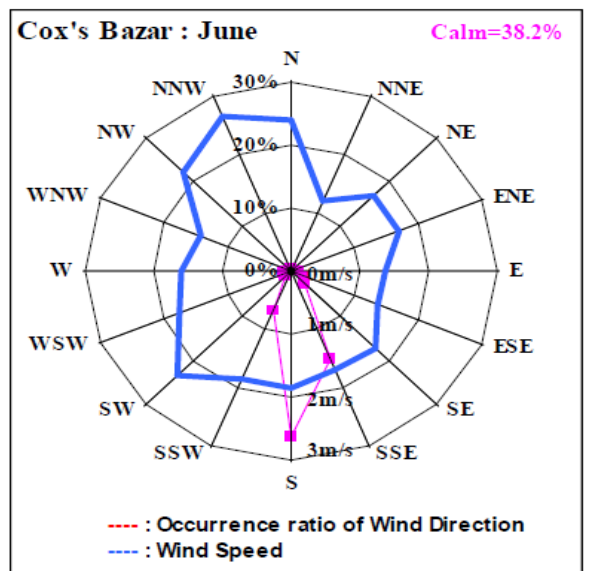
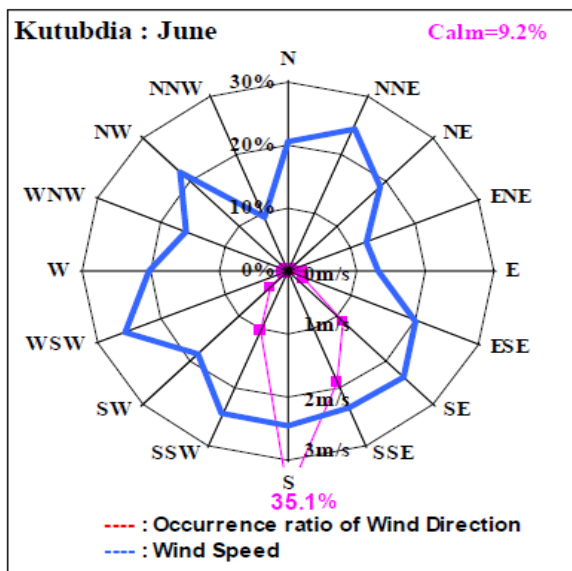
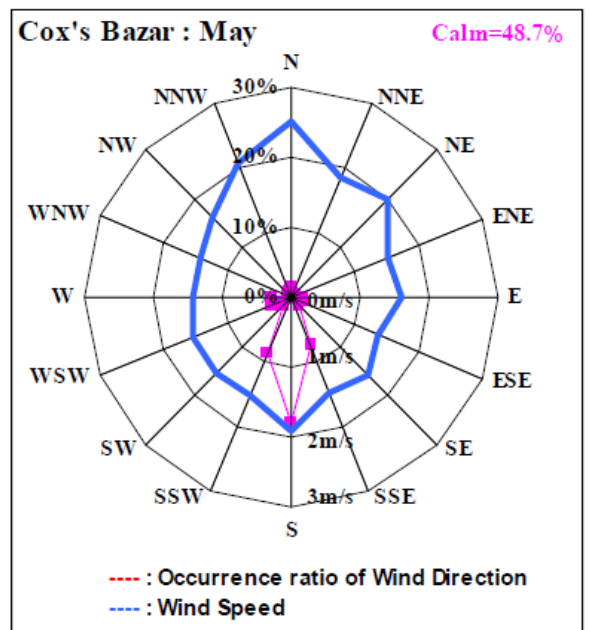
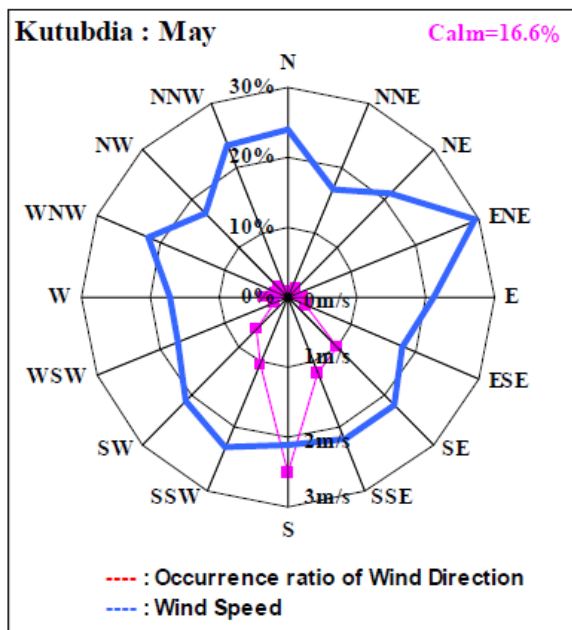
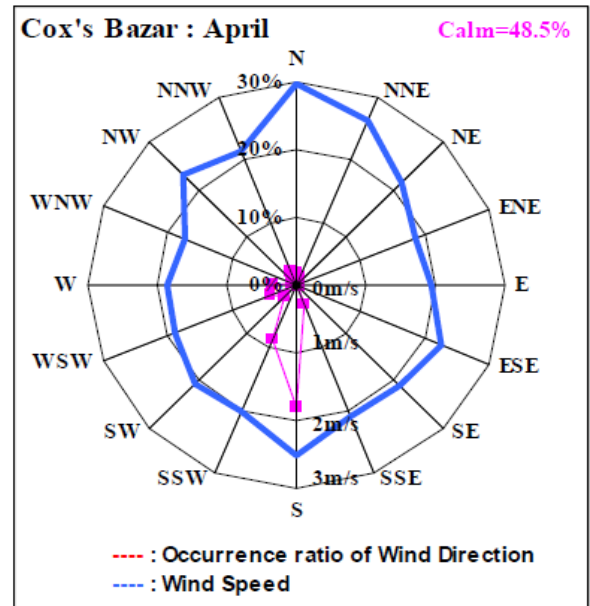
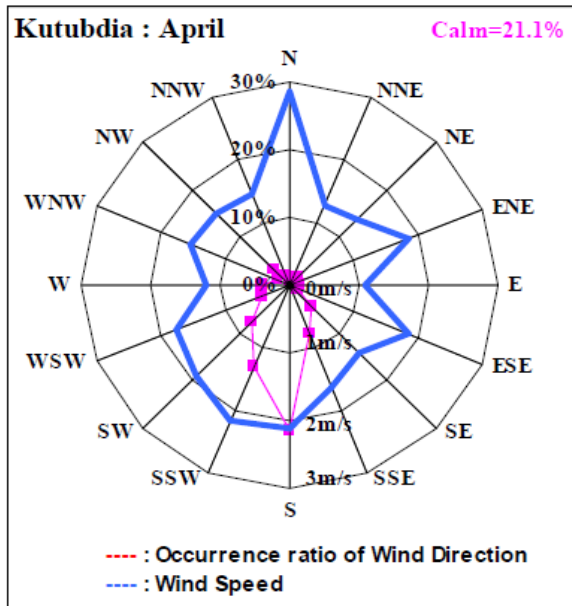
Evaporation is the process by which water changes from a liquid to a gas or vapor and back into water cycle as atmospheric water vapor. The atmosphere of coastal zone always enriches with humidity because of high evaporation over the sea surface. Solar radiation and evaporation are maximum during the pre-monsoon periods compared to the rest of the year. During high temperature in March-April, the evaporation from the soil also become high which further increase the soil salinity. A significant rainfall during this period could help mitigate the salinity problem

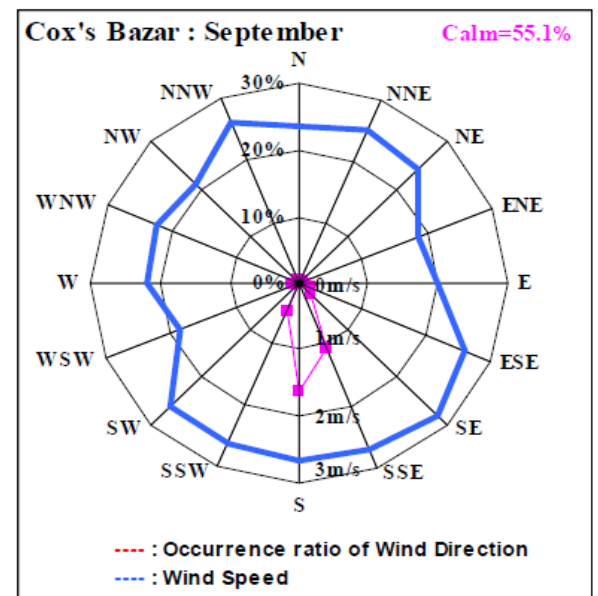
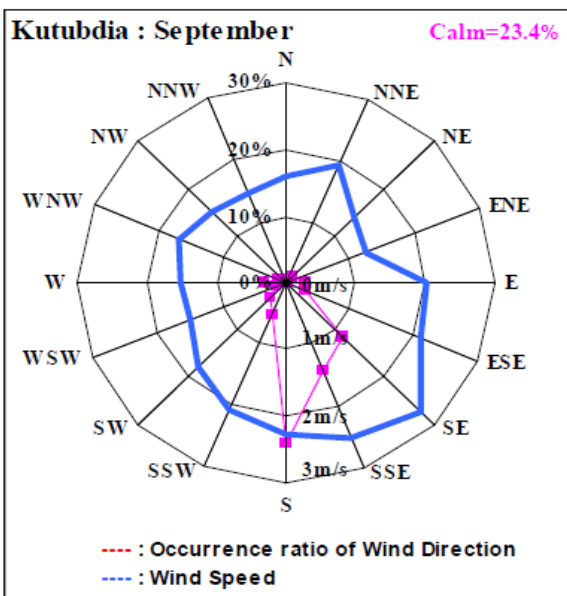
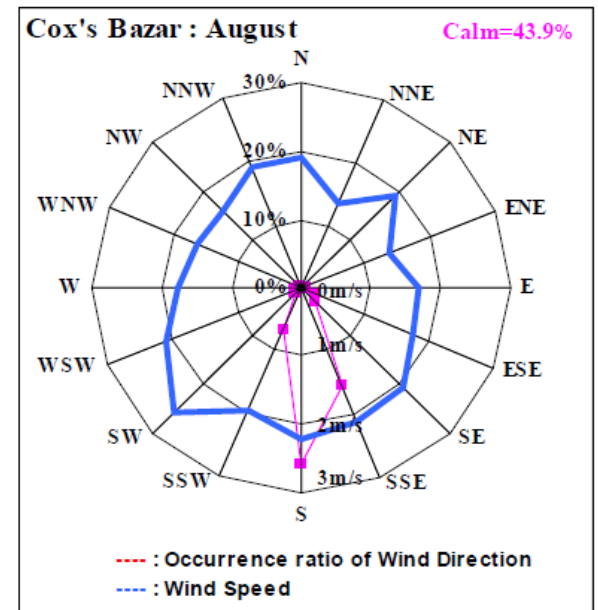
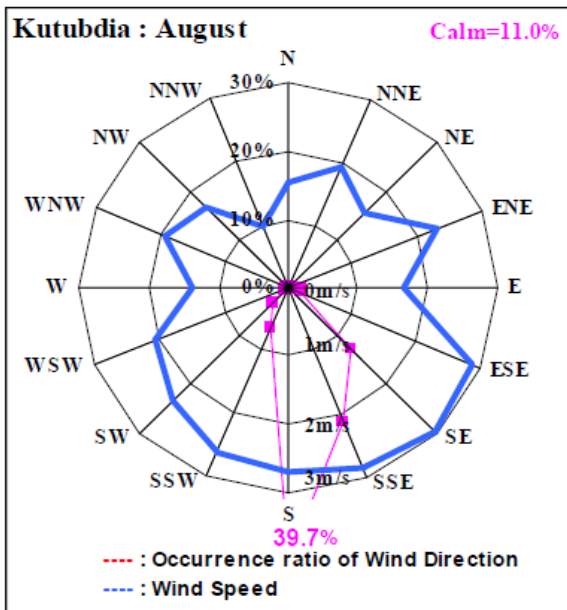
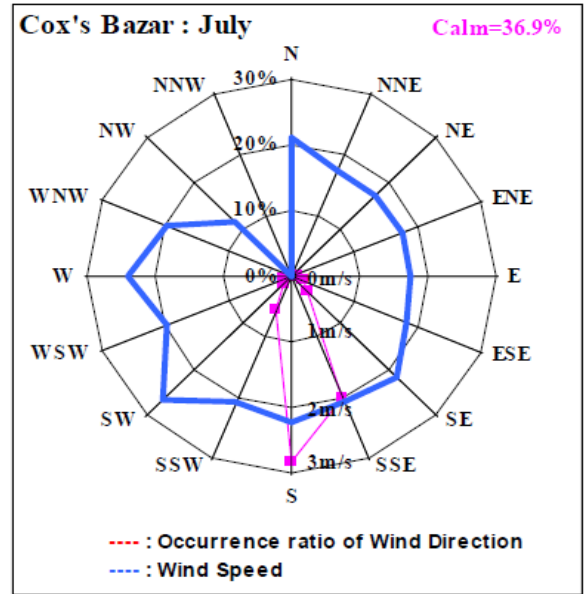
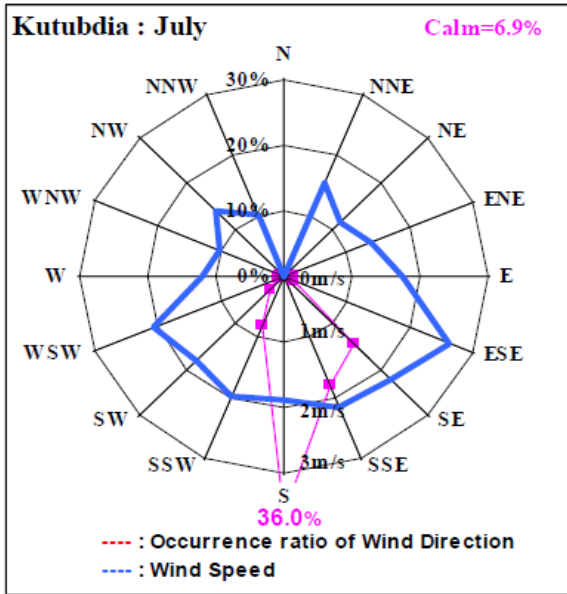
5.2.5 Wind Speeds

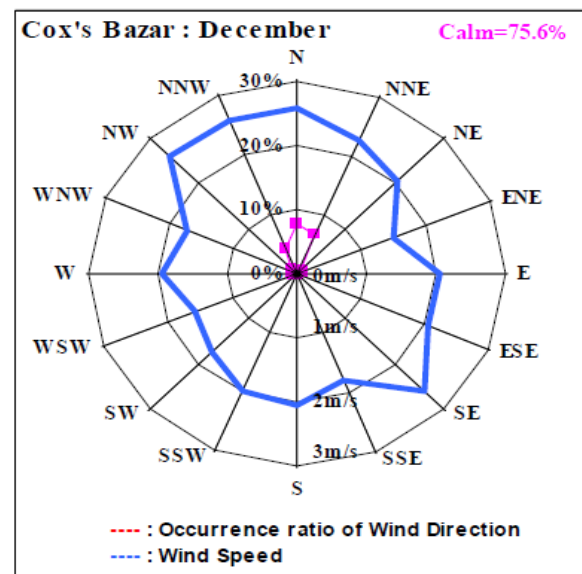
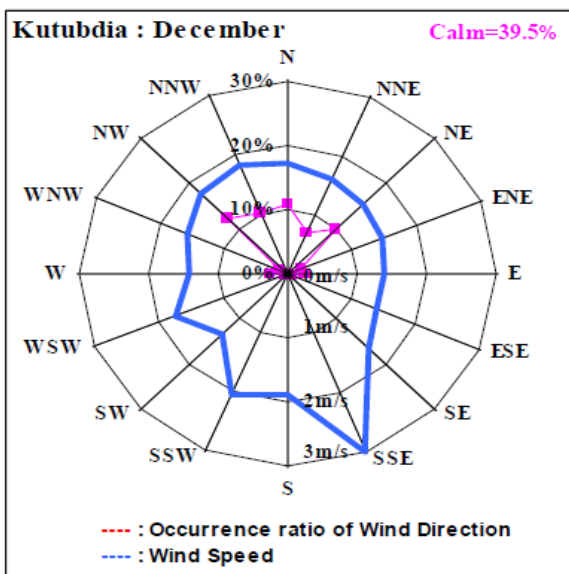
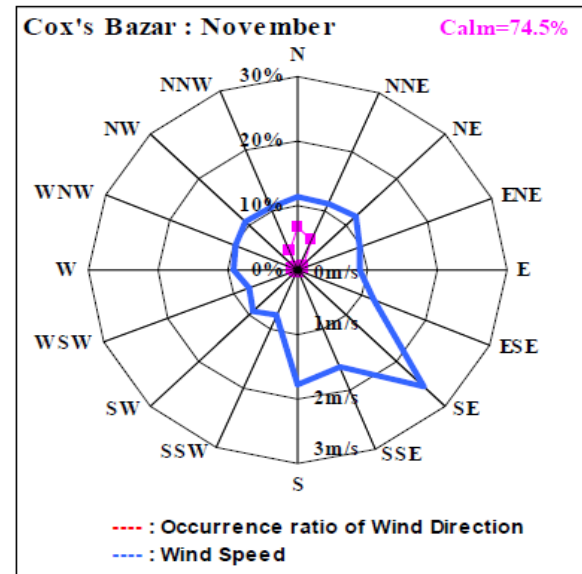
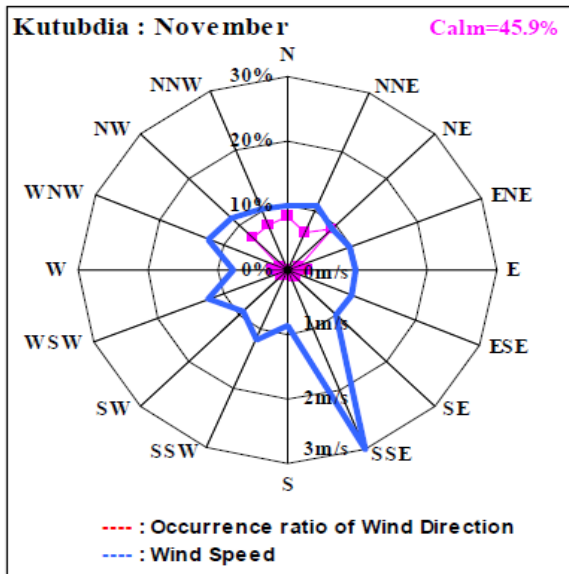
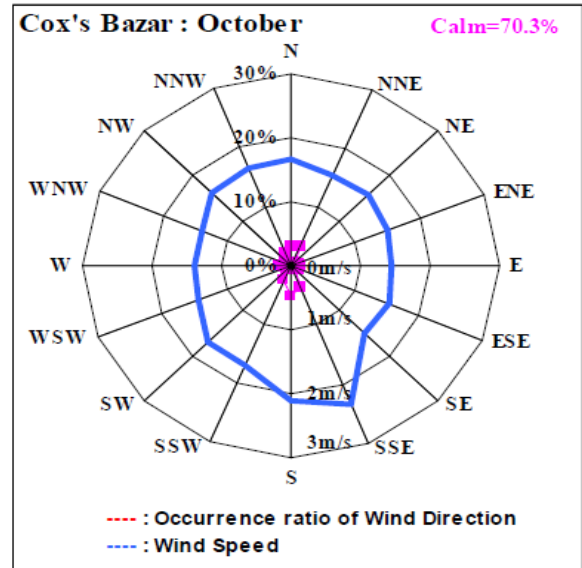
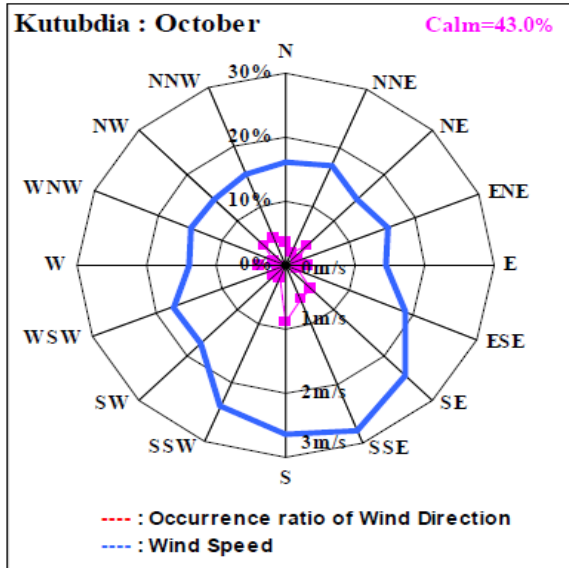
The Figure given below indicates the monthly frequency ratio of wind direction and the average wind speed for each wind direction in Kutubdia and Cox’s Bazar. The data was missing in Kutubdia for 2006. In Cox’s Bazar, “Calm (wind speed 0.5m/sec and lower)” occurs most frequently, accounting for more than 50% from September to March. Except for this difference, the wind directions in both areas show similar tendencies. Northerly winds are dominant in January and February, and no significant high wind speed was observed in specific wind direction. Southerly winds become dominant from March, especially from April to September. In July and August, there is a tendency of slightly higher wind speed in southwesterly winds, otherwise no significant high wind speed was observed in any specific wind direction. Wind direction shifts from southerly winds to northerly winds in October, and there is a tendency of high wind speed of southwesterly winds. Northerly

winds are dominant in November and December, but high wind speed tends to occur in southwesterly winds.









Source: EIA of Construction of Matarbari 600X2 MW Coal Fired Power Plant and Associated Facilities

Figure 10: Monthly wind rose

5.2.6 Sun Shine Hours

Sunshine duration or sunshine hours is a climatological indicator, measuring duration of sunshine in a given period (usually, a day or a year) for a given location on Earth; typically expressed as an averaged value over several years. It is a general indicator of cloudiness of a location, and thus differs from insolation, which measures the total energy delivered by sunlight over a given period. Sunshine duration is usually expressed in hours per year, or in (average) hours per day. In the project area, December is the sunniest, followed by January and November. July and August has the lowest amount of sunshine. The average monthly sunshine hours at the project has been given in Figure 11.

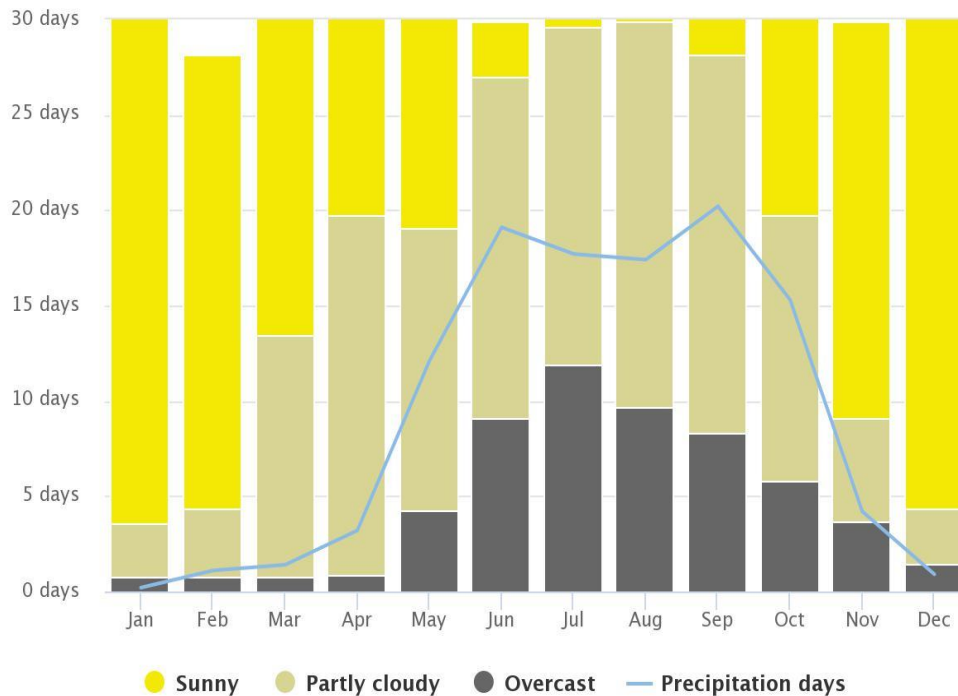


Figure 11: Average monthly sunshine hours in the project area

Source: BMD

5.3 Air Quality and Noise

5.3.1 Ambient Air Quality of the project site with respect to Standard of ECR, 1997

Maheshkhali Upazila is not industrialized. The present ambient air quality of the concerned area, as a result, is not much contaminated. To assess the present air quality of the area, one Ambient Air Quality Monitoring (AAQM) Stations were setup. The locations of the monitoring stations for air quality study were selected on the basis of meteorological data, topography, sensitive locations etc. Predominant wind direction during the season is from south and south west. Monitoring was conducted in respect of the following parameters:

- Total Suspended Particulate Matter (SPM)
- Sulphur Dioxide (SO₂)
- Nitrogen Oxides (NO₂)

All the above mentioned pollutants were monitored at the station. The equipment was placed at a height of 3 to 7 meters above ground level at the monitoring stations, thus negating the effects of windblown ground dust and free from vertical obstructions within a cone of 120° from the actual position of the sampler, to avoid any impedance to the pollutants. The equipment was always placed

at open space free from trees and vegetation which otherwise act as a sink of pollutants resulting in lower levels in monitoring results. The results were compared with respect to Standard of ECR, 1997 for industrial and mixed area. Summary of the monitored air quality results are given below in the following Table. All the air quality parameters were within the acceptable range prescribed by Environmental Conservation Rules (ECR), 1997.

Table 41: Determination of air quality of the project area

Air quality parameters	SPM ($\mu\text{g}/\text{m}^3$)	SO _x ($\mu\text{g}/\text{m}^3$)	NO _x ($\mu\text{g}/\text{m}^3$)
Average concentration	56	4.4	7.5
Standard Limit (ECR, 1997)	Below 200	Below 120	Below 100

Source: Bangladesh Environmental Engineering Training & Lab Services Ltd.

5.3.2 Ambient Noise Level of the Project Site with respect to Standard of Noise Pollution (Control) Rules, 2006.

Data indicates that the existing noise levels in proposed area are within the range of Bangladesh Environmental Quality Standard as well as WB General EHS Guidelines, 2007 for residential zone. This report uses the primary data as baseline data of noise environment.

Table 42: Noise level in the project area

Location	Noise level dB(A)	BD Standard dB(A) (Noise Pollution (Control) Rules, 2006)
	Day	Day
South-West Corner	57	75
North-West Corner	51	
South-East Corner	48	
North-East Corner	45	

Source: Bangladesh environmental engineering training & lab services ltd.

The baseline noise environment in the project area was within the range accepted by Bangladesh Environmental Quality Standard (Noise Pollution (Control) Rules, 2006).

5.3.3 Air Pollution and Noise Sources from existing and known sources

Existing and Known Sources of Noise

Noise attenuation is typically described as a set reduction in decibel level per doubling of distance from the source. Depending on the nature of the noise source, sound propagates at different rates. Measures of sound level from a source should specify the distance from the source. The standard reference distance for sound levels at the source is 50 feet. Natural factors such as topography, vegetation, and temperature can further reduce noise over distance. The two most common types of noise are point source and line source. Point source noise is associated with noise that remains in one place for extended periods of time, such as with construction activities. Line source noise is generated by moving objects along a linear corridor. Highway traffic is the best example of line source noise. The standard reduction for point source noise is 6 dB per doubling of distance from the source while for a line source it is 3 dB per doubling of distance from the source.

Construction Noise

One of the easiest things to identify and one of the hardest things to quantify is noise associated with the actual construction of the project. How much noise construction activities will generate, how often will it occur, and how long will it last are all questions that should be answered in the assessment. Construction is usually performed in a series of steps or phases, and noise associated with different phases can vary greatly. However, similarities in noise sources allow typical

construction equipment to be placed into one of three categories: heavy equipment, stationary equipment, or impact equipment.

Heavy equipment

Heavy equipment can be defined as earth-moving equipment, such as excavating machinery like excavators, backhoes, and front loaders, as well as handling equipment like graders, pavers, rollers, and dump trucks. Noise levels at 50 feet from heavy equipment range from about 72 to 97 dB. During the phase of construction using heavy equipment, noise is generated more or less at a constant level. Therefore, noise levels can be equated to an average hourly level.

Stationary Equipment

Stationary equipment such as pumps, power generators, and air compressors, effluent treatment plant (ETP) etc., generally run continuously at relatively constant power and speed. Noise levels at 50 feet from stationary equipment can range from 68 to 88 dB, with pumps typically in the quieter range. An averaged noise level may be assumed for stationary equipment because of its fixed location and constant noise pattern.

Existing and known sources of Air pollutants

There are several sources of air pollutants like stake emissions, emissions from different processing units, emissions from vehicles, emissions from landfill discharge, emissions from natural gas use, emissions from electricity consumption etc.

5.4 Water Resources

5.4.1 Surface Water System

The rivers of Bangladesh mark both the physiography of the nation and the life of the people. About 700 in number, these rivers generally flow south. The larger rivers serve as the main source of water for cultivation and as the principal arteries of commercial transportation. Rivers also provide fish, an important source of protein. Flooding of the rivers during the monsoon season causes enormous hardship and hinders development, but fresh deposits of rich silt replenish the fertile but overworked soil. The rivers also drain excess monsoon rainfall into the Bay of Bengal. Thus, the great river system is at the same time the country's principal resource and its greatest hazard. The profusion of rivers can be divided into five major networks.

- The Jamuna-Brahmaputra
- The second system is the Padma-Ganges
- The third network is the Surma-Meghna system
- The fourth river system--the Padma-Meghna
- A fifth river system, unconnected to the other four, is the Karnafuly.

The project area falls in the fifth river system of Bangladesh. The project area covers Kuhelia River. Figure 12 *Figure 12* shows the existing river network map of the project area.

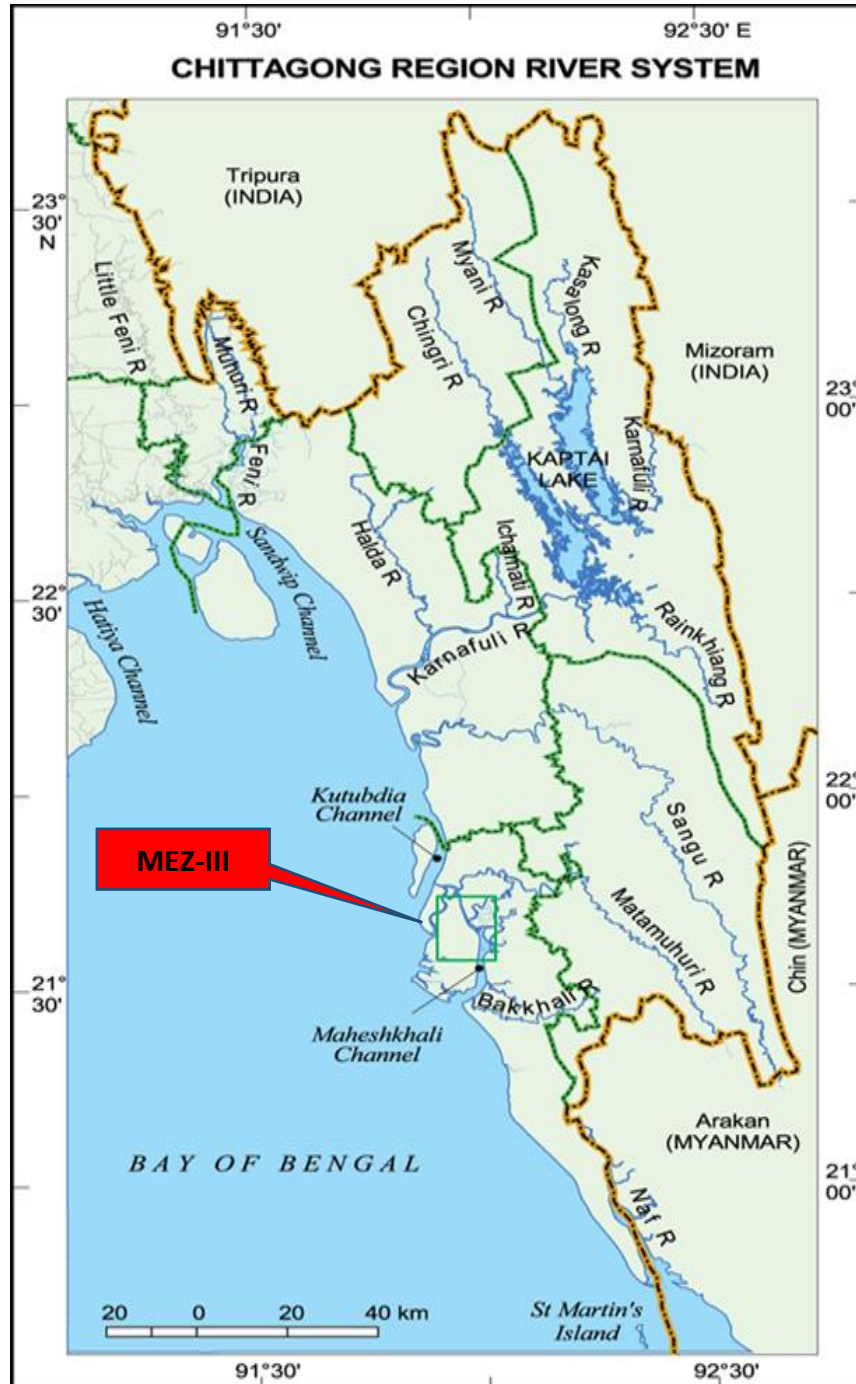


Figure 12: River system map

Source: National Encyclopedia of Bangladesh, Banglapedia

Water quality Analysis

Water sampling and analysis were undertaken to understand the overall baseline water quality characteristics of the surface and groundwater in the project area. The surface water sampling was based on the identification of the major surface water body and its interaction with the project. Ground water sampling locations were selected to obtain representative water samples from various zones within the project area. The samples were collected from existing tube well (Hand pump being used by the villagers). A total of five (5) samples, three (3) surface water samples and two (2) ground water samples were collected from the studied area. The samples were analyzed for parameters covering physical, chemical and bacteriological characteristics as mentioned in the scope of works.

Water samples were collected randomly in pre-washed sterile glass bottles. The surface water quality was compared with the Bangladesh ECR standard for best practice classification criteria and has been given in the following Table.

The local people use surface water for domestic and a little bit drinking purposes. The MEZ-III will use the surface water during different phases i.e., pre-construction and construction. For operational activities, the project will use ground water through deep tube-well system and if the project uses surface water during operation phase, it will treat through water treatment plant (WTP) before use. Since adjacent to the project site, there is a likelihood of polluting the river and sea due to wastewater discharge and runoff during rainy season. To mitigate this, the project has a provision of using CETP to treat wastewater before discharge, if produced. No effluent (solid or liquid) will be discharged into the river without being treated. The possibility of leakage of oil and other pollutants can make the rainwater within the project site polluted. So, the rain water (susceptible of containing pollutant) will not be discharged into the river without treatment. Appropriate boundary wall will be built to prevent runoff and raw material (including toxic substances) will be transported by covering and stored with protection.

Table 43: Surface water quality near the project site

Water quality parameters	Unit	Concentration	Bangladeshi Standard for Inland Surface Water (ECR, 1997)	Methods of Analysis
pH	-	7.80	6 - 9	pH meter
DO	mg/L	5.7	4.5 – 8	DO Meter
Chloride	mg/L	106	600	APHA, 1998
Phosphate	mg/L	1.8	8	APHA,1998
BOD ₅	mg/L	5.8	50	DO Meter
COD	mg/L	112	200	APHA, 1998
Ammonia	mg/L	2.8	50	UVS
Total coliform (TC)	CFU/100ml	> 200	-	Membrane Filter method
Salinity	ppt	9.8	-	Portable salinity kit
Suspended solid	mg/L	145	150	APHA,1998
Arsenic (As)	mg/L	Nil	0.2	AAS
Iron	mg/L	0.20	0.18	APHA, 1998

*CFU= Colony Forming Unit

Source: Bangladesh environmental engineering training & lab services ltd.

5.4.2 Tropical Cyclones and Tidal Flooding

Natural hazards can be categorized into three broad categories in Bangladesh, like exogenic hazards caused by the earth surface processes (flood, riverbank erosion, coastal erosion, landslide, soil erosion and groundwater contamination); endogenic hazards caused by internal earth processes (earthquake and volcanic eruption); and, atmospheric hazards caused by atmospheric processes (storm, cyclone, northwester, tornado, hurricane, drought, etc.). On many occasions there are overlaps between these different events. Natural hazards can be profiled against seven basic criteria such as event magnitude, frequency of occurring, duration and areal extent, speed of onset, spatial dispersion and temporal spacing.

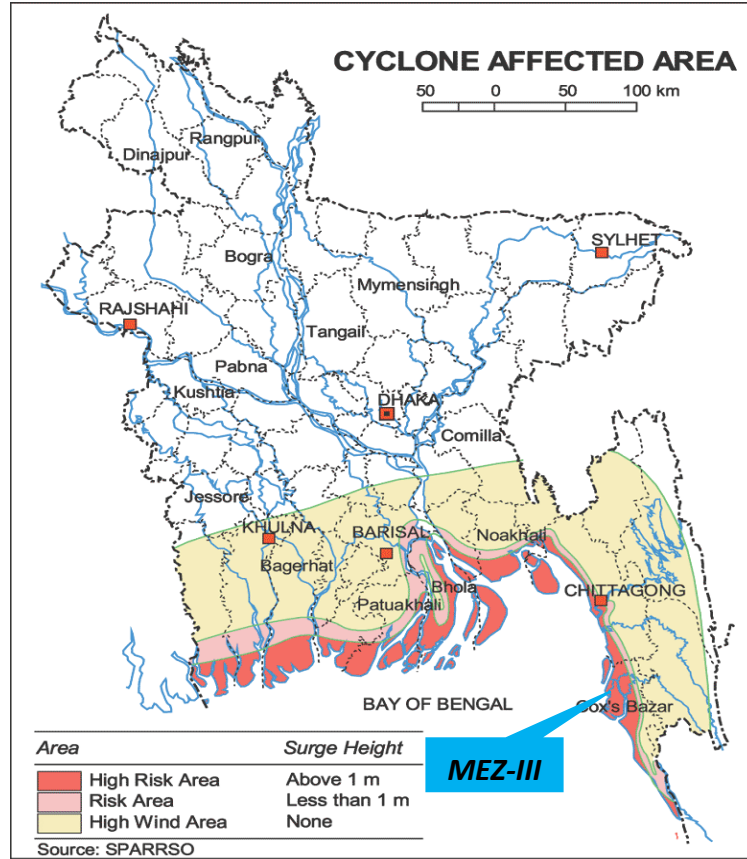


Figure 13: Position of MEZ-III at cyclone affected areas of Bangladesh

Source: SPARRSO

During the years 1960 to 2015, Bangladesh was hit by 55 severe cyclones, 33 of which were accompanied by storm surges. List of major cyclones recorded in Chittagong-Cox's Bazar area in last 30 years is presented in Table 44.

Table 44: List of major cyclonic storms in project area

Year	Location	Maximum wind speed (Km/h)	Height of storm surge (m)	Causality	Damages
24–25 May, 1985	Chittagong, Cox's Bazar, Noakhali, coastal islands (Sandwip, Hatiya, and Urirchar)	Chittagong-154, Sandwip-140, Cox's Bazar-100	3.0-4.6	11,069 people, 135,033 cattle died.	94,379 houses and 74 km of road, and embankments destroyed.
18 December, 1990	Cox's Bazar Coast	115	-	-	-
29–30 April, 1991	Chittagong, Sandwip, Cox's Bazar, Khepupara, Bhola	Sandwip-225, Chittagong-160, Khepupara (Kalapara)-180, Kutubdia-180, Cox's	5 - 8	The storm made landfall near the coast north of Chittagong port during the night of the 29th April 150,000 people,	Loss of property was estimated at about Tk 60. Billion.

Year	Location	Maximum wind speed (Km/h)	Height of storm surge (m)	Causality	Damages
		Bazar-185 Bhola-178		70,000 cattle died.	
29 April-3 May, 1994	Coastal islands, Cox's Bazar	210	-	400 people, 8,000 cattle died.	-
21-25 November, 1995	Coastal islands, Cox's Bazar	210		650 people, 17,000 cattle died.	-
16-19 May, 1997	Coastal islands and chars near Chittagong, Cox's Bazar, Noakhali and Bhola districts	225	3.05	126 people died.	
25-27 September, 1997	Coastal islands near Chittagong, Cox's Bazar, Noakhali and Bhola	150	1.83 - 3.05	-	-
16-20 May, 1998	Coastal islands near Chittagong, Cox's Bazar, and Noakhali	150	1.83- 2.44	-	-
19 May, 2005	Cox's Bazar	65-90	0.6-1.2	-	-
14-15 May, 2007	Cyclone Akash struck about 115 km south of Chittagong	120	-	14 people were died.	US\$ 982 million amount property damage
15 November, 2007	Coastal islands near Chittagong, Cox's Bazar	260	-	Made landfall on southern Bangladesh, causing over 3,500 deaths.	Severe damage
17 April, 2009	Chittagong, Cox's Bazar coastal area	90	-	-	-
16-17 May, 2013	Mahasen, hit near Chittagong	85	-	17npeople died, and nearly 1.3 million were affected across the country.	Losses to crops exceeded US\$5.14 million.
29 July, 2015	Cyclone Komenhit near Chittagong.	75	-	The floods killed 132 people, of which at least 39 were directly related to Komen.	About 510,000 houses in the country were damaged and many residents lost their source of income. 667,221 acres (270,000 ha) of crop fields were damaged.

Year	Location	Maximum wind speed (Km/h)	Height of storm surge (m)	Causality	Damages
21 May, 2016	Cyclone Roanu made landfall near Chittagong.	100	-	killing people 26	Around 40,000 homesteads and business houses were damaged. Food storage, seasonal crops were damaged. Livestock, including fish and shrimp farms were swept away.

Source: Draft Environmental and Social Impact Assessment for Proposed Kutubdia LNG Project, 2017 (Vol:4)

The project area experiencing two types of flood like tidal and storm surge flood. Tidal flooding experienced in project areas in tow times in a day. During this flooding river water level is higher than normal level. Storm surges is a type of flood in which the project site is located, mostly occurred along the coastal areas of Bangladesh which has a coast line of about 800 km along the southern part of Bay of Bangle. This coastal area is shallow and the coastal line in the eastern portion is conical in shape. Therefore, storm surges are likely to occur due to flood tides of cyclones and southwestern monsoon winds.

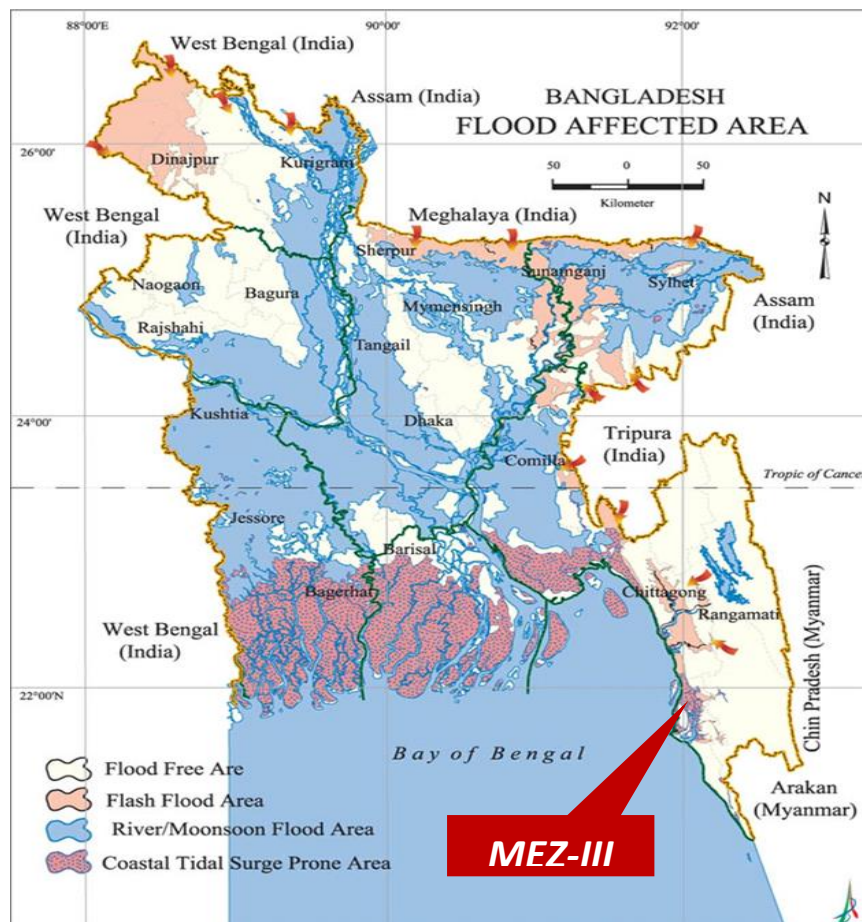


Figure 14: Position of MEZ-III at flood prone areas of Bangladesh

Source: www.thebangladesh.net

The Kohelia River itself is ungauged. So, there is no measured water level and discharge data of the river. However, there are a few surrounding rivers/Channels for which water level data is available.

These data were collected from the Bangladesh Water Development Board (BWDB) and Water Resources Planning Organization. The details of the data collected are given in Table 45.

Table 45: Water level data near the project site.

Water bodies/ River/ Channel	Highest flood in m PWD(Year)
Maheshkhali Channel	4.36 (1985)
	4.21 (1983)
	4.20 (1987)
	4.20 (1988)
	4.20 (1989)
Kutubdia Channel	5.46 (1971)
	4.90 (1972)
	4.20 (1997)
	2.23 (2005)

Source: BWDB, WARPO

A study conducted by CPGCBL, showed that considering the above gauge stations with respect to Kohelia River at Maheshkhali, the 50-year flood level was estimated to be about 4.63 m PWD and the 50-year mean tidal water level about 2.74 m PWD.

5.4.3 Salinity

Saline water intrusion is highly seasonal in Bangladesh. Salinity and its seasonal variation are dominant factors for the coastal eco-system, fisheries and agriculture. Therefore, any change in the present spatial and temporal variation of salinity will affect the biophysical system of the coastal area. The changes in salinity in the coastal area of Bangladesh have been assessed by IWM & CEGIS, 2007 on Coastal Communities and their Livelihoods in Bangladesh. Based on the study results, the iso-saline lines of 1 & 5 ppt for base condition and 1, 5 & 15 ppt have been drawn for 2050s conditions (given in the Figures below). These figures indicate that in base condition about 10% areas are under 1 ppt salinity and 16% under 5 ppt salinity and this area will increase to 17.5% (1 ppt) and 24% (5 ppt) by 2050s. From the figures, it is clear that the proposed project is very adjacent to the salinity wave front.

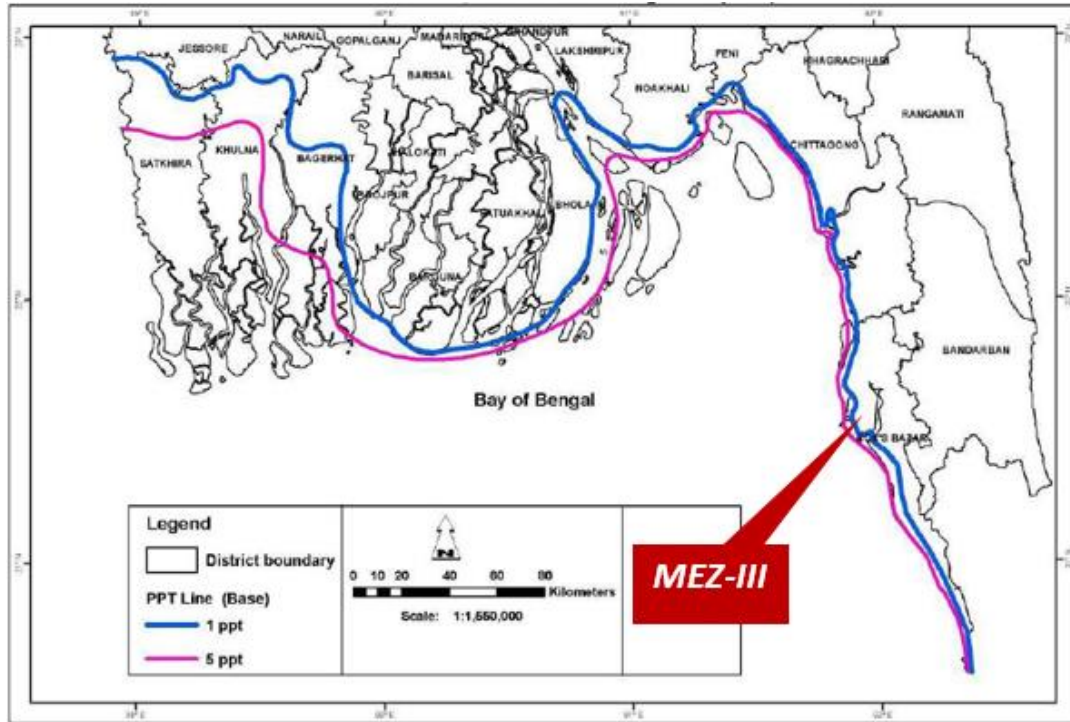


Figure 15: Salinity condition in coastal area (for base condition)

Source: EIA on proposed 6.5 km long embankment cum road construction from Rajghat Bridge, Matarbari to Mohiraghona, Dhalghata under Matarbari 2x600 MW USC Coal-Fired Power Project

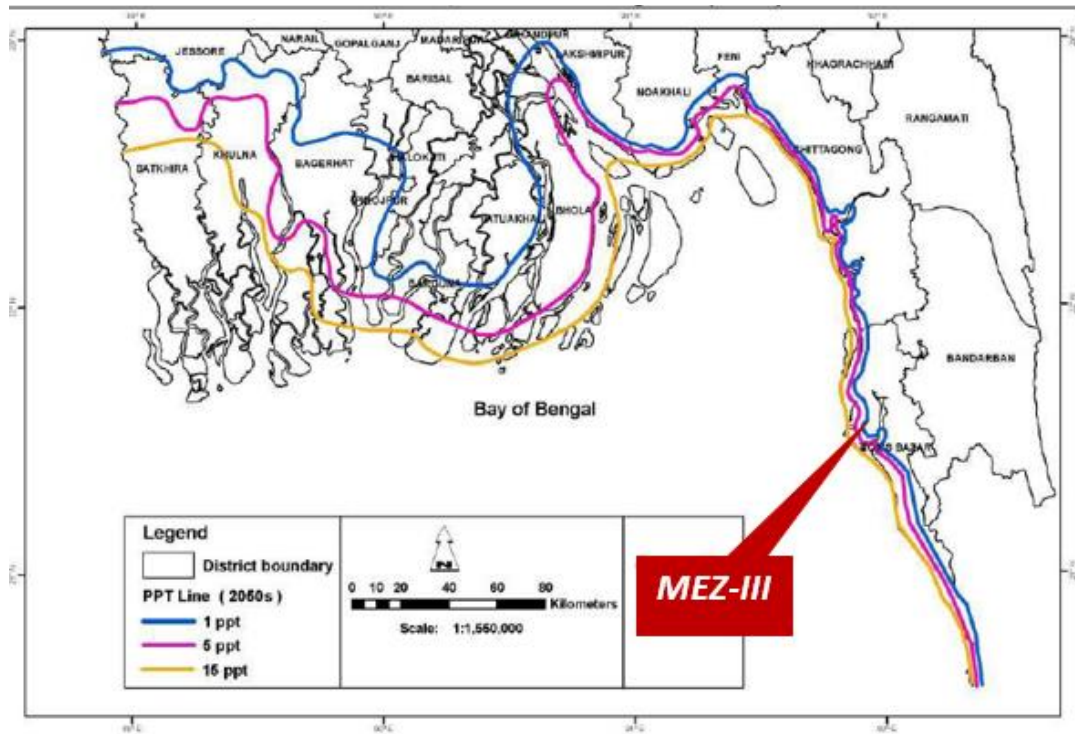


Figure 16: Salinity condition in coastal area (for 2050)

Source: EIA on proposed 6.5 km long embankment cum road construction from Rajghat Bridge, Matarbari to Mohiraghona, Dhalghata under Matarbari 2x600 MW USC Coal-Fired Power Project

5.4.4 Drainage Congestion and Water Logging

Drainage congestion and water logging are not prominent in the study area. The project area has already been bounded by water development board embankment on Koheli River. Few part of the

embankment was breached. During high tide, water frequently enter to the project area through Kohelia River breaching embankment and Bara Matamuhuri khal and other connecting khals meanwhile it inundates the lowland. Accordingly, during ebb tide, water drain out properly so drainage congestion is not found the study area. During monsoon period, most of the low land becomes full of water. From the study it is observed there would not be any significant impact of the proposed project. This is mainly due to the fact that the BWDB polder already exists and it will only be improved.

5.4.5 Erosion and sedimentation

Millions of people of the country are affected by riverbank erosion every year that damages standing crops, farmland and homestead land. The site is vulnerable for bank erosion. The erosion activity is being lower down the river bed of Kohelia through sedimentation of materials. The proposed embankment cum road along the west of Kohelia River of the island shall be made very strong and permanent to save the island from cyclone, tidal waves aid erosion along with Sedimentation.

Table 46: Occurrence of river erosion in various Upazilas of Cox' Bazar district (2008-2011)

Upazilas	2008	2009	2010	2011
Chakaria	Yes	Yes	Yes	Yes
Cox's Bazar Sadar	No	No	No	No
Kutubdia	No	No	No	No
Maheshkhali	No	No	No	No
Pekua	No	No	No	No
Ramu	No	No	No	No
Teknaf	No	No	No	No
Ukhia	No	No	No	No

Source: BBS, 2011

MEZ-III authority will build protective embankment and boundary wall to prevent both riverbank and soil erosion through surface runoff of the project.

5.4.6 River Morphology

The terms river morphology used to describe the shapes of river channels and how they change over time. The morphology of a river channel is a function of a number of processes and environmental conditions, including the composition and erodibility of the bed and banks (e.g., sand, clay, bedrock); vegetation and the rate of plant growth; the availability of sediment; the size and composition of the sediment moving through the channel; the rate of sediment transport through the channel and the rate of deposition on the floodplain, banks, bars, and bed; and regional aggradation or degradation due to subsidence or uplift.

The Delft 3D model can be used for morphological change prediction purpose. The Flow Module of the model with the sediment and morphology components enabled was used to predict morphological changes in the Kohelia River. As the embankment-cum-road is already in place and its alignment would be more or less the same under the proposed condition, the model was run a number of times with the grid and bathymetry setup earlier for base condition. The information on sediment characteristics was derived based on the data provided in JICA et al. (2013). In the given Figure, shows the cumulative erosion/sedimentation scenarios for both base condition and three future time horizons (5, 10 and 20 years later). The overall results indicate that the morphological changes may be more in the lower reaches of the river than that in the upper reaches. These lower reaches may show both erosion and deposition in the future. The main channel between the

downstream end and the middle reach may become deeper in future due to bed erosion. Both sides of the deeper channel show a pattern of siltation due to low velocity in the short to medium terms (5-10 years). In the long term (10-20 years), the banks of the river show a tendency of erosion. Thus, erosion protection measures would be needed throughout the river.

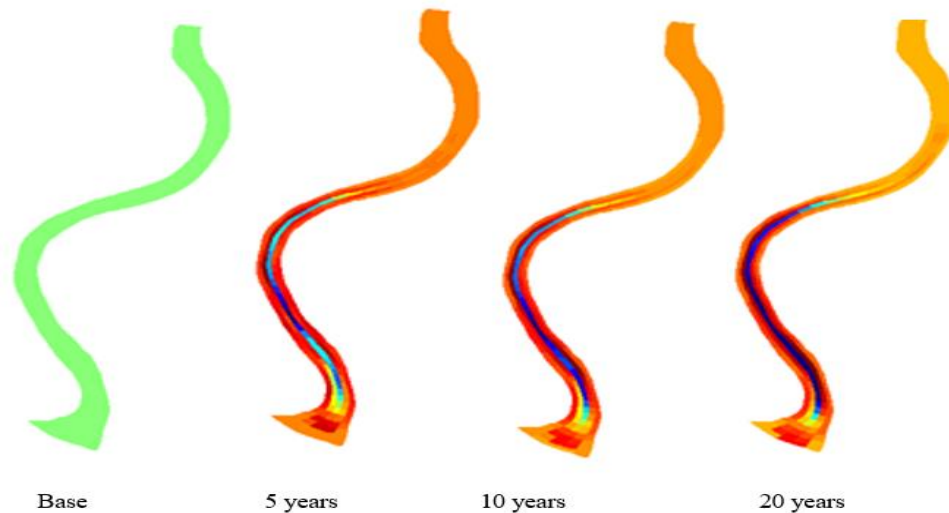


Figure 17: Simulated time series maps of erosion-sedimentation in the Kohelia River with the Delft 3D model

(Note: The deep blue color indicates erosion, the deep red sedimentation and others indicate more or less no change)

Source: EIA on proposed 6.5 km long embankment cum road construction from Rajghat Bridge, Matarbari to Mohiraghona, Dhalghata under Matarbari 2x600 MW USC Coal-Fired Power Project

5.4.7 Navigation

Major rivers include Matamuhuri River, Uzantia, Kohelia, Masgona rivers and Maheshkhali channel are adjacent to the project area which would be utilized for transportation of construction materials of the infrastructure of the project. This river is enough depth of navigability for river transportation especially cargo, steamer etc. The water of the Kohelia River is used mainly for the transportation of cash crops like (salt and shrimp) and fishing by non-engine and engine driven country boats. The erosion material is being deposited in the river bed leading to somewhat low navigable depth. But navigation of the rivers is now still active.

5.4.8 Ground Water System

Bangladesh is located over a subsiding basin of tectonic origin with a great thickness of sedimentary strata. This is an unconsolidated alluvial deposit of recent to sub-recent age overlying marine sediments. The recent delta and alluvial plains of the Ganges, Brahmaputra and the Meghna Rivers constitute the upper formation. The near surface quaternary alluvium contains good aquifer characteristics (transmission and storage coefficients). The groundwater storage reservoir has three divisions; upper clay and silt layer, a middle composite aquifer (fine to very fine sand) and a main aquifer consisting of medium to coarse sand.

Groundwater table fluctuations indicate the recharge and discharge to the groundwater reservoir. The highest groundwater table occurs in the study area during the month of August-September when the aquifer recharges fully and the lowest is during February-March due to natural discharge and groundwater use for domestic and irrigation purposes.

Groundwater is abundant in Bangladesh and the aquifers are highly productive. The sediments are predominantly non-indurated and easy to drill by hand, at least to shallow levels. Water tables vary across the country but are typically shallow at around 1–10 m below the ground surface. These factors have made groundwater an attractive and easily accessible resource and have led to a rapid proliferation in the use of groundwater over the last few decades. Today, 97% of the population relies on groundwater for potable supplies and groundwater is also an important source for irrigation and industry. Groundwater levels across Bangladesh become depressed during the dry season, but the aquifers replenish fully during the monsoon. Exceptions occur beneath the major cities, especially Dhaka, where large-scale abstraction has led to long-term drawdown of the water table.

The number of tube wells in Bangladesh is not known but estimates put the number at around 6–11 million. The vast majority of these are private tube wells, which penetrate the shallow alluvial aquifers to depths typically of 10–60 m. Irrigation boreholes typically tap deeper aquifers in the region of 70–100 m depth. In some areas, notably the south and the Sylhet Basin of north-east Bangladesh, deep tube wells abstract groundwater from depths of 150 m or more. In the south, the deep tube wells have been installed to avoid high salinity at shallower levels (BGS and DPHE, 2001). Shallow hand-dug wells occur in some areas, though they are much less common than tube-wells. In the project area more than 90% people use ground water as a source of drinking water.

It is observed from the ground water analysis that Arsenic, Iron, Manganese and Total Dissolve Solids content in the ground water of the project area exceeded the Bangladesh Standard and Testing Institutes (BSTI) standard. Around 89.5% water used from ground in the project area (BBS, 2011).

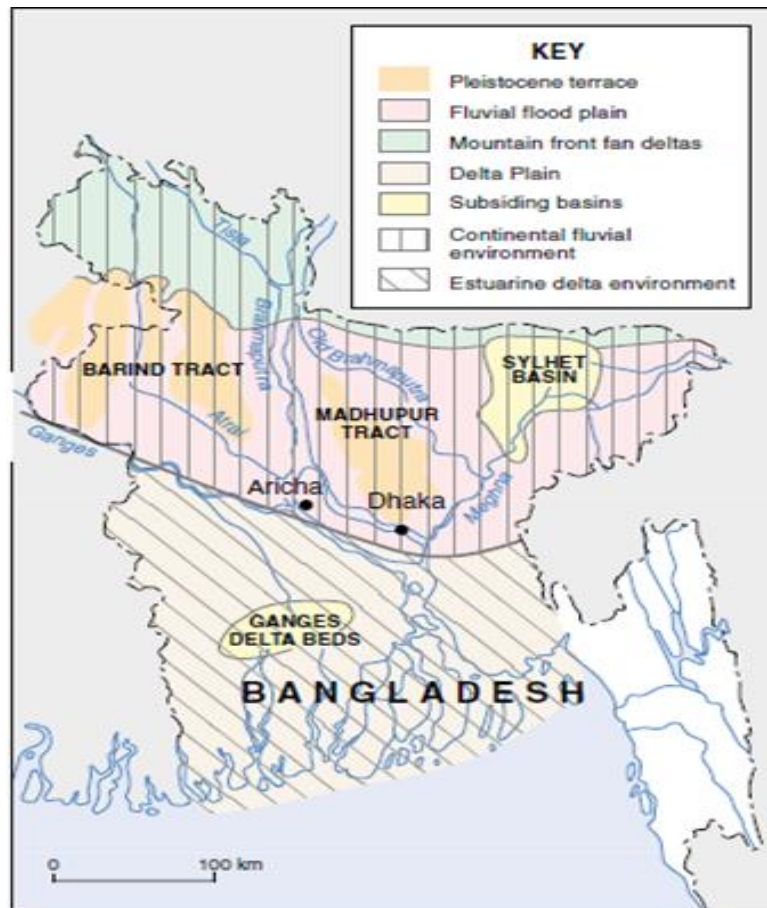


Figure 18: Simplified geology and geomorphology of Bangladesh

Source: British Geological Survey, NERC, 2001

Table 47: Ground water quality data of the project site

SL. No.	Parameter	Unit	Concentration present	Bangladesh Standard for Drinking water (ECR, 1997)	Analysis Method
1.	Temperature	°C	27	-	Digital thermometer
2.	P ^H		7.15	6.5-8.5	P ^H meter
3.	TDS	mg/L	723	1000	Conductivity meter
4.	Turbidity	mg/L	2.1	10	Turbidity meter
5.	EC	μc/cm	1246	-	Conductivity meter
6.	Chloride	mg/L	156	150-600	APHA, 1998
7.	DO	mg/L	2.27	0.3-1	DO meter
8.	Salinity	mg/L	0.6	-	Salinity Meter
9.	Alkalinity	mg/L	280	-	APHA, 1998
10.	Total coliform (TC)	CFU/100ml	0	Nil	Membrane Filter method
11.	Fecal Coliform	CFU/100ml	Nil	Nil	Membrane Filter method
12.	Arsenic	mg/L	0.01	0.05	AAS
13.	NH ₃	mg/L	0.04	0.05	AAS

*CFU= Colony Forming Unit; *BDL= Below Detection Limit

Source: Bangladesh environmental engineering training & lab services ltd.

5.5 Land Resources

5.5.1 Agro-ecological regions

Agro-ecological Zones are land areas categorized on the basis of four elements such as physiography, soils, land levels in relation to flooding and agro-climatology. Physiography forms the primary element in defining and delineating the agro ecological regions in Bangladesh. Soils form the second element in defining and differentiating agro ecological zones as soil conditions determine important properties for plant growth, moisture supply, root aeration and nutrient supply. The third factor is land level in relation to flooding. The last one is related to different agricultural products for different climatic conditions of the regions (Banglapedia, 2017). It is considered in identifying agro ecological zones in Bangladesh comprises the four climatic zones of the country. Agro-ecological zone indicates an area characterized by homogeneous agricultural and ecological characteristics. This homogeneity is more prominent in the sub-region and unit levels.

The agro-ecological zones of Bangladesh have been divided in 30 regions. The proposed MEZ-III falls under the Chittagong Coastal Plain. This region occupies the plain land in greater Chittagong and the eastern part of Feni. It is a compound unit of piedmont, river, tidal and estuarine floodplain landscapes. The major problem in these soils is high salinity during dry season (October to May). Grey silt loams and silty clay loam soils are predominant. Acid Sulphate soils which are potentially extremely acidic occur in mangrove tidal floodplains. Non-calcareous Grey Floodplain soils, Non-calcareous Alluvium and Acid Sulphate soils are the major components of the general soil types of the area. General fertility level of the soils is medium, and N and K are limiting. Status of S is high. Organic matter content is low to moderate and the status of Zn and B is medium.



Figure 19: Agro-ecological regions of Bangladesh

Source: www.thebangladesh.net

5.5.2 Land Types

Based on depth of inundation during monsoon season, land type of Bangladesh has been classified. In terms of depth of flooding, five classes of land type are recognized (SRDI, 1988), these are high land (above flood level), medium highland (flooding depth 0-90 cm), medium lowland (flooding depth 90-180 cm), low land (flooding depth 90-270 cm) and very lowland (flooding depth >270 cm). The land type characteristics are uniform within the study area, although the land type of Cox's bazar district is medium high land. Out of total 26456 acres of land, 24% (6340 acres) low land, 59% (15500 acres) medium land and 17% (4616 acres) are high land in Maheshkhali. The land type of proposed MEZ-III is medium high land. Figure 20 show the land types of proposed project.

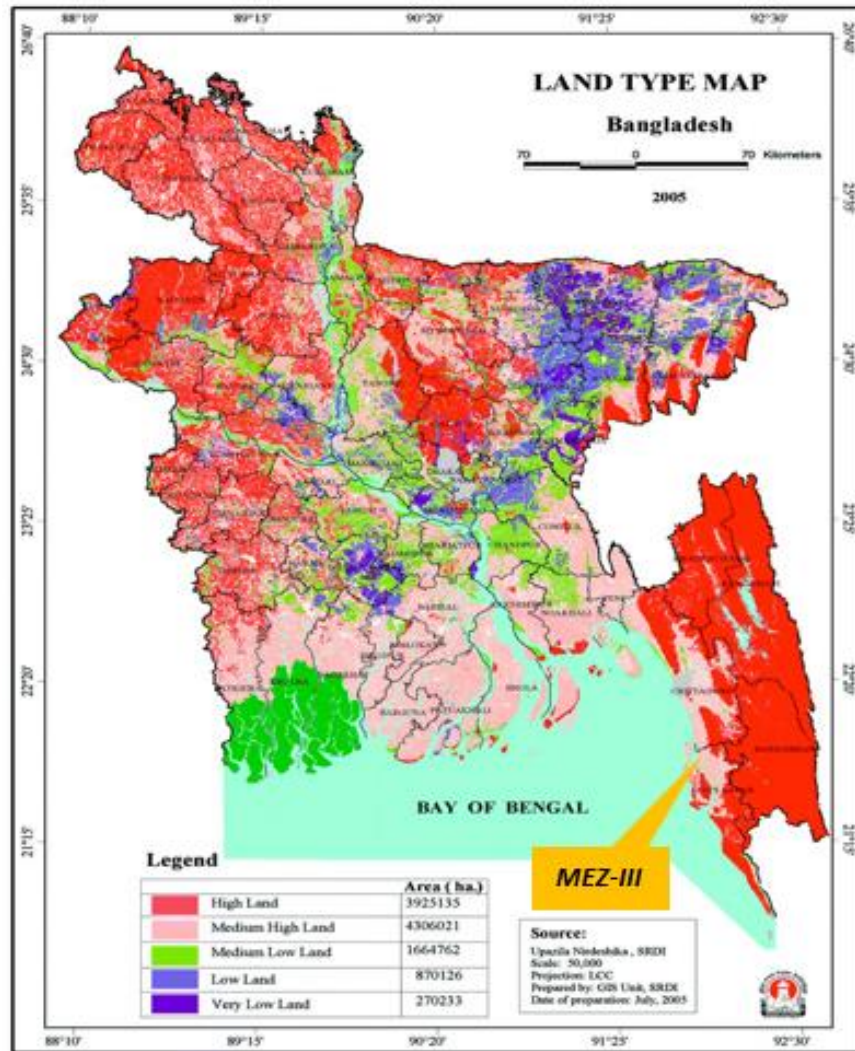


Figure 20: Land types map of Bangladesh indicating the project site

Source: SRDI, 1997

5.5.3 Soil Texture

Soils of the project area are mainly formed from recent alluvial sediments. The area has a wide variation in geology and landforms due to variation of sediment deposits or deposited in different times from Karnaphuli, Sangu, Matamuhuri, Banshkhali and Naf Rivers. On the basis of broader characteristics of the alluvia, the whole area is mainly divided into two physiography i.e. tidal floodplains and sandy beaches.

Tidal flood plains are tidally flooded, very poorly drained, finely stratified now silty to clayey alluvium. They are occurring on tidal mud flats, regularly tidally flooded and remain wet throughout the year. The alluvium is mostly moderately to strongly saline. Mangrove tidal floodplains are grey colored, silty clay loam to clayey non-saline soils are occurring in high to medium highlands. Some medium lowlands are seasonally moderately deeply flooded. Soils in this type of lands are grey colored, moderately fine textured and strongly saline (often used for salt bed). This type of soils is mainly occurring in the Maheshkhali area especially in the Kuhelia river bank side. Beach sands soils are mainly grey in colour and sandy in texture. They are tidally flooded and strongly saline.

Food and Agricultural Organization (FAO) conducted a number of surveys classification presents a series of 28 general soil classes of Bangladesh (shows in the figure below). The project survey area

falls in the soil tract group 3, 10, 17a & 17b which are acid Sulphate soil; Grey Piedmont Soils; Mainly Deep, Brown (some red), Soils on low hills and Deep and Shallow Brown soils on very steep, high hill ranges respectively.

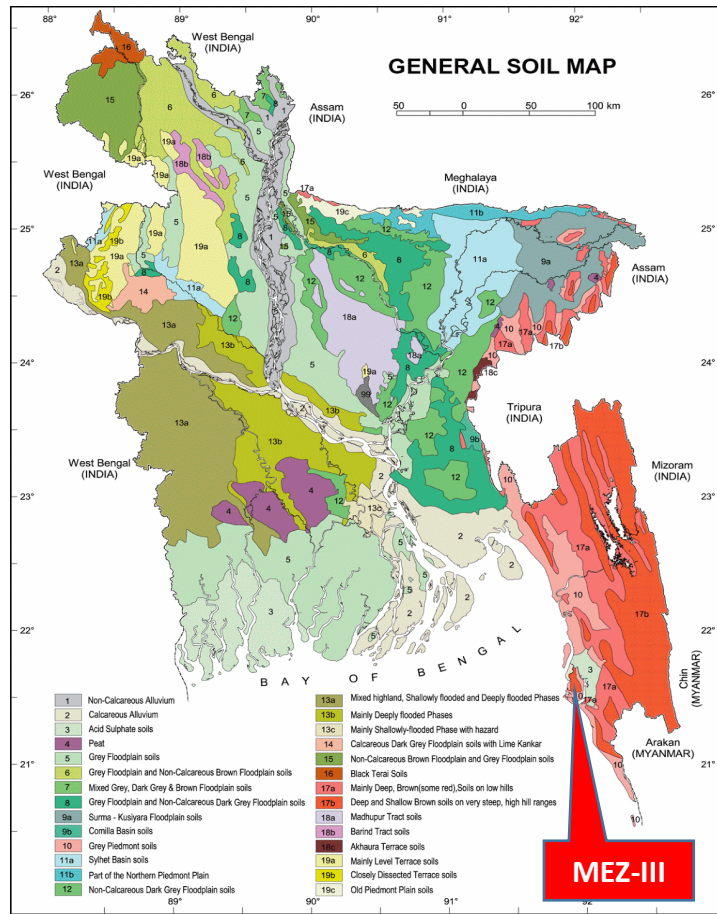


Figure 21: Soil classification map of Bangladesh

Source: Banglapedia

5.5.4 Land Use

Within the project area including directly benefited area, there are no substantial variations in land types and land use patterns. Land types of the project area are mostly medium high land. There are agricultural and industrial area, water bodies (Rivers, canals, small canals, Ponds, etc.), and fallow land, etc. Total area of Maheshkhali Upazila is 362.18 sq km (BBS, 2011). There is no reserve forest within the project area. The Bangladesh Bureau of Statistics, 2011, provided the land area based on utilization of Maheshkhali Upazila.

Land use in the project area are fully depends on the surface water availability, quality etc. In the Maheshkhali area 2073.4 hectares of land are used for salt production. Around 80% land is irrigable due to abundant surface water in and the project area. In Maheshkhali total cultivable land 5275.36 hectares, salt production 2073.4 hectares, shrimp cultivation 2105.69 hectares, fallow land 1715.21 hectares. Only 23% land is used for agricultural use¹⁵. The total operated land area of Maheshkhali Upazilla is 35168 acres, among them 1194acres, 15535 acres, 153 acres and 9574 acres are

¹⁵(Source:EIA on proposed 6.5 km long embankment cum road construction from Rajghat Bridge, Matarbari to Mohiraghona, Dhalghata under Matarbari 2x600 MW USC Coal-Fired Power Project).

permanent cropped area, temporary cropped area, permanent fallow area and others, respectively. Out of 15535 acres of temporary cropped area, 170 acres, 11505 acres, 2990 acres, and 1040 acres are current fallow, single, double and triple cropped area, respectively (BBS, 2011). Figure 22 shows the agricultural land use map of Bangladesh.

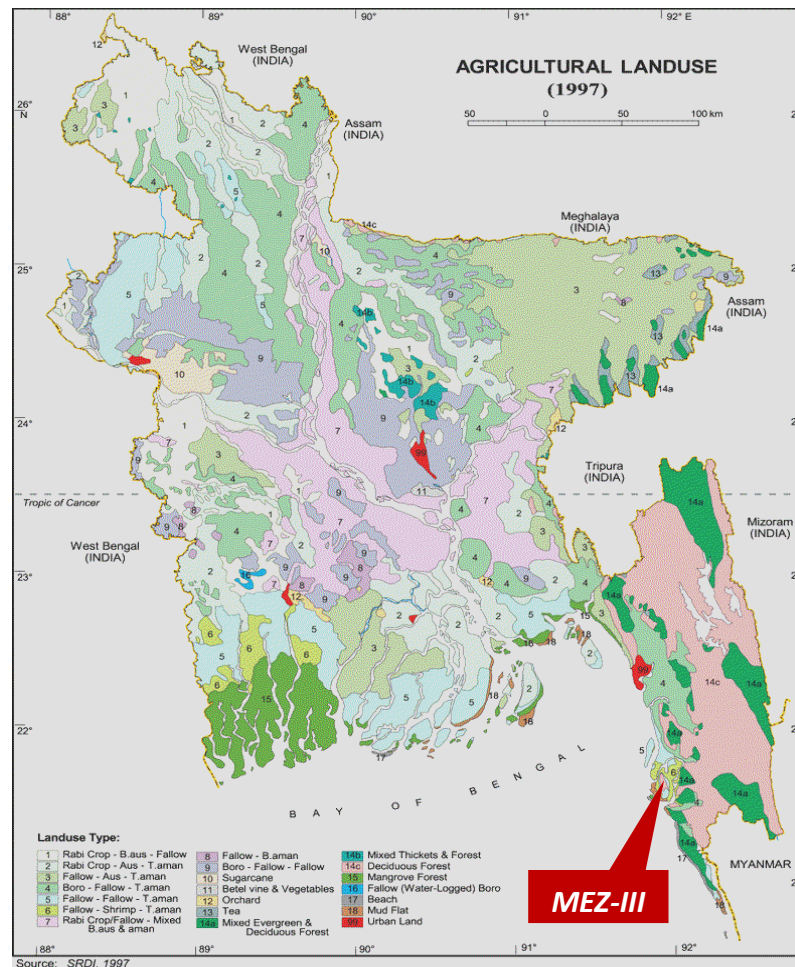


Figure 22: Agricultural land use map of Bangladesh

Source: SRDI

5.6 Agricultural Resources

5.6.1 Farming Practice

People are mainly farmers and fishers. Some are also involved with trade and commerce. Many people are having business in the Cox's Bazaar. No industry or other major economic enterprises were set up in the project area.

Local level employment is mainly in the agriculture sector. Land ownership pattern also shows that more than 60% are landless or marginal famers who work either as land labour, salt labour or boat labour. Among the rest only 10% are rich farmers and rest are small, middle or substantial farmers. Most of them are being own small plots of land.

Various types of farming practices occurred in the proposed project area are prominent as namely dairy, crop, fish farming etc. which is run by individually or combined or mixed. Mixed farming is a common practice in the study area.

Farmers cultivate their crops using their perception and indigenous knowledge about the environment, especially the duration and magnitude of flood. The project area has a diversified farming practice like Paddy, potato, pulse, onion, garlic, ginger, betel leaf, betel nut, wheat, sugarcane, ground nut, tobacco, rubber, vegetables etc. The following table shows the land area based on utilization of the project area.

Table 48: Land area based on utilization (area in acres and production in metric ton)

Name of the Crops	2010-2011		2009-2010	
	Areas	Production	Areas	Production
Wheat	0	0	0	0
Jute	0	0	0	0
Sugarcane	0	0	0	0
Lentil (Masur)	0	0	0	0
Mug	0	0	0	0
Maize	0	0	0	0
Gram	0	0	0	0
Motor	0	0	0	0
Kheshari	0	0	0	0
Mash-Kalai	0	0	0	0
Potato	100	600	90	560
Sweet potato	62	300	60	280
Rape and mustard	0	0	0	0
Ground nut	0	0	0	0
Til	0	0	0	0
Pepper	112	63	110	50
Onion	0	0	0	0
Garlic	0	0	0	0
Turmeric	0	0	0	0
Ginger	0	0	0	0
Tomato	75	480	70	460
Radish	62	225	60	210
Bean	62	100	61	95
Pumpkin	25	150	20	120
Parble (Potol)	0	0	0	0
Cabbage	0	0	0	0
Brinjal	85	420	80	400
Lady's finger	60	225	55	200
Arum	25	50	20	40
Cauliflower	0	0	0	0
Cucumber	75	540	70	500
Papaya	50	100	50	100
Guava	67	80	67	80
Lime and Lemon	12	10	10	10
Jackfruit	175	700	160	650
Banana	125	700	120	650
Pineapple	5	14	5	14
Mango	260	1050	250	1000
Litchi	25	25	26	25
Blackberry	25	450	24	420
Water melon	8	9	8	9

Source: BBS, 2011

5.6.2 Cropping Pattern and Intensity

Existing main cropping pattern of the project area is shrimp and salt cultivation. There are mainly three cropping pattern season exists. Kharif-I covers Mar-Jun, Kharif-II covers Jul-Oct, Rabi season covers Nov-Feb. Cropping pattern of the area is fallow - high yield variety (HYV) rice. The second prominent cropping pattern is fallow - local rice - pulses. The cropping intensity of Chittagong is about 187%. (Yearbook of Agricultural Statistics, 2015).

5.6.3 Cropped Area

The total operated land area is 26456 acres, permanent cropped is 1194 acres, temporary cropped area is 15535 acres, permanent fallow area is 153 acres and other is 9574 acres in Maheshkhali Upazila of Cox’s Bazar District. Figure 23 shows the cropped area of the project site.

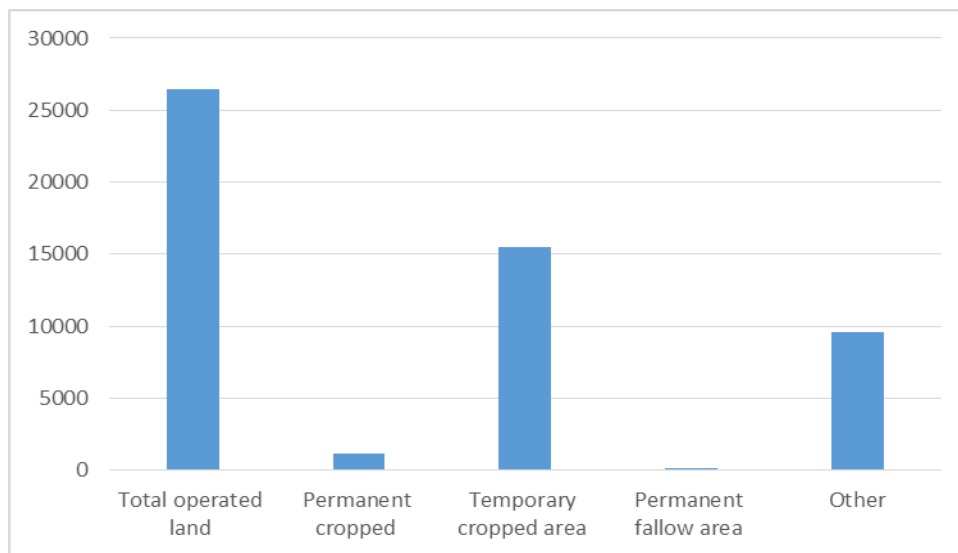


Figure 23: Cropped area in the project site

Source: BBS, 2011

The project will not hamper the agricultural practices and development; rather the farmers could be benefited indirectly by promotion of economic growth of the area by the project.

5.6.4 Crop Production

The main crop of the project is shrimp and salt. Most of the people are earning money by cultivation and working of salt and shrimp field. Other crops are Paddy, potato, mustard, pepper, maize, sugarcane, wheat, groundnut, betel, tobacco, watermelon, vegetables in the study area. Crop production especially for Paddy, wheat and potato in the study area is not a full satisfactory trend. Table 49 shows the rice production in the project area.

Table 49: Production of Rice in the Project Area (Area in acre and production in metric ton)

Year	Types of rice					
	Aus		Aman		Boro	
	Area	Production	Area	Production	Area	Production
2009-2010	238	229	20982	27590	17432	26626
2010-2011	162	157	21050	24863	17745	27542

Source: BBS, 2011

5.6.5 Crop Damage

Crop production is damaged by different climatic threats like flood, drought, heavy rainfall, untimely rainfall, tornado, cyclone, river bank erosion etc. Within the threats, flood and cyclone are main objects that can damage the crops seriously. Every year, almost one-third of Bangladesh is flooded. However, because of topographical characteristics, the regions of the country experience the degree of flooding; some parts may be under deep flood water, others unaffected. Flooding is beneficial only within certain limits of timing, duration and magnitude. In the project area, mostly flood and cyclone with tidal surge are main responsible to damage the crops. So, the project should have scope to do required management in the project area.

5.6.6 Main Constraints of Crop Damage

Economic, environmental and other factors can constrain crop production in different ways. Economic demotivation and financial problem can cause initial pessimism in production decision. Environmental hostile factors like disasters and unwanted conditions can cause harms in latter stage of production. Main constraints of crop production in the project area are-

- Irregular irrigation facilities during winter season
- Flood water submerged the land during rainy season
- Lack of training for suitable cultivation and overcoming the loss of crop to the farmers
- Non-introducing the new high yielding varieties and new technologies;
- Low fertility of land
- Lack of open market sell of seeds and fertilizer, quality seed and other inputs as demanded by farmers
- Unavailability of credits
- Lack of agricultural loans of flood-affected farmers

5.7 Livestock and Poultry

Livestock and poultry has been playing significant role in the economy of the study area, as in the agricultural share of economy of Bangladesh. Along with agriculture, it is an essential part of integrated farming system. Livestock provides supports for cultivation like threshing and crushing of oil seeds; cow dung as a source of manure and fuel; a ready source of funds; and meat, milk and eggs for household consumption. Agricultural by-products can be used as fodder and feed of Livestock and poultry. There are 233261 Cow and buffalo, 61179 goat and 11005 sheep in the project area. Moreover, there are also 398588 hen and cock, 63676 duck in the project site (BBS, 2011).

Table 50: Status of livestock and poultry at the project area

Particulars	Number
Cow & buffalo	29826
Goat	16149
Sheep	1836
Hen and Cock	290874
Duck	33535

Source: BBS, 2011

Most of the households in the project area have poultry and livestock, a practice that helps to reduce poverty through generating alternative income and employment. The common livestock and Poultry found in the Project area are Cow/bullock, Buffalo, Goat, Sheep, Duck, Chicken etc.

5.7.1 Feed and Fodder Shortage

Fodders and feed is the most important input of livestock rearing. Crop residues and naturally grown grasses alongside roads, river bank, char lands, etc. are the main feed for the cattle in Bangladesh. Shortage of fodder and high price of feed ingredients are affecting the small holders significantly. Dairy units are running off due to shortage of fodder or grazing land/ high price of feed ingredients. The pasture land has reduced significantly all over the country due to cultivation of High Yielding Varieties (HYV) of rice to meet the demand of growing population. Climate change is causing unusual behavior in temperature, rainfall, flooding pattern etc., and affecting either in natural growth or damaging the pasture grasses. Besides, adulteration of commercial feed by the miller; Inadequate or no quality control system of commercial feed is traceable.

A potential threat to natural growth of grasses in the char lands for grazing of animals. Fodder cultivation is not generally practiced by the smallholders, because of land constraints belonging to them. However, Private dairy farmers grow the fodder for their cows either in their own land or leased out lands from others. Most of the poor families do not have their adequate land to grow fodders. They are to depend on naturally grown grasses in alongside roads, embankments and polders, and also on aquatic plants. The smallholders suffer from shortage of fodder during cropping seasons. Seasonal variation is experienced by the farmers in availability of forages. Crop residues and a very little amount of green forages are given to their animals throughout the year. The dairy farmers cultivate maize as fodders and fodders of exotic and high yielding varieties for their animals. Some of these are perennial type, such as: Napier, Para, German, Sudan grass, Jumbo, etc. However, fodder cultivation in cultivable land depends on opportunity costs with other crop (Bangladesh Delta Plan, 2010). Constraints of feeds and fodder availability in the project site for cattle can be summarized as follows:

1. Scarcity of grazing land;
2. Scarcity of land for fodder cultivation.
3. Low quality and adulterated feed in the market
4. Use of crop residues as household cooking fuel and other purposes.
5. Change in cropping pattern
6. Lack of standards and quality control system
7. Lack of knowledge of feeding system
8. Lack of coordinated effort.

5.7.2 Livestock/Poultry Diseases

Parasites and diseases cause serious losses in the livestock and poultry production. Compounding factors make the control of health problems difficult and they include:

- General low level of nutrition
- Large livestock population
- Warm humid climate
- Congestion of animals during annual flooding
- Difficult communications impede implementing control programs.

The government has estimated that losses due to internal parasites are far greater than losses caused by diseases but both are serious. Mainly, adequate levels of nutrition would significantly reduce production losses caused by parasites. The most frequently reported diseases among cattle and buffaloes are anthrax, black quarter and foot and mouth disease. Newcastle disease, fowl pox, fowl cholera and duck plague are common among poultry (BARC, 1985).

The most crucial period is between July and October (rainy season) for outbreak of livestock and poultry diseases. The duck plague generally occurs in summer. However, some diseases prevail throughout the year. During monsoon season, the wet condition of the animal shelter promotes various kinds of diseases to the bullocks and cows. The unhygienic condition of the courtyards during this season may also spread the diseases to the poultry birds.

5.8 Fisheries

5.8.1 Introduction

Fish of different varieties abound in this district which enjoys the advantages of marine fishing. Moreover, varieties of fish are caught from rivers, tributary channels and creeks and even from paddy field during rainy season. Prawn is abundantly available in the district. Prawn farming and salt production in the coastal area of the district are the most important economic activities of the area. Dry fish is an important source of income to the fishermen especially in the islands.

Fish resources of the Project area are diversified with different fresh and brackish water habitats. Open water fish habitat of the Project area including surrounding rivers and khal, acting as major arteries of fish migration into and within the project area. These water bodies play a vital role in maintaining fish productivity of internal open water. Bulk of the commercial fish production is coming from culture fish habitats while the main catch of capture/open water habitats comes from different seasonal and perennial khals particularly during wet season. The numbers of fish area is decreasing due to shrinkage of open water fish habitat, loss of khal-river connectivity, presence of water regulatory structures on the khals and their improper operations, and the corresponding decrease of fish catch. On the other hand, aquaculture is developing in suitable ponds of congestion free highland area within the Polder. The information regarding fisheries in Maheshkhali Upazila is given in the Table 51.

Table 51: Fish production in Maheshkhali Upazila of Cox's Bazar district

Sources	2010-2011	2009-2010
Number of pond	570	-
Number of Dighee	1	-
Number of fisherman	40000	35000
Production of fish	15000	14000

Source: BBS, 2011

5.8.2 Problems and Issues

Fish biodiversity is affected by morphological changes of River, disruption of ecology, intensive agriculture, indiscriminate fishing, and loss of River-khal connectivity for filling wetlands and water regulatory structures on khals on the project area. The key fisheries problems and issues identified during baseline survey are as follows:

- Unplanned and indiscriminate fishing using monofilament gill net, and overexploitation of fishes by using huge number of narrow meshed estuarine set bag nets for fishing;
- Interrupting fish migration and movement due to improper management and malfunctioning of the water regulatory structures along with encroachment and barriers;
- Siltation of internal khals, causing loss to the year-round river-khal connectivity;
- Lack of quality fish seed and feed for the improved aquaculture practices;
- Insufficient loan facilities for aquaculture practices;
- Lacking of extension services and updated information;
- Poor market facility;

- Prevalence of fish diseases;
- Lack of technical knowledge on pond management; and
- Insufficiently trained farmers in the project area

5.8.3 Habitat Description

On the basis of habitat of fisheries of the study area are classified under two broad categories: capture fisheries and culture fisheries. Rivers and Internal khals are considered under capture fish habitat; whereas the ponds: homestead ponds and commercial ponds are classified under culture fisheries. Fish habitat in Rivers and internal khals is generally the open source of fisheries for local people like non-commercial professional and household level fishermen. It also enriches the inland closed water commercial and private culture of fisheries like ponds, leased beels, etc. especially during rainy season.

5.8.4 Fish Production and Effort

The estimated total fish production of the Project area is about 99 percent comes from culture fisheries while the rest comes from capture fisheries habitats. The annual fish production of Maheshkhali Upazila in the fiscal year of 2009-10 and 2010-11 were 14000 and 15000 metric ton, respectively (BBS, 2011). Fish production trend from capture/open water fisheries is declining in the project area. The production is declining mostly due to obstacles to fish migration and shrinkage of fish habitat. Aquaculture is expanding gradually in the area by converting the cultivated land, as well as the medium low lands of the area.

It is reported during the field investigation and consultations with the local people very few households are engaged in commercial fishing while about few households are involved in part time fishing activity in and around the area. Fishermen are usually catch fish in the nearby tidal floodplain, rivers and khals. The available fisheries occupations of the area are mainly fishermen, fish traders, and fish farmers. Women of the traditional fishermen families are also involved in collection of post larvae shrimp in the area.

Fishing in the project area, fishermen is mostly carried out with the help of push nets, beach seine nets, shrimp nets, estuary setbag nets, marine setbag nets and long lines. The structures of the three net types, i.e., shrimp nets, estuary setbag nets and marine setbag nets, are basically the same, although the water depths for those nets to be set up are different. The push net is used to target shrimp fly for shrimp cultivation; therefore, push nets are not used during the dry season, which is when salt cultivation is conducted instead of shrimp cultivation. Most of the fishing gear is used throughout the year.

5.8.5 Fish Migration

Many types of fish migrate on a regular basis, on time scales ranging from daily to annually or longer, and over distances ranging from a few meters to thousands of kilometers. Fish usually migrate to feed or to reproduce, but in other cases the reasons are unclear. Migrations involve the fish moving from one part of a water body to another on a regular basis.

The open water fish species migrate for spawning and feeding to open and regulated khals as they use these khals for feeding and shelter ground. Most of the open water fishes choose still water during that time and the migration is very crucial for reproduction of fishes. Some fish species migrate horizontally to these water bodies as part of their life cycle. Due to sedimentation channel bed and water control structures hamper the migration of fish and other aquatic biota. Fish species

such as Tengra, Phaisa, Gulsha, Khorsula, etc. migrate horizontally to these water bodies as part of their life cycle. A difference can be made between main channel migratory species, such as the major carps and the floodplain resident species that are often small and have accessory respiratory systems and prolific reproduction.

5.8.6 Fish Biodiversity

The Project area is moderate in fish biodiversity though biodiversity of fishes has been declining over the years. Obstruction in fish migration routes, morphological changes of internal khals, siltation of fish habitats, squeezing of spawning and feeding grounds and further expansion of both culture fishery are some of the causes of gradual declining of fish abundance and biodiversity. The Project area is rich in fish biodiversity. There are about more than 100 species of fish and shrimp. A list of fisheries species in the propose project site is given in the Table 52.

Table 52: List of aquatic species recorded in river and sea

SL.No.	Local (Bangladeshi) Name	English Name	Scientific Name
1.	Aila	Black banded trevally	<i>Seriolina nigrofasciata</i>
2.	Koral bata	Flathead grey mullet	<i>Mugil cephalus</i>
3.	Chowkha	Big-eye ilish	<i>Ilish filligera</i>
4.	Pan mach	Spotted sickle fish	<i>Drepane punctata</i>
5.	Poysha mach	Deep pugnose pony fish	<i>Scutor ruconius</i>
6.	Futki chapa	Talang quenfish	<i>Scomberoides commersonianus</i>
7.	Faissa/dati faissa	Long jaw thryssa	<i>Thryssa setirostris</i>
8.	Sada datina	Silver grunter	<i>Pomadasys hasta</i>
9.	Ram chowkkhya	Elongati ilish	<i>Ilisha elongate</i>
10.	Chowkkhya faissa	Jewelled shad	<i>Ilisha megaloptera</i>
11.	Kata gogut	Catfish	<i>Arius nenga</i>
12.	Hatir kan	Spade fish	<i>Ephippus orbis</i>
13.	Toli	Tolishad	<i>Hilsa toli</i>
14.	Ilish	Hilsha	<i>Tenualosa ilisha</i>
15.	Kamila	Indian Pike conger	<i>Congresox talabonoides</i>
16.	Ram kata	Catfish	<i>Arius maculates</i>
17.	Kaua mach	Hard tail scad	<i>Megalaspis cordyla</i>
18.	Khoilla	Grey mullet	<i>Mugil corsula</i>
19.	Gang koi	Triple tailed fish	<i>Lobotes surinamensis</i>
20.	Koral	Giant seaperch	<i>Lates calcarifer</i>
21.	Korati chela	Tenpounders	<i>Elops machnate</i>
22.	Kuichcha	White spotted moray	<i>Gymnothorax punctatus</i>
23.	Laukka	Indian salmon	<i>Polynemus indicus</i>
24.	Olua	Neglected grenadier anchovy	<i>Coilia neglecta</i>
25.	Mur baila	Flathead fish	<i>Platycephalus indicus</i>
26.	Mouri	Shrimp scad	<i>Alepes djeddaba</i>
27.	Pekhom mouri	Indian thread fin	<i>Alectis indicus</i>
28.	Malabar mouri	Malabar cavalla	<i>Carangoides malabaricus</i>
29.	Chowkhkha	Yellow striae scad	<i>Selaroides leptoplepis</i>
30.	Samudrik pangas	Fatty catfish	<i>Pangasius pangasius</i>
31.	Hail chanda	Black pomfret	<i>Parastromateus niger</i>
32.	Tobolchi	Ox-eyed scad	<i>Selar boops</i>
33.	Takia	Fringe scale sardine	<i>Sardinella fimbriata</i>
34.	Ram gojar/shol	Cobia	<i>Rachycentron canadus</i>
35.	Nilambori	Short fin scad	<i>Decapterus macrosoma</i>
36.	Sada datina	Silver grunter	<i>Pomadasys hasta</i>
37.	Taila faisa	Hair fin anchovy	<i>Setipinna taty</i>

SL.No.	Local (Bangladeshi) Name	English Name	Scientific Name
38.	Tailla	Fourfinger threadfin	<i>Eleutheronema tetradactylum</i>
39.	Roissa	Paradise threadfin	<i>Polynemus paradiseus</i>
40.	Tek chanda	Jacks	<i>Atropus atropus</i>
41.	Tengra	Bagrid catfish	<i>Mystus gulio</i>
42.	Thuitta	Red cornet fish	<i>Fistularia villosa</i>
43.	Hichchiri	White sardine	<i>Escualosa thoracata</i>
44.	Rupali Chanda	Silver pomfret	<i>Pampus argentius</i>
45.	Undora	Lady fish	<i>Sillago domina</i>
46.	Lal poa	Silver jew	<i>Johnius argentius</i>
47.	Churi	Ribbon fish	<i>Trichiurus savala</i>
48.	Cheowa	Torpedo trevally	<i>Taenoides anguillaris</i>
49.	Loitta	Bombay duck	<i>Harpodon nehereus</i>
50.	Maitya	Jack and pompanos	<i>Cybium guttatum</i>
51.	Pata mach	Sole	<i>Cynoglossus mactostomus</i>
52.	Bom maitya	Tuna	<i>Euthynnus affinis</i>
53.	Bata	Bata	<i>Mugil cephalus</i>
54.	Potka	Potka	<i>Chelonodon patoca</i>
55.	Chiring	Gobi	<i>Apocryptes bato</i>
56.	Sada chingri	White shrimp	<i>Penaeus indicus</i>
57.	Horina chingri	Brown shrimp	<i>Metapenaeus monoceros</i>
58.	Chali chingri	Yellow shrimp	<i>Metapenaeus brevicornis</i>
59.	Bhetki	Barramundi	<i>Lates calcarifer</i>
60.	-	Cuttlefish	<i>Sepia sp.</i>
61.	-	Squid	<i>Loligo sp.</i>
62.	Kachu chingri	Bird shrimp	<i>Metapenaeus lysianassa</i>
63.	Baghatara chingri	Rainbow Shrimp	<i>Parapenaeopsis sculptilis</i>
64.	Chingri	Small shrimp	<i>Acetes sp.</i>
65.	Kakra	Moon crab	<i>Matuta planipes</i>
66.	Kakra	Ridged swimming crab	<i>Charybdis natator</i>
67.	Kakra	Giant mud crab	<i>Scylla sp.</i>
68.	-	Bengal's snake-eel	<i>Pisodonophis boro</i>
69.	Phasa	Hairfin anchovies	<i>Setipinna phasa</i>
70.	-	Speigler's mullet	<i>Valamugil speigleri</i>
71.	-	Spottail needlefish	<i>Strongylura strongylura</i>
72.	-	Commerson's glassy	<i>Ambassis sp.</i>
73.	Gurjāli	Fourfinger threadfin	<i>Eleutheronema tetradactylum</i>
74.	-	Tank goby	<i>Glossogobius giuris</i>
75.	Bhetki	Barramundi	<i>Lates calcarifer</i>
76.	-	Small-head hairtail	<i>Lepturacanthus savala</i>
77.	-	John's snapper/golden snapper	<i>Lutjanus johnii</i>
78.	-	Eel goby	<i>Odontamblyopus rubicundus</i>
79.	-	Burrowing goby	<i>Trypauchen vagina</i>
80.	Chewa	Lanceolate goby	<i>Pseudapocryptes elongates</i>
81.	Borguni	Target Fish	<i>Terapon jarbua</i>
82.	Shamuk	Shells	<i>Gasteropods</i>
83.	-	Maine borers	<i>Teredo</i>
84.	Jhinuk	Oysters	<i>Pelecypods</i>
85.	Octopas	Octopuses	<i>Phylum echinydermata</i>
86.	-	Sponges	<i>Porifera</i>
87.	Jely mach	Jelly fish	<i>Medusozoa</i>
88.	Probal	Corals	<i>Disambiguation</i>
89.	-	Sea- anemone	<i>Actiniaria</i>
90.	Tara mach	Star fish	<i>Asteroidea</i>

SL.No.	Local (Bangladeshi) Name	English Name	Scientific Name
91.	-	Sea-urchin	<i>Echinoidea</i>
92.	Shomoudro shosha	Sea- cucumber	<i>Holothuroidea</i>

Source: BBS, 2011 & field visit

5.8.7 Fisheries Management

There is no fishery based community association found in the study area. Fishing right on existing fish habitats is limited. Enforcement of fisheries regulation is also weak. No fish sanctuary is found in the study area.

5.9 Ecological Resources

5.9.1 Bio-ecological Zones

IUCN, The World Conservation Union, has divided Bangladesh into 25 Bio-ecological Zones (Nishat et al, 2002) in the context of physiographic and biological diversity. The study area has fallen under two bio-ecological zones of Coastal Floodplain and coastal marine water. The area (both directly and indirectly impacted area) occupies terrestrial as well as aquatic ecosystems. Each of the bio-ecological zones represents the overall ecological situation of an area of the country. A map of the Bio-ecological zone is presented in the figure below.

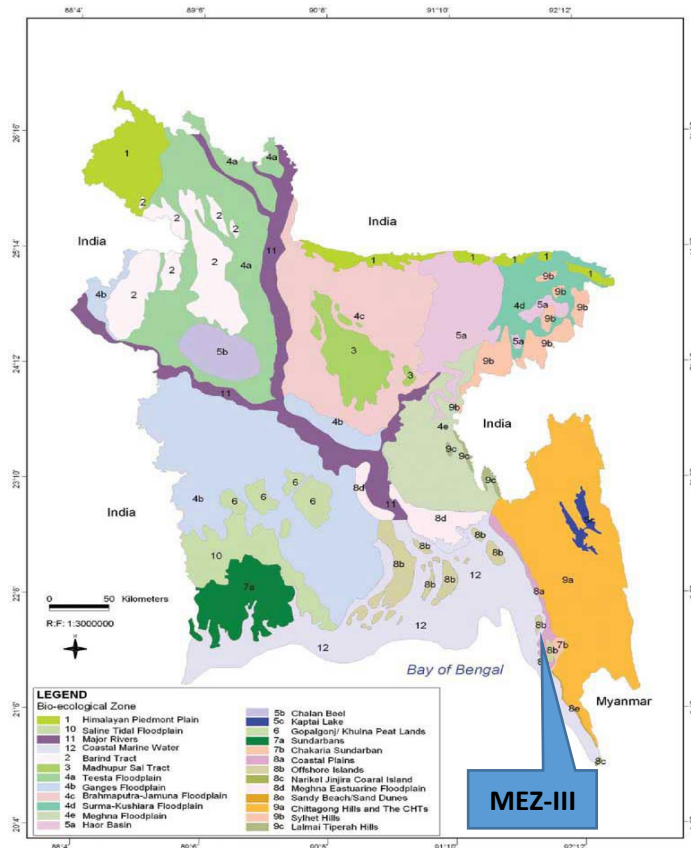


Figure 24: Bio-ecological zones of Bangladesh

Source: www.thebangladesh.net

5.9.2 Ecologically valuable habitats

Ecologically Critical Areas (ECA's)

In the proposed project influence zone surrounding, there is no ECA area or even any protected area. Sonadia ECA is about 12.70 km far from the project site.

Coral reef

According to the Chief Scientific Officer of the Bangladesh Fisheries Research Institute in Cox's Bazar, there is no coral reef habitat around the project site, and the closest coral reef to the project site is St. Martins Island located approximately 126 km from the project site.

Seaweed

According to the Chief Scientific Officer of the Bangladesh Fisheries Research Institute in Cox's Bazar, seaweed does not grow around the project site because the transparency of the sea water is low.

Mangrove forest

There are no mangrove forests around the proposed site. They are only scattered at the riverside of the Kohalia River. There is a mangrove forest, which is large scale and artificially established, at the south side of Matarbari Island and its opposite bank of Maheshkhali Island.

Mudflats

Mudflats or mud flats, also known as tidal flats, are coastal wetlands that form when mud is deposited by tides or rivers. Very wide mud flats appear along Kohelia River at low tide level where water fowls such as herons and egrets were found being feed on benthos. Occurring on tidal mud flats, they are tidally flooded on a regular basis and remain wet throughout the year.

5.9.3 Common Flora and Fauna

In general terms an ecological system can be defined as an assemblage of organisms (plant, animal and other living organisms - also referred to as a biotic community) living together with their environment (or biotope), functioning as a loose unit. That is, a dynamic and complex whole, interacting as an "ecological unit". Ecosystems are functional units of interacting abiotic, biotic, and cultural (anthropogenic) components. All natural ecosystems are open systems where energy and matter are transferred in and out through the complex interactions of energy, water, carbon, oxygen, nitrogen, phosphorus, sulfur and other cycles. The project site is located in rural area. Appropriate mitigation program should be undertaken to protect the existing ecosystem from gaseous emissions and water discharge from the proposed MEZ-III.

The project site consists of land used for salt farms and other purposes, and not primeval forests or tropical rain forests. The area is the presumed habitat of birds, dolphins, and sea turtles on the IUCN Red list (endangered species, etc.), and construction work may have a possible impact on the rare species and ecosystem.

Terrestrial Flora

The forests of Cox's Bazar broadly represent five categories of natural vegetation. These are: Tropical wet evergreen, Tropical moist semi-evergreen, Tropical moist deciduous, bamboo brakes and grassland. Terrestrial plants found during survey in and around the project area, on homesteads, roadside and agricultural lands have been listed. Most of the species found in this area are angiosperms. No threatened species, as designated by IUCN status declaration of 2012, were recorded. Three species (*Calamus guruba Buch-Ham*, *Trihosanthes cordata Roxb*, and *Lepisanthes rubiginosa*) which are considered as threatened species under local status by scientist groups in Bangladesh were recorded, but these species have wide distributions and are common in the region (Biologist-group's views of Chittagong University).

Large area close to Kuhelia River is used as salt fields which are turned into shrimp farms during rainy season. On the bank along the Kuhelia River, there were some patches of mangrove trees. The project area provides the following major species of natural plants including herbs, shrubs, grasses and plants which are important both economically as well as for environmental sustainability of the area.

Table 53: List of some terrestrial flora around the project site

SL. No.	Local name	English name	Scientific Name
1.	Jali bet	Cane	<i>Calamus guruba Buch-Ham.</i>
2.	Noyte shaakh	Snake guard	<i>Trichosanthes cordata Roxb.</i>
3.	Bara harina/Chagalnadi	Rusty sapindus	<i>Lepisanthes rubiginosa</i>
4.	Pain gach	Australian pine tree	<i>Casuarina equisetifolia</i>
5.	Akashmoni	Earleaf acacia	<i>Acacia auriculiformis</i>
6.	-	Api-api	<i>Avicennia alba</i>
7.	Bina	Indian Mangrove	<i>Avicennia officinalis Sonneratia</i>
8.	-	Herbaceous seepweed	<i>Suaeda maritima</i>
9.	Kas	Polymorphic grass	<i>Saccharum spontaneum</i>
10.	Jadu palang	Sea purslane	<i>Sesuvium portulacastrum</i>
11.	Chhagalkhuri	Beach morning glory	<i>Ipomea pes-carpae</i>
12.	Muragphul	Plumed cockscomb	<i>Celosia argentea</i>
13.	Durba	Bermuda grass	<i>Cynodon dactylon</i>
14.	Biliti siris	Raintree	<i>Samanea saman</i>
15.	Kalo jam	Java Plum	<i>Syzygium cumini</i>
16.	Shisu	Indian rosewood	<i>Dalbergia sissoo</i>
17.	Chotra	West Indian Lantana	<i>Lantana camara</i>
18.	Reri	Castor bean	<i>Ricinus communis</i>
19.	Sachishak	Ponnanganni	<i>Alternanthera sessilis</i>
20.	Kabonapi	Alligator weed	<i>Alternantheraphiloxeroides</i>
21.	Garjan	Garjan	<i>Dipterocarpus turbinatus</i>
22.	Boilam	-	<i>Anisoptera scaphula</i>
23.	Narikel	Coconut	<i>Cocos nucifers</i>
24.	Bonshimul	Silk cotton tree	<i>Bombax insiginis</i>
25.	Chundul	Cheeni	<i>Tettameles nudiflora</i>
26.	Telsur	Rock Dammar	<i>Hopea odorata</i>
27.	Segun	Teak	<i>Tectona grandis</i>
28.	Chapalish	Chapalish	<i>Artocarpus chapalish</i>
29.	Dhup	Black dhup	<i>Canarium resiniferum</i>
30.	Gamar	Beechwood	<i>Gumelina arborea</i>
31.	Jarul	Giant crape-myrtle	<i>Lagerstroemia speciosa</i>
32.	Hartaki	Chebolic myrobalan	<i>Terminalia chebula</i>
33.	Bahera	Bastard myrobalan	<i>Terminalia bellirica</i>
34.	Hargaza	Okshi	<i>Dillenia pentagyna</i>
35.	Pitraj	Pithraj tree	<i>Aphanamixls polystachia</i>
36.	Chalmoogra	Chaulmoogra	<i>Hydnocarpus kurjii</i>
37.	Jalpai	-	<i>Elaeocarpus tectorius</i>
38.	Rudrakia	-	<i>E ganitrues</i>
39.	Tatua	Mimosa	<i>Albizia odoratissima</i>
40.	Deohal	False Mangosteen	<i>Garciria xanthochymus</i>
41.	Bon sonalu	Apple blossom tree	<i>Cassia nodosa</i>
42.	Dumur	Fig tree	<i>Ficus sp.</i>
43.	Bazna	-	<i>Zanthophyllum flavescens</i>
44.	Harphata	-	<i>Baccaurca sapida</i>

SL. No.	Local name	English name	Scientific Name
45.	Barela	Long-Leaf Varnish Tree	<i>Holigarna caustica</i>
46.	Nageswar	Sri Lankan ironwood	<i>Mesua nagassarium</i>
47.	Kiabon	-	<i>Carallia lucida</i>
48.	Kasturi	Indian cassia	<i>Cinnamomum cecidodaphne</i>
49.	Ashok	Ashoka	<i>Saraca indica</i>
50.	Jam	Blackberry	<i>Eugenia jambolana vav</i>
51.	Mooli	Muli Bamboo	<i>Melocanna bambusoides</i>
52.	Lola bans	Bamboo	<i>Melocanna compactiflorus</i>
53.	Bandori	-	<i>Calamus tenuis</i>
54.	Chalta	Elephant Apple	<i>Dillenia indica</i>
55.	Pitali	-	<i>Trewia nudiflora</i>
56.	Sheora	Sand Paper Tree	<i>Streblus asper</i>
57.	Akh	Cane	<i>Calamus viminalis</i>
58.	Am	Mango	<i>Mangifera indica</i>

Sources: BBS, 2011 & Field visit

Terrestrial Fauna

As for precious species of animals designated by IUCN, the Spoon-billed Sandpiper (*Eurynorhynchus pygmeus*) and Hawksbill turtle (*Eretmochelys imbricate*) classified as Critically Endangered, three turtles species (*Geoclemys hamiltonii*, *Chelonia mydas*, *Caretta caretta*) classified as Endangered and one turtle species (*Lepidochelys olivacea*) classified as Vulnerable were observed within the project site and the front beach. There were no other precious species of insects, amphibians, reptiles, mammals or birds that were designated by IUCN.

Five species of reptiles (*Calotes versicolor*, *Mabuya mabuya*, *Gekko gecko*, *Panghura tentoria*, *Naja naja*) which are considered by Bangladesh researchers as threatened species, and 2 species of birds (*Arachnothera magna*, *Ketupa zeylonensis*) considered as threatened species were observed, however they are commonly seen over broad areas and the impact of the project on these species is expected to be insignificant.

Rivers, channels, creeks, ponds, puddles and some swamps create open surface of fresh water which local residents use as water resource as well as cattle and birds. Very wide mud flats appear along Kuhelia River at low tide level where water fowls such as herons and egrets were found being feed on benthos.

Spawning takes place at nighttime when human activity is low, however the light and noise of any nighttime construction may have adverse effects on these species. Consequently, night construction activity in the spawning season should be avoided as much as possible and should be conducted under minimum light. Lighting colors that do not affect the spawning (e.g., red or yellow) should be selected. The careful monitoring of spawning status is necessary.

The terrestrial fauna including mammals, birds, reptiles and amphibians around the project site area presented in the following Table 54.

Table 54: List of some terrestrial fauna around the project site

SL. No.	Local name	English name	Scientific Name
Mammals			
1.	Chamchika	Indian Pipistrelle	<i>Pipistrellus coromandra</i>
2.	Kola Badur	Leschenault's Rousette	<i>Rousettus leschenaulti</i>

SL. No.	Local name	English name	Scientific Name
3.	Baro badur	Indian Flying Fox	<i>Pteropus giganteus</i>
4.	Kathbirali	Hoary-bellied Himalayan Squirrel	<i>Callosciurus pygerythrus</i>
5.	Indur	House rat	<i>Rattus rattus</i>
6.	Indur	Indian Mole rat	<i>Bandicota indica</i>
7.	Chika	House shrew	<i>Suncus murinus</i>
8.	Baghdas	Large Indian Civet	<i>Viverra zibetha</i>
9.	Ud biral	Common otter	<i>Lutra lutra</i>
10.	Bejji	Indian grey mongoose	<i>Herpestes edwardsii</i>
11.	Mecho biral	Fishing cat	<i>Felis viverrina</i>
12.	Bon biral	Jungle cats	<i>Felis chaus</i>
13.	Khek shial	Foxes	<i>Vulpes bengalensis</i>
14.	Banor	Rhesus macaque	<i>Macaca mulatta</i>
15.	Kukur	Dog	<i>Cannis Familiaris</i>
16.	Chagol	Goat	<i>Capra Hircus</i>
17.	Bhera	Sheep	<i>Bovidae : Ovis</i>
18.	Goru	Cow	<i>Bos taurus</i>
19.	Mohesh	Buffalo	<i>Bubalus bubalis</i>
20.	Biral	Cat	<i>Felis : Catus</i>
Birds			
1.	-	Spoon-billed sandpiper	<i>Eurynorhynchus pygmeus</i>
2.	-	Arachnothera magna	<i>Streaked Spiderhunter</i>
3.	-	Brown Fish Owl	<i>Ketupa zeylonensis</i>
4.	-	River Lapwing	<i>Vanellus duvaucelii</i>
5.	Kalamatha Kastechora	Black-headed Ibis	<i>Threskiornis melanocephalus</i>
6.	Heugliner Gangchil	Brown headed Gull	<i>Chroicocephalus brunnicephalus</i>
7.	Kalaghar Panchil	Black-naped Tern	<i>Sterna sumatrana</i>
8.	Palasi Gangchil	Great Black-headed Gull	<i>Larus ichthyaetus</i>
9.	Khoiramatha Gangchil	Brown-headed Gull	<i>Larus brunnicephalus</i>
10.	Choto Dhuljiria	Little Sand Plover	<i>Charadrius mongolus</i>
11.	Boro Dhuljiria	Greater Sand Plover	<i>Charadrius leschenaultii</i>
12.	Kentish Jiria	Kentish Plover	<i>Charadrius alexandrinus</i>
13.	Proshanto Shonajiria	Pacific Golden Plover	<i>Pluvialis fulva</i>
14.	Timinker Chaha	Timminck's Stint	<i>Calidris temminckii</i>
15.	Sanderlin	Sanderlin	<i>Calidris alba</i>
16.	Lal Nuribatan	Ruddy Turnstone	<i>Arenaria interpres</i>
17.	Pati Batan	Common Sandpiper	<i>Actitis hypoleucos</i>
18.	Bon Batan	Wood Sandpiper	<i>Tringa glareola</i>
19.	Choto Gulinda	Whimbrel	<i>Numenius phaeopus</i>
20.	Eureshio Gulinda	Eurasian Curlew	<i>Numenius arquata</i>
21.	Lenja Chega	Pin-tailed Snipe	<i>Gallinago stenura</i>
22.	Dholaghar Machranga	Collared Kingfisher	<i>Todiramplus chloris</i>
23.	Khoira Chokachoki	Ruddy Shelduck	<i>Tadorna ferruginea</i>
24.	Machmural	Osprey	<i>Pandion haliaetus</i>
25.	Kalamatha Nishibok	Black-crowned Night Heron	<i>Nycticorax nycticorax</i>
26.	Choto Panchil	Little Tern	<i>Sterna albifrons</i>
27.	Dhupni Bok	Grey Heron	<i>Ardea cinerea</i>
28.	China Kanibok	Chinese Pond Heron	<i>Ardeola bacchus</i>
29.	Deshi Kanibok	Indian Pond Heron	<i>Ardeola grayii</i>
30.	Go Boga	Cattle Egret	<i>Bubulcus ibis</i>
31.	Boro Boga	Great Egret	<i>Casmerodias albus</i>
32.	Majhla Boga	Intermediate Egret	<i>Egretta intermedia</i>
33.	Choto Boga	Little Egret	<i>Egretta garzetta</i>

SL. No.	Local name	English name	Scientific Name
34.	Choto Pankouri	Little Cormorant	<i>Phalacrocorax niger</i>
35.	Lenja Ratchora	Large-tailed Nightjar	<i>Caprimulgus macrurus</i>
36.	Khuruley Pencha	Spotted Owlet	<i>Athene brama</i>
37.	Khoira mechupacha	Brown Fish Owl	<i>Ketupa zeylonensis</i>
38.	Asio Talbatashi	Asian Palm Swift	<i>Cypsiurus balasiensis</i>
39.	Shobuj Tia	Rose-ringed Parakeet	<i>Psittacula krameri</i>
40.	Modna Tia	Red-breasted Parakeet	<i>Psittacula alexandri</i>
41.	Neel-lej Shuichora	Blue-tailed Bee-eater	<i>Merops philippinus</i>
42.	Khoiramatha Shuichora	Chestnut-headed Bee-eater	<i>Merops leschenaulti</i>
43.	Bangla kaththokra	Lesser goldenback	<i>Dinopium benghalense</i>
44.	Pati Hoodhood	Eurasian Hoopoe	<i>Upupa epops</i>
45.	Pakra Machranga	Pied Kingfisher	<i>Ceryle rudis</i>
46.	Dholagoloa Machranga	White-throated Kingfisher	<i>Halcyon smyrnensis</i>
47.	Pati Machranga	Common Kingfisher	<i>Alcedo atthis</i>
48.	Dholagola Chatighurani	White-throated Fantail	<i>Rhipidura albicollis</i>
49.	Fingey	Bronzed Drongo	<i>Dicrurus aeneus</i>
50.	Boro Racket-Fingey	Greater Racket-tailed Drongo	<i>Dicrurus paradiseus</i>
51.	Kalaghar Rajon	Black-naped Monarch	<i>Hypothymis azurea</i>
52.	Fatik Jal	Common Iora	<i>Aegithina tiphia</i>
53.	Taiga Chutki	Taiga Flycatcher	<i>Ficedula albicilla</i>
54.	Nirol Prina	Plain Prinia	<i>Prinia inornata</i>
55.	Udoi Dholachokh	Oriental White-eye	<i>Zosterops palpebrosus</i>
56.	Golafola Satarey	Puff-throated Babbler	<i>Pellorneum ruficeps</i>
57.	Dhani Tulika	Paddyfield Pipit	<i>Anthus rufulus</i>
58.	Dholakomor Munia	White-rumped Munia	<i>Lonchura striata</i>
59.	Tila Munia	Scaly-breasted Munia	<i>Lonchura punctulata</i>
60.	Kalamatha Munia	Tricoloured Munia	<i>Lonchura malacca</i>
61.	Deshi Chandithot	Indian Silverbill	<i>Lonchura malabarica</i>
62.	Deshi Babui/Baoi	Baya Weaver	<i>Ploceus philippinus</i>
63.	Dahi Makarmar	Streaked Spiderhunter	<i>Arachnothera magna</i>
64.	Shidure Moutushi	Crimson Sunbird	<i>Aethopyga siparaja</i>
65.	Beguni Moutushi	Purple Sunbird	<i>Cinnyris asiaticus</i>
66.	Begunikomor Moutushi	Purple-rumped Sunbird	<i>Leptocoma zeylonica</i>
67.	Chunimukhi Moutushi	Ruby-cheeked Sunbird	<i>Chalcoparia singalensis</i>
68.	Komlapet Fuljhur	Orange-bellied Flowerpecker	<i>Dicaeum trigonostigma</i>
69.	Metethot Fuljhuri	Pale-billed Flowerpecker	<i>Dicaeum erythrorhynchos</i>
70.	Lalpith Fuljhuri	Scarlet-billed Flowerpecker	<i>Dicaeum cruentatum</i>
71.	KhoiraHarichacha	Rufous Treepie	<i>Dendrocitta vagabunda</i>
72.	Metey Bonababil	Ashy Woodswallow	<i>Artamus fuscus</i>
73.	Holdey Pakhi	Black-hooded Oriole	<i>Oriolus xanthonus</i>
74.	Dar Kak	Jungle Crow	<i>Corvus macrorhynchos</i>
75.	Pati Kak	House Crow	<i>Corvus splendens</i>
76.	Bangla Bulbul	Red-vented Bulbul	<i>Pycnonotus cafer</i>
77.	Holdepa Horial	Yellow-footed Green Pigeon	<i>Treron phoenicopterus</i>
78.	Tila Ghughu	Spotted Dove	<i>Streptopelia chinensis</i>
79.	Raj Ghughu	Eurasian Collared Dove	<i>Streptopelia decaocto</i>
80.	Horikol	Orange-breasted Green Pigeon	<i>Treron bicinctus</i>
81.	Jalali Kabutor	Common Pigeon	<i>Columba livia</i>
82.	Pati Tuntuni	Common Tailorbird	<i>Orthotomus sutorius</i>
83.	Udoi Doel	Oriental Magpie-Robin	<i>Copsychus saularis</i>
84.	Jhuti Sahlik	Jungle Myna	<i>Acridotheres fuscus</i>
85.	Bhat Shalik	Common Myna	<i>Acridotheres tristis</i>

SL. No.	Local name	English name	Scientific Name
86.	Dholatola Shalik	Pale-bellied Myna	<i>Acridotheres cinereus</i>
87.	Khoiralej Kathshalik	Chestnut-tailed Starling	<i>Sturnus malabaricus</i>
88.	Pakra Shalik	Pied Myna	<i>Sturnus contra</i>
89.	Kala Fingey	Black Drongo	<i>Dicrurus macrocerus</i>
90.	Pati Chorui	House Sparrow	<i>Passer domesticus</i>
91.	Kalamatha Kastechora	Black-headed Ibis	<i>Threskiornis melanocephalus</i>
92.	Chhoto Chaha	Little Stint	<i>Calidris minuta</i>
93.	Terek Batash	Terek Sandpiper	<i>Xenus cinereus</i>
94.	Chhoto Dhuljiria	Lesser Sand Plover	<i>Charadrius mongolus</i>
Reptiles			
1.	Kalo Kasim	Spotted Pond Turtle	<i>Geoclemys hamiltonii</i>
2.	-	Olive Ridley Turtle	<i>Lepidochelys olivacea</i>
3.	-	Logger head turtle	<i>Caretta caretta</i>
4.	Kachim	Green turtle	<i>Chelonia mydas</i>
5.	-	Hawksbill turtle	<i>Eretmochelys Imbricate</i>
6.	Kalo Kossop	Indian Black Turtle	<i>Melanochelys trijuga</i>
7.	Majhari Kaitta	Median Roofed Turtle	<i>Pangshura tentoria</i>
8.	Roktochusha	Garden lizard	<i>Calotes versicolor</i>
9.	Achil	Skink	<i>Mabuya mabuya</i>
10.	Tokkhak	Tokay Gecko	<i>Gekko gekko</i>
11.		Pangshura tentoria	<i>Median Roofed Turtle</i>
12.	Kono bang	Southeast Asian toad	<i>Duttaphrynus melanostictus</i>
13.	Kotkoti bang	Green Frog	<i>Euphyctis hexadactylus</i>
14.	-	Cricket frog	<i>Fejervarya limnocharis</i>
15.	Kola bang	Bull frog	<i>Hoplobatrachus tigerinus</i>
16.	Koper Ashami Bang	Cope's Assam Frog	<i>Sylvirana leptoglossa</i>
17.	Gasu Bang	Bronzed Frog	<i>Rana temporalis</i>
18.	Gokhra	Cobra	<i>Naja naja</i>
19.	Python	Python	<i>Molunrus tivittatus</i>
20.	Tiktiki	Lizards	<i>Hemidactylus prooki</i>
21.	Gokhra shap	Monocellate cobra/Bengal cobra	<i>Naja kaouthia Lesson</i>
22.	Dhora sap	Checkered keel back	<i>Xenochrophis piscator</i>
23.	Jati Sap	Monocled Cobra	<i>Naja kaouthia</i>
24.	Sibolder Joloj Shap	Siebold's Smooth Water Snake	<i>Enhydris sieboldi</i>

Sources: BBS, 2011 & Field visit

5.9.4 Ecosystem Services and Function

The Millennium Ecosystem Assessment (MA) defined ecosystem services are "the benefits people obtain from ecosystems." The MA also delineated the four categories of ecosystem services—supporting, provisioning, regulating and cultural. The national economy and the people of Bangladesh are inseparably linked to the productivity and sustainability of Bangladesh's ecosystem, including vast and differentiated terrestrial ecosystem that are seasonally variable in their characteristics as well. The population of the project area usually gets all types of ecosystem services as discussed below.

Supporting services

Ecosystem services "those are necessary for the production of all other ecosystem services". These include services such as nutrient recycling, primary production and soil formation. These services make it possible for the ecosystems to provide services such as food supply, flood regulation, and water purification.

Products obtained from ecosystems

- Food (including sea food and game), crops, wild foods, and spices
- Raw materials (including lumber, skins, fuel wood, organic matter, fodder, and fertilizer)
- Genetic resources (including crop improvement genes, and health care)
- Water
- Biogenic minerals
- Medicinal resources (including pharmaceuticals, chemical models, and test and assay organisms)
- Energy (hydropower, biomass fuels)
- Ornamental resources (including fashion, handicraft, jewelry, pets, worship, decoration and souvenirs like furs, feathers, ivory, orchids, butterflies, aquarium fish, shells, etc.)

Regulating services

"Benefits obtained from the regulation of ecosystem processes"

- Carbon sequestration and climate regulation
- Waste decomposition and detoxification
- Purification of water and air
- Pest and disease control

Cultural services

"Nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences"

- Cultural (including use of nature as motif in books, film, painting, folklore, national symbols, architect, advertising, etc.)
- Spiritual and historical (including use of nature for religious or heritage value or natural)
- Recreational experiences (including ecotourism, outdoor sports, and recreation)
- Science and education (including use of natural systems for school excursions, and scientific discovery)
- Therapeutic (including Eco therapy, social forestry and animal assisted therapy)

5.10 Socio-Economic Condition

5.10.1 Socio-Economic Condition

The total population of Maheshkhali Upazila is 321218 with a population density of 887 per square km. Among the total population, 215019 are male and 155525 are female; the sex ratio (male/female) is 107. There are 122140 HHs with average size of a HH is 5.5. Based on religious identity, 301858 are Muslim, 16647 are Hindu, 2682 are Buddhist, 6 are Christian and 25 are others. The economy of Maheshkhali is mainly agro-based. The demographic profile of the project area has been illustrated in the following Table 55.

Table 55: Demographic conditions of the project area

Demographic indicators		Maheshkhali Upazila	
Total Population	Male	3,21,218	2,15,019
	Female		1,55,525
Population density (per sq. km.)		887	
Number of Households		1,22,140	
Average Household sizes		5.5	
Sex ratio		107	
Number of Population by	Muslim	3,01,858	
	Hindu	16,647	
	Buddhist	2,682	

Demographic indicators		Maheshkhali Upazila
religion	Christian	6
identity.	Others	25

Source: BBS, 2011

The area is a disaster prone area as many cyclones and tidal bores affected the area in the past. Farmers do not go for land cultivation as that is not profitable to them. As a result, leasing out of land on annual rent basis is a common practice in the area. For salt cultivation each Kani (40 decimals) is leased out at BDT 12,000 (US\$ 1=80) to 18,000 where for shrimp cultivation at BDT 2,000-3,000. Shrimp is less profitable than salt cultivation due to modern technique used for salt production at less cost.

With the modern technique salt production per hectare has gone very high and thereby profit also increased, in return, land lease value has also increased. In the case of homestead land, it is about BDT 30,000-35,000. Some 20% households have migrant members outside the country, who are dependent on remittances. They are mainly working in Saudi Arab, Dubai, Malaysia, Oman, etc. These people have less dependency on farming; as a result, affect to the family income would be less due to land acquisition or other interventions from the project side. Presence of NGOs is there in the locality including all national level NGOs. The area is also known for operation of Muslim NGOs who were rendering services specifically to Rohingya refugees and other local Muslim people. All kinds of welfare activities are done by those NGOs. People in the area are also positive to the NGO activities. Other local level institutions are also there about which more detail to be investigated (EIA study of long embankment cum road construction at Maheshkhali, 2016).

5.10.2 Quality of Life Indicators

Education

The average literacy rate at Maheshkhali Upazila is 30.8%; male 30.5%, female 31.1.7%. The number and types of different educational institutions are given in the Table 56.

Table 56: Number and types of different educational institutions in the project area

Name of the educational institutions	Number of educational institutions
Government primary school (class I-V)	47
Registered primary school (class I-V)	16
Private (non-registered) primary school (class I-V),	04
Kindergarten school (pre-schooling),	13
NGO school	10
Government secondary school	01
Government college	00
Non-Government college	04
Madrasah	20
Kawmi madrasah	20
Ebtedayee madrasah	09
Technical and vocational institution	01
Medical college	00
Agricultural and veterinary college	00

Source: BBS, 2011

Health and Recreation

They have to travel to the nearest market to see quack doctors and other sources for medical and health treatment. They often suffer from general fever, respiratory infection (such as cold), diarrhoea and stomach-ache. The health and social welfare data of Maheshkhali Upazila has been given below. The population of the project area usually gets limited access of recreation facilities. Not many of them collect information from TV or radio as they do not have these items at home. They often listen to radio or watch TV at tea stands or in the local markets for collecting information, apart from which they hear news from neighbors and friends.

Table 57: The health and social welfare situation of the project area

Health related facilities	Number						
	No.	No. of bed	No. of doctor	No. of Nurse	No. of technician		No. of other staff
Government health complex	1	50	4	2	2		66
Private hospital/clinic	0	0	0	0	0		0
Diagnostic center	2	3	0	-	2		5
Physician/Practitioner	No. physician	MBBS/FCPS/Over	L.M.F	Unani/Ayurvedic	Homeopathy		-
	10	0		0	0		0
Number of health center providing health and family planning services	No. of union health centre	Health services	Sterilization	MR	Injection/Copper-T	Oral pill/Condom	No. of immunization center
	6	40394	0	0	81101	15040	66
Number of existing family planning personnel	TFPO	MO	FPI	TFPA	FWV	FWA	Midwife or SBA
	1	0	1	2	4	27	15

Source: BBS, 2011

Water and Sanitation and Housing

All of the local people depended on tube wells for water. Local residents used alum (phitkari) for purifying water instead of boiling water. Almost 98% of households of Maheshkhali Upazila have access to safe drinking water. On the other hand, only 60% of the households are under access to sanitary latrines (Health Bulletin, 2014). The housing status of the project area are combination pucca, semi-pucca, katcha and terraces. However, Katcha houses are more common in Maheshkhali Upazila.

5.10.3 Income and Poverty

The highest average monthly household nominal income was recorded BDT. 14092 for Chittagong Division. The estimates of HCR in 2010 using the lower poverty line show that Chittagong division has the lowest incidence of poverty of 13.1 percent. In 2010, using the lower poverty line, per capita income of the poor is Chittagong division at Tk. 648.71 and using the upper poverty line, per capita income of the poor is Chittagong division at Tk. 1307.27 (HIES 2010). Chittagong Division has recorded the lowest HCR of incidence of poverty at 26.2%. The poverty headcount rate of Chittagong

division is 26.1 as well as percentage of poor people is 16.8. Figure 25 shows the project area in the poverty map of Bangladesh.

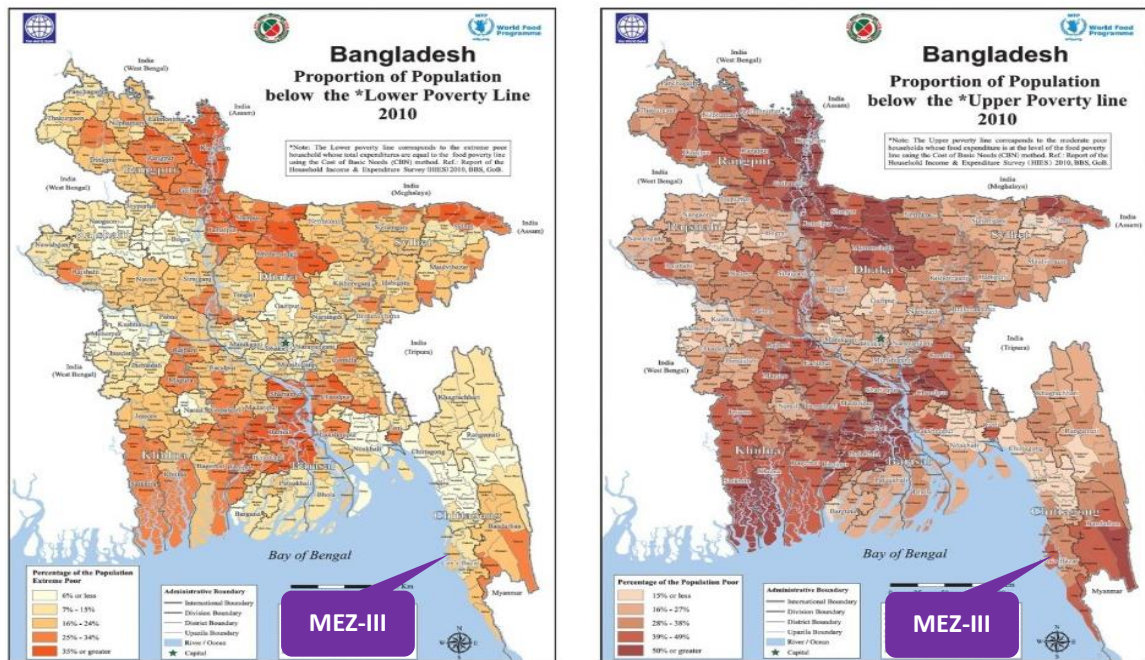


Figure 25: Poverty map of Bangladesh indicating the project site

5.10.4 Gender and Women

Total Female population in Maheshkhali Upazila is 155,525. Sex ratio was 107; the average literacy rate of female is 31.1.7% comparatively higher than the male 30.5 %. (BBS, 2011). Women are usually doing no work in the field very often. Confined to home women are assigned to duties of performing domestic chores, bearing and rearing children and serving to the husband and the elders. Sometimes poor women, widows, divorcees work as day labourer in LGED’s road construction projects. Frequently they do not go for shopping or marketing in the local bazaar. Women headed households also share with the neighbours to fulfil their shopping or marketing needs as maximum as possible to avoid teasing or harassment from the male members of the society.

5.10.5 Common Property Resources

Throughout the world there are assets that are neither private nor state property, but common property. The term denotes a class of institutions that govern the ownership and rights-of-access to assets. Common property assets are to be distinguished from "public goods," in that, unlike the latter, use by someone of a unit of a common property asset typically reduces the amount available to others by one unit (in economic terminology, such an asset is rivalrous in use). The institution of common property creates and harbors reciprocal externalities. As some of the most interesting examples of common property assets are natural resources, this entry is restricted to them. Social Institutions, Khals, Playgrounds can be referred as common property resources. Hats, bazars and fairs are social institution or at least the mechanism of not only trade but also social interaction. The common property resources of the project are having been given in the Table 58.

Table 58: Common property resources of the project area.

Common property resources	Number of common property resources
Daily bazar	20
Weekly hat	125
Public library	20
Mosque	430
Eid-Gah	10
Temple	25
Church	0
Pagoda	7
Stadium/ Playground	6
Park/ Amusement Park	0
Bridge	160
Baily bridge	0
Culvert	200

Source: BBS, 2011

5.10.6 Conflict of Interest and Law and Order Situation

Local conflicts may occur between local residents who may feel that they have received unfair compensation and other local residents or conflict with staff of the Deputy Commissioner’s Office. Conflict may occur between local residents and external workers because of any changes to local customs if external workers cannot understand local customs.

A number of consultations with local residents will be required to conduct in preparing the LARAP during implementation. Regulations in Bangladesh stipulate the need to conduct public consultations in land acquiring processes.

Local people should be employed for the construction works to the maximum extent possible, and any workers from other countries should be taught to respect local customs in order to facilitate good relationships with local people. The lodgings of the project workers should be equipped with sufficient living facilities to keep workers at the project site as much as possible.

The existing law and order situation is improved. Because people of the project area are getting compensation form the authority on regular basis. It will continue up to finish the compensation of affected person.

5.11 Historical, Cultural and Archaeological Sites

There are no historical, cultural and archaeological properties or heritage sites in or around the site. The Adinath temple is nearest and the most of famous historical place of this Island.

Chapter 6: Identification and Analysis of Key Environmental Issues

6.1 Environmental Sensitivity Investigation

The proposed project area is environmentally sensitive due to the geographical location. All the environmentally sensitive issues were investigated by a selected consultants group through carry out primary and secondary data analysis. The main hindrances of the proposed project sustainability are natural calamity like storm surges, cyclones, Tsunami, flood, river bank erosion etc. Design consultants should consider this sensitive issue in the design structure to make project environmentally sound and sustainable. The structure should be maintained adequate height to protect from storm surges, cyclones, Tsunami and flooding, etc. Disaster management plan has to be developed by the project proponent to protect from natural calamities.

6.2 Natural Hazards

A vulnerability map gives the precise location of sites where people, the natural environment or property are at risk due to a potentially catastrophic event, often induced by climate change, which could result in death, injury, pollution or other destruction. Such maps are made in conjunction with information about different types of risks. It could delineate the commercial, tourist, and residential zones that would be damaged in case of natural disaster.

Vulnerability mapping can allow for improved communication about risks and what is threatened. It allows for better visual presentations and understanding of the risks and vulnerabilities so that decision-makers can see where resources are needed for protection of these areas. The vulnerability maps will allow them to decide on mitigating measures to prevent or reduce loss of life, injury and environmental consequences before a disaster occurs. Those preparing the maps can overlap flood inundation and slope stability zones with property maps in order to determine which properties and buildings are at risk. They can then notify the landowners and inform them of government subsidies or other support available for undertaking a measure that would protect their homes from potential damage by, for example, water inundation or slope failure. The following figure shows the vulnerability map of different natural hazards of Bangladesh. Form the figure 26 it is evident that the study area is flood and cyclone prone areas.

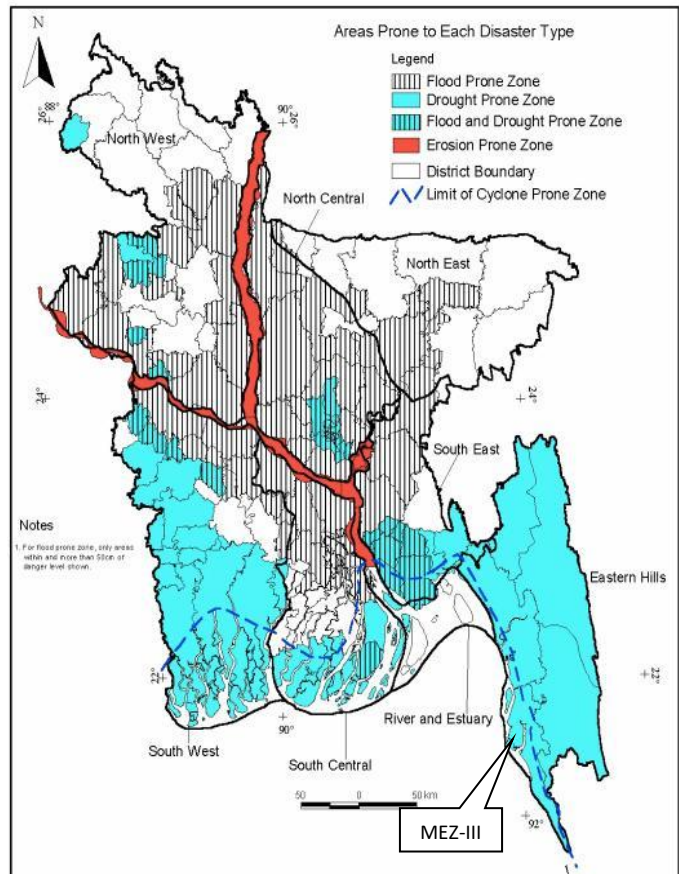


Figure 26: Natural disaster-prone areas of Bangladesh indicating the project area

6.2.1 Seismicity

Seismic structural strength assessment of existing buildings, strengthening of existing proposed foundation system and superstructures of critical structures, incorporation of liquefaction potential criteria in the structural design process for structures are few of the considerations to be in mind. A preventive measure can be coordinated by ensuring anti-seismic design (end bearing pile foundation including bored or driven piles and use reinforced concrete raft for shallow foundation), quality control (selection of adequate material and appropriate workmanship) under expert supervision. MEZ-III site lies in the seismic zone II which is also called moderate intensity seismic zone with basic seismic coefficient of 0.05g. Having location in Zone-II the land buildings and land-based structures for this Project should be designed to withstand maximum lateral load of 50% of gravity load.

6.2.2 Flooding, Cyclone and River Bank Erosion

The cyclonic map of Bangladesh shows that the proposed project area falls under high cyclonic risk area with surge height above 1m and subsequently tidal flood occurs in the project area. The proposed EZ has no possibility of erosion/river bank erosion according to the morphological history of Kohelia River. Despite of the river along the EZ has possibility of erosion. However, the proponent will construct retaining wall along the river bank in order to protect from erosion.

6.2.3 Change of Meteorology

The proposed project is rural area and temperature, rainfall, humidity, etc. components of weather may change little bit for the development of EZ.

6.3 Environmental Asset

Environmental assets are the naturally occurring living and non-living components of the Earth, together constituting the bio-physical environment, which may provide benefits to humanity. The environmental assets can be grouped into two categories: Individual approach and Ecosystem approach. In the project area environmental assets/resources include water, soil and fish, forests, lakes and agricultural/salt farms areas.

6.3.1 Fertile Soil

The project site consists of land used for salt farms and other purposes, agricultural activities are very limited in this area. Industrialization has comparative advantage over farming here, thus, the soil fertility is not much of concern in this area. Of course, once and when the proposed economic zone will be established, such environmental assets (fertile soil) of surrounding areas might be affected. But, with proper measures any extraordinarily harmful affect can be avoided.

6.3.2 Water Resources

This EZ will depend significantly on both surface water as well as ground water resources. Groundwater may need to be treated as this water may contain excess salts and some other impurities. Groundwater should be used rationally to avoid over extraction problem. Recycling and reuse of treated water can decrease the depletion of ground water resource. Other sources like rain water could be reserved to reduce pressure on ground water.

6.3.3 Fishery and aquaculture

Information on fishery was collected and confirmed at Maheshkhali Upazila Office. Fisherman's village in Maheshkhali Upazila is located along the coast line and Kohelia River, and the number of

fisherman's households is estimated to be 3000 to 4000. The average annual income by fishing activities is about BDT. 10,000 to 15,000 household⁻¹. There are four main fishing zones in the Bay of Bengal. It can be noted that the sea side of the proposed EZ is not the main fishing ground (EIA of Proposed 6.5 km Long Embankment Cum Road Construction from Rajghat Bridge, Matarbari to Mohiraghona, Dhalghata, 2015).

6.3.4 Air

The present air quality of this EZ is fair enough to work and stay in that area. But due to the future industrial activities, sufficient monitoring and protection works should be applied to save the air quality for maintaining an eco-friendly environment.

6.3.5 Agriculture

The land of the project area will be turned into industrial land. But the surrounding areas are slightly producing different agricultural products. Direct and indirect effects on that asset of surrounding areas will be negligible.

6.3.6 Environmental Hotspot

No significant environmental hot spots existed in the project area. The project area is very close to the sea. Sea, itself is an environmental hot spot for multiple resources diversity. The project authority will take appropriate protective measures to save these natural resources. Another important hot spot named Sonadia Island designated as an Ecologically Critical Areas (ECAs) by DoE. The area is approximately 15 km from the project site. Neither of the hot spots area are affected by the project activities. Another environmentally sensitive area is Kutubdia Island which is 18 km away from the project site.

6.4 Likely Beneficial Impact

6.4.1 Socio-Economic Benefits

Many people are having business in the Cox's Bazar. No industry or other major economic enterprises were set up in the project area. Due to the proposed EZ development connectivity between local and national areas will be improved. People will get benefit through set up new industry, increase in employment and business opportunities. By improving network connectivity, people easily contact with other areas, exchange their views and customs, sharing experiences. Various utility services facility like electricity, road facility etc. enhance the local people livelihood and living standard.

6.4.2 Infrastructural Development

The infrastructural development for the MEZ-III will improve the economic activity of the region greatly. New roads, electrical network, residential area, school, college, hospital and other modern facilities of life will follow the establishment of the economic zone.

6.4.3 Industrial Decentralization

Most importantly MEZ-III will come with the promise of employment of thousands of skilled and unskilled people of the locality. Inevitably, standard of living is projected to improve significantly. In addition to individual benefits, the proposed economic zone will significantly add to the overall economic development of the country.

6.4.4 Community Recommendations

The following recommendations were made during public consultation both individual and FGD-

1. As positive externalities, proposed MEZ-III should improve and create livelihood to the local people;
2. For less disturbance to local settings, MEZ-III should engage qualified contractor to ensure quality of works as well as timely completion of work;
3. Local people should be employed by the contractor during construction work;
4. Adequate safety measures should be taken during construction work;
5. Concerns were also raised on possible traffic and population pressure caused by external employed personnel;
6. Water treatment system should be installed to prevent water pollution.
7. Finally, local people have appreciated the EZ Project and employment generation; and have promised that they will cooperate with the executing agency during Project implementation.

6.5 Alternate Analysis

Project alternative is required, if the impacts of the project design are significant to the environment and social components. Different sites were analyzed on the basis of location, accessibility, potential for industrial growth, availability of raw material, infrastructural development, availability of manpower, vulnerability to natural and manmade disasters, availability of the basic amenities and utilities for industrial development, etc.

6.5.1 Scope of Alternative Location

No significant adverse environmental impacts are found with present location of project. Hence, it does not cause an impact on terrestrial biodiversity as well as aquatic fisheries values. The proposed location is close the Kohelia river due to its nature of business, and it indicates possible water pollution and river erosion. But the proponent will maintain CSTP and CETP to reduce the pollution of water through discharge. The land comprises both private and government Khash land. Therefore, the site will produce minimum or no socio-economic impact regarding land acquisition. The proposed site is above the flood level and it will be suitable for construction of the project. These factors leave no scope for considering a more feasible site other than the current one.

6.5.2 Alternative Technology and Raw Materials

The existing offsite infrastructures shall facilitate extra benefit to EZ developer which makes the project cost effective to the client. Most of the technologies proposed in the project are labor intensive. Minimum mechanical equipment will be used during construction work. All these works will be done by labor force with minimum mechanical equipment except in the case of piling. This action will produce minimal environmental impacts. During piling period sound pollution may occur which will adversely affect the workers and operator exposed to machine. Care should be taken and adequate protective measures should be applied for the working persons at and nearby the drilling site.

6.5.3 'Non-Project' Consideration

The analysis has also been done with and without project scenario. Implementation of proposed project will create lot of positive impacts on investment, employment, indirect source of income, education, and socio-economic status of community as well. Provision of good quality facilities will help to enhance the quality of life of the people. The project will help to create job opportunities to

considerable number of people. The Implementation of the proposed project will produce only negligible and insignificant environmental impacts using efficient and effective technology.

On the other hand, if the project is not implemented, the people of the project area will still have to suffer from various problems they are facing today. In the absence of a good investment infrastructure the region will be deprived from the potential for increased production, generation of new economic activities and employment. The economic zone project will facilitate opportunity for investment (national as well as foreign) significantly.

It is assessed from the impact study that majority of the impacts will be caused during construction phase of the project and would be of insignificant in nature. Some Positive impacts on socio-economic status will be revealed during operation phase. All the negative impacts can be mitigated through adoption of advanced technologies, appropriate mitigation measures, and adopting sound engineering designs. Hence, considering all technical, social and environmental issues proposed site is more feasible than the other site. The proposed site shall also be more feasible in terms of economic factor.

6.6 Environmental and Social Impacts Assessment Methodologies

The assessment of effects and identification of residual impacts takes account of any incorporated mitigation measures adopted due to any potential impact of project activities and will be largely dependent on the extent and duration of change, the number of people or size of the resource affected and their sensitivity to the change. Potential impacts can be both negative and positive (beneficial), and the methodology defined below will be applied to define both beneficial and adverse potential impacts. The criteria for determining significance are generally specific for each environmental and social aspect but generally the magnitude of each potential impact is defined along with the sensitivity of the receptor. Generic criteria for defining magnitude and sensitivity used for the project are summarized below.

6.6.1 Magnitude

The assessment of magnitude has been undertaken in two steps. Firstly, the key issues associated with the project are categorized as beneficial or adverse. Secondly, potential impacts have been categorized as major, moderate, minor or negligible based on consideration of the parameters such as:

- Duration of the potential impact;
- Spatial extent of the potential impact;
- Reversibility;
- Likelihood; and
- Legal standards and established professional criteria.

The magnitude of potential impacts of the Project has generally been identified according to the categories outlined in the Table 59.

Table 59: Parameters for determining magnitude of impacts

Parameters	Major	Moderate	Minor	Negligible/Nil
Duration of potential impacts	Long term (more than 35 years)	Medium Term Lifespan of the project(5 to 15 years)	Less than project lifespan	Temporary with no detectable potential impact
Spatial extent of the potential impacts	Widespread far beyond project boundaries	Beyond immediate project components, site	Within project boundary	Specific location within project component or site

Parameters	Major	Moderate	Minor	Negligible/Nil
		boundaries or local area		boundaries with no detectable potential impact
Reversibility of potential impacts	Potential impact is effectively permanent, requiring considerable intervention to return to baseline	Baseline requires a year or so with some interventions to return to baseline	Baseline returns naturally or with limited intervention within a few months	Baseline remains constant
Likelihood of potential impacts occurring	Occurs under typical operating or construction conditions (certain)	Occurs under worst case (negative impact) or best case (positive impact) operating conditions (Likely)	Occurs under abnormal, exceptional or emergency conditions (occasional)	Unlikely to occur
Legal standards and established professional criteria	Breaches national standards and or international guidelines/obligations	Complies with limits given in national standards but breaches international lender guidelines in one or more parameters	Meets minimum national standard limits or international guidelines	Not applicable

6.6.2 Sensitivity

The sensitivity of a receptor has been determined based on review of the population (including proximity / numbers / vulnerability) and presence of features on the site or the surrounding area. Criteria for determining receptor sensitivity of the Project’s potential impacts are outlined in the Table 60.

Table 60: Criteria for determining sensitivity of receptors

Sensitivity Determination	Definition
Very High	Vulnerable receptor with little or no capacity to absorb proposed changes or minimal opportunities for mitigation.
High	Vulnerable receptor with little or no capacity to absorb proposed changes or limited opportunities for mitigation.
Medium	Vulnerable receptor with some capacity to absorb proposed changes or moderate opportunities for mitigation
Low / Negligible	Vulnerable receptor with good capacity to absorb proposed changes or/and good opportunities for mitigation

6.6.3 Assigning Significance

Following the assessment of magnitude, the quality and sensitivity of the receiving environment or potential receptor has been determined and the significance of each potential impact established using the potential impact significance matrix shown in Table 61.

Table 61: Assessment of potential impact significance

Magnitude of Potential impact	Sensitivity of Receptors
-------------------------------	--------------------------

	Very High	High	Medium	Low / Negligible
Major	Critical	Major	Moderate	Negligible
Moderate	Major	Major	Moderate	Negligible
Minor	Moderate	Moderate	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

6.6.4 Mitigation Measures

Subsequent to the impact assessment discussed above, appropriate mitigation measures have been proposed to avoid, offset, mitigate/reduce, or compensate for the identified impacts. Generally, impacts having moderate to critical consequence require appropriate avoidance/mitigation/compensatory measures to reduce the significance. Impacts having low to negligible significance can be left alone not needing any mitigation measures.

Generally, preference is given to the avoidance of the impact with the help of options available for nature, siting, timing, method/procedure, or scale of any Project activity. If avoidance is not possible, appropriate mitigation and control measures are proposed to reduce the consequencesignificance of the predicted impact. Finally, if impact reduction is not possible, compensatory measures are proposed.

6.6.5 Assessment of Residual Impacts

The final step in the impact assessment process is determining the significance of the residual impacts, which essentially are the impacts which would be experienced even after implementing the mitigation/compensatory measures. Ideally, all of the residual impacts should be of negligible to low significance. For any residual impacts having moderate significance, monitoring mechanism is necessary to ensure that their significance does not increase. No residual impacts having major or critical significance are generally acceptable.

6.6.6 Impact Screening

As part of the environmental impact assessment process, a screening matrix was used tailored specifically to the proposed project, focusing the potential environmental impacts during the design, construction and operation phases. The matrix examined the interaction of project activities with various components of the environment. The impacts were broadly classified as physical, biological and social, and then each of these broad categories further divided into different aspects. The potential impacts thus predicted were characterized as follows:

- High negative (adverse) impact;
- Low negative impact,
- Insignificant impact,
- High positive (beneficial) impact,
- Low positive impact, and
- No impact.

The potential Environmental and Social Impacts Matrix of MEZ-III have been given in the following Tables. The negative impacts predicted in this manner were the ‘unmitigated’ impacts. Appropriate mitigation measures were recommended as part of this EIA, thus reducing the occurrence possibility and severity of the potentially adverse impacts.

Table 62: Environmental and social impacts screening matrix- construction phase

Parameter	Physical Environment					Ecological Environment			Social Environment				
	Topography	Hydrology	Water Quality	Air Quality	Noise	Vegetation	Fauna	Aquatic Environment	Displacement	Employment	Service	Health	Culture
Possession of Land													
Site development	P			T		P				T		T	
Civil and Structural Work			T	T	T					T		T	
Mechanical and Electrical Work				T	T					T			
Water Requirement			T										
Transport				T	T								
Employment			T							T	T		T

Here, P= Permanent, T= Temporary

Table 63: Environmental impact identification matrix- operational phase

Parameter	Physical Environment					Ecological Environment			Social Environment				
	Topography	Hydrology	Water Quality	Air Quality	Noise	Vegetation	Fauna	Aquatic Environment	Displacement	Employment	Service	Health	Culture
Water Requirement													
Liquid Effluent			T					T				T	
Gaseous effluent				P		T						T	
Solid Waste												T	
Hazardous Waste													
Transport				T	T							T	
Operational noise					P							P	
Immigration			T							P	P		P
Employment										P			

Here, P= Permanent, T= Temporary

Table 64: Checklist of potential environmental impacts

Project phases	Actions affecting environmental resources	SEI _s without mitigation measures				Type		Comments
		None	Minor	Medium	Major	Adverse	Beneficial	
Construction phase	Land value depreciation	x					x	Land value change: Positive impact
	Loss of and displacement from homestead land	x						No displacement: No impact
	Loss of and displacement from agricultural land	x						Primary economic activity to secondary activity
	Damage to nearby operation	x						No impact anticipated as no major installation
	Disruption of drainage pattern	x				x		Take care of local drainage pattern
	Encroachment into precious ecology	x						No precious ecological issues: no impact
	Runoff Erosion		x					Take care of local drainage pattern
	Worker accident		x			x		Take care by good housekeeping
	Sanitation diseases hazard		x			x		Concentration of laborers may cause unhygienic health condition
	Noise/ Vibration hazard			x		x		Pilling/ equipment installation may cause noise
	Traffic congestion				x	x		Preventive measure will be undertaken
	Employment				x		x	Good employment opportunity
Operation phase	Encroachment into precious ecology	x						No precious ecological issues: No impact
	Depreciation of environmental aesthetics		x					Local community prefer employment generation activities
	Erosion/Silt runoff	x						Having boundary wall: no impact
	Pollution from liquid discharge		x					Preventive measure will be undertaken
	Pollution from solid wastes		x			x		Preventive measure will be undertaken
	Air quality	x						No major impact; if happen necessary preventive measure will be undertaken
	Occupational health hazard			x		x		Reduce by good management practice
	Odor hazard		x					Preventive measure will be undertaken
	Traffic congestion		x					Preventive measure will be undertaken
	Noise hazard		x					Moderate impact
Employment			x			x	Good employment opportunity.	

Chapter 7: Environmental and Social Impacts

7.1 Introduction

The study was carried out considering present environmental setting, nature and extent of the proposed activities of the zone. Potential environmental impacts associated with the proposed Project activities are classified as: i) impacts during site preparation or pre-construction phase, ii) construction phase, and iii) operation or post construction phase.

Some of the important impacts associated with the proposed project will be linked with land use, land stability (soil erosion), soil contamination, water availability, surface and ground water quality, water pollution, waste and wastewater disposal, ambient air quality, ambient noise levels, vegetation, fauna (terrestrial and aquatic), drainage pattern, hydrology, climate change, socio-economic, places of social/cultural importance (religious structures, community structures), construction and raw material sourcing and storing, and OHS. Adequate mitigation measures are needed to mitigate/minimize all likely environmental impacts and those have been discussed along with the impacts.

During the field visit, consultations were also held with people in the locality including those presently living in and around the project areas, local government authorities, school teacher, nearby residents, etc. Outcome of these consultations were used in impact assessment and devising mitigation measures.

7.2 Impact on Air Quality and Noise

7.2.1 Pre-construction phase

Air Quality

Generation of dust is expected by land preparation, and generation of air pollutants (SO_x and NO_x, etc.) is anticipated from the operation of heavy machinery and trucks, but the impact will be limited only to the development stage. Watering the area, especially in the dry season, and using cover sheets on trucks for the transportation of soil/sand will be undertaken to reduce dust generation. Periodic maintenance and management of all the land filling machinery and vehicles will be conducted to reduce exhaust gas discharged from the machinery and vehicles.

Noise and Vibration

The impact of noise caused by the operation of heavy land filling machinery and trucks is predicted but will be limited to the surrounding area.

7.2.2 Construction Phase

Air

Dust emissions and gaseous emissions can adversely affect air quality and cause environmental nuisance to surrounding areas. The construction activities that will take place onsite are expected to result in considerable quantities of gaseous emissions. The contaminants of potential concern (COPC) during the construction phase may include: NO_x, SO_x, CO and Particulate Matter.

Dust and particulates

Fugitive dust and particulate matter will be generated during the construction phase of the proposed petrochemical complex. This will lead to a localized temporary reduction of air quality, which is

considered to potentially affect workers onsite and some offsite receptors such as adjacent road users and staff working in adjacent facilities as well as nearby touristic villages. The following are the main impacts expected to result from the generation of dust:

- Nuisance and disturbance;
- Loss of visual amenity through deposition;
- Impacts on the health of onsite workers (i.e. increase in allergies, respiratory stress);
- Impact on onsite cars and vehicles where dust is deposited decreasing visibility; and
- Visual and health disturbances to neighboring facilities
- Gaseous emissions

Another contributor to air quality reduction will be the emissions from vehicle-exhaust during site clearing and grading, transport of material and equipment and due to equipment use. These emissions include:

- Sulphur dioxide (SO₂): the amount of SO₂ in exhaust gases is directly dependent on the sulphur content of the used fuel.
- Nitrogen oxides (NO_x): NO_x emissions from contractor equipment/activities contribute to pollution in the form of acid rain, disturbances of the ozone layer and local health problems.
- Carbon monoxide (CO): The release of carbon monoxide (CO) occurs as a result of incomplete combustion of fuel in engines.
- Volatile Organic Compounds (VOCs): The main sources of VOCs emissions from construction phase are breathing losses (In tanks), Working losses (Displacement and withdrawal in tanks).

Noise and Vibration

The operation of heavy machinery and trucks are predicted to create vibration, but this will be limited to the surrounding area. In the actual construction work, schedule management will be performed to maintain constant amounts of construction work and to ensure that low vibration equipment will be used as much as possible. Construction work will be performed during daytime, especially piling works. Measures for reducing generation of noise, such as speed reduction of vehicles in residential areas, will be taken, whereby vehicle noise impact will be minimized. Thus, all efforts will be taken to minimize the noise impact.

7.2.3 Post-construction phase

Air

Volatile Organic Compounds (VOCs), nitrogen oxides (NO_x), carbon monoxide (CO), sulphur dioxide (SO₂) and particulate matter (PM₁₀) were identified as Contaminants of Potential Concern (COPC). The impacts affecting air quality in the project area could result from the following environmental aspects:

- Complex equipment testing and start-up;
- Complex operations;
- Raw material Transport/Use of Trucks and Vehicles; and
- Operation of the marine terminal
- Process furnaces, boilers and gas turbines

Particulate matter

Particulate matter will be generated during operation of the proposed Complex and similarly during the testing and start-up stage. The values of particulate matter (PM) expected to be emitted during normal operation from each of the different sources (e.g. furnaces and turbines). These emissions

of particulate matter will persist long time and the duration of impacts during the testing and start-up stage will be limited (less than one year).

Gaseous emissions

Air quality will also be reduced by gaseous emissions from operation of the proposed petrochemical complex and similarly during the testing and start-up stage as well as decoking activities and product and material transport by trucks. There will be a reduction in air quality as a result of emissions from process furnaces, flares, boilers and turbines. The main gaseous emissions of concern will include: nitrogen oxides (NO_x), carbon monoxide (CO) and sulphur dioxide (SO₂). The gaseous emissions impact due to the proposed complex normal operations will persist as long as the plant is under operation while the duration of impacts during the testing and start-up stage will be limited (less than one year). Impacts are therefore expected to reduce the air quality.

The amount of SO₂ in exhaust gases is directly dependent on the sulphur content of the used fuel. NO_x is a mixture of nitric oxide (NO) and nitrogen dioxide (NO₂). NO₂ is an odorous, brown, acidic, highly corrosive gas that can affect human health and the environment. In particular, high levels of NO₂ can damage the human respiratory system and increase a person's susceptibility to, and severity of, respiratory infections and asthma. Long-term exposure can cause chronic lung disease. NO₂ is also harmful to vegetation, damaging foliage and inhibiting growth. NO₂ reacts with oxygen (O₂) to form NO and Ozone (O₃). As with NO, O₃ when found in the lower atmosphere is harmful to human health producing similar effects on the respiratory system. Carbon monoxide (CO) is emitted as a result of incomplete combustion of fuel in engines. The emission rates of the contaminants of potential concern during the normal operation of the proposed complex. It is worth noting that all the air emissions sources are complying with the most stringent industry specific applicable limit.

Noise and Vibration

Noise generation due to operation of pumps & compressors, boilers, cooling tower etc. The VR of noise in the operation phase is considered as medium. These activities will happen throughout the operation phase, although the magnitude and extent are low, the impact of noise can be considered as Moderate.

Vibration impacts that can arise from moving equipment (Pump, compressors, motors) are also unlikely to affect adjacent properties since such equipment will be located almost exclusively in the processing area (Which is distant from adjacent properties). This impact will occur throughout the operation phase of the project and the magnitude, spatial extent and duration of this impact are moderate, very low and very low. So, the overall impact is insignificant.

7.3 Impact on Water Resources

To assess the impacts of the proposed MEZ-III on water resources, in particular on hydrologic and hydraulic parameters, statistical analyses of available water levels and flooding at surrounding stations were carried out.

7.3.1 Pre-construction phase

The area is a coastal area and located on the bank of Bay of Bengal, and Kohelia River is adjacent to the project site. Earth filling activities on the course, water level and quality of the river is anticipated; though the hydrological and morphological change is not significant for the development of MEZ-III.

7.3.2 Construction Phase

Potential impact on surface water quality could arise due to:

- Surface runoff from construction site;
- Generation and disposal of domestic wastewater from construction camp;
- Piling activities;
- Dredging activities etc.
- Spillage of chemicals and solid wastes

Surface runoffs from construction material storage area, construction waste storage areas, hazardous waste (waste oil, used oil etc.) and chemical storage areas may lead to pollution of receiving natural drainage channels, etc. As the slope of the area is towards Bay of Bengal, these surface run offs are likely to reach the Bay of Bengal. During the process of earth work (excavation and stacking of soil) will be required; the surface runoff from disturbed sites may lead to pollution of receiving water bodies. This situation is likely to be more pronounced considering high rainfall received in these areas. The surface run offs may contain the high sediment load, oil residues, organic wastes, etc. This may adverse impact on water quality, which ultimately leads to impacts on aquatic ecology. Generally, the project area may affect by flooding by the river during wet season. But there is no significant river erosion along the zone. Furthermore, it is generally expected that the effect of the proposed project on regional hydrologic and hydraulic conditions would be minimum. Indeed, the comparison of flood levels between the proposed and baseline conditions indicated that there would not be any significant impact on flood level and hence on drainage through the Kohelia River. The situation is unlikely to aggravate further from its current state. The average height of the site is about 4-5m above mean sea level.

During construction phase, BEZA/Contractors will provide sanitation facilities for workers at the construction site. The domestic wastewater will be treated through septic tank and soak pit. Therefore, sewage will not be disposed in the sea or nearby surface water body. Construction of jetty and the trestle will require excavation of seabed material near shore and will involve piling work. The excavation activities and piling work in the seabed will generate fine sediments and will also result in re-suspension of sediments in water. This is expected to increase the turbidity of water and thus have an adverse impact on surface water quality. The turbid water may have impact on aquatic ecology; thus, affecting primary productivity. The leakage and spillage of oil and lubricants from machineries and equipment may also cause adverse impact on water quality.

7.3.3 Post Construction Phase

There may be soil runoff from the exposed soil of the land development, loading unloading and cut slopes, and water pollution of the upstream area of the surrounding river is predicted. Since the project area is mainly low-lying area, soil runoff and turbid water generation will not be significant. In addition, concrete wastewater generated from industrial operation and from the sewage to have effects. Anti-diffusion membranes will be installed around the construction site to prevent diffusion of turbidity, and these measures will minimize the impact of effluent contamination of river water and underground water. Runoff of exposed soil surfaces into rivers is expected. Adequate measures to prevent erosion will be taken. Central Sewerage Treatment Plant (CSTP) and Central Effluent Treatment Plant (CETP) shall be installed in operations phase of the project to reduce wastewater pollution in the nearby water bodies. In order to reduce the pressure on ground BEZA should install Desalination Plant for treating sea water for drinking water as well as potable water.

7.4 Impact on Land Resources

7.4.1 Pre-Construction phase

It is expected that no soil erosion occurred from the project site as it will be well protected by embankment constructed by BEZA/BWDB as part of the development. Earth filling would be required, and from its activities the quality of the soil as well as the structure of the soil can be destroyed. Filling materials' quality must be tested before using as filling materials. At the proposed site where the project will be developed, no households will be directly affected by the project implementation who own land within the proposed alignment site. So, replacement and resettlement are not necessary. But, through proper consultation with the community people indirectly affected people should be considered and involved in the implementation of the project.

Topography and Geology

The topography of project site is low flat land. The land filling may affect the topography and geology of the area around the proposed site. Filling will cause change of land types. Some protection measures against slope sliding or erosion especially in rainy season need to be considered.

Drainage congestion

Land filling can disrupt the natural drainage pattern and cause drainage congestion which can affect the land resource. Protecting natural storm water drainage network and/or creating more drainage network could be a solution.

7.4.2 Construction Phase

Topography and Geology

The construction of the accessroad may affect the topography and geology of the area around the proposed site. Construction of infrastructures will cause change of land types and the entire topography of project site. Some protection measures against slope sliding or erosion especially in rainy season need to be considered.

Soil

Soil pollution at the construction site will be occurred possibly by leakages of oil and chemical materials from vehicles, vessels and construction machineries. Vehicles and machineries will be maintained regularly, oil and chemical materials will be stored at an appropriate storage site to prevent any permeation into the ground. These measures will minimize the impact of any soil contamination.

Sediment

Sediment pollution may occur in case of construction wastewater flows into the river. Channels, ditches and temporary settling ponds will be dug and constructed around the construction area. Wastewater treatment facilities for workers, such as septic tanks and oil separators for oily run-off water, will be installed in the workers' camp and the construction area. Oil and chemical materials will be stored in an appropriate storage site to prevent any permeation into the ground. These measures will minimize the impact of sediment contamination of river water.

Drainage congestion

Construction of infrastructures can disrupt the natural drainage pattern and cause drainage congestion which can affect the land resource. Protecting natural storm water drainage network and/or creating more drainage network could be a solution.

7.4.3 Post Construction Phase

Soil pollution at the zone will be occurred possibly by leakages of oil and chemical materials from

vehicles and industries. Regular maintenance and supervision can minimize the incidence.

7.5 Impact on Agriculture Resources

7.5.1 Construction phase

The proposed project area is used only for salt cultivation. In construction phase after land development, existing land will be converted into industrial land use with construction of different on-site and off-site infrastructure. It will require different amount of temporary construction labor and will absorb from different sectors. It can create seasonal scarcity of such labor.

7.5.2 Post Construction phase

Different industries will require different amount of permanent semi-skilled and unskilled labor and will absorb from different sectors of industries. It can create scarcity of such labor and boost their wage up. As per national policy low productive agricultural land could be used for industrial development. Project affected community (land owners) should get job in the project with a priority basis.

7.6 Impact on Fisheries

7.6.1 Pre-Construction and Construction phase

The proposed EZ area is mainly saltpan. The local residents earn their livelihood by cultivating salt. Moreover, significant number of them also does fishing six months in a year in the project area. Land development work converted low lying area into flood free area, where fisheries (seasonal) habitat may reduce. Construction of jetty facilities may destruct natural habitat of fisheries. Dredging activities in the sea may reduce the quantity of fishes. Dredging materials, oil and chemical materials of heavy machines, vehicles, etc. will be stored in an appropriate storage site to prevent any release into the water body. These measures will minimize the impact on fisheries. During construction period construction materials may be released to the nearby river, and ditches. This may damage the fisheries ecosystem of the respective water body. Construction materials, oil and chemical materials of heavy machines, vehicles, etc. will be stored in an appropriate storage site to prevent any release into the water body. These measures will minimize the impact of fisheries.

7.6.2 Post Construction Phase

During operation, runoff of exposed soil surfaces and drainage of wastewater from industrial operation and sewage drainage into river and ocean is expected which can lead to the contamination of the water body from unexpected substances and it can destroy fisheries ecosystem. Sea/River traffic may produce heavy noise which will disturb fish habitat. Appropriate protection measure from waste water contamination (if any) to the river by functioning CETP and CSTP will be established to control the pollution, save the fisheries and other aquatic resources of the project area. Appropriate monitoring system will be devised for desired standard of CETP outlet parameters.

7.7 Impact on Ecosystem

7.7.1 Pre-Construction and Construction Phase

Terrestrial Ecology and Biodiversity

The site is considered as 'no trees area', so, there is no vegetation within the zone except some herbs. Some fauna lived and depended on food from the area will lose the habitat and source of sustenance. Plantation will provide them new home and source of sustenance by the project. The

impact on flora and fauna will not be significant for this reason. Although, some scattered mangrove species are located in the west bank of Kohelia River. During construction period a large number of migrant people will be temporarily reside in the area. Wastes generated from the construction work will include waste plastics, waste glasses and waste oil. Furthermore, household wastes discarded from the camping ground of the workers will include cans, bottles and garbage. If such wastes are not adequately handled, flora and fauna can be affected. Segregating waste at collection, recycling and reusing waste will be promoted and non-recyclable waste will be disposed at appropriate sites according to related regulations. Hazardous waste will also be treated accordingly. To reduce the amount of solid waste discharged from the workers during the construction work, efforts will be taken to employ local workers wherever possible, so that the amount of household waste at the workers camp will be minimized. These measures will be taken to ensure protection of aquatic and terrestrial ecosystem. The major impacts during construction phase on terrestrial ecosystem and biodiversity are-

- Vegetation clearance;
- Fugitive emission and deposition on vegetation; and
- Noise and vibration.

Embedded control measures for protecting terrestrial ecosystem and biodiversity are as follows-

- Vegetation removal to be minimal and limited to the zone;
- Water sprinkling for dust suppression; and
- Provision of dust curtains to reduce the dust emission
- Plantation of local species for stabilization of the filled in material and plantation in surrounding areas; and
- Additional plantation at other identified areas such as all unpaved vacant spaces throughout the zone.

Aquatic Ecology and Biodiversity

The impacts on aquatic ecology and biodiversity during construction phase are as follows-

- Surface runoff from construction site, discharge of hydro-testing water, spillage & leakage of oil and lubricate, from construction site;
- Noise and vibration due to piling activities in the sea;
- Move of ship and vessels and
- Illumination.

Olive Ridley's Turtle (*Lepidochelys olivacea*) IUCN listed Vulnerable 2016.3 species. Olive Ridley turtles have been reported nesting in the Coast of Maheshkhali Island. Besides, *Caretta caretta* (Logger head turtle), *Chelonia mydas* (Green turtle), *Eretmochelys Imbricate* (Hawksbill turtle) are also found in the Maheshkhali Island. These species are likely to get impacted due to various construction activities of the project such as. The surface runoff from construction site, generation of suspended solid during piling, spillage & leakage of oil and lubricate, etc., may cause perceptible changes in water quality and also can affect the aquatic habitat and fauna.

7.7.2 Post Construction Phase

Terrestrial Ecology and Biodiversity

During post-construction period, the major impacts on terrestrial ecology shall arise from

- Emission from operation of different industrial units and
- Illumination, noise and vibration at site

A thick green belt of 15-20 m within and outside the project boundary will help in reducing the impacts from air emissions and noise and vibration impacts. During post-construction period residential workers shall live in the area. Household wastes discarded from the residence of the workers will include cans, bottles and garbage which can contaminate water and soil. Moreover, hazardous waste from industries can pollute the terrestrial eco-system. It is claimed according to the type and nature of unit industries that, no wastewater or liquid waste will be generated from the EZ. If any industry produces such waste, will be treated according to the regulations of DOE before disposal. Segregating waste at collection, recycling and reusing waste will be promoted and non-recyclable waste will be disposed at appropriate sites according to related regulations.

Aquatic Ecology and Biodiversity

The major impacts sources of aquatic ecology and biodiversity during operation phase of the project include-

- Spillage & leakage of fuel & lubricant;
- Move of ship and vessels and
- Illumination, noise and vibration.

Some mitigations measures can be positioning of illumination lights land ward side and not sea side, restricted and limited movement of vessels during the nesting period, establishment of turtle nesting locations through Forest Department and local NGO's, support local Forest Department and local NGOs for in situ turtle nesting activities etc.

7.8 Socio-economic Impact

7.8.1 Pre-Construction Phase

✧ Land Acquisition

The land required for proposed MEZ-III is the combination of Government's Khash land and private land. Bangladesh Economic Zones Authority (BEZA) will acquired the land. Since no displacement of settlement occurred resettlement and rehabilitation are not relevant.

✧ Disturbance to Existing Social Infrastructure and Services

Material, equipment and worker transportation may disturb existing road traffic including public transport using the highway and commercial vessels of nearby industries. For movement of vehicles, traffic management system should be developed. Also, during construction period, a lot of construction labour would gather in those areas that may lead the gathering of excess peoples.

✧ Local Conflicts of Interest

No conflicts will occur with local residents. Moreover, a number of consultations with local residents have been conducted in preparing the EIA Report. Local people should be employed for the construction works to the maximum extent possible, and any workers from other places/countries should be taught to respect local customs in order to facilitate good relationships with local people. The lodgings of the project workers should be equipped with sufficient living facilities to keep workers at the project site as much as possible.

7.8.2 Construction Phase

✧ Infectious Diseases such as HIV/AIDS

A temporary influx of migrant labor during the construction period may increase the risk of sexual transmitted diseases (STDs). Local people should be recruited for simple work as much as possible

so to minimize the risk of infectious diseases being transmitted from external workers. Pre-employment and periodic medical check-ups should be conducted for external workers.

✧ **Work Environment (including Work Safety)**

A high-risk rate of accidents is predicted for the construction work. Construction companies should establish work safety plans and implement them. Work safety plans should stipulate mitigation measures on soft aspects (safety training, etc.) and hard aspects (provide workers with appropriate protective equipment, etc.).

✧ **Accidents**

Land traffic accidents during construction work may occur. As prevention measures for land traffic accidents, observation of traffic regulations, and training and education on safe driving will be implemented.

✧ **Livelihood**

The land parcels that will potentially go for land acquisition during the construction phase are salt cultivation fields as assessed from satellite imagery and from the field survey for the proposed MEZ-III. The impacts on different stakeholder groups, as envisaged are as follows:

Though the salt cultivation is profitable livelihood option, local people who are engaged in salt cultivation, are also not entirely dependent on salt cultivation as this activity is restricted only for six months in a year. Due to establishment of the project, the sharecroppers and lessee farmers (if any) cultivating within the project area would have to discontinue their practice in the project area once the construction activities start. The project will influence the sharecroppers to search for other land parcels in the vicinity in order to continue their practice. Restriction on use of land in project area may lead to impact their livelihood and income. This impact may be temporary i.e. loss of income during the transition phase and could be mitigated once the sharecropper, lessee farmers find a new site for cultivation and renews his sharecropping practice. However, the impacts could also be long term and in some instances lead to change in occupational pattern (like cultivator to agricultural or wage labor, contract worker etc.) if any sharecropping family is unable to find alternate land.

Similar impacts, as in case of the sharecroppers, are envisaged for the salt pan owners (usually the salt pan owners take land on lease from the land owners for salt cultivation) and its laborers. Restriction on use of land parcels due to acquisition (for land-based facility) may lead to impact livelihood and income of the salt pan workers/ laborers. However, this impact may be temporary, till the salt pan owners find other parcel of land to take on lease and the workers find salt cultivation work at other salt pans in neighboring areas. The impacts could also be long term and in some instances lead to change in occupational pattern if any laborers working in salt pans is unable to find alternate place of work or land.

✧ **Traffic**

Due to the establishment of proposed EZ, the River/Sea traffic volume will be increased significantly in the project area which may affect local community. MEZ-III authority should establish a Traffic management plan to control excess Sea/River traffic.

7.8.3 Post-Construction Phase

✧ **Disturbance to Rights on Water Resource**

Withdrawal of ground water for EZ's operation may affect the ground water level and availability of water for the local people.

✧ **Disturbance to the Existing Social Infrastructure and Service**

The road route of the local residence may shift as project area will be fenced. It also can alter the existing roadways. Traffic volume and traffic jams can be increased in the road, community road and road around the project plant area. Mitigation measures to decrease traffic volume will be taken, such as development of alternative roads, traffic management plans etc.

✧ **Distribution of Benefits and Compensation**

People who live in other areas may have limited access or be prevented from accessing the school and medical facility along the road, which may cause grievances. The road shall be open to all local people to the maximum extent possible in order to improve peoples' life.

✧ **Local Conflicts of Interest**

Local conflicts of interest may occur among employers, employees of local community, local mass people and local political leaders. There may be feelings of resentment and reconciliation, as people living around the project will benefit. However, conflicts among local residents may occur if such benefits were unfairly distributed.

✧ **Accidents**

The risk of traffic accident may be increased. Observation of traffic regulations, installation of traffic signs, and training and education on safe driving shall be conducted for land traffic vehicles.

✧ **Livelihood**

The proposed EZ establishment will generate huge employment opportunities for the local people. The salt pans shall have converted into industrial land and the land price will increase in the nearby areas; as a result, overall livelihood condition of the Project Affected Peoples (PAPs) will be improved.

✧ **Traffic**

Development of access road, loading/unloading of goods requires huge traffic volume both in land River/Sea transportation system. Generation of Noise from the excess traffic is expected which will cause disturbances to the local people. Development of other projects in the nearby areas like Maheshkhali Economic Zone –I, Maheshkhali Economic Zone-II, Matharbari Coal Fired Power Plant etc. shall increase both road and River/Sea Traffic volume to a greatest extent. Excess traffic will cause traffic jam, accidents, damaging effects on marine ecosystems, disturbances/ nuisance to local people.

Chapter 8: Public Consultation and Disclosure

8.1 Introduction

Community participation always plays a key role for sustainable development. According to the guidelines of the DoE and the development partners, people's participation in planning and implementation phases of category A & B projects (usually red category) is essential to take necessary actions for minimizing any undue socio-cultural, political or any other conflicts and to address environmental issues. People have the right to know about what is going to happen in their surroundings. They must be informed about the positive and negative impacts for obtaining their perceptions, views and feedbacks on the probable changes likely to happen within the study area. Therefore, a series of public consultation meetings (PCMs) and public disclosure (PD) were undertaken with community stakeholders in accordance with the World Bank's Environmental Guidelines.

8.2 Objectives of Public Consultation and Disclosure Meeting

The primary objective of the PCMs and PD is to incorporate the opinions and suggestions of the public and all other stakeholders at the project planning stage to ensure wider acceptability of the project. The key objectives are as follows:

- ✓ To provide information on the economic, environmental, and social benefits as well as potential negative impacts from the project;
- ✓ To ensure that the potential project affected persons (PAPs), stakeholders, and local communities are engaged in a meaningful dialogue and are well informed prior to the decision of the project Proponent as to the nature and extent of social and environmental impacts attributable to the proposed project with respect to planning;
- ✓ To ensure that the concerns of, and issues raised by the PAPs, stakeholders, and local communities are incorporated and adequately addressed in the EIA study;
- ✓ To engage in a participative exercise with PAPs, stakeholders, and local communities and obtain expertise and local, traditional wisdom and knowledge from them in order to plan the mitigation measures; and
- ✓ To facilitate periodic opportunities to the principal stakeholders to offer their inputs on all key components of the project.

8.3 Approach and Methodology of Public Consultation and Disclosure Meeting

8.3.1 Approach of PCM and PD for EIA

PCM and PD offer an opportunity for people to participate in the decision making process for design, development, and implementation of the project. It provides a platform for project-affected persons and different stakeholders to express their views on possible impacts of the proposed intervention on environmental and social parameters.

PCM and PD for EIA are planned at two different stages (EIA scoping stage and draft EIA report stage) in order to collect opinions and feedback of the public and to disseminate information on the project and EIA Study.

- a) EIA Scoping Stage:** The first stage of the PCM and PD for EIA is conducted at the time of environmental scoping in the initial stage of the EIA study. Information on the project and scope

of the EIA study is disseminated to the public and then comments and opinions are collected to incorporate into the report.

- b) Draft EIA Report Stage:** The second stage of the PCM and PD for EIA is conducted at the time of preparation of draft EIA report. Information about findings of draft environmental and social impact assessment study and proposed mitigation measures are disseminated to the general public that are directly or indirectly affected by the project. In addition, their feedback and opinions are obtained which are reflected in the EIA report together with their comments and request on the environmental and social mitigation measures, environmental management plan (EMP) and environmental monitoring plan (EMoP).

8.3.2 Methodology of PCM and PD for EIA

The consultant team prepared a checklist for the consultation meetings. The issues on the overall study, planning as well as project interventions and probable impacts of project on the environment, socio-economic condition and institution were incorporated in the checklist. The issues of discussion were also shared with the implementing authority for obtaining their responses and suggestions. The probable places of meeting were selected in consultation with the local representative of the study area.

A Socio-environmentalist from the multi-disciplinary EIA consultant team facilitated the consultation process with instantly available local people separately to collect/record opinions and views from their own perspectives. The other members of the EIA team also attended and assisted as necessary. The team used maps of the study area during discussion to share about the interventions for the participants of the consultation meetings. The facilitators explained all relevant points and issues in order to enable the participants to comprehend the proposed interventions/ activities properly and to respond accordingly. The team took utmost care in recording opinions and views of the participants relevant to the EIA study.

8.3.3 Stakeholder Engagement Plan

In order to ensure effective engagement and open, frequent and honest dialogue with local communities and other key stakeholders, a stakeholder engagement plan is designed throughout the life of the project. This plan is to be developed and implemented in order to identify stakeholder and their issues of concern, establishes the methods for consultation, and provides a specific action plan for stakeholder engagement throughout the life of the project.

Table 65: Stakeholder engagement plan

Key Stakeholders	
Project Proponent	Maheshkhali Economic Zone-III
Related organizations/ Local government	Union Parishad (UP member-male and female).
Local people	Land owners, Businessmen, Fishermen, Day Labor, Teacher, Religious people, women etc.
Private business	Private companies/ factories around the zone.
Non-Governmental Organizations	Community Based Organizations (CBOs).
Engagement methods	
EIA phase	Organizing consultation meetings inviting key stakeholders above at draft scoping report and draft EIA report.
Pre-construction/ Construction phase/ Regular operation Phase	<ul style="list-style-type: none"> – Regular communication with local community through personal contact; – Meeting with the representative of village on the quarterly basis;

	<ul style="list-style-type: none"> – Participatory meeting with villagers; – Interview survey with villagers.
Information disclosure	
EIA phase: Pre-construction/ Construction phase/ Regular operation Phase	Disclosures of draft scoping report and draft EIA report.
Grievance mechanism process and complaints register	
All phase	<ul style="list-style-type: none"> – Receiving complaints and opinions from the public on regular basis through the engagement method; – Meeting with the representative of villages; – Participatory meeting with villagers.

Source: EIA Study Team

8.4 Public Consultation Meetings (PCMs)

Participatory Rapid Assessment (PRA) and Focused Group Discussions (FGDs) were held in major settlement areas of the project site to inform people about the objectives of the project. In each of the consultation, participants were encouraged to share their observations, suggestions, and experiences on various environmental and safety issues and suitable mitigation and enhancement measures. Issues discussed were:

1. Awareness and extent of the project and development components;
2. Resettlement and compensation of project affected peoples (PAPs);
3. Benefits of the project for the economic and social advancement of the community;
4. Labor availability in the project area or requirement of outside labor involvement;
5. Local disturbances due to dust, noise generation during construction activities;
6. Necessity of cutting trees and the degree of clearing vegetation at project sites;
7. Impact on fisheries and salt cultivation;
8. Water logging and drainage problem, if any;
9. Discharge of polluted water into the River;
10. Earth filling to develop the zone;
11. Possible negative environmental consequences of the project like air quality, Water pollution, and human health impacts etc.

The meetings were aimed to:

1. Ensure that the public was provided with opportunities to participate in the decision making process and to influence decisions that would affect them;
2. Identify the widest range of potential issues about the project as early as possible and in some cases, have those resolved;
3. Ensure that government departments were notified and consulted early in the process; and
4. Ensure a broad range of perspectives were considered in any decision.

Positive Impacts of the project by Local People:

1. The proposed project will create employment opportunity for the adjacent local community during construction and operation phases;
2. Existing road network and transportation facility will be improved due to establishment of MEZ-III;
3. Land value around the project will be increased;
4. Education, health, bazaar, telecom, hotel & restaurant facilities will be available and established;
5. New business will be introduced.

Negative Impact of the project by the Local People:

1. Pollution of river and sea water;
2. Reduction of aquatic species;
3. Loss of employment;
4. Increase traffic congestion;

5. Pollution of air environment during construction phase.

The following recommendations given by the participants during consultation:

1. As positive externalities, BEZA should improve and create livelihood to the local people;
2. For less disturbance to local settings, BEZA should engage qualified contractor to ensure quality of works as well as timely completion of work;
3. Local people should be employed by the contractor during construction work;
4. Adequate safety measures should be taken during construction work;
5. Concerns were also raised on possible traffic and population pressure caused by external employed personnel;
6. Water treatment system should be installed to prevent water pollution;
7. Finally, local people have appreciated the EZ project and employment generation; and have promised that they will cooperate with the executing agency during project implementation.

8.5 Proceedings of Public Hearing

The public hearing for the development of proposed MEZ-III was conducted on 08 March 2018 at 12:30 pm in the premises of Dhalghata Union at Maheshkhali Upazilla of Cox’s Bazar District. The public hearing was attended by Chairman, the Union Parishad (UP) members of Dhalghata Union, project relevant stakeholders and representatives of Shahidul Consultant.

Chairman of Dhalghata Union Parishad initiated the proceedings and welcomed the gathering. He narrated the procedure to be followed for obtaining Environmental Clearance (EC) and explained purpose and usefulness of this public hearing.

Representative of Shahidul Consultant, Mr. Muhammad Abul Foysal (Socio-environmental Expert) explained the proposed project and the environmental assessment of the region which included project background; introduction of the project proponent; institutional and legal framework for the project specifying role of Shahidul Consultant; project description with brief of project location, its connectivity, land use plan, and other aspects like sources and consumption of water, management of wastewater, source and consumption of electricity, solid waste generation and disposal, development of green belt, and other social and economic development that would emanate from this industrial area. Potential impacts of the development, suggested mitigation measures to mitigate them, environmental and social monitoring program was also explained to the public. Thereafter the UP members requested the attending public to convey their suggestions/ comments/ concerns about the proposed project. Concerns raised during Public Hearing conducted for Maheshkhali Economic Zone-III (MEZ-III) and their response by concerned authorities are presented in the Table 66.

Table 66: Concerns rose by PAPs during public hearing and response from the authority

SN	Name of Participant	Concern/ Objection	Response/Solution
1.	Md. Aktaruzzaman, Union Parishad (UP) member	He asked for the priority of local people in the work of development project. He also asked for appropriate price of land and the compensation within proposed time.	<ul style="list-style-type: none"> • Affected people would be compensated as per Bangladesh Laws (Ordinance 1982) through the district administration. Payment of compensation at market value before the commencement of the pre-construction phase of the project.

SN	Name of Participant	Concern/ Objection	Response/Solution
			<ul style="list-style-type: none"> Compensations for land, structures, and trees to the private land owners will be provided on the basis of the current rates. The compensation will be provided before the commencement of the construction.
2.	Bodiul Alam, Political leader	He mentioned that around 80% local people depend on fisheries. Their main professions are fishing and salt cultivation. They also catch shrimp and crab from river and sea. So, he was anxious about the future of these professions. Because the habitat of species will be changed due to development.	<ul style="list-style-type: none"> Ministry of Fisheries (MoF) will be monitor the breeding location and habitat. BEZA will treat and maintain their liquid and solid waste before discharge into environment as per as regulations.
3.	Samsul Alam, Social worker	He indicates that the main problem will be loss of employment. He also suggested establishing training centre for affected people and giving priority to local people to work in MEZ-III.	<ul style="list-style-type: none"> BEZA will support with his suggestion and agreed to give their priority as employee.
4.	Akhtar, Salt Farmer	He asked for what will happen to those who work as labour and sharecroppers of land. If the project takes the land they will be jobless and no other options for them to work. Moreover, he hoped an ordinance will be enacted by local government/government regarding compensation of project affected peoples (PAPs).	<ul style="list-style-type: none"> BEZA will be given them priority as worker. Training will be provided to them to work on MEZ-III.
5.	Mr. Nurul Islam Union Parishad (UP) member	He discussed about the effect on environment, especially on fisheries which may affect their livelihood.	<ul style="list-style-type: none"> BEZA will follow all environment related rules and regulations.
6.	Md. Azizul Hoaqe Union Parishad (UP) member	He said that yearly earn from salt cultivation land is around 5 lakh/acre. He asked for 1 corer compensation for per acre land.	<ul style="list-style-type: none"> Affected people would be compensated as per Bangladesh Laws (Ordinance 1982) through the district administration. Payment of compensation at market value before the commencement of the pre-construction phase of the project Compensations for land, structures, and trees to the private land owners will be provided on the basis of the current rates. The compensation will be provided before the commencement of the construction.

List of participants attended in public hearing is attached in **Annex-6**.

8.6 Public Disclosure Meetings (PDMs)

For the implementation of PD at the draft EIA stage, the additional arrangement was made to implement at the draft EIA stage taking into account the opinion received at the scoping stage as follows:

1. Preparation and disclosure of the main part in local language in addition to the documents which are officially required in accordance with EIA procedure;
2. Arrangement of PD before the day of holding PCM;
3. Arrangement for changing PD period i.e., 1 month to 2 weeks; and
4. Distribution of the reports to more places.

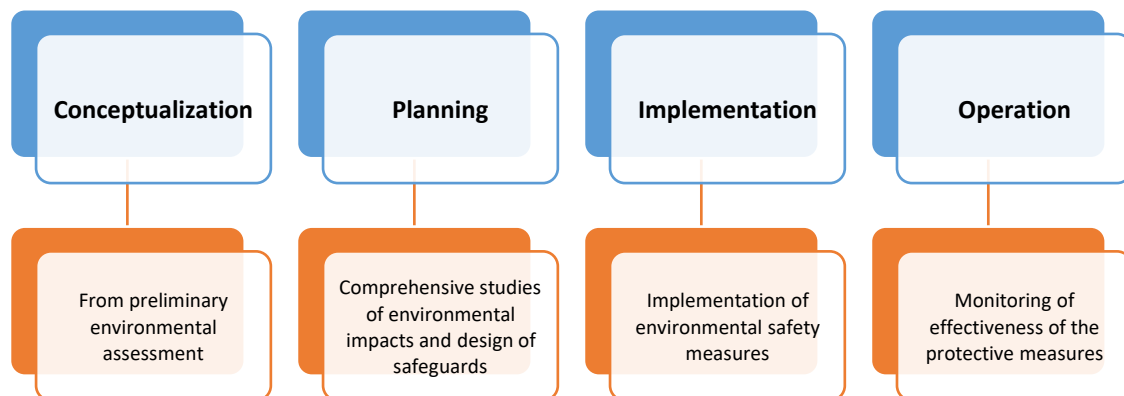


Figure 27: Public consultation meeting at Dhalghata Union

Chapter 9: Environmental Management Plan and Monitoring Indicators

9.1 Introduction

Environmental Management Plan (EMP) is a site-specific plan developed to ensure that all necessary measures including mitigation and monitoring activities are identified and implemented in order to preserve and protect the environment and to avoid and manage the negative impacts of the project and comply with environmental legislation. The primary objective of the EMP is to provide a guideline for proper management and monitoring of the identified environmental and other impacts due to the project and to offer document to the implementers for accomplishing the institutional requirements of the authority. It will identify the residual impacts and unavoidable impact and its management. As GoB is committed to ensure sound environmental condition, preparation and execution of EMP is mandatory for preparation, implementation and monitoring of environmental protection measures during and after commissioning of the Project. EMP indicates how various measures are proposed to be undertaken during different phases of the Project including cost components. It consists of various steps including:



The present study clarifies the following proposed EMP:

- The mitigation measures that needs to be taken during construction and operation phases of the project to eliminate or offset adverse environmental impacts, or reduce to acceptable limits;
- The actions needed to implement these measures; and
- A monitoring plan consists of concrete monitoring indicator require to assess the effectiveness of the mitigation measures employed.

Similarly, integrated EMP is a necessary requirement for implementation of the MEZ-III, which will be a guide for the environmental protection activities. A comprehensive measure for mitigation and monitoring of possible environmental hazards has been enlisted for ensuring safety measures and minimizing the risks and hazards due to implementation of the project in the study.

9.2 Mitigation Plan

The establishment and execution of proposed MEZ-III is believed to have a positive impact for sustainable economic growth of the country as well as provision of employment to the local people.

However, the project may also have some impacts on the existing local environment, eco-system and socio-cultural activities including land use, soil quality, pollution of water, air, noise, etc. Therefore, a mitigation mechanism has to be established to the affected communities regarding various harmful impacts including the effects on livelihoods, environment, agriculture, water bodies, and surrounding social infrastructures. A detail EMP including health & safety measures has been described in the following table. The Project Proponent will be responsible for accomplishing the proposed safety measures mentioned in the proposed EMP.

Following are the main advantages of the environmental mitigation plan:

- Ensure plan for the fulfillment of basic environmental standards essentially required to meet during design, construction, and operation period of the project;
- Provide plan for the development of compensatory actions especially in the form of compensatory forestation, green zone development and landscaping for minimizing the negative ecological impacts due to the project;
- Reduce the potential environmental impacts, causing the biophysical environment in the area to deteriorate and indirectly slow down the economy of local communities by the project.

The EMP for MEZ-III has been prepared based upon optimum and reasonable costs that are needed for mitigation measures on a “least-cost” basis. Activities that needs to be carried out for the environmental management and monitoring of the proposed EZ could be divided into two phases: during construction phase, and during operation phase.

Table 67: Environmental mitigation and management plan (construction phase)

Category	Item	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
Pollution	Air Quality	<ul style="list-style-type: none"> Emission of dust, PM (PM_{2.5}, PM₁₀), gaseous emission like SO_x, NO_x, CO, CO₂, etc. 	<ul style="list-style-type: none"> Monitoring of wind speed and direction to manage dust-generating activities during undesirable conditions. Dust suppression should be undertaken where necessary by covering and/or spraying affected land surfaces with water. Prevent offsite migration of dust using appropriate screens. Use or establish hard-covered roadways for vehicle movement. Vehicle speed restrictions should be applied across the project site to avoid excessive dust generation. Trucks transporting excavated soil and other construction raw material to and from the site to be covered to minimize fugitive dust emission. . Cover all onsite construction material and construction waste storage/stockpiling locations. Use low sulphur content fuel for machinery and equipment to reduce SO₂ emissions from engines whenever possible. Modify machinery to reduce NO_x emissions. All energy consuming and CO₂-generating activities should be done as efficiently as possible to minimize CO₂ emissions. Adopt a policy of switching off machinery and equipment when not in use. Appropriate maintenance, engine tuning and servicing of construction equipment to minimize exhaust emissions. Minimize unnecessary journeys or equipment use. 	BEZA
	Wastes	<ul style="list-style-type: none"> Generation of construction wastes 	<ul style="list-style-type: none"> Waste management plan to be prepared Quantities of construction materials to be accurately estimated to minimize the potential for excess generation of waste. Construction activities to be appropriately scheduled to minimize the potential for rework. Sizing of storage areas/skips will be in accordance with the 	BEZA

Category	Item	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
			expected waste quantities and the frequency of disposal. Waste skips/containers are to be suitably labelled for easy identification of material. Waste skips will be covered to avoid waste scattering onsite. <ul style="list-style-type: none"> • Waste bins will be installed clearly marked wherever required. Such places include eating/rest areas, next to operational areas and next to any worker assembly areas. • Adequate waste management, awareness and communication through training, tool box talks and posters placed across the site. • Engage licensed approved subcontractors to undertake all waste and recycling activities. • The provision of Central Solid Waste Dumping Station (CSWDS) to safe dumping of all the hazardous and non-hazardous solid wastes. 	
	Noise and Vibration	<ul style="list-style-type: none"> • Impacts of noise and vibration by construction machineries and vehicles 	<ul style="list-style-type: none"> • Installation of sound-proofing sheet • Avoidance of construction at night time • Advanced notice for construction work time near the residential area • Avoidance of intensive operation of construction machineries • Speed limit for drivers • Preventive maintenance of equipment and vehicles • Unnecessary engine operations to be minimized (e.g. equipment with intermitted use switched off when not working) • DG sets to be provided with acoustic enclosures and exhaust mufflers. <p>The following techniques can eliminate the vibrational problems to a greatest extent in the construction phase of the project.</p> <p>Measures to mitigate vibration can address the source, the transmission path or at the receiver. Source control methods include the use of auger to install piles instead of pile driver: this would greatly reduce noise and vibration level.</p> <p>Piles in properly selected patterns also reduce noise and vibration level.</p>	BEZA

Category	Item	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
			Introducing barriers to the vibration waves in the transmission path can reduce vibrations that reach a building. When surface waves predominate deep trenching is an effective method. <ul style="list-style-type: none"> • Other methods are to avoid demolition methods that involve impact, avoid the use of earth moving equipment, vibratory rollers and packers near sensitive areas. 	
Natural Environment	Flora, Fauna, and Biodiversity	<ul style="list-style-type: none"> • Clearance of existing vegetation • Degradation of the marine environment or loss of marine resources may occur due to the dredging activities as well as open-water dredging material disposal. • Loss of terrestrial biodiversity • Disturbance to threatened marine resources (Olive Ridley's Turtle, Chelonia mydas (Green turtle), Eretmochelys Imbricate (Hawksbill turtle) are also found in the of Maheshkhali Island). 	<ul style="list-style-type: none"> • Clear marking of boundary of the project site to prevent the contractor from clearing the vegetation outside of the Project site • Prevent unnecessary clearing or disturbance of native vegetation. • Vehicle tracks and roads should be used to decrease habitat destruction. • Minimizing areas of excavation and active work sites as far as possible. • All work will be undertaken during the day, as much as reasonably practical, to ensure lighting does not impact birds and noise will be reduced as much as reasonably practical to avoid fauna disturbance. • If protected/sensitive species are discovered or suspected, then work will be ceased and inform the relevant authority; contractor will seek expert advice and/or consult the client in order to develop and agree on an appropriate management strategy; • No litter or plastic bags/containers will fly off the site boundaries. • Vegetation removal to be minimal and limited to the zone. • Water sprinkling for dust suppression; and • Provision of dust curtains to reduce the dust emission. <p><u>Measures for protecting Sea Turtles:</u> These species are sensitive to light and noise, so noise and use of flashlights on the coast at night can cause nesting females to halt their nesting.</p> <p><u>Measures available to mitigate these impacts should be taken:</u></p> <ul style="list-style-type: none"> • Turning off unnecessary lights during the nesting season 	BEZA

Category	Item	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
			<ul style="list-style-type: none"> Using a smaller number or lower wattage of lights Shielding, redirecting and repositioning lights Using red, yellow, and low-pressure sodium-vapor lights (as sea turtles are less affected by these colors) Using low-level noise heavy machinery (concrete mixing, excavation machinery, etc.) Planning construction activities to minimize adverse effects during the nesting season Avoiding tall structures creating shade on the coast to maintain nest temperatures Control the introduction of non-native plants which may lead to impenetrable root mats. 	
	Fishery Resources	<ul style="list-style-type: none"> Reduce fishery resources, disturbances to fishery habitat etc. 	<ul style="list-style-type: none"> Dredging activities need to be done carefully. Prevention of leakage of hazardous chemicals and oils into the water bodies. Fishermen will be informed about the project construction and their feedback to be taken on seasonality and routes during construction. The Project will try and avoid disrupting peak fishing activities to the extent feasible. A monitoring study with GPS may be undertaken by the project proponent that will monitor and assess the actual fishing routes, fishing zones and fish catch of the local fishermen that may potentially get impacted due to the project activities. The project authority should make a specific route for River transportation in the Sea near the project site by consulting with the Department of Fisheries (DoF), Bangladesh in order to minimize the negative impacts on fishery resources. Undertake construction activities in marine areas in a short time as possible. Vessels to minimize unnecessary vessel movements, such as 	BEZA

Category	Item	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
			propeller thrusting, to avoid sediment disturbance <ul style="list-style-type: none"> Care must be taken during construction of marine jetty. 	
	Hydrology	<ul style="list-style-type: none"> Impact on hydrology due to water consumption used in the construction works 	<ul style="list-style-type: none"> Limited and short-term usage of groundwater Preparation of tentative retention pond 	BEZA
	Soil/ Sea Sediment	<ul style="list-style-type: none"> Soil erosion of the bank Soil and sediment contamination 	<ul style="list-style-type: none"> Provision of temporary drainage and/or sandbag to minimize soil erosion due to rainy water Minimizing areas of excavation and work as possible Where possible, excavated material shall be reused during the construction works onsite as appropriate. Stockpiling of soils onsite to be kept to a minimum. Dredged material disposal area shall be inspected and maintained regularly. Stockpiling of dredged materials to be kept to a minimum. Dredged materials stored at the designated disposal area shall be appropriately handled and analyzed frequently. The disposal area near the Port area will include liners or other hydraulic containment design options to prevent leaching of contaminants into adjacent soil. Best practices for soil management should be followed Control all onsite wastewater streams and ensure appropriate collection, treatment and discharge. Good housekeeping to minimize spills/leaks. Minimize onsite storage of potentially contaminating materials Proper handling and management of wastes. Proper handling and storage of potentially contaminating materials (e.g. diesel fuel) and wastes in appropriate secondary containment to avoid accidental release. 	BEZA
	Physiography & Drainage	<ul style="list-style-type: none"> Disruption of natural drainage system 	<ul style="list-style-type: none"> Storm water drainage structure will be provided to drain all the surface runoff into the sea. 	
Social	Living and livelihood/	<ul style="list-style-type: none"> Impact of loss of livelihood 	<ul style="list-style-type: none"> Aim of EZ establishment is to provide and create 	BEZA

Category	Item	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
Environment	Vulnerable Group	opportunity	employment opportunities. <ul style="list-style-type: none"> As a mitigation measure the land owner, share croppers, lessee farmers and the salt pan workers will be appropriately compensated as per Government Rules. Unskilled labor during the project construction phase should be sourced from the local community. In order to ensure the appropriate livelihood of the fisherman, designated fishing route must be selected for the fisherman by consulting with the Department of Fisheries, Bangladesh. There has to be alternate livelihood options for fisherman, salt farmer, share croppers and lessee farmers. 	
	Local Conflict of Interests	<ul style="list-style-type: none"> Loss or change of livelihood 	<ul style="list-style-type: none"> Provision of special assistance, if applicable. 	BEZA
	Existing Infrastructures and Services	<ul style="list-style-type: none"> Accessibility to social infrastructure for local community 	<ul style="list-style-type: none"> Control of traffic volume 	BEZA
	Benefits of Community Development Activities / CSER Activity	<ul style="list-style-type: none"> Employment generation, improved educational and health facilities. 	<ul style="list-style-type: none"> The initiatives of the project proponents are likely to be focused on livelihood restoration, income generation, education and provision of health facilities which can further improve the quality of life of the community in the vicinity. 	
Water	Water Pollution	<ul style="list-style-type: none"> Surface/Sea and groundwater pollution 	Pollution prevention: Surface water <ul style="list-style-type: none"> Avoiding seepage of wastewater, fuel, oil and oily water; Vessels will never be overloaded; Waste disposal to marine environment are prohibited. Treat accidental spills on any floating unit with spill containment and clean up (dispersant) materials; and Weather and marine conditions will be assessed before work commences each day. Work activities will be suspended during thunderstorms and rough sea conditions. Treating turbid water from land, such as rainwater run-off, with precipitation process and discharging the remaining water into the 	BEZA

Category	Item	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
			excavated part of the zone. <ul style="list-style-type: none"> • Provision of septic tank and soak pit. Pollution prevention: Ground water <ul style="list-style-type: none"> • Control all onsite wastewater streams and ensure appropriate collection, treatment and discharge. • Prevent discharge of contaminants and wastewater streams to ground water. • Apply high quality control standards to the construction of wastewater storage trenches/tanks to avoid leakage and arrange for frequent discharge to prevent sewage spillage/overflow. • Good housekeeping to prevent leaks and incidental spills. • Minimize onsite storage of potentially contaminating materials • Dredged materials stored at the designated disposal area shall be appropriately handled and analyzed frequently. • Adequate management and proper handling and storage of construction materials, oils and fuel to avoid spillages. • Wastes properly managed and disposed. • The implementation of a continuous and regular site inspection system. • Frequent and regular discharge of wastewater storage tanks/trenches. • Conducting dredging at sea area with pump dredger or grab dredger and setting film preventing the diffusion of contamination. • Restrict the earth work activities during monsoon season; • Channelize all surface runoff from the construction site through storm water drainage system and provide adequate size double chambered sedimentation tank; • Prevent & mitigate spill of paint/fuel within the construction site; 	
Health and Safety	Risks for infectious diseases such as AIDS/HIV	<ul style="list-style-type: none"> • Increasing risks for infectious diseases due to the influx of workers 	Conducting mitigation measures stipulated in the international guidelines such as EHS Guidelines of IFC; <ul style="list-style-type: none"> • To provide surveillance for worker's health. 	BEZA

Category	Item	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
			<ul style="list-style-type: none"> • Prevention of illness among workers by undertaking health awareness and education initiatives and by conducting immunization programs for workers. • To provide treatment through standard case management in on-site and community health care facilities as necessary. • Educating project personnel and area residents on risks, prevention, and available treatment. • Promoting collaboration with local authorities to enhance access of worker's families and the community to public health services and promote immunization as necessary. • Promoting use of repellents, clothing, netting, and other barriers to prevent insect bites. • Prevention of larval and adult propagation through sanitary improvements and elimination of breeding habitats close to human settlements. • Elimination of unusable impounded water 	
	Occupational Health and Safety	<ul style="list-style-type: none"> • Accidents and incidents during the operation of each tenant 	Conducting mitigation measures training stipulated in the international guidelines such as EHS Guidelines of IFC; Common: <ul style="list-style-type: none"> • To provide adequate health care facilities and first aid within construction sites • To provide OHS training program and information of basic site rules of work, basic hazard awareness, site specific hazards, safe work practices, and emergency procedure Occupational Health: <ul style="list-style-type: none"> • To provide adequate lavatory facilities for the number of people expected to work in the facility • To provide adequate supplies and easy access of drinking water with a sanitary means • To provide temporary shelters to protect against heat stroke during working activities or for use as rest areas as needed • To arrange for provision of clean eating areas where workers are 	BEZA

Category	Item	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
			<p>not exposed to the hazardous or noxious substances where there is potential for exposure to substances poisonous by ingestion of food as necessary</p> <ul style="list-style-type: none"> To promote the use of repellents, clothing, netting, and other barriers to prevent insect bites and snake bite <p>Occupational Safety:</p> <ul style="list-style-type: none"> Adequate preventive measures from negative factors such as fire precautions, lighting, safe access, work environment temperature, area signage, labelling of equipment, communicate Hazard codes, electrical To establish rights-of-way, site speed limits, vehicle inspection requirements, operating rules and procedures, and control of traffic patterns or direction To identify and provide appropriate PPE that offers adequate protection to the worker, co-workers, and occasional visitors Proper maintenance of PPE and the instruction of proper use 	
	Community Health and Safety	<ul style="list-style-type: none"> Third party accidents with residents near the construction site Accidents with local people by the traffic of construction vehicles Disputes among local people and migrated workers 	<p>Conducting mitigation measures stipulated in the international guidelines such as EHS Guidelines of IFC such as;</p> <p>Common:</p> <ul style="list-style-type: none"> Establish the plan of site safety and security measures to communities and its implementation Education and instruction to the Project personnel and construction workers on risks, prevention, and available treatment <p>General Site Hazard:</p> <ul style="list-style-type: none"> Restricting access to the site with a focus on high risk structures or areas depending on site-specific situations including fencing, signage, and communication of risks to the local community Removing hazardous conditions on construction sites such as covering openings to small confined spaces, ensuring means of escape for larger openings such as trenches or excavations, or locked storage of hazardous materials <p>Traffic Safety:</p>	BEZA

Category	Item	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
			<ul style="list-style-type: none"> Emphasizing safety aspects among drivers Improving driving skills and requiring licensing of drivers Adopting limits for trip duration and arranging driver rosters to avoid overtiredness Avoiding dangerous routes and times of day to reduce the risk of accidents <p>Other:</p> <ul style="list-style-type: none"> Dispute settlement among stakeholders in case incidences occur Arrangement of worker's accommodation as necessary 	
Emergency	Usage of Chemicals	Risk of chemical materials	<ul style="list-style-type: none"> Formulation of chemical management plan as necessary Training of safety usage and preparation of the emergency response plans Implementation of the proper storage and record of usage. Applying for the acquisition of the license with management plan in accordance with the relevant law, and compliance with the law. Provision of protective equipment and clothes to workers as necessary. 	BEZA
	Flood Risk	<ul style="list-style-type: none"> Increasing of the impact of flood in and around the Projects site 	<ul style="list-style-type: none"> Preparation of the disaster prevention equipment and management manual 	BEZA
	Risk of Fire	<ul style="list-style-type: none"> Impact on the community around the Project site by increasing of risk of fire 	<ul style="list-style-type: none"> Installation of the fire hydrants along the road Implementation of emergency drill 	BEZA
	Earthquake/Cyclones	<ul style="list-style-type: none"> Increasing of the damage of the earthquake in and around the Projects site 	<ul style="list-style-type: none"> Compliance with the National Standard Operational Procedure for building construction Preparation of the disaster prevention plan such as emergency contact list Implementation of suggested Disaster Management Plan (DMP) 	BEZA
Others	Global Warming	<ul style="list-style-type: none"> Impact in the increase of GHGs by vehicle traffic operation of tenants in the construction phase. 	<ul style="list-style-type: none"> Control of GHGs emission by energy use efficiency, process modification, selection of fuels or other materials, the processing of which may result in less emission, application of emission control techniques, if possible. Provision of commuter bus 	BEZA

Table 68: Environmental mitigation and management plan (operation phase)

Category	Issues	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
Pollution	Air Quality	<ul style="list-style-type: none"> Emission of dust, PM, gaseous emission like SO_x, NO_x, CO, CO₂, Volatile Organic Compounds (VOCs), Hazardous Air Pollutants (HAPs) etc. 	<ul style="list-style-type: none"> Regular monitoring and maintenance of all equipment, generators as part of the environmental monitoring plan. This would ensure that any emission excess is noticed, and then mitigation measures can be put in place until the appropriate criteria are met. Mitigation could include process shut down; Implementation of advanced multi-variable and on-line optimization, incorporating on-line analyzers, performance controls, and constraint controls. Use of cyclones (Tertiary cyclones, multi cyclones) to abate particulate emissions. Besides, electrostatic precipitators, Wet flue gas scrubber etc. should be used to control PM emission. Ensure that air emissions from point sources will meet all relevant national and international standards. Besides point source monitoring, air quality monitoring should be carried out in specific locations; Use low sulphur content fuel for machinery/equipment, modify machinery, and switch off machinery/equipment when not in use. Use portable leak detection equipment to identify and prevent fugitive emissions; Any leak once detected will be immediately reported; Bag filters shall be applied to control PM emissions and scrubbers can be used to control gaseous emissions; In order to reduce SO_x Concentrations De-SO_x catalyst additive, feed desulphurization and Flue gas desulphurization methods must be followed. Minimize unnecessary journeys and equipment use and adopt a policy of switching off machinery and equipment when not in use; and Use best available technologies for emissions reduction of NO_x like Fuel De-nitrification, FCC NO_x control, Diluent injection, Flue 	BEZA

Category	Issues	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
			Gas recirculation, Steam or water injection, Low NOx burners, Selective non-catalytic reduction and selective catalytic reduction etc. <ul style="list-style-type: none"> • Provision for covering/Pressurizing of API separators with or without vapor recovery for controlling VOCs. 	
			<ul style="list-style-type: none"> • Preparation of feasible mitigation measures, such as, energy use efficiency, process modification, selection of fuels or other materials, the processing of which may result in less polluting emission, application of emission control techniques, if necessary. 	BEZA
	Water Quality	<ul style="list-style-type: none"> • Deterioration of water quality due to wastewater discharge into nearby water bodies. 	Ground Water: <ul style="list-style-type: none"> • Proper maintenance and management of the plant during operation should ensure that the risk of spillage and leakage are minimized; • Regular inspection of pipes and other potential sources of leaks for the early detection of possible seepage; • Store and manage potentially contaminating materials according to best environmental practices; • Implement a comprehensive Waste Management Policy which ensures the safe storage and timely treatment and/or removal of waste; • Ensure double lining of evaporation pond intact, and ensure avoiding damaging during routine removal of solids; • Install groundwater monitoring wells and implement a continuous monitoring and sampling program, as part of the environmental monitoring plan, to detect any impacts to groundwater quality; and • Formulate a spill contingency plan. • Provision of Desalination Plant in order reduce the over pressure on groundwater. Surface water: <ul style="list-style-type: none"> • Weather and marine conditions will be assessed before work commences each day. Work activities will be suspended during 	BEZA, DOE

Category	Issues	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
			<p>thunderstorms and rough sea conditions;</p> <ul style="list-style-type: none"> • Keeping liquid effluents to minimum as applicable; • Temperature and salinity will be regularly monitored and documented at the outfall; • Avoiding taking or disposing water at known sensitive, breeding or nesting areas; • Avoiding swimming and fishing from navigation routes as possible • The provision of a Central Effluent Treatment Plant (CETP) with good cushion to meet the hydraulic and pollution load during operating the plants. The project authorities should ascertain at planning stage and further evaluate at commissioning stage so that the treated effluent would have characteristics of prescribed limits of National and International standards. The performance of CETP should be continuously monitored and any deviation in performance should be corrected on priority basis. • Regular monitoring of effluent from different treatment units and also combined final discharge of treated wastewater is recommended. Performance evaluation of effluent treatment plant as well as sewage treatment plant should be undertaken at regular intervals for all relevant parameters covered under this study • The project authority should establish a Central Sewerage Treatment Plant (CSTP) in order to treat and proper management of Sewages produced during operation phases. 	
	Wastes	<ul style="list-style-type: none"> • Impact of waste generated from factories and offices. 	<ul style="list-style-type: none"> • Maximize the opportunities for reuse and recycling of materials to minimize solid waste generation. • Waste bins will be installed wherever required. • Different types of wastes shall not be mixed into one container • Provide proper disposal methods for each waste stream. • Maintain a record of waste leaving the site (description and volume) e.g. use of waste manifests. • Light bulbs and fluorescent light fittings to be treated at an approved hazardous waste treatment facility. 	BEZA, DOE

Category	Issues	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
			<ul style="list-style-type: none"> Spent catalysts will be returned to the manufacturer. 	
	Soil and sea sediment	<ul style="list-style-type: none"> Contamination of Soil and Sea Sediment 	<p>Soil:</p> <ul style="list-style-type: none"> Store and manage potentially contaminating materials according to best environmental practices to avoid spills and leaks; Regular monitoring and maintenance and using best available techniques Adopt good handling and transportation practices to avoid loss of material and soil contamination Formulate a spill contingency plan and have appropriate response equipment available onsite; and Implement a comprehensive Waste Management Policy which ensures the safe storage and timely treatment and removal of waste. Wastes should be properly managed and disposed of in accordance to the waste management plan. <p>Sea Sediment:</p> <p>Weather and marine conditions will be assessed before work commences each day. Work activities will be suspended during thunderstorms and rough sea conditions.</p> <ul style="list-style-type: none"> Vessels will never be overloaded; and Sediment quality to be assessed and documented. 	BEZA, DOE
	Noise and Vibration	<ul style="list-style-type: none"> Noise and vibration result negative health impacts and damaging machineries and equipment's. 	<ul style="list-style-type: none"> Avoiding continuous (more than 8 hrs) exposure of workers to high noise areas. Provision of ear muffs at the high noise areas. Ensuring preventive maintenance of equipment. During operational phase, it is recommended that routine maintenance procedures will put in place to ensure that vibration is minimized. This measure includes inspection and maintenance of mountings to isolate machinery that is prone to vibrations and the balancing or reciprocating and rotating machinery. 	BEZA, DOE
	Odor	<ul style="list-style-type: none"> Odor caused by the tenants. 	<ul style="list-style-type: none"> With reference to usage, producing of disposing and handling of dangerous or hazardous materials in the project area, the tenants 	BEZA, DOE

Category	Issues	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
			must, at its sole responsibility and expense, shall treat safety manage, eliminate or dispose of all dangerous or hazardous materials and waste. <ul style="list-style-type: none"> • Waste reduction, waste minimization and cleaner production principles or conventional emission control equipment, as necessary. • Taking appropriate measures for handling general waste • Prohibit illegal waste disposal 	
Natural Environment	Ecology and Biodiversity		<p><u>Terrestrial Ecology and Biodiversity:</u></p> <ul style="list-style-type: none"> • Machinery and generators with ‘quiet’, ‘muffled’ or ‘silenced’ running should be used where available; • Site noisy equipment (e.g. generators) away from receptors where possible; • Use baffles and acoustic insulation, where appropriate; • Fitting vehicles with effective exhaust silencers, where available; • Minimize machinery operation and vehicle movements, particularly during the night hours; and • Restrict working hours for particularly loud or intrusive activities. • Recommended measures to avoid inappropriate waste disposal include the implementation of a comprehensive Waste Management Policy which ensures the safe storage and timely treatment and removal of waste. <ul style="list-style-type: none"> • Development of Green belt throughout the periphery of the zone and all the unpaved vacant spaces of the zone. <p><u>Marine/Aquatic Ecology and Biodiversity:</u></p> <ul style="list-style-type: none"> • Minimize unnecessary vessel movements, such as propeller thrusting, to avoid sediment disturbance; • Avoiding swimming and fishing from navigation routes as possible • Vessels will never be overloaded; • Inspection will be undertaken to identify the potential of leak/spills in the different offshore components, including pipelines, 	BEZA, DOE

Category	Issues	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
			and to implement corrective action if necessary; and regular monitoring to ensure water discharged complies with national limits. <ul style="list-style-type: none"> • Proper spill control plan to be adopted on site. • Oily water separator to be installed at the point of surface run-off discharge • Suggestions from Oil Spill Contingency Plan to be strictly implemented in case of spillage • Minimum illumination at the coastal side 	
	Hydrological	<ul style="list-style-type: none"> • Impact on hydrology due to the change in land use. 	<ul style="list-style-type: none"> • Management of retention ponds • Install of additional earth drain line around the boundary of the project area if a flood were to occur. 	BEZA, DOE
	Soil Erosion	<ul style="list-style-type: none"> • Impact on existing canal by discharge water 	<ul style="list-style-type: none"> • Management of retention ponds • Erosion of river bank must be protected by river training activities 	BEZA, DOE
	Natural Resources	<ul style="list-style-type: none"> • Impacts on natural resources 	<ul style="list-style-type: none"> • Optimize and reduce the use and consumption of fossil fuels and diesel. • Water consumption will be optimized by identifying and implementing water conservation and re-use measures, wherever feasible. • Optimize and reduce the use of electrical sources. Wherever/whenever possible, switch-off electrical appliances. 	BEZA, DOE
	Fisheries Resources	<ul style="list-style-type: none"> • Damaging effects on fishery habitat 	<ul style="list-style-type: none"> • Minimize unnecessary vessel movements, such as propeller thrusting, to avoid sediment disturbance; • Avoiding swimming and fishing from navigation routes as possible • Vessels will never be overloaded; • Inspection will be undertaken to identify the potential of leak/spills in the different offshore components, including pipelines, and to implement corrective action if necessary; and regular monitoring to ensure water discharged complies with national limits. • Fishermen will be informed about the project and their feedback 	BEZA

Category	Issues	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
			to be taken on seasonality and routes. <ul style="list-style-type: none"> The Project will try and avoid disrupting peak fishing activities to the extent feasible. A monitoring study with GPS may be undertaken by the project proponent that will monitor and assess the actual fishing routes, fishing zones and fish catch of the local fishermen that may potentially get impacted due to the project activities. The project authority should make a specific route for River transportation in the Sea near the project site by consulting with the Department of Fisheries (DoF), Bangladesh in order to minimize the negative impacts on fishery resources. 	
Social Environment	Population	<ul style="list-style-type: none"> Nuisance and disturbance to the nearby population 	<ul style="list-style-type: none"> Ongoing good maintenance, operation, and housekeeping should be applied to minimize air emissions. Incorporate appropriate controls into the design of the proposed EZ to ensure that- <ul style="list-style-type: none"> Applicable noise regulations and guidelines are met; Machinery and generators with 'quiet', 'muffled' or 'silenced' running should be used where available. Restrict working hours for particularly loud or intrusive activities. Identified restricted areas requiring personnel noise protection will be established, where necessary. 	BEZA, DOE
	Traffic	<ul style="list-style-type: none"> Nuisance and disturbance to the nearby population, accidents, disturbance to marine ecology and biodiversity. 	<ul style="list-style-type: none"> Time traffic flows to avoid periods of heavy traffic along main roads. Provide a dedicated parking area for private vehicles of project personnel. Safe driving training will be mandatory to all drivers Basic maintenance for vehicles will be carried out by the driver/operator. Defects found will be repaired before the vehicle is back to service. Periodic servicing of vehicles will be carried out in accordance 	BEZA, DOE

Category	Issues	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
			<p>with the manufacturer’s instructions.</p> <ul style="list-style-type: none"> • Avoid vehicle movements during rush hours. • Adopt a traffic plan to cover all transport arrangements during the construction phase • Drivers will undergo medical surveillance. • Training and licensing industrial vehicle operators of specialized vehicles such as forklifts, including safe loading/unloading, load limits • Adequate planning of activities to ensure and avoid unnecessary transportation trips. This may include ensuring full loading of trucks for the transport of required building materials to the site where possible. • Provide driver safety training. • A traffic management plan for road and Sea/River transportation system has to be prepared. • Marine vessels must not be over loaded. • Provision of a specific Sea/River transportation route for vehicles including marine vessels. • Minimize unnecessary vessel movements, such as propeller thrusting, to avoid sediment disturbance • Avoid unnecessary journeys • Vehicle speed restrictions should be applied • Avoid traffic rush-hours whenever possible • Avoid unnecessary journeys and equipment use. • Minimize night time vehicle movement • Marine vessels should have oil/spill removal facilities. 	
	Socio-economic activities	<ul style="list-style-type: none"> • Employment generation, infrastructure development etc. 	<ul style="list-style-type: none"> • Extending reach of Corporate Social and Environmental Responsibilities (CSER) Program. • Monitoring speed and route of project-related vehicles 	BEZA, DOE
	Misdistribution of benefit and	<ul style="list-style-type: none"> • Impact on living environment in local community 	<ul style="list-style-type: none"> • Communication with local community through community relation department. 	BEZA, DOE

Category	Issues	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
	damage Children's right	<ul style="list-style-type: none"> Impact on illegal child labor 	<ul style="list-style-type: none"> Compliance with the relevant regulations 	BEZA, DOE
	Local Conflicts of Interest	<ul style="list-style-type: none"> Conflict between local residents and workers 	<ul style="list-style-type: none"> Employ local residents as much as possible Promote communication between workers and local people (e.g., join in local events) 	
	Livelihood	<ul style="list-style-type: none"> Employment generation Disruption of livelihood patterns. 	<ul style="list-style-type: none"> Aim of EZ establishment is to provide and create employment opportunities. As a mitigation measure the land owner, share croppers, lessee farmers and the salt pan workers will be appropriately compensated as per Government Rules. Local people should get job priority in the propose MEZ-III In order to ensure the appropriate livelihood of the fisherman, designated fishing route must be selected for the fisherman by consulting with the Department of Fisheries, Bangladesh. There has to be alternate livelihood options for fisherman, salt farmer, share croppers and lessee farmers. Training should be provided to the local people for their skill enhancement 	
Health and Safety	Risks for Infectious Diseases such as AIDS/HIV	<ul style="list-style-type: none"> Increasing risks for infectious diseases due to the influx of workers 	Conducting mitigation measures stipulated in the international guidelines such as EHS Guidelines of IFC such as; <ul style="list-style-type: none"> To provide surveillance for worker's health Prevention of illness among workers by undertaking health awareness and education initiatives and by conducting immunization programs for workers To provide treatment through standard case management in on-site and community health care facilities as necessary Educating project personnel and area residents on risks, prevention, and available treatment Promoting collaboration with local authorities to enhance access of worker's families and the community to public health services and 	BEZA, DOE

Category	Issues	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
			promote immunization as necessary	
			<ul style="list-style-type: none"> Promoting use of repellents, clothing, netting, and other barriers to prevent insect bites Prevention of larval and adult propagation through sanitary improvements and elimination of breeding habitats close to human settlements Elimination of unusable impounded water 	BEZA, DOE
	Occupational Health and Safety	<ul style="list-style-type: none"> Accidents and incidents during the operation of each tenant. 	Conducting mitigation measures training stipulated in the international guidelines such as EHS Guidelines of IFC such as; Common: <ul style="list-style-type: none"> To provide adequate health care facilities and first aid within construction sites To provide OHS training program and information of basic site rules of work, basic hazard awareness, site specific hazards, safe work practices, and emergency procedure Occupational Health: <ul style="list-style-type: none"> To provide adequate lavatory facilities for the number of people expected to work in the facility To provide adequate supplies and easy access of drinking water with a sanitary means To provide temporary shelters to protect against heat stroke during working activities or for use as rest areas as needed To arrange for provision of clean eating areas where workers are not exposed to the hazardous or noxious substances where there is potential for exposure to substances poisonous by ingestion of food as necessary To promote the use of repellents, clothing, netting, and other barriers to prevent insect bites and snake bite Occupational Safety: <ul style="list-style-type: none"> Adequate preventive measures from negative factors such as fire precautions, lighting, safe access, work environment temperature, area signage, labelling of equipment, communicate Hazard codes, 	BEZA, DOE

Category	Issues	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
			electrical <ul style="list-style-type: none"> • To establish rights-of-way, site speed limits, vehicle inspection requirements, operating rules and procedures, and control of traffic patterns or direction • To identify and provide appropriate PPE that offers adequate protection to the worker, co-workers, and occasional visitors • Proper maintenance of PPE and the instruction of proper use 	
	Community Health and Safety	<ul style="list-style-type: none"> • Third party accidents with residents near the construction site • Accidents with local people by the traffic of construction vehicles • Disputes among local people and migrated workers 	Conducting mitigation measures stipulated in the international guidelines such as EHS Guidelines of IFC such as; Common: <ul style="list-style-type: none"> • Establish the plan of site safety and security measures to communities and its implementation • Education and instruction to the project personnel and construction workers on risks, prevention, and available treatment General site hazard: <ul style="list-style-type: none"> • Restricting access to the site with a focus on high risk structures or areas depending on site-specific situations including fencing, signage, and communication of risks to the local community • Removing hazardous conditions on construction sites such as covering openings to small confined spaces, ensuring means of escape for larger openings such as trenches or excavations, or locked storage of hazardous materials Traffic Safety: <ul style="list-style-type: none"> • Emphasizing safety aspects among drivers • Improving driving skills and requiring licensing of drivers • Adopting limits for trip duration and arranging driver rosters to avoid overtiredness • Avoiding dangerous routes and times of day to reduce the risk of accidents Other: <ul style="list-style-type: none"> • Dispute settlement among stakeholders in case incidences occur • Arrangement of worker's accommodation as necessary 	BEZA, DOE

Category	Issues	Expected Environmental and Social Impacts	Proposed Environmental Mitigation Measures and Environmental Management	Responsible Organization
Emergency	Usages of Chemical	<ul style="list-style-type: none"> • Risk of chemical materials 	<ul style="list-style-type: none"> • Formulation of chemical management plan as necessary • Training of safety usage and preparation of the emergency response plans • Implementation of the proper storage and record of usage. • Applying for the acquisition of the license with management plan in accordance with the relevant law, and compliance with the law. • Provision of protective equipment and clothes to workers as necessary. 	BEZA, DOE
	Risk of flood and cyclone	<ul style="list-style-type: none"> • Increasing of the impact of flood in and around the projects site 	<ul style="list-style-type: none"> • Preparation of the disaster prevention equipment and management manual, preparation of disaster impact assessment and management plan etc. 	BEZA, DOE
	Risk of Fire	<ul style="list-style-type: none"> • Impact on the community around the project site by increasing of risk of fire 	<ul style="list-style-type: none"> • Installation of the fire hydrants along the road • Implementation of emergency drill 	BEZA, DOE
	Earthquake	<ul style="list-style-type: none"> • Increasing of the damage of the earthquake in and around the projects site 	<ul style="list-style-type: none"> • Compliance with the National Standard Operational Procedure for building construction • Preparation of the disaster prevention plan such as emergency contact list 	BEZA, DOE
Others	Global Warming	<ul style="list-style-type: none"> • Impact in the increase of GHGs by vehicle traffic operation of tenants in the operation phase. 	<ul style="list-style-type: none"> • Control of GHGs emission by energy use efficiency, process modification, selection of fuels or other materials, the processing of which may result in less emission, application of emission control techniques, if possible • Provision of commuter bus 	BEZA, DOE

9.3 Corporate Social and Environmental Responsibility (CSER)

The concept of corporate social responsibility is based on the idea that not only public policy but companies, too, should take responsibility for social issues. In more recent approaches, CSER is seen as a concept in which companies voluntarily integrate social and environmental concerns into their business operations and into the interaction with their stakeholders. The idea of being a socially responsible company means doing more than comply with the law when investing in human resources and the environment.

Under the CSER framework, BEZA has proposed action plans for the benefit and welfare of the society as well as environmental sustainability of the project which is given below:

Proposed Action Plans

- At policy level, the CSER trust needs to allocate a considerable resource on alternative livelihoods. The CSER trust guidelines of BEZA if any shall clearly define project role and participation in the alternative livelihoods implementation plan. The project may contribute to the alternate livelihoods plan under their CSER networks.
- The CSER trust shall engage an external agency to conduct a market study to identify livelihood options. A phased alternative livelihood plan along with financial feasibility shall be developed for all the affected villages. If required, an external agency shall be contacted to implement the livelihood plan.
- A monitoring committee shall be formulated to ensure proper implementation and documentation of the alternative livelihood plan.
- A sustainable environment friendly green belt may be proposed under the CSER fund throughout the periphery of the project area and all the unpaved open spaces if present.

Green Belt Development

The development of green belt in and around the proposed MEZ-III will be accorded top priority. The green belt will be developed by CSER fund. Landscaping of the entire plant area and colony will be done. A thicker green belt will be developed throughout the periphery of the proposed EZ. Special landscaping shall be made around the technical buildings, main entrance of plant and Administrative building. Trees will be planted on the sides of the main approach road to the plant and colony. Plantation will be done with special type of tree, which is suitable for the climate requiring minimum irrigation.

Environmental and Social Management Plans to be Prepared

This Section of the EIA report provides recommendations for environmental and social management measures based on the available information at this stage of the project. However, it is planned that at a later stage, namely detailed design phase, MEZ-III will prepare detailed management plans and procedures to address potential social and environmental impacts identified within this EIA and ensure implementation of the measures contained therein. Recommended management plans and/or procedures are presented in the following table. These individual plans or procedures may be stand-alone documents or combined into a larger environmental management plan addressing a range of environmental aspects, according to project needs. They may be prepared by or in collaboration with project contractors. Each management plan will document applicable legal requirements (if existing), criteria, standards, and mitigation and management commitments for the project. Monitoring and reporting requirements will be included to (1) increase baseline information, (2) confirm predicted impacts and (3) identify unforeseen impacts, thus enabling continuous improvement and adaptive management where required.

Table 69: Recommended management plans

Plan	Content/Objectives
Emergency Response Plan	Includes safe working procedures for staff, designation of safety zones and measures to protect sensitive receptors
Waste Management Plan	Provides detailed descriptions and quantities of wastes expected to be produced by the project, direct waste flows and outline project waste collection and disposal frequencies
Traffic Management Plan	Includes a baseline transport study and impact assessment, expected traffic movements throughout construction and operations, assessment of optimum traffic routing, recommendations for upgrading local infrastructure, recommendations for road safety education, and other procedures to mitigate and manage traffic impacts.
Noise, Dust and Light Management Plan	Includes an inventory of all noise, dust, particulate matter and light generating activities, and details control methods to be used during construction and operations.
Chemicals and Hazardous Materials Handling Plan	Outlines procedures for storage and use of chemicals and hazardous materials, including access and security, provision of PPE and distribution of MSDS information.
Decommissioning Plan	Outlines procedures for decommissioning project facilities

9.4 Mitigation and Management Plan for Threatened Species of Concern

Biological repercussions to nesting turtles do not always occur. Any impact is dependent upon the level of physical disturbance caused by noise and lighting adjacent to the coast. When the levels of physical disturbance appear to be high, effective mitigation measures described in the Table 70 should be implemented.

Table 70: Proposed Mitigation and Management Measures on Threatened Species

SN	Scientific (English)	IUCN Category	Proposed Mitigation or Management Measures
1.	<i>Eurynorhynchus pygmeus</i> (Spoon-billed Sandpiper)	CR	For the purpose of protecting the species, workers will be instructed to strictly comply with hunting and capturing restrictions prescribed by law.
2.	<i>Geoclemys hamiltonii</i> (Spotted Pond Turtle)	VU	Feed on fish, invertebrates, and floating aquatic plants. There are no ponds or waterways which provide them with such foods in the project site. Prohibit disturbance, harassment, and hunting by project workers or contractors while working, traveling by vehicles or residing in the project field accommodation and encourage workers to quickly place them into nearby fresh ponds or rivers if they encounter the creatures.
3.	<i>Lepidochelys olivacea</i> , (Olive Ridley Turtle)	VU	Sensitive to light and noise, so noise and use of flashlights on the coast at night can cause nesting females to halt their nesting.
4.	<i>Caretta caretta</i> (Logger Head Turtle)	EN	Measures available to mitigate these impacts should be taken: <ul style="list-style-type: none"> • Turning off unnecessary lights during the nesting season • Using a smaller number or lower wattage of lights • Shielding, redirecting and repositioning lights • Using red, yellow, and low-pressure sodium-vapor lights (as sea turtles are less affected by these colors) • Using low-level noise heavy machinery (concrete mixing, excavation machinery, etc.)
5.	<i>Chelonia mydas</i> (Green Turtle)	EN	
6.	<i>Eretmochelys imbricate</i> (Hawksbill Turtle)	CR	

SN	Scientific (English)	IUCN Category	Proposed Mitigation or Management Measures
			<ul style="list-style-type: none"> • Planning construction activities to minimize adverse effects during the nesting season • Avoiding tall structures creating shade on the coast to maintain nest temperatures. • Control the introduction of non-native plants which may lead to impenetrable root mats.

EN= Endangered, VU=Vulnerable, CR=Critically Endangered

Table 71: Threatened Species proposed by Bangladesh Scientist Groups in the project area

Taxa	Number	Scientific Name	English Name	Available Mitigation Measures
Flora	1.	<i>Calamus guruba</i> <i>Buch. -Ham.</i>	Cane	<ul style="list-style-type: none"> • Transfer to similar sites to the project area • And if impossible to transfer: • Collection of seeds or adoption of cuttings
	2.	<i>Trichosanthes cordata</i> Roxb.	Snake guard	
	3.	<i>Lepisanthes rubiginosa</i>	Rusty sapindus	
Reptile	1.	<i>Calotes versicolor</i>	Garden lizard	<ul style="list-style-type: none"> • Possession of these species by project workers or contractors while working.
	2.	<i>Mabuya mabuya</i>	Skink	
	3.	<i>Gekko gekko</i>	Tokay Gecko	
	4.	<i>Pangshura tentoria</i>	Median Roofed Turtle	
	5.	<i>Naja naja</i>	Bicled Cobra	
Bird	1.	<i>Arachnothera magna</i>	Streaked Spiderhunter	These species can easily fly away from the disturbed habitat and find other suitable habitats. <ul style="list-style-type: none"> • Prohibit illegal hunting by project workers or contractors while working.
	2.	<i>Ketupa zeylonensis</i>	Broun Fish Owl	
	3.	<i>Vanellus duvaucelii</i>	River Lapwing	

9.5 Enhancement Plan

A detailed EMP with possible mitigation measures during pre-construction, construction and operational phases have been proposed in the present study. So, as a part of enhancement plan, some following measures are proposed to carry out for reducing the potential risks:

- vi. Development of green belt by tree plantation of native flora within and around the entire location of the zone;
- vii. To prevent the pollution of water, air and soil, discharging industrial gaseous effluent, solid wastes, waste water before releasing out;
- viii. Maintain national and international environmental, social, health & safety standard to build trust and confidence among workers as well as foreign investors;
- ix. All the unpaved open places throughout the zone premises, if have, can be made greener by planting trees in order to enhance the aesthetic view of sites as well as long term environmental sustainability with the aid of CESR fund.

9.6 Contingency Plan

A contingency plan is an essential guideline for undertaking the immediate need-based response in a well-designed, organized and coordinated manner for facing any adverse incident during an emergency. Contingency plan will guide to identify the victims at risk (who, what extent, when), responsible authority and the materialistic & natural disruptions (what extent). Nature of emergency & hazardous situations may be of any or all of the following categories:

a. Emergency

- Fire, burn injury
- Accidental injury
- Electric shock
- Explosion
- Any Medical emergency

b. Natural Disasters

- Flood
- Earthquake
- Storm/tornados/cyclone

c. Other External Factors: manmade disaster, sabotage, war

The objectives of having an Emergency Response Plan (ERP) are to:

- Guide the authority/emergency response team (ERT) in determining the appropriate response to emergencies
- Provide respondents/ERT with planned strategy and recognized measures
- Guide to notify the appropriate ERT personnel and regulatory authorities
- Manage public and media relations
- Notify the next-to-kin of accident victims
- Promote inter-section communications to ensure an “EZ-wide” coordinated emergency response to minimize the effects of troublesome events
- Reducing recovery time and costs
- Respond to immediate requirements to safeguard the environment and the community

Generally following steps of responses can be followed to combat any emergency:

Step-1: Risk determination & immediate measures

- (i) Identification of potential hazards associated with the emergency episode due to the natural events or regular activities
- (ii) taking appropriate measures by the ERT/authority for determining the type, quality, extent of involvement

Step-2: Local investigation: Determination of the source/reason of the event resulting to the emergency and prevent further losses.

Step-3: Detail assessment: Conduct an assessment of the incident site for any further information on hazards and taking necessary actions for remedies.

Step-4: Rehabilitation: Initiating restoration/rehabilitation measures.

Step-5: Reporting: Reporting of the occurrence of the incidence with all the details including the measures undertaken to the appropriate authority taking initiative for further steps including financial assistance etc. to the appropriate authority.

Step-6: Risk Communication: Taking steps for mass communication with addressing public and media regarding concerns and issues including human lives, property and the environment and responses to resolute the stress of the community and the country.

Functioning of following units can be helpful to combat any emergency in the industrial area.

Emergency Response Cell with an:

- a. Well trained emergency response team (ERT)
- b. Emergency preparedness plan
- c. Provision of periodic drill of emergency rescue operations; e.g. Firefighting services;
- d. Emergency medical services
- e. Provision of emergency transfer of patients

Health, Safety and Safe Work Environment

In accordance with the requirement of DoE, BEZA must have a plan to take adequate measures against accidents and to meet the emergency. A contingency plan should be in place to deal with any emergency or natural calamities. There should be trained emergency response teams, specific contingency plans and incidence specific equipment packages in place to deal with these types of emergencies. In case of an emergency incident occur, immediate action must be taken to mitigate the impacts. In order to minimize the possibility of injury to the responders and others it is important that emergency responders follow the steps of emergency response plan to avoid missing of any events. The Health and Safety Management Guideline of MEZ-III is attached in **Annex-8**.

Work plays a central role in people's lives, since most workers spend at least eight hours a day in the workplace, whether it is on a plantation, in an office, factory, etc. Therefore, work environments should be safe and healthy. Yet this is not the case for many workers. Every day workers all over the world are faced with a multitude of health hazards, such as:

- Dusts;
- Gases;
- Noise;
- Vibration;
- Extreme temperatures.

Unfortunately, some employers assume little responsibility for the protection of workers' health and safety. In fact, some employers do not even know that they have the moral and often legal responsibility to protect workers. As a result of the hazards and a lack of attention given to health and safety, work-related accidents and diseases are common in all parts of the world.

Costs of Occupational Injury/Disease

Work-related accidents or diseases are very costly and can have many serious direct and indirect effects on the lives of workers and their families. For workers some of the direct costs of an injury or illness are:

- The pain and suffering of the injury or illness;
- The loss of income;
- The possible loss of a job;
- Health-care costs.

It has been estimated that the indirect costs of an accident or illness can be four to ten times greater than the direct costs, or even more. An occupational illness or accident can have so many indirect costs to workers that it is often difficult to measure them. One of the most obvious indirect costs is the human suffering caused to workers' families, which cannot be compensated with money.

The costs to employers of occupational accidents or illnesses are also estimated to be enormous. For a small business, the cost of even one accident can be a financial disaster. For employers, some of the direct costs are:

- Payment for work not performed;
- Medical and compensation payments;
- Repair or replacement of damaged machinery and equipment;
- Reduction or a temporary halt in production;
- Increased training expenses and administration costs;
- Possible reduction in the quality of work;
- Negative effect on morale of other workers.

Some of the indirect costs for employers are:

- The injured/ill worker has to be replaced;
- A new worker has to be trained and given time to adjust;

- It takes time before the new worker is producing at the rate of the original worker;
- Time must be devoted to obligatory investigations, to the writing of reports and filling out of forms;
- Accidents often arouse the concern of fellow workers and influence labor relations in a negative way;
- Poor health and safety conditions in the workplace can also result in poor public relations.

Overall, the costs of most work-related accidents or illnesses are very high to the workers and their families and to the employers as well. On a national scale, the estimated costs of occupational accidents and illnesses can be as high as three to four per cent of a country's gross national product. In reality, no one really knows the total costs of work-related accidents or diseases because there are a multitude of indirect costs which are difficult to measure beside the more obvious direct costs. MEZ-III will ensure health, safety and safe work environment for the officials and workers.

9.7 Compensation Plan

A standard compensation plan has to be developed for securing the legal demand of the individuals or households who are willing to give their land due to development of the proposed EZ Project. It essentially needs to provide necessary compensation as per the law of land. No Resettlement Action Plan (RAP) is required because there is no displacement due to the Project development. Workers who develop any disease/injury during construction or operational phase of the proposed project should be treated accordingly with ensuring necessary compensation by the responsible authority.

9.8 Monitoring Plan

The main purpose of a monitoring plan for the potential environmental parameters during the construction and operation phases in this Project is:

- To provide a standard guideline for comparing the baseline environmental conditions (data observed/collected during the study period) and other factors with that of the construction and operational phases.
- To evaluate the effectiveness of the mitigation measures for preservation of the natural environment.
- To detect any disruption of environment according to national standards.

Several environmental components can be affected during the construction and operation of the Project. Following plan has been formulated for monitoring and evaluation of environmental components with potential risk of disruption.

Table 72: Monitoring plan (construction phase)

Category	Issues	Location	Frequency	Responsible Organization
Air Quality	<ul style="list-style-type: none"> • NO_x, SO_x, CO, PM_{2.5}, PM₁₀ etc. 	<ul style="list-style-type: none"> • 3 points in the construction site 	1 week/3 months	BEZA
Water Quality	<ul style="list-style-type: none"> • Water temperature, pH, SS, TDS, EC, DO, BOD₅, COD, Total coliforms, chromium, As etc. 	<ul style="list-style-type: none"> • Outflow of construction • (at least 3 sampling points/mixing point **) • Well near the construction site (1 point) 	Once/2 months	BEZA
Wastes	<ul style="list-style-type: none"> • Amount and kind of solid wastes 	<ul style="list-style-type: none"> • Construction site 	Once/3 months	BEZA
Noise and Vibration	<ul style="list-style-type: none"> • Noise and vibration level 	<ul style="list-style-type: none"> • Preservation area such as residence around 	Once (24 hours)/3	BEZA

Category	Issues	Location	Frequency	Responsible Organization
	<ul style="list-style-type: none"> Traffic count 	the proposed construction site (at least 1 point)	months	
		<ul style="list-style-type: none"> Preservation site such as residence along the route for on-site vehicles (1 point for noise and vibration) 	Once (24 hours)/3 months	BEZA
Ecosystem (Endangered Species)	<ul style="list-style-type: none"> Species, Number - Bangladesh Wild Life (Preservation) (Amendment) Act, 1974 - JICA Guideline (2010) 	<ul style="list-style-type: none"> Endangered Species 1 point in the Construction area Sea turtle 1 lines: Beach in front of the site and the sandbar. 	1) Endangered species - Bird: Once a week in migration season - Others: Twice a year in dry and rainy seasons 2) Every 3 days in spawning season	BEZA
Ecosystem (Marine Biota)	<ul style="list-style-type: none"> Species, Number of Phyto and Zoo Plankton Benthos (Sea bottom) 	<ul style="list-style-type: none"> 5 points: Sea area in front of construction area 	Twice a year in dry and rainy seasons	BEZA
Ecosystem (Mud Flat, Fish & Nekton)	<ul style="list-style-type: none"> Species, Number, and Weight of. Benthos (Mud flat) Fish and Nekton 	<ul style="list-style-type: none"> 1 point: In front of the site 	Twice a year in dry and rainy seasons	
Hydrology	<ul style="list-style-type: none"> Groundwater level Ground elevation level Consumption of groundwater amount 	<ul style="list-style-type: none"> Well near the construction site 	Once/ months	BEZA
Living and Livelihood/ Vulnerable Group/ Misdistribution of Benefit and Damage/ Children's Right	<ul style="list-style-type: none"> The implementation status for CSR activities such as community support program 	<ul style="list-style-type: none"> Around project Site 	Once /year	BEZA
Risks for Infectious Disease such as AIDS/HIV	<ul style="list-style-type: none"> Awareness of infectious diseases 	<ul style="list-style-type: none"> Construction site 	Once/month	BEZA
Occupational Health and Safety	<ul style="list-style-type: none"> Record of accidents and infectious diseases 	<ul style="list-style-type: none"> Construction site 	Once/month	BEZA
Community Health and Safety	<ul style="list-style-type: none"> Record of accidents and infectious diseases related to the community 	<ul style="list-style-type: none"> Around construction site 	Once/month	BEZA
	<ul style="list-style-type: none"> The implementation 	<ul style="list-style-type: none"> Around Project Site 	Once /year	BEZA

Category	Issues	Location	Frequency	Responsible Organization
	status for CSER activities such as community support program			

Source: EIA Study Team

Note: *Air quality monitoring site in the construction area should be selected in consideration of keeping the same location during construction phase.

** Water quality monitoring location should be selected at least three points for one discharge point to confirm the impact of the effluent water from the Project site to the existing canals/Rivers/water bodies.

Table 73: Monitoring plan (operation phase)

Monitoring Category	Environmental and Social Issues	Location	Frequency	Responsible Organization
Air Quality	<ul style="list-style-type: none"> NO_x, SO_x, CO, PM_{2.5}, PM₁₀, VOCs, HAPs etc. 	<ul style="list-style-type: none"> Representative location inside the Project area 	1 week each in the dry and rainy seasons (first 3 years after starting of the operation stage)	BEZA, Tenants
Water Quality	<ul style="list-style-type: none"> Water temperature, pH, SS, DO, BOD₅, COD, color, odor, Total Nitrogen, Total Phosphorus, Sulphide, Chromium, Arsenic, Copper, Mercury, Cadmium, Lead, and Nickel etc. 	<ul style="list-style-type: none"> At least 3 sampling points/mixing point: discharge water, upstream water, and downstream water) 	Every month: Water temperature, pH, SS, DO, BOD ₅ , COD, color and odor, Every 3 months: all parameters	BEZA, Tenants
Wastes	<ul style="list-style-type: none"> Amount of hazardous and non-hazardous wastes in the project site. 	<ul style="list-style-type: none"> Project site 	Twice/year (submission of the environmental report by the tenants)	BEZA, Tenants
Soil Contamination	<ul style="list-style-type: none"> Status of control of solid and liquid waste which causes soil contamination. 	<ul style="list-style-type: none"> Project site 	Twice/year (submission of the environmental report by the tenants)	BEZA, Tenants
Noise and Vibration	<ul style="list-style-type: none"> Source noise emissions (Noise level monitoring in dB (A) near noise generating equipment's, e.g. pumps, flare etc. 	<ul style="list-style-type: none"> Project site 	One time each in the dry and rainy seasons (first 3 years after starting the operation stage)	BEZA, Tenants
Odor	<ul style="list-style-type: none"> Status offensive odor control by the Proponent 	<ul style="list-style-type: none"> Project site 	Twice/year (submission of the environmental report by tenants)	BEZA, Tenants
Ecosystem (Endangered Species)	<ul style="list-style-type: none"> Species, Number - Bangladesh Wild Life (Preservation) (Amendment) Act, 1974 - JICA Guideline (2010) 	<ul style="list-style-type: none"> Endangered Species 1 point in the Construction area Sea turtle 2 lines: Beach in front of the site and the sandbar. 	1) Endangered species - Bird: Once a week in migration season - Others: Twice a year in dry and rainy seasons 2) Every 3 days in spawning season	BEZA, Tenants

Monitoring Category	Environmental and Social Issues	Location	Frequency	Responsible Organization
Ecosystem (Marine Biota)	<ul style="list-style-type: none"> Species, Number of Phyto and Zoo Plankton Benthos (Sea bottom) 	<ul style="list-style-type: none"> 5 points: Sea area in front of construction area 	Twice a year in dry and rainy seasons	BEZA, Tenants
Ecosystem (Mud Flat, Fish & Nekton)	<ul style="list-style-type: none"> Species, Number, and Weight of. Benthos (Mud flat) Fish and Nekton 	<ul style="list-style-type: none"> 1 point: In front of the site 	Twice a year in dry and rainy seasons	BEZA, Tenants
Living and Livelihood/ Vulnerable Group/ Misdistribution of Benefit and Damage/Children's Right	<ul style="list-style-type: none"> The implementation status for CSER activities such as community support program. 	<ul style="list-style-type: none"> Around Project Site 	Once /year	BEZA, Tenants
Risks for Infectious Disease such as AIDS/HIV	<ul style="list-style-type: none"> Status of measures against infectious diseases 	<ul style="list-style-type: none"> Project Site 	Twice/year (Submission of the environmental report by the tenants)	BEZA, Tenants
Occupational Health and Safety	<ul style="list-style-type: none"> Record of accidents and infectious diseases 	<ul style="list-style-type: none"> Work sites and offices 	Twice/year (Submission of the environmental report by the tenants)	BEZA, Tenants
Community Health and Safety	<ul style="list-style-type: none"> Record of accidents and infectious diseases related to the community 	<ul style="list-style-type: none"> Around the Project site 	Twice/year (Submission of the environmental report by the tenants)	BEZA, Tenants
	<ul style="list-style-type: none"> The implementation status for CSER activities such as community support program 	<ul style="list-style-type: none"> Around Project Site 	Once /year	BEZA, Tenants
Usage of Chemicals	<ul style="list-style-type: none"> Record of the type and quantity of chemicals and implementation status of control measures through self-inspection 	<ul style="list-style-type: none"> Project Site 	Biannually	BEZA, Tenants

9.9 Monitoring Indicators

Due to establishment of the proposed project several environmental components have potential risk of disruption either during construction or operational phases that needs to be monitored for detection and management of any damage of the environment. Following are the plausible indicators with major significance that should be monitored and evaluated for the potential risks that could be beneficial for carried out proper mitigation measures:

- a) Health & safety issues of workers
- b) Air quality
- c) Water quality (ground water and surface water)
- d) Noise level
- e) River water level
- f) Soil erosion

- g) Waste management
- h) Existence of terrestrial and marine flora & fauna (compared to the baseline scenario)

Chapter 10: Cost Estimation for Environmental Mitigation Measures and Monitoring

This section describes the budget plans for the environmental management and environmental monitoring by the project proponent. On the other hand, the tenants will take necessary environmental mitigation measures and its expenses for the environmental management not only at the construction and operation phases but also at the closing, termination, and after termination phases in accordance with their EIA study. However, the budget plan for environmental management of each work cannot be estimated at this stage because there is no certain information on industrial sectors of tenants.

10.1 Budget Plan for Environmental Management

Most of the mitigation measures such as preservation and retention of existing canal, construction of CETP, and plans and trainings are already included in the Project cost. Main costs for mitigation measures are shown Table 74. Detailed costs for each mitigation measure are to be calculated at the detailed design stage.

Table 74: Cost for main mitigation measures

SN	Item	Budget (per year)	
		Before/During Construction Phase	Operation Phase
1.	Construction of coastal bank	Will be included in the Project Cost	Will be included in the Project Cost
2.	Residential road for the purpose of community accessibility improvement		
3.	Greening area		
4.	Others (sprinkle water, waste disposal, training and education)		

Source: EIA Study Team

10.2 Budget Plan for Environmental Monitoring

In terms of budget for environmental monitoring before/during construction and operation phases, main monitoring cost related with field measurements such as air, water, and noise quality. Annual costs for field measurements in the construction phase by contractor and in the operation phase by the Proponent are estimated, respectively, as shown in the Table 75.

Table 75: Estimated annual costs for monitoring in the construction and operation phases

SN	Parameters	No. of Samples/Sites (per year)	Unit cost @ (BDT)	Total cost (BDT)/year
1.	Ambient Air Quality (SPM; PM _{2.5} ; PM ₁₀ ; SO _x ; NO _x ; CO)	16	10,000	1,60,000
2.	Surface Water Quality: BOD, COD, DO, pH, TDS, TSS, Ammonia, Nitrate, TC, FC, heavy metals and other pollutants	08	15,000	1,20,000
3.	Ground water quality (Arsenic, Iron, etc.)	08	15,000	1,20,000
4.	Noise Quality	16	5,000	80,000
5.	Wastewater (C/ETP, C/STP)	08	15,000	1,20,000
6.	Environment, health and safety training for staff development and ESMP evaluation	02	5,00,000	10,00,000
Total Cost Per Year				16,00,000

Source: EIA Study Team

Besides, a total of 65,000 trees would be planted by BEZA which tentative cost would be about BDT. 1, 30, 00,000.

Table 76: Estimated annual cost for manpower for supervising environmental management and monitoring activities

SN	Designation	Number	Cost BDT. (per month)	Cost BDT. (per year)
1.	Environmental Specialist	1.00	1,00,000.00	12,00,000.00
2.	Field-Survey Supervisor	1.00	25,000.00	3,00,000.00
3.	Field-Surveyor(1 month)	1.00	25,000.00	25,000.00
4.	Support staff	2.00	10,000.00	2,40,000.00
			Total	17,65,000.00

Source: EIA Study Team

Chapter 11: Conclusion and Recommendations

11.1 Conclusion

As to the results of the EIA study for the industrial area of MEZ-III Project, the following items are found:

- f) In terms of living environment, most of the impacts are controlled and limited in and around the project area. The key negative impacts such as emission of gas and dust, deterioration of water quality, generation of noise and vibration are expected. However, implementation of appropriate mitigation and management plan, such as to spray water to bare areas for dust prevention, and to avoid the incentive operation of the construction machinery for prevention of emission gas, noise and vibration during construction phase, and to provide the commuter bus by Proponent and to comply with the tentative target value of effluent water flowing out of the wastewater treatment plant during operation phase, will minimize these impacts.
- g) In terms of natural environment, there are some mangrove forest species like Baen (*Avicennia officinalis*), Keora (*Sonneratia apetala*) and Jahu (*Casuarina equisetifolia*) on the char of project area. Similarly, sea adjacent to Haserchar (south-west corner of the project site) is found breeding ground of turtle (*Chelonia mydas*), shark (*Carcharhinus amblyrhynchos*) and dolphin (*Tursiops truncates*). However, implementation of appropriate mitigation measures, such as planting trees, vegetation and sodding of public spaces as soon as possible, and demarcation of route for vessels navigation, 'no' any discharge into sea will minimize the impact on the surrounding ecosystem.
- h) In terms of social environment, there are a land acquisition and compensation activities during pre-construction, and construction phases of the project. However, BEZA shall ensure the compliance with provisions of all relevant ordinances relating to compensation and rehabilitation issues properly. On the other hand, some positive impacts of the project such as increase in job opportunity and improvement of social infrastructure are also expected.
- i) In terms of health and safety, some impacts on occupational/community health and safety and increase in number of accidents are expected. However, implementation of appropriate mitigation and management plan, such as to manage working conditions during the construction work and to provide security and maintain safety prevention measures during construction/operation phase will minimize these impacts.
- j) In consideration of the result of the EIA study for the project, the Environmental Management Plans (EMPs) including adequate mitigation measures to reduce the negative impacts and Environmental Monitoring Plan (EMoP) are proposed for each phase of the Project: Pre-Construction Phase, Construction/Closing Phase, and Operation Phase.

It was confirmed that the environmental, social and health impacts of the project were assessed and the EMP was formulated properly. In the process of EIA, opportunity of public involvement was ensured and comments from the public were reflected into the final report. Thus, the EIA was completed in accordance with the requirements of the EIA procedure properly; in that case BEZA will follow EMP accordingly.

11.2 Recommendations

Following recommendations are made based on the EIA study for development of the MEZ-III Project:

- n) BEZA should take No Objection Certificate (NOC) from BIWTA for the construction of Marine Jetty, land filling through dredging into sea and construction of coastal bank;
- o) BEZA should take NOC from Department of Forests (DOF) for felling of newly formed mangrove trees of the zone;
- p) BEZA should install and function CETP and CSTP for the treatment of waste water and maintain 'zero' discharge provision for minimizing marine pollution;
- q) National 3R Strategy for Waste Management (Reduce, Reuse, Recycle) should be followed for the management of Solid Waste;
- r) Rain water harvesting should be carried out to reduce the pressure on surface and ground water resources;
- s) Roof top all infrastructures should be managed for the purpose of harvesting rain water, photovoltaic solar energy and gardening;
- t) Proposed EMPs and EMoP should be implemented strictly during construction and operation phase of the project;
- u) OHS Guideline of IFC for workers should be strictly followed to minimize occupational health hazards;
- v) All infrastructures of the zone should be built based on the seismic design consideration to avoid potential hazard risk;
- w) To avoid hazard due to any disaster, warning system, emergency evacuation system, construction of ground flood at an elevated level, provision of emergency equipment should be considered;
- x) Proper training regarding EHS should be provided to Project Management Unit as well as work forces during construction and operation phases;
- y) Development of a mangrove green belt surrounding the area should be considered with due importance;
- z) Eligible local people should be considered on priority basis that will be helpful for minimizing the socio-economic disruption.

ডায়েরী নং ৪.....৪৬২.....

তারিখ ৪...২৬/০২/১৮.....

ডায়েরী নং ৪.....৪২৬.....

তারিখ ৪...০৬/০২/১৮.....

Manager (IP)
Cantonment
৯/১/১৮

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
প্রধানমন্ত্রীর কার্যালয়

প্রধানমন্ত্রীর কার্যালয়ে প্রাপ্ত
বাংলাদেশ অর্থনৈতিক অঞ্চল
সংক্রান্ত কার্যক্রম

১. বিবর্তিত সনদ (পত্র) সংক্রান্ত ৪ নং প্রতীকী
২. অর্থনৈতিক অঞ্চল কর্তৃপক্ষ (বেঙ্গা) এর অনুকূলে দীর্ঘমেয়াদী বন্দোবস্ত প্রদান
৩. পত্র, তারিখ ২৩/০২/২০১৮ তারিখের ০৩.৭৫৯.০১৪.২৫.০০.০২৯.২০১৫-৩০৫৩ নং স্মারক।
৪. সংক্রান্ত প্রস্তাবের বিবরণীতে বিবরণসমূহের ক্রমিক নং ১-৩ পর্যন্ত
একত্রিতভাবে প্রেরণ করা হয়েছে।

১৮/২/১৮

পুরাতন সংসদ ভবন
ঢাকা

পত্র সংখ্যা ০৩.০৬৮.০১৮.০৯.০০.০৩৩.২০১৭-৮০

DM (IP)
৯/১/১৮

তারিখ ১৮ মাঘ, ১৪২৪ বঙ্গ
৩১ জানুয়ারি, ২০১৮ খ্রিঃ

বিষয়ঃ মহেশখালী অর্থনৈতিক অঞ্চল এর সরকারি খাস জমি বিনা সেলামীতে/প্রতীকী মূল্যে বাংলাদেশ অর্থনৈতিক অঞ্চল কর্তৃপক্ষ (বেঙ্গা) এর অনুকূলে দীর্ঘমেয়াদী বন্দোবস্ত প্রদান।

সূত্রঃ বেঙ্গা'র ২৩/০২/২০১৮ তারিখের ০৩.৭৫৯.০১৪.২৫.০০.০২৯.২০১৫-৩০৫৩ নং স্মারক।

উপর্যুক্ত বিষয়ে ও সূত্রের প্রেক্ষিতে মহেশখালী অর্থনৈতিক অঞ্চল স্থাপনের নিমিত্ত সরকারি খাস জমি বাংলাদেশ অর্থনৈতিক অঞ্চল কর্তৃপক্ষ (বেঙ্গা) এর অনুকূলে বন্দোবস্ত প্রদানের লক্ষ্যে দ্রুত পদক্ষেপ নেয়ার জন্য নির্দেশক্রমে অনুরোধ করা হলো।

সংযুক্তিঃ সূত্রে বর্ণিত পত্র।

গ. ইউল হাসান

পরিচালক-১

ফোনঃ ৯১৩৭৮৫০

Email: dir1@pno.gov.bd

জেলা প্রশাসক
কক্সবাজার।

অনুলিপিঃ

নির্বাহী চেয়ারম্যান
বাংলাদেশ অর্থনৈতিক অঞ্চল কর্তৃপক্ষ
১১১ বীর উত্তম সি.আর.দত্ত রোড, ঢাকা।

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
বাংলাদেশ অর্থনৈতিক অঞ্চল কর্তৃপক্ষ
প্রধানমন্ত্রীর কার্যালয়, ঢাকা
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বাংলাদেশ অর্থনৈতিক অঞ্চল কর্তৃপক্ষ (বেজা) - এর গভর্নিং বোর্ডের ৩য় সভার কার্যবিবরণী

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উপস্থিতি : পরিশিষ্ট 'ক'

সভার শুরুতে মাননীয় প্রধানমন্ত্রী উপস্থিত সকলকে স্বাগত জানিয়ে বাংলাদেশের আর্থ-সামাজিক অবস্থার অগ্রগতি, সরকার কর্তৃক গৃহীত উন্নয়ন পরিকল্পনা সমন্বয় ও বাস্তবায়নের বিষয়ে দিক-নির্দেশনামূলক বক্তব্য প্রদান করেন। তিনি জানান যে, পর্যায়ক্রমে দেশের বিভিন্ন এলাকায় ১০০টি অর্থনৈতিক অঞ্চল প্রতিষ্ঠার জন্য উদ্যোগ গ্রহণ করা হয়েছে। অর্থনৈতিক অঞ্চল প্রতিষ্ঠার ক্ষেত্রে জনগণের সুবিধার বিষয়টি বিবেচনা করতে হবে। জলাভার, লেক ইত্যাদিসহ পরিবেশ বান্ধব অর্থনৈতিক অঞ্চল গড়ে তোলার বিষয়ে তিনি গুরুত্ব আরোপ করেন। তিনি বলেন যে, মানুষের আয় বেড়েছে; বাজার সম্প্রসারিত হয়েছে; ভারত-ভূটান-নেপাল এবং মায়ানমার-চীন-ভারত করিডোরে ব্যবসা বাণিজ্যের সুযোগ সৃষ্টি হয়েছে। দেশে যোগাযোগ ব্যবস্থার উন্নতি হয়েছে এবং নতুন স্থলবন্দর চালুসহ পুরাতন স্থলবন্দরগুলোকে আধুনিকায়নের মাধ্যমে গতিশীল করা হয়েছে। পায়রা সমুদ্র বন্দর স্থাপন করা হচ্ছে। বিশাল সমুদ্র সীমা অর্জিত হয়েছে। কৃষি জমি রক্ষা করেও শিল্পের জন্য জমি দেয়া সম্ভব। গ্রামীণ অর্থনীতির সুবয় উন্নয়নের জন্য সারাদেশব্যাপী অর্থনৈতিক অঞ্চল গড়ে তোলা হবে। বিনিয়োগ বাড়ানোর জন্য ইপিজেড না করে বর্তমানে অধিক বিনিয়োগের সুযোগ সৃষ্ণের লক্ষ্যে অর্থনৈতিক অঞ্চল গড়ে তোলা হচ্ছে।

মাননীয় প্রধানমন্ত্রী বলেন যে আমাদেরকে আন্তর্জাতিক চাহিদা পর্যবেক্ষণ করে শিল্প কারখানা গড়ে তুলতে হবে এবং সক্ষমতা বৃদ্ধি করতে হবে। কৃষি প্রক্রিয়াজাতকরণ শিল্পের পাশাপাশি ক্ষুদ্র ও মাঝারি শিল্প গড়ে তোলার উপর জোর দিতে হবে। বিশ্ব বাজারের সাথে প্রতিযোগিতামূলকভাবে আমাদের উৎপাদন, শিল্পায়ন এবং উৎপাদিত পণ্য ও সেবা বাজারজাতকরণে ইতিবাচক ভূমিকা রাখতে হবে।

তিনি বলেন যে, বাংলাদেশের ভৌগোলিক অবস্থান খুবই গুরুত্বপূর্ণ। ইতোমধ্যে গৃহীত ৭ম পঞ্চবার্ষিকী পরিকল্পনার লক্ষ্য অর্জনের জন্য আমাদের ব্যাপক শিল্পায়ন দরকার। ২০২১ সালের পূর্বেই আমরা মধ্য আয়ের দেশ এবং ২০৪১ সালে উন্নত দেশে উন্নীত হতে বাংলাদেশ প্রতিজ্ঞাবদ্ধ। তিনি দৃঢ়তার সাথে বলেন যে, সকল বাধা পেরিয়ে বাংলাদেশ এগিয়ে যাবেই।

সভাপতির অনুমতিক্রমে গভর্নিং বোর্ডের সচিব ও বাংলাদেশ অর্থনৈতিক অঞ্চল কর্তৃপক্ষ (বেজা)-এর নির্বাহী চেয়ারম্যান বেজার ভিশন, লক্ষ্যমাত্রা, অগ্রগতি এবং সভার আলোচ্যসূচী উপস্থাপন করেন। তিনি বিগত ১ বছরে বেজার সফলতা এবং ভবিষ্যত লক্ষ্যমাত্রা সভায় উপস্থাপন করেন। তিনি আগামী ১৫ বছরে ৭৫,০০০ একর জমিতে ১০০টি অর্থনৈতিক অঞ্চল স্থাপন, ১ কোটি লোকের কর্মসংস্থানের মাধ্যমে দারিদ্র বিমোচনে সহায়ক ভূমিকা পালন, অর্থনৈতিক অঞ্চল থেকে অতিরিক্ত ৪০ বিলিয়ন মার্কিন ডলারের পণ্য ও সেবা রপ্তানী, শিল্পায়নের জন্য ভূমি ব্যাংকের ভূমিকা পালন এবং মিরসরাই উপজেলায় ১৫ হাজার একর জমির উপর মাল্টি প্রডাক্ট মাল্টিপল অর্থনৈতিক অঞ্চলসহ আধুনিক শিল্প নগরী গড়ে তোলার প্রত্যয় ব্যক্ত করেন। এক্ষেত্রে তিনি জিটুজি পদ্ধতিতে অর্থনৈতিক অঞ্চল প্রতিষ্ঠায় অগ্রগতি, কার্যকর ওয়ানস্টপ সার্ভিস সুবিধার বিস্তৃতি, দক্ষিণ ও দক্ষিণ-পূর্ব এশিয়ার তুলনায় প্রতিযোগিতামূলক প্রণোদনা শ্যাকেজ, বাংলাদেশে জাপান ও চীনের শিল্পের Relocation এর ব্যাপক অগ্রহ, কম মজুরীতে দক্ষ শ্রমিকের সহজলভ্যতা, কর্মক্ষম বিশাল জনশক্তি/যুবশক্তি (Demographic Dividend), গতিশীল অর্থনৈতিক প্রবৃদ্ধি এবং প্রতিবেশী দেশসমূহে ২০০ কোটির অধিক লোকের বাজার চাহিদার বিষয়ে বিস্তারিত বিশ্লেষণ উপস্থাপন করেন।

ক্রমিক নং	প্রস্তাবিত অঞ্চল	জমির তফসিল
০৯.	মহেশখালী অর্থনৈতিক অঞ্চল-২, কাপারমার ছড়া, কক্সবাজার।	জেলা: কক্সবাজার উপজেলা: মহেশখালী মৌজা: উত্তর মলকিলা জমির পরিমাণ: ৮২৭.৩১ একর
১০.	মহেশখালী অর্থনৈতিক অঞ্চল-৩, ধলঘাটা, কক্সবাজার।	জেলা: কক্সবাজার উপজেলা: মহেশখালী মৌজা: ধলঘাটা জমির পরিমাণ: ৩৭৬.৫৮ একর
১১.	নারায়ণগঞ্জ অর্থনৈতিক অঞ্চল, সোনারগাঁ।	জেলা: নারায়ণগঞ্জ উপজেলা: সোনারগাঁ মৌজা: কান্দী, বিজয়নগরদাঁ, কনকান্দি, খামারপাড়া ও পারশামবাড়ী। জমির পরিমাণ: ১০০০.০০ একর
১২.	নাটোর অর্থনৈতিক অঞ্চল। (Agro Food Processing Zone)	জেলা: নাটোর উপজেলা: লালপুর মৌজা: আরজী বাকনাই, রসুলপুর, বন্দোবস্ত গোবিন্দপুর, বাকনাই বালিতিড়া, লালপুর ও চরজাজিরা। জমির পরিমাণ: ৩২১০ একর
১৩.	মেঘনা ইন্ডাস্ট্রিয়াল ইকোনমিক জোন, সোনারগাঁ, নারায়ণগঞ্জ।	জেলা: নারায়ণগঞ্জ উপজেলা: সোনারগাঁ মৌজা: মল্লিকেরপাড়া, ছোটশিলমান্দী, কগড়াখোলা, কান্দারগাঁও বায়না জমির পরিমাণ: ৮০ একর।
১৪.	মেঘনা ইকোনমিক জোন, সোনারগাঁ, নারায়ণগঞ্জ।	জেলা: নারায়ণগঞ্জ উপজেলা: সোনারগাঁ মৌজা: ছয়হিসা, চর: বড়নাথপুর, চর রমজান, সোনাউল্লাহ। জমির পরিমাণ: ২৪৫ একর।
১৫.	কুমিল্লা ইকোনমিক জোন	জেলা: কুমিল্লা উপজেলা: মেঘনা মৌজা: সোনাচর (সুটেরচর নামক এলাকা) জমির পরিমাণ: ২৭২ একর
১৬.	ফকরম ইকোনমিক জোন, রামপাল, বাগেরহাট।	জেলা: বাগেরহাট উপজেলা: রামপাল মৌজা: দিগরাজ, বুড়িরডাঙ্গা, মংলা জমির পরিমাণ: ৩০০ একর।
১৭.	আড়াইহাজার অর্থনৈতিক অঞ্চল, নারায়ণগঞ্জ। (জাপানিজ ইকোনমিক জোন)	জেলা: নারায়ণগঞ্জ উপজেলা: আড়াইহাজার মৌজা: পাঁচরোহী, বড়নওগাও, পাঁচগাও, দুহারা জমির পরিমাণ: ১০১০.৯০ একর। ব্যক্তিমাগিকানাধীন- ৯৯৯.৯১৫০ একর সরকারি খাস- ১০.৯৮ একর অর্ধ-সরকারি- ০.৯০৯০ একর
১৮.	মহেশখালী বিশেষ অর্থনৈতিক অঞ্চল, কক্সবাজার।	জেলা: কক্সবাজার উপজেলা: মহেশখালী মৌজা: ছোট মলকিলা জমির পরিমাণ: ১০০০ একর (আনুমানিক) জমির শ্রেণী: চরভরাট জমি।
১৯.	রাজশাহী অর্থনৈতিক অঞ্চল।	জেলা: রাজশাহী উপজেলা: পবা মৌজা: কয়ড়া, জয়কৃষ্ণপুর, মাড়িয়া, বাধানগর, ভবানীপুর। মোট জমির পরিমাণ: ২০৪.০৬ একর ব্যক্তি মাগিকানাধীন: ১০২.৪০ একর, সরকারি খাস: ১০১.৬৬ একর

(খ) বাংলাদেশ অর্থনৈতিক অঞ্চল কর্তৃপক্ষ কর্তৃক 'The Bangladesh Economic Zones (Appointment of Developer, etc) Guidelines, 2015' অনুমোদন।

আলোচনাঃ বাংলাদেশ অর্থনৈতিক অঞ্চল আইন, ২০১০ এর ধারা ৩৮ এ প্রদত্ত ক্ষমতাবলে বাংলাদেশ অর্থনৈতিক অঞ্চল (ডেভেলপার নিয়োগ, ইত্যাদি) বিধিমালা, ২০১৪ প্রণয়ন করা হয়। উক্ত বিধিমালার বিধি-৪ এ বলা হয়েছে, এ বিধিমালার উদ্দেশ্য পূরণকল্পে কর্তৃপক্ষ গভর্নিং বোর্ডের অনুমোদনক্রমে ডেভেলপার নিয়োগ গাইডলাইন প্রণয়ন করতে পারবে। সে মোতাবেক বেঙ্গা কর্তৃক 'The Bangladesh Economic Zones (Appointment of Developer, etc) Guidelines, 2015' এর একটি খসড়া প্রণয়নপূর্বক আন্তঃমন্ত্রণালয় সভার মাধ্যমে তা চূড়ান্তকরণের প্রস্তাব প্রধানমন্ত্রীর কার্যালয়ে প্রেরণ করা হয়। এর প্রেক্ষিতে গত ০৭-০৭-২০১৫ তারিখে প্রধানমন্ত্রীর কার্যালয়ে বাংলাদেশ অর্থনৈতিক অঞ্চল কর্তৃপক্ষ কর্তৃক প্রণীত 'The Bangladesh Economic Zones (Appointment of Developer, etc) Guidelines, 2015' চূড়ান্তকরণ সংক্রান্ত আন্তঃমন্ত্রণালয় সভা অনুষ্ঠিত হয়। উক্ত সভায় গাইডলাইনটি অধিকতর সমৃদ্ধকরণের জন্য পিপিপি কর্তৃপক্ষের প্রধান নির্বাহী কর্মকর্তাকে আহ্বায়ক করে ০৫ (পাঁচ) সদস্যের কমিটি গঠন করা হয়। উক্ত কমিটি কর্তৃক ০৪টি বৈঠক করে সংশ্লিষ্ট গাইডলাইনস এর প্রয়োজনীয় পরিমার্জনপূর্বক খসড়াটি চূড়ান্ত করে প্রধানমন্ত্রীর কার্যালয়ে প্রেরণ করা হয়েছে। আলোচনায় অংশগ্রহণ করে উপস্থিত সদস্যগণ বর্ণিত গাইডলাইনটি আইন মন্ত্রণালয়ে ভেটিং এর জন্য প্রেরণ এবং পরবর্তিতে প্রধানমন্ত্রীর অনুমোদনের পর তা জারী করার বিষয়ে একমত পোষণ করেন।

সিদ্ধান্ত-১১.৩ : "The Bangladesh Economic Zones (Appointment of Developer etc) Guidelines, 2015" টি ভেটিং এর জন্য আইন মন্ত্রণালয়ে প্রেরণ এবং পরবর্তিতে প্রধানমন্ত্রীর অনুমোদন গ্রহণ করে জারী করার জন্য সিদ্ধান্ত গৃহীত হলো।

সভায় আর কোন আলোচ্য বিষয় না থাকায় গভর্নিং বোর্ডের সদস্য-সচিব ও বাংলাদেশ অর্থনৈতিক অঞ্চল কর্তৃপক্ষের নির্বাহী চেয়ারম্যান গভর্নিং বোর্ডের তৃতীয় সভায় সদস্যগণের উপস্থিতি ও আলোচনায় স্বতঃস্ফূর্ত অংশগ্রহণের জন্য ধন্যবাদ ও কৃতজ্ঞতা জ্ঞাপন করেন। পরিশেষে সভাপতি উপস্থিত সকলকে ধন্যবাদ জানিয়ে সভার সমাপ্তি ঘোষণা করেন।

স্বাক্ষরিত
১৮/১১/১৫
(শেখ হাসিনা)
চেয়ারম্যান
গভর্নিং বোর্ড
বাংলাদেশ অর্থনৈতিক অঞ্চল কর্তৃপক্ষ
ও
প্রধানমন্ত্রী
গণপ্রজাতন্ত্রী বাংলাদেশ সরকার।

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
বাংলাদেশ অর্থনৈতিক অঞ্চল কর্তৃপক্ষ
প্রধানমন্ত্রীর কার্যালয়, ঢাকা
www.beza.gov.bd

বাংলাদেশ অর্থনৈতিক অঞ্চল কর্তৃপক্ষ (বেজা) - এর গভর্নিং বোর্ডের ৫ম সভার কার্যবিবরণী

সভাপতি : শেখ হাসিনা	সভার তারিখ : ০৫ জানুয়ারি ২০১৭খ্রিঃ।
চেয়ারম্যান	সময় : সকাল ১১:৩০ টা।
গভর্নিং বোর্ড	স্থান : চামেলী
বাংলাদেশ অর্থনৈতিক অঞ্চল কর্তৃপক্ষ	প্রধানমন্ত্রীর কার্যালয়।
ও	
প্রধানমন্ত্রী	
গণপ্রজাতন্ত্রী বাংলাদেশ সরকার।	

উপস্থিতি : পরিশিষ্ট 'ক'

মাননীয় প্রধানমন্ত্রী গভর্নিং বোর্ডের সদস্যবৃন্দ এবং আমন্ত্রিত অতিথিবৃন্দকে স্বাগত জানিয়ে সভার কাজ শুরু করেন। তিনি দেশের সার্বিক উন্নয়ন নিশ্চিত করার উদ্দেশ্যে দেশের বিভিন্ন স্থানে পরিবেশ বান্ধব এবং পরিকল্পিত শিল্প স্থাপনের উপর গুরুত্ব আরোপ করেন। তিনি উল্লেখ করেন যে, যত্রতত্র শিল্প স্থাপন করলে একদিকে যেমন কৃষি জমি হ্রাস পায়, অন্যদিকে পরিবেশও মারাত্মকভাবে ক্ষতিগ্রস্ত হয়। শিল্প স্থাপনের মাধ্যমে উৎপাদন এবং কর্মসংস্থান যেমন জরুরি তেমন ১৬ কোটি লোকের খাদ্য নিরাপত্তা নিশ্চিত করাও জরুরি। অর্থনৈতিক অঞ্চল সৃষ্টির মাধ্যমে পরিকল্পিত শিল্পায়ন করে জমির সুষ্ঠু ব্যবহার করার মাধ্যমে কর্মসংস্থানও বৃদ্ধি করা যাবে এবং কৃষি উৎপাদন বৃদ্ধি করে খাদ্য নিরাপত্তাও নিশ্চিত করা সম্ভব হবে। এ ছাড়াও অর্থনৈতিক অঞ্চল স্থাপনের ক্ষেত্রে চাষের জমি অধিগ্রহণের চেয়ে খাস এবং পতিত জমিকেই অগ্রাধিকার দিতে হবে। কোন ক্ষেত্রে জমি অধিগ্রহণের প্রয়োজন হলে সে ক্ষেত্রে ক্ষতিগ্রস্তদেরকে সঠিকভাবে পুনর্বাসিত করার উপর গুরুত্ব প্রদান করতে হবে। তিনি মিরসরাই-ফেনী অর্থনৈতিক অঞ্চলে আরও জমি অধিগ্রহণ করে বিনিয়োগকারীদের জন্য সকল সুবিধাসহ শিল্প স্থাপনের উপযোগী ভূমি আরও সমৃদ্ধ করার উপর গুরুত্ব আরোপ করেন।

তিনি দেশের সার্বিক উন্নয়ন সাধন এবং কর্মসংস্থান সৃষ্টির লক্ষ্যে শিল্প স্থাপনকে কিছু এলাকায় সীমাবদ্ধ না রেখে দেশের সুসম উন্নয়ন নিশ্চিতকরণের উদ্দেশ্যে দেশব্যাপী শিল্পের বিকাশ সাধনের জন্য অর্থনৈতিক অঞ্চল স্থাপনের উপর গুরুত্ব আরোপ করেন। তিনি জানান যে, দেশের বিভিন্ন এলাকায় বিভিন্ন ধরনের কাঁচামাল উৎপাদিত হয়। যে অঞ্চলে যে ধরনের কাঁচামাল উৎপাদিত হয় সে অঞ্চলে উক্ত কাঁচামাল ভিত্তিক শিল্প স্থাপন করলে একদিকে যেমন অধিক মূল্য সংযোজিত হয়ে উন্নতমানের পণ্য উৎপাদিত হবে, অন্যদিকে কাঁচামাল উৎপাদনকারীরা তাদের পণ্যের ন্যায্যমূল্য পাবে, কর্মসংস্থান সৃষ্টি হবে এবং দারিদ্র্য বিমোচন হবে।

তিনি জানান যে, বর্তমানে দেশী ও বিদেশী বিনিয়োগকারীরা এ দেশে বিনিয়োগে যথেষ্ট আগ্রহ দেখাচ্ছে। এ সুযোগ কাজে লাগিয়ে বিনিয়োগ বৃদ্ধি, ব্যবসা বাণিজ্যের সম্প্রসারণ এবং শিল্পের বহুমুখীকরণের মাধ্যমে দেশকে অর্থনৈতিকভাবে স্বাবলম্বী করতে হবে। চেয়ারম্যান, বেজা গভর্নিং বোর্ড, আরও বলেন যে, লক্ষ্যমাত্রা অনুযায়ী দেশে ১০০টি অর্থনৈতিক অঞ্চল প্রতিষ্ঠিত হলে এবং সেখানে বিনিয়োগকারীরা শিল্প স্থাপন করলে আমরা আন্তর্জাতিক মানের পণ্য উৎপাদন করে বিদেশে আমাদের পণ্যের বাজার আরও সম্প্রসারণ করতে সক্ষম হবো। রপ্তানি বাজার এবং আমাদের দেশের চাহিদা-ভিত্তিক কৃষি ও খাদ্য প্রক্রিয়াকরণ শিল্পসহ ক্ষুদ্র ও মাঝারি শিল্পের ব্যাপক বিকাশ ঘটবে। ফলে কাঙ্ক্ষিত লক্ষ্য তথা ২০২১ সালের মধ্যে মধ্যম আয়ের দেশ এবং ২০৪১ সালের মধ্যে উন্নত দেশের সমমনে পৌঁছানো সম্ভব হবে। তিনি সবাইকে এ লক্ষ্যে কাজ করার আহ্বান জানান। তিনি দৃঢ়ভাবে আশা ব্যক্ত করেন যে, সবাই ঐক্যবদ্ধ এবং সমন্বিতভাবে কাজ করলে সকল বাধা-বিপত্তি অতিক্রম করে বাংলাদেশ কাঙ্ক্ষিত লক্ষ্যে পৌঁছাতে পারবে।

গ্রুপ-ক (মোট ৬টি): মিরসরাই অর্থনৈতিক অঞ্চল, ফেনী অর্থনৈতিক অঞ্চল, শ্রীহট্ট অর্থনৈতিক অঞ্চল, ঢাকা অর্থনৈতিক অঞ্চল, আড়াইহাজার-২ অর্থনৈতিক অঞ্চল এবং গজারিয়া অর্থনৈতিক অঞ্চল।

ক্রমিক	জমির শ্রেণী	বর্গমিটার প্রতি বাৎসরিক মূল্য (মাঃ ডঃ)	চুক্তির মেয়াদ (বৎসর)	বর্গমিটার প্রতি মোট মূল্য (মাঃ ডঃ)
১	২	৩	৪	৫
ক	এককালীন চুক্তি ভিত্তিক			
	উন্নত	০.৬০	৫০	৩০.০০
	অনুমত	০.৩০	৫০	১৫.০০
খ	বিশেষায়িত অবকাঠামো	০.৩৪৫	৫০	১৭.২৫
গ	বাৎসরিক ভাড়া ভিত্তিক			
	উন্নত	১.৫০	৫০	-
	অনুমত	০.৭৫	৫০	-
ঘ	বিশেষায়িত অবকাঠামো	০.৯০	৫০	-

গ্রুপ-খ (মোট ১০টি): কক্সবাজার বিশেষ অর্থনৈতিক অঞ্চল, মহেশখালী অর্থনৈতিক অঞ্চল-১, মহেশখালী অর্থনৈতিক অঞ্চল-২, মহেশখালী অর্থনৈতিক অঞ্চল-৩, মহেশখালী বিশেষ অর্থনৈতিক অঞ্চল, মহেশখালী বিশেষ অর্থনৈতিক অঞ্চল-৪, মহেশখালী অর্থনৈতিক অঞ্চল, সাবরাং টুরিজম পার্ক, নাফ টুরিজম পার্ক (জালিয়ার দ্বীপ অর্থনৈতিক অঞ্চল) এবং মোংলা অর্থনৈতিক অঞ্চল।

ক্রমিক	জমির শ্রেণী	বর্গমিটার প্রতি বাৎসরিক মূল্য (মাঃ ডঃ)	চুক্তির মেয়াদ (বৎসর)	বর্গমিটার প্রতি মোট মূল্য (মাঃ ডঃ)
১	২	৩	৪	৫
ক	এককালীন চুক্তি ভিত্তিক			
	উন্নত	০.৫২৫	৫০	২৬.২৫
	অনুমত	০.২৬২	৫০	১৩.১২৫
খ	বিশেষায়িত অবকাঠামো	০.৩১৫	৫০	১৫.৭৫
গ	বাৎসরিক ভাড়া ভিত্তিক			
	উন্নত	১.৩৫	৫০	-
	অনুমত	০.৬৭৫	৫০	-
ঘ	বিশেষায়িত অবকাঠামো	০.৮১	৫০	-

গ্রুপ-গঃ নীলফামারী অর্থনৈতিক অঞ্চলঃ

ক্রমিক	জমির শ্রেণী	বর্গমিটার প্রতি বাৎসরিক মূল্য (মাঃ ডঃ)	চুক্তির মেয়াদ (বৎসর)	বর্গমিটার প্রতি মোট মূল্য (মাঃ ডঃ)
১	২	৩	৪	৫
ক	এককালীন চুক্তি ভিত্তিক			
	উন্নত	০.৪০৫	৫০	২০.২৫
	অনুমত	০.২০২	৫০	১০.১২৫
খ	বিশেষায়িত অবকাঠামো	০.২৪	৫০	১২.০০
গ	বাৎসরিক ভাড়া ভিত্তিক			
	উন্নত	১.০৫	৫০	-
	অনুমত	০.৫২৫	৫০	-
ঘ	বিশেষায়িত অবকাঠামো	০.৬৩	৫০	-

মন্ত্রী, গৃহায়ণ ও গণপূর্ত মন্ত্রণালয় সভায় উল্লেখ করেন যে, মাননীয় প্রধানমন্ত্রীর সময়োপযোগী নির্দেশনার কারণেই মিরসরাই-ফেনীর অবহেলিত জনপদে অর্থনৈতিক অঞ্চল প্রতিষ্ঠার মাধ্যমে উন্নয়নের নতুন গতি সঞ্চারিত হয়েছে এবং উক্ত অঞ্চলে দেশের বৃহত্তম শিল্পাঞ্চল প্রতিষ্ঠিত হচ্ছে। শিল্পাঞ্চলকে কেন্দ্র করে রাস্তাসহ অন্যান্য অবকাঠামো দ্রুত গড়ে উঠছে। তাই বড়তাকিয়া-মিরসরাই অর্থনৈতিক অঞ্চল পর্যন্ত চার লেন বিশিষ্ট ২৯ কিঃমিঃ রাস্তার নাম “শেখ হাসিনা সরণি” হওয়া উচিত। সভায় উপস্থিত সদস্যবৃন্দ এবং আমন্ত্রিত অতিথিবৃন্দ এ বিষয়ে ঐকমত্য পোষণ করেন।

সিদ্ধান্ত-(৭.২): বড়তাকিয়া-মিরসরাই অর্থনৈতিক অঞ্চল পর্যন্ত ৪ (চার) লেন বিশিষ্ট ২৯ (উনত্রিশ) কিলোমিটার রাস্তার নাম “শেখ হাসিনা সরণি” নামকরণ করা হলো।

৯। আলোচ্যসূচী-৭: বিবিধ;

(৭.৩) বেজার গভর্নিং বোর্ডে বাংলাদেশ বিনিয়োগ উন্নয়ন কর্তৃপক্ষের (বিডা) নির্বাহী চেয়ারম্যানকে অন্তর্ভুক্তকরণ।

আলোচনা: বেজার নির্বাহী চেয়ারম্যান সভায় অবহিত করেন যে অধুনালুপ্ত বিনিয়োগ বোর্ডের নির্বাহী চেয়ারম্যান বেজার গভর্নিং বোর্ডের সদস্য ছিলেন। কিন্তু বিনিয়োগ বোর্ড এবং প্রাইভেটাইজেশন কমিশন বিলুপ্ত হয়ে “বাংলাদেশ বিনিয়োগ উন্নয়ন কর্তৃপক্ষ” গঠিত হবার পর উক্ত কর্তৃপক্ষ থেকে বর্তমানে বেজার গভর্নিং বোর্ডে কোন সদস্য নেই। যেহেতু বিনিয়োগ বোর্ড ও প্রাইভেটাইজেশন কমিশন বিলুপ্ত হয়ে বিডা গঠিত হয়েছে, সেহেতু বিডার নির্বাহী চেয়ারম্যানকে বেজার গভর্নিং বোর্ডের সদস্য হিসেবে অন্তর্ভুক্তির জন্য বেজার নির্বাহী চেয়ারম্যান প্রস্তাব করেন। সভায় উপস্থিত মাননীয় সদস্যবৃন্দ উক্ত প্রস্তাবের সাথে একমত পোষণ করেন।

সিদ্ধান্ত-(৭.৩): বাংলাদেশ বিনিয়োগ উন্নয়ন কর্তৃপক্ষ (বিডা) এর নির্বাহী চেয়ারম্যানকে বেজার গভর্নিং বোর্ডের সদস্য হিসেবে অন্তর্ভুক্ত করা হলো।

পরিশেষে গভর্নিং বোর্ডের চেয়ারম্যান, মাননীয় প্রধানমন্ত্রী সবাইকে ধন্যবাদ জানিয়ে সভার সমাপ্তি ঘোষণা করেন।

স্বাক্ষরিত

০৫/০২/২০১৭

(শেখ হাসিনা)

চেয়ারম্যান

গভর্নিং বোর্ড

বাংলাদেশ অর্থনৈতিক অঞ্চল কর্তৃপক্ষ

ও

প্রধানমন্ত্রী


গণপ্রজাতন্ত্রী বাংলাদেশ সরকার।


এল.এ মামলা নং- ০৫/২০১৭-১৮


প্রকল্পের নাম: বাংলাদেশ অর্থনৈতিক অঞ্চল-৩ (ধলঘাটা)।


চূড়ান্ত দাগসূচী (বৌখভাবে প্রস্তুতকৃত)


জমির শ্রেণি	খাস জমির পরিমাণ (একর)	ব্যক্তি মালিকানাধীন জমির পরিমাণ (একর)	জেলা পরিষদের জমির পরিমাণ (একর)	সর্বমোট জমির পরিমাণ (একর)
নাল/পুকুর	২.৫৬	৪৩৩.৪৬	--	৪৩৬.০২
চালা/ পু:পাড়/ বাগান/ রাস্তা/পথ/বাধ/ কাটি	--	--	--	--
ভিটি/ বাড়ী	--	--	--	--



মোঃ আব্দুল বারীক
সার্ভেয়ার
এল.এ. শাখা
জেলা প্রশাসকের কার্যালয়, কক্সবাজার।



মোঃ মাসুদ রানা
সার্ভেয়ার
এল.এ. শাখা
জেলা প্রশাসকের কার্যালয়, কক্সবাজার।

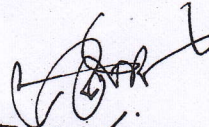

মোঃ জাহাঙ্গীর হোসেন
সার্ভেয়ার
এল.এ. শাখা
জেলা প্রশাসকের কার্যালয়, কক্সবাজার।


ভূমি অধিগ্রহণ কর্মকর্তা
কক্সবাজার।


মোঃ ফেরদৌস খান
সার্ভেয়ার
ভূমি অধিগ্রহণ শাখা
জেলা প্রশাসকের কার্যালয়, কক্সবাজার।


মোঃ আব্দুল বাতেন
কানুনগো
এল.এ. শাখা
জেলা প্রশাসকের কার্যালয়
কক্সবাজার।


সেপারেশন সিস্টেম
অফিস: ভূমি অধিগ্রহণ শাখা
জেলা প্রশাসকের কার্যালয়, কক্সবাজার।


অতিরিক্ত জেলা প্রশাসক (রাজস্ব)
কক্সবাজার।

বাংলাদেশ অর্থনৈতিক জরিপ-৩ (খলঘাটা) এর অন্তর্ভুক্ত জমির দাগসূচী (বোধ ভাবে প্রস্তুতকৃত):

ক্রমিক নং	বি.এস দাগ নং	বি.এস খতিয়ান নং	সৃজিত খতিয়ান নং	দাগে মোট জমির পরিমাণ (একর)	প্রস্তাবিত জমির পরিমাণ (একর)	বি.এস রেকর্ড অনুযায় শ্রেণী	আংশিক ক/পূর্ণ	পূর্বের অধিগ্রহণ কৃত জমি (একরে)	পূর্বের অধিগ্রহণ কেইস নং	সরেজমিনে তদন্তকালে প্রাপ্ত শ্রেণি		
										নাল/পুকুর	চালা/পূ.পাড়/ বাগান/ রাস্তা/পথ/বাধ/ কাটি	ভিত্তি/ বাড়ী
১.	৭৬৮২	৯৬		০.২২	০.১৫	নাল	আং	০.০৭		০.১৫		
২.	৭৬৮৩	৬১		০.৪২	০.৪২	নাল	পূর্ণ	--	০৫/৯০-৯১	০.১৫		
৩.	৭৬৮৪	২০৪	১৬৭২,১৬৭৩	১.১৪	১.১৪	নাল	পূর্ণ	--		০.৪২		
৪.	৭৬৮৫	২২৬	১৬৭২,১৬৭৩	০.৩২	০.২৩	নাল	পূর্ণ	--		১.১৪		
৫.	৭৬৮৬	৯৬	-	০.৯৪	০.৯৪	নাল	পূর্ণ	--		০.২৩		
৬.	৭৬৮৭	১৩৩	-	০.০৪	০.০৪	নাল	পূর্ণ	--		০.৯৪		
৭.	৭৬৮৮	৮৩৯	-	০.০৬	০.০৬	নাল	পূর্ণ	--		০.০৪		
৮.	৭৬৮৯	১৩৩	-	০.৪০	০.৪০	নাল	পূর্ণ	--		০.০৬		
৯.	৭৬৯০	৬১	-	০.১৯	০.১৯	নাল	পূর্ণ	--		০.৪০		
১০.	৭৬৯১	৬১	-	০.৪২	০.৩৪	নাল	আং	০.০৮	০৫/৯০-৯১	০.১৯		
১১.	৭৬৯২	৮৫৭	১৪৯২	১.৬৬	১.৪৭	নাল	আং	০.১৯	০৫/৯০-৯১	০.৩৪		
১২.	৭৬৯৩	১৩৪		০.০৭	০.০৭	নাল	পূর্ণ	--		১.৪৭		
১৩.	৭৬৯৪	১৩৪		০.০৭	০.০৭	-	পূর্ণ	--		০.০৭		
১৪.	৭৬৯৫	৩৪৭		০.১৪	০.১৪	নাল	পূর্ণ	--	সূচীমতে	০.০৭		
১৫.	৭৬৯৬	২০৪	১৬৭২,১৬৭৩	০.৫৬	০.৫৬	নাল	পূর্ণ	--		০.১৪		
১৬.	৭৬৯৭	৮৫০		০.০৬	০.০৬	নাল	পূর্ণ	--		০.৫৬		
১৭.	৭৬৯৮	৮৬৬		০.৪৮	০.৪৮	নাল	পূর্ণ	--		০.০৬		
১৮.	৭৬৯৯	৮৫০		০.৩৯	০.৩৯	নাল	পূর্ণ	--		০.৪৮		
১৯.	৭৭০০	৩১৭	১৫১৪	০.৮৮	০.৮৮	নাল	পূর্ণ	--		০.৩৯		
২০.	৭৭০১	৫৩৪	-	০.৯৭	০.৯৭	নাল	পূর্ণ	--		০.৮৮		
২১.	৭৭০২	৬০	-	১.১৯	১.১৯	-	পূর্ণ	--		০.৯৭		
২২.	৭৭০৪	৬০	-	০.১৫	০.১৫	নাল	পূর্ণ	--	সূচীমতে	১.১৯		
২৩.	৭৭০৫	৫৩৪	-	০.১৫	০.১৫	নাল	পূর্ণ	--		০.১৫		
২৪.	৭৭০৬	১৯৮	-	২.৫৪	২.৫৪	নাল	পূর্ণ	--		০.১৫		
২৫.	৭৭০৭	৫৩৪	-	.৩০	.৩০	নাল	পূর্ণ	--		২.৫৪		
২৬.	৭৭২৮	২২	-	৪.২৩	৪.২৩	নাল	পূর্ণ	--		.৩০		
২৭.	৭৭২৯	৩৩৮	-	০.৬৯	০.৬৯	নাল	পূর্ণ	--		৪.২৩		
২৮.	৭৭৩০	৩৪৭	-	০.১১	০.১১	নাল	পূর্ণ	--		০.৬৯		
২৯.	৭৭৩১	৩৪৭	-	০.১১	০.১১	নাল	পূর্ণ	--		০.১১		
৩০.	৭৭৩২	৩৩৮	-	০.২১	০.২১	নাল	পূর্ণ	--		০.১১		
৩১.	৭৭৩৩	১০৪১	-	০.২১	০.০৯	নাল	আং	০.১২	০৫/৯০-৯১	০.২১		
৩২.	৭৭৩৪	৬১	-	০.৪১	০.২৮	নাল	আং	০.১৩	০৫/৯০-৯১	০.০৯		
৩৩.	৭৭৩৫	১১২	-	০.৮৯	০.৭৯	নাল	আং	০.১০	০৫/৯০-৯১	০.২৮		
৩৪.	৭৭৩৬	৯৩	-	০.৮৩	০.৭০	নাল	আং	০.১৩	০৫/৯০-৯১	০.৭৯		
৩৫.	৭৭৩৭	৩৪৭	-	০.৬৯	০.৬৯	নাল	পূর্ণ	--		০.৭০		
৩৬.	৭৭৩৮	৩৪৭	-	০.৪১	০.৪১	নাল	পূর্ণ	--		০.৬৯		
৩৭.	৭৭৩৯	৮১৭	-	০.৪৫	০.২৩	নাল	আং	০.২২	০৫/৯০-৯১	০.৪১		
৩৮.	৭৭৪০	৩৪০	-	১.৩৬	১.৩৬	নাল	পূর্ণ	--		০.২৩		
৩৯.	৭৭৪১	৫৮৭	১৫৫৮,১৫৫৫	১.৩০	১.৩০	নাল	পূর্ণ	--		১.৩৬		
৪০.	৭৯২৯	১০৪১		১.৪১	১.৪১	নুনমাঠ	পূর্ণ	--		১.৩০		
৪১.	৭৯৩০	১১১৮		৩.৪০	৩.৪০	-	পূর্ণ	--		১.৪১		
৪২.	৭৯৩২	৩৪৮		০.৯৮	০.৯৮	নাল	পূর্ণ	--		৩.৪০		
৪৩.	৭৯৩৩	২৮৬	১৫৫৬,১৫৫৭	১.০০	১.০০	নাল	পূর্ণ	--		০.৯৮		
৪৪.	৭৯৩৪	৪৭০	-	০.৩৬	০.৩৬	নাল	পূর্ণ	--		১.০০		
৪৫.	৭৯৩৫	৭৬৩	-	০.৬০	০.৬০	নাল	পূর্ণ	--		০.৩৬		
৪৬.	৭৯৩৬	১২৬৩	-	০.৬২	০.৬২	নাল	পূর্ণ	--		০.৬০		
৪৭.	৭৯৩৭	১০০০	-	১.৯১	১.৯১	নুনমাঠ	পূর্ণ	--		০.৬২		
৪৮.	৭৯৩৮	১২৬৩	-	০.৫৬	০.৫৬	নাল	পূর্ণ	--		১.৯১		
৪৯.	৭৯৩৯	৮৬৩	-	০.৭৯	০.৭৯	নুনমাঠ	পূর্ণ	--		০.৫৬		
৫০.	৭৯৪০	৮৬৩	-	০.২৯	০.২৯	নাল	পূর্ণ	--	সূচীমতে	০.৭৯		
৫১.	৭৯৪১	২৮৬	-	১.১৩	১.১৩	নুনমাঠ	পূর্ণ	--		০.২৯		
৫২.	৭৯৪২	২৩২	১৬৯১	১.৫৮	১.৫৮	নুনমাঠ	পূর্ণ	--		১.১৩		
					৩৯.১৬							
										৩৯.১৬		

মোঃ আব্দুল বারীক মোঃ মাসুদ রানা মোঃ জাহাঙ্গীর হোসেন মোঃ ফেরদৌস খাঁন মোঃ আব্দুল বাতেন
 সার্ভেয়ার সার্ভেয়ার সার্ভেয়ার সার্ভেয়ার সার্ভেয়ার
 এল.এ.শাখা এল.এ.শাখা এল.এ.শাখা এল.এ.শাখা এল.এ.শাখা
 জেলা প্রশাসকের কার্যালয়, কক্সবাজার জেলা প্রশাসকের কার্যালয়, কক্সবাজার জেলা প্রশাসকের কার্যালয়, কক্সবাজার জেলা প্রশাসকের কার্যালয়, কক্সবাজার।

ক্রমিক নং	বি.এস দাগ নং	বি.এস খতিয়ান নং	সুজিত খতিয়ান নং	দাগে মোট জমির পরিমাণ (একর)	প্রস্তাবিত জমির পরিমাণ (একর)	বি.এস রেকর্ড অনুযায়ী শ্রেণী	আংশিক ক/পূর্ণ	পূর্বের অধিগ্রহণ কৃত জমি (একরে)	পূর্বের অধিগ্রহণ কেইস নং	সরেজমিনে তদন্তকালে প্রাপ্ত শ্রেণি		
										নাল/পুকুর	চালা/পু-পাড়/ বাগান/ রাস্তা/পথ/বাধ/ কাটি	জিটি/ বাড়ী
৫৩.	৭৯৪৩	২২,১৬২, ৮২৯, ৮৫০	১৬৭২	ইজা ৭.১২	৩৯.১৬		খাল	আং			৩৯.১৬	
৫৪.	৭৯৪৭	৭২২		০.৫৬	০.৫৬	নুনমাঠ	পূর্ণ				০.৫৬	
৫৫.	৭৯৪৮	২৩২	১৬৯১	০.৬২	০.২৭	নুনমাঠ	আং	০.৩৫	২৩/৯২-৯৩		০.২৭	
৫৬.	৮০৭০	৩৫২	-	০.২৩	০.২৩	বালুচর	পূর্ণ				০.২৩	
৫৭.	৮০৭২	৪৫৫	-	০.৯৭	০.৯৭	বালুচর	পূর্ণ				০.৯৭	
৫৮.	৮০৭৩	৪৫৫	-	০.৩২	০.৩২	বালুচর	পূর্ণ				০.৩২	
৫৯.	৮০৭৪	৪৫৫	-	০.৩৩	০.৩৩	বালুচর	পূর্ণ				০.৩৩	
৬০.	৮০৭৫	১	-	০.৪৮	০.৪৮	বালুচর	পূর্ণ				০.৪৮	
৬১.	৮০৭৭	৩৫২	-	০.৭৮	০.৭৮	বালুচর	পূর্ণ				০.৭৮	
৬২.	৮০৮০	৩২৬	-	১.১৮	১.১৮	বালুচর	পূর্ণ				১.১৮	
৬৩.	৮০৮২	৭৮৭	-	০.৩২	০.৩২	বালুচর	পূর্ণ				০.৩২	
৬৪.	৮০৮৩	৭৮৭	-	০.৬২	০.৬২	বালুচর	পূর্ণ				০.৬২	
৬৫.	৮০৮৪	৬৫৪	-	০.১৫	০.১৫	বালুচর	পূর্ণ				০.১৫	
৬৬.	৮০৮৫	৬৩৭	-	০.১৩	০.১৩	বালুচর	পূর্ণ				০.১৩	
৬৭.	৮০৮৬	৬৫৪	-	০.০৩	০.০৩	বালুচর	পূর্ণ				০.০৩	
৬৮.	৮০৮৮	৩৫২	-	০.৭০	০.৭০	বালুচর	পূর্ণ				০.৭০	
৬৯.	৮০৮৯	৬১৭	-	১.০৫	১.০৫	বালুচর	পূর্ণ				১.০৫	
৭০.	৮০৯২	৬০৫	-	১.৪৭	১.৪৭	বালুচর	পূর্ণ				১.৪৭	
৭১.	৮০৯৪	৩৫৩	-	০.২৪	০.২৪	বালুচর	পূর্ণ				০.২৪	
৭২.	৮০৯৫	১৩৬৭	-	০.১২	০.১২	বালুচর	পূর্ণ				০.১২	
৭৩.	৮০৯৬	১১৬৪	-	০.০৫	০.০৫	বালুচর	পূর্ণ				০.০৫	
৭৪.	৮১৩২	১৩৩	-	০.৩৫	০.৩৫	নুনমাঠ	পূর্ণ				০.৩৫	
৭৫.	৮১৩৩	৮৩৯	-	০.৪৪	০.৪৪	নাল	পূর্ণ				০.৪৪	
৭৬.	৮১৩৪	১৩৬৭	-	০.৭৭	০.৭৭	নুনমাঠ	পূর্ণ				০.৭৭	
৭৭.	৮১৩৫	৩৫৩	-	০.৭২	০.৭২	নুনমাঠ	পূর্ণ				০.৭২	
৭৮.	৮১৩৬	১১৬৪	-	০.৫৭	০.৫৭	নুনমাঠ	পূর্ণ				০.৫৭	
৭৯.	৮১৩৭	১৩৬৭	-	০.২৮	০.২৮	নুনমাঠ	পূর্ণ				০.২৮	
৮০.	৮১৩৮	৩৫৩	-	০.৩০	০.৩০	খিলা	পূর্ণ				০.৩০	
৮১.	৮১৩৯	১১৬৪	-	০.০৫	০.০৫	খিলা	পূর্ণ				০.০৫	
৮২.	৮১৪০	৭৩৩	-	০.৪০	০.৪০	খিলা	পূর্ণ				০.৪০	
৮৩.	৮১৪১	১০০০	-	০.০৯	০.০৯	নুনমাঠ	পূর্ণ				০.০৯	
৮৪.	৮১৪২	১০৬২	-	১.৩৮	১.২২	নুনমাঠ	আং	০.১৬	২৩/৯২-৯৩		১.২২	
৮৫.	৮১৪৩	২৩	-	০.৩১	০.১৫	নুনমাঠ	আং	০.১৬	২৩/৯২-৯৩		০.১৫	
৮৬.	৮১৪৪	১৭৬	-	০.৩৫	০.১৫	নুনমাঠ	আং	০.২০	২৩/৯২-৯৩		০.১৫	
৮৭.	৮১৪৫	৭২২	-	০.৬৩	০.২৩	নুনমাঠ	আং	০.৪০	২৩/৯২-৯৩		০.২৩	
৮৮.	৮১৪৬	১১১৮	-	০.৪২	০.৪০	নুনমাঠ	আং	০.০২	২৩/৯২-৯৩		০.৪০	
৮৯.	৮১৪৭	১০০০	১৬৫৩	১.৩০	১.১৮	নুনমাঠ	আং	০.১২	২৩/৯২-৯৩		১.১৮	
৯০.	৮১৪৮	১০৬৩	-	১.৪২	০.৬৫	বালুচর	আং	০.৭৭	২৩/৯২-৯৩		০.৬৫	
৯১.	৮১৪৯	৭২২	-	১.৬১	১.৪৬	নুনমাঠ	আং	০.১৭	২৩/৯২-৯৩		১.৪৬	
৯২.	৮১৫০	২৩	১৬১৯, ১৬২০	২.৪৮	২.১৬	নুনমাঠ	আং	০.৩২	২৩/৯২-৯৩		২.১৬	
৯৩.	৮১৫১	১৭৬	-	০.৩৮	০.৩৮	নুনমাঠ	পূর্ণ				০.৩৮	
৯৪.	৮১৫২	১৭৬	-	০.৩৬	০.৩৬	নুনমাঠ	পূর্ণ				০.৩৬	
৯৫.	৮১৫৩	১৭৬	-	০.৩৮	০.৩৮	নুনমাঠ	পূর্ণ				০.৩৮	
৯৬.	৮১৫৪	১৭৬	-	০.৪১	০.৪১	নুনমাঠ	পূর্ণ				০.৪১	
৯৭.	৮১৫৫	১৭৬	-	০.২৮	০.২৬	নুনমাঠ	আং	০.০২	২৩/৯২-৯৩		০.২৬	
৯৮.	৮১৫৬	৫০৪	-	০.৩১	০.৩১	নুনমাঠ	পূর্ণ				০.৩১	
৯৯.	৮১৫৭	৫০৩	-	০.৩৮	০.৩৮	নুনমাঠ	পূর্ণ				০.৩৮	
১০০.	৮১৫৮	৫০৩	-	০.৩৫	০.৩৫	নুনমাঠ	পূর্ণ				০.৩৫	
১০১.	৮১৫৯	৫০৩	-	০.৪২	০.৪২	নুনমাঠ	পূর্ণ				০.৪২	
১০২.	৮১৬০	৫০৩	১৫১০	০.৪৩	০.৪৩	নুনমাঠ	পূর্ণ				০.৪৩	
১০৩.	৮১৬১	৫০৪	-	০.৪৩	০.৪৩	নুনমাঠ	পূর্ণ				০.৪৩	
১০৪.	৮১৬২	৫০৩	-	০.৫৭	০.৫৭	নুনমাঠ	পূর্ণ				০.৫৭	
১০৫.	৮১৬৩	৫০৩	-	০.৫৬	০.৫৬	নুনমাঠ	পূর্ণ				০.৫৬	
					৬৭.৮৫						৬৭.৮৫	

মোঃ আব্দুল বারীক
সার্ভেয়ার
এল.এ.শাখা

মোঃ মাসুদ রানা
সার্ভেয়ার
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ক্রমিক নং	বি.এস দাগ নং	বি.এস খতিয়ান নং	সুজিত খতিয়ান নং	দাগে মোট জমির পরিমাণ (একর)	প্রস্তাবিত জমির পরিমাণ (একর)	বি.এস রেকর্ড অনুযায় ী শ্রেণী	আংশিক ক/ পূর্ণ	পূর্বের অধিগ্রহণ কৃত জমি (একরে)	পূর্বের অধিগ্রহণ কেইস নং	সরেজমিনে উদন্তকালে প্রাপ্ত শ্রেণি		
										নাল/পুকুর	চালা/ পু:পাড়া/ বাগান/ রাস্তা/পথ/বাধ/ কাটি	ভিটি/ বাড়ী
১০৬	৮১৬৪	৫০৪	১৬৪৩	০.৯৭	০.৯৭	নুনমাঠ	পূর্ণ			৬৭.৮৫		
১০৭	৮১৬৫	৫০৩	-	০.৩০	০.৩০	নুনমাঠ	পূর্ণ			০.৯৭		
১০৮	৮১৬৬	৫০৩	-	০.৩১	০.৩১	নুনমাঠ	পূর্ণ			০.৩০		
১০৯	৮১৬৭	৫৩২	-	১.৫২	১.৫২	নুনমাঠ	পূর্ণ			০.৩১		
১১০	৮১৬৮	৪৭১	-	১.৫৫	১.৫৫	নুনমাঠ	পূর্ণ			১.৫২		
১১১	৮১৬৯	৩১৭	১৫১৪	১.৭৮	১.৭৮	নুনমাঠ	পূর্ণ			১.৫৫		
১১২	৮১৭০	৯৬	১৫১০	২.০৩	২.০৩	নুনমাঠ	পূর্ণ			১.৭৮		
১১৩	৮১৭১	১০২৭,১১ ০৬	১৬২৪,১৫৭৬, ১৫৭৭	৩.০৯	৩.০৯	নুনমাঠ	পূর্ণ			২.০৩		
১১৪	৮১৭২	১১৭৪	-	০.৩৬	০.৩৬	নুনমাঠ	পূর্ণ			৩.০৯		
১১৫	৮১৭৩	৮৬০	১৫৩২	২.০০	২.০০	নুনমাঠ	পূর্ণ			০.৩৬		
১১৬	৮১৭৪	১২০৪	-	০.৪০	০.৪০	নুনমাঠ	পূর্ণ			২.০০		
১১৭	৮১৭৫	১১৭৪	-	১.৪০	১.৪০	নুনমাঠ	পূর্ণ			০.৪০		
১১৮	৮১৭৬	১১৬৬	-	১.৪০	১.৪০	নুনমাঠ	পূর্ণ			১.৪০		
১১৯	৮১৭৭	১০০১	১৬৫৩	১.৪৮	১.৪৮	নুনমাঠ	পূর্ণ			১.৪০		
১২০	৮১৭৮	১১৬৫	১৬৬৬	০.৫১	০.৫১	নুনমাঠ	পূর্ণ			১.৪৮		
১২১	৮১৭৯	১১৬৫	১৬৮৪	১.৭২	১.৭২	নুনমাঠ	পূর্ণ			০.৫১		
১২২	৮১৮০	৭৪	-	০.৪০	০.৪০	নুনমাঠ	পূর্ণ			১.৭২		
১২৩	৮১৮১	১১৬৫	-	০.৩৩	০.৩৩	নুনমাঠ	পূর্ণ			০.৪০		
১২৪	৮১৮২	৬৪০	-	০.৫৪	০.৫৪	নুনমাঠ	পূর্ণ		সূচীমতে	০.৩৩		
১২৫	৮১৮৩	৯০০	১৫১৮	১.০৬	১.০৬	নুনমাঠ	পূর্ণ			০.৫৪		
১২৬	৮১৮৪	১৭৬	-	০.১০	০.১০	নুনমাঠ	পূর্ণ			১.০৬		
১২৭	৮১৮৫	১৭৬	-	০.১৩	০.১৩	নুনমাঠ	পূর্ণ			০.১০		
১২৮	৮১৮৬	১৭৬	-	০.১৬	০.১৬	নুনমাঠ	পূর্ণ			০.১৩		
১২৯	৮১৮৭	১৭৬	-	০.৪৪	০.৪৪	নুনমাঠ	পূর্ণ			০.১৬		
১৩০	৮১৮৮	১৭৬	-	০.৪১	০.৪১	নুনমাঠ	পূর্ণ			০.৪৪		
১৩১	৮১৮৯	৭০৫	১৫৬৩	০.৪৮	০.৪৮	নুনমাঠ	পূর্ণ			০.৪১		
১৩২	৮১৯০	৩৮২	১৬৪৩,১৬৬৮	১.৪৩	১.৪৩	নুনমাঠ	পূর্ণ			০.৪৮		
১৩৩	৮১৯১	১০০২	১৬৫৩	১.৩৮	১.৩৮	নুনমাঠ	পূর্ণ			১.৪৩		
১৩৪	৮১৯২	৮৩৯	১৫৭৫	০.৭৮	০.৭৮	নুনমাঠ	পূর্ণ			১.৩৮		
১৩৫	৮১৯৩	১৩৩	১৬১৮	০.৯৪	০.৯৪	নুনমাঠ	পূর্ণ			০.৭৮		
১৩৬	৮১৯৪	২০৪	১৬৭২	০.৩১	০.৩১	নুনমাঠ	পূর্ণ			০.৯৪		
১৩৭	৮১৯৫	১০০১	-	০.২৫	০.২৫	নুনমাঠ	পূর্ণ			০.৩১		
১৩৮	৮১৯৬	১০০১	-	০.২৮	০.২৮	নুনমাঠ	পূর্ণ			০.২৫		
১৩৯	৮১৯৭	১২৬২	-	০.২৮	০.২৮	নুনমাঠ	পূর্ণ			০.২৮		
১৪০	৮১৯৮	১০৪০	-	০.৩৪	০.৩৪	নুনমাঠ	পূর্ণ			০.২৮		
১৪১	৮১৯৯	১২৬২	-	০.০৬	০.০৬	নুনমাঠ	পূর্ণ			০.৩৪		
১৪২	৮২০০	১১০৭	-	০.১৬	০.১৬	নুনমাঠ	পূর্ণ			০.০৬		
১৪৩	৮২০১	১০০১	-	০.৪১	০.৪১	নুনমাঠ	পূর্ণ			০.১৬		
১৪৪	৮২০২	১০০১	-	০.৩৩	০.৩৩	নুনমাঠ	পূর্ণ			০.৪১		
১৪৫	৮২০৩	১০৪০	-	০.৩৩	০.৩৩	নুনমাঠ	পূর্ণ			০.৩৩		
১৪৬	৮২০৪	১২৬২	-	০.২৯	০.২৯	নুনমাঠ	পূর্ণ			০.৩৩		
১৪৭	৮২০৫	৪৬,৩৪১	১৬৫৬	১.৬০	১.৬০	খাল	পূর্ণ			০.২৯		
১৪৮	৮২৪৮	-	-	২.৪৭	২.৪৭	বালুচর	পূর্ণ			১.৬০		
১৪৯	৮২৪৯	৭৩৯	-	১.৪৭	১.৪৭	নাল	পূর্ণ			২.৪৭		
১৫০	৮২৫০	৭৬৯	১৬৪৪	০.৪২	০.৪২	নুনমাঠ	পূর্ণ			১.৪৭		
১৫১	৮২৫১	১১৯২	-	০.১৩	০.১৩	নুনমাঠ	পূর্ণ			০.৪২		
১৫২	৮২৫২	১১৯২	-	০.৫৬	০.৫৬	নুনমাঠ	পূর্ণ			০.১৩		
১৫৩	৮২৫৩	১১৯২	-	০.৩৯	০.৩৯	নুনমাঠ	পূর্ণ			০.৫৬		
১৫৪	৮২৫৪	১১৯২	-	০.১৭	০.১৭	নুনমাঠ	পূর্ণ			০.৩৯		
১৫৫	৮২৫৫	১১৯২	-	০.৩৮	০.৩৮	নুনমাঠ	পূর্ণ			০.১৭		
১৫৬	৮২৫৬	১১৯২	-	০.৩১	০.৩১	নুনমাঠ	পূর্ণ			০.৩৮		
১৫৭	৮২৫৭	১২০৫	-	০.১৫	০.১৫	নুনমাঠ	পূর্ণ			০.৩১		
১৫৮	৮২৫৮	৯৪৭	-	০.৪৭	০.৪৭	নুনমাঠ	পূর্ণ			০.১৫		
১৫৯										০.৪৭		

মোঃ আব্দুল বারীক
সার্ভেয়ার
এল.এ. শাখা

মোঃ মাসুদ রানা
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মোঃ জাহাঙ্গীর হোসেন
সার্ভেয়ার
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মোঃ ফেরদৌস খান
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এল.এ. শাখা
জেলা প্রশাসকের সহকারী
ককরাবাজার।

১৫

ক্রমিক নং	বি.এস দাগ নং	বি.এস খতিয়ান নং	সৃষ্টিত খতিয়ান নং	দাগে মোট জমির পরিমাণ (একর)	প্রস্তাবিত জমির পরিমাণ (একর)	বি.এস রেকর্ড অনুযায় ী শ্রেণী	আংশি ক/পূর্ণ	পূর্বের অধিগ্রহণ কৃত জমি (একরে)	পূর্বের অধিগ্রহণ কেইস নং	সরঞ্জামিনে তদন্তকালে প্রাপ্ত শ্রেণি		
										নাল/পুকুর	চাল/পু:পাড়/ বাগান/ রাস্তা/পথ/বাধ/ কাটি	ভিটি/ বাড়ী
১৬০.				ইজা	১০৮.৮১						১০৮.৮১	
১৬১.	৮২৫৯	২৫২	-	০.৮৯	০.৮৯	নুনমাঠ	পূর্ণ				০.৮৯	
১৬২.	৮২৬০	৯৪৭	-	০.০৫	০.০৫	নুনমাঠ	পূর্ণ				০.০৫	
১৬৩.	৮২৬১	১২০৫	-	০.০৪	০.০৪	নুনমাঠ	পূর্ণ				০.০৪	
১৬৪.	৮২৬২	৯৪৭	-	০.১০	০.১০	নুনমাঠ	পূর্ণ				০.১০	
১৬৫.	৮২৬৩	১২০৫	-	০.৬০	০.৬০	নুনমাঠ	পূর্ণ				০.৬০	
১৬৬.	৮২৬৪	৬০	-	০.২৬	০.২৬	নুনমাঠ	পূর্ণ				০.২৬	
১৬৭.	৮২৬৫	৭৫	-	১.২৪	১.২৪	নুনমাঠ	পূর্ণ				১.২৪	
১৬৮.	৮২৬৬	৪৯৬	-	০.২৫	০.২৫	নুনমাঠ	পূর্ণ				০.২৫	
১৬৯.	৮২৬৭	৪৫৬	-	০.৭২	০.৭২	নুনমাঠ	পূর্ণ				০.৭২	
১৭০.	৮২৬৮	৭০	-	০.৬৬	০.৬৬	নুনমাঠ	পূর্ণ		সূচীমতে		০.৬৬	
১৭১.	৮২৬৯	৫৯১	-	০.৭০	০.৭০	নুনমাঠ	পূর্ণ				০.৭০	
১৭২.	৮২৭০	৪৯৬	-	১.৫৩	১.৫৩	নুনমাঠ	পূর্ণ				১.৫৩	
১৭৩.	৮২৭১	৩৪৮	-	১.৮৮	১.৮৮	নুনমাঠ	পূর্ণ				১.৮৮	
১৭৪.	৮২৭২	৮৫১	-	১.০০	১.০০	নুনমাঠ	পূর্ণ				১.০০	
১৭৫.	৮২৭৩	২৫২	-	০.১৬	০.১৬	নুনমাঠ	পূর্ণ				০.১৬	
১৭৬.	৮২৭৪	৬৩৯	১৬২৪	০.২৫	০.২৫	নুনমাঠ	পূর্ণ				০.২৫	
১৭৭.	৮২৭৫	৬৩৯	১৬২৪	০.৬১	০.৬১	নুনমাঠ	পূর্ণ				০.৬১	
১৭৮.	৮২৭৬	৯৪৭	১৬৮৪	০.৯৪	০.৯৪	নুনমাঠ	পূর্ণ				০.৯৪	
১৭৯.	৮২৭৭	২৫২	-	০.৭৩	০.৭৩	নুনমাঠ	পূর্ণ				০.৭৩	
১৮০.	৮২৭৮	৬৩৯	-	০.২৫	০.২৫	নুনমাঠ	পূর্ণ				০.২৫	
১৮১.	৮২৭৯	৯৪৭	-	০.২০	০.২০	নুনমাঠ	পূর্ণ				০.২০	
১৮২.	৮২৮০	২৫২	-	০.৩২	০.৩২	নুনমাঠ	পূর্ণ				০.৩২	
১৮৩.	৮২৮১	৯৪৭	-	০.০৭	০.০৭	নুনমাঠ	পূর্ণ				০.০৭	
১৮৪.	৮২৮২	৬৩৯	-	০.২৩	০.২৩	নুনমাঠ	পূর্ণ				০.২৩	
১৮৫.	৮২৮৩	২৫২	-	০.০৪	০.০৪	নুনমাঠ	পূর্ণ				০.০৪	
১৮৬.	৮২৮৪	৯৪৭	১৬৫৩	০.০৫	০.০৫	নুনমাঠ	পূর্ণ				০.০৫	
১৮৭.	৮২৮৬	২৫২	-	০.০৭	০.০৭	নুনমাঠ	পূর্ণ				০.০৭	
১৮৮.	৮২৮৭	৯৪৭	-	০.০৭	০.০৭	নুনমাঠ	পূর্ণ				০.০৭	
১৮৯.	৮২৮৮	১২৬২	-	০.৮৭	০.৮৭	নুনমাঠ	পূর্ণ				০.৮৭	
১৯০.	৮২৮৯	৫৫০	-	০.৭৩	০.৭৩	নুনমাঠ	পূর্ণ				০.৭৩	
১৯১.	৮২৯০	৫৫০	-	০.৭৬	০.৭৬	নুনমাঠ	পূর্ণ				০.৭৬	
১৯২.	৮২৯১	৫৫০	-	০.৭৩	০.৭৩	নুনমাঠ	পূর্ণ				০.৭৩	
১৯৩.	৮২৯২	৫৫০	-	০.১৯	০.১৯	নুনমাঠ	পূর্ণ				০.১৯	
১৯৪.	৮২৯৩	৫৫০	-	০.১৪	০.১৪	নুনমাঠ	পূর্ণ				০.১৪	
১৯৫.	৮২৯৪	৫৫০	-	০.১৭	০.১৭	নুনমাঠ	পূর্ণ				০.১৭	
১৯৬.	৮২৯৫	৫৫০	-	০.১৮	০.১৮	নুনমাঠ	পূর্ণ				০.১৮	
১৯৭.	৮২৯৬	৯১৭	-	০.৮৫	০.৮৫	নুনমাঠ	পূর্ণ				০.৮৫	
১৯৮.	৮২৯৭	১০০৫	-	০.৯৮	০.৯৮	নুনমাঠ	পূর্ণ				০.৯৮	
১৯৯.	৮২৯৮	১০০৩	১৬৫৩	০.৯৬	০.৯৬	নুনমাঠ	পূর্ণ		সূচী মতে		০.৯৬	
২০০.	৮২৯৯	২২৩	১৫৭০	০.৬৮	০.৬৮	নুনমাঠ	পূর্ণ				০.৬৮	
২০১.	৮৩০০	১৯৯	১৫৭০	১.৯৪	১.৯৪	নুনমাঠ	পূর্ণ				১.৯৪	
২০২.	৮৩০৩	৪৭০		৪.৭৪	৪.৭৪	নুনমাঠ	পূর্ণ				৪.৭৪	
২০৩.	৮৩০৪	২৫৫	১৫৫৫, ১৫৫৬ ১৫৫৭, ১৬৬ ৪	৩.৪৬	৩.৪৬	-	পূর্ণ		সূচীমতে তেরি		৩.৪৬	
২০৪.	১২৯৬৭	৩৪		০.৫২	০.৫২	খিলা	পূর্ণ				০.৫২	
২০৫.	১২৯৬৮	৪৫২	১৪৬৬	০.২০	০.২০	বালুচর	পূর্ণ		সূচী মতে		০.২০	
২০৬.	১২৯৬৯	৮৩৮	-	০.৩৭	০.৩৭	নাল	আং				০.৩৭	
২০৭.	১২৯৭০	৩৪	-	১.৩৯	১.৩৯	খিলা	পূর্ণ				১.৩৯	
২০৮.	১২৯৭৪	৪৫২	-	১.২৮	১.২৮	বালুচর	পূর্ণ				১.২৮	
২০৯.	১২৯৭৫	৭৩	-	০.৯১	০.৯১	খিলা	পূর্ণ				০.৯১	
২১০.	১২৯৭৬	১২০৫	-	০.৭২	০.৭২	চর	পূর্ণ				০.৭২	
২১১.	১২৯৭৭	৭৮৬	-	০.৭৮	০.৭৮	বালুচর	পূর্ণ				০.৭৮	
২১২.				ইজা	১৪৭.৭৭						১৪৭.৭৭	
২১৩.	১২৯৭৮	১১৬১	-	০.৩৬	০.৩৬	খিলা	পূর্ণ				০.৩৬	
২১৪.	১২৯৭৯	৮২৫	-	১.৩১	১.৩১	খিলা	পূর্ণ				১.৩১	
২১৫.					১৪৭.৭৭						১৪৭.৭৭	

মোঃ আব্দুল বারীক সার্ভেয়ার এল.এ.শাখা প্রশাসকের কার্যালয়, কক্সবাজার।
 মোঃ মাসুদ হান্না সার্ভেয়ার এল.এ.শাখা প্রশাসকের কার্যালয়, কক্সবাজার।
 মোঃ জাহাঙ্গীর হোসেন সার্ভেয়ার এল.এ.শাখা প্রশাসকের কার্যালয়, কক্সবাজার।
 মোঃ ফেরদৌস খাঁন সার্ভেয়ার জুমি অধিগ্রহণ শাখা প্রশাসকের কার্যালয়, কক্সবাজার।
 মোঃ আব্দুল বাতেন কানুনগো এল.এ.শাখা প্রশাসকের কার্যালয়, কক্সবাজার।

ক্রমিক নং	বি.এস দাগ নং	বি.এস খতিয়ান নং	সুজিত খতিয়ান নং	দাগে মোট জমির পরিমাণ (একর)	প্রস্তাবিত জমির পরিমাণ (একর)	বি.এস রেকর্ড অনুযায়ী শ্রেণী	আর্থিক ক/পূর্ণ	পূর্বের অধিগ্রহণ কৃত জমি (একরে)	পূর্বের অধিগ্রহণ কেইস নং	সরেজমিনে তদন্তকালে প্রাপ্ত শ্রেণি		
										নাল/পুকুর	চালা/পু:পাড়/ বামান/ রাস্তা/পথ/বাথ/ কাটি	জিটি/ বাড়ী
২১৬				ইজা	১৪৭.৭৭							
২১৭	১২৯৮২	৭২	-	০.৫১	০.৫১	বালুচর	পূর্ণ		সূচী মতে			১৪৭.৭৭
২১৮	১২৯৮৩	৮২৯	-	০.০৮	০.০৮	বালুচর	পূর্ণ					০.৫১
২১৯	১২৯৮৪	৮২৯	-	১.১৯	১.১৯	বালুচর	পূর্ণ					০.০৮
২২০	১২৯৯১	২৩৩	-	০.২৪	০.২৪	বালুচর	পূর্ণ					১.১৯
২২১	১২৯৯৩	২৩৩	-	১.০৬	১.০৬	বালুচর	চপূর্ণ					০.২৪
২২২	১২৯৯৫	৪৩২	-	০.২০	০.২০	বালুচর	পূর্ণ					১.০৬
২২৩	১২৯৯৬	১২১০	-	০.১৫	০.১৫	পতিত	পূর্ণ					০.২০
২২৪	১২৯৯৭	৮৬৩	-	০.১৬	০.১৬	বালুচর	পূর্ণ					০.১৫
২২৫	১২৯৯৮	৪৩২	-	০.২৫	০.২৫	বালুচর	পূর্ণ					০.১৬
২২৬	১২৯৯৯	৮৬৩	-	০.১১	০.১১	বালুচর	পূর্ণ					০.২৫
২২৭	১৩০০০	১২১০	-	০.১০	০.১০	পতিত	পূর্ণ					০.১১
২২৮	১৩০০১	৩৬১	-	০.৫১	০.৫১	খিলা	পূর্ণ					০.১০
২২৯	১৩০০২	২৭	-	০.৩০	০.৩০	বালুচর	পূর্ণ					০.৫১
২৩০	১৩০০৬	৪৫২	-	০.৭৬	০.৭৬	বালুচর	পূর্ণ					০.৩০
২৩১	১৩০০৭	১৮৫	-	০.৯৯	০.৯৯	বালুচর	পূর্ণ					০.৭৬
২৩২	১৩০০৮	১২০২	-	০.১২	০.১২	বালুচর	পূর্ণ					০.৯৯
২৩৩	১৩০১১	১৮৭	-	০.০৮	০.০৮	বালুচর	পূর্ণ					০.১২
২৩৪	১৩০১৩	১৩৬৫	-	০.৬৫	০.৬৫	বালুচর	পূর্ণ		সূচীমতে			০.০৮
২৩৫	১৩০১৪	১৩৬৫	-	০.৭০	০.৭০	বালুচর	পূর্ণ		সূচীমতে			০.৬৫
২৩৬	১৩০১৫	৩৫৫	-	১.০৬	১.০৬	চর	পূর্ণ					০.৭০
২৩৭	১৩০১৬	৭৮০	-	০.৪৪	০.৪৪	বালুচর	পূর্ণ					১.০৬
২৩৮	১৩০১৭	৮২৯	-	১.৪৬	১.৪৬	বালুচর	পূর্ণ					০.৪৪
২৩৯	১৩০২৩	৮২৯	-	১.১৪	১.১৪	বালুচর	পূর্ণ					১.৪৬
২৪০	১৩০২৭	৮৫	-	০.৫৫	০.৫৫	বালুচর	পূর্ণ					১.১৪
২৪১	১৩০২৮	৮৫	-	০.৯৭	০.৯৭	বালুচর	পূর্ণ					০.৫৫
২৪২	১৩০৩০	১২০২	-	০.১৪	০.১৪	বালুচর	পূর্ণ					০.৯৭
২৪৩	১৩০৩১	১৮৫	-	০.১০	০.১০	বালুচর	পূর্ণ					০.১৪
২৪৪	১৩০৩২	১২০২	-	০.১০	০.১০	বালুচর	পূর্ণ					০.১০
২৪৫	১৩০৩৩	২৪৫	-	০.০২	০.০২	বালুচর	পূর্ণ					০.১০
২৪৬	১৩০৩৪	১৮৭	-	০.১৬	০.১৬	বালুচর	পূর্ণ					০.০২
২৪৭	১৩৫০১	৩০	-	০.৩২	০.৩২	বালুচর	পূর্ণ					০.১৬
২৪৮	১৩৫০২	৩০	-	০.৩০	০.৩০	বালুচর	পূর্ণ					০.৩২
২৪৯	১৩৫০৩	৪৫৫	-	০.০৬	০.০৬	বালুচর	পূর্ণ					০.৩০
২৫০	১৩৫০৪	৪৫৫	-	০.১৩	০.১৩	বালুচর	পূর্ণ					০.০৬
২৫১	১৩৫০৫	৪৫৫	-	০.১২	০.১২	বালুচর	পূর্ণ					০.১৩
২৫২	১৩৫০৬	৪৫৫	-	০.০৯	০.০৯	বালুচর	পূর্ণ					০.১২
২৫৩	১৩৫০৭	১১০৮	-	০.৩০	০.৩০	বালুচর	পূর্ণ					০.০৯
২৫৪	১৩৫০৮	১	-	০.১৮	০.১৮	বালুচর	পূর্ণ					০.৩০
২৫৫	১৩৫০৯	৪৩১	-	০.২৫	০.২৫	বালুচর	পূর্ণ					০.১৮
২৫৬	১৩৫১০	৩৫০	-	০.২০	০.২০	বালুচর	পূর্ণ					০.২৫
২৫৭	১৩৫১১	৭৬৮	-	০.২৩	০.২৩	বালুচর	পূর্ণ					০.২০
২৫৮	১৩৫১২	৯	-	০.১১	০.১১	বালুচর	পূর্ণ					০.২৩
২৫৯	১৩৫১৩	১০৩	-	০.২২	০.২২	বালুচর	পূর্ণ					০.১১
২৬০	১৩৫১৪	১০৩	-	০.১২	০.১২	বালুচর	পূর্ণ					০.২২
২৬১	১৩৫১৫	৫৬২	-	০.১৯	০.১৯	বালুচর	পূর্ণ					০.১২
২৬২	১৩৫১৬	৩৫৪	-	০.১২	০.১২	বালুচর	পূর্ণ					০.১৯
২৬৩	১৩৫১৮	ছুট	-	০.৩৬	০.৩৬	বালুচর	পূর্ণ					০.১২
২৬৪	১৩৫২০	৬৫	-	১.৬৩	১.৬৩	বালুচর	পূর্ণ					০.৩৬
২৬৫	১৩৫২২	১০১৫	-	১.৪৩	১.৪৩	বালুচর	পূর্ণ					১.৬৩
২৬৬	১৩৫২৫	১১৯	-	০.৭৫	০.৭৫	বালুচর	পূর্ণ		সূচীমতে			১.৪৩
২৬৭	১৩৫২৬	৫৭	-	১.৩২	১.৩২	বালুচর	পূর্ণ					০.৭৫
২৬৮	১৩৫৩০	১	-	০.৫৭	০.৫৭	বালুচর	পূর্ণ					১.৩২
২৬৯	১৩৫৩১	৫৩২	-	১.৪০	১.৪০	নুনমাঠ	পূর্ণ					০.৫৭
২৭০					১৭২.৪৭							১.৪০

মোঃ আব্দুল বারীক
সার্ভেয়ার
এল.এ.শাখা
রা প্রশাসকের কার্যালয়, কক্সবাজার।

মোঃ মাসুদ রানা
সার্ভেয়ার
এল.এ.শাখা
প্রশাসকের কার্যালয়, কক্সবাজার।

মোঃ জাহাঙ্গীর হোসেনমাঃ ফেরদৌস খান
সার্ভেয়ার
এল.এ.শাখা
জমি অধিগ্রহণ শাখা
প্রশাসকের কার্যালয়, কক্সবাজার।

মোঃ আব্দুল বাতেন
কামুনগো
এল.এ.শাখা
জেলা প্রশাসকের কার্যালয়
কক্সবাজার।

স্বাক্ষরিত
১৭/১১/১৭

ক্রমিক নং	বি.এস দাগ নং	বি.এস খতিয়ান নং	সুজিত খতিয়ান নং	দাগে মোট জমির পরিমাণ (একর)	প্রস্তাবিত জমির পরিমাণ (একর)	বি.এস রেকর্ড অনুযায়ী শ্রেণী	আংশিক ক/পূর্ণ	পূর্বের অধিগ্রহণ কৃত জমি (একরে)	পূর্বের অধিগ্রহণ কেইস নং	সরেজমিনে তদন্তকালে প্রাপ্ত শ্রেণি		
										নাল/পুকুর	চালা/পু:পাড়/ বাগান/ রাস্তা/পথ/বাধ/ কাটি	ভিত্তি বাড়ি
৩২৭												
৩২৮	১৩৬০৩	৩০	-	০.৪১	০.৪১	বালুচর	পূর্ণ					১৯৭.৪৯
৩২৯	১৩৬০৫	১২২	-	০.২০	০.২০	বালুচর	পূর্ণ					০.৪১
৩৩০	১৩৬০৭	১২০৫	-	০.১৯	০.১৯	বালুচর	পূর্ণ					০.২০
৩৩১	১৩৬০৮	৩০	-	০.৩০	০.৩০	বালুচর	পূর্ণ					০.১৯
৩৩২	১৩৬০৯	৫৯১	-	০.৩৪	০.৩৪	বালুচর	পূর্ণ					০.৩০
৩৩৩	১৩৬১০	৫৯১	-	০.০২	০.০২	বালুচর	পূর্ণ					০.৩৪
৩৩৪	১৩৬১১	৩১	-	০.০৪	০.০৪	বালুচর	পূর্ণ					০.০২
৩৩৫	১৩৬১২	৩১	-	০.১৬	০.১৬	বালুচর	পূর্ণ					০.০৪
৩৩৬	১৩৬১৩	৩১	-	০.২৩	০.২৩	বালুচর	পূর্ণ					০.১৬
৩৩৭	১৩৬১৫	৮৬১	-	০.৩১	০.৩১	বালুচর	পূর্ণ					০.২৩
৩৩৮	১৩৬১৬	৮৬১	-	০.২৭	০.২৭	বালুচর	পূর্ণ					০.৩১
৩৩৯	১৩৬১৭	৮৬১	-	০.১৭	০.১৭	বালুচর	পূর্ণ					০.২৭
৩৪০	১৩৬১৮	১১০৮	-	০.৮৮	০.৮৮	বালুচর	পূর্ণ					০.১৭
৩৪১	১৩৬২২	১০৬৩	-	০.৯২	০.০৬	বালুচর	আং					০.৮৮
৩৪২	১৩৬২৩	১৩৪৬	-	০.২২	০.২২	বালুচর	পূর্ণ					০.০৬
৩৪৩	১৩৬২৫	৩০	-	০.৩৮	০.৩৮	বালুচর	পূর্ণ					০.২২
৩৪৪	১৩৬২৭	৩০	-	০.৪৪	০.৪৪	বালুচর	পূর্ণ					০.৩৮
৩৪৫	১৩৬২৮	১১৭৬	-	০.৩৮	০.৩৮	বালুচর	পূর্ণ					০.৪৪
৩৪৬	১৩৬২৯	৩০	-	০.৪৬	০.৪৬	বালুচর	পূর্ণ					০.৩৮
৩৪৭	১৩৬৩০	৮৬১	-	০.৬৭	০.৬৭	বালুচর	পূর্ণ					০.৪৬
৩৪৮	১৩৬৪১	৮৬১	-	০.৩২	০.৩২	বালুচর	পূর্ণ					০.৬৭
৩৪৯	১৩৬৪২	৪৫	-	০.০৬	০.০৬	বালুচর	পূর্ণ					০.৩২
৩৫০	১৩৬৪৩	৮৬১	-	০.০৪	০.০৪	বালুচর	পূর্ণ					০.০৬
৩৫১	১৩৬৪৪	১৫৩	-	০.১৩	০.১৩	বালুচর	পূর্ণ					০.০৪
৩৫২	১৩৬৪৫	১৫৩	-	০.১২	০.১২	বালুচর	পূর্ণ					০.১৩
৩৫৩	১৩৬৪৬	৪৩১	-	০.৯৫	০.৯৫	বালুচর	পূর্ণ					০.১২
৩৫৪	১৩৬৪৭	৪৩১	-	০.৩৯	০.৩৯	বালুচর	পূর্ণ					০.৯৫
৩৫৫	১৩৬৪৮	৩১	-	০.০৬	০.০৬	বালুচর	পূর্ণ					০.৩৯
৩৫৬	১৩৬৪৯	৩০	-	০.২৫	০.২৫	বালুচর	পূর্ণ					০.০৬
৩৫৭	১৩৬৫০	৩০,৩১	-	০.৩০	০.৩০	বালুচর	পূর্ণ					০.২৫
৩৫৮	১৩৬৫১	৩১	-	০.২৩	০.২৩	বালুচর	পূর্ণ					০.৩০
৩৫৯	১৩৬৫২	৩১	-	০.১৫	০.১৫	বালুচর	পূর্ণ		সূচীমতে			০.২৩
৩৬০	১৩৬৫৩	৩১	-	০.১৪	০.১৪	বালুচর	পূর্ণ					০.১৫
৩৬১	১৩৬৫৬	৩৭	-	০.১৭	০.১৭	বালুচর	পূর্ণ					০.১৪
৩৬২	১৩৬৭৬	১১৬৮	-	০.৩০	০.৩০	বালুচর	পূর্ণ					০.১৭
৩৬৩	১৩৬৭৭	৩৮২	-	০.২৫	০.২৫	বালুচর	পূর্ণ					০.৩০
৩৬৪	১৩৬৭৮	৭২৪	-	০.২০	০.২০	নাল	পূর্ণ					০.২৫
৩৬৫	১৩৬৭৯	১১৯৪	-	০.৩০	০.৩০	বালুচর	পূর্ণ					০.২০
৩৬৬	১৩৬৮০	১১৯৪	-	০.০২	০.০২	বালুচর	পূর্ণ					০.৩০
৩৬৭	১৩৬৮১	১১৯৪	-	০.০৮	০.০৮	বালুচর	পূর্ণ					০.০২
৩৬৮	১৩৬৮৫	১৩১৩	-	০.২৮	০.২৮	বালুচর	পূর্ণ					০.০৮
৩৬৯	১৩৬৯১	১২৬৪	-	০.০৭	০.০৭	ভিটা	পূর্ণ					০.২৮
৩৭০	১৩৬৯২	১২৬৪	-	০.১৪	০.১৪	--	পূর্ণ					০.০৭
৩৭১	১৩৬৯৩	৮৯৯	-	০.৩৬	০.৩৬	নুনমাঠ	পূর্ণ					০.১৪
৩৭২	১৩৬৯৪	৯০২	-	০.২০	০.২০	নুনমাঠ	পূর্ণ					০.৩৬
৩৭৩	১৩৬৯৫	৮৫০	-	০.১১	০.১১	নুনমাঠ	পূর্ণ					০.২০
৩৭৪	১৩৬৯৬	৫৩২	-	০.৪২	০.৪২	নুনমাঠ	পূর্ণ					০.১১
৩৭৫	১৩৬৯৭	৮৫০	-	০.৩১	০.৩১	নাল	পূর্ণ					০.৪২
৩৭৬	১৩৬৯৮	১৩৪৬	-	০.৩৬	০.৩৬	--	পূর্ণ					০.৩১
৩৭৭	১৩৬৯৯	১২৬৫	-	০.৩৮	০.৩৮	নাল	পূর্ণ					০.৩৬
৩৭৮	১৩৭০০	১২৬৫	-	০.৪১	০.৪১	নাল	পূর্ণ					০.৩৮
৩৭৯	১৩৭০১	১২৬৫	-	০.৬৫	০.৬৫	নাল	পূর্ণ					০.৪১
৩৮০	১৩৭০৬	৪৫৮	-	০.০৮	০.০৮	নাল	পূর্ণ					০.৬৫
৩৮১	১৩৭০৭	৪৫৮	-	০.০৬	০.০৬	নাল	পূর্ণ					০.০৮
৩৮২					২১১.৯১							০.০৬

মোঃ আব্দুল বারীক
সার্ভেয়ার
এল.এ.শাখা
প্রশাসকের কার্যালয়, কক্সবাজার।

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২১১.৯১

ক্রমিক নং	বি.এস দাগ নং	বি.এস খতিয়ান নং	সৃষ্টিত খতিয়ান নং	দাগে মোট জমির পরিমাণ (একর)	প্রস্তাবিত জমির পরিমাণ (একর)	বি.এস রেকর্ড অনুযায়ী শ্রেণী	আংশিক ক/পূর্ণ	পূর্বের অধিগ্রহণ কৃত জমি (একরে)	পূর্বের অধিগ্রহণ কেইস নং	সরেজমিনে তদন্তকালে প্রাপ্ত শ্রেণি		
										নাল/পুকুর	চালা/পু:পাড়/ বাগান/ রাঙা/পথ/বাথ/ কাটি.	ভিটি/ বাড়ী
৩৮৩				ইজা	২১১.৯১							
৩৮৪	১৩৭০৮	৪৫৮	১৬২৪	০.০৭	০.০৭	নাল	পূর্ণ					২১১.৯১
৩৮৫	১৩৭০৯	৪৫৮	-	০.০৭	০.০৭	নাল	পূর্ণ					০.০৭
৩৮৬	১৩৭১২	৬৩৯	-	০.১৮	০.১৮	নাল	পূর্ণ					০.০৭
৩৮৭	১৩৭১৩	১২০৫	-	০.১২	০.১২	নাল	পূর্ণ					০.১৮
৩৮৮	১৩৭১৪	১১৯৪	-	১.৪৮	১.৪৮	নুনমাঠ	পূর্ণ					০.১২
৩৮৯	১৩৭১৫	৭২৪	-	০.২৬	০.২৬	নুনমাঠ	পূর্ণ					১.৪৮
৩৯০	১৩৭১৬	৩৮২	-	০.৩২	০.৩২	খাল	পূর্ণ					০.২৬
৩৯১	১৩৭১৭	৩৮২	-	০.১২	০.১২	নাল	পূর্ণ					০.৩২
৩৯২	১৩৭১৮	৩৮২	-	০.০৬	০.০৬	খাল	পূর্ণ					০.১২
৩৯৩	১৩৭১৯	১১৬৮	-	০.৪৮	০.৪৮	নুনমাঠ	পূর্ণ					০.০৬
৩৯৪	১৩৭২৪	১৩৭১	-	০.৩৪	০.৩৪	নুনমাঠ	পূর্ণ					০.৪৮
৩৯৫	১৩৭২৫	৬১০	১৬৭২	০.৩১	০.৩১	নুনমাঠ	পূর্ণ					০.৩৪
৩৯৬	১৩৭২৬	১২২২	-	০.৪৩	০.৪৩	নুনমাঠ	পূর্ণ					০.৩১
৩৯৭	১৩৭২৭	১২০৫	-	০.২৪	০.২৪	নাল	পূর্ণ					০.৪৩
৩৯৮	১৩৭২৮	১২২	-	০.৫৩	০.৪৯	নুনমাঠ	আং	০.০৪	২৩/৯২-৯৩			০.২৪
৩৯৯	১৩৭২৯	১২০৫	-	০.৪৩	০.১৩	নাল	আং	০.৩০	২৩/৯২-৯৩			০.৪৯
৪০০	১৩৭৩০	১২২	-	০.২৩	০.০৪	নুনমাঠ	আং	০.১৯	২৩/৯২-৯৩			০.১৩
৪০১	১৩৭৩১	৭৯	-	১.০০	০.৭৯	নুনমাঠ	আং	০.২১	২৩/৯২-৯৩			০.০৪
৪০২	১৩৭৩২	৯৮৩	-	১.৩৬	১.৩৬	নুনমাঠ	পূর্ণ					০.৭৯
৪০৩	১৩৭৩৩	১০৬৩	-	০.৬২	০.৬২	নুনমাঠ	পূর্ণ					১.৩৬
৪০৪	১৩৭৩৫	৩০	-	১.১৩	১.১৩	নাল	পূর্ণ					০.৬২
৪০৫	১৩৭৩৬	৩০	-	১.০৭	১.০৭	নাল	পূর্ণ					১.১৩
৪০৬	১৩৭৩৭	৩০	-	০.৯৮	০.৯১	নাল	আং	০.০৭	২৩/৯২-৯৩			১.০৭
৪০৭	১৩৭৩৮	৩০	-	০.৮৮	০.৬২	নাল	আং	০.২৬	২৩/৯২-৯৩			০.৯১
৪০৮	১৩৭৩৯	৩২	-	০.৫৮	০.৩১	নুনমাঠ	আং	০.২৭	২৩/৯২-৯৩			০.৬২
৪০৯	১৩৭৪০	২৩৬	-	০.৬৯	০.৪৭	নুনমাঠ	আং	০.২২	২৩/৯২-৯৩			০.৩১
৪১০	১৩৭৪১	১৩৬২	-	০.৫০	০.২৪	নুনমাঠ	আং	০.২৬	২৩/৯২-৯৩			০.৪৭
৪১১	১৩৭৪২	৫৮২	-	০.৩০	০.৩০	নাল	পূর্ণ					০.২৪
৪১২	১৩৭৪৩	৫৭	-	০.৮১	০.৮১	বালুচর	পূর্ণ					০.৩০
৪১৩	১৩৭৪৪	১৩৭১	১৬৮২	০.৬৩	০.৬৩	নাল	পূর্ণ					০.৮১
৪১৪	১৩৭৪৫	৯০২	-	১.০৭	১.০৭	নুনমাঠ	পূর্ণ					০.৬৩
৪১৫	১৩৭৪৭	১৭৭	-	০.২৮	০.২৮	নুনমাঠ	পূর্ণ					১.০৭
৪১৬	১৩৭৪৮	১৭৭	-	০.২৬	০.২৬	নুনমাঠ	পূর্ণ					০.২৮
৪১৭	১৩৭৪৯	১৭৭	-	০.২৯	০.২৯	নুনমাঠ	পূর্ণ					০.২৬
৪১৮	১৩৭৫০	১৭৭	১৬৮২	০.২৬	০.২৬	নুনমাঠ	পূর্ণ					০.২৯
৪১৯	১৩৭৫১	১৭৭	-	০.২৮	০.২৮	নুনমাঠ	পূর্ণ					০.২৬
৪২০	১৩৭৫২	১৩৭০	১৬৮৪	২.৮৩	২.৭৮	নুনমাঠ	আং	০.০৫	০৫/৯০-৯১			০.২৮
৪২১	১৩৭৫৬	১৩৭২	১৬৬৬, ১৬৮২	৩.০৪	৩.০০	নুনমাঠ	আং	০.০৪	০৫/৯০-৯১			২.৭৮
৪২২	১৩৭৫৮	১৩৭২	-	০.৫৪	০.৫৪	নুনমাঠ	পূর্ণ					৩.০০
৪২৩	১৩৭৫৯	১৩৭১	১৬৭৩, ১৬৮৪	০.৯৩	০.৯৩	নুনমাঠ	পূর্ণ					০.৫৪
৪২৪	১৩৭৬০	৬১০	১৬৭৩	১.০০	১.০০	নুনমাঠ	পূর্ণ					০.৯৩
৪২৫	১৩৭৬১	১৭৭	-	০.৭৮	০.৭৮	নুনমাঠ	পূর্ণ					১.০০
৪২৬	১৩৭৬২	১৭৭	১৫৩৩	০.২৮	০.২৮	নুনমাঠ	পূর্ণ					০.৭৮
৪২৭	১৩৭৬৩	১৭৭	১৫৬৩	০.১০	০.১০	নুনমাঠ	পূর্ণ					০.২৮
৪২৮	১৩৭৬৪	১৭৭	-	০.১০	০.১০	নুনমাঠ	পূর্ণ					০.১০
৪২৯	১৩৭৬৫	১৩৭৩	১৬৬৬, ১৬৭৩, ১৬৮৪	২.৮১	২.৬৬	নুনমাঠ	আং	০.১৫	০৫/৯০-৯১			০.১০
৪৩০	১৩৭৬৬	১৩৭৩	১৬৬৬, ১৬৮২	১.৪৯	০.৯৯	নুনমাঠ	আং	০.২৪+০.২৬	০৫/৯০-৯১ ও ২৩/৯২-৯৩			০.৯৯
৪৩১	১৩৭৬৮	১৩৭৪	-	০.২৫	০.১২	নুনমাঠ	আং	০.১৩	২৩/৯২-৯৩			০.১২
৪৩২	১৩৭৬৯	১৩৭৪	-	০.০৭	০.০৭	নুনমাঠ	পূর্ণ					০.০৭
৪৩৩	১৩৭৭০	১৩৭৪	-	০.১০	০.০৯	নুনমাঠ	আং	০.০১	২৩/৯২-৯৩			০.০৭
৪৩৪	১৩৭৭১	১৩৭৪	-	০.১১	০.১১	নুনমাঠ	পূর্ণ					০.০৯
৪৩৫	১৩৭৭২	১০৬৩	-	০.২২	০.২২	বাড়ী	পূর্ণ					০.১১
৪৩৬					২৪২.৫২							২৪২.৫২

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প্রশাসকের কার্যালয়, কক্সবাজার।

মোঃ জাহাঙ্গীর হোসেন
সার্ভেয়ার
এল.এ. শাখা
জেলা প্রশাসকের কার্যালয়, কক্সবাজার।

মোঃ ফেরদৌস খাঁন
সার্ভেয়ার
ভূমি অধিগ্রহণ শাখা
প্রশাসকের কার্যালয়, কক্সবাজার।

মোঃ আব্দুল বাতেন
কানুনগো
এল.এ. শাখা
প্রশাসকের কার্যালয়, কক্সবাজার।

২১

ক্রমিক নং	বি.এস দাগ নং	বি.এস খতিয়ান নং	সৃজিত খতিয়ান নং	দাগে মেটি জমির পরিমাণ (একর)	প্রস্তাবিত জমির পরিমাণ (একর)	বি.এস রেকর্ড অনুযায়ী শ্রেণী	আংশিক ক/পূর্ণ	পূর্বের অধিগ্রহণ কৃত জমি (একরে)	পূর্বের অধিগ্রহণ কেইস নং	সরেজমিনে তদন্তকালে প্রাপ্ত শ্রেণি		
										নাল/পুকুর	চালা/পু:পাড়া/ বাগান/ রাস্তা/পথ/বাধ/ কাটি	জিডি/ বাড়ী
৪৩৭				ইজা	২৪২.৫২							২৪২.৫২
৪৩৮	১৩৭৭৩	৮০	-	০.১৬	০.১৬	জিটা	পূর্ণ					০.১৬
৪৩৯	১৩৭৭৫	৮০	-	০.০৫	০.০১	জিটা	আং	০.০৪	২৩/৯২-৯৩			০.০১
৪৪০	১৩৭৭৭	১৩৬৮	-	০.৪৭	০.০৪	নাল	আং	০.৩৫+০.০৮	২৩/৯২-৯৩, ০৫/৯০-৯১			০.০৪
৪৪১	১৩৭৮০	১১৬৭	-	০.৩২	০.৩১	বাড়ী	আং	০.০১	২৩/৯২-৯৩			০.৩১
৪৪২	১৩৭৮১	৬৫৩	-	০.২৪	০.২৩	ইল	আং	০.০১	২৩/৯২-৯৩			০.২৩
৪৪৩	১৩৭৮২	২৪৩	-	০.২৪	০.২৩	নাল	আং	০.০১	২৩/৯২-৯৩			০.২৩
৪৪৪	১৩৭৮৩	৪১৯	-	০.৩৬	০.৩০	নাল	আং	০.০৬	২৩/৯২-৯৩			০.৩০
৪৪৫	১৩৭৮৮	৯০৩	-	০.৩৩	০.১৫	নাল	আং	০.১৮	২৩/৯২-৯৩			০.১৫
৪৪৬	১৩৭৮৯	৯০৩	-	০.১৭	০.১৬	বাড়ী	আং	০.০১	২৩/৯২-৯৩			০.১৬
৪৪৭	১৩৭৯০	১২২	-	০.২১	০.১৪	বাড়ী	আং	০.০৭	২৩/৯২-৯৩			০.১৪
৪৪৮	১৩৭৯১	১৫১	-	০.১৯	০.০৭	বাড়ী	আং	০.১২	২৩/৯২-৯৩			০.০৭
৪৪৯	১৩৭৯২	১৫১	-	০.১২	০.১২	নাল	পূর্ণ					০.১২
৪৫০	১৩৭৯৩	১৩৩৩	-	০.১৭	০.১১	বাড়ী	আং	০.০৬	২৩/৯২-৯৩			০.১১
৪৫১	১৩৭৯৪	১২০৫	-	০.৩১	০.২১	বাড়ী	আং	০.১০	২৩/৯২-৯৩			০.২১
৪৫২	১৩৭৯৫	২৫৯	-	০.৫১	০.৩৫	জিটা	আং	০.১৬+০.০৩	২৩/৯২-৯৩, ০৫/৯০-৯১			০.৩৫
৪৫৩	১৩৭৯৬	৫০৫	-	০.১৪	০.১০	নাল	আং	০.০৪	০৫/৯০-৯১			০.১০
৪৫৪	১৩৭৯৮	১৩১৩	-	০.১৭	০.০৭	নাল	আং	০.০২+০.০৮	২৩/৯২-৯৩, ০৫/৯০-৯১			০.০৭
৪৫৫	১৩৭৯৯	৪৫৮	১৬২৪	০.৫১	০.৩২	নাল	আং	০.০২+০.১৭	২৩/৯২-৯৩, ০৫/৯০-৯১			০.৩২
৪৫৬	১৩৮০১	১৭৬	-	০.০৯	০.০১	নুনমাঠ	আং	০.০৮+০.০৫	২৩/৯২-৯৩, ০৫/৯০-৯১			০.০১
৪৫৭	১৩৮০২	৪৪	-	০.০৮	০.০২	নাল	আং	০.০৬	২৩/৯২-৯৩			০.০২
৪৫৮	১৩৮০৩	৪৪	-	০.০৮	০.০১	নাল	আং	০.০৭	২৩/৯২-৯৩			০.০১
৪৫৯	১৩৮০৬	১২৬৫	-	০.২৩	০.২৩	নুনমাঠ	পূর্ণ					০.২৩
৪৬০	১৩৮০৭	১২৬৫	-	০.১৮	০.১৮	নুনমাঠ	পূর্ণ					০.১৮
৪৬১	১৩৮০৮	১২৬৫	-	০.০৭	০.০৭	নাল	পূর্ণ					০.০৭
৪৬২	১৩৮১২	৪৪	-	০.০৯	০.০২	নাল	আং	০.০৭	২৩/৯২-৯৩			০.০২
৪৬৩	১৩৮১৩	৫০৫	-	০.৩৯	০.১৪	নাল	আং	০.১৬+০.০৯	২৩/৯২-৯৩, ০৫/৯০-৯১			০.১৪
৪৬৪	১৩৮১৪	১৩১৩ ও ৬১	-	০.৫৬	০.৪৮	নাল	আং	০.০২+০.০৬	০৫/৯০-৯১ ও ২৩/৯২- ৯৩			০.৪৮
৪৬৫	১৩৮১৫	১৩১৩	-	০.৩৯	০.৩৯	নাল	পূর্ণ					০.৩৯
৪৬৬	১৩৮১৬	৫০২	-	০.৬৫	০.৪৫	নুনমাঠ	আং	০.২০	০৫/৯০-৯১			০.৪৫
৪৬৭	১৩৮১৮	১২২	-	০.২৪	০.০৬	নাল	আং	০.১৮	০৫/৯০-৯১			০.০৬
৪৬৮	১৩৮১৯	২৮৭	-	০.৬৪	০.৪৯	নুনমাঠ	আং	০.১৫	০৫/৯০-৯১			০.৪৯
৪৬৯	১৩৮২০	১৩৪৬	১৫১৪	০.৫৯	০.৫৪	নুনমাঠ	আং	০.০৫	০৫/৯০-৯১			০.৫৪
৪৭০	১৩৮২১	২০৭	-	০.৫৬	০.৫৬	নুনমাঠ	পূর্ণ					০.৫৬
৪৭১	১৩৮২২	১৭১	-	১.২৬	০.৯৭	নুনমাঠ	আং	০.২৩+০.০৬	০৫/৯০-৯১ ও ২৩/৯২- ৯৩			০.৯৭
৪৭২	১৩৮২৩	৮৬০	১৫৩২	০.৯০	০.৬৭	নুনমাঠ	আং	০.২৩	০৫/৯০-৯১			০.৬৭
৪৭৩	১৩৮২৪	১১৭৪	-	০.৪৫	০.৪৫	নুনমাঠ	পূর্ণ					০.৪৫
৪৭৪	১৩৮২৫	১১৭৪	-	০.২০	০.২০	নুনমাঠ	পূর্ণ					০.২০
৪৭৫	১৩৮২৬	৮৯৮	-	০.৮৫	০.৭৭	নুনমাঠ	আং	০.০৮	০৫/৯০-৯১			০.৭৭
৪৭৬	১৩৮২৮	৫৯	-	০.৭৬	০.৭৬	নুনমাঠ	পূর্ণ					০.৭৬
৪৭৭	১৩৮২৯	৭৪	-	০.৮০	০.৮০	নুনমাঠ	পূর্ণ					০.৮০
৪৭৮	১৩৮৩০	১১৬৫	-	০.৯১	০.৮৮	নুনমাঠ	আং	০.০৩	০৫/৯০-৯১			০.৮৮
৪৭৯	১৩৮৩২	৬৪০	-	১.৬০	১.৫৮	নুনমাঠ	আং					১.৫৮
৪৮০	১৩৮৩৩	১৭৬	-	০.৬৩	০.৬৩	নুনমাঠ	পূর্ণ					০.৬৩
৪৮১	১৩৮৩৪	৯৪৮	-	০.৬৪	০.৬৪	নুনমাঠ	পূর্ণ					০.৬৪
৪৮২	১৩৮৩৫	৬৪০	-	০.৩৭	০.২১	নুনমাঠ	পূর্ণ					০.২১
৪৮৩	১৩৮৩৬	১৭৬	-	০.১৮	০.১৮	নুনমাঠ	পূর্ণ					০.১৮
৪৮৪					২৫৭.৯৯							২৫৭.৯৯

মোঃ আব্দুল বারীক
সার্ভেয়ার
এল.এ. শাখা
জেলা প্রশাসকের কার্যালয়, কক্সবাজার।

মোঃ মাসুদ রানা
সার্ভেয়ার
এল.এ. শাখা
জেলা প্রশাসকের কার্যালয়, কক্সবাজার।

মোঃ জাহাঙ্গীর হোসেন
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মোঃ ফেরদৌস খান
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মোঃ আব্দুল বাতেন
কানুনগো
এল.এ. শাখা
জেলা প্রশাসকের কার্যালয়, কক্সবাজার।

১

ক্রমিক নং	বি.এস দাগ নং	বি.এস খতিয়ান নং	সুজিত খতিয়ান নং	দাগে মোট জমির পরিমান (একর)	প্রস্তাবিত জমির পরিমান (একর)	বি.এস রেকর্ড অনুযায় শ্রেনী	আংশি ক/ পূর্ণ	পূর্বের অধিগ্রহণ কৃত জমি (একরে)	পূর্বের অধিগ্রহণ কেইস নং	সরঞ্জমিনে তদন্তকালে প্রাপ্ত শ্রেণি		
										নাল/পুকুর	চালা/ পু:পাড়/ বাগান/ রাস্তা/পথ/বাধ/ কাটি	ভিটি/ বাড়ী
৪৮৫				ইজা	২৫৭.৯৯							
৪৮৬	১৩৮৩৭	৩৮২	-	০.৪২	০.৪২	নুনমাঠ	পূর্ণ					২৫৭.৯৯
৪৮৭	১৩৮৩৮	৫৯	-	০.৯৬	০.৯৬	নুনমাঠ	পূর্ণ					০.৪২
৪৮৮	১৩৮৩৯	৮৪০	১৫৭৫, ১৬২৪ , ১৬১৮	১.৩২	১.৩২	নুনমাঠ	পূর্ণ					০.৯৬
৪৮৯	১৩৮৪০	৮৪০	১৬১৮	১.৩২	১.২৯	নুনমাঠ	আং	০.০৩	০৫/৯০-৯১			১.৩২
৪৯০	১৩৮৪১	৫১৮	-	০.৩২	০.৩২	নুনমাঠ	পূর্ণ					১.২৯
৪৯১	১৩৮৪২	৫১৮	-	১.৩৬	১.৩০	নুনমাঠ	আং	০.০৬	০৫/৯০-৯১			০.৩২
৪৯২	১৩৮৪৪	৬১	-	০.৫৬	০.৫৬	নুনমাঠ	পূর্ণ					১.৩০
৪৯৩	১৩৮৪৫	৭৫, ৩৭৫	-	০.৬৩	০.৬৩	নুনমাঠ	পূর্ণ					০.৫৬
৪৯৪	১৩৮৪৬	২৬০	-	০.২৬	০.২৬	নুনমাঠ	পূর্ণ					০.৬৩
৪৯৫	১৩৮৪৭	১২০৫	-	০.৫৪	০.৫৪	নুনমাঠ	পূর্ণ					০.২৬
৪৯৬	১৩৮৪৮	৭৫	-	০.৬৩	০.৬৩	নুনক্ষে ত	পূর্ণ					০.৫৪
৪৯৭	১৩৮৪৯	৫৯	-	০.১৩	০.১৩	নুনমাঠ	পূর্ণ					০.৬৩
৪৯৮	১৩৮৫০	৪৫৬	-	০.৩৬	০.৩৬	নুনমাঠ	পূর্ণ					০.১৩
৪৯৯	১৩৮৫১	৭০	-	০.৩২	০.৩২	নুনমাঠ	পূর্ণ					০.৩৬
৫০০	১৩৮৫২	৫৯১	-	০.২৯	০.২৯	নুনমাঠ	পূর্ণ					০.৩২
৫০১	১৩৮৫৩	৪৯৭	-	০.৩২	০.৩২	নুনমাঠ	পূর্ণ					০.২৯
৫০২	১৩৮৫৪	১৩৬৯	-	০.২৪	০.২৪	নুনমাঠ	পূর্ণ					০.৩২
৫০৩	১৩৮৫৫	১৩৬৯	-	০.০৩	০.০৩	নুনমাঠ	পূর্ণ					০.২৪
৫০৪	১৩৮৫৬	১৩৬৯	-	০.০৩	০.০৩	নুনমাঠ	পূর্ণ					০.০৩
৫০৫	১৩৮৫৭	২৮৮	১৫৫৬, ১৫৫৫ , ১৫৫৭	৩.৫০	৩.৪৮	নুনমাঠ	আং	০.০২	০৫/৯০-৯১			৩.৪৮
৫০৬	১৩৮৫৮	৮৯৭	-	০.৯৭	০.৯৭	নুনমাঠ	পূর্ণ					০.৯৭
৫০৭	১৩৮৫৯	৮৯৭	-	০.২৩	০.২৩	নুনমাঠ	পূর্ণ					০.২৩
৫০৮	১৩৮৬০	ছুটি	-	১.২৬	১.২৬	নুনমাঠ	পূর্ণ					১.২৬
৫০৯	১৩৮৬২	৭২৩	১৫৭০	১.২৮	১.১৮	নুনমাঠ	আং	০.১০	০৫/৯০-৯১			১.২৮
৫১০	১৩৮৬৩	২০০	১৫৭০	০.৩৬	০.৩৬	নুনমাঠ	পূর্ণ					০.৩৬
৫১১	১৩৮৬৪	২০১	১৫৭০	০.৯৯	০.৬৯	নুনমাঠ	আং	০.৩০	০৫/৯০-৯১			০.৬৯
৫১২	১৩৮৬৭	৫৬	১৪৫৩	২.০০	২.০০	নুনমাঠ	পূর্ণ					২.০০
৫১৩	১৩৮৬৮	২৩৫	-	০.৯৮	০.৯৮	নুনমাঠ	পূর্ণ					০.৯৮
৫১৪	১৩৮৬৯	১২০৬	-	১.৭০	১.৭০	নুনমাঠ	পূর্ণ					১.৭০
৫১৫	১৩৮৭০	২৩৫	-	১.০২	১.০২	নুনমাঠ	পূর্ণ					১.০২
৫১৬	১৩৮৭১	১২০৬	-	০.৮৮	০.৮৮	নুনমাঠ	পূর্ণ					০.৮৮
৫১৭	১৩৮৭২	১২০৬	-	১.১০	১.১০	নুনমাঠ	পূর্ণ					১.১০
৫১৮	১৩৮৭৩	১২০৬	-	১.৪২	১.৪২	নুনমাঠ	পূর্ণ					১.৪২
৫১৯	১৩৮৭৪	১২০৬	-	৩.৩০	৩.৩০	নুনমাঠ	পূর্ণ					৩.৩০
৫২০	১৩৮৭৫	১২০৬	-	১.১২	১.১২	নাল	পূর্ণ					১.১২
৫২১	১৩৮৭৭	৫৬	-	৫.১০	৫.১০	নুনমাঠ	পূর্ণ					৫.১০
৫২২	১৩৮৭৮	১৩১৪	-	৪.৮৫	৪.৮৫	নুনমাঠ	পূর্ণ					৪.৮৫
৫২৩	১৩৮৭৯	২৩৫	-	৮.৬৯	৮.৬৯	নুনমাঠ	পূর্ণ					৮.৬৯
৫২৪	১৩৮৮০	৫৬	-	৩.২০	৩.২০	নাল	পূর্ণ					৩.২০
৫২৫	১৩৮৮১	১৩১৪	-	৩.৯০	৩.৯০	নাল	পূর্ণ					৩.৯০
৫২৬	১৩৮৮২	১২০৬	-	২.৮২	২.৮২	নাল	পূর্ণ					২.৮২
৫২৭	১৩৮৮৩	৫৬	-	৪.১০	৩.৩৬	নাল	আং	০.৭৪	২৩/৯২-৯৩			৩.৩৬
৫২৮	১৩৮৮৪	৫৬	-	২.৬৮	১.৪৮	নাল	আং	১.২০	২৩/৯২-৯৩			১.৪৮
৫২৯	১৩৮৮৫	৫৬	-	০.৮০	০.৭৯	নুনমাঠ	আং	০.৯০	২৩/৯২-৯৩			০.৭৯
৫৩০	১৩৮৮৬	৫৬	-	০.৯২	০.৯২	নুনমাঠ	আং	০.০১	২৩/৯২-৯৩			০.৯২
৫৩১	১৩৮৮৭	৫৬	-	০.৮০	০.৭৯	নুনমাঠ	আং	০.০১	২৩/৯২-৯৩			০.৭৯
৫৩২	১৩৮৮৮	৫৬	-	০.৮০	০.৭৯	নুনমাঠ	আং	০.০১	২৩/৯২-৯৩			০.৭৯
৫৩৩	১৩৮৮৯	১২০৬	-	০.৮০	০.২৪	নাল	আং	০.১৬	২৩/৯২-৯৩			০.২৪
৫৩৪	১৩৮৯০	১৩১৪	-	০.২০	০.২০	নাল	পূর্ণ					০.২০
৫৩৫	১৩৮৯১	২৩৫	-	০.৩৫	০.৩৪	নুনমাঠ	আং	০.০১	২৩/৯২-৯৩			০.৩৪
৫৩৬	১৩৮৯২	৫৬	-	০.২০	০.২০	নাল	পূর্ণ					০.২০
৫৩৭				৩৪০.৭০								৩৪০.৭০

আব্দুল বারীক
সার্ভেয়ার
এল.এ.শাখা
শাসকের কার্যালয়, কস্বাবাজার।

মোঃ মাসুদ রানা
সার্ভেয়ার
এল.এ.শাখা
শাসকের কার্যালয়, কস্বাবাজার।

মোঃ জাহাঙ্গীর হোসেন
সার্ভেয়ার
এল.এ.শাখা
শাসকের কার্যালয়, কস্বাবাজার।

মোঃ ফেরদৌস খান
সার্ভেয়ার
ভূমি অধিগ্রহণ শাখা
শাসকের কার্যালয়, কস্বাবাজার।

মোঃ আব্দুল বাতেন
কামুনীগো
এল.এ.শাখা
শাসকের কার্যালয়, কস্বাবাজার।

স্বাক্ষরিত
সার্ভেয়ার

বাংলাদেশ অর্থনৈতিক অঞ্চল-৩ (খন্দাঘাটা) এর অর্জিত জমির দাগসূচী (মৌজা ভাবে প্রস্তুতকৃত)

ক্রমিক নং	বি.এস দাগ নং	বি.এস খতিয়ান নং	সৃজিত খতিয়ান নং	দাগে মোট জমির পরিমাণ (একর)	প্রস্তাবিত জমির পরিমাণ (একর)	বি.এস রেকর্ড নং অনুযায়ী শ্রেণী	আংশিক ক/পূর্ণ	পূর্বের অধিগ্রহণ কৃত জমি (একরে)	পূর্বের অধিগ্রহণ কেইস নং	সরেজমিনে উদভকালে প্রাপ্ত শ্রেণী		
										নাল/পুকুর	চালা/পু:পাড়/ বাগান/ রাস্তা/পথ/বাধ/ কাটি	ভিটি/ বাড়ী
৫৩৮				ইজা	৩৪০.৭০					৩৪০.৭০		
৫৩৯	১৩৮৯৩	৫৬	-	০.৪০	০.২৬	নাল	আং	০.১৪	২৩/৯২-৯৩	০.২৬		
৫৪০	১৩৮৯৪	৫৬	-	২.০২	১.৮২	নুনমাঠ	আং	০.২০	২৩/৯২-৯৩	১.৮২		
৫৪১	১৩৮৯৫	১৩১৪	-	০.৩০	০.৩০	নুনমাঠ	পূর্ণ			০.৩০		
৫৪২	১৩৮৯৬	৯০২	-	০.০৯	০.০৯	নুনমাঠ	পূর্ণ			০.০৯		
৫৪৩	১৩৮৯৭	৯০২	-	০.৬৪	০.৬৪	নুনমাঠ	পূর্ণ			০.৬৪		
৫৪৪	১৩৮৯৮	১৩৭১	-	০.২০	০.২০	নুনমাঠ	পূর্ণ			০.২০		
৫৪৫	১৩৯০১	১৩১৪	--	০.৬০	০.৬০	নুনমাঠ	পূর্ণ			০.৬০		
৫৪৬	১৩৯০২	২৩৫	-	০.৫০	০.৫০	নাল	পূর্ণ			০.৫০		
৫৪৭	১৩৯০৩	৫৬	-	০.৬০	০.৬০	নুনমাঠ	পূর্ণ			০.৬০		
৫৪৮	১৩৯০৪	১২০৬	-	০.৪০	০.৪০	নুনমাঠ	পূর্ণ			০.৪০		
৫৪৯	১৩৯০৫	৫৬	-	০.২০	০.০৮	নাল	আং	০.১২	২৩/৯২-৯৩	০.০৮		
৫৫০	১৩৯০৬	১৩১৪	-	০.৬২	০.২৫	নুনমাঠ	আং	০.৩৭	২৩/৯২-৯৩	০.২৫		
৫৫১	১৩৯০৭	১২০৬	-	০.৩২	০.৩২	-	পূর্ণ			০.৩২		
৫৫২	১৩৯০৮	৯০২	-	০.৬৪	০.৬৪	-	পূর্ণ			০.৬৪		
৫৫৩	১৩৯০৯	২৩৫	-	০.২২	০.২২	-	পূর্ণ			০.২২		
৫৫৪	১৩৯১০	১৩৬২	-	১.৫৫	০.৯১	নুনমাঠ	আং	০.৬৪	২৩/৯২-৯৩	০.৯১		
৫৫৫	১৩৯১১	২৩৬	-	০.১২	০.১২	নুনমাঠ	পূর্ণ			০.১২		
৫৫৬	১৩৯১২	৫৬	-	০.৪০	০.৪০	নুনমাঠ	পূর্ণ			০.৪০		
৫৫৭	১৩৯১৩	৫৬	-	০.৪৪	০.৪৪	নুনমাঠ	পূর্ণ			০.৪৪		
৫৫৮	১৩৯১৪	৫৬	--	০.৪৮	০.৪৮	নাল	পূর্ণ			০.৪৮		
৫৫৯	১৩৯১৫	৫৬	-	১.৯৫	১.৮৮	নুনমাঠ	আং	০.০৭	২৩/৯২-৯৩	১.৮৮		
৫৬০	১৩৯১৬	৫৬	-	০.১২	০.১২	নুনমাঠ	পূর্ণ			০.১২		
৫৬১	১৩৯১৭	৫৬	-	০.২২	০.২২	নুনমাঠ	পূর্ণ			০.২২		
৫৬২	১৩৯১৮	৫৬	--	১.৯৬	১.৯৬	নুনমাঠ	পূর্ণ			১.৯৬		
৫৬৩	১৩৯১৯	১২০৬	-	০.৩৮	০.৩৮	নাল	পূর্ণ			০.৩৮		
৫৬৪	১৩৯২০	৫৬	-	০.৭০	০.৭০	নুনমাঠ	পূর্ণ			০.৭০		
৫৬৫	১৩৯২১	১২০৬	-	১.০০	১.০০	নুনমাঠ	পূর্ণ			১.০০		
৫৬৬	১৩৯২২	২৩৫	-	০.৬৫	০.৬৫	নুনমাঠ	পূর্ণ			০.৬৫		
৫৬৭	১৩৯২৩	১৩১৪	-	০.৬২	০.৬২	নাল	পূর্ণ			০.৬২		
৫৬৮	১৩৯২৪	৫৬	-	০.৬৪	০.৬৪	নাল	পূর্ণ			০.৬৪		
৫৬৯	১৩৯২৫	২৩৫	--	০.৭২	০.৭২	নুনমাঠ	পূর্ণ			০.৭২		
৫৭০	১৩৯২৬	৫৬	-	৪.৮৪	৪.৮৪	নুনমাঠ	পূর্ণ			৪.৮৪		
৫৭১	১৩৯২৭	৫৬	-	০.০৪	০.০৪	নাল	পূর্ণ			০.০৪		
৫৭২	১৩৯২৮	১৩১৪	-	০.৬০	০.৬০	নাল	পূর্ণ			০.৬০		
৫৭৩	১৩৯২৯	১৩১৪	-	০.০৬	০.০৬	নাল	পূর্ণ			০.০৬		
৫৭৪	১৩৯৩০	১৩১৪	--	০.০৪	০.০৪	নাল	পূর্ণ			০.০৪		
৫৭৫	১৩৯৩১	২৩৫	-	০.৮৪	০.৮৪	নাল	পূর্ণ			০.৮৪		
৫৭৬	১৩৯৩২	১২০৬	-	০.৭৮	০.৭৮	নাল	পূর্ণ			০.৭৮		
৫৭৭	১৩৯৩৩	১২০৬	-	০.২৪	০.২৪	নাল	পূর্ণ			০.২৪		
৫৭৮	১৩৯৩৪	৫৬	-	০.৭০	০.৭০	নাল	পূর্ণ			০.৭০		
৫৭৯	১৩৯৩৫	৫৬	-	০.৫২	০.৪৪	কাটি	আং	০.০৮	২৩/৯২-৯৩	০.৪৪		
৫৮০	১৩৯৩৬	৫৬	-	০.৯২	০.৯২	খাল	পূর্ণ			০.৯২		
৫৮১	১৩৯৩৭	৫৬	-	১.০৫	১.০৫	নাল	পূর্ণ			১.০৫		
৫৮২	১৩৯৩৮	১৩১৪	-	১.৩৮	১.৩৮	নাল	পূর্ণ			১.৩৮		
৫৮৩	১৩৯৩৯	২৩৫	-	৩.২২	৩.১০	নাল	আং	০.১২	২৩/৯২-৯৩	৩.১০		
৫৮৪	১৩৯৪০	১৩১৪	-	০.৯৪	০.৭৫	নাল	আং	০.১৯	২৩/৯২-৯৩	০.৭৫		
৫৮৫	১৩৯৪১	৫৬	--	১.২০	০.৯৬	নাল	আং	০.২৪	২৩/৯২-৯৩	০.৯৬		
৫৮৬	১৩৯৪২	৫৬	-	৫.০২	৪.০৭	নাল	আং	০.৯৫	২৩/৯২-৯৩	৪.০৭		
৫৮৭	১৩৯৪৩	১২০৬	-	৩.৬৫	৩.০৫	নাল	আং	০.৬০	২৩/৯২-৯৩	৩.০৫		
৫৮৮	১৩৯৪৪	৫৬	-	০.২৪	০.০৭	নাল	আং	০.১৭	২৩/৯২-৯৩	০.০৭		
৫৮৯	১৩৯৪৫	১২০৬	-	০.২০	০.১৬	খামার	আং	০.০৪	২৩/৯২-৯৩	০.১৬		
৫৯০	১৩৯৪৬	৫৬	-	৫.৮৫	৫.৫০	নাল	আং	০.৩৫	২৩/৯২-৯৩	৫.৫০		
৫৯১	১৪০০১	১২৯০	-	৩.৩৭	২.১৩	নাল	আং	১.২৪	০৫/৯০-৯১	২.১৩		
৫৯২	১৪০০২	৩৫৬	১৬৭৪	২.৯৭	২.৯৭	খিলা	পূর্ণ			২.৯৭		
৫৯৩					৩৯৩.৫৫					৩৯৩.৫৫		

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জেলা প্রশাসকের কার্যালয়, কুমিল্লা।

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স্বাক্ষরিত
তারিখ: ০৫/১০/১১
স্বাক্ষর: মোঃ আব্দুল বাতেন

বাংলাদেশ অর্থনৈতিক অঞ্চল-৩ (খলঘাটা) এর অন্তর্ভুক্ত জমির দাগসূচী (যৌথ ভাবে প্রস্তুতকৃত):

ক্রমিক নং	বি.এস দাগ নং	বি.এস খতিয়ান নং	সৃজিত খতিয়ান নং	দাগে মোট জমির পরিমাণ (একর)	প্রস্তাবিত জমির পরিমাণ (একর)	বি.এস রেকর্ড অনুযায়ী শ্রেণী	আংশিক/ পূর্ণ	পূর্বের অধিগ্রহণ কৃত জমি (একরে)	পূর্বের অধিগ্রহণ কেইস নং	সরেজমিনে তদন্তকালে প্রাপ্ত শ্রেণি		
										নাল/পুকুর	চালা/পু:পাড়/ বাগান/ রাস্তা/পথ/বাধ/ কাটি	ভিটি/ বাড়ী
				ইজা	৩৯৩.৫৫							৩৯৩.৫৫
৫৯৫	১৪০০৩	৩৫৬	১৬৭৪	০.৭০	০.৭০	নাল	পূর্ণ					০.৭০
৫৯৬	১৪০০৪	৩৫৬	১৬৭৪	০.৮৮	০.৮৮	নাল	পূর্ণ					০.৮৮
৫৯৭	১৪০০৫	৩৫৬	১৬৭৪	১.১৬	১.১৬	নাল	পূর্ণ					১.১৬
৫৯৮	১৪০০৬	৩৫৬	-	০.৪০	০.৪০	পথ	পূর্ণ					০.৪০
৫৯৯	১৪০০৭	৩৫৬	১৬৭৪	৪.৬৭	৪.৬৭	নাল	পূর্ণ					৪.৬৭
৬০০	১৪০০৮	৩৫৬	-	১.৩২	১.৩২	নাল	পূর্ণ					১.৩২
৬০১	১৪০০৯	৩৫৬	-	১.১৭	১.১৭	নাল	পূর্ণ					১.১৭
৬০২	১৪০১০	৩৫৬	-	১.১৭	১.১৭	নাল	পূর্ণ					১.১৭
৬০৩	১৪০১১	৩৫৬	-	২.৫০	২.৫০	নাল	পূর্ণ					২.৫০
৬০৪	১৪০১২	৩৫৬	-	০.৮৪	০.৮৪	নাল	পূর্ণ					০.৮৪
৬০৫	১৪০১৪	৩৫৬	-	০.২৮	০.২৮	নাল	পূর্ণ					০.২৮
৬০৬	১৪০১৫	৩৫৬	-	২.৫০	২.৫০	-	পূর্ণ					২.৫০
৬০৭	১৪০১৬	৩৫৬	-	১.০৭	১.০৭	নাল	পূর্ণ					১.০৭
৬০৮	১৪০১৭	৩৫৬	-	১.৬০	১.৬০	নাল	পূর্ণ					১.৬০
৬০৯	১৪০১৮	৩৫৬	-	১.২০	১.২০	নাল	পূর্ণ					১.২০
৬১০	১৪০১৯	৩৫৬	-	০.৭০	০.৭০	নাল	পূর্ণ					০.৭০
৬১১	১৪০২০	৩৫৬	-	১.০৬	১.০৫	নাল	আং	০.০১	২৩/৯২-৯৩			১.০৫
৬১২	১৪০২১	৩৫৬	-	০.৫২	০.৩৮	নাল	আং	০.১৪	২৩/৯২-৯৩			০.৩৮
৬১৩	১৪০২২	৩৫৬	-	০.৯০	০.৯০	পথ	পূর্ণ					০.৯০
৬১৪	১৪০২৩	৩৫৬	-	১.৯৬	১.৯৬	নাল	পূর্ণ					১.৯৬
৬১৫	১৪০২৪	৩৫৬	-	১.৭১	০.৮১	খাল	আং	০.৯০	২৩/৯২-৯৩			০.৮১
৬১৬	১৪০২৫	৩৫৬	-	০.৫২	০.৪৬	নাল	আং	০.০৬	২৩/৯২-৯৩			০.৪৬
৬১৭	১৪০২৬	৩৫৬	-	০.৩৬	০.৩৩	পথ	আং	০.০৩	২৩/৯২-৯৩			০.৩৩
৬১৮	১৪০২৭	৩৫৬	-	৪.৫২	৪.৪১	খিলা	আং	০.১১	২৩/৯২-৯৩			৪.৪১
৬১৯	১৪০২৯	৩৫৬	-	১.৫০	০.৬৫	নাল	আং	০.৮৫	২৩/৯২-৯৩			০.৬৫
৬২০	১৪০৩০	৩৫৬	-	২.৩০	২.২৬	নাল	আং	০.০৪	২৩/৯২-৯৩			২.২৬
৬২১	১৪০৩১	৩৫৬	-	১.৭৪	১.৭৪	নাল	পূর্ণ					১.৭৪
৬২২	১৪০৩২	৩৫৬	-	০.৮৪	০.৮৪	নাল	পূর্ণ					০.৮৪
৬২৩	৮৩০৪/৮ ৩৫৯	২৫৫	-	৩.৫২	৩.৫২	ডোবা	পূর্ণ					৩.৫২
৬২৪	৮৩০৪/৮ ৩৫৮	৪৭০	-	০.২৫	০.২০	বাধ	আং	০.০৫	০৫/৯০-৯১			০.২০
৬২৫	৮২৯৬/৮ ৩৩৭	৯১৭	-	০.৪০	০.৪০	নুনমাঠ	পূর্ণ					০.৪০
৬২৬	৮২৯৬/৮ ৩৩৬	১	-	০.৪০	০.৪০	নুনমাঠ	পূর্ণ					০.৪০
সর্বমোট=					৪৩৬.০২							৪৩৬.০২

মোঃ আব্দুল বারীক
সার্ভেয়ার
এল.এ. শাখা
জেলা প্রশাসকের কার্যালয়, কক্সবাজার।

মোঃ মাসুদ রানা
সার্ভেয়ার
এল.এ. শাখা
জেলা প্রশাসকের কার্যালয়, কক্সবাজার।

মোঃ জাহাঙ্গীর হোসেন
সার্ভেয়ার
এল.এ. শাখা
জেলা প্রশাসকের কার্যালয়, কক্সবাজার।

মোঃ ফেরদৌস খান
সার্ভেয়ার
ভূমি অধিগ্রহণ শাখা
জেলা প্রশাসকের কার্যালয়, কক্সবাজার।

ভূমি অধিগ্রহণ কর্মকর্তা
কক্সবাজার।

মোঃ আব্দুল বাতেন
কানুনগো
এল.এ. শাখা
জেলা প্রশাসকের কার্যালয়, কক্সবাজার।

সিনিয়র কর্মকর্তা
ভূমি অধিগ্রহণ শাখা
জেলা প্রশাসকের কার্যালয়, কক্সবাজার।

অতিরিক্ত জেলা প্রশাসক (রাজস্ব)
কক্সবাজার।

প্রস্তাবিত অর্থনৈতিক অঞ্চল ধলঘাটা এর

দাগ সূচীপত্র

ক্রমিক নং	বি.এস দাগ নং	খতিয়ান নং	জমির পরিমাণ	শ্রেণী	মন্তব্য
১	৮০৬৬	১ বাংলাদেশ সরকার পক্ষে ডেপুটি কমিশনার, কক্সবাজার।	০.২২	নুনমাঠ	
২	৭৮১১		০.১৫	নুনমাঠ	
৩	৭৮১৪		০.০২	নুনমাঠ	
৪	৭৮২৩		০.১৫	নুনমাঠ	
৫	১২৯১৪		০.৫৪	বালুচর	
৬	৭৭৫৭		১.১৪	খাল	
৭	৭৭৬৬		০.০৩	রাস্তা	
৮	৭৭৬৮		০.৪৫	রাস্তা	
৯	৭৭৬৯		০.৩৮	গোপাটি	
১০	৭৭৭৪		০.০৯	নাল	
১১	৭৮৬৭		১ বাংলাদেশ সরকার পক্ষে ডেপুটি কমিশনার, কক্সবাজার।	০.০১	পাউন্ডি
১২	৭৮৮৪	০.৬৬		নুনমাঠ	
১৩	৭৯০৭	০.১৬		নুনমাঠ	
১৪	৭৯৪৩	১.১২		নাল	
১৫	৮০০৫	০.০৬		কবরস্থান	
১৬	৮০০৬	০.২০		কবরস্থান	
১৭	৮০২৪	০.০২		নাল	
১৮	৮০৩৮	১.০৭		রাস্তা	
১৯	৮০৫২	০.৩৯		খাল	
২০	৮১০৫	১.২৮		নুনমাঠ	
২১	৮১০৬	১.২৫		নাল	
২২	৮১০৭	০.১১	নাল		
২৩	৮২১২	১ বাংলাদেশ সরকার পক্ষে ডেপুটি কমিশনার, কক্সবাজার।	০.২১	রাস্তা	
২৪	৮২১৯		০.৩৮	রাস্তা	
২৫	৮২৮৫		০.১৮	নাল	
২৬	৮৩০১		০.৩৮	নাল	
২৭	৮৩০২		১.০৬	কাটি	
২৮	৮০৭১		১.২৬	বালুচর	
২৯	৮০৭৬		১.২১	বালুচর	
৩০	৮০৭৮		০.৩৩	রাস্তা	
৩১	৮০৮৭		০.৭৪	বালুচর	
৩২	৮০৯১		০.০৩	বালুচর	
৩৩	৮০৯৩		০.২০	নাল	
৩৪	৭৬৮৫	১ বাংলাদেশ সরকার পক্ষে ডেপুটি কমিশনার, কক্সবাজার।	০.০৯	নাল	
৩৫	৭৭০৩		০.৩৩	নাল	
৩৬	১২৮৩১		২.৩০	নাল	
৩৭	১২৮৩০		০.১০	রাস্তা	
৩৮	১৩০০৩		০.৩৫	বালুচর	
৩৯	১৩০০৪		০.৩৮	বালুচর	
৪০	১৩০০৫		০.১৪	বালুচর	
৪১	১৩০০৯		১.৩৩	বালুচর	
৪২	১৩০১০		২.৭৮	বালুচর	
৪৩	১৩০১২		১.৩৫	বালুচর	
৪৪	১৩০১৮		০.৯০	বালুচর	
৪৫	১৩০১৯	০.৯৮	বালুচর		
৪৬	১৩০২০	০.৭৫	বালুচর		
৪৭	১৩০২১	০.৮৫	বালুচর		
		মোট-	২৮.১১ একর	ইজা	

Choz

ক্রমিক নং	বি.এস দাগ নং	খতিয়ান নং	জমির পরিমাণ	শ্রেণী	মন্তব্য	
৪৮	১৩০২২	১ বাংলাদেশ সরকার পক্ষে ডেপুটি কমিশনার, কক্সবাজার।	১.৪৭	বালুচর		
৪৯	১৩০২৯		০.২২	বালুচর		
৫০	১৩০৫২		০.৫০	বালুচর		
৫১	১২৯৯৪		১.৭৩	বালুচর		
৫২	১২৯৯২		০.২৩	বালুচর		
৫৩	১২৯৮৯		০.৫৫	বালুচর		
৫৪	১২৯৮৭		০.৩২	বালুচর		
৫৫	১২৯৮৮		০.২৭	বালুচর		
৫৬	১২৯৮৫		১.৫৪	বালুচর		
৫৭	১২৯৮১		১.৬১	বালুচর		
৫৮	১২৯৭২		০.০৭	বালুচর		
৫৯	১২৯৭১		২.৪৯	বালুচর		
৬০	১২৯৭০		০.০৭	বালুচর		
৬১	১২৯৬৯		০.১৭	বালুচর		
৬২	১২৯৬৬	১ বাংলাদেশ সরকার পক্ষে ডেপুটি কমিশনার, কক্সবাজার।	০.০৩	বালুচর		
৬৩	১২৯৬৫		৮.২৩	বালুচর		
৬৪	১২৯৬৪		০.১২	বালুচর		
৬৫	১৩৫১৭		০.৩৫	বালুচর		
৬৬	১৩৫১৯		১.৯৮	বালুচর		
৬৭	১৩৫২১		১.১০	বালুচর		
৬৮	১৩৫২৩		০.৭৯	বালুচর		
৬৯	১৩৫২৪		০.৭৫	বালুচর		
৭০	১৩৫২৭		১.৩৩	বালুচর		
৭১	১৩৫২৮		২.০৯	বালুচর		
৭২	১৩৫২৯		১.৮২	বালুচর		
৭৩	১৩৫৩২		০.৪৫	বালুচর		
৭৪	১৩৫৩৩		০.৫৭	বালুচর		
৭৫	১৩৫৩৫		১ বাংলাদেশ সরকার পক্ষে ডেপুটি কমিশনার, কক্সবাজার।	১.২০	বালুচর	
৭৬	১৩৫৩৯	৩.১৪		বালুচর		
৭৭	১৩৫৫৪	৫.৭১		খাল		
৭৮	১৩৫৫৫	১.৪৭		বালুচর		
৭৯	১৩৫৫৯	০.২০		খাল		
৮০	১৩৫৬০	৭৪.৭৩		নদী	বর্তমানে বালুচর	
৮১	১৩৫৬৭	০.১০		বালুচর		
৮২	১৩৫৮৯	০.২৬		বালুচর		
৮৩	১৩৫৯৪	০.২৫		বালুচর		
৮৪	১৩৫৯৫	০.৬৭		বালুচর		
৮৫	১৩৫৯৬	০.২৩		বালুচর		
৮৬	১৩৬০০	০.৮৯		বালুচর		
৮৭	১৩৫৭১	০.১০		বালুচর		
৮৮	১৩৬০১	০.৭৯		বালুচর		
৮৯	১৩৬০২	১ বাংলাদেশ সরকার পক্ষে ডেপুটি কমিশনার, কক্সবাজার।	০.৬২	বালুচর		
৯০	১৩৬০৪		০.৯৯	বালুচর		
৯১	১৩৬০৬		০.০৮	বালুচর		
৯২	১৩৬১৪		১.০৭	বালুচর		
৯৩	১৩৬১৯		১.৪১	বালুচর		
৯৪	১৩৬২০		২.০৪	বালুচর		
৯৫	১৩৬২১		২.০১	বালুচর		
৯৬	১৩৬২২		০.৮৬	বালুচর		
			মোট-	১২৯.৬৭ একর	ইজা	

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ক্রমিক নং	বি.এস দাগ নং	খতিয়ান নং	জমির পরিমাণ	শ্রেণী	মন্তব্য	
৯৭	১৩৬২৪	১ বাংলাদেশ সরকার পক্ষে ডেপুটি কমিশনার, কক্সবাজার।	০.২৬	বালুচর		
৯৮	১৩৬২৬		০.৩৯	বালুচর		
৯৯	১৩৬৩০		০.৬০	বালুচর		
১০০	১৩৬৩১		০.২৫	বালুচর		
১০১	১৩৬৩২		০.৩৪	বালুচর		
১০২	১৩৬৩৩		১.১০	বালুচর		
১০৩	১৩৬৩৪		১.০৪	বালুচর		
১০৪	১৩৬৩৫		০.১১	বালুচর		
১০৫	১৩৬৩৬		১.০২	বালুচর		
১০৬	১৩৬৩৭		০.২৮	খাল		
১০৭	১৩৬৩৯		০.০৩	বালুচর		
১০৮	১৩৬৪০		০.১৫	বালুচর		
১০৯	১৩৬৫৪		০.৫৫	বালুচর		
১১০	১৩৬৫৫		০.১৩	বালুচর		
১১১	১৩৬৫৭		১ বাংলাদেশ সরকার পক্ষে ডেপুটি কমিশনার, কক্সবাজার।	০.৭৪	বালুচর	
১১২	১৩৬৫৮	০.১৫		বালুচর		
১১৩	১৩৬৫৯	০.১৭		বালুচর		
১১৪	১৩৬৬০	০.০৮		বালুচর		
১১৫	১৩৬৬১	০.২৫		বালুচর		
১১৬	১৩৬৬২	০.৪১		বালুচর		
১১৭	১৩৬৬৩	০.০৮		বালুচর		
১১৮	১৩৬৬৮	০.৪৮		বালুচর		
১১৯	১৩৬৬৯	৩.৬৩		বালুচর		
১২০	১৩৬৭৫	০.২৭		বালুচর		
১২১	১৩৬৮২	০.০৬		বালুচর		
১২২	১৩৬৮৩	০.১৪		বালুচর		
১২৩	১৩৬৮৪	০.২২		বালুচর		
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১২৬	১৩৭০২		০.১৩	নাল		
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১৩২	১৩৭২০		০.৪৪	নুনমাঠ		
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১৪১	১৩৭৫৭	০.২৯		নুনমাঠ		
১৪২	১৩৭৭৪	০.০৪		ভিটা		
১৪৩	১৩৮০৪	০.১৪		খিলা		
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ক্রমিক নং	বি.এস দাগ নং	খতিয়ান নং	জমির পরিমাণ	শ্রেণী	মন্তব্য
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১৪৫	১৩৮০৯		০.১৬	কবরস্থান	
১৪৬	১৩৮২৭		০.৩৫	নুনমাঠ	
১৪৭	১৩৮৩১		০.০৯	নুনমাঠ	
১৪৮	১৩৮৪৩		০.১১	নুনমাঠ	
১৪৯	১৩৮৬১		১.২৩	নুনমাঠ	
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১৫৫	১৩৯৫২		০.৩৪	খাল	
১৫৬	১৩৯৫৩		৮.৭৪	বালুচর	
১৫৭	১৩৯৫৪		২৩.৬৪	বালুচর	
১৫৮	১৩৯৫৫		১২.১৮	নদী	
১৫৯	১৪০১৩		৪.০৪	খাল	
১৬০	১২৮৫৫		০.০৩	নাল	
১৬১	১২৮৫৪		০.০৩	নাল	
১৬২	১২৮৫৩		০.২০	নাল	
১৬৩	১২৮৫২		০.০৬	নাল	
১৬৪	১২৮৫১	১ বাংলাদেশ সরকার পক্ষে ডেপুটি কমিশনার, কক্সবাজার।	০.০৫	নাল	
১৬৫	১২৮৫০		০.১৬	নাল	
১৬৬	১২৮৩৬		০.২২	রাস্তা	
১৬৭	১২৮৬৭		০.২২	নাল	
১৬৮	১৪০৩৬		১১১.১৭	বালুচর	
১৬৯	৭৮০৪		০.৬৩	নুনমাঠ	
১৭০	৩৫১২		২১.৩০	বালুচর	
১৭১	১২৮২৪		০.২০	রাস্তা	
১৭২	১৩০৩৫		১৯০.০০	সাগর	বর্তমানে বালুচর
			মোট-	৫৭২.৬১ একর	

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ক্রমিক নং	বি.এস দাগ নং	খতিয়ান নং	জমির পরিমাণ	শ্রেণী	মন্তব্য
১	৮০৬৫	২ বাংলাদেশ সরকার পক্ষে পানি ও বিদ্যুৎ উন্নয়ন বোর্ড	৩.২১	নয়নজুলি	
২	৩৫০৯		৩.৪৮	নয়নজুলি	
৩	৮০৯০		১৩.৭৬	নয়নজুলি	
৪	৮০৬৪		৩.২১	নয়নজুলি	
৫	৮০৫৯		৩.৭৫	বাঁধ	
৬	৮১০২		২.৫৪	নয়নজুলি	
৭	১৩৬৭৩		১৯.৭৮	নয়নজুলি	
৮	১৩৬৮৯		৪.৩৬	কাটিবাঁধ	
৯	১৩৬৯০		৬.৪৩	নয়নজুলি	
১০	১৩৯৪৭		১২.৩১	নয়নজুলি	
১১	১৩৯৪৮		১১.০০	কাটিবাঁধ	
১২	১৩৯৪৯	২ বাংলাদেশ সরকার পক্ষে পানি ও বিদ্যুৎ উন্নয়ন বোর্ড	১৮.০৫	নয়নজুলি	
১৩	১৪০২৮		৩.৮৪	নয়নজুলি	
১৪	১৪০৩৩		২৬.৬১	নয়নজুলি	
১৫	১৪০৩৪		৬.২৮	কাটিবাঁধ	
১৬	১৩৬৮৮		৫.২০	নয়নজুলি	
১৭	৩৫১০		৩.০৫	কাটি	
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২২	১২৮৮৫		৬.৪৮	নয়নজুলি	
২৩	১৪০৩৮	২৬.০০	নয়নজুলি		
		মোট-	১৯৯.৭৪ একর		

Photo

মৌজা- ধলঘাটা (চরভরাট)

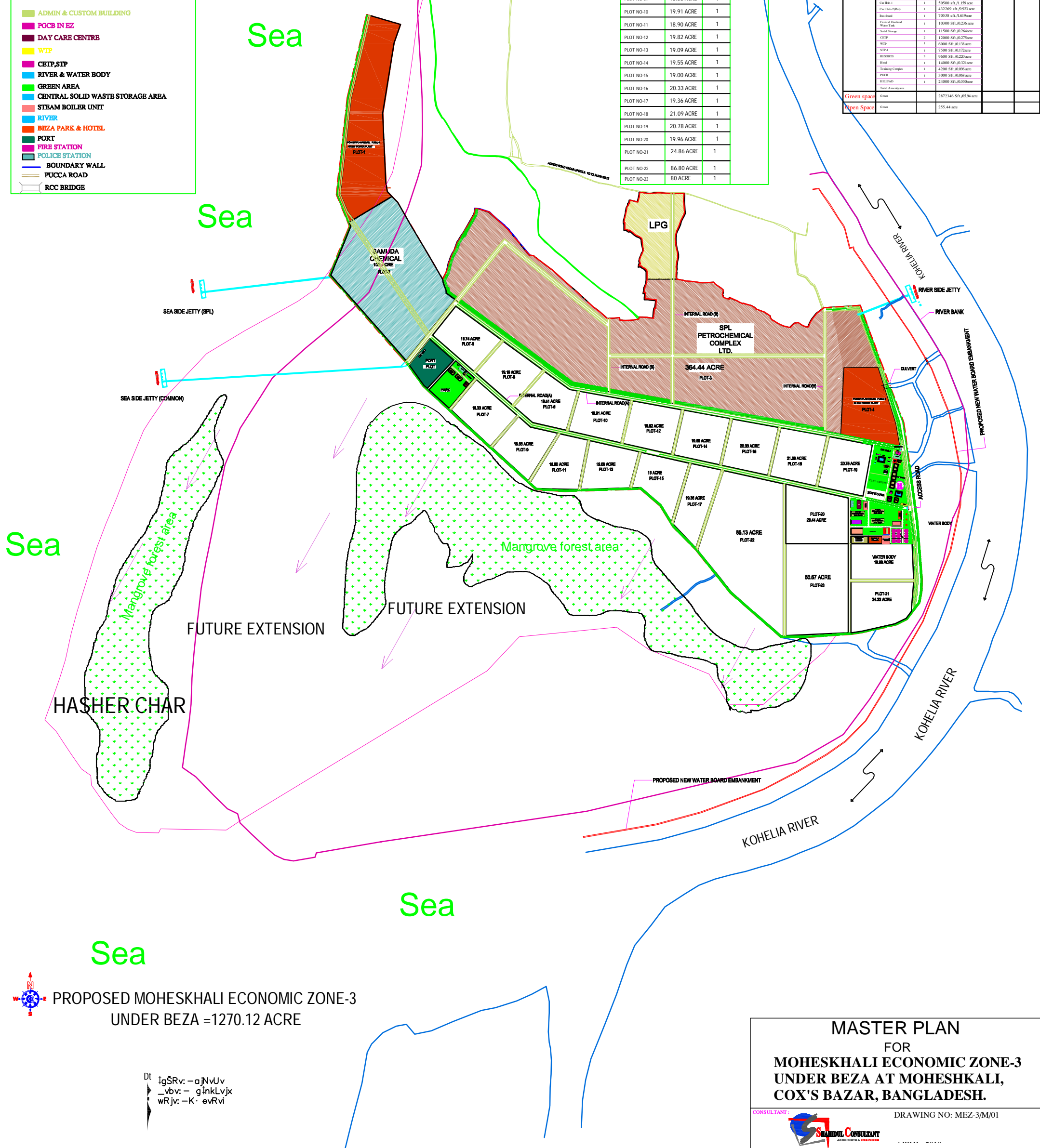
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১	৩৫১২/ক	বি.এস খতিয়ান বর্ধিত	২১.৪০	বালুচর	নুই জায়গার(খস-১৭০)
	১৪০৩৬/ক	চরভরাট জমি	৪০.৩৫	বালুচর	নুই জায়গার(খস-১৩৮)
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LEGEND

- COMMERCIAL, ADMINISTRATIVE & UNIVERSITY
- PLOT
- RESORTS
- RESIDENTIAL BUILDING IN
- HOOKERS MARKET
- CAR HUB
- MOSQUE
- HELIPAD
- POWER PLANT
- COMMERCIAL BUILDING
- TRAINING COMPLEX
- ADMIN & CUSTOM BUILDING
- PCB IN EZ
- DAY CARE CENTRE
- WTP
- CETP, STP
- RIVER & WATER BODY
- GREEN AREA
- CENTRAL SOLID WASTE STORAGE AREA
- STEAM BOILER UNIT
- RIVER
- BEZA PARK & HOTEL
- PORT
- FIRE STATION
- POLICE STATION
- BOUNDARY WALL
- PUCCA ROAD
- ROC BRIDGE

DESCRIPTION OF INDUSTRIAL PLOT Size Area & No	PLOT SIZE/AREA	PLOT(No)	TOTAL PLOT
PLOT NO-01 POWER PLANT (DUEL FUEL)-1	62.48 ACRE	1	23 nos (813.38 ACRE)
PLOT NO-02 (SAMUDA CHEMICAL)	91.79 ACRE	1	
PLOT NO-03 (SUPER PETRO CHEMICAL)	364.44 ACRE	1	
PLOT NO-04 POWER PLANT (DUEL FUEL)-2	29.94 ACRE	1	
PLOT NO-05	19.74 ACRE	1	
PLOT NO-06	19.19 ACRE	1	
PLOT NO-07	19.33 ACRE	1	
PLOT NO-08	19.51 ACRE	1	
PLOT NO-09	18.58 ACRE	1	
PLOT NO-10	19.91 ACRE	1	
PLOT NO-11	18.90 ACRE	1	
PLOT NO-12	19.82 ACRE	1	
PLOT NO-13	19.09 ACRE	1	
PLOT NO-14	19.55 ACRE	1	
PLOT NO-15	19.00 ACRE	1	
PLOT NO-16	20.33 ACRE	1	
PLOT NO-17	19.36 ACRE	1	
PLOT NO-18	21.09 ACRE	1	
PLOT NO-19	20.78 ACRE	1	
PLOT NO-20	19.96 ACRE	1	
PLOT NO-21	24.86 ACRE	1	
PLOT NO-22	86.80 ACRE	1	
PLOT NO-23	80 ACRE	1	

MOHESKHALI Economic Zone					Total Covered Area	Unused
Name	Plot Type	No.	AREA			
Commercial Bldg	Commercial Bldg	3	101325 Sft./2.326 acre		28.55 Acre	106.80 Acre
Residential Bldg	Residential Bldg	9	43830 Sft./1.006 acre			
High school	High school	1	2542 Sft./0.058 acre			
College	College	1	2342 Sft./0.054 acre			
Hospital & Medical College	Hospital & Medical College	1	50096 Sft./1.150 acre			
Medical Center	Medical Center	1	2700 Sft./0.062 acre			
Library	Library	1	4000 Sft./0.092 acre			
Play Ground	Play Ground	1	112336 Sft./2.581 acre			
Post office & union bldg	Post office & union bldg	1	9470 Sft./0.217 acre			
School & College	School & College	1	40597 Sft./0.932 acre			
Police Station	Police Station	1	9470 Sft./0.217 acre			
Day care center	Day care center	1	9470 Sft./0.217 acre			
Shopping Complex	Shopping Complex	1	24600 Sft./0.557 acre			
Banking Center	Banking Center	1	30591 Sft./0.702 acre			
Community Center	Community Center	1	18090 Sft./0.418 acre			
Auditorium	Auditorium	1	18750 Sft./0.430 acre			
Security & fire alarm comp	Security & fire alarm comp	2	5800 Sft./0.133 acre			
Multi Purpose Commercial Building	Multi Purpose Commercial Building	1	5100 Sft./0.117 acre			
Control Room	Control Room	1	16500 Sft./0.378 acre			
OFFICERS RESIDENCE	OFFICERS RESIDENCE	3	32100 Sft./0.736 acre			
Admin & Control Bldg	Admin & Control Bldg	2	12000 Sft./0.275 acre			
Inventory	Inventory	3	30000 Sft./0.688 acre			
TRUCK STATION	TRUCK STATION	2	6600 Sft./0.151 acre			
Car Wash	Car Wash	1	10500 Sft./0.240 acre			
Car Wash-2nd	Car Wash-2nd	1	43200 Sft./0.992 acre			
Bus Stand	Bus Stand	1	70538 Sft./1.610 acre			
Central Roadside Water Tank	Central Roadside Water Tank	1	10300 Sft./0.236 acre			
Build Storage	Build Storage	1	11500 Sft./0.264 acre			
CETP	CETP	2	12000 Sft./0.275 acre			
WTP	WTP	1	6000 Sft./0.138 acre			
STP-1	STP-1	1	7500 Sft./0.172 acre			
RESORTS	RESORTS	3	9600 Sft./0.220 acre			
Talent	Talent	1	14000 Sft./0.320 acre			
Shopping Complex	Shopping Complex	1	4200 Sft./0.096 acre			
PCB	PCB	1	3000 Sft./0.068 acre			
HELIPAD	HELIPAD	1	24000 Sft./0.550 acre			
Total Covered area			2872346 Sft./65.96 acre			
Green space	Green space					
Open Space	Open Space					



PROPOSED MOHESKHALI ECONOMIC ZONE-3 UNDER BEZA =1270.12 ACRE

DT igSRv: -ajNvUv
_vbv: - g'inkLvix
wRjv: -K' evRvi

MASTER PLAN FOR MOHESKHALI ECONOMIC ZONE-3 UNDER BEZA AT MOHESKHALI, COX'S BAZAR, BANGLADESH.

CONSULTANT: DRAWING NO: MEZ-3/M/01

Disaster Impact Assessment and Management Plan

Maheshkhali Economic Zone-III

Dhalghata, Cox's Bazar, Bangladesh

Table of Contents

1.	Disaster Impact Assessment	3
1.1	Introduction	3
1.2	Methodology of MCA Analysis	3
1.3	Past Accident Data Analysis	3
1.4	Hazard Identification	3
1.5	Fire and Explosion Index (FEI)	4
1.6	MCA Analysis.....	4
1.7	Fire and Explosion Scenarios.....	4
1.8	Flash Fire	5
1.9	Natural Calamities	5
2.	Disaster Management Plan (DMP).....	5
2.1	Approach to Disaster Management Plan.....	5
2.2	Formulation of DMP and Emergency Services	5
2.3	Need for Disaster Management Plan	6
2.4	Objectives of Disaster Management Plan.....	6
2.5	Different Phases of Disaster	7
2.6	Basis of the Plan	7
2.7	Emergency Planning and Response Procedures	7
2.8	On-site Disaster Management Plan.....	8
2.9	Emergency Organization Structure	9
2.10	Role and Responsibilities	11
2.11	Off-site Disaster Management Plan.....	19
2.12	Mock Drills	23
2.13	Checklist for Capability Assessment	24

Disaster Impact Assessment and Management Plan

1. Disaster Impact Assessment

1.1 Introduction

Accidental risk involves the occurrence or potential occurrence of some accident consisting of an event or sequence of events resulting into fire, natural calamities like flood and cyclone, explosion or toxic hazards to human health and environment. Risk Assessment (RA) provides a numerical measure of the risk that a particular facility poses to the public. It begins with the identification of probable potential hazardous events at an industry and categorization as per the predetermined criteria. The consequences of major credible events are calculated for different combinations of weather conditions to simulate worst possible scenario. These consequence predictions are combined to provide numerical measures of the risk for the entire facility. MCA stands for Maximum Credible Accident or in other words, an accident with maximum damage distance, which is believed to be probable. MCA analysis does not include quantification of the probability of occurrence of an accident. In practice the selection of accident scenarios for MCA analysis is carried out on the basis of Engineering judgement and expertise in the field of risk analysis especially in accident analysis. Detailed study helps in plotting the damage contours on the detailed plot plan in order to assess the magnitude of a particular event. A disastrous situation is the outcome of fire, natural calamities and explosion or toxic hazards in addition to other natural causes that eventually lead to loss of life, property and ecological imbalances.

1.2 Methodology of MCA Analysis

The MCA analysis involves ordering and ranking of various sections in terms of potential vulnerability. The data requirements for MCA analysis are:

- Operating manual
- Flow diagram and P&I diagrams
- Detailed design parameters
- Physical and chemical properties of all the chemicals
- Detailed plant layout
- Detailed area layout
- Past accident data

Following steps are involved in the MCA analysis:

- Identification of potential hazardous sections and representative failure cases.
- Visualization of release scenarios considering type and the quantity of the hazardous material.
- Damage distance computations for the released cases at different wind velocities and atmospheric stability classes for heat radiations and pressure waves.
- Drawing of damage contours on plot plan to show the effect due to the accidental release of chemicals.

1.3 Past Accident Data Analysis

Analysis of events arising out of the unsafe conditions is one of the basic requirements for ensuring safety in any facility. The data required for such an analysis has either to be generated by monitoring and/or collected from the records of the past occurrences. This data, when analysed, helps in formulation of the steps towards mitigation of hazards faced commonly. Trends in safety of various activities can be evaluated and actions can be planned accordingly, to improve the safety.

1.4 Hazard Identification

Identification of hazards is an important step in Risk Assessment as it leads to the generation of accidental scenarios. The merits of including the hazard for further investigation are subsequently

determined by its significance, normally using a cut-off or threshold quantity. Once a hazard has been identified, it is necessary to evaluate it in terms of the risk it presents to the employees and the neighbouring community. In principle, both probability and consequences should be considered, but there are occasions where either the probability or the consequence can show to be sufficiently low or sufficiently high, decisions can be made on just one factor. During the hazard identification component, the following considerations are taken into account.

- Chemical identities
- Location of process unit facilities for hazardous materials.
- The types and design of process units
- The quantity of material that could be involved in an airborne release and
- The nature of the hazard (e.g. airborne toxic vapours or mists, fire, explosion, large quantities stored or processed handling conditions) most likely to accompany hazardous materials spills or releases

1.5 Fire and Explosion Index (FEI)

Fire and Explosion Index (FEI) is useful in identification of areas in which the potential risk reaches a certain level. It estimates the global risk associated with a process unit and classifies the units according to their general level of risk. FEI covers aspects related to the intrinsic hazard of materials, the quantities handled and operating conditions. This factor gives index value for the area which could be affected by an accident, the damage to property within the area and the working days lost due to accidents.

1.6 MCA Analysis

MCA analysis encompasses defined techniques to identify the hazards and compute the consequent effects in terms of damage distances due to heat radiation, toxic releases, vapour cloud explosion etc. A list of probable or potential accidents of the major units in the complex arising due to use, storage and handling of the hazardous materials are examined to establish their credibility. Depending upon the effective hazardous attributes and their impact on the event, the maximum effect on the surrounding environment and the respective damage caused can be assessed. Hazardous substance, on release can cause damage on a large scale. The extent of the damage is dependent upon the nature of the release and the physical state of the material. In the present report the consequences for flammable hazards are considered and the damages caused due to such releases are assessed with recourse to MCA analysis.

Flammable substances on release may cause Jet fire and less likely unconfined vapour cloud explosion causing possible damage to the surrounding area. The extent of damage depends upon the nature of the release. The release of flammable materials and subsequent ignition result in heat radiation wave or vapour cloud depending upon the flammability and its physical state. Damage distances due to release of hazardous materials depend on atmospheric stability and wind speed. It is important to visualize the consequence of the release of such substances and the damage caused to the surrounding areas.

1.7 Fire and Explosion Scenarios

Combustible materials within their flammable limits may ignite and burn if exposed to an ignition source of sufficient energy. On process plants, this normally occurs as a result of a leakage or spillage. Depending on the physical properties of the material and the operating parameters, the combustion of material in a plant may take on a number of forms like jet fire, flash fire and pool fire.

1.8 Flash Fire

A flash fire is the non-explosive combustion of a vapour cloud resulting from a release of flammable material into the open air, which after mixing with air, ignites. A flash fire results from the ignition of a released flammable cloud in which there is essentially no increase in combustion rate. The ignition source could be electric spark, a hot surface, and friction between moving parts of a machine or an open fire. Flash fire may occur due to its less vapour temperature than ambient temperature. Hence, as a result of a spill, they are dispersed initially by the negative buoyancy of cold vapours and subsequently by the atmospheric turbulence. After the release and dispersion of the flammable fuel the resulting vapour cloud is ignited and when the fuel vapour is not mixed with sufficient air prior to ignition, it results in diffusion fire burning. Therefore the rate at which the fuel vapour and air are mixed together during combustion determines the rate of burning in the flash fire.

The main dangers of flash fire are radiation and direct flame contact. The size of the flammable cloud determines the area of possible direct flame contact effects.

Radiation effects on a target depend on several factors including its distance from the flames, flame height, flame emissive power, local atmospheric transitivity and cloud size.

Most of the time, flash combustion lasts for no more than a few seconds.

1.9 Natural Calamities

Natural calamities like tropical cyclones, flood, earthquakes etc. can occur within the zone. The project site falls under the earthquake zone II which indicate medium intensity of earthquake.

2. Disaster Management Plan (DMP)

2.1 Approach to Disaster Management Plan

Onsite Emergency or disaster is an unpleasant sudden event of such a magnitude which may cause extensive damage to life and property, due to in-plant emergencies resulting from deficiencies in operation, maintenance, design and human error; natural calamities like flood, cyclone and earthquake; and deliberate and other acts of man like sabotage, riot, war etc. It is important for every industry to have a well-documented Emergency Plan to meet any major untoward incident or disaster. In view of this, an approach to Disaster Management Plan (DMP) to tackle the emergencies, MEZ-III has been delineated in the following sections. Roles and responsibilities of key personnel have also been defined in the plan.

2.2 Formulation of DMP and Emergency Services

BEZA will formulate a Disaster Management Plan for better and safe management of their plants. The DMP is related to the final assessment and it is the responsibility of the plant management document including the following elements.

- Assessment of the size and nature of the events foreseen and the probability of their occurrence;
- Formulation of the plan and liaison with authorities, including the emergency services.
- Procedures for raising the alarm and communications both within and outside the works;
- Appointment of key personnel and their duties and responsibilities, especially for works incident controller and works main controller;
- Emergency control centre;
- Action on-site;
- Action off-site;

The plan is prepared to set out the way in which designated people at the site of the incident can initiate supplementary action both inside and outside the works at an appropriate time. An essential element of the plan must be the provision for attempting to make safe the affected unit,

for example by shutting it down. On a complex site, the plan includes the full sequence of key personnel to be called in from other sections or from off site.

2.3 Need for Disaster Management Plan

The petroleum and petrochemical complex will produce lot of toxic, highly reactive, explosive or inflammable chemicals which are potentially hazardous not only to the human beings, flora and fauna but also to all forms of property and our environment as a whole. Thus, extreme care is essential in handling such chemicals in any form and at all stages of manufacture, processing, treatment, package, storage, transportation, use, collection, destruction, conversion or sale. Several agencies of the Government are entrusted with the responsibility of ensuring safe handling and management of hazardous chemicals under acts and rules made for the purpose. In spite of these measures, the possibility of accidents cannot be ruled out. Human errors and mechanical, electrical, instrumental or system failures have, on occasions, led to severe disasters. Accidents occurred at Bhopal, Mexico and other parts of the world have made people concerned with the dangers of chemical accidents. Occurrence of such accidents makes it essential that the Central and State Governments as well as the local authorities are fully prepared to mitigate the sufferings and meet the eventualities resulting from any unfortunate occurrence of chemical accidents in our country.

Following are the general types of Emergency /Disaster which lead to preparation of disaster management plan:

- Fire in tank farm area
- Large oil spillage which may escape outside the plant boundary.
- Major fire / explosion in unit area
- Toxic gas release
- Major Earthquake above 7 Richter Scale
- Tropical Cyclones/Tornado

2.4 Objectives of Disaster Management Plan

The purpose of DMP is to give an approach to detail organizational responsibilities, actions, reporting requirements and support resources available to ensure effective and timely management of emergencies associated to production and operations in the site. The overall objectives of DMP are to:

- Ensure safety of people, protect the environment and safeguard commercial considerations
- Immediate response to emergency scene with effective communication network and organized procedures
- Obtain early warning of emergency conditions so as to prevent impact on personnel, assets and environment
- Safeguard personnel to prevent injuries or loss of life by protecting personnel from the hazard and evacuating personnel from an installation when necessary.
- Minimize the impact of the event on the installation and the environment, by:
 - Minimizing the hazard as far as possible
 - Minimizing the potential for escalation
 - Containing any release
- To provide guidance to help stock holders take appropriate action to prevent accidents involving hazardous substances and to mitigate adverse effects of accidents that do nevertheless occur.

2.5 Different Phases of Disaster

Warning Phase

Emergencies/disasters are generally preceded by warnings during which preventive measures may be initiated. For example release of light hydrocarbons, uncontrollable build-up of pressure in process equipment, weather forecast give warning about formation of vapour cloud, cyclones, equipment failure etc. This is the phase when emergency/disaster actually strikes and preventive measures may hardly be taken. However, control measures to minimise the effects may be taken through a well-planned and ready-to-act disaster management plan. The duration may be from seconds to days.

Rescue Phase

This is the phase when impact is almost over and efforts are concentrated on rescue and relief measures.

Relief Phase

In this phase, apart from organization and relief measures internally, depending on severity of the disaster, external help should also be summoned to provide relief measures (like evacuations to a safe place and providing medical help, food clothing etc.). This phase will continue till normalcy is restored.

Rehabilitation Phase

This is the final and longest phase. During which measures required to put the situation back to normal as far as possible are taken. Checking the systems, estimating the damages, repair of equipment's and putting them again into service are taken up. Help from revenue/insurance authorities need to be obtained to assess the damage, quantum of compensation to be paid etc.

Key Elements

Following are the key elements of Disaster Management Plan:

- Basis of the plan
- Accident/emergency response planning procedures
- On-site Disaster Management Plan
- Off-site Disaster Management Plan

2.6 Basis of the Plan

Identification and assessment of hazards is crucial for on-site emergency planning and it is therefore necessary to identify what emergencies could arise in production of various products and their storage. Hazard analysis or consequence analysis gives the following results.

- Hazards from spread of fire or release of flammable and toxic chemicals from storage and production units.
- Hazards due to formation of pressure waves due to vapour cloud explosion of flammable gases and oil spill hazards.

2.7 Emergency Planning and Response Procedures

Emergency rarely occurs; therefore activities during emergencies require coordination of higher order than for planned activities carried out according to fixed time schedule or on a routine day-to-day basis. To effectively coordinate emergency response activities, an organizational approach to planning is required. The important areas of emergency planning are Organization and Responsibilities, Procedures, Communication, Transport, Resource requirements and Control Centre. Offsite emergency requires additional planning over and above those considered under onsite plans, which should be properly integrated to ensure better coordination.

The emergency planning includes anticipatory action for emergency, maintenance and streamlining of emergency preparedness and ability for sudden mobilization of all forces to meet any calamity.

2.8 On-site Disaster Management Plan

Onsite Emergency/disaster is an unpleasant event of such magnitude which may cause extensive damage to life and property due to plant emergencies resulting from deficiencies in Operation, Maintenance, design and human error, natural calamities like flood, cyclone and earthquake; and deliberate and other acts of man like sabotage, riot and war etc. An Onsite Disaster may occur all of a sudden or proceeded by a major fire. Purpose for the on-site disaster management plan is-

- To protect persons and property of processing equipment's in case of all kinds of accidents, emergencies and disasters
- To inform people and surroundings about emergency if it is likely to adversely affect them
- To inform authorities including helping agencies (doctors, hospitals, fire, police transport etc.) in advance, and also at the time of actual happening
- To identify, assess, foresee and work out various kinds of possible hazards, their places, potential and damaging capacity and area in case of above happenings. Review, revise, redesign, replace or reconstruct the process, plant, vessels and control measures if so assessed.

In order to handle disaster / emergency situations, an organizational chart entrusting responsibility to various personnel of the plant and showing their specific roles should be available. Following fire protection facilities are available to combat the emergencies and depending upon the type of emergencies any one or combination of the facilities are applied.

- Fire Water System
- Carbon Dioxide System
- Foam System
- First Aid Fire Fighting Equipment
- Mobile Fire Fighting Equipment
- Gas / Fire Detection and Alarm System.

Before Crisis

- Prepare a plan of the storage, handling and pumping stations premises and surroundings showing therein the areas of various hazards like fire, explosion, toxic releases and also location of assembly points, fire station or equipment's room, telephone room, first aid or ambulance room, emergency control room, main gate, emergency gates, normal wind direction, outside fire station, hospital and other services. Mention their distances from proposed activities.
- The fire protection equipment shall be kept in good operating condition at all the time and fire fighting system should be periodically tested for people functioning logged for record and corrective action.
- The fire fighting training shall be provided to all officers, truck drivers and other employees who are likely to be present in installation
- There should be regular mock fire drills once a month record of such drills shall be maintained
- Every employee or authorized person working in the production shall be familiarized with the fire alarm signal and shall know the location of fire alarm point nearest to place of work
- Assign key personnel and alternate responsible for site safety

- Describe risk associated with each operation conducted.

During Crisis

- Monitor the behaviour of entrant for any effects that suggests they should be evacuated
- Evacuate the space if any hazard that could danger the entrant is detected
- Perform no other duties that may interfere with their primary responsibilities
- Notify the attendant if they experience any warning signs or symptoms of exposures or detect a dangerous condition.
- Exit the permit space when instructed by attendant
- Reporting Procedure

In the event of fire from accidental release of flammable gas or liquid, a person seeing the incident will follow the laid down procedure in the plant and report as follows:

- Will dial the nearest telephone
- Will state his name and exact location of emergency
- Will contact affected officers on duty
- People reporting the accident will remain near the location to guide emergency crew arriving at the scene

In case fire emergency person should activate the nearest available push button type instrument which will automatically sound an alarm in fire control room indicating the location of fire.

After Crisis

- Report injuries or blood or body fluid exposures to the appropriate supervisor immediately
- Assembly points:

Assembly points shall be set up farthest from the location of likely hazardous events, where pre-designed persons from the works, contractors and visitors would assemble in case of emergency. Up-to date list of pre-designed employees shift wise must be available at these points so that roll call could be taken. Pre-designated persons would take charge of these points and mark presence as the people come into it.

- Wash wounds and skin sites that have been affected with soap & water
- Workers should be seen as soon as possible by a health professional
- Provide information to the relevant public authority and community including other closely located facilities regarding the nature of hazard and emergency procedure in event of major accident
- Record and discuss the lessons learned and the analysis of major accidents and misses with employees and employee representative

2.9 Emergency Organization Structure

Following are the key personnel and the units in the plant which are responsible to take appropriate actions during emergencies.

Site Main Controller

President/SSM - (the senior most functionary available at site).

The President/Site Shit Manager (SSM) will be designated as the Site Main Controller at the time of an emergency and report at the Emergency Control Centre (ECC) which will be the Primary Command Post. He will be the Chief Co-ordinator and take overall command of the emergency management. He will be assisted by other coordinators as designated for various functions. The Site Main Controller will provide all decisions support and resources support to the Site Incident

Controller at the incident site for initiating appropriate actions for emergency control. He will also liaise with mutual aid members and all outside agencies including Local Crisis Management Committee, District Contingency Plan Committee (District Collector), Police, Civil Defence, Factories Inspectorate, etc. to seek assistance/help and provide necessary information to them. Normally, the SSM is available on round the clock duty at the site to coordinate overall manufacturing activities and management of emergency (if any). In the event of an emergency, the Site Shift Manager (SSM) will assume the charge of the Site Main Controller till the Executive or the President arrives.

Site Incident Controller

AVP/GM/DGM/Sr. Mgr. /Mgr. - (next lower to the senior most functionary of operation available at site).

The next lower to senior most functionary of operation available at site will be Site Incident Controller. On receiving information about the emergency, he will report at the incident site and take over from the Deputy Incident Controller (shift-in-charge). He will take overall command of the emergency control operation as the Site Incident Controller and will take decisions in co-ordinations with Site Main Controller for controlling emergency situation. He will co-ordinate with all the key personnel, fire fighting and rescue team leaders and other support services and provide necessary information and advice to them for effectively managing control measures / actions.

Deputy Incident Controller

The shift-in-charge is available on round the clock duty in every plant. He is competent for plant operation and responsible for all activities related to production / maintenance including prevention / control of incidents and handling emergencies (if any) in the plant. He will be designated as the Deputy Incident Controller. In the event of an emergency in the plant, he will immediately assume the charge of the site Incident Controller and take decisions in consultation with the Site Main Controller. To initiate immediate actions for controlling/mitigating emergency situation at the incident site till the Site Incident Controller (next senior personnel in production) arrives.

Co-ordinators

(The senior most functionaries available in the respective services)

The senior most functionaries available at site in the respective services will be the co-ordinators at the time of an emergency. They will report at the Emergency Control Centre (ECC), known as the Primary Command Post, unless and otherwise instructed by the Chief Co-ordinator (The Site Main Controller). They will assist and advise the Site Main Controller in all matters for effectively managing control measures and mitigating operations.

Emergency Control Centre (ECC) (The Primary Command Post)

In the event of an emergency, SSM Office will be designated as the Emergency Control Centre, which will be known as the Primary command Post. If, the SSM office is likely to be affected due to unfavourable wind direction or any other reasons, the Emergency Control Centre will be shifted to the Construction Conference Room which will be having necessary facilities to connect communication links as provided in the SSM Office.

Field Command Post (Incident Site)

- An emergency requires co-ordination of numerous activities beyond spill containment and countermeasure efforts from a safe location at the incident scene. The Field Command Post will be established in the "Cold Zone" for staging deployed apparatus, resources and equipment with means of communications and manning to effectively co-ordinate control efforts.

Assembly Points

- Two alternate locations for safe assembly points have been earmarked at all the operating plants. These locations are designated for assembling non-essential workers, visitors, and other persons who are not required in the plant site at the time of emergency but they are to be moved to safe places. These locations have been provided with sign boards displaying "Assembly Points" for easy identification.
- The persons required to be assembled at the assembly point should choose safer assembly point out of the two, considering the wind direction at that time. The plant control room will also announce the same on the plant PA system, if possible
- The person assembled at the assembly point shall follow the instruction for evacuation of the plant area and move to safe locations as directed. They should move in the cross wind direction or up-wind direction, whichever is safer.

2.10 Role and Responsibilities

Site Main Controller

The Site Main Controller will be the chief co-ordinator and shall be assisted by other co-ordinators (senior most functionaries in the respective disciplines). He will take overall command of the emergency management and his duties and the responsibilities are as below:

He will:

- Report at the Emergency Control Centre as soon as he gets information about the emergency at site and will assume overall responsibility if taking decisions and directing actions as necessary for mitigating the situation and managing the emergency effectively with due consideration and priorities for personnel safety, safety to the company's property and the environment
- Assess the magnitude of the situation in co-ordination with the Incident Controller / Dy. Incident Controller and decide whether major emergency exists or is likely to develop, requiring external assistance. Accordingly, he will decide to inform Local/District emergency Chief and other emergency control groups for help and the nature of help required including assistance from mutual aid members and declare on-site emergency
- Decide the safe route of entry for external assistance/help to reach at site of the incident considering wind direction and the place of the incident and also the place of reporting such assistance. He will also direct the security to guide them properly
- Ensure that the Key Personnel and Co-ordinators are called in
- Ensure that all non-essential workers, visitors, contractors are safely moved to assembly points and direct for search and rescue operation within the affected areas, if necessary
- Be in constant communication with the Site Incident Controller to continuously review and assess the situation and possible developments
- Direct actions for safe shut down of plant(s) or section of the plant and evacuation of plant personnel and other necessary action is in consultation with the other co-ordinators
- Exercise direct operational control over areas in the complex other than those affected in consultation with other co-ordinators
- To liaise with the local meteorological office to receive early notification of changes in wind direction and weather conditions
- Liaise with the senior officials of Police, Fire Brigade, Medical and Factories Inspectorate and pass on information on possible effects to the surrounding areas outside the factory premises and necessity of evacuating the area and moving the people to safe places.
- Liaise with various co-ordinators to ensure that various team are functioning well, casualties are receiving attention and traffic movement within the works is well regulated.
- Arrange for a log of the emergency to be maintained in the Primary Command Post
- Release authorized information to press through the media co-ordinator

- Control rehabilitation of the affected persons and the affected areas after cessation of the emergency

Site Incident Controller

The Site Incident Controller is the Key Personnel for operations function reporting at the incident site and will take the overall command of actions for emergency control operation on his arrival at the incident site. He will be supported by other key personnel representing various emergency services and initiate emergency control actions under the direction of the Site Main Controller (Primary Command Post). The duties and the responsibilities of the Site Incident Controller include the following:

He will:

- Report at the incident site immediately after getting information about an emergency. Upon his arrival at the site, he will assess the scale of emergency in consultation with the Deputy Incident Controller and evaluate, if a major emergency exists or is likely to develop and inform Emergency Control Centre (primary Command Post) accordingly asking for assistance and indicating kind of support needed
- Take overall control of handling the emergency at site and take action for isolation of source of containment loss to the extent feasible. Simultaneously, in case of fire organize appropriate fire response in coordination with Key personnel (Fire & Safety) to get the situation under control and to prevent its escalation
- Set up communication point (Field Command Post) and establish contact with Site Main Controller (Primary Command Post) and keep him informed about the development
- Keep on assessing the emergency situation at the site and communicate to the Site Main Controller (Primary Command Post) and keep him informed about the development
- Co-ordinate the activities of other key personnel reporting at the Field
- Command Post, under his overall command
- Direct all operation with the affected areas giving due priorities for safety of personnel and to minimize damage to environment, plant and property
- Provide advice and information to Fire fighting and rescue personnel, external fire services and other emergency services/teams as and when they arrive at the incident site and co-ordinate with them for effective control actions.
- Ensure that all non-essential workers and staff within the affected area are evacuated to appropriate assembly points and that areas are searched for casualties
- Organize rescue teams for search of casualties in the affected areas (if any) and send them to safe areas / medical centre for first aid and medical relief
- Seek additional support and resources as may be needed through Primary Command Post.
- Send decision support from the Primary Command Post for decision such as precautionary shut down of neighbouring facilities, precautionary evacuation of people in the neighbouring facilities, activating mutual aid plan, etc.
- Be in constant liaison with the Site Main Controller and keep him informed about the situation at the incident site
- Preserve all evidences so as to facilitate any inquiry into the cause and circumstances, which caused or escalated the emergency (to arrange photographs, video, etc.)
- Arrange for head count after the emergency is over with respect to the personnel on duty in the affected areas

Deputy Incident Controller

Normally, the Shift-in-charge of a plant being always available at the plant site and well aware of the plant operating conditions at all times will be designated as the Deputy Incident Controller and assume the charge of the Site Incident Controller at the time of an emergency till the Site Incident

Controller arrives at the incident site, he will assist the Site Incident Controller on his arrival and work under his direction in emergency control operation.

The responsibilities and duties of the Deputy Incident Controller will be as defined for the Site Incident Controller. In addition he will ensure the following:

He will:

- In the event of an emergency, caused due to any incident in the plant, he will immediately actuate plant level emergency siren (hooter) to warn the field personnel, contractors' employees, etc. and also arrange for announcement about the emergency and necessary instruction for them for assembling at the safe assembly point or evacuation, etc.
- Ensure that the SSM and senior plant personnel have been informed about the emergency

Fire Services Personnel

Main role of Fire Services personnel is fire fighting and rescue operations, helping in operations like, prevention of loss of containment of hydrocarbon, spill/leak containment, etc. Their main responsibilities and duties are described specifically as below:

Chief of Fire (or next senior most fire personnel available)

- He will be the Key Personnel for the Fire and Safety Services at the incident scene and co-ordinating and commanding all the related operations in consultation with the Site Incident Controller
- He will report at the Field command Post (Incident Site) immediately after receiving the information about an emergency at site, contact the Site Incident Controller and the first turn out leader for necessary information/advice to decide control strategies
- He will take overall command of fire fighting/rescue operations and other measures as necessary to control and mitigate the situation and lead the fire fighting crew including outside / mutual aid fire fighting teams.
- He will assess the severity/magnitude of the situation and decide the level of the emergency in consultation with the Site Incident Controller and inform the Site Main Controller (Primary Command Post) at ECC. He will also advise him for declaring on-site emergency (if necessary)
- He will call for additional resources/help from other Depts. (AFS personnel), mutual aid members, etc. through Primary Command Post as necessary and deploy them appropriately for fire fighting and rescue operation at the incident scene. He will also co-ordinate with other key personnel
- He will ensure that sufficient personnel protective equipment, masks, Breathing Air sets, Spare Breathing Air, Cylinders etc. are available at the field Command Post for use by the crew members and ensure that no one access the "Hot Zone" without adequate personnel protection. He will call for logistic support (mobilising additional supplies through Primary Command Post (Site Main Controller/HSE&F Co-ordinator)
- He will keep constant contact with Primary Command Post and seek decision support from the Site Main Controller in critical matters/operations and also inform him, if other plants in the complex or surrounding population are likely to be affected
- He will co-ordinate with Security Key Personnel for access control and barricading the affected area in order to prevent vehicular movement
- He will assist in rescue and first aid operations

Shift Fire Officer (Riding Officers)

- Upon receiving emergency call/alarm, he will quickly prepare for the fire turn out and mount the leading fire tender along with the crew members and rush to the incident site taking a safe route of entry considering the wind direction.
- Report to the Dy. Incident Controller/the Incident Controller and Position the Fire Tender strategically at a location in consultation with the Dy. Incident Controller/the Incident Controller
- He will decide the line of action for fire fighting and/or other control actions at the scene in consultation with the Dy. Incident Controller/Incident Controller and take appropriate actions for fire fighting and control Measures
- He will guide and lead the fire fighting crew in fire fighting and rescue operation till the arrival of F&S Key person (the Chief of Fire or next senior most person)
- He will ensure the safety of the crew members and that crew members are fully equipped with necessary personnel protection prior to enter "Hot Zone"
- He will assess the severity of the situation and may call for second turnout/additional help through the Dy. Incident Controller/Incident Controller (Field Command Post)
- He will keep constant contact with the key personnel (F&S) at the Field
- Command Post and inform about the situation and probable developments

Firemen on Duty at the Fire Control Room

[The fireman on duty at the Fire Control Room will acknowledge the emergency alarm received on the panel and promptly note the plant area/where the incident occurred

- He will note down the information, if emergency call is received through telephone, hot line or messenger
- He will sound the fire bell to inform the fire crew to get ready and take their positions, simultaneously brief the Shift Fire Officer about the emergency message
- He will intimate the Site Shift Manager and the Security Dept. about the emergency giving short description about the occurrence (if known)
- He will actuate emergency siren after receiving instruction from Primary Command Post (Site Main Controller/HSE&F Co-ordinator)
- He will ask telephone operator to pass on to the communication about the emergency to the Auxiliary Fire Squad of all the plants/selected plants on receiving the instruction from HSE&F Co-ordinator/Site Main Controller
- He will always be ready and alert for receiving any message / instructions from Primary Command Post/Field Command Post

Auxiliary Fire Squad Members

AFS Members shall be ready on hearing emergency siren and will report to site incident controller at site (Field Command Post) on receiving message from ECC

- They will do the fire fighting under the instruction of Shift Officer. Help to bring fire fighting equipment from nearby plants
- AFS Members of the plant under emergency will immediately go to the emergency site and will start first aid fire fighting.
- As per the emergency situation they will use the fixed fire fighting equipment to protect plant equipment from heat exposure.
- They will guide non-essential personnel in case of evacuation
- They will do monitoring/closing of storm water drains if required
- They will help key personnel for taking action on site. Help to Security Personnel for traffic Control

Non-essential Personnel

The plant employees, contractors' employees, visitors, etc., (other than emergency response personnel) present at the incident site are not required to be present at the incident site during the emergency at the site. In the event of declaration of an emergency in the plant/area, these persons shall quickly assemble at the safe assembly point of the plant/area and shall respond as instructed by the Site Incident Controller.

Instruction to the Non-essential Personnel

- Do not panic. Ensure that persons in your immediate vicinity are warned
- Remain alert for announcement from the Control Room, such "Proceed to Safe Assembly Point" and act accordingly
- Do not rush to the scene to be a spectator
- Await instructions at the Assembly Point, report your presence to the superiors/ or the Site Incident controller, inform his whereabouts of your colleagues if they have not arrived
- Do not engage telephone/talk back system and other communication channels, unnecessarily
- Do not approach Control Centres without urgent/or important reasons
- If you are not assigned any specific role, move away as directed
- Do not offer non-authentic information/unconfirmed facts/fact/or conjecture

Telephone Operator

At the time of emergency, communications both inwards as well as outward are very essential and telephone operator's swift action becomes very important. He plays very important part in communicating information/messages to the concerned personnel/outside agencies/mutual aid members/staff members etc. and also receiving a large numbers of outside calls. His main responsibilities and duties are as below:

- He will keep the board free to the extent possible for incoming calls
- He will immediately convey message to the "Key Personnel" and the "Coordinator" about the emergency as per the instruction of the Site main controller.
- The telephone operator will follow instructions from the Site Main Controller/or Media Co-ordinator only, for passing on any information to outside agency about the emergency or direct all such queries to the media co-ordinator for appropriate reply.
- As far as possible he should not entertain unknown/unimportant outside calls/inquiries during initial few hours of the emergency

HSE & F Coordinator

- He will report at the Emergency Control Centre (Primary Command Post) immediately after receiving information about the emergency. He will assist the Site Main Controller for taking critical decisions and provide necessary advice and information
- He will co-ordinate with Key Person (Fire & Safety) and will assist the Site Main Controller for providing decision support and resources support to the Key Persons (F&S), as may be necessary
- He will arrange for mobilizing off-duty fire personnel from their residence; and call other members of the staff for assistance
- He will ensure that the AFS members have been called for assistance and liaise with mutual aid members / Fire Brigade for mobilization of additional resources
- He will co-ordinate with the materials/stores co-ordinator and mobilize additional resources, viz., spillage containment equipment/fire fighting equipment/material, personal protective equipment, spare breathing air cylinders, etc., as may be required at the incident site for control measures

- He will liaise with Factory Inspectorate / Pollution Control authorities in consultation with the Site Main Controller and provide necessary information. He will also ask for the help, if necessary to evacuate neighbouring area outside the complex as advised by the Site Main Controller
- He will organize relieving groups for fire fighting
- He will also initiate necessary actions to minimise impact on Environment

Medical Coordinator

The Chief Medical Officer (or the next in command available at site) will be the Medical Co-ordinator and perform the following duties:

- He will contact the Site Main Controller immediately after receiving the information about the emergency
- He will report immediately at the Emergency Control Centre (Primary Command Post) or OHC as instructed by the Site Main Controller and contact the Key personnel (Medical) and take stock of the situation
- He will assist and advise the Site Main Controller in all critical decisions in the area of health/medical services to the affected persons and keep constant liaisons with him
- Organize rescue and first aid arrangements for the affected persons at the site in the "cold Zone", as may be necessary with essential staff/equipment and post additional ambulance for transporting seriously injured persons
- Ensure that adequate paramedical staff, equipment and medicines are available at the OHC. He will mobilize additional resources from neighbouring industries, if necessary
- To liaise with the Local Medical Authorities and City Hospitals, if the casualties are more and situation demands treatment at additional medical centres
- To co-ordinate with the Transport Co-ordinator for transporting victims to various hospitals
- To arrange for additional ambulances from other hospitals/ Municipal Corporation
- The Medical Co-ordinator should ensure the upkeep of agreed medical supplies, antidotes and equipment that should always be kept in stock for treating victims of burns and hazardous chemicals. The medical authorities should be aware of the type of treatment to be administered.
- He will liaise with the media co-ordinator for release of news to the press

Security Co-coordinator

The Chief of Security or the next in command available at site shall be the Security Co-ordinator. He will have the following duties / responsibilities:

- He will instruct and deploy plant security personnel to ensure that the law and order is maintained; and unnecessary gathering of the personnel at the scene of emergency is prevented and ensure control of traffic movement in and out of the factory areas
- He will instruct the security personnel / Security Gates to direct and guide external emergency vehicles (Fire tenders/ambulances etc.) called for assistance/help from neighbouring industries/Local administration, to the scene of incident
- He will instruct security personnel who could be spared to assist Site Incident Controller/Key Personnel (fire and Safety) in fire fighting and evacuation of personnel, at the Incident Site
- He will take action to regulate traffic movement and prevention of traffic jams inside the works as well as outside the factory gates for proper and speedy movement of the emergency vehicles, ambulances, other vehicles carrying outside resources, etc.
- He will mobilize additional security force for help, as necessary

- He will liaise with the police and other local authorities for external help, a necessary for evacuation of the neighbouring areas outside the factory premises in consultation with the Site Main Controller
- If necessary, he will arrange for announcement through the mobile P.A. system for alerting and instructing the population in the surrounding areas as directed by the Site Main Controller

Engineering Co-coordinator

- He will report to the Site Main Controller at the Emergency Control Centre
- (Primary Command Post) immediately after receiving information about Onsite emergency.
- He will take stock of the situation and assist/advise the Site Main Controller in deciding control strategies.
- He will mobilize the team from the Maintenance Dept. to assist the Site Incident Controller in control operation at the Field Command Post.
- Arrange isolation of electrical lines from distribution point/substations as required by the Site Incident Controller by calling the Electrical Engineer / Electricians.
- Provide all other engineering support, as may be required.
- Liaise with Key Personnel (Eng. /Maintenance) and co-ordinate with other groups.

Communication Coordinator

Communication Co-ordinator plays very important part at the time of an emergency particularly when extensive disruption of services takes place. He has the following duties and responsibilities:

- To ensure all available communications links remain functional.
- To quickly establish communication links between the Field command Post and (if this happens to be in remote off site area) and the Primary Command Post.
- To arrange for announcement on the public address system and maintain contacts with congregation points like canteen, main gate, control rooms etc.
- To ensure that previously agreed inventory of various types of communication equipment is maintained in working condition and frequent checks are carried out and records maintained.
- To maintain voice record of significant communications with timings received/passed from the Primary Command Post.
- To provide additional/alternate communication facilities as required at the site.

P&A Coordinator

He will report at the Primary Command Post (ECC) immediately after getting information about an emergency at the site and assist/advise the Site Main Controller in taking important decisions in the matters related to welfare/necessities/of emergency personnel at site, care/needs of the affected persons. His duties and responsibilities include the following:

- He will ensure that a record of affected personnel is prepared with their local/permanent addresses and telephone numbers
- He will ensure that the relatives of the affected personnel have been informed
- Assign officials at the hospitals to look after the needs of the affected personnel under medical treatment
- Co-ordinate with the Finance Co-ordinator for necessary funds required to cater the needs of affected personnel, emergency purchases and for other requirements
- To arrange for refreshments, snacks, food, and other needs as may be required for the emergency personnel from time to time
- Co-ordinate with the Purchase Co-ordinator for necessary emergency procurement of necessary items

- Ensure that staff personnel as necessary for assistance and help are informed/called from their residences
- He will co-ordinate with the instruct Key Personnel transport/welfare & canteen for mobilizing additional resources, as may be required
- To co-ordinate with the neighbouring industries for additional vehicles/ambulances and other resources as may be required
- To liaise with the Local Administration for additional assistance/help as may be needed

Transport Coordinator

The Transport Co-ordinator shall perform the following duties, mobilize all available company's vehicles for emergency use along with the drivers:

- Arrange for transport of victims to hospitals/dispensaries
- Arrange for duty rotation of the drivers to meet the emergency situation
- To direct re-fuelling of the vehicles
- To co-ordinate with the neighbouring industries for additional vehicles / ambulances as may be required
- To co-ordinate with the neighbouring industries for additional vehicles / ambulances as may be required
- To arrange for vehicles from outside local transport agencies, if required
- To keep in contact with the Site Main Controller for evacuation of personnel and transportation of victims

The Welfare / Canteen Coordinator

The Welfare Co-ordinator will have the following responsibilities:

- Ensure that casualties receive adequate attention and arrange additional help (ex-gratia payment etc.), if required with consultation with the Chief Co-ordinator
- Inform the relatives of the victims
- When emergency is prolonged, he will arrange for relieving personnel and organize refreshment / catering facilities and arrangements for their rest (bedding, and other necessities)
- He will arrange to procure and keep stocks of necessary food items and other necessary supplies as may be required for the personnel working round-the-clock
- He will arrange for hot drinks /snacks and food and other necessary items for emergency response personnel, as required

Media Coordinator

The Media Co-ordinator will co-ordinate the following under the direction of the Site Main Controller (The Chief Co-ordinator):

- He will liaise with various media and release written statements to the press through prior concurrence of the Chief Co-ordinate
- He will handle media interview with various media groups make arrangements for televising the information about the incident, the number of casualties, etc.
- He will inform State and Central Government and the statutory bodies of the nature and magnitude of the incident, the number of casualties, etc.
- He will locate himself such that media persons/third parties do not need to go past the complex security gates and that adequate communication links exists.
- Media personnel often insist on visiting incident scene. He will escort media team(s) If such visits are approved by the Chief Co-ordinator
- He will be in constant contact with the Medical Co-ordinator, and other coordinators to be aware of latest development and closely liaise with the Chief Co-ordinator

Finance Coordinator

- He will report at the Emergency Control Centre immediately after getting information about the emergency at site
- He will release finance (cash / cheques, etc.) as directed by the Site Main Controller (Chief Co-ordinator)
- He will assist the Purchase Co-ordinator for emergency procurement.
- He will liaise with Insurance Company personnel as directed by the Site Main Controller.

Purchase Coordinator

- The Purchase Co-ordinator will report at the Emergency Control Centre as soon as he is informed about an emergency at site
- He will assist the Site Main Controller and arrange for emergency purchase of necessary items as may be required during the emergency.
- He will co-ordinate with the Materials Co-ordinator and other co-ordinator for necessary emergency items to be procured
- He will mobilize necessary manpower as may be required, etc.

Materials Coordinator

The Materials Co-ordinator will ensure:

- Availability of the materials required by the Site Incident Controller
- Arrange issues of materials from the General Stores round-the-clock during an emergency
- Arrange emergency procurements from local dealers / vendors or from neighbouring industries
- Arrange transportation of materials from General Store to the Incident Site in co-ordination with the Transport Co-ordinator

2.11 Off-site Disaster Management Plan

Emergency is a sudden unexpected event, which can cause serious damage to personnel life, property and environment outside the boundary wall of the refinery as a whole, which necessitate evolving Off-site Emergency Plan to combat any such eventuality. In Offsite disaster management plan, many agencies like Revenue, Public Health, Fire Services, Police, Civil Defence, Home Guards, Medical Services and other Voluntary organization are involved. Thus, handling of such emergencies requires an organized multidisciplinary approach.

Evacuation of people, if required, can be done in orderly way. The different agencies involved in evacuation of people are Civil Administration (both state and central), non Govt. organizations, factory Inspectorate and Police authorities.

Fire

Effects of fire on population will be mainly due to thermal radiation. In such cases, houses situated to the proximity of disaster need to be evacuated, although a severe smoke hazard due to fire is to be reviewed periodically.

Explosion

An explosion will give a very little time to warn population and areas affected may be much longer than that in case of fire. The effects of explosion on population will be mainly due to shock waves, flying splinters, collapse of structures and exposure to thermal radiation.

Toxic gas/vapour release

A toxic gas release will generally threat much larger area and population, exposed to the drifting cloud of toxic gases and vapours. The time available for warning population will depend on the point of release, wind direction and velocity.

Huge oil spillage may lead to escape of Oil out-side the factory premises and take the route of our effluent discharge channel. People outside the complex may be warned not to collect oil and provide any source of ignition to create fire in the effluent discharge channel.

The purpose of the off-site disaster management plan is:

- To save lives and injuries and to prevent or reduce property losses
- To provide for quick resumption of normal situation or operation
- To make explicit the inter related be suggested if necessary
- To make explicit inter related set of actions to be undertaken in the event of an industrial accident posing hazards to the community
- To inform people and surrounding about emergency and disaster if it is likely to adversely affect machinery will be established for this purpose to guide the people in proper way
- To plan for rescue and recuperation of casualties and injuries. To plan for relief and rehabilitation
- To plan for prevention of harms, total loss and recurrence of disaster. It will be ensured that absolute safety and security is achieved within the shortest time

Before Crisis

This will include the safety procedure to be followed during an emergency through posters, talks and mass media in different languages including local language. Leaflets containing do's/ don'ts before and during emergency should be circulated to educate the people in vicinity.

- People in vicinity of hazardous installation, and others who are potentially affected in the event of an accident, should be aware of the risks of accidents, know where to obtain information concerning the installation, and understand what to do in the event of an accident
- Non-governmental Organizations (NGO's) (Such as environmental, humanitarian and consumer group) should motivate their constituents and others, to be involved in risk reduction and accident prevention efforts.
- They should help to identify specific concerns and priorities regarding risk reduction and prevention, preparedness and response activities.
- NGO's should facilitate efforts to inform the public and should provide technical assistance to help the public analyse and understand information that is made available
- Public authorities (at all levels) and management of hazardous installation should established emergency planning activities/program's for accidents involving the hazardous substance.
- All parties who will be involved in emergency planning process. In this respect public health authorities, including experts from information centres should be involved in relevant aspects of offsite emergency planning
- Emergency warning alert system should be in place to warn the potentially affected public, or there is an imminent threat of an accident.
- The system chosen should be effective and provide timely warning. Suitable warning system could include or a combination of for e.g.: sirens, automatic telephone message, and mobile public address system.

During Crisis

Central Control Committee: As the off-site plan is to be prepared by the government a central control committee shall be formed under the chairmanship of area head. Other officers from police, fire, factory, medical, engineering, social welfare, publicity, railway, transport and requisite departments shall be incorporated as members. Some experts will also be included for guidance. The functions of committee should be:

- To work as main co-coordinating body constituted of necessary district heads and other authorities with overall command, coordination, guidance, supervision, policy and doing all necessary things to control disaster in shortest times
 - To prepare, review, alter or cancel this plan and to keep it a complete document with all details
 - To take advice and assistance from experts in fields to make plan more successful
 - To set in motion all machineries to this plan in event of disaster causing or likely to cause severe damage to public, property or environment
 - The incident control committee, traffic control committee and press publicity committee will first be informed, as they are needed first.
- Medical Help, Ambulance and Hospital Committee: This committee consisted of doctors for medical help to the injured persons because of disaster. Injuries may be of many types. As such doctors are rarely available we have to mobilize and utilize all available doctors in the area.

Functions and duties of the committee include:

- To give medical help to all injured as early as possible
 - Civil surgeon is the secretary who will organize his team
 - On receiving information to rush to spot he will immediately inform his team and will proceed with all necessary equipment's.
 - First aid and possible treatment shall be provided at the spot or at some convenient place and patients may be requested to shift to hospitals for further treatment.
 - All efforts shall be made on war basis to save maximum lives and to treat maximum injuries.
 - Continuity of the treatment shall be maintained till the disaster is controlled.
- Traffic Control, Law and Order: The committee is headed by District Superintendent of Police. Functions and duties of this committee should be:
 - To control traffic towards and near disaster, to maintain law and order
 - To evacuate the places badly affected or likely to be affected
 - To shift the evacuated people to safe assembly points
 - To rehabilitate them after disaster is over.
 - Necessary vehicles, wireless sets and instruments for quick communications shall be maintained and used as per need

After Crisis

At the time of disaster, many people may badly be affected. Injured people shall be treated by medical help, ambulance and hospital committee, but those not injured but displaced kept at assembly points, whose relative or property is lost, houses collapsed and in need of any kind of help shall be treated by this welfare and restoration committee. Functions and duties of this committee are:

- To find out persons in need of human help owing to disastrous effect.
- They may give first aid if medical team is not available
- They will serve the evacuated people kept at assembly points. They will arrange for their food, water, shelter, clothing, sanitation, and guidelines to reach any needful places
- They will look for removal and disposal of dead bodies, for help of sick, weak, children and needy persons for their essential requirements

- The team will also work for restoration of detached people, lost articles, essential commodities etc.
- The team will also look after the restoration of government articles
- The team will also ensure that the original activities, services and systems are resumed again as they were functioning before the disaster

Police Department

- The police should assist in controlling of the accident site, organizing evacuation and removing of any seriously injured people to hospitals.
- Co-ordination with the transport authorities, civil defence and home guards
- Co-ordination with army, navy, air force and state fire services
- Arrange for post mortem of dead bodies
- Establish communication centre
- Fire Brigade
- The fire brigade shall organize to put out fires and provide assistance as required.

Hospitals and Doctors

- Hospitals and doctors must be ready to treat any injuries.
- Co-ordinate the activities of Primary Health Centres and Municipal
- Dispensaries to ensure required quantities of drugs and equipment's
- Securing assistance of medical and paramedical personnel from nearby hospitals/institutions
- Temporary mortuary and identification of dead bodies

- **Media**

- The media should have ready and continuous access to designated officials with relevant information, as well as to other sources in order to provide essential and accurate information to public throughout the emergency and to help avoid confusion
- Efforts should be made to check the clarity and reliability of information as it becomes available, and before it is communicated to public.
- Public health authorities should be consulted when issuing statements to the media concerning health aspects of chemical accidents.
- Members of the media should facilitate response efforts by providing means for informing the public with credible information about accidents involving hazardous substances.

Non-governmental organizations (NGOs)

- NGO's could provide a valuable source of expertise and information to support emergency response efforts. Members of NGOs could assist response personnel by performing specified tasks, as planned during the emergency planning process. Such tasks could include providing humanitarian, psychological & social assistance to members of community and response personnel.

Duties of NGOs are listed below:

- Evacuation of personnel from the affected area
- Arrangements at rallying posts and parking yards
- Rehabilitation of evacuated persons
- Co-ordination with other agencies such as police, medical, animal husbandry, agriculture, electricity board, fire services, home guards and civil defence.
- Establishing shelters for rescue, medical, fire fighting personnel.
- Evacuation of personnel from the affected area
- Arrangements at rallying posts and parking yards

- Rehabilitation of evacuated persons
- Co-ordination with other agencies such as police, medical, animal husbandry, agriculture, electricity board, fire services, home guards and civil defence.
- Establishing shelters for rescue, medical, fire fighting personnel.

2.12 Mock Drills

As per the Industrial Major Accident Hazard Rules,

- (a) The occupier shall ensure that a mock drill of the on-site emergency plan is conducted every six months.
- (b) A detail report of the mock drill conducted shall be made immediately available to the concerned authority.

Accordingly, Onsite Disaster Mock Drills are conducted once in six months.

Also, Major Fire and Minor Fire mock drills are conducted once in three months and one month respectively.

Lessons Learned System for Mock Drills

Performances during the mock drills are reviewed by CEC Co-ordinators and other involved persons including observers. Observations/shortcomings are reviewed and recommendations are made for improvements which are followed by F&S for compliance. The action points from the mock drill observations should be circulated to all concerned for liquidation.

All Clear / Re-entry Procedures

Chief Emergency Controller (CEC) will declare "All Clear" after control of the Incident and arrange measures required for post Disaster control period and ask Fire Station to Blow 2 minutes straight run siren.

After incident normalization, CEC would ask Unit in-charge to visit and check the incident site along with representatives of Inspection and F&S and also Maintenance (Electrical / Mechanical / Civil/ Instrumentation/ Rotary) as needed. Standard Checks particular to a unit will be provided by respective Area Managers. Based on feedback of the team, CEC would allow re-entry / resumption of operations at the incident site.

Evacuation Plan

Purpose

To establish method of systematic, safe and orderly evacuation of all the occupants in case of fire or any emergency, in the least possible time, to a safe assembly point through nearest safe means of escape. Additionally to use available fire appliances provided for controlling or extinguishing fire and safeguarding of human life.

Fire Escape Drill Procedure

- In the event of fire condition or on hearing the fire alarm all the occupants of the building shall immediately leave the work area and proceed towards nearest safe escape route. A care should be taken before leaving the workplace so that the escape route shall not be blocked due to chairs or other similar object.
- Security In-charge will ensure the access control system is defeated for safe evacuation of all the occupants from the affected building.
- The occupants will have to leave the affected area / block / building in a speedy and orderly manner.

- Before leaving the workplace occupants will switch off electrical gadgets such as AC, Computers, Water heaters, etc. The area owner of the building will ensure electric supply cut off to the affected building.
- The emergency exit / normal exit if not affected due to fire and / or smoke shall be used for speedy evacuation.
- All occupants will follow in a row while escaping from the block / building. Unnecessary haste and crowding shall be avoided on the escape route. Panic actions of the occupants will definitely delay the evacuation.
- The occupants having visitors shall ensure the safe evacuation of the visitor along with them to the safe assembly point.
- Efforts shall be made to control or extinguish the fire with the help of available fire extinguishers in that area.
- Building / block in-charge shall ensure the safe escape and orderly evacuation of all the occupants.
- All occupants after being evacuated shall assemble at designate safe assembly point. Block/building in-charge will arrange for head count to ensure that all the occupants have been safely evacuated.
- Security in-charge shall ensure that all the visitors have been evacuated as per visitor entry register/gate pass register. The visitors shall evacuate from the building / block along with the occupants and report to security in charge.
- The missing/suspected trapped occupants will be searched and rescued by the fire crew.
- Upon All-Clear signal from the incident controller, occupants can go back to their work place.

Do's

- Leave your workplace immediately and rush through safe escape route.
- Evacuate in a speedy but orderly manner.
- Help elderly and handicapped persons for evacuation.
- Assemble at safe assembly point and report to your floor coordinator.

Don'ts

- Panic.
- Re-enter in the affected building.

Training

On job training to the engineers on various facets of risk analysis would go a long way in improving their horizon which in turn is expected to reflect in the operation of plant, especially from the safety stand point. In order to combat with emergency situations arising out of accident release of hazardous chemicals, it is necessary for industries to prepare an exhaustive offsite and onsite emergency preparedness plan. The fire crew belonging to the fire fighting department shall be given intensive training for the use of all equipment and in various fire fighting methods for handling different types of fires.

2.13 Checklist for Capability Assessment

The checklist will help in assessing the preparedness, prevention and response resources capabilities. The points included in the checklist are only indicative and there is a need to closely examine the local requirements while preparing the checklist.

For good control and management of an incident, there are three important requisites.

- Defined Organisation

- Effective means
- Trained people

The organisation has to be properly structured for routine as well as emergency purposes with clear understanding of duties and responsibilities. The structure has to consider an execution and speedy implementation of the response plans; while at the same time, it should be flexible enough to tune itself to the fast changing situations. All plans and procedures for emergency handling should be established. Checklists in the form of Do's and Don'ts of preventive maintenance, strengthening of HSE, manufacturing utility staff are listed in the subsequent subsections. Work permit check list is described below:

Work permit check list is described below:

Sl. No.	Precaution to be taken	Yes	No
1.	Electrically isolated and fuse removed. Lock out-Tag out (LOTO) followed		
2.	Flow isolated by closing valves		
3.	De-pressurized – vacuum released		
4.	Vessel cooled		
5.	Drained fully and drain kept open		
6.	Vent kept open		
7.	Manhole kept open		
8.	Vessel purged with steam		
9.	Vessel purged with water		
10.	Vessel purged with nitrogen/ air		
11.	Vessel free from toxic gases/vapours/ flammable substances		
12.	Gas test shows > 20% oxygen inside vessel		
13.	Safety tags card placed wherever required		
14.	Personal PPE's provided		
15.	Exhaust / ventilation inside vessel is sufficient		
16.	Caution boards placed		
17.	Tools and tackles checked as per specifications		
18.	Head count of the area known to relevant persons		
19.	Trained Site supervisor nominated		
20.	Safety measures such as hydrant, alarms, sensors checked		

Fire Emergency and Safety Preparedness Plan

Maheshkhali Economic Zone-III

Dhalghata, Cox's Bazar, Bangladesh

Table of Contents

Purpose	1
Definitions	1
Responsibilities	1
General Principle of Fire-fighting	1
Fire Preparedness and Planning	1
Records.....	4

Fire Emergency and Safety Preparedness Plan

Purpose

The action plan is for use in the event of a fire incident, if any at the proposed project. The primary objectives of plan are to save lives, prevent injuries and eliminate or minimize damage to property.

Definitions

Safety plan for project operation: A diagram of proposed plant is indicating the location of and safety and fire protection equipment will be prepared. This plan is to be displayed in the entrance to the plant.

Responsibilities

- A. Plant in Charge : Overall responsibility
- B. Fire Marshal : Responsible for implementation and
- C. Employees : Compliance with plant manager's Directions.

General Principle of Fire-fighting

- A. The safeguarding of life and safety of personnel shall take precedence overall other considerations when determining the actions to be taken in case of fire
- B. The key to successful firefighting is to take action quickly to suppress, extinguish, or control the fire before it can become established or spread further
- C. A fire requires three elements in order to start and to be sustained|
 - i. H e a t
 - ii. O x y g e n (Air)
 - iii. Fuel.

These elements form the triangle of fire. If any one of these elements is removed the fire will be extinguished.

- D. All firefighting efforts should be based on the triangle of fire and should aim at eliminating one or more of the three essential elements

Fire Preparedness and Planning

- A. The plant and its personnel must be prepared to respond to a fire at all times regardless of operating status
 - 1. The plant manager shall ensure that all fire-fighting equipment is maintained in a constant state of readiness and is available to personnel
 - 2. It is the responsibility of the plant manager and every supervisor to ensure that the employees under their supervision know how exit the plant in a fire emergency. An ordinary evacuation depends on both adequate warning and employee awareness of the proper procedures. State of readiness by conducting weekly fire drills
 - 3. The plant manager shall establish an emergency organization consisting of a selected number of employees, organized and trained, to deal effectively with fires, explosions, and similar occurrences
 - 4. The plant manager shall ensure that procedures and check lists are maintained and kept current for after-hours notification of key personnel

when the facility is operating at less than normal complement or shutdown

5. Proposed change in facility layout, materials, operation and construction shall be reviewed by unit safety and fire prevent personnel as early in the planning stage as possible to establish necessary fire prevention and control measures
- B. The plant fire marshal shall inspect the plant daily to ensure that all fire-fighting equipment is in place and available for use, as well as to identify any potential fire hazards
1. Emergency exits and routes leading to them shall be clearly identified by signs
 2. Current standard on construction, dimensions, lighting and number of exits required by safety codes shall apply in designating exits
- C. A program of fire-fight training shall be established by the fire marshal under the direction of the plant manager. This program shall ensure that all personnel are familiar with:
- a. The fire-fighting equipment at the plant
 - b. Fire-fighting techniques
 - c. The fire emergency preparedness plan.
2. The plant fire-fighting plan shall be posted at various strategic locations throughout the plant, including in the control room. This plan shall include a floor plan drawn to indicate the emergency exits, the procedure for sounding an alarm and evacuation instructions
3. If possible, the safety committee shall arrange for key emergency instruction and telephone numbers from plan to be highlight in the plant's internal directory
- D. A set of master keys providing access to all doors will be maintained in a special fire locker within the control room
- E. Interface with local fire department
1. Plant management through the fire marshal, shall establish an interface with local fire department and shall establish an action plan for action plan for use in case the local fire department is called to respond to emergency
 2. The action plan shall:
 - a. Establish a protocol for responding to an emergency call from the plant
 - b. Define the types of firefighting equipment to be used at the plant
 - c. Ensure that the fire department has access to the facility
 - d. Determine who will be in overall command of fire-fighting efforts.
 - e. Clearly establish actions to be taken by the fire department in response to different types of fire and different types of fire and different sections for example, oil storage tank fires, electricity fires and lubricant store fire etc.
 3. The fire marshal shall ask the fire department to become familiar with the plant and to participate in firefighting training conducted at the plant.

4. The plant manager shall also ensure that the fire department can connect directly to the plant fire-fighting system without on the spot modifications.

F. Special fire-fighting procedures are to be posted at fixed firefighting operating stations such as the control room CO2 flooding station, the separator room and so on.

G. Training

1. Fire awareness training shall be given to all plant personnel as a part of new employee orientation
2. Fire- fighting training and qualification examinations will be given to all plant operating staff and to maintenance staff. Selected personnel will be required to attend advanced fire-fighting course
3. Specialized training shall be provided to persons with responsibilities for maintenance of fire- fighting equipment, related systems and supplies
4. The fire marshal must attend advance fire-fighting course and demonstrate a complete understanding of the plant procedures and fire- fighting system
5. The fire marshal shall coordinate with the local fire department and shall arrange for joint fire- fighting training at the plant site

H. Fire Drills

1. Each location shall establish an evacuation procedure to be followed in fire drills and emergencies
2. Each location shall have an alarm system or other suitable means to alert the occupants to the need for evacuation
3. The plant manager shall conduct weekly fire drills to:
 - a. Demonstrate the operational readiness or fire-fighting equipment
 - (1) During each drill, the fire pump and at least one fire hose should be operated for a minimum of ten minutes.
 - (2) The fire hose used in weekly drill should be rotated.

1. Personnel Response to a fire alarm (Drill or emergency)

- a. Take whatever immediate steps are necessary and feasible to minimize any hazard in leaving the working area unattended.
- b. Do not use elevators for evacuation purposes.
- c. Do not reenter facilities until the "All clear" signal sounds or clear verbal instructions to reenter are given by responsible authority.

2. Supervisor Response to a fire alarm (Drill or emergency)

- a. Direct the evacuation of your area and account for personnel.
- b. Advise the responding authority of the situation and warn of potentially hazardous conditions.

3. If a fire Occurs

- A. In all cases, immediately raise the alarm by operating local fire alarm buttons
- B. Assess the situation to determine if the fire can be extinguished easily. If so attempt to fight the fire using available equipment
- C. If the fire is large or has the potential to become large:
 1. If possible, isolate the air supply and/or the fuel supply to the fire. This may include shutting down vent fans, closing ventilators and closing fuel supply valves
 2. Stop any operating equipment. Shut down engines adjacent to the fire. Bear in mind that shutting down the plant completely will cause a black out and may make fire-fighting difficult
 3. Attack the fire using the appropriate equipment. Be aware of potential electrical shock hazards when using water to fight a fire
- D. In all cases, the shift supervisor shall initiate a call to the local fire department and notify others according to the fire emergency notification and response lists in attachment.
- E. If the fire is too large or cannot be readily extinguished by actions of one person, a firefighting team should be assembled under the direction of the person designated to be in charge. Based on the individual circumstances the approach will be some appropriate combination and sequence of the following:
 - a. Contain the fire. Use hoses or the means to restrict the fire to as small an area as is practically possible. If necessary, use boundary cooling.
 - b. Isolate the fuel supply by closing all supply valves to the equipment or area.
 - c. Isolate or minimize the air supply to the fire by closing vents and dampers and shutting down vents fans.
 - d. Attack the fire using appropriate means. F.

After a fire

1. Post a fire watch for at least 30 minutes after any fire. In the case of larger fires, a longer fire watch may be necessary.
2. The operations supervisor or maintenance supervisor shall prepare an incident report. The plant manager shall distribute copies of the incident report for any fire at the plant to the owner and to the General Manager operation, with a copy retained on file.
3. The plant manager shall hold a debriefing to review the action taken during the fire and to emphasize "lessons learned". Any recommendations for changes in this procedure or in the plant fire- fighting plan, as deemed appropriate, should be made to the safety committee.

Records

- A. All records are to be maintained for three years.
- B. Superseded copies of the procedure are to be retained on file for three years.

Waste Management Plan

(National 3R Strategy)

for

Maheshkhali Economic Zone-III

Dhalghata, Cox's Bazar, Bangladesh

Table of Contents

1.1	Inventory of hazardous waste generation.....	1
1.2	Waste avoidance and waste minimization at source.....	1
1.3	Reuse, recovery and recycling of hazardous waste	1
1.4	E-waste	1
1.5	Encourage cleaner production and eco-design practice	1
1.6	Encourage the use of Environmental Product Labeling	2
1.7	Encourage the implementation of Environmental Management Systems (EMS),	2
1.8	Safe disposal of hazardous waste	2
1.9	Setting up of Common Treatment, Storage and Disposal Facilities (TSDFs)	2
1.10	Transportation of hazardous waste	2
1.11	Use of cement kilns for hazardous waste incineration	2
1.12	Illegal dump sites and remediation.....	2
1.13	Strengthening the infrastructure of regulatory bodies.....	3
1.14	Disposal of date expired drugs & pesticides:.....	3
1.15	Handling and management of hazardous waste during ship dismantling:	3

Waste Management Plan

Hazardous Waste of Industry

1.1 Inventory of hazardous waste generation

Since industries change their products, processes and capacity of production, and new industries get established periodic, updating of inventories is required. It should be made mandatory on the part of industries to report changes/additions in hazardous waste generation and steps taken to reduce generation of waste per unit of production. Industries will be required to store hazardous waste for a period not exceeding 90 days and shall maintain a record of sale, transfer, storage, recycling and reprocessing of such wastes unless agreed by DoE. The waste could either be recycled /reused or disposed of in captive or common Treatment, Storage and Disposed Facilities (TSDF) available in the country, or be incinerated. Inventories of 'end of life' consumer products such as e-waste are also required to be made.

1.2 Waste avoidance and waste minimization at source

In the hierarchy of waste management, waste avoidance and waste minimization have to be attempted first, for which dissemination of information on technological options should be a continuing exercise. Promote implementation of recovery of resources such as solvents, other reagents and by-products as well as re-generation of spent catalysts in a time frame manner.

1.3 Reuse, recovery and recycling of hazardous waste

Industrial associations/industries should explore options/ opportunities of reusing, recovery and recycling of hazardous waste in an environmentally sound manner. Establishment of 'Waste Exchange Banks/ Centers' should be encouraged to provide information on wastes and promote reuse, recovery and recycling technologies which upscale the quality of resource recovery. Introduce payback scheme as part of extended corporate responsibility in case of lead-acid batteries. Develop a system for channel sing of wastes containing toxic metals for recovery, such as mercury from thermometers and fluorescent tube lights, cadmium from batteries etc.

1.4 E-waste

The recycling of e-waste is required to be regulated due to presence of hazardous constituents in the components of waste electrical and electronic assemblies. Governments should encourage e-waste recycling projects under public-private partnership mode.

1.5 Encourage cleaner production and eco-design practice

Encourage cleaner production and eco-design practice within each manufacturing sector: This is a process which minimizes environmental impact across the product life cycle, whilst producing a high quality, cost-effective product.

1.6 Encourage the use of Environmental Product Labeling

Encourage the use of Environmental Product Labeling on products to enable consumers to make informed choices about the products they buy.

1.7 Encourage the implementation of Environmental Management Systems (EMS),

Encourage the implementation of Environmental Management Systems (EMS), which can result in better resource efficiency and increased awareness of waste prevention and recycling practices throughout staff, the DoE, will promote the implementation of EMS through the provision of guidance, advice and leading by example.

1.8 Safe disposal of hazardous waste

For the waste which cannot be recycled/ reused, safe and environmentally sound disposal should be adopted depending upon waste category. Design and operation norms of disposal facilities should be strictly adhered to as per the guidelines to be framed by DoE. Supervision of such facilities by DoE during construction stage is required to ensure quality of construction as per guidelines, including post closure monitoring.

1.9 Setting up of Common Treatment, Storage and Disposal Facilities (TSDFs)

Setting-up of TSDFs should be considered within industrial estates/ EPZs. The Government may consider providing financial support for establishing such treatment facilities. The TSDFs shall cater to meticulously delineated hazardous waste catchments areas taking into consideration their distance from the generators and availability of wastes. DoE shall ensure that in a given hazardous waste catchments area, there are no multiple operating TSDFs. Private sector will be encouraged to establish TSDFs.

1.10 Transportation of hazardous waste

DoE will develop on-line tracking system for movement of hazardous waste from generation to the disposal/ recovery/ recycle stage. Industries have to pay for collection and transportation of waste for treatment and disposal outside the industries own premises.

1.11 Use of cement kilns for hazardous waste incineration

Use of hazardous wastes (such as ETP sludge from dyes & dye intermediates, tyre chips, paint sludge, Toluene-Di-Isocyanate tar residue and refinery sludge) as supplementary fuels in cement kilns need to be promoted.

1.12 Illegal dump sites and remediation

To take care of illegal dumping, surveillance both by enforcement agencies and industry associations needs to be stepped up. The approach for site remediation of dump sites would vary from site to site depending on nature of pollutants, future damage potential and remedial cost. The remediation strategy should focus on the 'Polluter Pays Principle'

which needs to be strictly enforced. In such a case, the polluter has to reinstate or restore the damaged or destroyed elements of the environment at his cost. To take care of cases of remediation wherein polluters are not traceable, a dedicated fund needs to be created by MoEF.

1.13 Strengthening the infrastructure of regulatory bodies

For effective enforcement of regulations, DoE has to be strengthened in terms of manpower, equipment, instruments and other infrastructure facilities. The Government may support DoE by adequate funding, training and awareness programmes, periodically.

1.14 Disposal of date expired drugs & pesticides:

In order to deal with such hazardous wastes, as well as disposal in a facility as per following options should be permitted:

- To have these processed wherever possible by the industry.
- To appropriately incinerate either through dedicated incinerators of individual industry or through incinerators available with common facilities.

1.15 Handling and management of hazardous waste during ship dismantling:

Adequate safety systems and procedures need to be adopted during dismantling of ships and handling of hazardous wastes/ materials (such as used oil, waste oil, asbestos containing panels/ tiles, damaged asbestos containing material, paint chips, and used chemicals like acids etc.) This activity is required to be regulated through DoE and Shipping Department.

OCCUPATIONAL HEALTH AND SAFETY PLAN

Maheshkhali Economic Zone-III

Dhalghata, Cox's Bazar, Bangladesh

May, 2018

Table of Contents

1.1. Purpose and Scope	0
1.2. Terms and Definition	0
1.3. Applicable Standards and Legislation	0
1.4. Roles and Responsibilities	21
1.5. Hazard Identification, Risk Assessment and Risk Control.....	23
1.6. Training.....	24
1.7. Documentation and Record Keeping	26
1.8. Safe Work Practices	27
1.8.1. Fitness for Duty	27
1.8.2. General Hazard Prevention	27
1.8.3. Task Specific Hazard Prevention.....	30
1.9. Emergency Management	32
1.10. Measurement and Evaluation.....	32
1.10.1. Systematic Monitoring.....	32
1.10.2. Workplace Monitoring	32
1.11. System and Process Improvement	32
1.12. Process Owner	33

List of Table

Table 1: Requirements under Bangladesh Labor Act, 2006 and Bangladesh Factories Act, 1965.....	1
Table 2: Proposed Training Modules.....	25

List of Figures

Figure 1: Identify and evaluate options for controlling hazards, using a "hierarchy of controls".....	24
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1.1. Purpose and Scope

The occupational health, safety management plan is a systematic process of identifying the impact of existing, new or substantially related to health, safety and/or the environment. The proposed plan aims to achieve the following objectives:

- Identification of hazards, associated risks and control measures for each activity;
- Define responsibilities to ensure effective implementation of health and safety (H&S) risk control measures;
- Mitigate potential impacts of project related activities that may affect the health, safety and security of workers and communities within the Project area;
- Maintain healthy workforce and labor pool with safe and healthy working environment;
- Reduce human injury and damage to property and environment in case of emergency;
- Contribute to the improved health and wellbeing of the local community in the Project area.

The plan is applicable to all employees, direct as well as contracted workers/ laborers employed on the project site. It shall be applicable both construction and operation phases of the project. The responsibility of implementing and modifying the plan if necessary lies with the company.

1.2. Terms and Definition

Confined Space: "Confined Space" means a compartment small size and limited access which by its small size and confined nature can readily create or aggravate a hazardous exposure.

Emergency: An unforeseen occurrence, a sudden and urgent occasion for action.

Fire Watch: Workers assigned as fire watch are the first line of defense in protecting other workers and property from harm during hot work.

First Aider: A person who has received training and who holds a current first aid certificate from an organization or employer whose training and qualification for first aiders are approved by the authority.

Hazard: A source, situation or act with a potential for harm in terms of:

- Ill health
- Damage to property, plant etc.
- Production losses or increased liabilities

Hazardous Substance: The term "hazardous substance" means a substance which by reason of being explosive, flammable, poisonous corrosive, oxidizing, irritant or otherwise harmful is likely to cause injury.

Hot Work: The term "hot work" means riveting, welding, burning or other fire or spark producing operations.

1.3. Applicable Standards and Legislation

The standards applicable to the proposed project have been enumerated below:

- IFC Performance Standard 3: Resource Efficiency and Pollution Prevention
 - IFC Environmental, Health, and Safety General Guidelines
 - Bangladesh Labor Act, 2006 (as amendment through July 22, 2013)
 - Bangladesh Factories Act, 1965
-

MEZ-III shall ensure that all conditions, pertaining to health, hygiene, safety and welfare are met in accordance with the below acts-

Table1:Requirements under Bangladesh Labor Act, 2006 and Bangladesh Factories Act, 1965

Health and Safety Aspect	Requirement
<p>Air emissions and ambient air quality</p>	<p>IFC Environmental, Health, and Safety General Guidelines</p> <ul style="list-style-type: none"> • This guideline applies to facilities or projects that generate emissions to air at any stage of the project life-cycle. It complements the industry-specific emissions guidance presented in the Industry Sector Environmental, Health, and Safety (EHS) Guidelines by providing information about common techniques for emissions management that may be applied to a range of industry sectors. This guideline provides an approach to the management of significant sources of emissions, including specific guidance for assessment and monitoring of impacts. It is also intended to provide additional information on approaches to emissions management in projects located in areas of poor air quality, where it may be necessary to establish project-specific emissions standards. • Emissions of air pollutants can occur from a wide variety of activities during the construction, operation, and decommissioning phases of a project. These activities can be categorized based on the spatial characteristic of the source including point sources, such as combustion, materials storage, or other industry sector specific processes. Where possible, facilities and projects should avoid, minimize, and control adverse impacts to human health, safety, and the environment from emissions to air. Where this is not possible, the generation and release of emissions of any type should be managed through a combination of: <ul style="list-style-type: none"> — Energy use efficiency — Process modification — Selection of fuels or other materials, the processing of which may result in less polluting emissions • Application of emissions control techniques • The selected prevention and control techniques may include one or more methods of treatment depending on: <ul style="list-style-type: none"> — Regulatory requirements — Significance of the source — Location of the emitting facility relative to other sources — Location of sensitive receptors — Existing ambient air quality, and potential for degradation of the air shed from a proposed project — Technical feasibility and cost effectiveness of the available options for prevention, control, and release of emissions
<p>Greenhouse gases</p>	<p>IFC Performance Standard 3: Resource Efficiency and Pollution Prevention, IFC Environmental, Health, and Safety General Guidelines</p> <ul style="list-style-type: none"> • The client will consider alternatives and implement technically and financially feasible and cost-effective options to reduce project-related GHG emissions during the design and operation of the project. The client will quantify direct emissions from the facilities owned or controlled within the physical project boundary, as well as indirect emissions associated with the off-site production of energy used by the project. Quantification of GHG emissions will be conducted by the client annually in accordance with internationally recognized methodologies and good practice • Recommendations for reduction and control of greenhouse gases include: <ul style="list-style-type: none"> — Carbon financing;

Health and Safety Aspect	Requirement
	<ul style="list-style-type: none"> — Enhancement of energy efficiency; — Protection and enhancement of sinks and reservoirs of green house gases; — Promotion of sustainable forms of agriculture and forestry; — Promotion, development and increased use of renewable forms of energy; — Carbon capture and storage technologies; — Limitation and / or reduction of methane emissions through recovery and use in waste management, as well as in the production, transport and distribution of energy (coal, oil, and gas).
Ventilation and temperature	<p>Chapter-V of Bangladesh Labor Act, 2006 and Section-14, Chapter III of Factories Act, 1965, IFC Environmental, Health, and Safety General Guidelines, IFC Performance Standard 3: Resource Efficiency and Pollution Prevention</p> <ul style="list-style-type: none"> • Effective and suitable provisions shall be made in every factory for securing and maintaining in every work-room adequate ventilation by the circulation of fresh air. • Such temperatures as will secure to workers therein reasonable conditions of comfort and which will prevent injury to health. • The walls and roof shall be of such material and so designed that such temperature shall not be exceeded but be kept as low as practicable. • Where the nature of the work carried on in the factory involves, or is likely to involve, the production of excessively high temperature, such adequate measures as are practicable, shall be taken to protect the workers there from by separating the process which produces such temperature from the work-room by insulating the hot parts or by other effective means. • If it appears to the Government that in any factory or class or description of factories excessively high temperature can be reduced by such methods as white-washing, spraying or insulating and screening outside walls or roofs or windows or by raising the level of the roof, or by insulating the roof either by an air space and double roof or by the use of insulating roofing materials, or by other methods, it may prescribe such of those or other methods to be adopted in the factory. • Sufficient fresh air should be supplied for indoor and confined work spaces. Heating, ventilation and air conditioning (HVAC) and industrial evaporative cooling systems should be equipped, maintained and operated so as to prevent growth and spreading of disease agents. • Exposure to hot or cold working conditions in indoor or outdoor environments can result temperature stress-related injury or death. Use of personal protective equipment (PPE) to protect against other occupational hazards can accentuate and aggravate heat-related illnesses. Extreme temperatures in permanent work environments should be avoided through implementation of engineering controls and ventilation. Where this is not possible, such as during short-term outdoor work, temperature-related stress management procedures should be implemented which include: <ul style="list-style-type: none"> — Monitoring weather forecasts for outdoor work to provide advance warning of extreme weather and scheduling work accordingly. — Adjustment of work and rest periods according to temperature stress management procedures provided by ACGIH67, depending on the temperature and workloads. — Providing temporary shelters to protect against the elements during working activities or for use as rest areas.

Health and Safety Aspect	Requirement
	<ul style="list-style-type: none"> — Use of protective clothing. — Providing easy access to adequate hydration such as drinking water or electrolyte drinks, and avoiding consumption of alcoholic beverages.
Artificial humidification	<p>Chapter-V of Bangladesh Labor Act, 2006 and Section-16, Chapter III of Factories Act, 1965</p> <ul style="list-style-type: none"> • If the humidity of air is artificially increased in any establishment, the water used for the purpose shall be taken from a public water supply system or other source of drinking water, or shall be effectively purified before it is so used. • If it appears to the Inspector that the water used for such purpose is not effectively purified as required under sub-section (1), he may serve on the employer an order in writing specifying the measures which in his opinion should be adopted, and requiring them to be carried out before a specified date.
Dust and fume	<p>Chapter-V of Bangladesh Labor Act, 2006 and Section-15, Chapter III of Factories Act, 1965, IFC Environmental, Health, and Safety General Guidelines, IFC Performance Standard 3: Resource Efficiency and Pollution Prevention</p> <ul style="list-style-type: none"> • In every factory in which, by reason of the manufacturing process carried on, there is given off any dust or fumes or other impurity of such a nature and to such an extent as is likely to be injurious or offensive to the workers employed therein, effective measures shall be taken to prevent its accumulation in any work- room and its inhalation by workers, and if any exhaust appliance is necessary for this purpose, it shall be applied as near as possible to the point of origin of the dust, fumes or other impurity, and such point shall be enclosed so far as is possible. • In any factory no stationary internal combustion engine shall be operated unless the exhaust is conducted into open air, and no internal combustion engine shall be operated in any room unless effective measures have been taken to prevent such accumulation of fumes there from as are likely to be injurious to the workers employed in the work-room. • Minimizing dust from material handling sources, such as conveyors and bins, by using covers and/or control equipment (water suppression, bag house, or cyclone). Minimizing dust from open area sources, including storage piles, by using control measures such as installing enclosures and covers, and increasing the moisture content. Dust suppression techniques should be implemented, such as applying water or non-toxic chemicals to minimize dust from vehicle movements. • Use of dust control methods, such as covers, water suppression, or increased moisture content for open materials storage piles, or controls, including air extraction and treatment through a bag house or cyclone for material handling sources, such as conveyors and bins. Oil and oil by-products is not a recommended method to control road dust. • PPE, such as dusk masks, should be used where dust levels are excessive.
Energy conservation	<p>IFC Environmental, Health, and Safety General Guidelines</p> <p>This guideline applies to facilities or projects that consume energy in process heating and cooling; process and auxiliary systems, such as motors, pumps, and fans; compressed air systems and heating, ventilation and air conditioning systems (HVAC); and lighting systems. It complements the industry specific emissions guidance presented in the Industry Sector Environmental, Health, and Safety (EHS) Guidelines by providing information about common techniques for energy conservation that may be applied to a range of industry sectors. Energy management at the facility level should</p>

Health and Safety Aspect	Requirement
	<p>be viewed in the context of overall consumption patterns, including those associated with production processes and supporting utilities, as well as overall impacts associated with emissions from power sources. The sections provide guidance on energy management with a focus on common utility systems often representing technical and financially feasible opportunities for improvement in energy conservation. However, operations should also evaluate energy conservation opportunities arising from manufacturing process modifications.</p>
<p>Wastewater and ambient water quality</p>	<p>IFC Environmental, Health, and Safety General Guidelines</p> <ul style="list-style-type: none"> • This guideline applies to projects that have either direct or indirect discharge of process wastewater, wastewater from utility operations or storm water to the environment. These guidelines are also applicable to industrial discharges to sanitary sewers that discharge to the environment without any treatment. Process Waste water may include contaminated wastewater from utility operations, storm water, and sanitary sewage. It provides information on common techniques for wastewater management, water conservation, and reuse that can be applied to a wide range of industry sectors. This guideline is meant to be complemented by the industry-specific effluent guidelines presented in the Industry Sector Environmental, Health, and Safety (EHS) Guidelines. Projects with the potential to generate process wastewater, sanitary (domestic) sewage, or storm water should incorporate the necessary precautions to avoid, minimize, and control adverse impacts to human health, safety, or the environment. In the context of their overall ESHS management system, facilities should: <ul style="list-style-type: none"> — Understand the quality, quantity, frequency and sources of liquid effluents in its installations. This includes knowledge about the locations, routes and integrity of internal drainage systems and discharge points — Plan and implement the segregation of liquid effluents principally along industrial, utility, sanitary, and storm water categories, in order to limit the volume of water requiring specialized treatment. Characteristics of individual streams may also be used for source segregation. — Identify opportunities to prevent or reduce wastewater pollution through such measures as recycle/reuse within their facility, input substitution, or process modification (e.g. change of technology or operating conditions/modes) — Assess compliance of their wastewater discharges with the applicable: (i) discharge standard (if the wastewater is discharged to a surface water or sewer), and (ii) water quality standard for a specific reuse (e.g. if the wastewater is reused for irrigation). • Additionally, the generation and discharge of wastewater of any type should be managed through a combination of: <ul style="list-style-type: none"> — Water use efficiency to reduce the amount of wastewater generation — Process modification, including waste minimization, and reducing the use of hazardous materials to reduce the load of pollutants requiring treatment — If needed, application of wastewater treatment techniques to further reduce the load of contaminants prior to discharge, taking into consideration potential impacts of cross-media transfer of contaminants during treatment (e.g., from water to air or land) • When wastewater treatment is required prior to discharge, the level of treatment should be based on: <ul style="list-style-type: none"> — Whether wastewater is being discharged to a sanitary sewer system, or to surface waters — National and local standards as reflected in permit requirements and sewer

Health and Safety Aspect	Requirement
	<p>system capacity to convey and treat wastewater if discharge is to sanitary sewer</p> <ul style="list-style-type: none"> — Assimilative capacity of the receiving water for the load of contaminant being discharged wastewater if discharge is to surface water — Intended use of the receiving water body (e.g. as a source of drinking water, recreation, irrigation, navigation, or other) — Presence of sensitive receptors (e.g., endangered species) or habitats — Good International Industry Practice (GIIP) for the relevant industry sector
Drinking water	<p>Chapter-V of Bangladesh Labor Act, 2006 and Section-19, Chapter III of Factories Act, 1965, IFC Environmental, Health, and Safety General Guidelines, IFC Performance Standard 3: Resource Efficiency and Pollution Prevention</p> <ol style="list-style-type: none"> 1. In every factory effective arrangements shall be made to provide and maintain at a suitable point conveniently situated for all workers employed therein, a sufficient supply of wholesome drinking water. 2. All such points shall be legibly marked "Drinking Water" in Bangla 3. In every factory wherein more than two hundred and fifty workers are ordinarily employed, provision shall be made for cooling the drinking water during the hot weather by effective means and for distribution thereof. 4. Where dehydration occurs in the body of workers due to work near machineries creating excessive heat, the workers shall be provided with oral re-hydration therapy. 5. Drinking water sources, whether public or private, should at all times be protected so that they meet or exceed applicable national acceptability standards or in their absence the current edition of WHO Guidelines for Drinking-Water Quality. 6. Where the project includes the delivery of water to the community or to users of facility infrastructure (such as hotel hosts and hospital patients), where water may be used for drinking, cooking, washing, and bathing, water quality should comply with national acceptability standards or in their absence the current edition of with WHO Drinking Water Guidelines. Water quality for more sensitive well-being-related demands such as water used in health care facilities or food production may require more stringent, industry-specific guidelines or standards, as applicable. Any dependency factors associated with the delivery of water to the local community should be planned for and managed to ensure the sustainability of the water supply by involving the community in its management to minimize the dependency in the long-term.
Water consumption and conservation	<p>IFC Performance Standard 3: Resource Efficiency and Pollution Prevention, IFC Environmental, Health, and Safety General Guidelines</p> <ul style="list-style-type: none"> • When the project is a potentially significant consumer of water, in addition to applying the resource efficiency requirements of this Performance Standard, the client shall adopt measures that avoid or reduce water usage so that the project's water consumption does not have significant adverse impacts on others. These measures include, but are not limited to, the use of additional technically feasible water conservation measures within the client's operations, the use of alternative water supplies, water consumption offsets to reduce total demand for water resources to within the available supply, and evaluation of alternative project locations. • In general guild line, water conservation programs should be implemented commensurate with the magnitude and cost of water use. These programs should promote the continuous reduction in water consumption and achieve savings in the

Health and Safety Aspect	Requirement
	<p>water pumping, treatment and disposal costs. Water conservation measures may include water monitoring/management techniques; process and cooling/heating water recycling, reuse, and other techniques; and sanitary water conservation techniques. General recommendations include:</p> <ul style="list-style-type: none"> — Storm/Rainwater harvesting and use. — Zero discharge design/Use of treated waste water to be included in project design processes. — Use of localized recirculation systems in plant/facility/shops (as opposed to centralized recirculation system), with provision only for makeup water. — Uses of dry process technologies e.g. dry quenching. — Process water system pressure management. — Project design to have measures for adequate water collection, spill control and leakage control system.
<p>Resource efficiency</p>	<p>IFC Performance Standard 3: Resource Efficiency and Pollution Prevention</p> <p>The client will implement technically and financially feasible and cost effective5 measures for improving efficiency in its consumption of energy, water, as well as other resources and material inputs, with a focus on areas that are considered core business activities. Such measures will integrate the principles of cleaner production into product design and production processes with the objective of conserving raw materials, energy, and water. Where benchmarking data are available, the client will make a comparison to establish the relative level of efficiency.</p>
<p>Hazardous materials management</p>	<p>IFC Performance Standard 3: Resource Efficiency and Pollution Prevention, IFC Environmental, Health, and Safety General Guidelines</p> <ul style="list-style-type: none"> • Hazardous materials are sometimes used as raw material or produced as product by the project. The client will avoid or, when avoidance is not possible, minimize and control the release of hazardous materials. In this context, the production, transportation, handling, storage, and use of hazardous materials for project activities should be assessed. The client will consider less hazardous substitutes where hazardous materials are intended to be used in manufacturing processes or other operations. The client will avoid the manufacture, trade, and use of chemicals and hazardous materials subject to international bans or phase-outs due to their high toxicity to living organisms, environmental persistence, potential for bioaccumulation, or potential for depletion of the ozone layer. • General guidelines apply to projects that use, store, or handle any quantity of hazardous materials (Hazmats), defined as materials that represent a risk to human health, property, or the environment due to their physical or chemical characteristics. Hazmats can be classified according to the hazard as explosives; compressed gases, including toxic or flammable gases; flammable liquids; flammable solids; oxidizing substances; toxic materials; radioactive material; and corrosive substances. <p>When a hazardous material is no longer usable for its original purpose and is intended for disposal, but still has hazardous properties, it is considered a hazardous waste. This section is divided into two main subsections:</p> <ul style="list-style-type: none"> — General Hazardous Materials Management: Guidance applicable to all projects or facilities that handle or store any quantity of hazardous materials. — Management of Major Hazards: Additional guidance for projects or facilities that store or handle hazardous materials at, or above, threshold quantities, and

Health and Safety Aspect	Requirement
	<p>thus require special treatment to prevent accidents such as fire, explosions, leaks or spills, and to prepare and respond to emergencies.</p> <ul style="list-style-type: none"> • The overall objective of hazardous materials management is to avoid or, when avoidance is not feasible, minimize uncontrolled releases of hazardous materials or accidents (including explosion and fire) during their production, handling, storage and use. This objective can be achieved by: <ul style="list-style-type: none"> — Establishing hazardous materials management priorities based on hazard analysis of risky operations identified through Social and Environmental Assessment. — Where practicable, avoiding or minimizing the use of hazardous materials. — Preventing uncontrolled releases of hazardous materials to the environment or uncontrolled reactions that might result in fire or explosion. — Using engineering controls (containment, automatic alarms, and shut-off systems) commensurate with the nature of hazard. — Implementing management controls (procedures, inspections, communications, training, and drills) to address residual risks that have not been prevented or controlled through engineering measures.
<p>Waste management, disposal of wastes and effluents</p>	<p>Chapter-V of Bangladesh Labor Act, 2006 and Section-13, Chapter III of Factories Act, 1965, IFC Environmental, Health, and Safety General Guidelines, IFC Performance Standard 3: Resource Efficiency and Pollution Prevention</p> <ul style="list-style-type: none"> • Effective arrangements shall be made in every factory for the disposal of wastes and effluents due to the manufacturing process carried on therein. • The client will avoid the generation of hazardous and non-hazardous waste materials. Where waste generation cannot be avoided, the client will reduce the generation of waste, and recover and reuse waste in a manner that is safe for human health and the environment. Where waste cannot be recovered or reused, the client will treat, destroy, or dispose of it in an environmentally sound manner that includes the appropriate control of emissions and residues resulting from the handling and processing of the waste material. If the generated waste is considered hazardous, the client will adopt GIP alternatives for its environmentally sound disposal while adhering to the limitations applicable to its transboundary movement. When hazardous waste disposal is conducted by third parties, the client will use contractors that are reputable and legitimate enterprises licensed by the relevant government regulatory agencies and obtain chain of custody documentation to the final destination. The client should ascertain whether licensed disposal sites are being operated to acceptable standards and where they are, the client will use these sites. Where this is not the case, clients should reduce waste sent to such sites and consider alternative disposal options, including the possibility of developing their own recovery or disposal facilities at the project site. • If waste materials are still generated after the implementation of feasible waste prevention, reduction, reuse, recovery and recycling measures, waste materials should be treated and disposed of and all measures should be taken to avoid potential impacts to human health and the environment. Selected management approaches should be consistent with the characteristics of the waste and local regulations, and may include one or more of the following: <ul style="list-style-type: none"> — On-site or off-site biological, chemical, or physical treatment of the waste material to render it nonhazardous prior to final disposal.

Health and Safety Aspect	Requirement
	<ul style="list-style-type: none"> — Treatment or disposal at permitted facilities specially designed to receive the waste. Examples include: composting operations for organic non-hazardous, wastes; properly designed, permitted and operated landfills or incinerators designed for the respective type of waste; or other methods known to be effective in the safe, final disposal of waste materials such as bioremediation. • In addition to the implementation of waste prevention strategies, the total amount of waste may be significantly reduced through the implementation of recycling plans, which should consider the following elements: <ul style="list-style-type: none"> — Evaluation of waste production processes and identification of potentially recyclable materials. — Identification and recycling of products that can be reintroduced into the manufacturing process or industry activity at the site. — Investigation of external markets for recycling by other industrial processing operations located in the neighborhood or region of the facility (e.g., waste exchange). — Establishing recycling objectives and formal tracking of waste generation and recycling rates. — Providing training and incentives to employees in order to meet objectives.
Pesticide Use and Management	<p>IFC Performance Standard 3: Resource Efficiency and Pollution Prevention, IFC Environmental, Health, and Safety General Guidelines</p> <p>The client will, where appropriate, formulate and implement an integrated pest management (IPM) and/or integrated vector management (IVM) approach targeting economically significant pest infestations and disease vectors of public health significance. The client's IPM and IVM program will integrate coordinated use of pest and environmental information along with available pest control methods, including cultural practices, biological, genetic, and, as a last resort, chemical means to prevent economically significant pest damage and/or disease transmission to humans and animals.</p>
Cleanliness	<p>Chapter-V of Bangladesh Labor Act, 2006 and Section-12, Chapter III of Factories Act, 1965, IFC Environmental, Health, and Safety General Guidelines, IFC Performance Standard 3: Resource Efficiency and Pollution Prevention</p> <ul style="list-style-type: none"> • Every factory shall be kept clean and free from effluvia arising from any drain privy or other nuisance. • Accumulation of dirt and refuse shall be moved daily by sweeping or by any other effective method from the floors and benches of workrooms and from staircases and passages and disposed of in a suitable manner • The floor of every workroom shall be cleaned at least once in every week by washing, using disinfectant where necessary or by some other effective method. • Where the floor is liable to become wet in the course of any manufacturing process to such extent as is capable of being drained, effective means of drainage shall be provided and maintained. • All inside walls and partitions, all ceilings or tops of rooms and walls, sides and tops of passages and staircases shall- <ul style="list-style-type: none"> — Where they are painted or varnished, be repainted or re-varnished at least once in every three years; — Where they are painted or varnished and have smooth impervious surfaces, be

Health and Safety Aspect	Requirement
	<p>cleaned at least once in every fourteenth month, by such methods as may be prescribed;</p> <p>— In any other case, be kept white- washed or color-washed and the white-washing or color-washing shall be carried out at least once in every fourteen months.</p> <ul style="list-style-type: none"> • The dates on which the processes required by clause (d) are carried out shall be entered in the prescribed register. • Where there is potential for exposure to substances poisonous by ingestion, suitable arrangements are to be made for provision of clean eating areas where workers are not exposed to the hazardous or noxious substances.
Latrines and urinals	<p>Chapter-V of Bangladesh Labor Act, 2006 and Section-20, Chapter III of Factories Act, 1965, IFC Environmental, Health, and Safety General Guidelines, IFC Performance Standard 3: Resource Efficiency and Pollution Prevention</p> <p>In every factory -</p> <ul style="list-style-type: none"> • Sufficient latrines and urinals of prescribed types shall be provided conveniently situated and accessible to workers at all times while they are in the factory; • Such latrines and urinals shall be provided separately for male and female workers; • Such latrines and urinals shall be adequately lighted and ventilated • All such latrines and urinals shall be maintained in a clean and sanitary condition at all times with suitable detergents or disinfectants • Toilet facilities should also be provided with adequate supplies of hot and cold running water, soap, and hand drying devices.
Dustbin and spittoon	<p>Chapter-V of Bangladesh Labor Act, 2006 and Section-21, Chapter III of Factories Act, 1965, IFC Environmental, Health, and Safety General Guidelines, IFC Performance Standard 3: Resource Efficiency and Pollution Prevention</p> <ul style="list-style-type: none"> • In every factory there shall be provided, at convenient places, a sufficient number of dustbins and spittoons which shall be maintained in a clean and hygienic condition. • No person shall through any dirt and spit within the premises of a factory except in the dustbin and spittoon provided for the purpose. • A notice containing this provision and the penalty for its violation shall be prominently displayed at suitable places in the premises. • Waste is stored in a manner that prevents the commingling or contact between incompatible wastes, and allows for inspection between containers to monitor leaks or spills. Examples include sufficient space between incompatibles or physical separation such as walls or containment curbs in closed containers away from direct sunlight, wind and rain.
Contaminated Land	<p>IFC Environmental, Health, and Safety General Guidelines</p> <p>This section provides a summary of management approaches for land contamination due to anthropogenic releases of hazardous materials, wastes, or oil, including naturally occurring substances. Releases of these materials may be the result of historic or current site activities, including, but not limited to, accidents during their handling and storage, or due to their poor management or disposal.</p>
Noise management	<p>IFC Environmental, Health, and Safety General Guidelines</p> <p>This section addresses impacts of noise beyond the property boundary of the facilities.</p>

Health and Safety Aspect	Requirement
	<p>Noise prevention and mitigation measures should be applied where predicted or measured noise impacts from a project facility or operations exceed the applicable noise level guideline at the most sensitive point of reception. The preferred method for controlling noise from stationary sources is to implement noise control measures at source.</p>
Lighting	<p>Chapter-V of Bangladesh Labor Act, 2006 and Section-18, Chapter III of Factories Act, 1965, IFC Environmental, Health, and Safety General Guidelines, IFC Performance Standard 3: Resource Efficiency and Pollution Prevention</p> <ul style="list-style-type: none"> • In every part of a factory where workers are working or passing, there shall be provided and maintained sufficient and suitable lighting, natural or artificial, or both. • In every factory all glazed windows and skylights used for the lighting of the work-room shall be kept clean on both the outer and inner surfaces and free from obstruction as far as possible. • In every factory effective provision shall so far as is practicable, be made for the prevention of – <ul style="list-style-type: none"> — Glare either directly from any source of light or by reflection from a smooth or polished surface, and — The formation of shadows to such an extent as to cause eye strain or risk of accident to any worker. • Emergency lighting of adequate intensity should be installed and automatically activated upon failure of the principal artificial light source to ensure safe shut-down, evacuation, etc.
Overcrowding	<p>Chapter-V of Bangladesh Labor Act, 2006 and Section-17, Chapter III of Factories Act, 1965, IFC Environmental, Health, and Safety General Guidelines, IFC Performance Standard 3: Resource Efficiency and Pollution Prevention</p> <ul style="list-style-type: none"> • No work-room in any factory shall be overcrowded to the extent that it is injurious to the health of the workers employed therein. • Without prejudice to the generality of the provisions of sub-section (1), there shall be provided for every worker employed in a work-room at least 9.5 cubic meter of space in the establishment • Explanation - For the purpose of this sub-section no account shall be taken of a space which is more than 4.25 meter above the level of the floor of the room. • If the Chief Inspector by order in writing so requires, there shall be posted in each work-room of a factory a notice specifying the maximum number of workers who may, in compliance with the provisions of this section, be employed in the room. • The Chief Inspector may, by order in writing exempt, subject to the conditions as he may think fit to impose, any work- room from the provisions of this section if he is satisfied that compliance therewith in respect of such room is not necessary for the purpose of health of the workers employed therein.
Occupational Health and Safety	<p>IFC Environmental, Health, and Safety General Guidelines</p> <ul style="list-style-type: none"> • Employers and supervisors are obliged to implement all reasonable precautions to protect the health and safety of workers. This section provides guidance and examples of reasonable precautions to implement in managing principal risks to occupational health and safety. Although the focus is placed on the operational phase of projects, much of the guidance also applies to construction and decommissioning activities. Companies should hire contractors that have the technical capability to

Health and Safety Aspect	Requirement
	<p>manage the occupational health and safety issues of their employees, extending the application of the hazard management activities through formal procurement agreements. Preventive and protective measures should be introduced according to the following order of priority:</p> <ul style="list-style-type: none"> — Eliminating the hazard by removing the activity from the work process. Examples include substitution with less hazardous chemicals, using different manufacturing processes, etc. — Controlling the hazard at its source through use of engineering controls. Examples include local exhaust ventilation, isolation rooms, machine guarding, acoustic insulating, etc. — Minimizing the hazard through design of safe work systems and administrative or institutional control measures. Examples include job rotation, training safe work procedures, lock-out and tag-out, workplace monitoring, limiting exposure or work duration, etc. — Providing appropriate personal protective equipment (PPE) in conjunction with training, use, and maintenance of the PPE. <ul style="list-style-type: none"> • The application of prevention and control measures to occupational hazards should be based on comprehensive job Environmental, Health, and Safety (EHS) Guidelines GENERAL EHS GUIDELINES: OCCUPATIONAL HEALTH AND SAFETY, APRIL 30, 2007 61, WORLD BANK GROUP safety or job hazard analyses. The results of these analyses should be prioritized as part of an action plan based on the likelihood and severity of the consequence of exposure to the identified hazards. The major subsections under this heading are: <ul style="list-style-type: none"> — General Facility Design and Operation — Communication and Training — Physical Hazards — Chemical Hazards — Biological Hazards — Radiological Hazards — Personal Protective Equipment (PPE) — Special Hazard Environments — Monitoring
Safety of machinery	<p>Chapter-VI of Bangladesh Labor Act, 2006, IFC Environmental, Health, and Safety General Guidelines, IFC Performance Standard 3: Resource Efficiency and Pollution Prevention</p> <ul style="list-style-type: none"> • It appears to an Inspector that the use of any building or any part of a building or any part of the ways, machinery or plant in the establishment involves imminent danger to human life or safety, he may serve on the employer of the establishment an order in writing prohibiting its use until it has been properly repaired or altered. • Injury or death can occur from being trapped, entangled, or struck by machinery parts due to unexpected starting of equipment or unobvious movement during operations. Recommended protective measures include: <ul style="list-style-type: none"> — Designing machines to eliminate trap hazards and ensuring that extremities are kept out of harm's way under normal operating conditions. Examples of proper design considerations include two-hand operated machines to prevent amputations or the availability of emergency stops dedicated to the machine

Health and Safety Aspect	Requirement
	<p>and placed in strategic locations. Where a machine or equipment has an exposed moving part or exposed pinch point that may endanger the safety of any worker, the machine or equipment should be equipped with, and protected by, a guard or other device that prevents access to the moving part or pinch point. Guards should be designed and installed in conformance with appropriate machine safety standards.</p> <p>— Turning off, disconnecting, isolating, and de-energizing(Locked Out and Tagged Out) machinery with exposed or guarded moving parts, or in which energy can be stored (e.g. compressed air, electrical components) during servicing or maintenance, in conformance with a standard such as CSAZ460 Lockout or equivalent ISO or ANSI standard.</p>
<p>Precaution in case of fire</p>	<p>Chapter-VI of Bangladesh Labor Act, 2006 and Section-6, Chapter IV of Factories Act, 1965, IFC Environmental, Health, and Safety General Guidelines, IFC Performance Standard 3: Resource Efficiency and Pollution Prevention</p> <ul style="list-style-type: none"> • Every establishment shall be provided with at least one alternative connection stairway at each floor and such means of escape in case of fire. • If it appears to the inspector that any establishment is not provided with the means of escape prescribed under sub-section (1) he may serve on the employer of the establishment an order in writing specifying the measures which in his opinion should be adopted before a date specified in the order. • In every establishment the door affording exit from any room shall not be locked or fastened so that they can be easily and immediately open from inside while any person is within the room and all such doors, unless they are of the sliding type, shall be constructed to open outwards, or where the door is between two rooms, in the direction of the nearest exit from the building and no such door shall be locked or obstructed while work is being carried on in the room. • In every establishment every window, or other exit affording means of escape in case of fire other than the means of exit in ordinary use, shall be distinctively marked in Bangla and in red letters of adequate size or by some other effective and clearly understood sign. • In every establishment every window, door or other exit affording means of escape in case of fire to every person employed therein. • A free passage-way giving access to each means of escape in case of fire shall be maintained for the use of the workers in every room of the establishment. • In every establishment wherein more than ten workers are ordinarily employed in any place above the ground floor, or explosive or highly inflammable materials are used, or stored, effective measures shall be taken to ensure that all workers are familiar with the means of escape in case of fire and have been adequately trained in the routine to be followed in such case. • In factories wherein fifty or more workers and employees are employed, shall arrange at least once in a year a mock fire-fighting and the employer shall maintain a book of records in this regards. • Where the flammable material is mainly comprised of dust, providing electrical grounding, spark detection, and, if needed, quenching systems. • Equipping facilities with fire detectors, alarm systems, and fire-fighting equipment. The equipment should be maintained in good working order and be readily

Health and Safety Aspect	Requirement
	<p>accessible. It should be adequate for the dimensions and use of the premises, equipment installed, physical and chemical properties of substances present, and the maximum number of people present.</p> <ul style="list-style-type: none"> • Provision of manual firefighting equipment that is easily accessible and simple to use. • Fire and emergency alarm systems that are both audible and visible.
<p>Fencing of machinery</p>	<p>Chapter-VI of Bangladesh Labor Act, 2006 and Section-23, Chapter IV of Factories Act, 1965</p> <ul style="list-style-type: none"> • In every establishment the following shall be securely fenced by the safeguards of substantial construction <ul style="list-style-type: none"> — Every moving part of a prime mover, and every fly wheel connected to a prime mover; — The head-race and tail race of every water wheel and water turbine; — Any part of a stock-bar which projects beyond the head stock of a lathe; — Every part of an electric generator, - a motor or rotary converter; — Every part of transmission machinery; and — Every dangerous part of any machinery. • Every set screw, bolt and key on any revolving shaft, spindle wheel or pinion all spur, worm and other toothed or friction gearing in motion with which any worker would otherwise be liable to come into contact shall be securely fenced to prevent such contact.
<p>Work on or near machinery in motion</p>	<p>Chapter-VI of Bangladesh Labor Act, 2006 and Section-24, Chapter IV of Factories Act, 1965</p> <ul style="list-style-type: none"> • Where, in any establishment, it becomes necessary to examine any part of machinery referred to in section 61 while the machinery is in motion, or as a result of such examination to carry out any mounting or shipping of belts, lubrication or other adjusting operation while the machinery is in motion, such examination or operation shall be made or carried out only by a specially trained male worker wearing tight-fitting clothing whose name has been recorded in the register prescribed in this behalf, and while he is so engaged such worker shall not handle a belt at a moving pulley unless the belt is less than six inches in a width and unless the belt joint is either laced or flush with the belt. • The Government may, by notification in the official Gazette, prohibit any specified establishment, the cleaning, lubricating, adjusting by any person of specified part of machinery when those parts are in motion.
<p>Striking gear and devices for cutting off power</p>	<p>Chapter-VI of Bangladesh Labor Act, 2006 and Section-26, Chapter IV of Factories Act, 1965</p> <p>In every establishment-</p> <ul style="list-style-type: none"> • Suitable striking gear and other efficient mechanical appliance shall be provided and maintained and used to move driving belts to and from fast and loose pulleys which form part of the transmission machinery, and such gear or appliances shall be so constructed as to prevent the belt from cropping back on the first pulleys. • Driving belt when not in use shall not be allowed to rest upon hafting in motion. • In every establishment suitable devices for cutting off power in emergencies from running.

Health and Safety Aspect	Requirement
	<ul style="list-style-type: none"> Machinery shall be provided and maintained in every work-room.
Self-acting machines	<p>Chapter-VI of Bangladesh Labor Act, 2006 and Section-34, Chapter IV of Factories Act, 1965</p> <p>No traversing part of a self-acting machine in any factory and no material carried thereon shall, if the space over which it runs is a space over which any person is liable to pass whether in the course of his employment or otherwise, be allowed to run on its outward or inward traverse within a distance or eighteen inches from any fixed structure which is not part of the machine.</p>
Cranes and other lifting machinery	<p>Chapter-VI of Bangladesh Labor Act, 2006 and Section-30, Chapter IV of Factories Act, 1965</p> <ul style="list-style-type: none"> The working gear, whether fixed or moveable, ropes, chains and anchoring or fixing appliances shall be- <ul style="list-style-type: none"> Of good construction, sound material and adequate strength. Properly maintained. Thoroughly examined by a competent person at least once in every period of twelve months and a register shall be kept containing the prescribed particulars of every such examination. No such machinery shall be loaded beyond the working load shall be plainly marked thereon. While any person is employed or working on or near the wheel-tract of a traveling crane in any place, where he would be likely to be struck by the crane, effective measures shall be taken to ensure that the crane does not approach within 6 meters of that place.
Hoists and lifts	<p>Chapter-VI of Bangladesh Labor Act, 2006 and Section-31, Chapter IV of Factories Act, 1965</p> <ul style="list-style-type: none"> Every hoist and lift shall be- <ul style="list-style-type: none"> Of good mechanical construction, sound material and adequate strength; Properly maintained and shall be thoroughly examined by a competent person at least once in every period of six months, and a register shall be kept containing the prescribed particulars of every examination; Every hoist way and lift way shall be sufficiently protected by an enclosure fitted with gates and the hoist or lift and every such enclosure shall be so constructed as to prevent any person or thing from being trapped between any part of the hoist or lift and any fixed structure or moving part. <ul style="list-style-type: none"> The maximum safe working load shall be plainly marked on every hoist or lift and no load greater than such load shall be carried thereon. The cage of every hoist or lift used for carrying persons shall be fitted with a gate on each side from which access is afforded to a landing. The following additional requirements shall apply to hoists and lifts used for carrying persons and installed or reconstructed in a factory after the commencement of this Act, namely: <ul style="list-style-type: none"> Where the cage is supported by rope or chain, there shall be at least two ropes or chains separately connected with the cage and balance weight, and each rope or chain with its attachments shall be capable of carrying the whole weight of the cage together with its maximum load. Efficient devices shall be provided and maintained capable of supporting the cage

Health and Safety Aspect	Requirement
	<p>together with its maximum load in the event of breakage of the ropes and chains.</p> <p>— An efficient automatic device shall be provided and maintained to prevent the cage from over running.</p>
Pressure plant	<p>Chapter-VI of Bangladesh Labor Act, 2006 and Section-33, Chapter IV of Factories Act, 1965</p> <p>If any factory or any part of the plant or machinery used in manufacturing process is operated at a pressure above the atmospheric pressure, effective measures shall be taken to ensure that the safe working pressure of such part is not exceeded.</p>
Floors, stairs and means of access	<p>Chapter-VI of Bangladesh Labor Act, 2006 and Section-34, Chapter IV of Factories Act, 1965</p> <p>In every factory</p> <ul style="list-style-type: none"> • All floors, stairs, passages and gangways shall be of sound construction and be properly maintained and where it is necessary to ensure their safety, steps, stairs, passages and gangways shall be provided with substantial handrails; and • There shall, in so far as reasonably practicable, be provided and maintained safe means of access to every place at which any person is, at any time, required to work.
Pits, sumps and openings	<p>Chapter-VI of Bangladesh Labor Act, 2006 and Section-24, Chapter IV of Factories Act, 1965</p> <p>In every factory, every fixed vessel, sump, tank, pit or opening in the ground or in a floor which by reason of its depth, situation, construction or contents is or may be a source of danger, shall be either securely covered or securely fenced.</p>
Excessive weights	<p>Chapter-VI of Bangladesh Labor Act, 2006 and Section-36, Chapter IV of Factories Act, 1965</p> <p>No person shall be employed in any establishment to lift, carry or move any load so heavy as to be likely to cause him injury.</p>
Protection of eyes	<p>Chapter-VI of Bangladesh Labor Act, 2006 and Section-37, Chapter IV of Factories Act, 1965</p> <p>Effective screens of suitable goggles shall be provided for the protection of persons employed on, or in the immediate vicinity of a process which involves:</p> <ul style="list-style-type: none"> • Risk of injury to the eyes from particles or fragments thrown off in the course of the process, or • Risk to the eyes by reason of exposure to excessive light or heat.
Precautions against dangerous fumes	<p>Chapter-VI of Bangladesh Labor Act, 2006 and Section-41, Chapter IV of Factories Act, 1965</p> <ul style="list-style-type: none"> • In any establishment no person shall enter or be permitted to enter any chamber, tank, vat pit, flue or other confined space in which dangerous fumes are likely to be present to such an extent as to involve risks of persons being overcome thereby, unless it is provided with a manhole of such size, as may be prescribed or other effective means of egress. • No portable electric light of a voltage of exceeding twenty-four volts shall be permitted in any establishment for use inside any confined space and where fumes are likely to be present to be used in such confined space. • No person in any establishment shall enter or be permitted to enter any such confined space until all practicable means have been taken to remove any fumes which may be present and to prevent any ingress of fume and unless either-

Health and Safety Aspect	Requirement
	<ul style="list-style-type: none"> — A certificate in writing has been given by a competent person, based on a test carried out by himself, that the space is free from dangerous fumes and fit for persons to enter, or — The worker is wearing a suitable breathing apparatus and a belt securely attached to a rope the free end of which is held by a person standing outside the confined space. <ul style="list-style-type: none"> • Suitable breathing apparatus, reviving apparatus, belts and ropes shall in every establishment, be kept ready for instant use beside any such confined space. As aforesaid which any person as entered and all such apparatus shall be periodically examined and certified by a competent person to be fit for use, and a sufficient number of persons employed in every establishment shall be trained and practiced in the use of all such apparatus and the method of restoring respiration. • No person shall be permitted to enter into any establishment, any boiler, furnace, flue chamber, tank, pipe or other confined space for the purpose of working or making any examination therein until it is sufficiently cooled by ventilation or otherwise to be safe for persons to enter.
Explosive or inflammable gas, dust, etc.	<p>Chapter-VI of Bangladesh Labor Act, 2006 and Section-42, Chapter IV of Factories Act, 1965</p> <ul style="list-style-type: none"> • Where, in any establishment or manufacturing process produce dust gas or fume or vapor of such character and to such extent as to be likely to explode on ignition, all practicable measures shall be taken to prevent any such explosion by <ul style="list-style-type: none"> — Effective enclosure of the plant or machinery used in the process; — Removal or prevention of the accumulation of such dust, gas, fume or vapour; — Exclusion or effective enclosure of all possible sources of ignition. • Where in any establishment the plant or machinery used in a process is not so constructed as to withstand the probable pressure which such an explosion as aforesaid would produce, all practicable measures shall be taken to restrict the spread and effects of the explosion by the provision in the plant or machinery of chokes. • Where any part of the plant or machinery in an establishment contains any explosive or inflammable gas or vapour under pressure greater than atmospheric pressure, that part shall not be opened except in accordance with the following provisions, namely- <ul style="list-style-type: none"> — Before fastening of any joint of any pipe connected with the part of the fastening of the cover of any opening into the part is loosened, any flow of the gas or vapour into the part or any such pipe shall be effectively stopped by a stop-valve or other means; — Before any such fastening or as aforesaid is removed, all practicable measures shall be taken to reduce pressure of the gas or vapour in the part or pipe to atmospheric pressure; — Where any such fastening as aforesaid, has been loosened or removed, effective measures shall be taken to prevent any explosive or inflammable gas or vapour from entering the part or pipe until the fastening is secured and securely replaced; — Provided that the provisions of this sub-section shall not apply in the case of plant or machinery installed in the open air. • No plant, tank or vessel which contains or has contained any explosive or

Health and Safety Aspect	Requirement
	inflammable substance shall be subjected in any establishment to any welding, brazing, soldering or cutting operation which involves the application of heat unless adequate measures have been first taken to remove such substance and any fumes arising there to render such substance shall be allowed to enter such plant, tank or vessel after any such operation until the metal has cooled sufficiently to prevent any risk of igniting the substance.
Dangerous operations	<p>Chapter-VII of Bangladesh Labor Act, 2006 and Section-87, Chapter IX of Factories Act, 1965</p> <p>Where the Government is satisfied that any operation carried on in a factory exposes any person employed in it to serious risk of bodily injury, poisoning or disease, it may make rules applicable to such factory or class of factories in which such operation is carried on -</p> <ul style="list-style-type: none"> — Specifying the operation and declaring it to be hazardous; — Prohibiting or restricting the employment of women, adolescents or children in the operation; — Providing for the periodical medical examination of persons employed in the operation and prohibiting the employment of persons not certified as fit for such employment; — Providing for the protection of all persons employed in the operation or in the vicinity of the places where it is carried on; and use of any specified materials or processes in connection with the operation; — Notice specifying use and precautions regarding use of any coercive chemicals
Notice to be given of accidents	<p>Chapter-VII of Bangladesh Labor Act, 2006 and Section-88, Chapter IX of Factories Act, 1965</p> <ul style="list-style-type: none"> • If any accident occurs in the factory causing loss of life or bodily injury, or an accidental explosion, ignition, outbreak of fire or irruption of water or fumes occurs, the employer shall give notice of the occurrence to the Inspector within following two) working days. • Where an accident mentioned in sub-section (1) causes bodily injury resulting in the compulsory absence from work of the person injured for a period exceeding forty-eight hours, it shall be entered in a register prescribed by rules. • A copy of the entries in the register referred to in sub-section (2) within fifteen days following the 30th day of June and the 31st day of December in each year to the Chief Inspector.
Notice of certain dangerous occurrences	<p>Chapter-VII of Bangladesh Labor Act, 2006 and Section-89, Chapter IX of Factories Act, 1965</p> <p>Where in a factory, any dangerous occurrence of a nature prescribed by rules occurs, whether causing any bodily injury or not, the employer shall inform the Inspector by notice within the following three working days.</p>
Notice of certain diseases	<p>Chapter-VII of Bangladesh Labor Act, 2006 and Section-90, Chapter IX of Factories Act, 1965</p> <ul style="list-style-type: none"> • Where in a factory any worker contacts any disease specified in the Second Schedule, the employer or the concerned worker or any person specified by him in this behalf shall send notice thereof to the Inspector in such prescribed form and within such time as may be prescribed by rules. • If any registered medical practitioner attends on a person who is, or has been

Health and Safety Aspect	Requirement
	<p>employed in a factory and who is, or is believed by such medical practitioner to be suffering from any disease specified in the Schedule, the medical practitioner shall, without delay, send a report in writing to the Chief Inspector stating -</p> <ul style="list-style-type: none"> — The name and full postal address of the patient; — The disease from which he believes the patient to be suffering; — The name and address of the factory in which the patient is or was last employed <ul style="list-style-type: none"> • The Government may add to or subtract from the Schedule any disease by notification in the official Gazette
<p>Power of direct enquiry into cases of accident or disease</p>	<p>Chapter-VII of Bangladesh Labor Act, 2006 and Section-91, Chapter IX of Factories Act, 1965</p> <ul style="list-style-type: none"> • When any accidental explosion, ignition, outbreak of fire or irruption of water or any other accident occurs in a factory, or when any disease specified in the Second Schedule has been or suspected to have been contracted in any factory , the Government if it is of opinion that a formal enquiry into the causes of, and the circumstances attending, the accident or disease ought to be held may appoint a competent person to hold such enquiry, and may appoint any person possessing legal or special knowledge to act as an assessor in holding the enquiry. • The person appointed to hold an enquiry under this section shall have all the powers of a Civil Court under the Code of Civil Procedure, 1908, for the purposes of enforcing the attendance of witnesses and compelling the production of documents and material objects, and every person required by the person making the enquiry to furnish any information shall be deemed to be legally bound so to do within the meaning of section 176 of the Penal Code. • Any person holding an enquiry under this section may exercise such of the powers of an Inspector under this Act, as he may think it is necessary or expedient to exercise, for the purposes of the enquiry. • The person holding the enquiry shall make a report to the Government stating the causes of the accident and the circumstances adding any observation which he or any of the assessors, may think fit to make. • The Government may cause such report to be published at such time and in such manner as may think fit.
<p>Power to take samples</p>	<p>Chapter-VII of Bangladesh Labor Act, 2006 and Section-92, Chapter IX of Factories Act, 1965</p> <ul style="list-style-type: none"> • An Inspector may, at any time during the normal working hours, informing the employer of a factory, take in the manner hereinafter provided, a sufficient sample of any substance used or intended to be used in the factory such use being in the opinion of the Inspector in contravention of the provisions of this Act or the rules, or is likely to cause bodily injury or injury to the health of, workers in factory. • Where any Inspector takes such sample, he shall, in the presence of the employer, unless he willfully absents himself, divide the sample into three portions and effectively seal and suitably mark them and shall permit the employer to add his own seal and mark thereon. • The employer shall, if the Inspector so requires, provide the appliances for dividing and sealing and marking the sample taken. • The Inspector shall forthwith give one portion of the sample to the employer,

Health and Safety Aspect	Requirement
	<p>send the second portion to a Government analyst and report thereon, and retain the third portion for production to the Court, before which proceedings if any are instituted in respect of the substance.</p> <ul style="list-style-type: none"> Any report, purporting to be a report under the hand of any government analyst upon any substance submitted to him for analysis and report under this section, may be used as evidence in any proceedings instituted in respect of the substance.
Washing facilities	<p>Chapter-VIII of Bangladesh Labor Act, 2006 and Section-43, Chapter V of Factories Act, 1965</p> <ul style="list-style-type: none"> In every factory - <ul style="list-style-type: none"> Adequate and suitable facilities for washing and bathing shall be and maintained for the use of the workers therein; Separate and adequately screened facilities shall be provided for the use of male and female workers; and Such facilities shall be conveniently accessible and shall be kept clean. The Government may, in respect of any factory or class or description of factories, prescribed standards of adequate and suitable facilities for washing.
First-aid appliances	<p>Chapter-VIII of Bangladesh Labor Act, 2006 and Section-44, Chapter V of Factories Act, 1965</p> <ul style="list-style-type: none"> There shall, in every factory be provided and maintained, so as to be readily accessible during all working hours, first aid boxes and cupboards equipped with the contents prescribed by rules; <ul style="list-style-type: none"> The number of such boxes and cupboards shall not be less than one for every one hundred and fifty workers ordinarily employed in the factory; Every first aid box and cupboard shall be kept in charge of a responsible person who is trained in first-aid treatment and who shall always be available during the working hours of the factory; A notice shall be affixed in every work-room stating the name of the person in charge of the first-aid box or cupboard provided in respect of that room and such person shall wear a badge so as to facilitate identification; In every factory wherein five hundred or more workers are employed, there shall be provided and maintained an ambulance room or dispensary of the prescribed size containing the prescribed equipment or similar facilities, in the charge of such medical and nursing staff as may be prescribed.
Canteens	<p>Chapter-VIII of Bangladesh Labor Act, 2006 and Section-45, Chapter V of Factories Act, 1965</p> <ul style="list-style-type: none"> In every factory wherein more than one hundred workers are ordinarily employed, there shall be provided adequate number of canteens for the use of the workers. <ul style="list-style-type: none"> The government may make rules providing for- <ul style="list-style-type: none"> The standards in respect of construction, accommodation, furniture and other equipment of the canteen; The constitution of a managing committee for the canteen and representation of the workers in the management of the canteen; and The managing committee to be formed under the rules shall determine the foodstuff to be served in the canteen, and the charges therefor.
Shelters	<p>Chapter-VIII of Bangladesh Labor Act, 2006 and Section-46, Chapter V of Factories Act, 1965</p>

Health and Safety Aspect	Requirement
	<p>Act, 1965</p> <ul style="list-style-type: none"> In every factory wherein more than fifty workers are ordinarily employed, adequate and suitable shelters or rest rooms, and a suitable lunch room with provision for drinking water where workers can eat meals brought by them, shall be provided and maintained for the use of the workers: Provided that any canteen maintained in accordance with the provisions of section 92 shall be regarded as part of the requirements of this sub-section: Provided further that where a lunch room exists no workers shall eat any food in the work room. The shelters, rest rooms or lunch rooms provided under sub-section (1) shall be sufficiently lighted and ventilated and shall be maintained in a cool and clean condition. In every factory where more than twenty five female workers are employed, separate shelter rooms are to be maintained and in factory where less than twenty five female workers are employed, separate and adequate spaces with screen shall be provided.
Rooms for children	<p>Chapter-VIII of Bangladesh Labor Act, 2006 and Section-47, Chapter V of Factories Act, 1965</p> <ul style="list-style-type: none"> In every factory, where forty or more female workers are ordinarily employed, there shall be provided and maintained a suitable room or rooms for the use of children under the age of 6 six years of such women. Such room shall be provided adequate accommodation, adequately lighted and ventilated and maintained in clean and sanitary condition, and shall be under the charge of woman trained or experienced in the care of children and infants. Such rooms shall be conveniently accessible to the mothers of the children, accommodated therein and, so far as is reasonably practicable, they shall not be situated in close proximity to any part of the factory where obnoxious fumes, dust or odors are given off, or where excessively noisy works are carried on. Such rooms shall be solidly constructed, and all walls and roofs shall be of suitable heat resisting materials, and shall be water-proof. The height of such rooms shall not be less than three hundred and sixty centimeters from the floor to the lowest part of the roof, and there shall be not less than six hundred sq. centimeters of the floor area for each child to be accommodated. Suitable and effective provisions shall be made in every part of each such rooms for securing and maintaining adequate ventilation by the circulation of fresh air. Such rooms shall be adequately furnished and equipped in particular, there shall be one suitable cot or cradle with necessary bedding for each child, and at least one chair or equivalent seating accommodation for the use of each mother while she is feeding or attending to her child, and a sufficient supply of suitable toys for the older children. A suitable fenced and shady open air play-ground shall be provided for the older children. Provided that the Chief Inspector may, by order in writing, exempt any factory from compliance with this sub-rule, if he is satisfied that there is not sufficient space available for the provision of such a playground.
Community health and safety	<p>IFC Environmental, Health, and Safety General Guidelines</p> <p>This section complements the guidance provided in the preceding environmental and</p>

Health and Safety Aspect	Requirement
	occupational health and safety sections, specifically addressing some aspects of project activities taking place outside of the traditional project boundaries, but nonetheless related to the project operations, as may be applicable on a project basis. These issues may arise at any stage of a project lifecycle and can have an impact beyond the life of the project. The major subsections under this heading are: <ul style="list-style-type: none"> — Water Quality and Availability — Structural Safety of Project Infrastructure — Life and Fire Safety (L&FS) — Traffic Safety — Transport of Hazardous Materials — Disease Prevention — Emergency Preparedness and Response
Construction and decommissioning	IFC Environmental, Health, and Safety General Guidelines This section provides additional, specific guidance on prevention and control of community health and safety impacts that may occur during new project development, at the end of the project life-cycle, or due to expansion or modification of existing project facilities. Cross referencing is made to various other sections of the General EHS Guidelines of IFC.

1.4. Roles and Responsibilities

The following section provides a brief description of the duties of various people:

Manager- Occupational Health & Safety (OHS)

- Provide leadership in the implementation of all safety initiatives during the entire phase;
- Responsible for the physical security and for maintaining a safe working environment at all times in the MEZ-III area;
- Ensure that the appropriate safety equipment is available and that emergency entry and egress is maintained and is unimpeded by working materials and tools;
- Responsible for instructing the hirer on general matters of MEZ-III and security and for appraising the employees of the company's health and safety policy;
- Supervise the entire safe working practices and care of the environment;
- Liaison with Workplace Safety Officer, Site Doctor/First Aider as required and provide technical advice or other assistance where necessary;
- Organize health and safety training for employees when necessary;
- Liaison with the construction teams, HSE department and sub-contractors on relevant HSE issues;
- Regularly maintain and review the record relevant to the OHS Plan (Incident/accident, injury and illness reporting, Incident/accident investigations, minutes of committee meetings, all updates or changes to the OSH Plan and periodic evaluation reports on the outcome of the OHS Plan).

Chief Safety Officer (CSO)

- Ensure that all employees and sub-contractors are following their responsibilities under the plan;

- Promote safe conduct of work in the City Seed Crushing Industries (Unit-2) Ltd.;
- Review the audit findings and close out reports;
- Liaison with the workplace safety and health officer (WSHO) of the MEZ-Ilion safety and health matters;
- Participate in HSE promotional activities, for example HSE committee meeting, training inspection and audit on project site;

Workplace Safety and Health Officer (WSHO)

The duties of the Workplace Safety Officer shall include the following:

- Ensure that the operations at the facility are in compliance with EHS requirements at all times;
- Conduct HS&E audits on regular basis and advice management for necessary action;
- Maintain first aid facilities and personnel protective equipment as demanded by the nature of the work/material safety data sheets;
- Investigate of all type of accidents and report to the Chief Safety Officer;
- Provide training to the workers and ensure that they are issued with adequate instructions and creating awareness of safe work practice among them;
- Carry out job safety analysis to determine "Hazards of the operations/activity and facilitate suitable solutions;
- Liaison with members of EHS on a regular basis to ensure that all local/state/federal health & safety requirements are met; and
- Participate in the preparation of all safety instructions, procedures and activities.

Safety Supervisor (SS)

- Issuance of Hot/Cold Work/ Confined Space permits for all non-routine works;
- Inspect of all work place, promotion of the safe conduct of work, hazard identification techniques and communication of corrective measures to manager (OHS)
- Carry tools box talks daily before beginning any work;
- Report defects in equipment; and
- Ensure workers participate in relevant safety activities

Site Doctor & First Aider

- Initial emergency response resuscitation and stabilization of critically ill or injured personnel
- Diagnosis and treatment of non-emergency medical conditions;
- Management and administration of medical services, supplies, nurse activities and patient records;
- Implementation of site health plans and preventive medicine activities including first training of employees; and
- Undertake regular health and hygiene inspections

Employees/Workmen:

- Use the correct tools and equipment for the job; use safety equipment and protective equipment/clothing supplied, e.g. Safety helmets, shoes, harness, goggles etc.; and
- Report all defects in equipment to the supervisor.

1.5. Hazard Identification, Risk Assessment and Risk Control

Identification of hazard, risk assessment and risk control measure must be part of a company's management system to fully ensure that all systems, procedures and processes of protection are in place for all employees. It is important for organization to consult with all employees and external emergency services to establish a risk management programme which includes the following-

Formation of a Risk Management Team

The team should be led by the Chief Safety Officer and comprise Workplace Safety Officer, Manager (OHS), persons from relevant departments with appropriate knowledge and experience. The duties and responsibilities of the team members should be clearly defined.

Hazard Identification

The identification process should also include consideration of:

- The way work is organized, managed and carried out including any changes that has occurred;
- Investigate injuries, illnesses, incidents to determine the underlying hazards, their causes, and safety and health program shortcomings;
- Determine the severity and likelihood of incidents that could result for each hazard identified, and use this information to prioritize corrective actions;
- The design of workplaces, work processes, materials and equipment;
- The purchasing of goods and services;
- The inspection, maintenance, testing, repair and replacement of equipment.

Risk Assessment

Based on the level of risk all identified hazard should be evaluated and assessed and should be constructed a list that include the required measures for controlling the risk of each hazards.

Prevention and Control Measure

The protective and preventive measures should be implemented to minimize or eliminate safety and health risks of the workers by priority basis-

- Where elimination is not possible, have to eliminate the hazard/risk
- Substitute the hazard/risk by replacing it with something that does not produce a hazard
- Control the hazard/risk at source through the use of engineering controls or organizational measures
- Minimize the hazard/risk by the design of safe work systems which include administrative control measures;
- Where residual hazards/risk cannot be controlled by collective measures, the employer should provide for appropriate personal protective equipment including gloves, Nomex/Uniform, respirators, hard hats, safety glasses, high-visibility clothing, and safety footwear and should be taken implement measures to ensure its use and maintenance. The preventive and protective measures should be documented and approved by the relevant management.

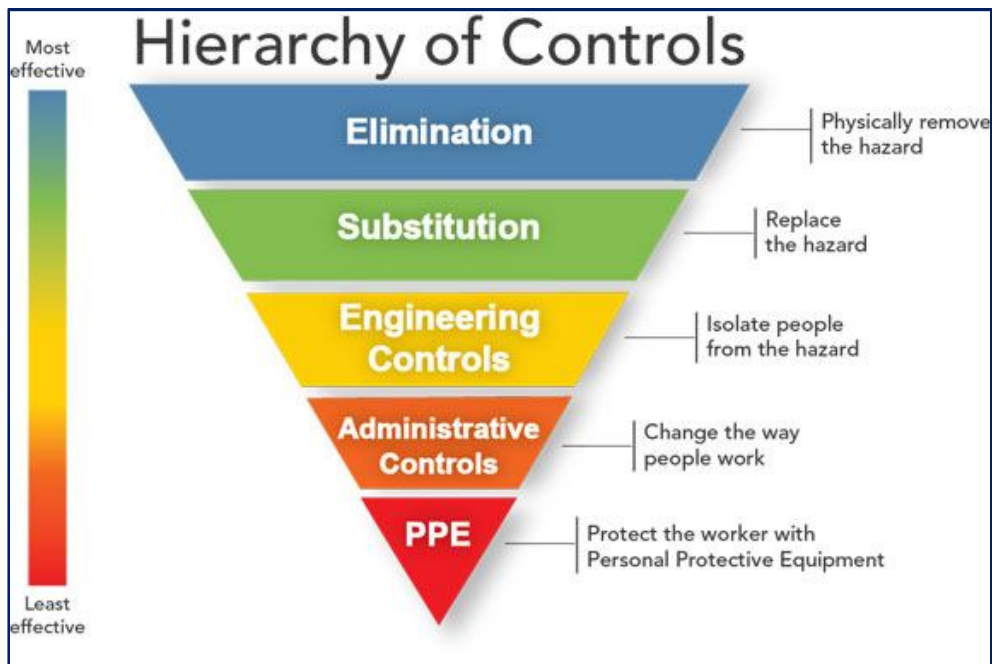


Figure 1: Identify and evaluate options for controlling hazards, using a "hierarchy of controls"

1.6. Training

Chief Safety Officer should ensure that every person is aware of the SHE risks associated with the work being carried out at the workplace and is trained and competent in the relevant work practices and maintained procedures.

The Management should establish procedures to identify training needs and provide adequate safety training for all levels of employees including contractors. The safety training should provide management staff with the knowledge and skills necessary for organizing and managing occupational safety and health programmes; team leaders with leadership skills and knowledge to lead, implement and apply occupational safety and health activities; and workers with the knowledge, skills and right attitudes to enable them to work safely without harming them, or others, health and the environment.

Types of SHE Training

Mandatory Training

Mandatory training is a requirement for all staff on first arrival at the site. It is necessary for them who holds the first managerial role with SHE responsibility for others and on appointment to the Director/Senior Managerial role. Manager (OHS), CSO, WSHO, SS, Workers, and Contractors etc. should cover the mandatory requirements.

Job or Hazard Specific training

Consideration of specific hazards arising from the work the line management can be identified and recorded the training need through the Safety, Health and Environment (SHE) department.

SHE Orientation and Awareness

BEZA should conduct safety and health orientation courses for new employees as well as direct and indirect (contract) workers.

Skill Training

Workers should also be given training in the skills appropriate to their work so as to improve their individual performance in their respective fields.

SHE Training Programme

There should be an in-house training programme for SHE related training which shall be implemented by Workplace Safety Supervisor on a regular basis for apprising the project staffs and workers about management of H&S risks entailed in the project activities. These are generic training programmes. BEZA may customize the programmes and/or undertake additional training programmes pertaining to project activities as identified necessary.

Table 2: Proposed Training Modules

SN	Training Name	Frequency	Description	Responsibility
1.	Induction Training on Health and Safety; They should cover the Company 1. SHE policy; 2. Hazards and risks associated with operation and workplace; 3. Control measure to be taken to eliminate or minimize SHE risks, including safe working systems and procedures; use of personal protective equipment; action to be carried out during emergency; 4. Emergency response procedures, such as firefighting, extinguisher use and evacuation procedure	-	All Company Staffs and contractors at the time of joining/engagement	Workplace Safety Supervisor
2.	Tool Box Training or pre-task briefings, highlighting hazards and the method of dealing with them	Daily	Held at each work location by foreman of contractor to discuss day's activities and specific hazards	Contractor Supervisor
3.	Foreman Safety Training	Fortnightly	Review Safety Performance for week and discuss the safety for upcoming operations	Contractor Supervisor
4.	Mass Training	Monthly	Presentation of significant safety issues	Workplace Safety Supervisor
5.	Special Job Hazard Training including Entry into Confined Space and Other Hazardous Environment	Half Yearly	Training about safety measures to be incorporated related to specific jobs	Workplace Safety Supervisor
6.	Safety Bulletins	Weekly	Specific issues visible through jobsite for constant awareness	Workplace Safety Supervisor
7.	Fire Safety	Half Yearly	Presentation of fire safety measures	Workplace Safety

SN	Training Name	Frequency	Description	Responsibility
				Supervisor
8.	Emergency Response	Half Yearly	For emergency preparedness	Workplace Safety Supervisor
9.	First Aid	Half Yearly	For emergency preparedness	Site Doctor
10.	Use of Personal Protective Equipment	Half Yearly	For workplace safety	Workplace Safety Supervisor, Contractor, Supervisor

1.7. Documentation and Record Keeping

Manager (OHS) should maintain documented procedures for the identification, maintenance and disposition of OHS records (hazards, assessment and control of risks) of the ongoing activities. OHS records shall be stored and maintained in such a way that they are readily retrievable and protected against damage, deterioration or loss. Their retention times shall be established and recorded. Such documents are as following-

- SHE policy;
- Hazard identification records;
- Risk register;
- Legal register;
- License, certificates, permits;
- Control methods including process control and machine design, safe work procedures, in-house work rules;
- Design drawings;
- Organization structure;
- SHE group meeting records;
- Training records;
- Drill reports;
- Inspection and audit reports;
- Medical and health surveillance records

Communication and Provision of Information

The CZ authority should communicate and inform any persons affected by the risk about:

- The nature of the risks involved; and
- The control measures or safe work procedures to be taken to address the risks involved

Review

The risk assessment should be reviewed and revised:

- At least once in every 3 years; and
- Upon the occurrence of any injuries to any person as a result of exposure to a hazard in the workplace; or where there is a significant change in work practices or procedures.

1.8. Safe Work Practices

In the MEZ-III area many hazards can generate which should be identified and eliminated or minimized to an acceptable level in order to achieve a safe and healthy work environment. The MEZ-III should to establish safe work practice for workers including but not limited to the following:

1.8.1. Fitness for Duty

Fitness for duty incorporates (but is not limited to) the promotion of physical, mental and emotional health. At the time of engagement, MEZ-III employees should to undergo a medical assessment to ensure they are medically fit to perform their role.

Health Surveillance

Management must ensure that health assessments are carried out in respect of all personnel who engage in specific tasks with the potential for occupational exposure, if:

- An identifiable disease or other adverse effect on the health of the employee may be related to the exposure;
- There is a reasonable likelihood that the disease or adverse effect may occur under the particular conditions of work; and
- There are recognized techniques for detecting indications of the disease or adverse effect.

Alcohol and Drugs

All personnel are required to undergo a pre-employment drug and alcohol test prior to commencing work with MEZ-III. Personnel must not commence work if they are not fit for duty or if they are impaired by alcohol, illicit drugs or medication.

Fatigue Management

Fatigue may arise from hours and patterns of work and activities although it is also influenced by factors outside of work, such as family responsibilities, stress, lifestyle, personal health etc., the management of fatigue is a shared responsibility between Management and the individual.

General Hazard Prevention

The MEZ-III should to prevent the following hazards-

Working Alone

Where Personnel are required to work alone, the activities and conditions shall be risk assessed and a safe system of work should be developed.

Manual Handling

Where a manual handling task is required, by doing a risk assessment appropriate controls should be implemented and organized manual handling training as appropriate. Management must ensure suitable powered mechanical equipment and lifting aids are provided to enable personnel to avoid heavy manual tasks.

Ergonomics

All personnel must consider ergonomics when designing or arranging workstations, products and systems so that they fit the personnel who use them. Management should be ensured that where

ergonomic hazards are identified and pose a threat to personal safety, a risk assessment is completed by a competent person. Special consideration should be given to ergonomics in confined spaces, awkward or difficult to access spaces, using heavy or awkward tools and equipment, and using repetitive or high force actions.

Hygiene and Sanitation

The MEZ-III should be supplied suitable facilities for personnel including:

- Toilet facilities within a reasonable distance from each workspace;
- Sanitation and hygiene facilities that are properly maintained;
- Eating places that are dry, clean, well ventilated and have adequate seating, tables, hand washing and waste disposal facilities; and
- Potable water supplies available to all personnel.

Occupational Hygiene

BEZA must ensure commitment to monitoring and reporting of occupational health hazards and hazardous occupational environments, and implement controls to reduce risk in accordance with all applicable regulations and, wherever practicable, with regard to accepted best practices.

Ongoing assessments should be conducted and, as required, controls implemented for the following occupational health hazards:

- Airborne contaminants such as metal dusts, respirable silica and asbestos fibers;
- Occupational noise exposure.

Risk assessment, evaluation and control of occupational hazards should be undertaken in consideration of the following broad hazard categories:

- Chemical hazards – such as fumes and vapours;
- Physical hazards – those related to heat, cold, noise, vibration, ionizing radiation, ultra-violet light and workplace lighting;
- Biological hazards – including mosquito borne viruses, potable water contaminants and other water borne hazards such as legionella; and
- Ergonomic hazards – including manual handling hazards.

The anticipation, recognition, evaluation, communication and control of occupational health hazards underpin to protect personnel from occupational related injury, illness and impairment.

Hazardous Substances

Management must be ensured the safe control of hazardous substances and reduce the level of exposure to personnel, property and the environment. A risk assessment with health surveillance should be required to monitor the health of personnel who are at significant risk of exposure to hazardous substances.

Smoking

Management must be provided a safe working environment by reducing the effects of Environmental Tobacco Smoke (ETS) to all personnel. Smoking is only permitted in designated smoking areas identified with sign post. The designated areas must be:

- Located outdoors;

- In well ventilated areas with no possibility that the redundant smoke will contaminate indoor areas;
- Located (where possible) away from pedestrian traffic areas and where personnel may be required to work; and
- Provided with cigarette butt bins to control litter and reduce potential fire risk.

Heat Stress

MEZ-III should be undertaken all necessary measures and precautions to ensure that employees do not suffer harm to their health from the adverse effects of extreme heat or cold. If conditions in any workplace are, or are likely to be, hot and humid, Safety Supervisor must ensure that:

- All employees are provided with instruction on measures to be taken to avoid any harmful effects from those conditions;
- Appropriate workplace environmental controls such as ventilation, and monitoring are implemented; and
- If appropriate, a program for monitoring the health of employees in the workplace is implemented.

Lightning

MEZ-III should be managed the risks associated with personnel being exposed to lightning. Workplace Safety Supervisor must continually monitor the surrounds for changes to weather conditions, and factor the difficulty of seeing conditions change or hearing thunder in a busy operational environment. Personnel must be prepared to respond to lightning immediately should an alert be received, thunder heard, or lightning observed.

Personal Protective Equipment (PPE)

The MEZ-III should be ensured that all personnel and visitors wear or use personal protective clothing or equipment provided if it is necessary to protect them from harm. All personnel should be used personal protective clothing and equipment where a sign is displayed to do so or as identified by risk assessment. Primarily, PPEs are required for the following protection-

- Head protection (Safety helmets)
- Foot protection (Safety footwear, gumboot etc.)
- Body protection (High visibility clothing, apron etc.)
- Personal protection (Full body harness, rope grap fall arrester etc.)
- Eye protection (Goggles, welder glasses etc.)
- Hand protection (Gloves, finger coats etc.)
- Respiratory protection (Nose mask, Self-Contained Breathing Apparatus (SCBAs) etc.)
- Hearing protection (Ear plugs, ear muffs etc.)

First Aid

- All premises must be provided with adequate first aid facilities with a full time qualified doctor and at least two trained first aiders during working hours;
- All employer must provide or ensure that there is appropriate and adequate equipment are rendered in the circumstances for enabling first aid to his employees if they are injured or become ill at work.

Hand Tools

Where personnel are required to use hand tools in the course of their job, the tools should be inspected before use. Certain damaged hand tools are prohibited from been used on MEZ-III sites, refer to the Prohibited Tools Register for further information.

Safety Signs

MEZ-III should be ensured that the sufficient Safety Signs are posted in workplaces and travel ways to prevent incidents, identify hazards, indicate the location of safety and fire protection equipment, and provide guidance and instruction in emergency procedures. Safety Signs must be sited in that place from where they can be readily seen and maintained in a clean and readable condition.

Fall Prevention

MEZ-III should be ensured that all personnel undertaking activities where there is a risk of a person falling from one level to another do so in a controlled manner to reduce the risk of personal injury. Specific regulations set out certain mandatory methods that are required to control the risk such as fall prevention systems, edge protection, and protection of holes and openings.

Working On, Over, In or Near Water

Management should be managed the risk of drowning when personnel are required to work on, over, in or near water.

1.8.2. Task Specific Hazard Prevention

High Risk Work

Management should be identified High Risk Work, and implemented a procedure or risk assessment specific to that task to ensure hierarchical controls are in place to eliminate, prevent or control the risk to as low as reasonably practicable (ALARP). At a time the authority should be ensured that personnel performing High Risk Work requiring a High Risk Work License, do hold a current license in that particular class, and are competent in that particular High Risk Work.

Electrical Work

The measures suggested above for electrical work includes-

- Qualified electrical supervisors must be appointed to carry out the duties;
- An electrical log book must be kept at each operational site to record plans, work carried out and other relevant information;
- Electrical equipment must be provided with full current isolating devices capable of being secured in the isolating position wherever practicable. Where such features are not practicable, a risk assessment shall be conducted to establish suitable alternative controls, and outcomes communicated to impacted personnel.

Confined Space

Cutting, burning and welding often take in confined spaces. Regular checking and gas free space should be taken into consideration to permit the work. The supervisor should to make the arrangements for working in a confined space including but not limited to-

- A confined space permit to work procedure should be established that allows work to be carried out in the confined space without risk to the health and safety of workers;
- A supervisor should accompany the worker. It shall be ensured that the supervisor has been provided adequate training;
- Establishing the testing of the atmosphere prior to entry where identified in the risk assessment and ongoing monitoring of the atmosphere whilst work in the confined space is being carried out;
- Ensuring good ventilation in the confined space to prevent stale air and ensure the air quality remains breathable;
- Removing any residues that may be present in the confined space which may give rise to risk or increase the risk to those working in the confined space;
- Isolating the confined space from any gasses, liquids or other flowing materials that may enter the confined space. This isolation should be in the form of a lock-off and isolation permit in order to prevent any accidental flow into the confined space;
- Ensuring that safe access and egress are provided into and out of the confined space. Where multiple accesses are required to a confined space a tally must be kept of the names of the workers in the confined space for emergency purposes;
- Ensuring that where there is excessive temperature in the confined space, the working shift is reduced and frequent breaks are provided. Arrangements must also be made to ensure that workers do not become dehydrated whilst working in excessive temperatures;
- Establishing an emergency procedure to deal with the rescue or recovery of any workers who become injured or endangered in the confined space.

All personnel required to enter a confined space will undergo confined space entry training. Personnel who have not taken this training are prohibited from entering a confined space. For any activity at confined space, the permit to work shall need to be obtained from the supervisor.

Hot Work

Hot work presents an increased risk of the fire and explosion hazards because it is most often performed in confined and enclosed spaces. These operations includes riveting, welding, burning, grinding or use of powder actuated tools or similar fire or spark producing operations. Before beginning hot work, the following task must be performed-

- The permit to work must demonstrate that the appropriate precautions have been taken to ensure the area is free of gas, flammable sludge or film adhering to surfaces, and that no other structure or operation is at risk from the cutting, burning or welding. There should be a person available at the fire watchman to raise the alarm in the event of the fire and apply immediate fire frightening measures.

Protection against Fire

Check that there is no flammable material, gas or dry woodwork which could catch fire; and that surfaces which have been in contact with hydrocarbons or toxic substance are completely clean.

Driving Safety

Management must ensure that Personnel permitted to drive either a vehicle in controlled areas or an vehicle on public roads, hold a current driving license and comply with the relevant road rules for that class of vehicle. All Personnel driving vehicles on land must obey all traffic directions; drive to conditions, and in accordance with relevant Traffic Management Plans.

1.9. Emergency Management

The authority should be maintained on site emergency preparedness and response plan to protect employees in case of emergency are as following but not limited to-

- Ensure emergency response resources are kept ready and in healthy condition;
- Training on Emergency Action Plans are taken place during new employee orientation, when changes occur in the action plans, and periodically as coordinated by the Safety and Health Manager;
- Regular mock drill are conducted to evaluate the effectiveness of emergency response;
- Keep emergency system/equipment such as fire extinguisher, emergency lighting, fire suppression and detection system in working;
- Emergency alert system like sirens, announcement etc. system should to be available and kept healthy.

1.10. Measurement and Evaluation

1.10.1. Systematic Monitoring

OSH Performance

The MEZ-III should be established and reviewed OSH Performance indicators on an annual basis. These performance indicators are monitored and communicated to personnel through regular meeting forums and in writing.

Internal OSH Audit

Internal health and safety audits should be conducted annually. Audit evidence is documented and findings recorded in the Health & Safety Audit Report Form.

OSHMS (Occupational Safety &Health Management System) Audit

MEZ-III has to be established implemented and maintained an audit program and procedure for periodic OSHMS audits. Audits need to be carried out by a competent person, in order to determine whether the OSHMS:

- Is in line with the City Seed Crushing Industries (Unit-2) Ltd.OSH Policy; and
- Meets the objectives and targets for continual OSH improvement.

1.10.2. Workplace Monitoring

Workplace Inspections

Management must ensure that each work area is inspection regularly to ensure the work area is safe. Workplace Inspections must be undertaken to identify and rectify hazards, communicate hazard types and controls put in place, monitor the effectiveness of controls and identify means of reducing risks to ALARP.

1.11. System and Process Improvement

Preventative and Corrective Actions

Management should be monitored and measured on a regular basis the key characteristics of the operation and activities that can cause illness and injury.

Continual Improvement

Management regularly should be reviewed and continually improved the OSH performance.

1.12. Process Owner

The Occupational Health and Safety Manager should be responsible to implement this plan.

Some suggested plan species for the better Green Belt development in and around any industrial settlement

Plant species suggested by Bangladesh Forest Research Institute for industrial areas:

Local Name	Scientific Name	Family Name	Common /English Name	Growth Habit	Uptake/ Tolerate In	Description		
						General	Growth Requirements	Importance
Mehogani	<i>Swietenia mahagnoni</i>	<i>Meliaceae</i>	West Indian mahogany	Tree	CO ₂	Medium-sized semi-evergreen tree Height: 40 to 50 feet Spread: 40 to 60 feet Crown uniformity: symmetrical Crown shape: round Crown density: moderate Growth rate: fast Maturation time: roughly 25 years	Adapted to: coarse and fine textured soils CaCO ₃ tolerance: medium Drought tolerance: medium Fertility requirement : medium pH: 6.0-7.0 Planting density per acre: 320-640 Precipitation: 1,000-2,000mm Root depth: minimum (inches) 36 Salinity tolerance: none Shade tolerance: Medium Temperature: 24 - 32°C	The dense, strong wood of mahogany is quite resistant to wind-damage, making this tree all the more ideal for use as a shade tree or street tree. Recommended for buffer strips around parking lots or for median strip plantings in the highway; tree has been successfully grown in urban areas where air pollution, poor drainage, compacted soil, and/or drought are common.
Neem	<i>Azadirachta indica</i>	<i>Meliaceae</i>	Neem	Tree	SO ₂ , SPM, CO ₂	Evergreen tree, but in severe drought it may shed most or nearly all of its leaves Height: 49–66 ft Spread: 49–66 ft Crown shape: Roundish Crown density: Open	Adapted to: It grows on a wide variety of neutral to alkaline soils but performs better than most species on shallow, stony, sandy soils, or in places where there is a hard calcareous or clay not far below the surface	Drought resistant and grows in many soil types.

						Growth rate: Medium Maturation time: start flowering and fruiting at the age of 4-5 years, but economic quantities of seed are produced only after 10-12 years	CaCO ₃ Tolerance: Medium Drought Tolerance: High Fertility Requirement : Medium pH: 6.2-7 Precipitation: 16–47 in Root Depth: deep-rooted Salinity Tolerance: Moderate Shade Tolerance: Young plants cannot tolerate intensive shade Temperature: 70–90 °F	
Narikel	<i>Cocos nucifera</i>	<i>Palmae</i>	Coconut	Tree	CO ₂	Evergreen tree Height: 50 to 60 feet Spread: 15 to 25 feet Crown uniformity: Symmetrical Crown shape: upright Crown density: Open Growth rate: Medium Maturation time: 3-6 years	Adapted to: Coarse, medium and fine textured soils Anaerobic Tolerance: Medium CaCO ₃ Tolerance: Medium Drought Tolerance: Medium Fertility Requirement : Low Moisture Use: Low pH: 4.0-8.0 Planting Density per Acre: 150-300 Precipitation: 1200-2300 mm Root Depth, Minimum (inches): 60 Salinity Tolerance: High Shade Tolerance: Intolerant Temperature: Minimum 18°F Fruit/Seed Abundance: High Fruit/Seed Period Begin: Year	All Coconut Palms are highly salt- tolerant and make nice street trees. Be aware that falling fruit can damage vehicles or hit pedestrians and the flower stalks (in spring) or developing fruit (summer) may need to be removed.
Tal	<i>Borassus flabellifer</i>	<i>Areaceae</i>	Palm	Tree	CO ₂	Evergreen tree Height: 98 ft Spread: up to 60 cm Crown shape: fan-shaped Crown density: open Growth rate: rapid	Adapted to: light (sandy), medium (loamy) and heavy (clay) soils Drought Tolerance: quite resistant pH: acid, neutral and basic (alkaline) soils and can grow in very alkaline soils	Quite drought resistant and also survive water logging quite well.

							Precipitation: 500-5000 mm Salinity Tolerance: none Shade Tolerance: Intolerant Temperature: 30°C (but it withstands extreme temperatures of 45°C and 0°C as well)	
Bokul	<i>Mimusops elengi</i>	<i>Sapotaceae</i>	Spanish cherry	Tree	SPM,SO ₂ , NO _x , CO ₂	Evergreen tree Height: 10 m to 12 m Spread: 10 m Crown shape: conical when young, and a dense, bushy, rounded crown when mature Crown density: moderate Growth rate: moderate	Adapted to: rich, free-draining loam and sand soils Drought tolerance: medium pH: 5.6 to 8.4 Precipitation: 800 to 4000 mm Shade tolerance: tolerant Temperature: annual lows of 19 to 24 °C, annual highs of 29 to 35 °C	It prefers moist soil and can tolerate drought. The plant can tolerate strong winds but not maritime exposure.
Nageshwar	<i>Mesua ferrea</i>	<i>Calophyllaceae</i>	Sri Lankan ironwood	Tree	CO ₂	Evergreen tree Height: 18 m to 30 m Spread: 6 m to 12 m Crown shape: conical Crown density: moderate Growth rate: slow	Adapted to: well drained and deep fertile soil, stiff clay soil pH: 5 - 5.5, tolerating 4.3 -6.9 Precipitation: 3,000-4,000mm, but tolerates 2,000 - 5,100 mm Shade tolerance: tolerant when young Temperature: 30 - 35°C	Improved soil quality, used as timber and medicine
Debdaru	<i>Polyalthia longifolia</i>	<i>Annonaceae</i>	False ashoka	Tree	SPM,SO ₂ , NO _x , CO ₂	Evergreen tree Height: up to 20 m Spread: 10 m Crown shape: columnar Growth rate: moderate	Adapted to: fertile, well-drained soil Drought tolerance: medium Fertility requirement : medium pH: 5.5 to 7.5 Precipitation: 600 to 2600 mm Salinity tolerance: moderate Shade tolerance: intolerant Temperature: 15- 36 °C	Wind Blocking, good tolerance to drought.
Gaab	<i>Diospyros malabarica</i>	<i>Ebenaceae</i>	Indian persimmon	Tree	CO ₂	Evergreen tree but deciduous in drier localities Height: 15 - 37 m	Adapted to: It grows in lowland forests, often near streams, prefers moist soil but sensitive	

						Crown shape: Conical Crown density: Open Growth rate: Slow	to water logging. Drought Tolerance: High pH: 6 – 7 Precipitation 1,500 -2,500mm Salinity Tolerance: none Shade Tolerance: Intolerant Temperature: 25 - 35°C	
Raj Koroi	<i>Albizia richardiana</i>	<i>Mimosaceae</i>	Silk tree	Tree	CO ₂	Deciduous tree	The trees prefer a sunny situation on dry to moderately moist soil. The substrate should be sandy-loamy, gritty-loamy or sandy clay soil.	
Polash	<i>Butea monosperma</i>	<i>Fabaceae</i>	Flame-of-the-forest	Tree	SPM,SO ₂ , NO _x , CO ₂	Deciduous tree Height: 5 - 15 m Spread: 30-40 ft Crown shape: cylindrical Growth rate: Slow	Adapted to: grows best on old alluvial soils and weathered red basalts, however it succeeds on a wide variety of soils including shallow, gravelly sites, black cotton soil, clay loams, and even saline or waterlogged soils where few other trees will grow Drought tolerance: moderate pH: 6 - 7 Precipitation:450 - 4,500 mm Salinity tolerance: low Shade tolerance: medium Temperature: -4 -49°C	Farmers frequently use palash to stabilize field bunds & for erosion control.
Kishnochura	<i>Delonix regia</i>	<i>Fabaceae</i>	Royal poinciana	Tree	SO ₂ , NO _x , CO ₂	Semi-deciduous tree Height: 35 to 40 feet Spread: 40 to 60 feet Crown uniformity: symmetrical Crown shape: vase, spreading Crown density: moderate Growth rate: fast, 5 feet per year	Adapted to: coarse, medium and fine textured soils Anaerobic tolerance : low CaCO ₃ tolerance: medium Drought tolerance: medium Fertility requirement: low Moisture use: medium pH: 4.0-7.0 Planting density per acre: 170-300	Tolerant of a wide variety of soils conditions.

							Precipitation: 700-1800mm Root depth, minimum (inches): 60 Salinity tolerance: medium Shade tolerance: intermediate Temperature: minimum 31°F	
Thuja	<i>Thuja orientalis</i>	<i>Pinaceae</i>	False white cedar	Shrub	SO ₂ , CO ₂	Evergreen Tree Height: 5 to 8 m Spread: 3 to 5 meters Crown uniformity: symmetrical Crown shape: oval Crown density: Dense Growth rate: Moderate	Adapted to: Clay, Loam, Sand Soils Drought Tolerance: Low Moisture Use: Medium pH: Acid to alkaline Salinity Tolerance: Low Shade Tolerance: Intolerant	
Orokeria	<i>Araucaria excelsa</i>	<i>Araucariaceae</i>	Norfolk island pine, star pine	Tree	CO ₂	Evergreen Tree Height: 60 to 80 feet Spread: 12 to 20 feet Crown uniformity: symmetrical Crown shape: pyramidal, columnar Crown density: open Growth rate: fast	Adapted to: prefers medium/loamy soils Drought Tolerance: Yes Ph: 4.6 to 5.5 Precipitation: Minimum 50 inches Salinity Tolerance: Moderate Shade Tolerance: Medium	Tolerate in drought, mild salt and strong wind.

Some other suggested pollution tolerant plants thus selected for the better Green Belt development in and around any industrial settlement

Local name	Scientific name	Family	Common/English Name	Uptake/Tolerate In
Jarul	<i>Lagerstroemia speciosa</i>	<i>Lythraceae</i>	Queen's crape-myrtle	CO ₂
Katbadam	<i>Terminalia catapa</i>	<i>Combrataceae</i>	Country-almond	CO ₂
Chatim	<i>Alstonia scholaris</i>	<i>Apocynaceae</i>	Blackboard tree, devil tree	SPM,SO ₂ ,NO _x , CO ₂
Kadam	<i>Neolamarckia cadamba</i>	<i>Rubiaceae</i>	Bur flower-tree	CO ₂
Aam	<i>Mangifera indica</i>	<i>Anacardiaceae</i>	Mango	SPM, NO _x , CO ₂
Sonalu, Bador Lathi	<i>Cassia fistula</i>	<i>Fabaceae</i>	Golden rain tree	SPM, CO ₂
Karach	<i>Pongamia pinnata</i>	<i>Fabaceae</i>	Indian beech	CO ₂

Local name	Scientific name	Family	Common/English Name	Uptake/Tolerate In
Arjun	<i>Terminalia arjuna</i>	Combretaceae	Arjun tree	SO ₂ , CO ₂
Bahera	<i>Terminalia bellirica</i>	Combretaceae	Bastard myrobalan	CO ₂
Jamun	<i>Syzygium cumini</i>	Myrtaceae.	Black plum	SO ₂ , NO _x , CO ₂
Kanchan	<i>Bauhinia variegata</i>	Fabaceae	Orchid-tree	SO ₂ , NO _x , CO ₂
Bot	<i>Ficus benghalensis</i>	Moraceae	Banyan	SPM, SO ₂ , NO _x , CO ₂
Ashwath	<i>Ficus religiosa</i>	Moraceae	Sacred fig	SPM, SO ₂ , NO _x , CO ₂
Kathal	<i>Artocarpus heterophyllus</i>	Moraceae	Jackfruit	SPM, SO ₂ , NO _x , CO ₂
Akashmoni	<i>Acacia auriculiformis</i>	Fabaceae	Acacia	CO ₂
Gamar	<i>Gmelina arborea</i>	Lamiaceae	Beechwood	CO ₂

Pollution tolerant shrubs

Local Name	Scientific Name	Family Name	Common/English Name	Uptake/Tolerate In
Baganbilash	<i>Bougainvillea sp.</i>	Nyctaginaceae	Baganbilash	SPM, CO ₂
Putush	<i>Lantana camara</i>	Verbenaceae,	Lantana	SPM, SO ₂ , NO _x , CO ₂
Hedge plants	<i>Vernonia angustifolia</i>	Asteraceae	Tall ironweed	CO ₂
Chandaprabha	<i>Tecoma stans</i>	Bignoniaceae	Yellow bells	SO ₂ , CO ₂

Pollution tolerant grass

Local Name	Scientific Name	Family Name	Common/English Name
Durba	<i>Cynodon dactylon</i>	Poaceae	Bermuda grass
Lemon grass	<i>Cymbopogon citratus</i>	Poaceae	Lemon grass
Khas	<i>Saccharum spontaneum</i>	Poaceae	Kans grass

NASA suggested air-filtering plants

The first list of air-filtering plants was compiled by NASA as part of a clean air study published in 1989. As well as absorbing carbon dioxide and releasing oxygen, as all plants do, these plants also eliminate significant amounts of benzene, formaldehyde and trichloroethylene.

Plant	Scientific Name	Family Name	Remove
Dwarf date palm	<i>Phoenix roebelenii</i>	Arecaceae	Formaldehyde, Xylene And Toluene
Areca palm	<i>Dypsis lutescens</i>	Arecaceae	Formaldehyde, Xylene And Toluene
Boston fern	<i>Nephrolepis exaltata</i>	Nephrolepidaceae	Formaldehyde, Xylene And Toluene

Plant	Scientific Name	Family Name	Remove
Kimberley Queen fern	<i>Nephrolepis obliterated</i>	<i>Nephrolepidaceae</i>	Formaldehyde, Xylene And Toluene
English ivy	<i>Hedera helix</i>	<i>Araliaceae</i>	Benzne, Formaldehyde, Trichloroethylene, Xylene And Toluene
Spider plant	<i>Chlorophytum comosum</i>	<i>Asparagaceae</i>	Formaldehyde, Xylene And Toluene
Money plant	<i>Epipremnum aureum</i>	<i>Araceae</i>	Benzne, Formaldehyde, Xylene And Toluene
Peace lily	<i>Spathiphyllum sp.</i>	<i>Araceae</i>	Benzne, Formaldehyde, Trichloroethylene, Xylene And Toluene, Ammonia
Flamingo lily	<i>Anthurium andraeanum</i>	<i>Araceae</i>	Formaldehyde, Xylene And Toluene, Ammonia
Chinese evergreen	<i>Aglaonema modestum</i>	<i>Araceae</i>	Benzne, Formaldehyde
Bamboo palm	<i>Chamaedorea seifrizii</i>	<i>Araceae</i>	Formaldehyde, Xylene And Toluene
Variegated snake plant, mother-in-law's tongue	<i>Sansevieria trifasciata</i>	<i>Asparagaceae</i>	Benzne, Formaldehyde, Trichloroethylene, Xylene And Toluene
Heartleaf philodendron	<i>Philodendron cordatum</i>	<i>Araceae</i>	Formaldehyde
Selloum philodendron	<i>Philodendron bipinnatifidum</i>	<i>Araceae</i>	Formaldehyde
Elephant ear philodendron	<i>Philodendron domesticum</i>	<i>Araceae</i>	Formaldehyde
Red-edged dracaena	<i>Dracaena marginata</i>	<i>Asparagaceae</i>	Benzne, Formaldehyde, Trichloroethylene, Xylene And Toluene
Cornstalk dracaena	<i>Dracaena fragrans</i>	<i>Asparagaceae</i>	Benzne, Formaldehyde, Trichloroethylene
Weeping fig	<i>Ficus benjamina</i>	<i>Moraceae</i>	Formaldehyde, Xylene And Toluene
Barberton daisy	<i>Gerbera jamesonii</i>	<i>Asteraceae</i>	Benzne, Formaldehyde, Trichloroethylene
Florist's chrysanthemum	<i>Chrysanthemum morifolium</i>	<i>Asteraceae</i>	Benzne, Formaldehyde, Trichloroethylene, Xylene And Toluene, Ammonia
Rubber plant	<i>Ficus elastica</i>	<i>Moraceae</i>	Formaldehyde
Dendrobium orchids	<i>Dendrobium spp.</i>	<i>Orchidaceae</i>	Formaldehyde
Dumb canes	<i>Dieffenbachia spp.</i>	<i>Araceae</i>	Formaldehyde
King of hearts	<i>Homalomena wallisii</i>	<i>Araceae</i>	Formaldehyde
Moth orchids	<i>Phalaenopsis spp.</i>	<i>Orchidaceae</i>	Formaldehyde
Aloe vera	<i>Aloe vera</i>	<i>Asphodelaceae</i>	Benzne, Formaldehyde,
Janet craig/ warneckeii	<i>Dracaena deremensis</i>	<i>Asparagaceae</i>	Benzne, Formaldehyde, Trichloroethylene
Banana	<i>Musa oriana</i>	<i>Musaceae</i>	Formaldehyde

Most of the plants on this list originated in tropical or subtropical environments. Due to their ability to flourish on reduced sunlight, their leaf composition allows them to photosynthesize well in household light.

Government of the People's Republic of Bangladesh
Department of Environment
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Env. G/S
27/2/18
29/02/2018

Memo No: 22.02.0000.018.72.31.18 . 113

Date: 04/03/2018

Subject: Exemption from Initial Environmental Examination (IEE) and Approval of Terms of Reference (TOR) for EIA of Maheshkhali Economic Zone at Dhalghata and Haserchar, Maheshkhali, Cox's Bazar.

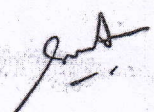
Ref: Your Application dated 18/02/2018.

With reference to your application dated 18/02/2018 for the subject mentioned above, the Department of Environment hereby gives Exemption from Initial Environmental Examination (IEE) and approval of Terms of Reference (ToR) for Environmental Impact Assessment (EIA) Study of the proposed Maheshkhali Economic Zone at Dhalghata and Haserchar, Maheshkhali, Cox's Bazar subject to fulfilling the following terms and conditions:

- I. The project authority shall conduct a comprehensive Environmental Impact Assessment (EIA) study considering the overall activity of the said project in accordance with this ToR and following additional suggestions.
- II. The EIA report should be prepared in accordance with following indicative outlines :

Executive summary

1. Introduction: (Background, brief description, rationale of the project, scope of study, methodology, limitation, EIA team, references)
2. Legislative, regulation and policy consideration (covering the potential legal, administrative, planning and policy framework within which the EIA will be prepared)
3. Project Description
 - i. Introduction
 - ii. Project Objective
 - iii. Project Options
 - iv. Interventions under Selected Options
 - v. Project activities: A list of the main project activities to be undertaken during site clearing, construction as well as operation
 - vi. Project schedule: The phase and timing for development of the project
 - vii. Resources and utilities demand: Resources required to develop the project, such as soil and construction material and demand for utilities (water, electricity, sewerage, waste disposal and others), as well as infrastructure (road, drains, and others) to support the project
 - viii. Map and survey information
Location map, cadastral map showing land plots (project and adjacent area), geological map showing geological units, fault zone, and other natural features.
 - ix. Project Plan, Design, Standard, Specification, Quantification, etc.
- 4 Environmental and Social Baseline
 - 4.1 Meteorology
 - 4.1.1 Temperature
 - 4.1.2 Humidity
 - 4.1.3 Rainfall
 - 4.1.4 Evaporation
 - 4.1.5 Wind Speed
 - 4.1.6 Sun Shine Hours



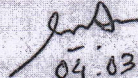
- 4.2 Air Quality and Noise
 - 4.2.1 Ambient Air Quality of the project site with respect to Standards of ECR, 1997
 - 4.2.2 Ambient Noise level of the project site with respect to Standards of Noise Pollution (Control) Rules, 2006
 - 4.2.3 Air pollutant and noise sources from existing and known sources
- 4.3 Water Resources
 - 4.3.1 Surface Water System
 - 4.3.2 Tropical Cyclones and Tidal Flooding
 - 4.3.3 Salinity
 - 4.3.4 Drainage Congestion and Water Logging
 - 4.3.5 Erosion and Sedimentation
 - 4.3.6 River Morphology
 - 4.3.7 Navigation
 - 4.3.8 Ground Water System
- 4.4 Land Resources
 - 4.4.1 Agro ecological Regions
 - 4.4.2 Land Types
 - 4.4.3 Soil Texture
 - 4.4.4 Land Use
- 4.5 Agriculture Resources
 - 4.5.1 Farming Practice
 - 4.5.2 Cropping Pattern and Intensity
 - 4.5.3 Cropped Area
 - 4.5.4 Crop Production
 - 4.5.5 Crop Damage
 - 4.5.6 Main Constraints of Crop Production
- 4.6 Livestock and Poultry
 - 4.6.1 Feed and Fodder Shortage
 - 4.6.2 Livestock/Poultry Diseases
- 4.7 Fisheries
 - 4.7.1 Introduction
 - 4.7.2 Problem and Issues
 - 4.7.3 Habitat Description
 - 4.7.4 Fish Production and Effort
 - 4.7.5 Fish Migration
 - 4.7.6 Fish Biodiversity
 - 4.7.7 Fisheries Management
- 4.8 Ecological Resources
 - 4.8.1 Bio-ecological Zone
 - 4.8.2 Common Flora and Fauna
 - 4.8.3 Ecosystem Services and Function
- 4.9 Socio Economic Condition
 - 4.9.1 Socio Economic Condition
 - 4.9.2 Quality of Life Indicators
 - 4.9.3 Income and Poverty
 - 4.9.4 Gender and Women
 - 4.9.5 Common Property Resources
 - 4.9.6 Conflict of Interest and Law and Order Situation
 - 4.9.7 Historical, Cultural and Archaeological Sites

- 5 Identification and Analysis of Key Environmental Issues (Analysis shall be presented with Scenarios, Maps, Graphics, etc. for the Case of Anticipated Impacts on Baseline)
 - 5.1 Environmental Sensitivity Investigation
 - 5.2 Environmental Asset
 - 5.3 Environmental Hot Spots
 - 5.4 Likely Beneficial Impacts
 - 5.5 Community Recommendations
 - 5.6 Alternate Analysis
- 6 Environmental and Social Impacts
 - 6.1 Introduction
 - 6.2 Impact on Air Quality and Noise
 - 6.2.1 Pre-Construction Phase
 - 6.2.2 Construction Phase
 - 6.2.3 Post-Construction Phase
 - 6.3 Impact on Water Resources
 - 6.3.1 Pre-Construction Phase
 - 6.3.2 Construction Phase
 - 6.3.3 Post-Construction Phase
 - 6.4 Impact on Land Resources
 - 6.4.1 Pre-Construction Phase
 - 6.4.2 Construction Phase
 - 6.4.3 Post-Construction Phase
 - 6.5 Impact on Agriculture Resources
 - 6.5.1 Pre-Construction Phase
 - 6.5.2 Construction Phase
 - 6.5.3 Post-Construction Phase
 - 6.6 Impact on Fisheries
 - 6.6.1 Pre-Construction Phase
 - 6.6.2 Construction Phase
 - 6.6.3 Post-Construction Phase
 - 6.7 Impact on Eco System
 - 6.7.1 Pre-Construction Phase
 - 6.7.2 Construction Phase
 - 6.7.3 Post-Construction Phase
 - 6.8 Socio Economic Impact
 - 6.8.1 Pre-Construction Phase
 - 6.8.2 Construction Phase
 - 6.8.3 Post-Construction Phase
- 7 Public Consultation and Disclosure
 - 7.1 Introduction
 - 7.2 Objectives of Public Consultation and Disclosure Meeting
 - 7.3 Approach and Methodology of Public Consultation and Disclosure Meeting
 - 7.4 Public Consultation Meetings (PCMs)
 - 7.5 Public Disclosure Meetings (PDMs)
- 8 Environmental Management Plan and Monitoring Indicators
 - 8.1 Introduction
 - 8.2 Mitigation Plan
 - 8.3 Enhancement Plan
 - 8.4 Contingency Plan
 - 8.5 Compensation Plan
 - 8.6 Monitoring Plan

8.7 Monitoring Indicators

- 9 Cost Estimation for Environmental Mitigation Measures and Monitoring
- 10 Emergency Response Plan & disaster Impact Assessment
- 11 Conclusions and Recommendations

- III. Without obtaining approval of EIA report by the Department of Environment, the project authority shall not be allowed to conduct earth filling or any kind of physical intervention in the proposed project site and also not be able to start the physical activity of the project.
- IV. This approval of the Terms of Reference (TOR) would not mean any acceptance or site clearance of the project.
- V. The proposed EIA study would not establish any claim, right in favor of the proponent for getting site clearance or environmental clearance.
- VI. Without obtaining Environmental Clearance, the project authority shall not be able to start the operation of the project.
- VII. The project authority shall submit the EIA report along with the filled-in application for Environmental Clearance in prescribed form, the feasibility study report, the applicable Environmental Clearance fee in a treasury chalan, the applicable VAT on clearance fee in a separate treasury chalan, the No Objection Certificate (NOC) from local authority, NOC in favor of Cutting/Dressing (if it is required) of Hill/Hillock from the concerned authority and NOC from other relevant agencies for operational activity etc. to the Cox's Bazar District Office of DOE in Cox's Bazar with a copy to the Head Office of DOE in Dhaka.


04.03.2018

(Syed Nazmul Ahsan)
Director (Environmental Clearance)
Phone # 02-8181673

Project Director

Bangladesh Economic Zone Authority
Prime Minister's Office
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111 Bir Uttam C. R Datta Road, Dhaka – 1205.

Copy Forwarded to:

- 1) PS to the Secretary, Ministry of Environment and Forests, Bangladesh Secretariat, Dhaka.
- 2) Director, Department of Environment, Chittagong Regional Office, Chittagong.
- 3) Deputy Director/ Office In-charge, Department of Environment, Cox's Bazar District Office, Cox's Bazar.
- 4) Assistant Director, Office of the Director General, Department of Environment, Head Office, Dhaka.