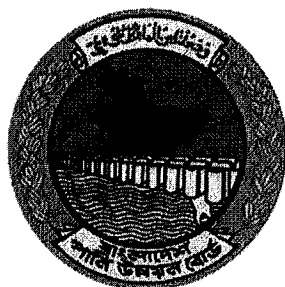


Government of the People's Republic of Bangladesh

Ministry of Water Resources



Bangladesh Water Development Board

PROJECT COMPLETION REPORT: IMED 04/2003

For

**Feasibility Study for Integrated Water Resources Management and
Development of Kutubdia and Matarbari Island**

October, 2023

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 : Feasibility Study for Integrated Water Resources Management and Development of Kutubdia and Matarbari Island
(Project Code: 224350300)
02. Administrative Ministry : Ministry of Water Resources (MoWR)
03. Executing Agency : Bangladesh Water Development Board (BWDB)
04. Location of the Project : Dhaka
05. Objective of the Project :

The overall objective of the project is to carry out a comprehensive study for Integrated Development and Water Resources Management of Kutubdia and Matarbari Island and devising long-term solutions for Water Resources Management considering technical, environmental and social aspects. The study will be conducted in two components, hydrological and morphological model study as component-1 and environmental and social impact study as component-2.

The specific objectives are (component-wise) of the project are:

Hydrological and Morphological Model Study (Component-1):

- To prepare a holistic and integrated plan for improved water resource management of Kutubdia and Matarbari island considering existing and future development projects, drainage pattern, climate change and sea level rise
- Assessing the requirement of Super Dyke construction and providing necessary recommendations for Super Dyke construction
- To assess the vulnerability due to storm surge, water logging, navigation and erosion at present and in future considering climate change and sea level rise
- To identify the prevailing problems of sedimentation in khals and rivers, drainage congestion, navigation, erosion and inundation due to cyclonic storm surge, wave and breaching of embankment, encroachment of drainage channel
- Developing mechanism to accelerate the development of chars at the west side of Kutubdia by increasing sediment deposition process and developing options for connecting chars to the main Island
- To prepare a plan for protection of accreted land by biological interventions
- Fresh water flow augmentation to the channels/rivers/khals of the study area and selecting suitable locations for rain water harvesting
- To assess the project with respect to Environmental Sustainability, Climate Resilience and Disaster Risk and find the ways for reducing/mitigating negative impacts;

Environmental and Social Impact Study (Component-2):

- To conduct a detailed Environmental and Social Impact Assessment (ESIA) for proposed interventions;
- To prepare environmental enhancement and conservation plan;
- To prepare biodiversity conservation and ecological restoration plan of the study area and surrounding

Islands including Hasher Dip due to various proposed interventions in the study;

- To develop Environmental Management and Monitoring Plan (EMMP) for conservation of aquatic resources, fisheries resources, bird sanctuaries etc.

06. Estimated Cost:

(In lakh Taka)

	Original	Latest Revised
(a) Total	426.51	-
(b) Taka	426.51	-
(c) Foreign Currency	-	-
(d) Project Aid	-	-
(e) RPA	-	-

07.

Date of Approval	:	PCP/PFS	PP
(a) Original	:	16/01/2022	-
(b) Latest Revised (No cost Time extension)	:	23/01/2023	-

08. Implementation Period:

	Date of Commencement	Date of Completion
(a) Original	January, 2022	February, 2023
(b) Latest Revised	January, 2022	June, 2023
(c) Actual	January, 2022	June, 2023

09. Financing Arrangement (Source-wise):

9.1 Status of Loan/Grant

a) Foreign Financing:

(In lakh Taka)

Source (s)	Currency as per Agreement	Amount in US \$ (Million)	Nature (Loan/Grant/supplier's/credit)	Date of Agreement	Date of Effective-ness	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
426.51	-	426.51	-

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9.2 Utilization of Project Aid: (Source wise)

(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):

(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 PFS		Actual Implementation period	Time Over-run (% of original implementation period)	Remarks
Original	Latest Revised			
1	2	3	4	5
January, 2022 to February, 2023 (14 months)	January, 2022 to June, 2023 (18 months)	January, 2022 to June, 2023 (18 months)	28.57%	Survey and data collection required additional time due to bad weather and Cyclone Sitrang. Beza proposed new Alignment of Embankment Required more time for data collection and analysis. (Annexure-1)

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	426.51	-	416.44	-2.36 %	-
TAKA	426.51	-	416.44		-
PA	-	-	-		-

03. Project Personnel: There was no provision of manpower in the PFS¹

Sanctioned strength as per PPF	Manpower employed during execution	Status of the existin-g manpower			Manpower Employed	
		Manpower requirement for O&M as per pp	Existing manpower for O & M	Others		
1	2	3	4	5		

04. Training of Project Personnel (Foreign/Local): No provision of training in this project

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

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 (±)
		Financial	Physical (Quantity)	Financial	Physical (Quantity)	
1	2	3	4	5	6	7
Revenue Expenditure						
Hydrological and Morphological Model Study	MM	288.07	100.00%	282.29	100.00%	
Environmental and Social Impact Study	MM	130.04	100.00%	127.34	100.00%	
Other stationery	Lot	1.60	100.00%	1.58	100.00%	
Honorarium	LS	3.80	100.00%	2.27	60.00%	
Domestic travel expenses	LS	1.00	100.00%	0.98	100.00%	
Capital Expenditure						
Computer and accessories	Lot	2.00	100.00%	1.99	100.00%	
Total=		426.51	100.00%	416.44	99.64%	

¹ There was no provision of manpower for conducting the project in the approved PFS. So, existing officers and staffs of the Project Director's office i.e. Officer of the Superintending Engineer (Civil), Directorate of Planning-1, BWDB execute the project.

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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
M. Abdur Rakib Executive Engineer (Civil) Directorate of Planning-1 BWDB, Dhaka Grade-5 (43,000 to 69,850)	Full time	-	Yes	13/02/2022	Till date	-

07. 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	-	-	-	-	-	-
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 Service for "Hydrological and Morphological Model Study for Integrated Water Resources Management and Development of Kutubdia and Matarbari Island."	288.07	288.04	08/02/2022	17/04/2022	Orginal 16/01/2023 Revised 26/06/2023	26/06/2023

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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 Service for "ESIA Study for Feasibility Study for Integrated Water Resources Management and Development of Kutubdia and Matarbari Island"	130.04	129.93	08/02/2022	18/04/2022	Orginal 17/01/2023 Revised 27/06/2023	27/06/2023

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

Name of the Field	Approved man month		Actual man month utilised	Remarks
	As per PFS	As per contract		
1	2	3	4	5
a) Foreign:	-	-	-	-
b) Local:				
Hydrological and Morphological Model Study	48.00	48.00	48.00	Conducted by Institute of Water Modelling
ESIA Study	22.00	22.00	22.00	Conducted by Center for Environmental and Geographic Information Services

09. Construction/Erection/Installation Tools & Equipment:

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 PFS				Financial provision & physical target as per latest revised PFS			
	Total	Taka	P.A.	Physical %	Total	Taka	P.A.	Physical %
1	2	3	4	5	6	7	8	9
2021-22	100.00	100.00	-	35.00%	-	-	-	-
2022-23	379.00	379.00	-	65.00%	-	-	-	-
Total	479.00	479.00		100.00%	-	-	-	-

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
2021-22	100.00	100.00	-	35.00%	100.00	47.36	47.36	-	31.48%
2022-23	379.00	379.00	-	65.00%	378.97	369.08	369.08	-	68.16%
Total	479.00	479.00		100.00%	478.97	416.44	416.44		99.64%

D. ACHIEVEMENT OF OBJECTIVES OF THE PROJECT:

Objectives as per PFS	Actual achievement	Reasons for shortfall, if any
Objectives of Hydrological and Morphological Model Study:		
To prepare a holistic and integrated plan for improved water resource management of Kutubdia and Matarbari island considering existing and future development projects, drainage pattern, climate change and sea level rise	A holistic and integrated plan for both polder Kutubdia and Matarbari for water resources management has been prepared considering climate change conditions, existing projects, and future projects. This includes the following things. - Improved drainage condition inside the polder by Khal excavation and reconstruction of regulators for water management. (Chapter 10, Article 10.1.1 and 10.2) - Raise the crest level for both polders to resist tidal flooding and cyclonic storm surge. (Chapter 4, Article 4.2.2) - Mitigation of freshwater/drinking water crisis inside the polder etc. (Chapter 4, Article 4.2.6) - Fixation of the embankment alignment considering future development of the economic zone. . (Chapter 4, Article 4.2.2)	-

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Objectives as per PFS	Actual achievement	Reasons for shortfall, if any
Assessing the requirement of Super Dyke construction and providing necessary recommendations for Super Dyke construction	The requirement of super dyke has been assessed based on development activities at Matarbari island and consultation with different stakeholders (MIDI, BEZA, CPGCBL, Matarbari Deep Sea Port)). Using state-of-the-art mathematical modeling techniques, crest level fixation has been done based on storm surge modeling results and technical stakeholder consultation. (Chapter 10, Article 10.1.4; Chapter 2, Article 2.3.5 & 2.3.6 and Chapter 4, Article 4.2.2)	-
To assess the vulnerability due to storm surge, water logging, navigation and erosion at present and in future considering climate change and sea level rise	Vulnerability due to storm surge has been assessed in present condition and future climate change conditions as well. Flood maps for different scenarios for drainage improvement have also been developed. Dredging is suggested around Matarbari island to serve the navigation purpose. Erosion has been assessed based on field visit, stakeholder consultation, satellite data and model result analysis. (Chapter 4, Article 4.2.2; Chapter 3, Article 3.1.3; Chapter 10, Article 10.1.1 & 10.2; Chapter 4, Article 4.2.5 and Chapter 3, Article 3.1.1 & 3.1.2)	-
To identify the prevailing problems of sedimentation in khals and rivers, drainage congestion, navigation, erosion and inundation due to cyclonic storm surge, wave and breaching of embankment, encroachment of drainage channel.	Several field visit, stakeholder consultation and desk job are performed to assess the present hydromorphological condition around the study area. Problems relevant to hydromorphological conditions are properly addressed. (Chapter 3, Article 3.1.1 & 3.1.2; Chapter 2, Article 2.3.7; Chapter 4, Article 4.2.3 and Chapter 10, Article 10.1.3)	-
Developing mechanism to accelerate the development of chars at the west side of Kutubdia by increasing sediment deposition process and developing options for connecting chars to the main Island	The present bathymetry survey shows that there is submerged char (250-350 m width) at the west side of Kutubdia which is 1 km away from the coast. Mechanism to accelerate the development of chars by increasing the sediment deposition process is not feasible based on hydro-morphological model simulation, long-term satellite image analysis and present survey data analysis. (Chapter 2, Article 2.3.7 and Chapter 3, Article 3.1.2)	-
To prepare a plan for protection of accreted land by biological interventions	Afforestation plan for both polders has been prepared in this regard. (Chapter 4, Article 4.2.7)	-

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Objectives as per PFS	Actual achievement	Reasons for shortfall, if any
Fresh water flow augmentation to the channels/rivers/khals of the study area and selecting suitable locations for rain water harvesting	Three (3) lakes each one acre are suggested to dig up in Matarbari for fresh water reserver. Khals inside the polders are designed in such a way that they can retain rainwater to some extent. 8 Pond Sand Filters (PSFs) are suggested to be installed in Kutubdia to mitigate drinking water scarcity. (Chapter 4, Article 4.2.6)	As both polders are located in the saline-prone area and there is no upstream connection with surrounding channels (i.e. Kutubdia and Kuhelia channel), hence, there is no scope for fresh water flow augmentation
To assess the project with respect to Environmental Sustainability, Climate Resilience and Disaster Risk and find the ways for reducing/mitigating negative impacts;	The project is properly assessed considering environmental sustainability, climate resilience, and disaster risk. Different ways have been identified to mitigate negative impacts. (Chapter 5)	-
Objectives of ESIA Study:		
To conduct a detailed Environmental and Social Impact Assessment (ESIA) for proposed interventions;	Environmental and social impacts of proposed project interventions have been prepared considering the aspects of different resources (Chapter 08)	-
To prepare environmental enhancement and conservation plan;	Environmental enhancement measures and conservation plan for different resources based on positive or negative impacts have been prepared considering the proposed interventions provided by Technical Study Team (IWM) (Chapter 09).	-
To prepare biodiversity conservation and ecological restoration plan of the study area and surrounding Islands including Hasher Dip due to various proposed interventions in the study;	Biodiversity conservation and ecological restoration plan of the study area and surrounding Islands including Hasher Dip have been prepared considering the proposed interventions of the study suggested by Technical Study Team (IWM) (Annex III).	-
To develop Environmental Management and Monitoring Plan (EMMP) for conservation of aquatic resources, fisheries resources, bird sanctuaries etc.	Environmental Management Plan (EMP) including mitigation measures, enhancement measures, compensation measures, and an environmental monitoring plan for different resources based on positive or negative impacts have been prepared considering the proposed interventions provided by Technical Study Team (IWM) (Chapter 09).	-

E. BENEFIT ANALYSIS

01. Annual Out-put: Not applicable for the 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).
-	-	-	-

02. Cost / Benefit: Not Applicable for the Study Project

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: N/A

F. MONITORING AND AUDITING

Monitoring: Nil

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)			

2. Auditing during and after Implementation:

2.1. Internal Audit: No audit conducted.

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:

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

Kutubdia is an Upazila of Cox's Bazar District in the Division of Chattogram, Bangladesh. The upazila consists of an island in the Bay of Bengal, off the coast near Chakaria, Cox's Bazar. It stands in the belly of Bay of Bengal. The island is impoldered with a coastal embankment Polder 71. This is one of the oldest islands of Bangladesh. About 125,000 people lives here According to the government official statistics (Census Report, 2011). Kutubdia is located at 21.816°N, 91.8583°E which is bounded by the Bay of Bengal on the north, west and south, Kutubdia Channel on the east. It has 58,463 households and a total area of 215.8 square kilometres. Thousands of visitors visit this island daily due to journeys and other business-related work. Kutubdia is rich in producing salt and dried fish.

The surroundings of Kutubdia Island is at dynamic stage along the Bay of Bengal. Natural char development is going on due to sediment deposition to the west of this Island which is visible during ebb. This process can be accelerated by taking necessary interventions to land accretion.

The Maheshkhali Upazila located in the tourist district of Cox's Bazar is best known for its natural beauty and salt cultivation. There are 8 unions and 1 municipality in this Upazila. This is the only hilly island in the country. With an area of over 362 square kilometers, the island is home to a population of about 2.2 lakh. The Bay of Bengal is located in the western and southern region of this hilly island and the Maheshkhali channel is in its north and northern part. With full of natural beauty, the island is known as a sanctuary of biodiversity. Many important small islands including Sonadia, Ghatibhanga, Hamzaradia, Ambashakali, North Nalbila, KalamerChora, and Dhalghata-Matarbari are situated on this island. Of them, Dhalghata-Matarbari is fully isolated in the most north-west region. These two unions have Koheliariver in their south-east area, Uzantia river in northern area, and Kutubdia channel in the western area. The government has already undertaken several multi-purpose development projects, focusing on MIDI (Maheshkhali-Matarbari Integrated Infrastructure Development Initiative), some of which are already under implementation. Among the projects under implementation, Maheshkhali Economic Zone-3 of BEZA, Singapore-Bangladesh 700 MW Coal Power Plant (PPP), Matarbari 1200 MW Coal Power Plant (PPP), 7.03 km express road under implementation by Roads and Highways Department are very important. Floods and cyclones will be major obstacles to implement these government projects and make them sustainable. As a result, the importance of natural disaster response and improved connectivity in the area is increasing day by day.

Matarbari is a union in Maheshkhali upazila of Cox's Bazar District. The total population of the union is 36,309. The union consists an island which is impoldered with a coastal embankment Polder 70. The island is located at 21.734933°N, 91.897565°E and bounded by Matamuhuri river on its north, Kohelia river on its east and south, Bay of Bengal and Kutubdia channel on its west. Matarbari island is covered by 43.5 square kilometers of lands. The main occupations are salt production, shrimp and crab farming, fishing from Bay of Bengal, agriculture and day labor.

Since 2016, there are two coal power plants being developed on the island, which have acquired much of the agricultural land. Besides, Matarbari sea port was originally built for Matarbari coal-fired power plant. Then government decided to turn it as a deep-sea port. The excavation and land filling of the projects have blocked the sluice gates and natural drainage systems of the island. Moreover, access road of Matarbari

port encroached Kohelia river and Matamuhuri river at different locations which further deteriorated the drainage capacity of the peripheral rivers.

1.2 Justification/Adequacy

Linkage With Bangladesh Delta Plan (BDP), 2100

Bangladesh Delta Plan (BDP) 2100 is a water centric, multi sectoral techno-economic long term adaptive plan. Delta Vision and Goals show a broader scope (water, food, economy) leading to a holistic approach with 19 themes. Among those themes first two themes are directly related to Water resources. Those themes are-

- i) Morphological Dynamics & River Management
- ii) Water Resources

The Project will contribute to the implementation of the Bangladesh Delta Plan 2100 from technical aspect. The concept of the project is in line with BDP2100. Particularly, the Project contributes to the following goals, strategies and sub-strategies:

BDP 2100 Higher Level Goals

Goal 1: Eliminate extreme poverty by 2030;

Goal 2: Achieve upper middle-income status by 2030; and

Goal 3: Being a Prosperous Country beyond 2041.

BDP 2100 Specific Goals

Goal 1: Ensure safety from floods and climate change related disasters;

Goal 3: Ensure sustainable and integrated river systems and estuaries management;

Goal 4: Conserve and preserve wetlands and ecosystems and promote their wise use;

Goal 6: Achieve optimal and integrated use of land and water resources.

Strategy at National Level

Flood Risk (FR) Management Strategies

- Strategy FR 1: Protecting Economic Strongholds and Critical Infrastructure.
 - FR 1.2: Construct adaptive and flood-storm-surge resilient building;
 - FR 1.5: Improvement of Drainage;
- Strategy FR 2: Equipping the Flood Management and Drainage(FMD) Schemes for the Future
 - FR 2.2: Drainage improvement inside FMDI schemes;
 - FR 2.4: Restoration, redesign and modification of embankments and structures (where necessary);
 - FR 2.5: River management, excavation and smart dredging preceded by appropriate feasibility study;
- Strategy FR 3: Safeguarding Livelihoods of Vulnerable Communities
- Sub-strategy FR 3.5: Flood and storm surge proofing of housing and other critical infrastructure supported by quick emergency services

Hotspot Specific Strategies

1) Coastal Zone

- Combating storm surge and salinity intrusion through effective management of existing polders;
- Increase drainage capacity and reduce flood risks;

Linkage with Sustainable Development Goals (SDGs)

To achieve Sustainable Development Goal (Goal no-6, Target 6.5.1 and 6.5.2) implement integrated water resources management at all levels and (Goal no-6, Target no- 6.6) it is essential to protect and restore water related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes river by 2020, a River Management Plan is essential. Goal 13 of SDG # 13 is take urgent action to combat climate change and its impacts. Goal 14 is to conserve and sustainably use the oceans, seas and marine resources for sustainable development.

1.3 Objectives

The overall objective of the project is to carry out a comprehensive study for Integrated Development and Water Resources Management of Kutubdia and Matarbari Island and devising long-term solutions for Water Resources Management considering technical, environmental and social aspects. The study will be conducted in two components, hydrological and morphological model study as component-1 and environmental and social impact study as component-2.

The specific objectives are (component-wise) of the project are:

Hydrological and Morphological Model Study (Component-1):

- To prepare a holistic and integrated plan for improved water resource management of Kutubdia and Matarbari island considering existing and future development projects, drainage pattern, climate change and sea level rise
- Assessing the requirement of Super Dyke construction and providing necessary recommendations for Super Dyke construction
- To assess the vulnerability due to storm surge, water logging, navigation and erosion at present and in future considering climate change and sea level rise
- To identify the prevailing problems of sedimentation in khals and rivers, drainage congestion, navigation, erosion and inundation due to cyclonic storm surge, wave and breaching of embankment, encroachment of drainage channel
- Developing mechanism to accelerate the development of chars at the west side of Kutubdia by increasing sediment deposition process and developing options for connecting chars to the main Island
- To prepare a plan for protection of accreted land by biological interventions
- Fresh water flow augmentation to the channels/rivers/khals of the study area and selecting suitable locations for rain water harvesting
- To assess the project with respect to Environmental Sustainability, Climate Resilience and Disaster Risk and find the ways for reducing/mitigating negative impacts;

Environmental and Social Impact Study (Component-2):

- To conduct a detailed Environmental and Social Impact Assessment (ESIA) for proposed interventions;
- To prepare environmental enhancement and conservation plan;
- To prepare biodiversity conservation and ecological restoration plan of the study area and surrounding Islands including Hasher Dip due to various proposed interventions in the study;

- To develop Environmental Management and Monitoring Plan (EMMP) for conservation of aquatic resources, fisheries resources, bird sanctuaries etc.

1.4 Project revision with reasons: Not applicable

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

The coastal areas of Bangladesh are highly prone to floods, cyclones and storm surges. Climate change and sea level rise threaten to submerge the Kutubdia and Matarbari island in the Bay of Bengal, increase the vulnerability due to cyclonic storm surge, coastal erosion and deteriorate the drainage conditions. Government has taken different development program in Maheshkhali-Matarbari Island. Under Maheshkhali-Matarbari Integrated Infrastructure Development Initiative (MIDI) Under this circumstance, a comprehensive study was required on Kutubdia and Matarbari island to assess the vulnerability of the islands at present and future due to climate change impact and planning for improved water management system.

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

◆ Project Identification:

Kutubdia is prone to multiple natural hazards such as tropical cyclones, storm surge, coastal erosion and sea level rise. Cyclones with two to four-meter-high tidal surges hit the island every year. Mangroves are the natural barrier against cyclonic surges. However, the mangroves are being gradually destroyed by shrimp culture practices. It is estimated that between 1970 and 2010, Kutubdia has lost 900 ha of its land mass. Its southern end is particularly disturbed by coastal erosion.

Polder No.70 was built in the seventies including Matarbari-Dhalghata Union under Maheshkhali Upazila in Cox's Bazar district. BWDB's Polder-70 is working as a shield for natural disasters around Matarbari-Dhalghata island. Due to a lack of necessary repair works for a long time, the polder was extensively damaged in different parts. A part of the polder in Suturia area of Dhalghata Union collapsed completely due to the morphological change in the seashore. Moreover, due to the construction of the wave breaker of the navigation channel of Matarbari 1200 MW Coal Power Plant, the breaking waves hit the polder no 70 directly. As a result, about 1 km of bank protection work of the Soroitola area under the Dhalghata union is on verge of destruction. For the same reason, another 1 km bank protection work of Jelepura and Saitpara is about to go underwater. Also, due to climate change and global warming, the height of the polder will not be enough to stop floodwater from entering the island. The drainage pattern is also changing on the island due to the construction of the projects. Salt cultivation is getting hampered day by day. A proper drainage system will be very essential in future days. Navigation problem is increasing in Kohelia river which is very important to the local people for daily movement.

◆ Project Preparation:

BWDB was taking two separate development projects for sustainable developments of the project area. One of the project is "Rehabilitation of Polder No. 71 for Sustainable Development" and the other one is "Construction of Super Dyke in Polder No. 70 and Sustainable Water Resources management at MIDI Area situated in Maheshkhali Upazila of Cox's Bazar". These projects aimed to protect ongoing and upcoming development projects in the study area from flood, erosion, high tide, cyclone, storm surge and other natural disasters. These projects, by constructing super dyke, will be helpful to provide safety for the people of the study area from

cyclone, storm surge and high tide. These projects would also aim to mitigate problems for fresh water scarcity of the study area, communication development, drainage and navigability improvement, rehabilitation of existing non-functional water control structures and rehabilitation of land-less people etc. A detail feasibility study including ESIA had been directed in a Steering Committee Meeting presided by Senior Secretary of MoWR dated on 17/06/2021 related to those two projects.

◆ **Appraisal:**

Departmental Project Evaluation (DPEC) meeting held on 09/12/2021 at Ministry of Water Resources. (Annexur-2)

◆ **Credit Negotiation:** N/A

◆ **Credit Agreement:** N/A

◆ **Credit Effectiveness:** N/A

◆ **Loan Disbursement:** N/A

◆ **Loan Conditionalities:** N/A

◆ **Project Approval:** Approved by Honorable State Minister, MoWR on 16/01/2022 (Annexure-3)

◆ **Others (if any):** N/A

4. Analysis of the Post-Implementation situation and result of the project: Not applicable for this study project

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): It is a consultancy service procurement project. The below mentioned problems do not occur.

5.1 Project Management

5.2 Project Director

5.3 Land Acquisition

5.12 Project aid disbursement and reimbursement

5.13 Mission of the development partners.

5.4	Procurement	5.14	Time & Cost Over-run
5.5	Consultancy	5.15	Project Supervision/Inspection
5.6	Contractor	5.16	Delay in Decision
5.7	Manpower	5.17	Transport
5.8	law & Order	5.18	Training
5.9	Natural calamity	5.19	Approval
5.10	Project financing, allocation and release.	5.20	Others.
5.11	Design formulation/approval		

6. Remarks & Recommendations of the Project Director

The present study applied mathematical modelling tools to achieve the objectives. Primary and secondary data were collected by means of field investigation and rigorous stakeholder consultation, key informant interview (KII), focused group discussion (FGD) as well as data from the relevant government agencies. Bay of Bengal storm surge and wave model has been updated in this study to ascertain the storm surge level and significant wave height under climate change condition. Model simulated surge level and wave height have been analyzed to design embankment crest level. Morphological model is used to assess erosion vulnerability at present and future due to climate change. The polder drainage model is used to assess the water-logged area during extreme rainfall conditions under climate change conditions. This model is also used to assess the effectiveness of different drainage improvement interventions.

The proposed project suggested re-sectioning of polder embankment along with construction of slope protection works, excavation of drainage khals, construction of regulators, repairing of existing regulators and mangrove plantation. Based on the mathematical modelling results and considering other issues the study has concluded that it is optimize for 40.18 km embankment resectioning and slope protection in 3 phases at Kutubdia island. Other interventions such as regulator construction and repairing, khal excavation, small rivers dredging, Pond excavation etc. have been included in the first pahse. On the other hand, 17.89 km embankment resectioning and slope protection in a single phase at Matarbari island.

The technical report i.e., the feasibility study report has been prepared according to specific formate of Planning Commission. On the other hand, the Environmental and Social Impact Assesment report has been prepared according to the Terms of Reference approved by the Department of Environment.

Finally, all the objectives and scopes have been accomplished under this study project. The design, cost estimate and ESIA have been conducted through the project. The feasibility study has shown that the project is technically feasible, environmentally sustainable, socially acceptable, and economically viable.

Rakib 26.10.23

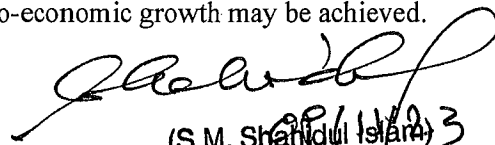
(M. Abdur Rakib)
Executive Engineer (Civil)
&
Project Director
Directorate of Planning-1
BWDB, Dhaka

Date:

Signature and seal of the Project Director

7. Remarks/Comments of Agency Head

The overall objectives of the project are to enhance the socioeconomic condition of Kutubdia and Matarbari by means of integrated water resources management. The study has been conducted considering two components: technical study (Hydrological and Morphological Model Study) and Environmental and Social Impact Assessment. The infrastructure proposed by the consultant is rational and aligned with the broad goals of the Bangladesh Delta Plan 2100. The implementation of interventions of this study will preserve biodiversity and eco-friendly in nature. The result of economic analysis indicates that the project is economically viable, as it secures a rate of return that exceeds 12%. Upon implementation of the suggestive measures, long-term perspective of the sustainable and inclusive socio-economic growth may be achieved.


(S.M. Shahidul Islam)
ID NO: 650307001
Director General
BWDB, Dhaka.
Signature and seal

Date:

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

The study has been completed successfully and in accordance with the study's recommendations, an investment project will be taken.

Date:

Signature and seal

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Government of People's Republic of Bangladesh

Ministry of Water Resources



Bangladesh Water Development Board

**Hydrological and Morphological Model Study for Integrated
Water Resources Management and Development of Kutubdia and
Matarbari Island**

Approved

26.06.2023

(Md. Romjan Ali Pramanik)
Director General
BWDB, Dhaka.

Final Report

June 2023



INSTITUTE OF WATER MODELLING

EXECUTIVE SUMMARY

E1 Introduction

Kutubdia, an island in Bangladesh, is one of the oldest and is surrounded by a coastal dike called Polder 71. Sediment build-up towards the west of the island is leading to the development of char, and land accretion could accelerate this process. Matarbari, Polder-70, located in the Maheshkhali Upazilla, has a population of 57,814 and is home to various government development projects, including the Maheshkhali Economic Zone-3, a coal power plant, and an express road. However, floods and cyclones pose significant challenges to the implementation of these projects, highlighting the importance of enhanced connectivity and natural disaster response in the region.

BWDB is undertaking two distinct sustainable development projects for the project area. The projects are "Rehabilitation of Polder No. 71 for Sustainable Development" and "Construction of Super Dyke in Polder No. 70 and Sustainable Water Resources Management at MIDI area in Maheshkhali Upazila of Cox's Bazar." These initiatives aim to protect ongoing and future development projects in the study region against flood, erosion, high tide, cyclone, and storm surge. By constructing a super dyke, these projects will assist in protecting the residents of the study region from cyclones, storm surges, and high tide. These initiatives will also strive to minimize difficulties associated with the study area's freshwater scarcity, communication development, drainage, and navigability enhancement, rehabilitation of existing non-functional water control facilities, and rehabilitation of landless people, among other things.

This Final Report has been prepared in connection with the study entitled "*Hydrological and Morphological Model Study for Integrated Water Resources Management and Development of Kutubdia and Matarbari Island*". Data analysis, model development, problem analysis, plausible options, selected option, design, costing, economic analysis, etc. are described in this report.

Objective of the Study

The overall goal of the project is to conduct a comprehensive study for Integrated Development and Water Resources Management of Kutubdia and Matarbari Island, as well as to develop long-term solutions for Water Resources Management that take into account technical, environmental, and social factors.

E2 Study Area and Prevailing Problems

The study area consists of Kutubdia and Matarbari islands, both located in the Bay of Bengal near Chakaria, Cox's Bazar in Bangladesh. Kutubdia is an island surrounded by a coastal embankment and is home to around 125,000 residents. The island is susceptible to natural hazards, including tropical cyclones, storm surges, coastal erosion, and sea level rise. On the other hand, Matarbari is an island surrounded by a coastal embankment and is home to a variety



Embankment Erosion

One of the main issues affecting the islands of Kutubdia and Matarbari is embankment erosion, which is diminishing the polder's ability to protect against tidal floods and storm surges. The Matarbari island's seaside embankment, especially Sitepara and Soraitola, has significantly degraded, according to field observations and stakeholder consultations. **Figure E2-2** depicts the damage that Cyclone Sitrang caused to Polder 70 and 71's embankments on October 25, 2022.

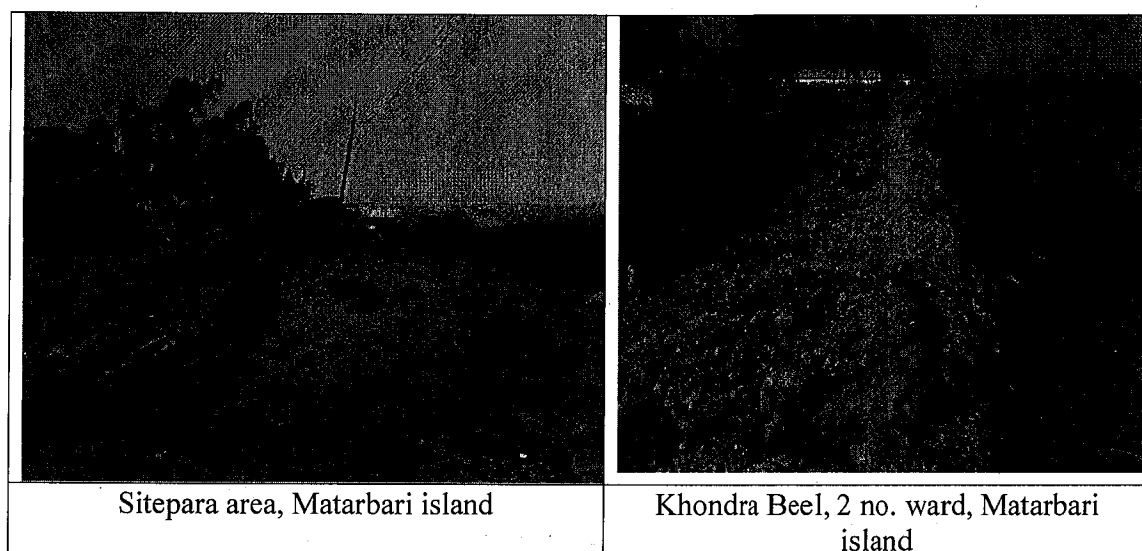


Figure E2-2: Embankment Erosion During Cyclone Sitrang, 25th October 2022

The present study identified that about 8.28 km of the embankment of Kutubdia and 6.02 km of Matarbari island embankment out of 40.18 km and 36.41 km (total proposed perimeter) respectively are already protected by CC block. The remaining (earthen + geotube/gebag) about 31.9 km, and 17.28 km (under BWDB jurisdiction) are vulnerable to erosion due to waves and currents during the time of cyclonic events under climate conditions. The most affected reach of the embankment based on field visit for Kutubdia and Matarbari are shown in **Figure E2-3**.

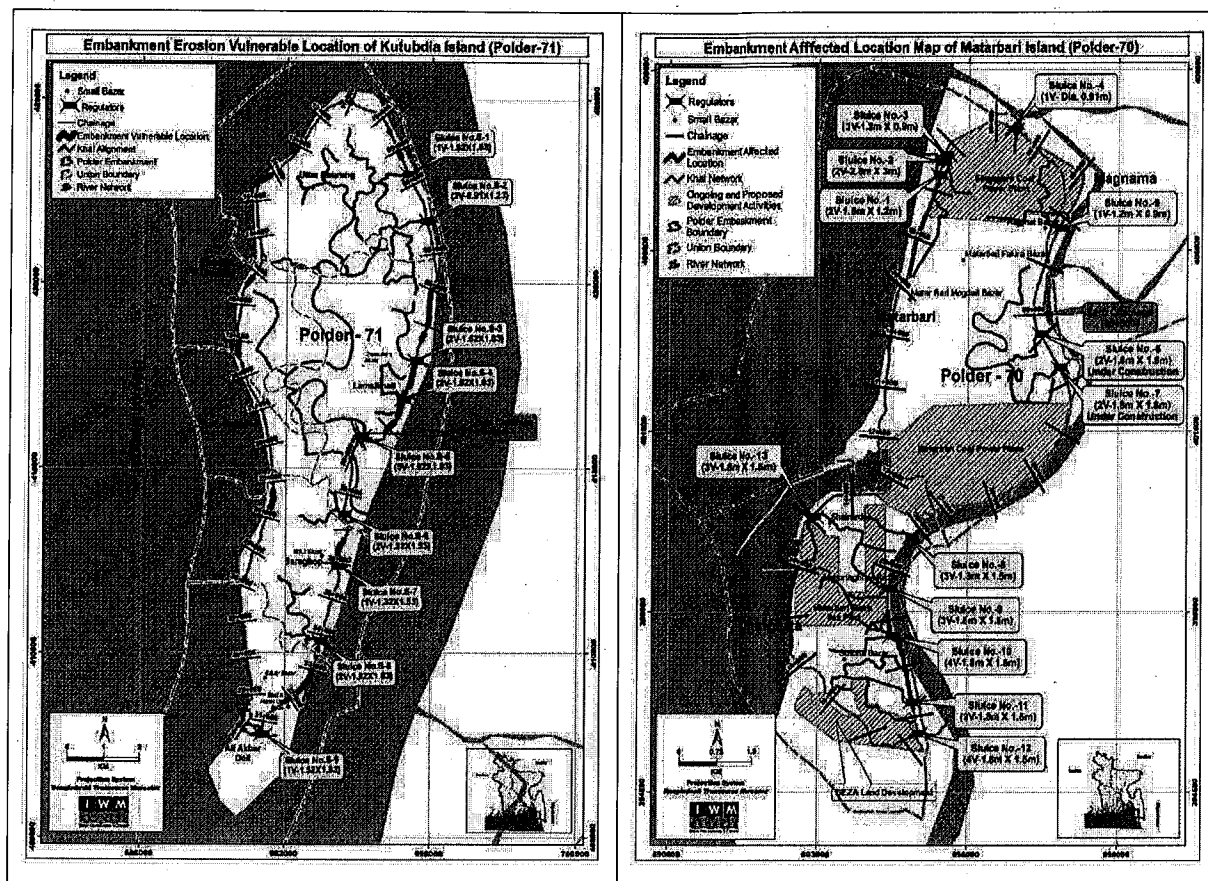


Figure E2-3: Most Affected Reach of Embankment of Polder 70 & 71

Bank Erosion

It is evident from the analysis that morphologically Kutubdia and Matarbari are very dynamic. Especially west side of the embankment for both polders are vulnerable to erosion process due to wave action. Based on the examination of the model simulation results, the measured data, soil condition and the historical satellite images, this study has been analyzed the causes of erosion as well as the vulnerable places of the rivers.

Tropical Cyclone and Storm Surge

Every year, Kutubdia and Matarbari are struck by cyclones with tidal surges of two to four meters high. Historical records show that destructive cyclones hit Kutubdia and Matarbari islands in 1960, 1970, 1989, and 1991. Among these, the cyclone of 1991 (with a speed of 225km/h) killed 40,000 people and damaged 80% of the dwellings. (Paul, 2006). The current study evaluated all severe cyclones that occurred between 1960 and 2022 to estimate inundation scenarios of Kutubdia and Matarbari islands under current and climate change conditions. the maximum inundation depth in Kutubdia and Matarbari islands ranges from 3m to 3.5m. Climate change will increase the depth of inundation as well as damage and susceptibility due to storm surge.

Water Logging

Kutubdia is now experiencing some water logging, which is expected to worsen in the future due to climate change. With the current drainage system and the hydrological situation in 2021, inundated area is less. Under the design hydrological conditions and under the 2050 climate change scenario more area will be inundated.

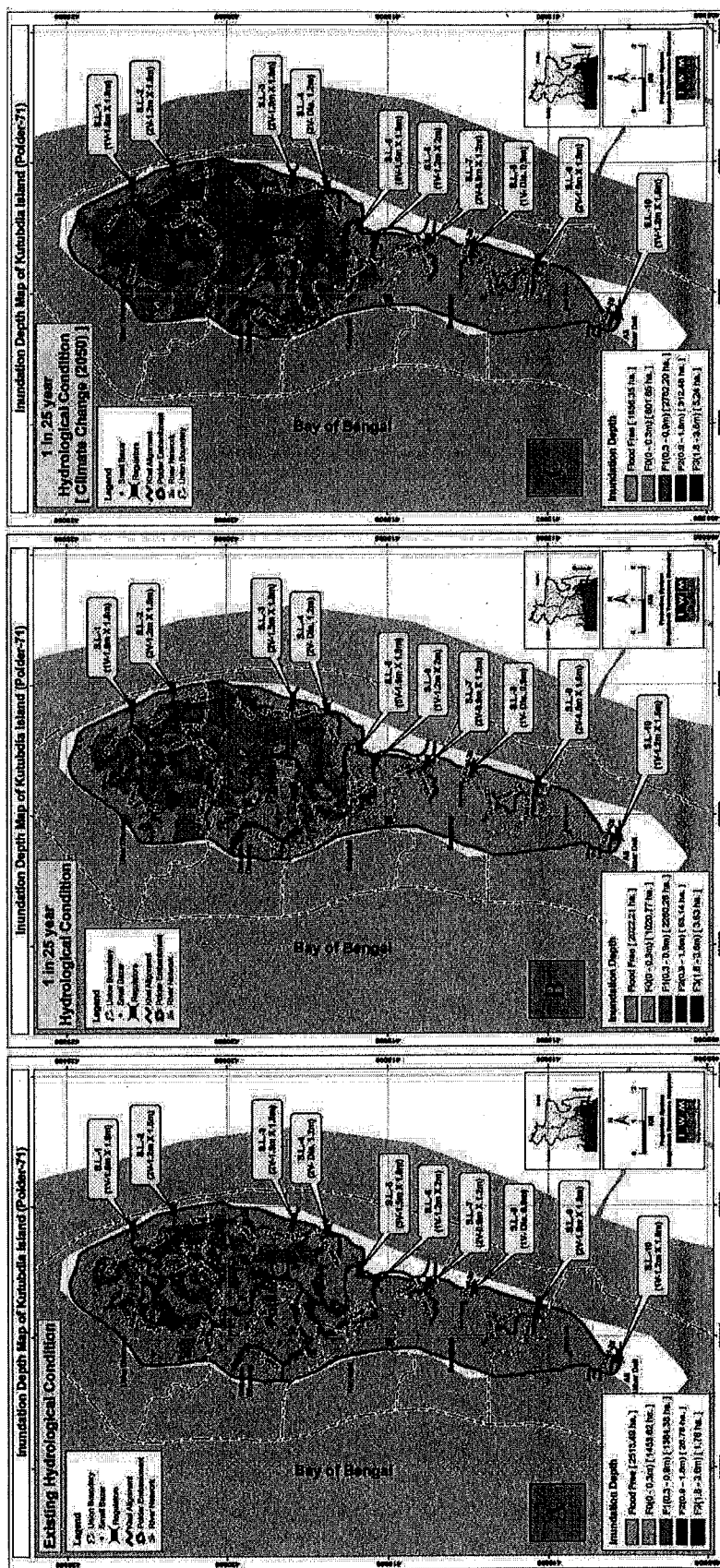


Figure E2-4: Inundation in Polder -71 at Existing Condition 2021 (A), Design Hydrological Condition (B) and Climate Change Scenario Applied on Design Hydrological Condition (C)

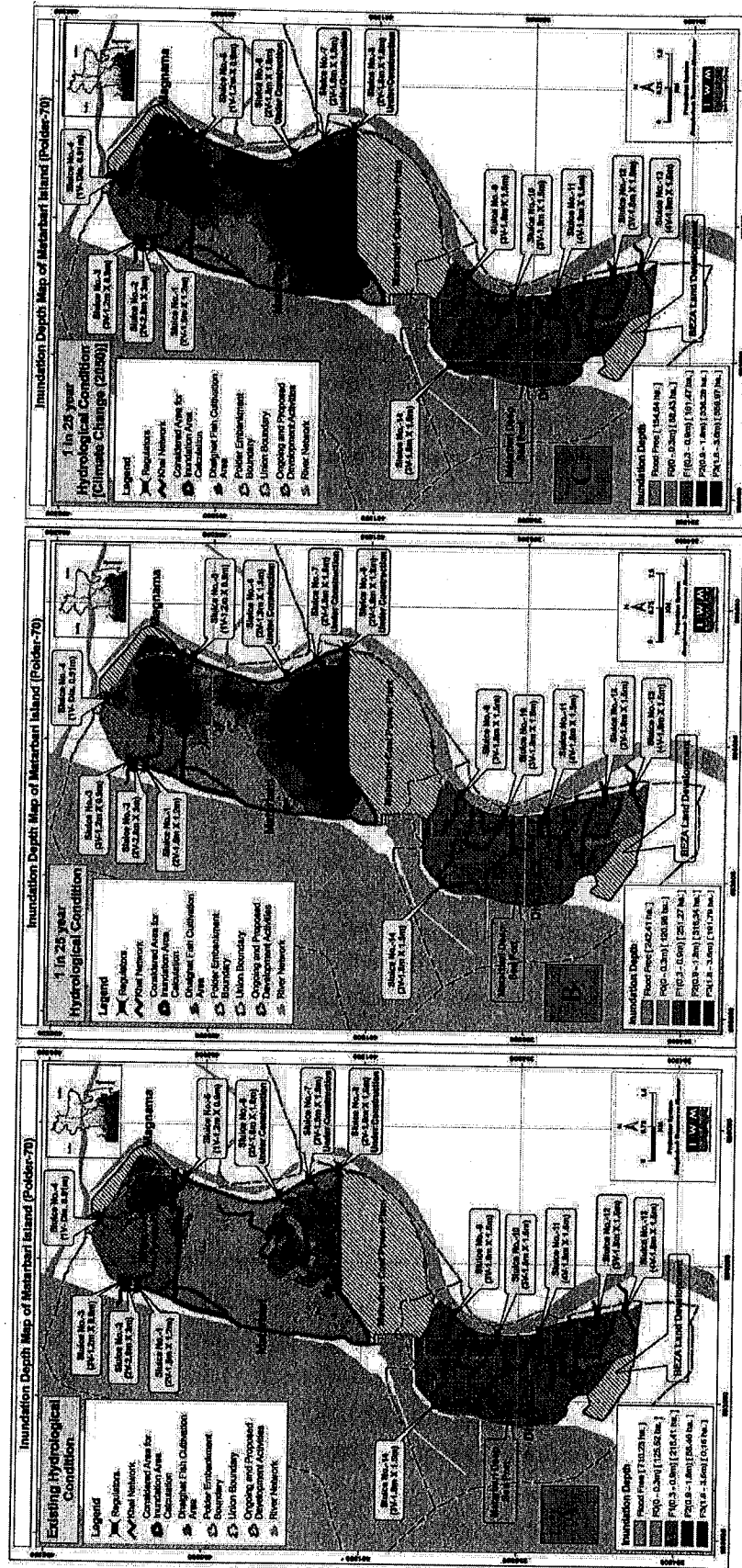


Figure E2-5: Inundation in Polder -70 at Existing condition 2021 (A), Design Hydrological Condition (B) and Climate Change Scenario Applied on Design Hydrological Condition (C)

During field visits, the IWM team noticed that several settlements are experiencing water logging as a result of rainfall water being trapped inside Matarbari Island (Polder-70) during the monsoon season. South Rajghat, Mastergona, and Uluguna villages are particularly hard hit in this regard. At present, only 6.11% village area in Matarbari union become flooded with existing drainage system and hydrological condition of 2020. About 45.26% area become flooded under design hydrological condition (1 in 25-year return period rainfall event). However, the flooded area will be increased to 62.19% due to climate change scenario 2050.

Fresh and Drinking Water Scarcity

Kutubdia Upazila is facing water scarcity with over 25% of its population lacking access to adequate drinking and household water. While deep tube-well water is available in some areas, other unions have no sweet groundwater. This has resulted in households spending money to access water, with water vendors delivering water door-to-door from various water points. Sustainable solutions such as rainwater harvesting, improved irrigation practices, and better water conservation techniques can help alleviate the water scarcity problem in the long run. Therefore, urgent action is required to ensure access to adequate and safe drinking water for all residents of the Upazila.

Out of nine wards of Matarbari Union more than three wards have been facing drinking water problem. More than 25 percent of total population faces water scarcity for both drinking and other household's uses. The people use pond/ditch water for cooking and washing utensils of the households. They face obstacles to getting water during dry season since the pond/ditch dried up.

Navigability Problem around Matarbari island

The east side of Matarbari is surrounded by the Kuhelia River. The river is for transporting goods by the local people. Moreover, the connecting and feeder canals, Matarbari Khal and Nunachori (Kalamerchora) Khal are also used as navigation. The Matarbari Khal is also connected with the Maheskhali river. The dredging of Matarbari khal will shorten the distance of navigation from Kuhelia river to Maheskhali river. Navigation is also seen in Nunachori Khal. Dredging of Kuhelia river, Matarbari and Nunachori Khal is required for smooth navigation. It also helps drainage of Matarbari polder.

Demand Analysis

Kutubdia and Matarbari are vulnerable to a variety of natural disasters, including tropical cyclones, storm surges, coastal erosion, and sea level rise. The people of Kutubdia and Matarbari island are demanding for strong polder embankment to protect the island from storm surge flooding as well improved polder drainage system. Super dyke at Matarbari will protect the industrial zone of BEZA at Dhalghata. Strengthening of polder embankment, protection against embankment erosion, excavation of drainage khal, construction of drainage regulators and land reclamation will improve the life and livelihood of the peoples of Kutubdia and Matarbari island as well as country's economic growth.

E3 Technical and Engineering Design

E3.1 Proposed Interventions

Kutubdia Island

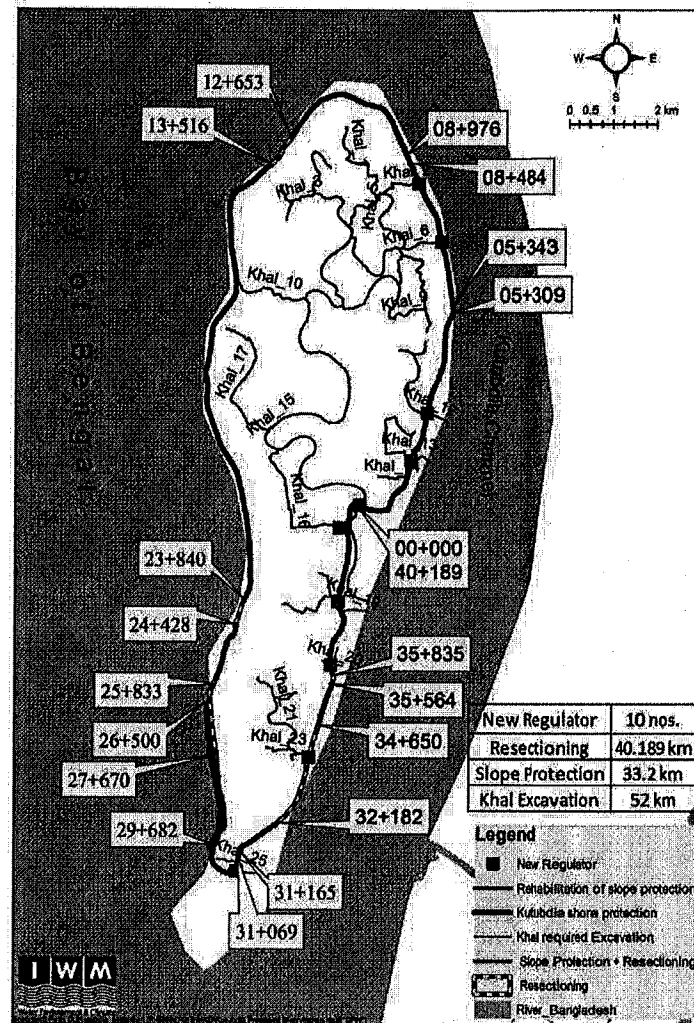


Figure E2-3: Proposed Interventions for Kutubdia Island (Polder-71)

The study recommended re-sectioning of the polder embankment, as well as slope protection works, construction of regulators, excavation of drainage khals, rainwater harvesting, and mangrove afforestation. **Figure E3-1** depicts the location of the proposed project interventions. The suggested interventions are as follows.

- Re-sectioning and slope protection works of about 40.18 km embankment. The total volume of earth work is about 5526855 m³
- Construction of 10 new regulators in Khal-2, Khal-6, Khal-12, Khal-13, Khal-15, Khal-16, Khal-19, Khal-20, Khal-21 and Khal-25.

- Re-excavation of Khal-1 to Khal-17. The total length of excavation is about 52 km and the excavation volume is 2398726 m³.
- Installation of PSF in 8 private ponds.
- Mangrove afforestation of about 82 hectares of land where 2500 nos. plants will be planted per hectare of land. Thus, about 204584 nos. plant will be planted. The suggested species for mangrove afforestation are Keora, Bain, and Gewa.

Matarbari Island

The study suggested re-sectioning of polder embankment along with construction of slope protection works, construction of regulators, excavation of drainage khals, dredging of peripheral river/khal, rainfall harvesting and mangrove afforestation. The location of proposed project interventions is shown in **Figure E3-1**. The suggested interventions are as follows.

- Re-sectioning and slope protections works of about 17.89 km embankment. Total volume of earth work is about 5023711 m³
- Construction of 7 new regulators in Khal-8, Khal-15, Khal-19, Khal-21, Khal-23, Khal-26 and Khal-28.
- Re-excavation of Khal-8 to Khal-11. The Total length of the excavation is about 10.12 km and the excavation volume is 374561 m³.
- Dredging of Kuhelia river, Matarbari Khal and Nunachori Khal. Total length of dredging is 19.43 km. Total dredging volume of Kuhelia and Matarbari Khal is 1467723 m³.
- Digging of 3 lakes each 1 acre.
- Mangrove afforestation is about 21.5 hectares of land where 4444 nos. plant will be planted per hectare of land. Thus, about 95361 nos. plant will be planted. The suggested species for mangrove afforestation are Keora, Bain and Gewa.

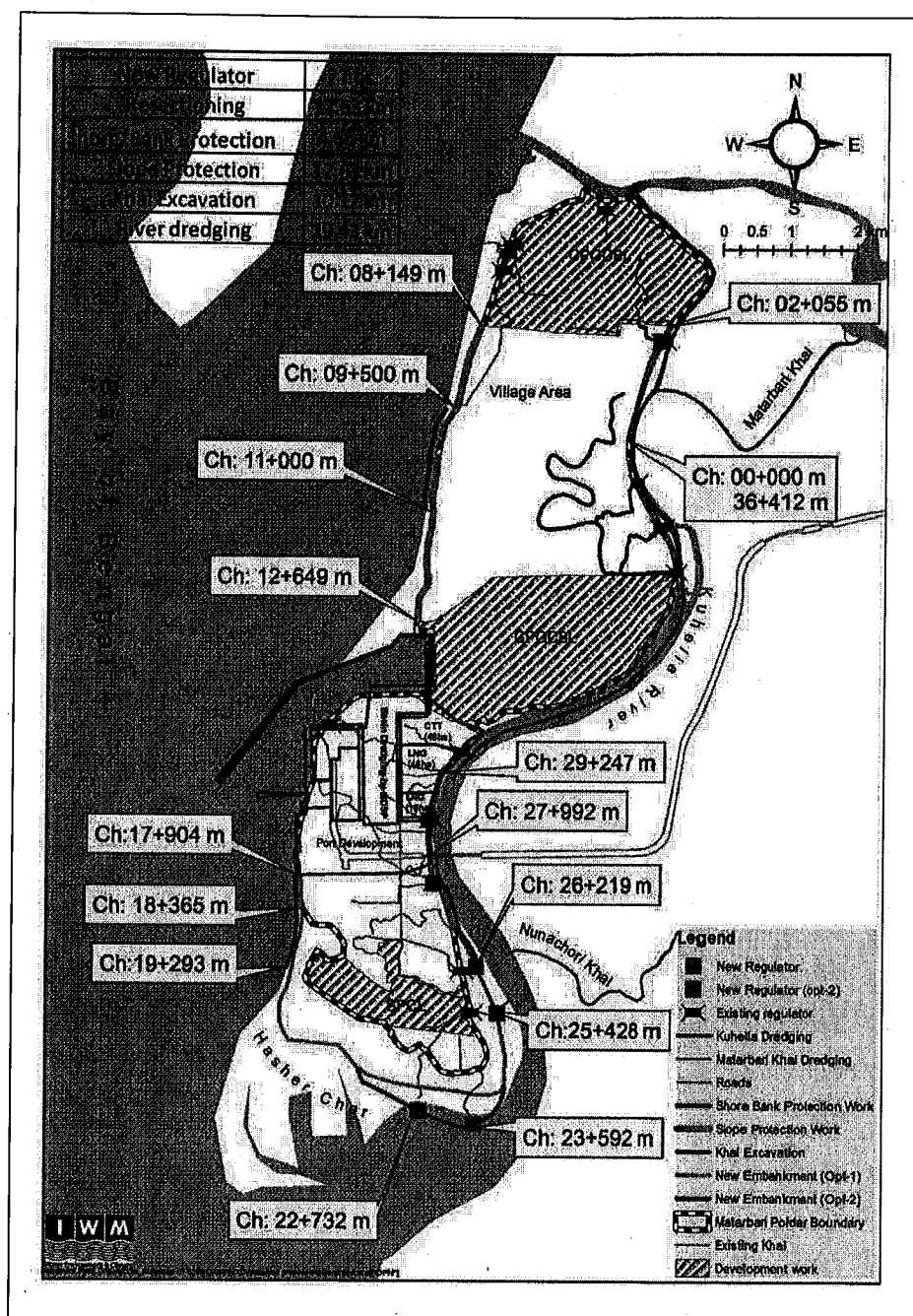


Figure E2-3: Proposed Interventions for Matarbari Island (Polder-70)

E3-2 Re-Sectioning and Slope Protection of Polder Embankment

The proposed project identified the damaged embankment as well as erosion vulnerable reach of existing polder embankment under climate change condition. About 40.189 km for Kutubdia and 17.89 km for Matarbari, embankment is identified as vulnerable for erosion under climate

change condition and suggested for re-sectioning and implementation of slope protection works.

Required embankment crest level is designed for different return periods. Several consultations have been made with the climate and coastal experts, stakeholders and implementing agencies to select the appropriate design event considering the uncertainty in climate change projections. In this study, embankment crest level for **100-yr. return period** has been adopted for implementation from current situation for Matarbari. However, for Kutubdia 30-yr return period is considered because Kutubdia is not as much as economically important as Matarbari. Based on the monitoring result of climate and storm surge, the embankment crest level could be designed for 100-yr. return period in future.

The present study suggested CC block for protection of embankment slope with a side slope 5H:1V in the seaside and 3H:1V in the countryside. Embankment will be raised up to 10 mPWD by earth filling at Matarbari and 8.5 mPWD in Kutubdia. The size of cover layer and toe protection material is given in **Table E3-1**.

Table E3-1: Size of Cover Layer and Toe Protection Material of Embankment Slope

Kutubdia Island

Region of the Embankment	Size of Cover Layer Above High Water Level	Size of Cover Layer Below High Water Level	Size of Toe Protection Material	Quantity of Toe Protection material (m ² /m)	Bed Width of Toe (m)	Depth of Toe (m)
0.00 km to 11.00 km	600×600×400 600×600×600	600×600×400	600×600×600	5.2	2.5	1.2
11.00 km to 15.00 km	600×600×400 600×600×600	750×750×750	1000×800×600 -60% 750×750×750- 40%	9.4	4	1.5
15.00 km to 19.00 km				14	7	1.5
19.00 km to 24.20 km				18	6	2
24.20 km to 25.017 km				14	7	1.5
25.017 km to 26.50 km				18	6	2
26.50 km to 27.67 km				18	6	2
27.67 km to 34.00 km				18	6	2
34.00 km to 37.00 km				14	7	1.5
37.00 km to 40.189 km	600×600×400 600×600×600	600×600×400	600×600×600	5.2	2.5	1.2

Matarbari Island

Reach of the Drainage Line (km)	Size of Canal/Regulator (m x m)	Size of Canal/Regulator (m x m)	Size of Canal/Regulator (m x m)	Number of Regulators (No.)	Area (ha)	Length (km)
0.00 km to 2.055 km	500×500×400	500×500×400	600×600×600	8	2	1.5
8.149 km to 9.50 km	600×600×400	600×600×600 600×600×400	1000×800×600	28	6	2
9.50 km to 11.00 km						
11.00 km to 12.649 km						
17.904 km to 22.750 km						
22.750 km to 25.428 km						
25.428 km to 29.247 km	500×500×400	500×500×400	600×600×600	10	3.5	1.5

E3-3 Drainage Improvement Measures

Taking into account field investigations, drainage model results under climate change conditions, and collaboration with design and field engineers, two drainage improvement alternatives for Kutubdia Island and two for Matarbari Island have been developed to evaluate their effectiveness using a mathematical model. The following are the potential options for Kutubdia and Matarbari Island:

Kutubdia Island:

Option-1	Excavation of necessary khals + Remodeling of non-functional Regulator
Option-2	Excavation of necessary khals + Remodeling of non-functional Regulator + Additional Vent.

The analysis of model results suggests that implementing Option-1 and Option-2 will raise the flood-free (F0+F1) area to 74.89% and 95.81%, respectively. As a result, option-2 is the most effective option for drainage improvement and is recommended for implementation. Option-2 entails the construction of ten new regulators as well as the excavation of Khal-1 through Khal-17.

Matarbari Island:

Option-1	Remodeling of non-functional Regulator
Option-2	Remodeling of non-functional Regulator + Excavation of necessary khals.

The analysis of model results suggests that implementing Option-1 and Option-2 will enhance the (F0+F1) area to 94.58% and 95.25%, respectively. Option-2 is chosen as the intervention after discussions with BWDB officials and local residents, and it is recommended for implementation. Option-2 includes the construction of 7 new regulators as well as the excavation of Khal-8 to Khal-11. Option 2, i.e., excavation of required khals in addition to the construction of additional regulators, is proposed for implementation in order to store water during the dry season.

E4 Environmental Sustainability, Climate Resilience, and Disaster Risk Analysis

E4.1 Environmental Impacts and Environmental Management Plan (EMP)

In **pre-construction phase**, the project can have various impacts on the environment, including the potential loss and fragmentation of habitats for flora and fauna due to the clearance of natural vegetation and disruption of habitat connectivity. Soil erosion is a common phenomenon in the Kutubdia-Matarbari and adjacent areas. Temporary storage, labor shed, and stockyard will be built on the non-agriculture lands. As a result, soil erosion might occur. While the use of heavy machinery and construction vehicles can generate noise and airborne pollutants that may negatively impact wildlife and air quality. Additionally, blocking natural migratory routes for wildlife can have long-term impacts on populations. However, pre-construction activities can also create employment opportunities for both semi-skilled and unskilled workers, providing potential economic benefits to the local community. Proper planning and implementation of pre-construction activities can help mitigate negative impacts on the environment and wildlife while promoting sustainable development.

During construction phase, proposed projects involve various construction activities that can have negative impacts on the environment and human health. Noise pollution is expected due to the use of equipment such as mixture machines, vibrators, and dredgers. Fugitive dust is also a concern, generated during the transportation of sand, shingles, and cement for concrete mixing, as well as emissions from construction equipment and open burning of waste materials. The construction activities can also impact the water quality of rivers and canals. Proper waste management is necessary to avoid environmental pollution and hazards.

The Kutubdia and Matarbari Island projects cover a total area of 6,254 hectares and involve construction work in areas with varying levels of soil erosion rates. The spatial coverage of soil erosion categories in Kutubdia is 93.9% for low, 6% for moderate, and 0.1% for high erosion rates. In Matarbari, the spatial coverage is 92.3% for low, 7.6% for moderate, and 0.1% for high erosion rates. These erosion rates must be considered during construction activities to prevent further erosion and environmental degradation.

The increased water turbidity caused by construction activities can make it difficult for fish to breathe, feed, breed, and nurse, leading to a decrease in fish diversity and composition. Construction activities may also hamper fish migration, which could result in a temporary

decrease in fish production. The majority of the undergrowth vegetation and benthic communities, such as mollusks, may be damaged during dredging activities. Moreover, the disposal of excavated material will harm aquatic habitats, and the movement of excavators may endanger red crabs, turtles, and migratory bird roosting sites.

The proposed project interventions will result in the displacement of an estimated 3457 households, comprising 974 households from the Matarbari and Dhalghata area, and 2483 households from Kutubdia island. These households are situated either in the vicinity of the embankment or are currently residing on it and rely on it for their livelihoods. The exact extent of their displacement and the means of providing compensation or resettlement assistance would need to be determined in consultation with the affected households and other relevant stakeholders.

The project's construction phase involves various operations that pose a risk of injury to workers. However, the project also creates employment opportunities for technical and non-technical work, prioritizing local community members, improving their livelihoods, food security, and reducing poverty. These opportunities could also create a positive impact on the local economy and social well-being by providing access to a stable source of income and opportunities for local businesses to grow.

Overall, the construction activities in Kutubdia and Matarbari Islands have the potential to cause environmental degradation and health hazards if proper measures are not taken. Mitigation measures, including proper waste management, noise and dust control, and monitoring of water quality and sedimentation, must be implemented to minimize negative impacts on the environment and human health.

During the Post Construction Phase, the problems related to drainage congestion and water logging will certainly be mitigated to a great extent due to the implementation of drainage improvement measures. If the project is not implemented, there would be changes in the drainage patterns and land use practices, but at a slower rate. However, within 20 years, about 71 ha (5%) and 25 ha (5%) of agricultural land would be converted into urban areas and other structures in both Kutubdia and Matarbari Island. Protection works in the study area would have significant local positive impacts. The overall impact of the project on land pollution is expected to be positive. It is expected that the proposed permanent rehabilitation of the embankment with slope protection would fix the bank along the Kutubdia and Matarbari, if the normal hydro-morphological condition prevails. It would save valuable lands and assets in the study area. Currently, the total crop production in Kutubdia Island is 16,666 metric tons of which rice and non-rice production is 5,545 metric tons (33.2%) and non-rice is 11,121 metric tons (66.8%). If the project is not implemented the situation would be aggravated. The crop production would be reduced by about 15,185 metric tons of which rice and non-rice would be about 4,710 metric tons (31.0%) and 10,475 metric tons (69%). After the implementation of the project crop production would be increased to 17,716 metric tons of which rice and non-rice would be about 5,940 metric tons. Additionally, about 2,428 metric tons of crops would be produced of which rice and non-rice crop production would be about 1171 metric tons (48.2%) and 1257 metric tons (51.8%). For Matarbari Island, currently, rice-based cropping patterns are observed in Matarbari Island. The total rice crop production in Matarbari Island is 3,270 metric tons. The rice crop production would be reduced about 2,899 metric tons. After the implementation of the project crop production would be about 3,330 metric tons. Additional about 432 metric tons of rice would be produced. Strengthening and heightening the embankment will reduce the flooding inundation risk of fishponds inside the Polder. It is

assumed that aquaculture practices and fish production will be increased by 22% after the rehabilitation of the embankment. The project would have a positive impact on ecological resources. Moreover, the overall socio-economic condition of the study area will be positively impacted.

The Environmental Management Plan (EMP) has been prepared with the aim of ensuring avoidance, minimization, and offsetting of adverse environmental impacts and enhancement of beneficial impacts. The EMP includes mitigation and enhancement measures to be taken during the pre-construction, construction, and post-construction phases. An environmental monitoring plan has been suggested at the end with the mention of agencies responsible for implementing the monitoring plan.

E4.2 Climate Change and Disaster Risk Analysis

The region under examination is extremely susceptible to natural disasters such as cyclones, storm surges, rising sea levels, high salinity, and erosion. The occurrence of tropical cyclones in this area frequently results in loss of life and damage to property. Additionally, the waves and heavy rain generated by cyclones contribute to erosion. Being an island, Kutubdia and Matarbari are highly at risk for cyclone damage.

Both islands undergo significant changes in their physical and hydrological characteristics and the size of the island has been decreasing for several decades due to erosion, leading to the displacement of many people who are forced to relocate to cities for survival.

A larger number of people become displaced Kutubdia and Matarbari face salinity intrusion from all sides due to seawater inflow during the tidal process.

Sea level rise is a very severe issue for the coastal area of Bangladesh. Increasing sea level is creating inundation and increasing salinity in coastal lowlands. This will be a major issue for the project area.

The storm surge can result in loss of life and damage to assets, both economically and socially, during and after the event. Due to the high population, inadequate infrastructure, and poor socioeconomic conditions, the area is highly susceptible to deaths, flooding, and property damage caused by tropical cyclones. The long-term and short-term risks posed by storm surges can affect national development, and people's livelihoods in a community, and slow down a nation's ability to achieve sustainable development. In the study area, storm surges typically result in extensive damage to crops, houses, and assets.

Contingency plans are an essential part of risk management. There are various uncertainties which may occur during the project period for which a contingency plan is required. These uncertain situations may be of any of the following categories:

- Natural disasters such as monsoon and tidal flooding, cyclonic storm surge and wave or earthquake

- Emergency such as fire, accidents, explosion or any medical emergency
- Other external factors such as manmade disaster, leakage of sediment into water, oil spill due to negligence, etc.

A contingency plan is developed to prevent and contain accidental sediment release into water, oil leakage/spills, fire or any other natural or man-made incident. The contingency plan should be included in contractors' costs.

E5 Cost-Benefit Analysis

E5.1 Project Costs

Capital Costs

The Consultant Engineers and the subject specialists have prepared cost estimates of the project, based on field visits and field surveys. Total Financial investment cost of the project is estimated as BDT 513055.84 lakh (Kutubdia phase 1 is 106916.54 lakh BDT and Matarbari is 406139.30 Lakh BDT).

Total investment cost of the project at financial price and economic prices are estimated as BDT 513055.84 lakh and BDT 386815.69 lakh respectively. The year-wise Financial and Economic Costs used in the analysis are given in Table E5-1.

Table E5-1: Year wise Financial and Economic Investment Cost (Lakh taka)

Year	Kutubdia phase 1		Matarbari		Total	
	Financial	Economic	Financial	Economic	Financial	Economic
1	9788.11	7815.40	28851.88	23009.32	38639.99	30824.72
2	41926.92	32599.97	159270.41	123841.68	201197.33	156441.65
3	38432.33	28459.68	156085.26	115585.71	194517.58	144045.39
4	16769.18	11826.04	61931.75	43677.88	78700.94	55503.92
Total	106916.54	80701.09	406139.30	306114.60	513055.84	386815.69

Project O&M Costs

Annual Operation and Maintenance (O&M) costs of the project facilities have been estimated based on the civil works cost. The annual O&M cost of Kutubdia phase 1 and Matarbari are estimated as 8717.96 BDT lakh.in financial and 6251.82 BDT in economic.

E5.2 Project Benefits

The Economic benefits of the project have been identified and quantified as far as possible for economic analysis. The objective of establishing the riverbank protection and river dredging.

Therefore, the benefits of the Embankment Re-Sectioning and Slope Protection Works could be listed as follows:

- Increased cropping intensity from 202.48% to 218.60% and yields will be increased of agricultural crops due to proposed intervention.
- Net benefits on agriculture have been considered for analysis. Other direct and indirect benefits of the project were ignored and not accounted for analysis although such sectors would enhance potential tangible benefits as a direct impact of the project. The proposed works are for the development Kutubdia phase 1 and Matarbari project.

The net benefit derived from the difference between the gross product and the production cost. Net Incremental Benefit, which represents the surplus of the net benefit in post-project condition over that of pre-project condition.

Induced Benefit

- Employment Opportunity of Local People

Non quantified benefits

Several potential benefits, both quantifiable and non-quantifiable, have not been quantified, as dependable data for making reasonable estimates are not available. Some of these non-quantified benefits have profound socio-economic implications for poverty reduction such as income generation for the local people.

E5.3 Key Economic Indicators and Findings

The economic indicators are computed for the Project to judge its economic viability. These indicators include Net Present Value (NPV), Benefit Cost Ratio (B/C Ratio) and Economic Internal Rate of Return (EIRR).

The analytical results of economic analysis are summarized in **Table E5-2**.

Table E5-2: Results of Base Case Economic Analysis (Lakh BDT)

Viability Indicator	Kutubdia	Matarbari	Total
1. Capital Cost Financial (Lakh BDT)	106916.54	406139.30	513055.84
2. Capital Cost Economic (Lakh BDT)	80701.09	306114.60	386815.69
3. O&M Cost Financial (Lakh BDT)	1748.74	6969.22	8717.96
4. O&M Cost Economic (Lakh BDT)	1394.27	5556.56	6950.83
5. Economic Benefit Cost Ratio (BCR @ 12%)	1.88	1.29	1.42
6. Economic Net Present Value (ENPV @ 12%) Lakh BDT	59927.59	75146.93	135074.52
7. Economic Internal Rate Return (EIRR %)	21.01%	17.22%	18.33%

The results indicate that the Project is economically viable, as it secures a rate of return that exceeds 12%, i.e., the opportunity cost of capital, presently used by all sectors of the economy in Bangladesh.

E6 Recommendations

- It is recommended to implement embankment re-sectioning and slope protection works for the suggested reach of the embankment. Design embankment crest level is suggested for 100-yr return period considering cyclonic storm surge and wave under climate change condition for Matarbari. The design crest level is 10 mPWD at seaside and 6.5 mPWD at river side. CC block is suggested for protection of embankment slope with a side slope 5H:1V in the seaside. However, in the case of Kutubdia 35-yr return period (8.5 mPWD all through) is suggested based on economic importance, stake holder consultation and field visit.
- It is also recommended for 40.18 km embankment resectioning and slope protection in 2 phases at Kutubdia and 17.89 km embankment resectioning and slope protection in Phase-1 at Matarbari island.
- To enhance drainage in Kutubdia, it is advised to replace 10 regulators and excavate 52 km of Khal. Additionally, for drainage improvement, construct 7 regulators and excavate 10.12 km of Khal in Matarbari island.
- To improve navigability around Matarbari island area, it is recommended to dredge Kuhelia river (11.1 km), Matarbari khal (4), Nunachori (Kalamaer chora) khal (3.86 km).
- In the Matarbari Village area, it is advised to dig three lakes, each covering 1 acre, to preserve freshwater and installation of PSF in 8 private ponds of Kutubdia to alleviate drinking water scarcity.
- The proposed interventions should be implemented in two phases: Phase-1 from 2023 to 2027, and Phase-2 after the completion of Phase-1.
- It is also recommended to plant 204584 nos.in Kutubdia, and 95361 nos. trees in Matarbari island.
- Highly economic activities are likely to happen in Matarbari island as economic zones and other mega infrastructures are being established by the government and private sector. Because of this, a high volume of traffic movement could be seen in this area. Even though the top width of the embankment is set as 9.8 meter, in future concerned authorities can increase the top width to 4 lane acquiring adjacent private land based on demand.

- Dhalghata is likely to be an industrial area in the future. There is the possibility to elevate the land level to 10 mPWD and drainage will occur by overland flow. So, it is recommended that regulators adjacent to this area should be constructed based on the development of that area and as per site conditions.

The suggested interventions of Phase-1, Phase-2 and Phase-3 are as follows.

Kutubdia island

Item Description	Unit	Quantity
Embankment Re-Sectioning and Slope Protection Works at seaside (Chainage with remarks)		
18+600 - 20+600	km	2
25+700 - 30+200	km	4.5
sub total	km	6.5
Afforestation (Keora, Bain and Gewa)	Nos.	204584
Land Acquisition	ha	44
Item Description	Unit	Quantity
Embankment Re-Sectioning and Slope Protection Works at seaside (Chainage with remarks)		
20+600 - 25+700	km	5.100
30+200 - 40+300	km	9.989
sub total	km	15.089
Construction of New Regulator (structure id)		
1V-1.5m X 1.8m (S.L.-8 and S.L.-10)	Nos.	2
2V-1.5m X 1.8m (S.L.-6, S.L.-7, and S.L.-9)	Nos.	3
sub total	Nos.	5
Item Description	Unit	Quantity
Embankment Re-Sectioning and Slope Protection Works at Kutubdia Channel side(Chainage with remarks)		
00+000 - 18+600	km	18.600
sub total	km	18.600
Construction of New Regulator (structure id)		
2V-1.5m X 1.8m (S.L.-1, S.L.-2, S.L.-3, and S.L.-4)	Nos.	4
5V-1.5m X 1.8m (S.L.-5)	Nos.	1
sub total	Nos.	5
Khal Excavation		
K_Khal_1	km	2.345
K_Khal_2	km	2.383
K_Khal_3	km	1.081
K_Khal_4	km	0.42
K_Khal_5	km	1.806
K_Khal_6	km	3.289

K_Khal_7	km	0.834
K_Khal_8	km	2.263
K_Khal_9	km	3.456
K_Khal_10	km	1.748
K_Khal_11	km	0.477
K_Khal_12	km	2.52
K_Khal_13	km	2.823
K_Khal_14	km	1.064
K_Khal_15	km	18.62
K_Khal_16	km	3.45
K_Khal_17	km	3.35
sub total		51.92

Matarbari island

Item Description	Unit	Quantity
Construction of super dyke with Slope Protection Works (Chainage and Remarks)		
00+000 - 02+053 (resectioning + slope protection)	km	2.053
08+149 - 12+649 (resectioning+ slope protection)	km	4.500
17+904 - 29+247 (resectioning + slope protection)	km	11.343
sub total	km	17.89
Carpeting Road over Super dyke	km	17.89
Construction of New Regulator (structure id)		
1V-1.5m X 1.8m (S.L.-5 and S.L.-13)	Nos./LS	2
2V-1.5m X 1.8m (S.L.-11, S.L.-12, S.L.-15 and S.L.-16)	Nos.	4
3V-1.5m X 1.8m (S.L.-10)	Nos./LS	1
sub total	Nos.	7
Khal Excavation		
M_Khal_8	km	0.59
M_Khal_9	km	1.18
M_Khal_10 (Rangakhali)	km	7.43
M_Khal_11	km	0.92
sub total	km	10.12
Dredging for Navigability		
Kohelia River	km	11.1
Matarbari Khal	km	4
Nunachori (Kalamerchora) Khal	km/LS	3.86
sub total	km	18.96
Rainfall Harvesting		

3 lakes each 1 acre	acre/LS	3
Afforestation (Keora, Bain and Gewa)	Nos.	95361

- The mitigation measures proposed in EIA should be strictly implemented.
- The monitoring plan proposed in the EIA should be strictly followed

Approved


26.06.2023

(Md. Romjan Ali Pramanik)
Director General
BWDB, Dhaka.

Final Report
on
ESIA Study for Feasibility Study for
Integrated Water Resources Management and Development
of Kutubdia and Matarbari Island

Volume I: Main Report

Executive Summary

The surroundings of the Kutubdia Island along the Bay of Bengal is at dynamic stage. Natural char development is in progress due to sediment deposition at the west of this Island, which is visible during ebb. This process can be accelerated through necessary interventions for land reclamation.

The government has already undertaken a number of (multi-purpose) development projects, focusing on MIDI (Maheshkhali-Matarbari Integrated Infrastructure Development Initiative), some of which are already under implementation. Mentionable are Maheshkhali Economic Zone-3 of BEZA, Singapore-Bangladesh 700 MW Coal Power Plant (PPP), Matarbari 1200 MW Coal Power Plant (PPP), the 7.03 km express road by Roads and Highways Department. Floods and cyclones may be the major obstacles to implement these projects and to make them sustainable. As a result, the importance of natural disaster response and improved connectivity in the area is increasing with time.

BWDB is planning to execute two separate development projects to make these projects sustainable. One of the project is "Rehabilitation of Polder No. 71 for Sustainable Development" and the other one is "Construction of Super Dyke in Polder No. 70 and Sustainable Water Resources management at MIDI area situated in Maheshkhali Upazila of Cox's Bazar" which will protect the ongoing as well as the upcoming development projects of the study area from flood, erosion, high tide, cyclone, storm surge and other natural disasters. The above-mentioned projects also aim to mitigate the problems regarding fresh water scarcity of the study area, communication development, drainage and navigability improvement, rehabilitation of existing non-functional water control structures, rehabilitation of land-less people etc.

Under these circumstances, Bangladesh Water Development Board (BWDB) decided to carry out a detailed feasibility study and Environmental and Social Impact Assessment (ESIA) study for integrated development and water resources management of Kutubdia and Matarbari Island.

The feasibility study team (IWM) suggested a number of interventions, include re-sectioning the polder embankment, as well as constructing slope protection structures, excavating drainage khals, constructing regulators, and planting mangrove trees.

The climate of study area is marked with wind speed, high temperature, sunshine hours, considerable humidity and moderate rainfall. According to Bangladesh National Building Code (BNBC), 2012; the study area is located under the earthquake Zone III ($Z=0.28$), which lies in the highest class of vulnerability level with respect to Bangladesh perspective.

The water resource system in Kutubdia Island mainly consists of internal khals or canals. There is no mentionable river system within this island. The western side of Matarbari Island is surrounded by the Bay of Bengal. Besides, there are two big rivers namely; Kohelia River and Matamuhuri River within the study area of Matarbari Island.

The gross study area is 12,069 hectares of which Net Cultivated Area (NCA) is 1,926 hectares (15.95% of the gross area). Among the land use, the gross area of the Kutubdia Island is 7,173 ha of which net cultivated area is 1,420 ha (19.79%). The rest area (80.21%) are beaches or sand bar, canals, industrial area, mangrove plantation, mudflats or intertidal area, ponds, rural settlements, salt pans, sea and shrub dominated area. In the Matarbari Island, the gross area is 4,897 ha of which NCA is 506 ha (10.3% of the total area). The rest area (89.7%) are baor, beaches or sand bar, built-up non-linear area, canals, industrial area, mangrove plantation, mudflats or intertidal area, ponds, rivers, rural settlements, salt pans, sea and shrub dominated area.

The pH value of the study area ranges from 5.1 to 7.9, which indicates that the soil is strongly acidic to slightly alkaline. The EC value around the study area varies ranges from 0.09- 2.03 ds/m. The highest value for both pH (7.9) and EC (2.03 ds/m) were found in Dhalghata (S-1) which might be due to the intrusion of saltwater and extensive salt cultivation. This type of condition is not favourable for crop cultivation, because excess salts hinder plant roots for withdrawing water from the surrounding soil.

The organic matter concentration of soils ranges from 0.61 to 3.00, which is very low to medium. the total Nitrogen value ranges from 0.04- 0.17 percent, which is very low to low as per SRDI standard. The lowest Organic matter and total Nitrogen both were found in Dhalghata; salt cultivation might be responsible for this phenomenon. The highest value for organic matter and total Nitrogen was found in Akber Balir Ghat, Uttar Dhurung, Kutubdia. In the context of available Phosphorus (P) and Sulphur (S), values are ranging from 10.95-30.01 ppm and 5.42-136.99 ppm, respectively. According to the SRDI standard value, the levels of accessible phosphorus (P) and sulfur (S) ranges from very low to very high in the former case, and medium to very high in the latter. The highest Lead (Pb) content was found in Dhalghata point (30.25 ppm) and the lowest Pb was found in Dakshin Dhurung, Kutubdia. Another heavy metal Cadmium (Cd) value ranges from 0.06- 0.42 ppm and four sites having below the detection limit. The highest Cadmium (Cd) content was found in Uttor Durong (S-6) point (30.25 ppm) and the lowest amount of Cd was found Akber Balir Ghat, Uttar Dhurung, Kutubdia. The overall cultivated land is suitable for crop cultivation.

The dominant cropping pattern is HYV Aus-HYV Aman-Fallow which is practiced in 21.1% of NCA followed by Fallow-HYV Aman-HYV Boro in 20.3% in the Kutubdia Island area. Beside this, the most prominent cropping pattern is Fallow-HYV Aman-HYV Boro which is practiced in 70.8% of the NCA followed by Fallow-HYV Aman-Fallow in 19.2% of the NCA. The single, double and triple cropped area is 13.6%, 59.8%, and 26.6% of NCA in the Kutubdia Island area. The cropping intensity of the Kutubdia Island area is 213%. In the Matarbari Island area, the single, double and triple cropped area is 19.2%, 70.8%, and 10.1% of the NCA respectively. The cropping intensity of the Matarbari Island area is 191%. It reveals that the cropping intensity of the study area, Kutubdia and Matarbari Island are higher and close to the national average cropping intensity (194%; BBS, 2018). Groundwater (using STWs) is the key source of irrigation in the study area both in the Kutubdia and Matarbari Island. All the STWs are installed privately.

A total of 16,666 metric tons of crops are annually produced after the loss of 4,152 metric tons of crops of which the rice crop is 5,445 metric tons (33.3%), and non-rice is 11,121 metric tons (66.7%) respectively in the Kutubdia Island. A total of 3,270 metric tons of rice crops are produced annually after the loss of 68 metric tons of HYV Aman crops in the Matarbari area. In Kutubdia and Matarbari Island area, salt cultivated area are 3,037 ha and 1,457 ha. A total of 285,053 metric tons and 137,687 metric tons of salt is produced in the Kutubdia and Matarbari Island area.

The project area possesses both capture and culture fishery with the predominance of hilsa fishery in the Bay of Bengal. The estimated area of total fish habitats for Kutubdia and Matarbari is about **2,110** and **3,234** hectares (ha) with the share of 'Bay of Bengal' of about **45.93%** and **41.06%** respectively. The Kutubdia and Matarbari Island are well known for fisheries resources. There are four main fishing grounds in the Bay of Bengal such as (i) South Patches (ii) South of South Patches, (ii) Middle Ground and (iv) Swatch of No Ground. The nearest one of the four major fishing grounds is the South Patches, located at 91.30'E to 92.10'E and 20.55'S to 21.52'S, having a total area of **3,662 sq km**. Department of Fisheries has identified the fishing grounds in Bay of Bengal as very important for the fisheries sector, especially for hilsa fisheries and breeding zone for other fish species. Rivers and channels are very important for the availability of nutrients and primary productions hence, it is one of the most important spawning sand nursery grounds of the fishes. Bank erosion attracts scour-loving fishes, like Tailla Phasa (*Setipinna taty*), Tapose (*Polynemus paradiseus*), and Olua (*Coilia dussumieri*) while hilsa

fish prefers the plankton rich habitat with high depth. Some key fish species of the study area are Ilish, Poma, Shrimp, Maitta, Tailla, Chanda, Datina, Gagra tengra, Surma, Bhol, pangus, Loittya, Churi etc. Among the composition, the dominant is hilsa by 40% followed by 15% Tailla and Poa; Shrimp 18%; Chanda and Gagra Tengra each occupy 10%.

The present study area falls under three Bio-ecological Zone, i.e. Coastal Marine Water, Coastal Plains, and Offshore Islands. Most of the parts fall into Coastal Marine Water. The study area contains a variety of landforms and ecosystems, including mangrove forest, mudflat, offshore, salt pan, cropland, freshwater aquaculture, pond, sea beach, settlements, and rivers. Terrestrial ecosystems are categorized based on their habitat. Various plant species are supported by each habitat. There are a good number of amphibian and aquatic wildlife in the coastal islands of Matarbari and Kutubdia. Two species of turtle are at risk of going extinct. The Bay of Bengal encircles the Kutubdia Island from three sides (north, west and south), while it lies in the west of the Matarbari. Both Kutubdia Island and Matarbari are affected by cyclonic storms and surges overtopping the embankments. Considering this, mangrove forests will be planted to safeguard the coastline. Overall ecosystems of the study area can be divided in four categories; 1. Terrestrial Ecosystem; 2. Coastal Ecosystem and 3. Aquatic Ecosystem and 4. Marine Ecosystem.

There are 255,005 population comprising of 46,135 households in the study area. The male population is higher than the female population, of which 130,609 (51.21 %) are males and 1,24,394 (48.78%) are females. The average sex ratio of males and females in these unions is 104, which is greater than the national level sex ratio of 100.3 (Population and Housing Census 2011), meaning there are 104 males for every 100 females. It was observed during site visits that crop cultivation, salt cultivation, and fishing are major livelihood-earning activities at both Matarbari and Kutubdia islands. Community consultation also reveals that most of the people are engaged in these activities and all other livelihood activities like small businesses, boat making and maintenance, salt and dry fish marketing are directly and indirectly dependent on these activities. Most of the land at Matarbari and Kutubdia island is used for salt cultivation during the dry season (November to April), and shrimp cultivation during the rainy season (May to October). The agricultural land in the study area is decreasing day by day due to the huge developmental activities are being occurred at the Matarbari area. Similarly, people are becoming more interested in salt farming than fish or crop cultivation. As a result, a small number of people are engaged in crop farming activities, and most of the labour is engaged in non-farming activities such as earth work for embankment construction, construction work for Matarbari Jetty, or power plant.

During public consultations, various aspects of the project were discussed. The issues raised by the local stakeholder touched on construction of super dyke, repair of the broken embankment before monsoon, construction of the new regulators, repair of the defective regulators, dredging of the Kohelia River for increasing the navigability, construction of the motorable roads on the super dyke and removal of the additional blocks. Detailed account of the discussions is presented in stakeholder consultation section.

During pre-construction phase, noise will be generated during site preparation, labour shed construction including toilets and material stockyard, transportation and loading and unloading of construction materials and equipment. Dust particles may be generated during the pre-construction activities and deteriorate the ambient air quality around the pre-construction activity sites and nearby. Fugitive dust emissions from the material stockyards may also deteriorate the ambient air quality of the locality. Soil erosion might occur due to the clearing of vegetation, debris, and the removal of the topsoil due to the above activities. Wastes will be generated during site preparation, labour shed construction including toilets and material stockyard, clearing of vegetation and debris within the demarcated alignment, etc. If these wastes are haphazardly disposed on the adjoining land;

it might degrade the land quality and create environmental pollution. Clearing of vegetation for site preparation will cause damage to flora of the demarcated project area, the impact would be temporary and minor damage as the demarcated alignment areas' vegetation density is very low except for the mangrove forest area of Hasher Char. The wildlife would be disturbed for the increase of human presence, vehicle noise, and for clearing of mangroves from Hasher Char area. The use of heavy machinery and construction vehicles during the pre-construction phase will generate dust and other airborne pollutants, which will negatively impact air quality and potentially harm wildlife. The pre-construction phase may involve the blocking of natural migratory routes for wildlife, such as migratory birds, which can have long-term impacts on populations. The pre-construction activities such as site preparation, construction of labour shed, carrying construction materials and equipment will create employment opportunity for both areas including both semiskilled and unskilled labour particularly for the local workers.

During the **construction phase**, noise will be generated from mixture machine, vibrator for manufacturing of CC block for river bank protection works, construction of groynes, construction/resectioning of embankment, creation of water storage reservoir, and dredging of river etc. Water quality might deteriorate, if empty cement bags, litters, washed off residuals of coarse aggregates, waste concrete, kitchen wastes, WC wastes from labour sheds, etc. are directly released to the river. Water quality may also deteriorate during dredging/excavation. Several wastes will be produced during site preparation, labour shed construction, including the installation of toilets and a materials stockyard, vegetation and debris removal within the demarcated alignment, etc. During construction period the fishes may shift from the area because of mixing the suspended sediment, water turbidity, sound etc. Moreover, fish eggs, fry, larvae and juveniles can be disrupted/destroyed in adjacent area including construction area.

The total crop production in the Kutubdia Island would be about 17,613 metric tons and rice and non-rice production would be about 5,881 metric tons and 11,732 metric tons. Additionally, about 1,171 metric tons (48.2%) of rice and 1,257 metric tons (51.8%) of non-rice would be produced in the Kutubdia Island. The total rice crop production in the Matarbari Island would be about 3,330 metric tons. However, additionally about 432 metric tons of rice crops would be produced in the Matarbari in the future with the project compared to the future without the project, and cropping intensity would be 215% and 195% in the Kutubdia and Matarbari Island respectively. The total salt production would be about 275,806 metric tons in the Kutubdia Island. Additionally, about 1,419 metric tons of salt would be produced. The total salt production would be about 135,474 metric tons in the Matarbari Island. However, additionally about 1,956 metric tons of salt would be produced in the Matarbari in the future with the project compared to the future without the project.

The most critical habitat in the marine ecosystem is the spawning ground of penaeid shrimp which usually lies between the 50 and 80 m. depth. The peak spawning period is from December–March (the most critical month being mid-January to mid-February). As a consequence of construction activities, fish diversity and composition would be decreased temporarily at the construction and adjacent area. Fish production will decrease during construction for certain period after completion of construction activities of the rehabilitation of bank protection, dredging and excavation construction due to hampering of fish migration and less recruitment. Most of the undergrowth vegetation will be damaged, where dredged earth will be dumped and block preparation yard. But it will regrow within 1 year after the construction work.

Permanent damages of bankside vegetation will also occur, where block will be placed. Mangrove vegetation (Hasher Char at Matarbari) and a few Jhau plantation at Hasher Char and Jhau plantations near Light House at Kutubdia will be damaged. The disposal of excavated material will harm aquatic habitat as well as existing mangrove and marginal plants along the river and canal banks.

Invertebrates and crustaceans will be harmed if soil from canal bed is excavated and the movement of excavator in important habitat area. It requires upland as part of its life cycle. Snails, on the other hand, will be wiped out as river beds will be re-excavated. The re-excavation will uproot the aquatic vegetation causing wildlife to relocate. Red crab and turtle may be endangered by the excavator movement. Moreover, migratory bird roosting site at Hasher char at Matarbari and Khudiyartek at Kutubdia area may be affected during construction period. Crab and turtle hatching ground may be disturbed. The construction phase of embankment construction can have several direct and indirect impacts on natural resources such as; soil erosion, water use, air and noise pollution and energy consumption.

The proposed project interventions will result in the displacement of an estimated 4157 households, comprising of 1200 households from the Matarbari and Dhalghata area, and 2957 households from Kutubdia Island. These households are situated either in the vicinity of the embankment or are currently residing on it and rely on it for their livelihoods. The exact extent of their displacement and the means of providing compensation or resettlement assistance would need to be determined in consultation with the affected households and other relevant stakeholders. Besides, there are some private households in Kutubdia Island along the project alignment, who will be forced to relocate at other places. Thus, super dyke and allied works will displace these households permanently. The protective work and other construction activities associated with the project offer employment opportunities for both technical and non-technical work, which is expected to benefit local communities living near the project and study area.

Mitigation and compensation of the negative impacts have been suggested in the Environmental and Social Management Plan section. Important mitigation measures suggested in the environmental and social management plan include the following:

- Water should be sprayed at the construction yard and connected road twice a day in order to suppress fugitive dust; Construction equipment namely batching plant/mixer machine, washing plant and grader, etc. should be properly maintained; Loading of the construction materials (sand, shingle, cement) for concrete mixing should be done carefully to avoid the emission of dust to the extent possible; Construction materials should be kept covered to avoid dispersion in air.
- Construction equipment should have proper mufflers and silencers and maintained properly in order to restrict noise level within national noise standards (Noise control rules, 2006); Movement of equipment carrying vehicles should be restricted/ limited during the daytime; Labour should use ear mufflers and plugs during noisy works; and Temporary Noise barriers should be constructed around the working area to minimize noise e.g. Timber noise barriers,
- The onsite wastes should be properly contained and prevented from escaping into neighbouring fields and properties. Empty cement bags, waste concrete, kitchen wastes, litter, etc. should be collected carefully and disposed of in a safe place.
- Dredged materials should be disposed of at designated areas according to the dredged material management guidelines.
- Disturbance of soil and vegetation should be kept to a minimum level. The greater the disturbance, the greater the potential for erosion. Likewise, vegetation must be re-established in all exposed areas as soon as practical after (or during) the pre-construction and construction phase.

- Six (6) earth materials management plan/measures suggested by community people should be considered in Kutubdia Island.
- Nine(9) earth materials management plan/ measures suggested by community people should be considered in Matarbari Island.
- Dredging machine and materials should be removed as soon as possible for ensuring less disturbance to water and its flow.
- Steel barrier should be installed to make protection from waste of construction materials. A confinement area should be built so that small fish and juvenile do not entered into construction site.
- The duration and intensity of construction activities in sensitive areas of Hasher Char should be reduced.
- Temporary habitats should be created in areas of Koheliya River and Hasher Char where natural habitats are temporarily destroyed, such as during excavation, temporary habitats can be created to provide a safe place for species to relocate.
- To protect aquatic habitats, silt curtains can be used during dredging, and construction activities should be avoided during the breeding season of fish and other aquatic species.
- Soil erosion can be controlled by implementing erosion and sediment control measures such as silt fences, sediment basins, and stabilizing slopes.
- Proper compensation should be ensured to the displace households (1200 Households at Matarbari and 2957 households of Kutubdia) according to the provisions in existing Land Acquisition and Requisition Act of Bangladesh.

For implementing the EMP, around BDT 83.43 million (42.78 million BDT in Kutubdia and 40.65 million BDT in Matarbari) would be required. The EMP cost will be BDT 54.68 million BDT (27.98 million BDT in Kutubdia and 26.70 million BDT in Matarbari) and monitoring cost will be BDT 28.75 Million (14.80 million BDT in Kutubdia and 13.95 million BDT in Matarbari).

বিষয়ঃ গত ০৯/১২/২০২১ খ্রিঃ তারিখে পানি উন্নয়ন বোর্ড কর্তৃক বাস্তবায়নের জন্য প্রস্তাবিত “কুতুবদিয়া এবং মাতারবাড়ি দ্বীপের সমন্বিত পানি সম্পদ ব্যবস্থাপনা ও উন্নয়ন এর নিমিত্ত সম্ভাব্যতা সমীক্ষা” শীর্ষক সমীক্ষা প্রকল্পের ওপর অনুষ্ঠিত ডিপিইসি সভার কার্যবিবরণী।

সভাপতি কবির বিন আনোয়ার
সিনিয়র সচিব
সভার তারিখ ০৯/১২/২০২১ খ্রিঃ।
সভার সময় ১১.০০ ঘটিকা
স্থান পানি সম্পদ মন্ত্রণালয়ের সম্মেলন কক্ষ (ভবন নং-০৬, কক্ষ নং- ৪০৬, বাংলাদেশ সচিবালয়, ঢাকা (ভার্চুয়াল zoom এর সাহায্যে বিভিন্ন সদস্যগণ সংযুক্ত হয়েছিলেন)
উপস্থিতি পরিশিষ্ট ‘ক’

১	উপস্থিত সকলকে স্বাগত জানিয়ে সভাপতি সভার কার্যক্রম শুরু করেন। সভাকে অবহিত করা হয় যে শুরুতেই উল্লেখ করা হয় যে, কুতুবদিয়া ও মাতারবাড়ি দ্বীপের পানি সম্পদ ব্যবস্থাপনার সমন্বিত উন্নয়নের লক্ষ্যে কারিগরি, পরিবেশগত ও সামাজিক দিকসমূহ বিবেচনায় দীর্ঘস্থায়ী সমাধানের পছন্দ নির্ধারণের লক্ষ্যে ৪২৬.৫১ লক্ষ টাকা ব্যয়ে এবং নভেম্বর ২০২১ হতে ডিসেম্বর ২০২২ পর্যন্ত মেয়াদে বাস্তবায়নের জন্য আলোচ্য সমীক্ষা প্রকল্পটি প্রস্তাব করা হয়েছে।
২।	সভায় প্রকল্প এলাকায় ভূমি পরিবৃদ্ধি, ভূমি পুনরুদ্ধার, ভাঙ্গন, পোন্ডার শক্তিশালীকরণ, অভ্যন্তরীণ নিষ্কাশন সমস্যা প্রভৃতি বিষয়ে আলোচনা করা হয়। সভাপতি কুতুবদিয়া দ্বীপের পশ্চিম পার্শ্বে ভাটার সময় দৃশ্যমান ডুবোচরের পলি পতন ত্বরান্বিত করা এবং মূল দ্বীপের সাথে দ্রুত সংযোগ করার বিষয়ে নির্দেশনা প্রদান করেন। এছাড়া তিনি প্রকল্প এলাকায় ডেজিং, তীর প্রতিরক্ষা, হাসের দ্বীপ সহ সংশ্লিষ্ট অন্যান্য দ্বীপে জীববৈচিত্র্য রক্ষণের পরিকল্পনা বিষয়ে আলোকপাত করেন। প্রকল্প এলাকায় চলমান বিভিন্ন ডেভেলপমেন্ট প্রজেক্ট এর আওতায় নির্মিত বাঁধ বা ডাইক বিবেচনায় নিয়ে সুপার ডাইক নির্মাণের বিষয়টি উল্লেখ করেন।
৩।	বিস্তারিত আলোচনা শেষে নিম্নবর্ণিত সিদ্ধান্তসমূহ গৃহীত হয়ঃ
৩.১।	কুতুবদিয়া দ্বীপের পশ্চিম পার্শ্বে ভাটার সময় দৃশ্যমান ডুবোচরের পলি পতন ত্বরান্বিত করা এবং মূল দ্বীপের সাথে দ্রুত সংযোগ স্থাপন করার বিষয়টি স্টাডি অন্তর্ভুক্ত করতে হবে।
৩.২।	প্রকল্প এলাকায় ভূমি পুনরুদ্ধার, ডেজিং, তীর প্রতিরক্ষা, হাসের দ্বীপ সহ সংশ্লিষ্ট অন্যান্য দ্বীপে জীববৈচিত্র্য, পরিবেশ, প্রতিবেশ, বাস্তুতন্ত্র সংরক্ষণের (Ecological Restoration Plan) লক্ষ্যে পরিকল্পনা স্টাডিতে অন্তর্ভুক্ত করতে হবে;
৩.৩।	প্রকল্প এলাকায় চলমান বিভিন্ন উন্নয়ন প্রকল্প এর আওতায় নির্মিত বাঁধ বা ডাইক বিবেচনায় নিয়ে সুপার ডাইক নির্মাণের সম্ভাব্যতা যাচাই করতে হবে।
৩.৪।	সমীক্ষা প্রকল্পে প্রকল্প এলাকার স্টেকহোল্ডারদের মতামতসমূহ গুরুত্বের সাথে বিবেচনায় নিতে হবে;
৩.৫।	সভায় “কুতুবদিয়া এবং মাতারবাড়ি দ্বীপের সমন্বিত পানি সম্পদ ব্যবস্থাপনা ও উন্নয়ন এর নিমিত্ত সম্ভাব্যতা সমীক্ষা” শীর্ষক প্রকল্পটি অনুমোদনের জন্য সুপারিশ করা হয় এবং চূড়ান্ত অনুমোদনের গ্রহণের নিমিত্ত মাননীয় প্রতিমন্ত্রীর সমীপে পেশ করার সিদ্ধান্ত নেওয়া হয়।
৩.৬।	আলোচ্য সমীক্ষার আলোকে গৃহীতব্য বিনিয়োগ প্রকল্পের অর্থনৈতিক বিশ্লেষণ করা আবশ্যিক।
আর কোন আলোচনা না থাকায় উপস্থিত সকলকে ধন্যবাদ জানিয়ে সভাপতি সভার সমাপ্তি ঘোষণা করেন।	

কবির বিন আনোয়ার

বিতরণ (জ্যেষ্ঠতার ক্রমানুসারে নয়) :

- ১) সিনিয়র সচিব, অর্থ বিভাগ, বাংলাদেশ সচিবালয়, ঢাকা।
- ২) সিনিয়র সচিব, জনপ্রশাসন মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
- ৩) সচিব, মহিলা ও শিশু বিষয়ক মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
- ৪) সচিব, পরিবেশ, বন ও জলবায়ু পরিবর্তন মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
- ৫) সচিব, বাস্তবায়ন পরিবীক্ষণ ও মূল্যায়ন বিভাগ, শেরে বাংলা নগর, ঢাকা।
- ৬) সদস্য, সাধারণ অর্থনীতি বিভাগ (সদস্য)-এর দপ্তর, পরিকল্পনা কমিশন, শেরে বাংলা নগর, ঢাকা।
- ৭) সদস্য, কার্যক্রম বিভাগ (সদস্য)-এর দপ্তর, পরিকল্পনা কমিশন, শেরে বাংলা নগর, ঢাকা।
- ৮) সদস্য, কৃষি পানি সম্পদ ও পল্লী প্রতিষ্ঠান বিভাগ (সদস্য)-এর দপ্তর, পরিকল্পনা কমিশন, শেরে বাংলা নগর, ঢাকা।
- ৯) অতিরিক্ত সচিব, প্রশাসন অনুবিভাগ, পানি সম্পদ মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
- ১০) অতিরিক্ত সচিব, উন্নয়ন অনুবিভাগ, পানি সম্পদ মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
- ১১) মহাপরিচালক, বাংলাদেশ পানি উন্নয়ন বোর্ড, ৭২ গ্রীণ রোড, ঢাকা।
- ১২) যুগ্মসচিব, পরিকল্পনা অনুবিভাগ, পানি সম্পদ মন্ত্রণালয়
- ১৩) যুগ্মসচিব, উন্নয়ন-১ অধিশাখা, পানি সম্পদ মন্ত্রণালয়
- ১৪) যুগ্মপ্রধান, এনইসি-একনেক ও সমন্বয় অনুবিভাগ, পরিকল্পনা বিভাগ
- ১৫) প্রধান প্রকৌশলী, দক্ষিণ-পূর্বাঞ্চল, বাপাউবো, চট্টগ্রাম।
- ১৬) উপপ্রধান, পরিকল্পনা-১ অধিশাখা, পানি সম্পদ মন্ত্রণালয়
- ১৭) উপসচিব, উন্নয়ন-১ শাখা, পানি সম্পদ মন্ত্রণালয়
- ১৮) অতিরিক্ত মহাপরিচালক (পূর্ব রিজিয়ন), পূর্ব রিজিয়ন, বাংলাদেশ পানি উন্নয়ন বোর্ড
- ১৯) অতিরিক্ত মহাপরিচালক (পরিকল্পনা), পরিকল্পনা, বাংলাদেশ পানি উন্নয়ন বোর্ড
- ২০) প্রধান প্রকৌশলী (পুর), প্রধান প্রকৌশলী (পুর), পরিকল্পনা এর দপ্তর, বাংলাদেশ পানি উন্নয়ন বোর্ড
- ২১) প্রধান প্রকৌশলী, প্রধান প্রকৌশলী, ডিজাইন, ঢাকা, বাংলাদেশ পানি উন্নয়ন বোর্ড
- ২২) উপসচিব, পরিকল্পনা-৬ শাখা, পানি সম্পদ মন্ত্রণালয়
- ২৩) উপসচিব, পরিকল্পনা-৩ শাখা, পানি সম্পদ মন্ত্রণালয়
- ২৪) উপসচিব, পরিকল্পনা-২ শাখা, পানি সম্পদ মন্ত্রণালয়
- ২৫) সিনিয়র সহকারী সচিব, পরিকল্পনা-৪ শাখা, পানি সম্পদ মন্ত্রণালয়
- ২৬) সিনিয়র সহকারী সচিব, পরিকল্পনা-১ শাখা, পানি সম্পদ মন্ত্রণালয়
- ২৭) তত্ত্বাবধায়ক প্রকৌশলী, কক্সবাজার পওর সার্কেল, বাপাউবো, কক্সবাজার।
- ২৮) তত্ত্বাবধায়ক প্রকৌশলী (পুর), পরিকল্পনা-১ পরিদপ্তর, বাংলাদেশ পানি উন্নয়ন বোর্ড
- ২৯) নির্বাহী প্রকৌশলী, কক্সবাজার পওর বিভাগ, বাপাউবো, কক্সবাজার।
- ৩০) সিনিয়র সচিবের একান্ত সচিব, সিনিয়র সচিবের দপ্তর, পানি সম্পদ মন্ত্রণালয়
- ৩১) নির্বাহী প্রকৌশলী(পুর), পরিকল্পনা-১ পরিদপ্তর, বাংলাদেশ পানি উন্নয়ন বোর্ড

মোঃ এহেতেশাম রেজা

উপসচিব

(একই স্মারক ও তারিখে প্রতিস্থাপিত)
গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
পানি সম্পদ মন্ত্রণালয়
পরিকল্পনা শাখা-৫
বাংলাদেশ সচিবালয়, ঢাকা।



পত্র সংখ্যা: ৪২.০০.০০০০.০৪৩.১৪.০০৭.২১-২৩৩

তারিখ: ০২ মাঘ, ১৪২৮
১৬ জানুয়ারি, ২০২২

প্রেরকঃ মোঃ এহেতেশাম রেজা
উপসচিব

প্রাপকঃ চিফ একাউন্টস এন্ড ফিন্যান্স অফিসার
পানি সম্পদ মন্ত্রণালয়,
২য় ১২ তলা সরকারি অফিস ভবন, সেগুন বাগিচা, ঢাকা।

বিষয়ঃ “কুতুবদিয়া এবং মাতারবাড়ি দ্বীপের সমন্বিত পানি সম্পদ ব্যবস্থাপনা ও উন্নয়ন এর নিমিত্ত সম্ভাব্যতা সমীক্ষা” শীর্ষক সমীক্ষা প্রকল্পের প্রশাসনিক অনুমোদন।

উপর্যুক্ত বিষয়ের পরিশ্রেক্ষিতে আমি নিম্নস্বাক্ষরকারী নির্দেশক্রমে বাংলাদেশ পানি উন্নয়ন বোর্ডের আওতায় “কুতুবদিয়া এবং মাতারবাড়ি দ্বীপের সমন্বিত পানি সম্পদ ব্যবস্থাপনা ও উন্নয়ন এর নিমিত্ত সম্ভাব্যতা সমীক্ষা” শীর্ষক প্রকল্পের প্রশাসনিক অনুমোদন জ্ঞাপন করছি। প্রকল্পটির অনুমোদিত মোট প্রাক্কলিত ব্যয় ৪২৬.৫১ লক্ষ (চার কোটি ছাব্বিশ লক্ষ একাত্তর হাজার) টাকা, যা (সম্পূর্ণ জিওবি)।

- ০২। অনুমোদিত প্রকল্পটির বাস্তবায়ন মেয়াদকাল জানুয়ারি, ২০২২ হতে ফেব্রুয়ারি, ২০২৩ পর্যন্ত।
০৩। অনুমোদিত প্রকল্পটির অংশ ও অংশওয়ারী ব্যয় বিভাজন নিম্নরূপ:

ক্রমিক	ইকোনমিক সাব-কোড	অংশের নাম	পরিমাণ/ সংখ্যা	প্রাক্কলিত ব্যয়
১	২	৩	৪	৫
ক) রাজস্ব ব্যয়:				
১	৩২৫৭১০১	হাইড্রোলজিক্যাল ও মরফোলজিক্যাল মডেলিং স্ট্যাডি পরিবেশ ও সামাজিক প্রভাব মূল্যায়ন	১ দফা	২৮৮.০৭
২	৩২৫৫১০৫	অন্যান্য মনিহারি	১ দফা	১.৬০
৩	৩১১১৩৩২	সম্মানী ভাতা	১ দফা	৩.৮০
৪	৩২৪১১০১	অভ্যন্তরীণ ভ্রমণ ব্যয়	১ দফা	১.০০
উপ-মোট রাজস্ব:				৪১৮.১১
খ) মূলধন খাত				
৬	৪১১২২০২	কম্পিউটার ও আনুষঙ্গিক	১ দফা	২.০০
উপমোট মূলধন:				২.০০
সর্বমোট (ক+খ) সর্বমোট:				৪২৬.৫১

০৪। অনুমোদিত PFS (প্রত্যেক পাতায় স্বাক্ষরিত) এক গ্রন্থ পরবর্তী ব্যবস্থা গ্রহণের জন্য এতদসঙ্গে প্রেরণ করা হলো।


(মোঃ এহেতেশাম রেজা
উপসচিব।
ফোনঃ ৯৫১৩৩৩৭

সদয় অবগতি ও প্রয়োজনীয় ব্যবস্থা গ্রহণের জন্য অনুলিপি (জ্যেষ্ঠতার ক্রমানুসারে নহে):

১. সিনিয়র সচিব, অর্থ বিভাগ, অর্থ মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা (দৃঃ আঃ উপসচিব, বাজেট শাখা-১৯)।
২. সিনিয়র সচিব, জনপ্রশাসন মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
৩. সচিব, বাস্তবায়ন ও পরিবীক্ষণ ও মূল্যায়ন বিভাগ, পরিকল্পনা মন্ত্রণালয়, শের-ই-বাংলা নগর, ঢাকা।
৪. সদস্য, কৃষি, পানি সম্পদ ও পল্লী প্রতিষ্ঠান বিভাগ, পরিকল্পনা কমিশন, শের-ই-বাংলা নগর, ঢাকা।
৫. সদস্য, কার্যক্রম বিভাগ, পরিকল্পনা কমিশন, শের-ই-বাংলা নগর, ঢাকা।
৬. সদস্য, সাধারণ অর্থনীতি বিভাগ, পরিকল্পনা কমিশন, শের-ই-বাংলা নগর, ঢাকা।
৭. অতিরিক্ত সচিব (উন্নয়ন), পানি সম্পদ মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
৮. মহাপরিচালক, বাংলাদেশ পানি উন্নয়ন বোর্ড, পানি ভবন, ঢাকা।
৯. উপসচিব (উন্নয়ন-১ শাখা), পানি সম্পদ মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।

অনুলিপি:

১. মাননীয় প্রতিমন্ত্রীর একান্ত সচিব, পানি সম্পদ মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
২. মাননীয় উপমন্ত্রীর একান্ত সচিব, পানি সম্পদ মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
৩. সিনিয়র সচিব মহোদয়ের একান্ত সচিব, পানি সম্পদ মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
৪. যুগ্মসচিব (পরিকল্পনা) মহোদয়ের ব্যক্তিগত কর্মকর্তা, পানি সম্পদ মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
৫. উপপ্রধান (পরিকল্পনা-১ অধিশাখা), মহোদয়ের ব্যক্তিগত কর্মকর্তা, পানি সম্পদ মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
৬. অফিস কপি/মাস্টার নথি।



ব্যয় বৃদ্ধি ব্যতিরেকে প্রকল্পের মেয়াদ বৃদ্ধির প্রস্তাব

প্রকল্পের নামঃ

কুতুবদিয়া এবং মাতারবাড়ি দ্বীপের সমন্বিত পানি
সম্পদ ব্যবস্থাপনা ও উন্নয়ন এর নিমিত্ত সম্ভাব্যতা
সমীক্ষা

মূল অনুমোদিতঃ

জানুয়ারী, ২০২২ হতে ফেব্রুয়ারী, ২০২৩।

প্রস্তাবিতঃ

জানুয়ারী, ২০২২ হতে জুন, ২০২৩।

বাস্তবায়নকারী সংস্থাঃ

বাংলাদেশ পানি উন্নয়ন বোর্ড।

উদ্যোগী মন্ত্রণালয়/বিভাগঃ

পানি সম্পদ মন্ত্রণালয়।

ব্যয় বৃদ্ধি ব্যতিরেকে প্রকল্পের মেয়াদ বৃদ্ধির প্রস্তাব

- ১। প্রকল্পের নাম : কুতুবদিয়া এবং মাতারবাড়ি দ্বীপের সমন্বিত পানি সম্পদ ব্যবস্থাপনা ও উন্নয়ন এর নিমিত্ত সম্ভাব্যতা সমীক্ষা।
- ২। বাস্তবায়নকারী সংস্থা : বাংলাদেশ পানি উন্নয়ন বোর্ড
- ৩। উদ্যোগী মন্ত্রণালয়/বিভাগঃ পানি সম্পদ মন্ত্রণালয়

৪। প্রাক্কলিত ব্যয় (লক্ষ টাকায়):	মোট	টাকা	প্রকল্প সাহায্য
৪.১. মূল অনুমোদিত:	৪২৬.৫১	৪২৬.৫১	০.০০
৪.২. সর্বশেষ সংশোধিত অনুমোদিত (প্রযোজ্য ক্ষেত্রে):	প্রযোজ্য নয়		

৫। বাস্তবায়নকাল :	আরম্ভ	সমাপ্তি
৫.১. মূল অনুমোদিত :	জানুয়ারী, ২০২২	ফেব্রুয়ারী, ২০২৩
৫.২. সর্বশেষ সংশোধিত অনুমোদিত (প্রযোজ্য ক্ষেত্রে):	প্রযোজ্য নয়	
৫.৩. ব্যয় বৃদ্ধি ব্যতিরেকে বর্ণিত (প্রযোজ্য ক্ষেত্রে)	প্রযোজ্য নয়	
৫.৪. প্রস্তাবিতঃ	জানুয়ারী, ২০২২	জুন, ২০২৩

৬। প্রকল্প সাহায্য সংক্রান্ত:	উন্নয়ন সহযোগী	ধরন (ঋণ/অনুদান)	পরিমাণ (লক্ষ টাকায়)	চুক্তির মেয়াদকাল
প্রযোজ্য নয়	ক.			
	খ.			
	গ.			

৭। বছরভিত্তিক সংস্থান, বরাদ্দ, অবমুক্তি ও আর্থিক ব্যয়ঃ

অর্থ বছর	(লক্ষ টাকায়)			
	মূল/সর্বশেষ সংশোধিত অনুমোদিত ডিপিপি/পিএফএস এ সংস্থান	মূল/সংশোধিত এডিপি বরাদ্দ	অবমুক্তকৃত টাকা	আর্থিক ব্যয়
	মোট (টাকা)	মোট (টাকা)		মোট (টাকা)
১	২	৩	৪	৫
আরএডিপি (২০২১-২২)		১০০.০০	১০০.০০	৪৭.৩৬
এডিপি (২০২২-২৩)		৩২৬.০০	১৬৩	-
সর্বমোটঃ	৪২৬.৫১	৪২৬.০০	২৬৩.০০	৪৭.৩৬

৮। অঙ্গুয়ারী বাস্তবায়ন অবস্থাঃ

ক্রমিক নং এবং ডিপিপি/টিপিপি অনুসারে অঙ্গুর নাম (পরিমাণসহ)	প্রাক্কলিত ব্যয়	(লক্ষ টাকায়)					
		গত অর্থ-বছর পর্যন্ত ক্রমপুঞ্জীভূত অগ্রগতি		বর্তমান অর্থ-বছরে লক্ষ্যমাত্রা		বর্তমান অর্থ-বছরে ডিসেম্বর-২০২২ মাস পর্যন্ত অগ্রগতি	
		আর্থিক (লক্ষ টাকা)	বাস্তব (অংগের %)	আর্থিক (লক্ষ টাকা)	বাস্তব (অংগের %)	আর্থিক (লক্ষ টাকা)	বাস্তব (অংগের %)
১	২	৩	৪	৫	৬	৭	৮
ক) রাজস্ব ব্যয়							
সম্ভাব্যতা সমীক্ষা (হাইড্রোলজিক্যাল ও মরফোলজিক্যাল মডেলিং) (৩২৫৭১০১)	২৮৮.০৭	২৮.৮০	৩২.০০%	২৫৯.২৪	৬৮.০০%	২৮.৮০	৪৫.০০%
সম্ভাব্যতা সমীক্ষা (পরিবেশ ও সামাজিক প্রভাব বিশ্লেষণ) (৩২৫৭১০১)	১৩০.০৪	১২.৯৯	২৮.০০%	১১৬.৯৪	৭২.০০%	১২.৯৯	৪০.০০%
অন্যান্য মনিহারি (৩২৫৫১০৫)	১.৬০	১.৫৮	১০০.০০%	০.০০	০.০০%	১.৫৮	০.০০%
সম্মানী ভাতা (৩১১১৩৩২)	৩.৮০	১.৯৯	৫৫.০০%	১.৮১	৪৫.০০%	১.৯৯	০.০০%
অভ্যন্তরীণ ভ্রমণ ব্যয় (৩২৪১১০১)	১.০০	০.০০	০.০০%	১.০০	১০০.০০%	০.০০	০.০০%
উপ-মোট (ক) :	৪২৪.৫১	৪৫.৩৭	৩১.১৬%	৩৭৮.৯৯	৭০.০০%	৪৫.৩৭	৪২.০০%
খ - মূলধন ব্যয়							
কম্পিউটার ও আনুষঙ্গিক (৪১১২২০২)	২.০০	১.৯৯	১০০.০০%	০.০০	০.০০%	১.৯৯	০.০০%
উপ-মোট (খ) :	২.০০	১.৯৯	১০০.০০%	০.০০	০.০০%	১.৯৯	০.০০%
সর্ব মোট (ক+খ) :	৪২৬.৫১	৪৭.৩৬	৩১.৪৮%	৩৭৮.৯৯	৬৮.৫২%	৪৭.৩৬	৪১.০০%

৪

৯। প্রস্তাবিত বর্ধিত মেয়াদকালে যে সকল অঞ্জের কাজ বাস্তবায়িত হবে এবং যে সকল অঞ্জের জন্য অর্থ ব্যয় হবে তার বৃত্তান্ত: (লক্ষ টাকায়)				
অঞ্জের নাম	এ কাজ কখন শুরু হয়েছে বা হবে? (এবং এ কাজ কখন শেষ হবে)	ডিপিপি/টিপিপি অনুযায়ী প্রাক্কলিত ব্যয় (এবং ইতোমধ্যে ব্যয়িত অর্থ)	ভবিষ্যতে সম্পাদন যোগ্য বাস্তবিক কাজের পরিমাণ এবং এজন্য ব্যয় যোগ্য অর্থ	শুরু করতে বা শেষ হতে বিলম্ব কেন তার বিস্তারিত ব্যাখ্যা
১	২	৩	৪	৫
সস্তাব্যতা সমীক্ষা (হাইড্রোলজিক্যাল ও মরফোলজিক্যাল মডেলিং) (৩২৫৭১০১)	জানুয়ারী, ২০২২ (জুন, ২০২৩)	২৮৮.০৭ (২৮.৮০)	২৫৯.২৭	প্রকল্পটি গত ১৬/০১/২০২২ তারিখে অনুমোদিত হয় ও প্রকল্পটির মেয়াদকাল জানুয়ারী, ২০২২ হতে ফেব্রুয়ারী, ২০২৩। পরবর্তীতে পরামর্শক প্রতিষ্ঠান আইডব্লিউএম ও সিইজিআইএস এর সাথে যথাক্রমে ১৭/০৪/২০২২ ও ১৮/০৪/২০২২ তারিখে দুটি চুক্তি স্বাক্ষরিত হয়।
সস্তাব্যতা সমীক্ষা (পরিবেশ ও সামাজিক প্রভাব বিশ্লেষণ) (৩২৫৭১০১)	জানুয়ারী, ২০২২ (জুন, ২০২৩)	১৩০.০৪ (১২.৯৯)	১১৭.০৫	
সম্মানী ভাতা (৩১১১৩৩২)	জানুয়ারী, ২০২২ (জুন, ২০২৩)	৩.৮০ (১.৯৯)	১.৮১	
অভ্যন্তরীণ ভ্রমণ ব্যয় (৩২৪১১০১)	জানুয়ারী, ২০২২ (জুন, ২০২৩)	১.০০ (০.০০)	১.০০	
সর্বমোট ব্যয়		৪৩.৭৮	৩৭৯.১৩	বিরূপ আবহাওয়ার (সাইক্লোন সিত্রাং সহ ও বিভিন্ন সময়ে সংঘটিত নিম্নচাপ) কারণে মাঠ পর্যায়ের জরিপ কাজ বিলম্বিত হয়। এছাড়া, প্রস্তাবিত অবকাঠামোসমূহ চূড়ান্ত করার জন্য অতিরিক্ত জরিপ কাজ করা প্রয়োজন (কপি সংযুক্ত-১)। উল্লেখ্য, বাংলাদেশ অর্থনৈতিক অঞ্চল কর্তৃপক্ষ (বেজা) কর্তৃক প্রকল্প এলাকার বাঁধের নতুন এলাইনম্যান্ট, অবকাঠামো নির্মাণ ও ভূমি উন্নয়নের পরিকল্পনা পরিবর্তিত হওয়ার ফলে অতিরিক্ত জরিপ কাজের প্রয়োজন হবে। এছাড়া, আইডব্লিউএম কর্তৃক প্রস্তাবিত অবকাঠামোগুলোর ওপর সিইজিআইএস কর্তৃক পরিবেশগত ও সামাজিক প্রভাব মূল্যায়নের নিমিত্ত অতিরিক্ত সময় প্রয়োজন হবে মর্মে পরামর্শক প্রতিষ্ঠান কর্তৃক জানানো হয় (কপি সংযুক্ত-২)। উল্লেখ্য যে, ২০২২-২৩ অর্থ বছরের আরএডিপিতে প্রকল্পটি অন্তর্ভুক্ত করা প্রয়োজন এবং একই সাথে প্রকল্পটির কার্যক্রম জুন, ২০২৩ এ সমাপ্তির নিমিত্ত এডিপি বরাদ্দের অতিরিক্ত ৫২.৬৪ লক্ষ টাকা বরাদ্দের সংস্থান প্রয়োজন। এমতাবস্থায়, প্রকল্পটির সুষ্ঠু বাস্তবায়নের স্বার্থে প্রকল্পটির মেয়াদ জুন, ২০২৩ পর্যন্ত বৃদ্ধি করা প্রয়োজন।

১০। ব্যয় বৃদ্ধি ব্যতিরেকে মেয়াদ বৃদ্ধির যৌক্তিকতাঃ

- ১০.১। প্রকল্পটি গত ১৬/০১/২০২২ তারিখে অনুমোদিত হয় ও প্রকল্পটির মেয়াদকাল জানুয়ারী, ২০২২ হতে ফেব্রুয়ারী, ২০২৩। পরবর্তীতে পরামর্শক প্রতিষ্ঠান আইডব্লিউএম ও সিইজিআইএস এর সাথে যথাক্রমে ১৭/০৪/২০২২ ও ১৮/০৪/২০২২ তারিখে দুটি চুক্তি স্বাক্ষরিত হয়।
বিরূপ আবহাওয়ার (সাইক্লোন সিত্রাং সহ ও বিভিন্ন সময়ে সংঘটিত নিম্নচাপ) কারণে মাঠ পর্যায়ের জরিপ কাজ বিলম্বিত হয়। এছাড়া, প্রস্তাবিত অবকাঠামোসমূহ চূড়ান্ত করার জন্য অতিরিক্ত জরিপ কাজ করা প্রয়োজন (কপি সংযুক্ত-১)। উল্লেখ্য, বাংলাদেশ অর্থনৈতিক অঞ্চল কর্তৃপক্ষ (বেজা) কর্তৃক প্রকল্প এলাকার বাঁধের নতুন এলাইনম্যান্ট, অবকাঠামো নির্মাণ ও ভূমি উন্নয়নের পরিকল্পনা পরিবর্তিত হওয়ার ফলে অতিরিক্ত জরিপ কাজের প্রয়োজন হবে। এছাড়া, আইডব্লিউএম কর্তৃক প্রস্তাবিত অবকাঠামোগুলোর ওপর সিইজিআইএস কর্তৃক পরিবেশগত ও সামাজিক প্রভাব মূল্যায়নের নিমিত্ত অতিরিক্ত সময় প্রয়োজন হবে মর্মে পরামর্শক প্রতিষ্ঠান কর্তৃক জানানো হয় (কপি সংযুক্ত-২)।
উল্লেখ্য যে, ২০২২-২৩ অর্থ বছরের আরএডিপিতে প্রকল্পটি অন্তর্ভুক্ত করা প্রয়োজন এবং একই সাথে প্রকল্পটির কার্যক্রম জুন, ২০২৩ এ সমাপ্তির নিমিত্ত এডিপি বরাদ্দের অতিরিক্ত ৫২.৬৪ লক্ষ টাকা বরাদ্দের সংস্থান প্রয়োজন। এমতাবস্থায়, প্রকল্পটির সুষ্ঠু বাস্তবায়নের স্বার্থে প্রকল্পটির মেয়াদ জুন, ২০২৩ পর্যন্ত বৃদ্ধি করা প্রয়োজন।
- ১০.২। প্রস্তাবিত কাজসমূহ প্রস্তাবিত মেয়াদের মধ্যে সমাপ্ত করা সম্ভব হবে কি নাঃ হ্যাঁ।
- ১০.৩। প্রস্তাবিত কাজগুলি কেন রাজস্ব বাজেট বা অন্য কোন প্রকল্পের আওতায় বাস্তবায়ন সম্ভবপর নহে তা বিস্তারিতভাবে উল্লেখ করতে হবেঃ
সমীক্ষা কাজটি একটি গবেষণাধর্মী এককভাবে সম্পূর্ণ কাজ, এর আংশিক কাজ আলাদাভাবে করলে কার্যকর কোনো ফলাফল পাওয়া যাবে না। তাই প্রস্তাবিত কাজগুলো রাজস্ব বাজেট বা অন্য কোনো প্রকল্পের আওতায় বাস্তবায়ন সম্ভবপর নয়।

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- ১০.৪। প্রকল্পে লোকবলের ক্ষেত্রে (যদি থাকে) বর্ধিত সময়ের জন্য তাদের প্রয়োজন থাকলে তজ্জন্য আর্থিক সংশ্লেষ, লোকবলের পদওয়ানী সংখ্যাসহ সংরক্ষণের যৌক্তিকতাঃ প্রযোজ্য নয়।
- ১০.৫। প্রকল্পে গাড়ী রক্ষনাবেক্ষণের সংস্থানের ক্ষেত্রে (যদি থাকে) বর্ধিত সময়ের জন্য তাদের প্রয়োজন থাকলে তজ্জন্য আর্থিক সংশ্লেষ, গাড়ীর সংখ্যাসহ সংরক্ষণের যৌক্তিকতাঃ
- প্রকল্পের জন্য আলাদা কোনো গাড়ীর সংস্থান নেই। অন্য কাজে ব্যবহৃত গাড়ি সাময়িকভাবে বিভিন্ন সময় এই প্রকল্পের কাজে ব্যবহার করা হয়।

Rakib 28.12.22
(M. Abdur Rakib)
Executive Engineer (Civil)
&
Project Director
Director of Planning-1
Prakalpa, Dhaka
নাম ও স্বাক্ষর

M. Rahman
02/02/2023
সংস্থা প্রধানের
নাম ও স্বাক্ষর
(মোঃ মাহবুবুর রহমান)
মহাপরিচালক
বাপাউবো, ঢাকা।

যুগ্ম-প্রধান/দায়িত্ব প্রাপ্ত কর্মকর্তার
নাম ও স্বাক্ষর

নম্বর: ৪২.০০.০০০০.০৪৩.১৪.০০৭.২১.১১

তারিখ: ৯ মাঘ ১৪২৯

২৩ জানুয়ারি ২০২৩

প্রাপক:

চিফ একাউন্টস এন্ড ফিন্যান্স অফিসার, পানি সম্পদ মন্ত্রণালয়, ২য় ১২ তলা সরকারি অফিস
ভবন, সেগুন বাগিচা, ঢাকা।

বিষয়: “কুতুবদিয়া এবং মাতারবাড়ি দ্বীপের সমন্বিত পানি সম্পদ ব্যবস্থাপনা ও উন্নয়ন এর নিমিত্ত
সম্ভাব্যতা সমীক্ষা” শীর্ষক সমীক্ষা প্রকল্পটির ব্যয় বৃদ্ধি ব্যতিরেকে বাস্তবায়ন মেয়াদ বৃদ্ধির
প্রশাসনিক অনুমোদন।

আমি নিম্নস্বাক্ষরকারী নির্দেশক্রমে “কুতুবদিয়া এবং মাতারবাড়ি দ্বীপের সমন্বিত পানি সম্পদ ব্যবস্থাপনা ও উন্নয়ন এর নিমিত্ত
সম্ভাব্যতা সমীক্ষা” শীর্ষক সমীক্ষা প্রকল্পটির ব্যয় বৃদ্ধি ব্যতিরেকে বাস্তবায়ন মেয়াদ জানুয়ারি, ২০২২ হতে ফেব্রুয়ারি, ২০২৩ এর পরিবর্তে
জানুয়ারি ২০২২ হতে জুন, ২০২৩ পর্যন্ত বৃদ্ধির প্রশাসনিক অনুমোদন জ্ঞাপন করছি।

০২। প্রকল্পটির অনুমোদিত মোট ব্যয় (সম্পূর্ণ জিওবি) ৪২৬.৫১ লক্ষ টাকা।

০৩। প্রকল্পটির অনুমোদিত বাস্তবায়ন মেয়াদকাল জানুয়ারি ২০২২ হতে জুন, ২০২৩ পর্যন্ত।

আপনার বিশ্বস্ত,



২৩-১-২০২৩

খান মোঃ হাসানুজ্জামান

সিনিয়র সহকারী সচিব

ফোন: ৯৫৪৫৫১৩

নম্বর: ৪২.০০.০০০০.০৪৩.১৪.০০৭.২১.১১/১(১৮)

তারিখ: ৯ মাঘ ১৪২৯

২৩ জানুয়ারি ২০২৩

অবগতি ও প্রয়োজনীয় (প্রযোজ্য ক্ষেত্রে) ব্যবস্থা গ্রহণের জন্য অনুলিপি প্রেরণ করা হইল:

- ১) সিনিয়র সচিব, জনপ্রশাসন মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
- ২) সিনিয়র সচিব, অর্থ বিভাগ, বাংলাদেশ সচিবালয়, ঢাকা, (দৃঃ আঃ উপসচিব, বাজেট শাখা-১৯)।
- ৩) সচিব, বাস্তবায়ন পরিবীক্ষণ ও মূল্যায়ন বিভাগ, শেরে বাংলা নগর, ঢাকা।
- ৪) সদস্য, কৃষি পানি সম্পদ ও পল্লী প্রতিষ্ঠান বিভাগ (সদস্য)-এর দপ্তর, পরিকল্পনা কমিশন, শেরে বাংলা নগর, ঢাকা।
- ৫) সদস্য, কার্যক্রম বিভাগ (সদস্য)-এর দপ্তর, পরিকল্পনা কমিশন, শেরে বাংলা নগর, ঢাকা।
- ৬) অতিরিক্ত সচিব, উন্নয়ন অনুবিভাগ, পানি সম্পদ মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
- ৭) অতিরিক্ত সচিব, পরিকল্পনা অনুবিভাগ, পানি সম্পদ মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
- ৮) মহাপরিচালক, বাংলাদেশ পানি উন্নয়ন বোর্ড, ৭২ গ্রীণ রোড, ঢাকা।

- ৯) যুগ্মসচিব, উন্নয়ন-১ অধিশাখা, পানি সম্পদ মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
- ১০) প্রধান প্রকৌশলী, দক্ষিণ-পূর্বাঞ্চল, বাংলাদেশ পানি উন্নয়ন বোর্ড, চট্টগ্রাম।।
- ১১) উপপ্রধান, পরিকল্পনা-১ অধিশাখা, পানি সম্পদ মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
- ১২) মাননীয় প্রতিমন্ত্রীর একান্ত সচিব, প্রতিমন্ত্রীর দপ্তর, পানি সম্পদ মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
- ১৩) উপসচিব, উন্নয়ন-১ শাখা, পানি সম্পদ মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
- ১৪) মাননীয় উপমন্ত্রীর একান্ত সচিব, উপমন্ত্রীর দপ্তর, পানি সম্পদ মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
- ১৫) তত্ত্বাবধায়ক প্রকৌশলী (পুর), পরিকল্পনা-১ পরিদপ্তর, বাংলাদেশ পানি উন্নয়ন বোর্ড, ঢাকা।
- ১৬) সচিবের একান্ত সচিব, সচিবের দপ্তর, পানি সম্পদ মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
- ১৭) নির্বাহী প্রকৌশলী(পুর), পরিকল্পনা-১ পরিদপ্তর, বাংলাদেশ পানি উন্নয়ন বোর্ড, ঢাকা।
- ১৮) অফিস কপি, মাস্টার নথি।



২৩-১-২০২৩

খান মোঃ হাসানুজ্জামান
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