

**GOVERNMENT OF THE PEOPLE'S REPUBLIC OF  
BANGLADESH**

**MINISTRY OF WATER RESOURCES**



**BANGLADESH WATER DEVELOPMENT BOARD**

**PROJECT COMPLETION REPORT (PCR)  
IMED 04/2003 (Revised)**

**Name of the Project : Technical Feasibility Study and Environmental & Social Impact Assessment (ESIA) of Embankment-Cum-Road and Water Management Systems for Economic Zone-4 at Sonadia-Ghotibhanga Islands, Moheshkhali, Cox's Bazar**

**Office of the Director, Directorate of Planning-1/Project Director, BWDB,  
WAPDA Bhaban (6th Floor), Motijheel C/A, Dhaka.  
Tel: 02-9551088, Fax: 02-9564702, E-mail: dplanning1@gmail.com**

**Government of the People's Republic of Bangladesh**  
**Ministry of Planning**  
**Implementation Monitoring and Evaluation Division**

**PROJECT COMPLETION REPORT : IMED 04/2003 (Revised)**

**A. PROJECT DESCRIPTION :**

01. **Name of the Project** : Technical Feasibility Study and Environmental & Social Impact Assessment (ESIA) of Embankment-Cum-road and Water Management systemes for Economic Zone-4 at Sonadia-Ghotibhanga Islands, Moheshkhali, Cox's-Bazar-(Project-code-222003000)
02. **Administrative Ministry/Division** : Ministry of Water Resources
03. **Executing Agency** : Bangladesh Water Development Board
04. **Location of the Project** : Moheshkhali, Cox's Bazar
05. **Objective of the Project:**

**The Original Objectives of Technical Feasibility Study**

The main objective of the technical evaluation study is to assess the best suitable alignment of the embankment cum road and water management systems for the economic zone-4 at Sonadia-Ghotibhanga Islands, Moheshkhali, Cox's Bazar. The specific objectives are as follows:

- Fixation of alignment for embankment-cum-road as coastal protection to economic zone-4 at Sonadia-Ghotibhanga Islands.
- Coastal protection considering tidal fluctuations, cyclone, storm surges, rainfall intensity, soil profile and climate change;
- Identification of sources of water resources for industrial and domestic uses and planning of rainfall harvesting system if and where feasible;
- Detailed design of coastal protection to the economic zone area with road facilities along with other appurtenant structures on necessity;
- Incorporation of flood wall concept integrated with embankment system if necessary.
- Provision of recreational facilities as a matter of tourist attraction along the coast line.
- Cost estimates, economic and financial analysis with EIRR, benefit-cost ratio and other components for preparation of DPP following the updated BWDB rates schedule.

**New objectives of Technical Feasibility Study**

The main objective of the study is to develop an environmental friendly plan for Eco Park and ecotourism in Sonadia and Ghotibhanga island in the Economic Zone-4 and develop conservation and enhancement plan for present biodiversity. The specific objectives are as follows:

- Preparation of future land zoning plan;
- Development of Biodiversity Conservation Plan;
- Identification of sources of water resources for industrial and domestic uses and planning of rainfall harvesting system if and where feasible;
- Provision of recreational facilities as a matter of tourist attraction along the coast line.
- Cost estimates, economic and financial analysis with EIRR, benefit-cost ratio and other components for preparation of DPP following the updated BWDB rates schedule.

## Objectives of Environmental and Social Impact Assessment (ESIA)

The main objective of the ESIA study is to assess the impacts of the proposed interventions on the environmental and social components and suggest an environmental management plan for sustainable development of the project. The study would ensure involvement of beneficiaries in project conceptualization, planning and implementation. The specific objectives are:

- Provide a consistent and common basis to protect environment by ensuring that the project is environmentally sound.
- Identifying the ecological elements, natural features and uniqueness for which the island has been declared as an ECA.
- Identifying, Quantifying and Evaluating the potential environmental consequences of storm water run-off and waste water treatment plants so that the impacts before implementation of the project & impacts of the projects are highlighted. The negative impacts would be addressed in a way conserving the society and environment.
- Ensure that all development with full consideration for economic and environmental optimization, and for a long-term sustainability and equitability of environmental resource conservation.
- Ensure that all development are climate resilient.

### 06. Estimated Cost :

	(In lakh Taka)	
	Original	Latest Revised
(a) Total	341.00	-
(b) Taka	341.00	-
(c) Foreign Currency	-	-
(d) Project Aid	-	-
(e) RPA	-	-

07.	Date of Approval	:	PCP/PFS	PP
	(a) Original	:	21.01.2018	
	(b) Latest Revised	:	20.11.2018	

### 08. Implementation Period :

	Date of Commencement	Date of Completion
(a) Original	January 2018	December 2018
(b) Latest Revised	January 2018	June 2019
(c) Actual	January 2018	June 2019

### 09. Financing Arrangement (Source-wise):

#### 9.1 Status of Loan/Grant

##### a) Foreign Financing : *Not Applicable*

Source (s)	Currency as per Agreement	Amount in US \$ (Million)	Nature (Loan/Grant/supplier's/credit)	Date of Agreement	Date of Effectiveness	Date of Closing	
						Original	Revised
1	2	3	4	5	6	7	8

## b) GOB:

(In lakh Taka)

Total amount	Loan	Grant	Cash Foreign Exchange
1	2	3	4
341.00	-	341.00	-

9.2 Utilization of Project Aid: *Not Applicable*

(In million)

Source (s)	Total Amount		Actual Expenditure		Unutilized Amount	
	In US \$	In Local Currency	In US \$	In Local Currency	In US \$	In Local Currency
1	2	3	4	5	6	7

9.3 Re-imbursible Project Aid (RPA): *Not Applicable*

(In lakh Taka)

R P A Amount		Amount Spent	Amount Claimed	Amount Re-imbursed	Remarks
As per PP	As per Agreement				
1	2	3	4	5	6

B. IMPLEMENTATION POSITION

## 01. Implementation Period:

Implementation Period as per PP		Actual Implementation period	Time Over-run (% of original implementation period)	Remarks
Original	Latest Revised			
1	2	3	4	5
January 2018-December 2018 (1 year)	January 2018-June 2019 (1.5 years)	January 2018-June 2019 (1.5 years)	0.5 year (50%)	Planning of eco-park and ecotourism and biodiversity conservation plan

## 02. Cost of the Project:

(In lakh Taka)

Description	Estimated Cost		Actual expenditure	Cost over-run (% of original cost)	Remarks
	Original	Latest revised			
1	2	3	4	5	6
TOTAL	341.00	-	337.48	-	The actual contract with the consultant was less than the estimated cost.
TAKA	341.00	-	337.48	-	
PA	-	-	-	-	

### 03. Project Personnel:

Sanctioned strength as per PP	Manpower employed during execution	Status of the existing manpower			Manpower Employed	
		Manpower requirement for O&M as per pp	Existing manpower for O & M	Others		
1	2	3	4	5	Male	Female
Officer (s)	13	-	-	-	11	2
Staff(s)	14	-	-	-	10	4
Total :	27	Existing Manpower of Directorate of Planning-1			21	6

### 04. Training of Project Personnel (Foreign/Local):

Field of Training /Study tour/workshop/ Seminar etc.	Provision as per PP		Actual		Remarks
	Number of person	Man - months	Number of person	Man - months	
1	2	3	4	5	6
a. Foreign	N/A	N/A	N/A	N/A	
b. Local	N/A	N/A	N/A	N/A	

### 05. Component-wise Progress (As per latest approved PFS) :

(In lakh Taka)

Items of work (as-per-PFS)	Unit	Target (as per PFS)		Actual Progress		Reasons for deviation (±)
		Physical	Financial	Physical (%)	Financial	
1	2	3	4	5	6	7
<b>A. Revenue</b>						
1. Honorinum	LS	100%	3.00	80%	2.41	
2. Seminar, Conference Expenses	LS	100%	10.00	100%	9.86	
3. Travel Expenses	LS	100%	2.00	100%	1.94	
4. Fuel & Gas	LS	100%	1.00	62%	0.62	
5. Stamps and seals	LS	100%	2.00	100%	1.98	
6. Consultancy						
6.1 Consultancy for Feasibility study (79 MM)	Man-Month	100%	228.25	100%	228.17	
6.2 Consultancy for ESIA (39 MM)	Man-Month	100%	93.75	100%	91.51	
<b>Sub-total (Revenue):</b>			<b>340.00</b>	<b>100%</b>	<b>336.49</b>	
<b>B. Capital</b>						
7. Computers and accessories	LS	100%	1.00	100%	0.99	

Items of work (as per PFS)	Unit	Target (as per PFS)		Actual Progress		Reasons for deviation (±)
		Physical	Financial	Physical (%)	Financial	
1	2	3	4	5	6	7
Sub-total (Capital):			1.00	100%	0.99	
Grand-Total			341.00	100%	337.48	

**06. Information regarding Project Director (s):**

Name & Designation with pay Scale.	Full time	Part time	Responsible for more than one project	Date of		Remarks
				Joining	Transfer	
1	2	3	4	5	6	7
Fazlur Rashid Superintending Engineer Grade-4; 50,000-71,200	Full time	-	Yes	21.02.2018	11.11.2018	
Dr. Shamal Chandra Das Superintending Engineer Grade-4; 50,000-71,200	Full time	-	Yes	11.11.2018 (Charge assume date) 07.01.2019 (Appoint date)	Till date	

07.

**08. Procurement of Transport (in Nos.): *Not Applicable***

Type of transport	Number as per P.P.	Procured with date	Transferred to Transport Pool with date	Transferred to O & M with date	Condemned/damaged with date	Remarks
1	2	3	4	5	6	7
Car	-	-	-	-	-	
Jeep	-	-	-	-	-	
Microbus	-	-	-	-	-	
Minibus	-	-	-	-	-	
Bus	-	-	-	-	-	
Pick-up	-	-	-	-	-	
Truck	-	-	-	-	-	
Motor Cycle	-	-	-	-	-	
By-cycle	-	-	-	-	-	
Speed Boat	-	-	-	-	-	
Launch	-	-	-	-	-	
Others with name	-	-	-	-	-	

**08. Procurement of Goods, Works and Consultancy Services:**

08.1 Goods & Works of the Project costing above Tk. 200.00 lakh. and Consultancy above Tk. 100.00 lakh :

Description of procurement (goods/works /consultancy) as per bid document	Tender/Bid/Proposal Cost (in lakh Taka)		Tender/Bid/Proposal		Date of completion of works/services and supply of goods	
	As per PFS	Contracted value	Invitation date	Contract signing/ L.C opening date	As per contract	Actual
1	2	3	4	5	6	7
Consultancy Services for "Technical Feasibility Study of Embankment-cum-road and Water Management Systems for Economic Zone-4 at Sonadia-Ghotibhanga Islands, Moheshkhali, Cox's Bazar"	228.25	228.17	04.02.2018	25.03.2018	25.12.2018	27.06.2019
Consultancy Services for Environmental and Social Impact Assessment (ESIA) of Embankment-cum-road and Water Management Systems for Economic Zone-4 at Sonadia-Ghotibhanga Islands, Moheshkhali, Cox's Bazar"	93.75	91.51	28.03.2018	21.05.2018	20.12.2018	27.06.2019

## 8.2 Use of Project Consultant (s) (Foreign/Local):

Name of the Field	Approved man month		Actual man month utilised	Remarks
	As per PP	As per contract		
1	2	3	4	5
a) Foreign :	-	-	-	
b) Local	118	118	118	

## 09. Construction/Erection/Installation Tools & Equipment: *Not Applicable*

Description of items	Quantity (as per PP)	Quantity procured with date	Transferred to O & M with date	Disposed off as per rule with date	Balance	Remarks
1	2	3	4	5	6	7

### C. FINANCIAL AND PHYSICAL PROGRAMME :

#### 01. (a) Original and revised schedule as per PFS :

(In lakh Taka)

Financial Year	Financial provision & physical target as per original PP				Financial provision & physical target as per latest revised PP			
	Total	Taka	P.A.	Physical %	Total	Taka	P.A.	Physical %
1	2	3	4	5	6	7	8	9
2017-18	30.00	30.00	-	15%	-	-	-	-
2018-19	311.00	311.00	-	85%	-	-	-	-
<b>Total</b>	<b>341.00</b>	<b>341.00</b>	<b>-</b>	<b>100%</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>

#### 01. (b) Revised ADP allocation and progress :

(In lakh Taka)

Financial Year	Revised Allocation & target				Taka release	Expenditure & physical progress			
	Total	Taka	P.A.	Physical %		Total	Taka	P.A.	Physical %
1	2	3	4	5	6	7	8	9	10
2017-18	30.00	30.00	-	15%	30.00	25.08	25.08	-	15%
2018-19	315.00	315.00	-	85%	313.60	312.40	312.40	-	85%
<b>Total</b>	<b>345.00</b>	<b>345.00</b>	<b>-</b>	<b>100%</b>	<b>343.60</b>	<b>337.48</b>	<b>337.48</b>	<b>-</b>	<b>100%</b>

### C. ACHIEVEMENT OF OBJECTIVES OF THE PROJECT:

According to all objectives & ToR, the study has addressed all the scope of works. But considering the ecological importance of the study area (Sonadia Island is under Ecologically Critical Area), it was decided that the Ecotourism and Eco-park could be developed in this Economic Zone instead of industry. Hence, the study is being carried with new objective with some new scope of works and outputs. The new objective of the study is to develop an environmental friendly plan for Eco Park and ecotourism in Sonadia and Ghotibhanga Island in the Economic Zone-4 and develop conservation and enhancement plan for present biodiversity. The specific objectives are illustrated below:

Objectives as per PP/PFS	Actual achievement	Reasons for shortfall, if any
<b>Technical Feasibility Study</b>		
Preparation of future land zoning plan	Land zoning plan has been prepared.	
Development Of Biodiversity Conservation Plan	Biodiversity Conservation Plan has been Developed.	
Identification of sources of water resources for industrial and domestic uses and planning of rainfall harvesting system if and where feasible;	Sources of water resources have been identified and rainwater harvesting system has been planned where feasible.	



Provision of recreational facilities as a matter of tourist attraction along the coast line.	Provision of recreational facilities has been kept.	
Cost estimates, economic and financial analysis with EIRR, benefit-cost ratio and other components for preparation of DPP following the updated BWDB rates schedule.	Cost estimates, economic and financial analysis, benefit-cost ratio and other components for preparation of DPP has been done.	
<b>Environmental &amp; Social impact Assessment (ESIA)</b>		
Provide a consistent and common basis to protect environment by ensuring that the project is environmentally sound.	A consistent and common basis has been provided to make the project environmentally sound.	
Identifying the ecological elements, natural features and uniqueness for which the island has been declared as an ECA.	The ecological elements, natural features and uniqueness of the island have been identified.	
Identifying, Quantifying and Evaluating the potential environmental consequences of storm water run-off and waste water treatment plants so that the impacts before implementation of the project & impacts of the projects are highlighted. The negative impacts would be addressed in a way conserving the society and environment.	The potential environmental consequences of storm water run-off and waste water treatment plants have been evaluated.	
Ensure that all development with full consideration for economic and environmental optimization, and for a long-term sustainability and equitability of environmental resource conservation.	All development has been done with full consideration of economic and environmental optimization.	
Ensure that all development are climate resilient	Climate resilient has been ensured.	

## E. BENEFIT ANALYSIS

### 01. Annual Out-put: *Not Applicable* for the Study Project.

The project is a Study Project.

Items of out-put	Unit	Estimated quantity expected at full capacity	Actual quantity of out-put during the 1st year of operation at full capacity (or during, real production for newly completed project).
(a)			
(b)			
(c)			
(d)			

**02. Cost / Benefit: *Not Applicable* (It is not an investment project, hence *not applicable*)**

Item	Estimated	Actual
(1) Benefit cost ratio of the project (i) Financial		
(ii) Economic		
(2) Internal Rate of Return (i) Financial		
(ii) Economic		

**03. Please give reasons for shortfall, if any, between the estimated and actual benefit:**  
*Not Applicable*

**F. MONITORING AND AUDITING**

**Monitoring: *Not Applicable***

Name & designation of the inspecting official	Date of Inspection	Identified Problems	Recommendations
1	2	3	4

(a) Ministry / Agency:

(b) IMED :

(c) Others: (Please specify)

**0.2. Auditing during and after Implementation:**

**2.1. Internal Audit: *No audit conducted yet.***

Period of Audit	Date of submission of Audit Report	Major findings/ objections	Whether objections resolved or not.
1	2	3	4

## 2.2. External Audit: *No audit conducted yet.*

Audit period	Date of submission of Audit Report	Major findings/ objections	Whether objections resolved or not.
1	2	3	4

### **G. DESCRIPTIVE REPORT**

#### **1. General Observations/Remarks of the Project on:**

##### **1.1 Background**

###### About Maheshkhali island

Maheshkhali is the only hilly island in Bangladesh. It is combined with Kutub Dia, another island smaller than Mahesh Khali forming the constituency known as Cox's Bazar-2 in Bangladesh National Parliament. It is an upazilla under Cox's Bazar. Maheshkhali Island is the main island of Maheshkhali Upazila, in the Cox's Bazar District of Bangladesh. This island is situated along the eastern side of the Bay of Bengal and directly exposed to cyclone, storm surge, wind wave and tidal action. Bangladesh Water Development Board (BWDB) built coastal embankments along the coast of the island for the safety of the people and their property against natural disasters in the early 1970s. The protected areas are within Polder 69-North-East (15.5km), Polder 69-Phase-1 (12.87km) and Polder 69- Extension (15.5km). In order to establish sustainable drainage condition and prevent salt water intrusion, BWDB built 14 regulators and excavated 20 natural khals. These polders have created a safe enabling environment that results in intensification of agriculture, commercial and economic activities inside the polders.

However, the entire area was not protected long since. Some portions of the polder get susceptible to severe damage due to tidal waves. Coastal erosion is a common phenomenon at this island. Some new areas have been emerged in near past. The Government of Bangladesh then decided to take up the area for massive economic development. The driving force would be Bangladesh Economic Zones Authority (BEZA).

###### About BEZA

Bangladesh Economic Zones Authority (BEZA) has been emerged by the Bangladesh Economic Zones Act, 2010, the Bangladesh Economic Zones Authority (BEZA) was officially instituted by the government on 9 November 2010.

BEZA aims to establish economic zones in all potential areas in Bangladesh including backward and underdeveloped regions with a view to encouraging rapid economic development through increase and diversification of industry, employment, production and export'. BEZA is attached with the Prime Minister's Office (PMO) and is mandated to establish, license, operate, manage and control economic zones in Bangladesh. BEZA aspires to become a sustainable development driving force and a world class investment promoter and service provider to ensure quality of life of the people. BEZA's mission is to persistently create value for the investors by establishing attractive investment facilities in the economic zones through One-Stop service and competitive incentive packages.

###### About the concerned Special Economic Zone Maheshkhali

As per background information found in the official website of Bangladesh Economic Zones Authority (BEZA), Maheshkhali Special Economic Zone Cox's Bazar would cover Ghotibhanga and

Sonadiya with a gross area of 12962.22 acres of land. This government owned area is selected for land development for economic purposes. However, this area is facing Bay of Bengal and needs strengthened protection from tidal thrust and storm.

Sonadia, Ghativanga, Amaboshakhali, North Nolbila, Kalamarchora, Hetalia, Hamidordia, Kutubzome are the new emerged char of Moheshkhali Upazilla which are not empoldered by coastal embankment. Bangladesh Economic Zone Authority took initiative to develop the area for economic zone and prepare the layout plan. In this context a meeting was held in the district commissioner's office of Cox's Bazar on 29th January, 2016. A draft layout plan was presented in the meeting showing the different components such as Economic Zone development, Power Plant, Deep Sea Port and other mega projects.

In the meantime, BEZA officials visited the proposed area several times and opined that this area must be protected from natural disaster by constructing embankment and other required infrastructure with allied facilities. Another meeting was held on 12<sup>th</sup> April, 2017 which was presided over by the Chief Coordinator (SDG) of Prime Minister's Office. In order to develop special economic zone-4 in Sonadia-Ghotivanga, about 10000-12000 acres of land (12962.22 acres as per BEZA official website) has been identified to be protected from natural disaster. It was decided in the meeting that Bangladesh Water Development Board would take all necessary initiatives and actions to develop road-cum embankment to protect the Economic-Zone 4 against natural disasters. Polderization of embankment system is an effective and efficient measure to provide resilience to the proposed economic zone to natural disasters and regular tidal fluctuations and its future development works against climate variability and climate change.

#### Importance of the coastline

It is well known that the coastline is a unique part of environment; it is a meeting place of land and sea. Coasts are extremely dynamic and complex areas. They include many different creatures and ecosystems, ranging from microscopic organisms to insects, shellfish, fish, plants, animals and birds. Many of the interactions between natural processes and human activities in coastal areas are not always well understood. The coast is generally accepted to be the area of land that directly influences or is influenced by the sea. The coast can be defined as an area with a landward and a seaward boundary that includes:

- coastal waters, which extend from the low water mark into the sea, up to the point where these waters are no longer influenced by land and land-associated activities;
- the coastline or sea shore, which is the area between the low and high water marks;
- coastlands, which are inland areas above the high water mark that influence or are influenced in some way by their proximity to coastal waters (these areas might stretch many kilometers inland)

Coastal ecosystems provide a range of direct and indirect benefits to us which includes:

- ✓ Direct benefits include subsistence food production and commercial food production (fishing and agriculture), raw materials (mining), Transportation, Recreation, Tourism, and aesthetic value (seafront property turnover); and
- ✓ Indirect benefits or ecosystem services that are used but not paid for include, erosion control, soil formation, water regulation and supply, nutrient cycling, biological control, habitats, pollination, climate regulation, genetic resource, gas regulation, existence value. The coast and its adjacent areas on and off shore are an important part of a local ecosystem as the mixture of fresh water and salt water in estuaries provides many nutrients for marine life. Salt marshes and beaches also support a diversity of plants, animals, and insects crucial to the food chain.

#### Plan to conduct Technical Evaluation

In view of the above, detailed feasibility and environmental studies are required to be carried out for planning and design of embankment system and other associated measures. As Maheshkhali is a natural island with massive extent of biodiversity, development of economic zone with massive

construction activities might face stress on natural and aquatic environment. Adding to this, air, water and soil pollution might be anticipated.

In response to the necessity felt to understand the morphology of the adjacent area, predict the behavior of tidal thrust and protect the planned exclusive economic zone at the concerned area, BWDB decides to conduct detailed technical study to finalize the alignment and detailed design of embankment-cum-road and water management systems for development of economic zone. In this regard, detailed assessment of influencing factors for technical justification might be attained. This would cover detailed river bathymetry survey, water level and discharge monitoring, wave current observation, geo-referencing of the entire economic zone-4 area, suspended sediment concentration observation, historical tidal fluctuation observation, bearing capacity of soil and finally probable alignment of coastal protection embankment cum road with necessary tidal protection measures. As the tidal barrier would shield the planned economic zone area, more emphasis would be given with respect to structural safety and return period as well. Not only embankment, on necessity, flood walls might be introduced along the embankment. Moreover, as the area is exposed to sea, probable tourist attractions might be taken into account for flourishing the project area as attractive tourist destination.

### **1.2 Justification/Adequacy**

As per background information found in the official website of BEZA, Maheshkhali Special Economic Zone Cox's Bazar would cover Ghotibhanga and Sonadiya with a gross area of 12962.22 acres of land. This government owned area is selected for land development for economic purposes. However, this area is facing Bay of Bengal and needs strengthened protection from tidal thrust and storm.

Sonadia, Ghativanga, Amaboshakhali, North Nolbila, Kalamarchora, Hetalia, Hamidordia, Kutubzome are the new emerged char of Moheshkhali Upazilla which are not empoldered by coastal embankment. Bangladesh Economic Zone Authority took initiative to develop the area for economic zone and prepare the layout plan. In this context a meeting was held in the district commissioner's office of Cox's Bazar on 29th January, 2016. A draft layout plan was presented in the meeting showing the different components such as Economic Zone development, Power Plant, Deep Sea Port and other mega projects.

In the meantime, BEZA officials visited the proposed area several times and opined that this area must be protected from natural disaster by constructing embankment and other required infrastructure with allied facilities. Another meeting was held on 12<sup>th</sup> April, 2017 which was presided over by the Chief Coordinator (SDG) of Prime Minister's Office. In order to develop special economic zone-4 in Sonadia-Ghotivanga, about 10000-12000 acres of land (12962.22 acres as per BEZA official website) has been identified to be protected from natural disaster. It was decided in the meeting that Bangladesh Water Development Board would take all necessary initiatives and actions to develop road-cum embankment to protect the Economic-Zone 4 against natural disasters. Polderization of embankment system is an effective and efficient measure to provide resilience to the proposed economic zone to natural disasters and regular tidal fluctuations and its future development works against climate variability and climate change.

It is well known that the coastline is a unique part of environment; it is a meeting place of land and sea. Coasts are extremely dynamic and complex areas. They include many different creatures and ecosystems, ranging from microscopic organisms to insects, shellfish, fish, plants, animals and birds. Many of the interactions between natural processes and human activities in coastal areas are not always well understood. The coast is generally accepted to be the area of land that directly influences or is influenced by the sea. The coast can be defined as an area with a landward and a seaward boundary that includes:

- coastal waters, which extend from the low water mark into the sea, up to the point where these waters are no longer influenced by land and land-associated activities;
- the coastline or sea shore, which is the area between the low and high water marks;
- coastlands, which are inland areas above the high water mark that influence or are influenced in some way by their proximity to coastal waters (these areas might stretch many kilometers inland)

Coastal ecosystems provide a range of direct and indirect benefits to us which includes:

- ✓ Direct benefits include subsistence food production and commercial food production (fishing and agriculture), raw materials (mining), Transportation, Recreation, Tourism, and aesthetic value (seafront property turnover); and
- ✓ Indirect benefits or ecosystem services that are used but not paid for include, erosion control, soil formation, water regulation and supply, nutrient cycling, biological control, habitats, pollination, climate regulation, genetic resource, gas regulation, existence value. The coast and its adjacent areas on and off shore are an important part of a local ecosystem as the mixture of fresh water and salt water in estuaries provides many nutrients for marine life. Salt marshes and beaches also support a diversity of plants, animals, and insects crucial to the food chain.

In view of the above, detailed feasibility and environmental studies are required to be carried out for planning and design of embankment system and other associated measures. As Maheshkhali is a natural island with massive extent of biodiversity, development of economic zone with massive construction activities might face stress on natural and aquatic environment. Adding to this, air, water and soil pollution might be anticipated.

In response to the necessity felt to understand the morphology of the adjacent area, predict the behavior of tidal thrust and protect the planned exclusive economic zone at the concerned area, BWDB decides to conduct detailed technical study to finalize the alignment and detailed design of embankment-cum-road and water management systems for development of economic zone. In this regard, detailed assessment of influencing factors for technical justification might be attained. This would cover detailed river bathymetry survey, water level and discharge monitoring, wave current observation, geo-referencing of the entire economic zone-4 area, suspended sediment concentration observation, historical tidal fluctuation observation, bearing capacity of soil and finally probable alignment of coastal protection embankment cum road with necessary tidal protection measures. As the tidal barrier would shield the planned economic zone area, more emphasis would be given with respect to structural safety and return period as well. Not only embankment, on necessity, flood walls might be introduced along the embankment. Moreover, as the area is exposed to sea, probable tourist attractions might be taken into account for flourishing the project area as attractive tourist destination.

### 1.3 Objectives

#### The Original Objectives of Technical Feasibility Study

The main objective of the technical evaluation study is to assess the best suitable alignment of the embankment cum road and water management systems for the economic zone-4 at Sonadia-Ghotibhanga Islands, Maheshkhali, Cox's Bazar. The specific objectives are as follows:

- Fixation of alignment for embankment-cum-road as coastal protection to economic zone-4 at Sonadia-Ghotibhanga Islands.
- Coastal protection considering tidal fluctuations, cyclone, storm surges, rainfall intensity, soil profile and climate change;
- Identification of sources of water resources for industrial and domestic uses and planning of rainfall harvesting system if and where feasible;

- Detailed design of coastal protection to the economic zone area with road facilities along with other appurtenant structures on necessity;
- Incorporation of flood wall concept integrated with embankment system if necessary.
- Provision of recreational facilities as a matter of tourist attraction along the coast line.
- Cost estimates, economic and financial analysis with EIRR, benefit-cost ratio and other components for preparation of DPP following the updated BWDB rates schedule.

### **New objectives of Technical Feasibility Study**

The main objective of the study is to develop an environmental friendly plan for Eco Park and ecotourism in Sonadia and Ghotibhanga island in the Economic Zone-4 and develop conservation and enhancement plan for present biodiversity. The specific objectives are as follows:

- Preparation of future land zoning plan;
- Development of Biodiversity Conservation Plan;
- Identification of sources of water resources for industrial and domestic uses and planning of rainfall harvesting system if and where feasible;
- Provision of recreational facilities as a matter of tourist attraction along the coast line.
- Cost estimates, economic and financial analysis with EIRR, benefit-cost ratio and other components for preparation of DPP following the updated BWDB rates schedule.

### **Objectives of Environmental and Social Impact Assessment (ESIA)**

The main objective of the ESIA study is to assess the impacts of the proposed interventions on the environmental and social components and suggest an environmental management plan for sustainable development of the project. The study would ensure involvement of beneficiaries in project conceptualization, planning and implementation. The specific objectives are:

- Provide a consistent and common basis to protect environment by ensuring that the project is environmentally sound.
- Identifying the ecological elements, natural features and uniqueness for which the island has been declared as an ECA.
- Identifying, Quantifying and Evaluating the potential environmental consequences of storm water run-off and waste water treatment plants so that the impacts before implementation of the project & impacts of the projects are highlighted. The negative impacts would be addressed in a way conserving the society and environment.
- Ensure that all development with full consideration for economic and environmental optimization, and for a long-term sustainability and equitability of environmental resource conservation.
- Ensure that all development are climate resilient.

### **1.4 Project revision with reasons**

Original PSP/PFS: January, 2018- December, 2018.	
Revised PSP/PFS: January, 2018- June, 2019.	Implementation period is extended without increasing of cost due to execution of additional work such as planning of ecopark, ecotourism and biodiversity conservation plan.

## **2. Rationale of the project in respect of Concept, Design, Location and Timing.**

Maheshkhali is a natural island with massive extent of biodiversity, development of economic zone with massive construction activities might face stress on natural and aquatic environment. Sonadia, Ghativanga, Amaboshakhali, North-Nolbila, Kalamarehora, Hetalia, Hamidordia, Kutubzome are the new emerged char of Maheshkhali Upazilla which are not empoldered by coastal embankment. Bangladesh Economic Zone Authority took initiative to develop the area for economic zone and prepare the layout plan. In this context a meeting was held in the district commissioner's office of Cox's Bazar on 29th January, 2016. A draft layout plan was presented in the meeting showing the different components such as Economic Zone development, Power Plant, Deep Sea Port and other mega projects. In the meantime, BEZA officials visited the proposed area several times and opined that this area must be protected from natural disaster by constructing embankment and other required infrastructure with allied facilities. Another meeting was held on 12<sup>th</sup> April, 2017 which was presided over by the Chief Coordinator (SDG) of Prime Minister's Office. In order to develop special economic zone-4 in Sonadia-Ghotivanga, about 10000-12000 acres of land (12962.22 acres as per BEZA official website) has been identified to be protected from natural disaster. It was decided in the meeting that Bangladesh Water Development Board would take all necessary initiatives and actions to develop road-cum embankment to protect the Economic-Zone 4 against natural disasters. In view of the above, detailed feasibility and environmental studies are required to be carried out for planning and design of embankment system and other associated measures.

In response to the necessity felt to understand the morphology of the adjacent area, predict the behavior of tidal thrust and protect the planned exclusive economic zone at the concerned area, BWDB decides to conduct detailed technical study to finalize the alignment and detailed design of embankment-cum-road and water management systems for development of economic zone. In this regard, detailed assessment of influencing factors for technical justification might be attained. This would cover detailed river bathymetry survey, water level and discharge monitoring, wave current observation, geo-referencing of the entire economic zone-4 area, suspended sediment concentration observation, historical tidal fluctuation observation, bearing capacity of soil and finally probable alignment of coastal protection embankment cum road with necessary tidal protection measures. As the tidal barrier would shield the planned economic zone area, more emphasis would be given with respect to structural safety and return period as well. Not only embankment, on necessity, flood walls might be introduced along the embankment. Moreover, as the area is exposed to sea, probable tourist attractions might be taken into account for flourishing the project area as attractive tourist destination.

According to the original PFS the project implementation period of the study project was from January, 2018 to December, 2018. But due to execution of additional work such as planning of eco-park and ecotourism and biodiversity conservation plan the project implementation period was extended by MoWR from January, 2018 to June, 2019 vide memo no 42.00.0000.039.14.026.17-403, Date: 20.11.2018 without increasing of cost.



Moreover, the contract agreement is signed lower cost than the approved cost. Hence, the project cost is reduced by Tk. 3.52 lakh. The expenditure of the project is 337.48 lakh Tk. and achievement is 100% and the project is being completed in approved time.

### **3. Brief description on planning and financing of the project and its applicability.**

#### **◆ Project Identification**

Bangladesh Economic Zone Authority took initiative to develop the area for economic zone and prepare the layout plan. In this context, a meeting was held in the District Commissioner's office of Cox's Bazar on 29th January, 2016. A draft layout plan was presented in the meeting showing the different components such as Economic Zone development, Power Plant, Deep Sea Port and other mega projects. Another meeting was held on 12<sup>th</sup> April, 2017 which was presided over by the Chief Coordinator (SDG) of Prime Minister's Office. In order to develop special economic zone-4 in Sonadia-Ghotivanga, about 10000-12000 acres of land (12962.22 acres as per BEZA official website) has been identified to be protected from natural disaster. It was decided in the meeting that Bangladesh Water Development Board would take all necessary initiatives and actions to develop road-cum embankment to protect the Economic-Zone 4 against natural disasters. Polderization of embankment system is an effective and efficient measure to provide resilience to the proposed economic zone to natural disasters and regular tidal fluctuations and its future development works against climate variability and climate change.

#### **◆ Project Preparation**

In view of the above, BWDB decides to conduct detailed feasibility and environmental studies for planning and design of embankment system and other associated measures.

#### **◆ Appraisal**

As Maheshkhali is a natural island with massive extent of biodiversity, development of economic zone with massive construction activities might face stress on natural and aquatic environment. Adding to this, air, water and soil pollution might be anticipated.

- ◆ Credit Negotiation
- ◆ Credit Agreement
- ◆ Credit Effectiveness
- ◆ Loan Disbursement
- ◆ Loan Conditionalities
- ◆ Project Approval.
- ◆ Others (if any).

Applicable for  
Investment Project

4. Analysis of the Post-Implementation situation and result of the project: Not Applicable

- 4.1 Whether the beneficiaries of the project have clear knowledge about the Target/ Objectives of the project.
- 4.2 Programme for use of created-facilities of the project
- 4.3 O & M programme of the project.
- 4.4 Impact of the project -
  - 4.4.1 Direct
  - 4.4.2 Indirect
- 4.5 Transfer of Technology and Institutional Building through the project
- 4.6 Employment generation through the project.
- 4.7 Possibility of Self employment
- 4.8 Possibility of women-employment opportunity
- 4.9 Women's participation in development
- 4.10 Probable Impact on Socio-Economic activity.
- 4.11 Impact on environment
- 4.12 Sustainability of the project
- 4.13 Contribution to poverty alleviation/reduction
- 4.14 Opinion of the public representatives, local elite, local administration, teachers, religious leaders, women's representatives etc.
- 4.15 Contribution of Micro-credit programmes and Comments on overlapping with any NGO activities.

5. Problems encountered during Implementation (with duration & steps taken to remove those)

- |   |   |
|---|---|
| 5.1 Project Management                          | 5.12 Project aid disbursement and re-imbursment |
| 5.2 Project Director                            | 5.13 Mission of the development partners.       |
| 5.3 Land Acquisition                            | 5.14 Time & Cost Over-run                       |
| 5.4 Procurement                                 | 5.15 Project Supervision/Inspection             |
| 5.5 Consultancy                                 | 5.16 Delay in Decision                          |
| 5.6 Contractor                                  | 5.17 Transport                                  |
| 5.7 Manpower                                    | 5.18 Training                                   |
| 5.8 law & Order                                 | 5.19 Approval                                   |
| 5.9 Natural calamity                            | 5.20 Others.                                    |
| 5.10 Project financing, allocation and release. |   |
| 5.11 Design formulation/approval                |   |

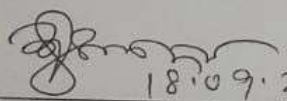
*It is a contract base consultancy project. The above problems don't occur*

6. **Remarks & Recommendations of the Project Director:**

The main objective of the study was to assess the best suitable alignment of the embankment cum road and water management systems for the economic zone-4 at Sonadia-Ghotibhanga Islands, Moheshkhali, Cox's Bazar and to assess the impacts of the proposed interventions on the environmental and social components. The Sonadia Island was declared as the Ecologically Critical Region (ECA) in 1999 and it has been found that Sonadia-Ghotibhanga Island is a unique place of Bangladesh and enriched with different flora and fauna including many endangered species. Hence, this area must be undisturbed from any activities which may hamper its natural resources. In this circumstance, Ecotourism and Eco-park can be developed in this Economic Zone instead of industry without any heavy construction. However, maximum no. of tourists, duration of tourism and other recommendations of the study should be followed strictly to get the maximum benefit and to ensure sustainability of the project. **Unless the mitigation measures along with monitoring tasks as recommended by the consultants are done rigorously and strictly (without any exception or negligence), the project will fail and damage the ECA irreversibly; if such dedication in implementation is not foreseeable, then, in such case it may not be advisable to proceed with the project's implementation.**

Date:

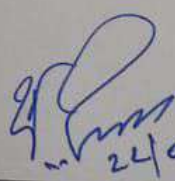
Signature and seal of the Project Director

  
18.09.2019  
Shamal Chandra Das  
Director General  
Directorate of Planning-1  
BWDB, Dhaka.

7. **Remarks/Comments of Agency Head**

Initially, the study project was undertaken to assess the best suitable alignment of the embankment cum road and water management systems for the economic zone-4 at Sonadia-Ghotibhanga Islands, Moheshkhali, Cox's Bazar including Environmental and Social Impact Assessment (ESIA). The Sonadia Island was declared as the Ecologically Critical Region (ECA) in 1999 and the area is enriched with different flora and fauna including many endangered species. Considering the ecological importance of the study area, Ecotourism and Eco-park can be developed as recommended by the consultants.

Date:

  
24/02/2017  
Signature and Seal  
(Md. Mahfuzur Rahman)  
Director General  
BWDB, Dhaka

8. **Remarks/Comments of the officer in- charge of the Ministry/Division**

Date:

Signature and Seal