Government of the People's Republic of Bangladesh
Ministry of Water Resources

Bangladesh Water Development Board

PROJECT COMPLETION REPORT: IMED 04/2003 (Revised)

Feasibility Study for Integrated Water Resources Management of Different Upazilas under Brahmanbaria District.

(ব্রাহ্মণবাড়িয়া জেলার অন্তর্গত বিভিন্ন উপজেলার সমন্বিত পানি সম্পদ ব্যবস্থাপনার নিমিত্ত সম্ভাব্যতা সমীক্ষা)

September, 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 of Different Upazilas under Brahmanbaria District. **(Project code- 222015400)**
02.	**AdministrativeMinistry/Division**	:	Ministry of Water Resources (MoWR)
03.	**Executing Agency**	:	Bangladesh Water Development Board (BWDB)
04.	**Location of the Project**	:	B. BariaSadar, Nasirnagar, Nabinagar, Sarail, Bijoynagar, Bancharampur and Ashuganj.

05. Objectives of the Study

The main objective of the study is to develop and manage water resources in the area with emphasis on flood management, drainage improvement, erosion protection especially due to wave action and irrigation development. This study also aims to devise a plan for safe harvesting of boro crops, explore the potential of fishery, agriculture, tourism and restore the environment and ecosystem including livelihood improvement of the area.

It is envisaged that the feasibility study would be implemented under two different components. Under Component-I, hydro-morphological aspects of the study including identification of the problems and their appropriate remedial measures would be addressed. Under Component-II, other aspects of the study e.g. socio-economic, agricultural, fisheries and environmental aspects would be addressed under this component.

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

Component-1: Hydro-morphology and Mathematical Modelling

- To investigate the problems (Bank Erosion, Flash Flood, Wave Action etc) for developing and managing the water resources of different Upazilas of Brahmanbaria district considering socio-economic and environmental conditions of the area to cope with the future hydro-morphological conditions.
- To identify the erosion vulnerable areas and take river bank protection measure for saving government and private establishments;
- To improve navigation facilities and establish connectivity between the rivers, drainage khals and haors;
- To investigate the feasibility of flood control embankment with slope protection;
- To assess the need of dredging, dredging alignment& dredging volume and to provide design and dredged material management plan.
- To prepare appropriate alignment of flood control embankment or flood wall and to identify location of water control structures / drainage structures, slope protection of embankment if necessary;
- Cost estimation, EIRR and other economic analysis;

Component-2: Environmental and Social Impact Assessment Study

The overall objective of the ESIA study is to assess the impacts of the proposed interventions on the environmental and social components and suggest an environmental management plan for sustainable development of the project. The ESIA would ensure to involve beneficiaries in project conceptualization, planning and implementation. The study will assess the biophysical and socio environmental impact with recommendation of appropriate mitigation plan in the project area and to prepare report on ESIA to obtain necessary clearances from the Department of Environment (DoE). The specific objectives of the consultancy service are following:

The specific objectives are:

- To conduct a detailed Environmental and Social Impact Assessment (ESIA) of the proposed interventions.
- To assess the project with respect to environmental sustainability, climate resilience and disaster risk and find the ways for reducing/mitigating negative impacts;
- Assessment of viability of tourism development in the project area and to prepare a plan for protection of natural environment including creation of eco-tourism spots by integrating forests through sustainable tree plantation;
- To prepare a land acquisition plan and lay out of acquired land along with demarcation on the CS/RS Mouza map.
- To prepare the methodology for Land Acquisition and resettlement action plan as per current ''Land Acquisition and resettlement Act-2017''
- Identifying, quantifying and evaluating the potential environmental consequences so that the impacts before implementation of the project & impacts of the projects are highlighted. The negative impacts would be addressed in a way conserving the society and environment.
- Prepare an Environmental Management Plan (EMP) which should include mitigation measures, enhancement measures, compensation measures and an environmental monitoring plan;

06. Estimated Cost :

(In lakh Taka)

	Original	**Latest Revised**
(a) Total	404.00	-
(b) Taka	404.00	-
(c) Foreign Currency	-	-
(d) Project Aid	-	-
(e) RPA	-	-

07. Date of Approval :

		PCP/PFS	PP
(a) Original	:	06/10/2022	-
(b) Latest Revised	:	-	-
(c) No Cost Time Extension	:	-	-

08. Implementation Period :

	Date of Commencement	Date of Completion
(a) Original	October 2022	June 2023
(b) Latest Revised	-	-
(c) Actual	October 2022	June 2023

09. Financing Arrangement (Source-wise):

9.1 Status of Loan/Grant

a) Foreign Financing : *Not Applicable*

Source (s)	Currency as per Agreement	Amount in US $ (Million)	Nature (Loan/Grant/ supplier's/ credit)	Date of Agreement	Date of 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
404.00	-	404.00	-

9.2 Utilization of Project Aid: *Not Applicable*

(In million)

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

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

(In lakh Taka)

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

B. IMPLEMENTATION POSITION

01. Implementation Period :

Implementation Period as per PP		Actual Implementation period	Time Over-run (% of original implementation period)	Remarks
Original	Latest Revised			
1	2	3	4	5
October 2022- June 2023 (8 months)	-	October 2022- June 2023 (8 months)	(0%)	The project was completed in time.

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	404.00	-	361.82	-10.44%	
TAKA	404.00	-	361.82		
PA	-	-	-		

03. Project Personnel: Existing manpower of Office of the Chief Engineer, Planning (Civil), BWDB were engaged with implementation of the project.

Sanctioned strength as per PP	Manpower employed during execution	Status of the existing manpower			Manpower Employed	
		Manpower requirement for O&M as per pp	Existing manpower for O & M	Others		
1	2	3	4	5	Male	Female
Officer (s)	04	-	-	-	03	01
Staff(s)	08	-	-	-	06	02
Total :	12	-			09	03

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

Field of Training /Study tour/workshop/Seminer etc.	Provision as per PP		Actual		Remarks
	Number of person	Man - months	Number of person	Man - months	
1	2	3	4	5	6
a. Foreign	-	-	-	-	-
b. Local	-	-	14	-	-

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

(In lakh Taka)

Items of work (as per PFS)	Unit	Target (as per PFS)		Actual Progress		Reasons for deviation (±)
		Physical	Financial	Physical (%)	Financial	
1	2	3	4	5	6	7
A. Revenue						
1. Honorarium	LS	100%	4.00	100%	0.85	
2. Domestic Travel Expenses (TA & DA)	LS	100%	2.00	100%	0.16	
3. Other Stationary	LS	100%	0.97	100%	0.97	
4. Consultancy Expenditure-1	LS	100%	257.80	100%	228.85	
5. Consultancy Expenditure -2	LS	100%	139.23	100%	130.99	
Sub-total (Revenue):			**404.00**		**361.82**	
B. Capital						
Sub-total (Capital):		**100%**	**0.00**		0.00	
Grand-Total		**100%**	**404.00**	**100%**	**361.82**	

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
Ali Ahsan Nishat Executive Engineer Office of the Chief Engineer, Planning, BWDB, Dhaka. Grade-5: 43,000-69,850	Yes	-	No	30/10/2022	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
Jeep	-	-	-	-	-	
Pick-up	-	-	-	-	-	

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	Tender/Bid/Proposal Cost (in lakh Taka)		Tender/Bid/Proposal		Date of completion of works/services and supply of goods	
/consultancy) as per bid document	As per PFS	Contracted value	Invitation date	Contract signing/ L.C opening date	As per contract	Actual
1	2	3	4	5	6	7
Consultancy Services for "Feasibility Study for Integrated Water Resources Management of Different Upazilas under Brahmanbaria District (Component-1)"	257.80	242.07	07.11.2022	01.01.2023	30.06.2023	30.06.2023
Consultancy Services for "Feasibility Study for Integrated Water Resources Management of Different Upazilas under Brahmanbaria District (Component-2)"	139.23	130.99	07.11.2022	01.01.2023	30.06.2023	30.06.2023

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

Name of the Field	Approved man month		Actual man month utilised	Remarks
	As per PP	As per contract		
1	2	3	4	5
a) **Foreign :**	-	-	-	
b) **Local :**	Component-1: 38 man month Component-2: 27 man month	Component-1: 38 man month Component-2: 27 man month	Component-1: 38 man month Component-2: 27 man month	Component-1 was conducted by IWM and component-2 was conducted by CEGIS.

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 PP				Financial provision & physical target as per latest revised PP			
	Total	Taka	P.A.	Physical %	Total	Taka	P.A.	Physical %
1	2	3	4	5	6	7	8	9
2022-23	404.00	404.00	-	100%	-	-	-	-
Total	**404.00**	**404.00**	-	**100%**	-	-	-	-

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
2022-23	404.00	404.00	-	100%	377.97	361.82	361.82	-	100%
Total	**404.00**	**404.00**	-	**100%**	377.97	361.82	361.82	-	**100%**

C. ACHIEVEMENT OF OBJECTIVES OF THE PROJECT:

	Objectives as per ToR	Actual achievement	Reasons for shortfall, if any
	The main objective of the study is to develop and manage water resources in the area with emphasis on flood management, drainage improvement, erosion protection especially due to wave action and irrigation development. This study also aims to devise a plan for safe harvesting of boro crops, explore the potential of fishery, agriculture, tourism and restore the environment and ecosystem including livelihood improvement of the area. It is envisaged that the feasibility study would be	The present study is performed with due emphasis on the relevant water management issues in Brahmanbaria district e.g., flood, drainage, irrigation, riverbank erosion, homestead erosion due to wave action etc. Required remedial measures have been proposed based on field investigation and analysis supported by field data collection and application of mathematical techniques. Interventions are formulated in such a manner that they cause no adversities on the wider ecosystem. Necessary mitigation measures are formulated to mitigate negative impacts if there is any. It is expected that implementation of the proposed interventions would pave the way to socio-economic development in the area thereby achieving the study objectives. In the scoping process, important social components likely to be impacted were	

	implemented under two different components. Under Component-I, hydro-morphological aspects of the study including identification of the problems and their appropriate remedial measures would be addressed. Under Component-II, other aspects of the study e.g. socio-economic, agricultural, fisheries and environmental aspects would be addressed under this component.	selected along with the important environmental components. Public consultations, an integral part of the EIA process, mainly consider the views and perceptions of local people and communities. Their suggestions were recorded in the chapter on public consultation. At the impact assessment stage, impacts on the important social components were assessed at the pre-construction, construction, and post-construction phases. This was followed by the environmental and social management plan where mitigation, compensation, and enhancement measures are suggested for the important social components.	
Component-1: Hydro-morphology and Mathematical Modelling			
i)	To investigate the problems (Bank Erosion, Flash Flood, Wave Action etc.) for developing and managing the water resources of different Upazilas of Brahmanbaria district considering socio-economic and environmental conditions of the area to cope with the future hydro-morphological conditions.	Completed Water management problems related to bank erosion, Flash flood and Wave action in Brahmanbaria district has been reviewed in detail and appropriate remedial measures are suggested, Section-4.3 of the FR. Proposed remedial measures are formulated with due consideration to socio-economic, environmental and hydro-morphological conditions.	
ii)	To identify the erosion vulnerable areas and take river-bank protection measure for saving government and private establishments;	Completed Erosion vulnerable areas have been identified and necessary protection measures proposed, Section-4.3.5 & 4.3.6 of the FR.	
iii)	To improve navigation facilities and establish connectivity between the rivers, drainage khals and haors;	Completed Navigation and connectivity issues duly addressed Section-4.3.14 & 4.3.15 of the FR.	
iv)	To investigate the feasibility of flood control embankment with slope protection;	Completed Flood and its management are duly addressed, Section-4.3.2 of the FR.	
v)	To assess the need of dredging, dredging alignment& dredging volume and to provide design and dredged material management plan.	Completed Dredging/re-excavation along with dredge material management plan is addressed in Section-4.3.7 & 4.3.12 of the FR.	
vi)	To prepare appropriate alignment of flood control embankment or flood wall and to identify location of	Completed Flood is discussed in Section-4.3.2 of the FR. No flood control embankment is suggested for flood management.	

	water control structures / drainage structures, slope protection of embankment if necessary;		
vii)	Cost estimation, EIRR and other economic analysis;	Completed Details provided in Section-6 of the FR.	
Component-2: Environmental and Social Impact Assessment Study			
i)	To conduct a detailed Environmental and Social Impact Assessment (ESIA) of the proposed interventions.	At first, a comprehensive baseline was developed by the CEGIS multidisciplinary (including Water Resources, Agriculture, Fisheries, Social, and Ecology) team through comprehensive visits to the study area. After getting the proposed interventions list the team estimated the Environmental and Social impacts in consultation with local peoples (including farmers, fishermen, businessmen, etc.) government and non-government offices, local leaders, UP chairman, and members. Detailed ESIA of the proposed interventions are listed in Appendix E, Dredged Material Management Plan.	
ii)	To assess the project with respect to environmental sustainability, climate resilience, and disaster risk and find the ways to reduce/mitigate negative impacts;	The hazard assessment has been carried out to identify the potential hazard in the study area or associated with or inherent in the design/ construction process and to identify possible measures to avoid the hazard along with the safety plan for minimizing the risk. Climate change risk analysis has been carried out following two main activities, e.g., trend analysis of recent climate and future climate projection. Details in the Chapter 10 (Hazard and Risk Assessment).	
iii)	Assessment of viability of tourism development in the project area and prepare a plan for the protection of the natural environment including the creation of eco-tourism spots by integrating forests through sustainable tree plantation;	Haors are one of the main tourist attractions for its natural beauty. The tourism potential of the project area has been assessed based on the physical situation and other development aspects. Details in the Appendix C (Tourism Development Plan).	
iv)	To prepare a land acquisition plan and layout of acquired land along with demarcation on the CS/RS Mouza map.	Initially, there is no plan for land acquisition in this project.	
v)	To prepare the methodology for Land Acquisition and resettlement action plan as per the current ''Land Acquisition and Resettlement Act-2017''	Initially, there is no plan for land acquisition in this project.	
vi)	Identifying, quantifying and evaluating the potential environmental consequences so that the impacts before implementation of the project & impacts of the projects are highlighted. The negative impacts would be addressed in	All environmental and social components are not impacted by the proposed interventions. Some components may be impacted while others are independent of the interventions. Important Environmental and Social Components (IECs) likely to be impacted by the proposed interventions concerning Water Resources, Morphology, Environmental Quality, Land Resources,	

	a way that conserving the society and environment.	Agriculture, Fisheries, Ecological Resources, and socio-economic condition and their rationales have been selected for impact assessment due to the interventions. As part of the environmental impact assessment process, a screening matrix was used tailored specifically to the proposed Project, focusing on the potential environmental impacts during the pre-construction, construction, and post-construction phases. The matrix examined the interaction of project activities with various components of the environment. Details in the Chapter 8 (Impact Prediction and Evaluation).	
vii)	Prepare an Environmental Management Plan (EMP) which should include mitigation measures, enhancement measures, compensation measures and an environmental monitoring plan;	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 a mention of agencies responsible for implementing the monitoring plan. Details in the Chapter 9 (Environmental Management and Monitoring Plan).	

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).
(a) (b)			

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

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

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

F. MONITORING AND AUDITING

Monitoring: Nil.

Name & designation of the inspecting official	Date of Inspection	Identified Problems	Recommendations
1	2	3	4
a) Ministry / Agency:	-	-	-
b) IMED :	-	-	-
c) Others:	-	-	-

0.2. Auditing during and after Implementation:

2.1. Internal Audit: Not conducted yet.

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

2.2. External Audit: Not conducted yet.

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

G. DESCRIPTIVE REPORT

1. General Observations/Remarks of the Project on:

1.1 Background

The Meghna river basin is a Trans boundary river basin with a total drainage area of 82,000 km^2. Almost all the volume of water of Assam and Meghalaya state of India passes through this Meghnariver in Bangladesh and falls into the Bay of Bengal. Passing through the heart of Bangladesh, huge volume of water continuously inundates the Haor areas of the north-eastern part of Bangladesh.

About 110 km of the total length of the western boundary of Brahmanbaria district is situated on the left bank of the Upper Meghna river. About 14.70 km of land is prone to erosion at about 13 places on the sharp bends and convex parts of the Meghna. Moreover, rivers like Titas, Buri, Howrah, etc. are eroding at different places. Sarail, Nasirnagar, Bancharampur and Nabinagar upazilas of Brahmanbaria district are inhabited by haors and beels.

The Nasirnagar upazila of Brahmanbaria district is situated between the Upper Meghna and the haor areas of Bangladesh. This area is governed by the characteristics of the Haors and mostly being submerged in water for 6-7 months. Most importantly, several localities including Suchiura, Dighar, Jethagram, Bhubon, Shampur, Kifatnagar, Norha, Harinber, Haripur, Mohakalpara, Rampur etc of Nasirnagar upazila experiences severe erosion due to wave attack and action. Also the flood causes a great deal of damage to the Boro rice, Aman and Robi crops, submergible embankments and other infrastructure. Due to this long term inundation scenario, communication and transportation of livelihoods and goods are also being hampered.

On 23/06/2021 a review meeting was held in the Ministry of Water Resources regarding the DPP titled "ব্রাহ্মণ বাড়িয়া জেলার নাসিরনগর উপজেলার চৈয়ার কুড়ি বাজার হতে হরিপুর গ্রাম এবং মহাকাল পাড়া হতে রামপুর গ্রাম পর্যন্ত স্লোপ সংরক্ষণ সহ বাঁধ নির্মাণ". In that meeting, decision has been made to determine the feasibility of constructing flood control embankment cum road on a priority basis.

To protect the village from the erosion of Titas river and the impact of the waves of DattakholaHaor in Brahmanbaria Sadar Upazila another DPP has been prepared titled "ব্রাহ্মণবাড়িয়া জেলার সদর উপজেলাধীন মজলিসপুর এলাকায় দত্তখোলা হাওর ও তিতাস নদীর ঢেউয়ের আঘাত হতে স্লোপ সংরক্ষণ সহ বাঁধ নির্মাণ প্রকল্প".

Besides, with an estimated of Taka 516 crore another dpp has been prepared for 17 places of 14.860 km length in Nabinagar Upazila as per the recommendation of the survey committee for preparation of DPP titled "ব্রাহ্মণবাড়িয়া জেলাধীন নবীনগর উপজেলার নবীনগর পৌরসভা ও অন্যান্য এলাকায় নদীভাঙ্গন মোকাবিলা ও উন্নয়ন প্রকল্প".

According to the recommendation of the technical committee for Sarail and Nasirnagar upazilas, another DPP has been prepared titled "ব্রাহ্মণবাড়িয়া জেলার নাসীরনগর উপজেলার চাতলপাড় ও সরাইল উপজেলার পানিশ্বর নামক স্থানে মেঘনা নদীর বামতীর সংরক্ষণ প্রকল্প".

In the light of these DPPs and in the light of the decision of the Project Review Committee meeting BWDB decided to conduct a feasibility study for construction of bank protection works, homestead protection (from wave), river dredging and khal re-excavation etc. at suitable locations in B. BariaSadar, Nasirnagar, Nabinagar, Sarail, Bijoynagar,Bancharampur and Ashuganj Upazilas of Brahmanbaria District.

1.2 Justification/Adequacy

The project is relevant in terms of compliance of the project with the national master plan(s), national development goals, compliance of the project with the missions and visions of the existing government and the relevance of the project with the visions of the executing agencies. Key documents which contextualized and guided the overall design of this project, are:

- **Perspective Plan of Bangladesh 2021-2041.**

This Plan addresses governance, human development (including rural women and youth), industry and trade, agriculture, power and energy, climate change and environment. The Plan presents a path to shift Bangladesh from a rural agrarian economy to a primarily industrial and digital economy.

- **Bangladesh Delta Plan 2100.**

BDP 2100 focuses primarily on the delta agenda through 2050 while reflecting the longer-term challenges of sustainably managing water, ecology, environment, and land resources in the context of natural disaster and climate change risk. The Delta Plan addresses flood control, sea level rise, water logging, river-bank erosion, irrigation, urban and rural water

supply, water pollution, land reclamation, river dredging for inland water traffic, environmental protection, fisheries, and preservation of biodiversity.

- **8th Five Year Plan, FY2021 to FY2025.**

The 8th FY Plan initiates the transition to the goals of the Perspective Plan and is built around six themes: (i) rapid recovery from COVID; (ii) GDP growth acceleration; employment generation, and rapid poverty reduction, (iii) a broad-based strategy of inclusiveness; (iv) a sustainable development pathway that is resilient to disaster and climate change; (v) improvement of critical institutions; and (vi) achieving the United Nations 17 sustainable development goals.

- **National Women Development Policy (2011)**

Which provides clear goals relating women, poverty, water, and agriculture in the context of climate change.

To meet the Sustainable Development Goals, it is essential to protect and restore water related ecosystems such as wetlands, khals and rivers, protect population from water induced disasters e.g. river bank erosion, wave erosion etc.

Linkage with Sustainable Development Goal (SDG)

SDGs' targets	**Integrated Issues (Development Targets) with Government 8FYP**
SDG 13. Take urgent action to combat Climate change and its impacts	i) Protection against Flood for safety of people, crop, and other resources. Conservation of rivers, waterways, wetland etc. ii) River dredging to enhance navigability and to facilitate water transportation and utilization of surface water irrigation;
Achievement of Targets due to implementation of the project	
• Protection of land and resources from damaging impact of river bank erosion. • Protection of people's assets from damaging effect of wave action. • Conserve wetland eco-system and support to agricultural production through water conservation by re-excavation of khals.	

Linkage with Bangladesh Delta Plan (BDP), 2100

- 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 BDP 2100. Particularly, the Project contributes to the following strategies and sub-strategies:

Strategy at National Level

- Strategy FR 1: Protecting Economic Strongholds and Critical Infrastructure.
- Strategy FR 2: Equipping the FMD Schemes for the future.
- Sub-strategy 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 3.7: River management as well as improved flood management, drainage O&M and flow management.

Hotspot Specific Strategies

- Haor and Flash Flood Area hotspot
- Protection of vulnerable communities from water induced disasters e.g. river bank erosion and wave erosion.
- Boosting up agricultural production through irrigation.

1.3 Objectives

The main objective of the study is to develop and manage water resources in the area with emphasis on flood management, drainage improvement, erosion protection especially due to wave action and irrigation development. This study also aims to devise a plan for safe harvesting of boro crops, explore the potential of fishery, agriculture, tourism and restore the environment and ecosystem including livelihood improvement of the area.

It is envisaged that the feasibility study would be implemented under two different components. Under Component-I, hydro-morphological aspects of the study including identification of the problems and their appropriate remedial measures would be addressed. Under Component-II, other aspects of the study e.g. socio-economic, agricultural, fisheries and environmental aspects would be addressed under this component.

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

Component-1: Hydro-morphology and Mathematical Modelling

- To investigate the problems (Bank Erosion, Flash Flood, Wave Action etc) for developing and managing the water resources of different Upazilas of Brahmanbaria district considering socio-economic and environmental conditions of the area to cope with the future hydro-morphological conditions.
- To identify the erosion vulnerable areas and take river bank protection measure for saving government and private establishments;
- To improve navigation facilities and establish connectivity between the rivers, drainage khals and haors;
- To investigate the feasibility of flood control embankment with slope protection;
- To assess the need of dredging, dredging alignment& dredging volume and to provide design and dredged material management plan.
- To prepare appropriate alignment of flood control embankment or flood wall and to identify location of water control structures / drainage structures, slope protection of embankment if necessary;
- Cost estimation, EIRR and other economic analysis;

Component-2: Environmental and Social Impact Assessment Study

The overall objective of the ESIA study is to assess the impacts of the proposed interventions on the environmental and social components and suggest an environmental management plan for sustainable development of the project. The ESIA would ensure to involve beneficiaries in project conceptualization, planning and implementation. The study will assess the biophysical and socio environmental impact with recommendation of appropriate mitigation plan in the project area and to prepare report on ESIA to obtain necessary clearances from the Department of Environment (DoE). The specific objectives of the consultancy service are following:

The specific objectives are:

- To conduct a detailed Environmental and Social Impact Assessment (ESIA) of the proposed interventions.
- To assess the project with respect to environmental sustainability, climate resilience and disaster risk and find the ways for reducing/mitigating negative impacts;
- Assessment of viability of tourism development in the project area and to prepare a plan for protection of natural environment including creation of eco-tourism spots by integrating forests through sustainable tree plantation;
- To prepare a land acquisition plan and lay out of acquired land along with demarcation on the CS/RS Mouza map.
- To prepare the methodology for Land Acquisition and resettlement action plan as per current ''Land Acquisition and resettlement Act-2017''
- Identifying, quantifying and evaluating the potential environmental consequences so that the impacts before implementation of the project & impacts of the projects are highlighted. The negative impacts would be addressed in a way conserving the society and environment.
- Prepare an Environmental Management Plan (EMP) which should include mitigation measures, enhancement measures, compensation measures and an environmental monitoring plan.

1.4 Project revision with reasons: Not Applicable

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

The study area is located at the tail end of the haor region of Bangladesh. Typical hydro-morphological characteristics of the haor region also prevails in the area and governs the agricultural, communication, other socio-economic activities of the locality. To boost up economic activity and help in poverty reduction, development and management of water resources in the area with emphasis on flood management, drainage improvement, erosion protection especially due to wave action and irrigation development is needed.

To address the problems of the area, different DPPs have been submitted to the concern authority but it was decided that before formulation of projects conducting a detailed feasibility study should be performed in a holistic approach so that it can be helpful to reduce suffering of local people form water induced miseries and uplift the socio-economic condition of the area. In the study process location specific aspects are duly considered and local stakeholders are consulted. The identified problems are presently causing damage and suffering to the local people and hindering economic growth in the area. Riverbank erosion is

identified at 14 locations along the left bank of Meghna river and at 18 locations in different internal rivers of Brahmanbaria district. Besides homestead erosion due to wave action is also observed at 13 segments/clusters/villages in the district. The proposed intervention would help curb the identified problems in the area.

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

- **Project Identification**

The gross area of the proposed study is about 950 sq. km which fully or partially covers seven upazilas of Brahmanbaria district. The upazilas are B. BariaSadar, Nasirnagar, Nabinagar, Sarail, Bijoynagar and Ashuganj. About 110 km of the total length of the western boundary of Brahmanbaria district is situated on the left bank of the Upper Meghna river. There are many erosion prone locations on the sharp and convex bends of the Meghna. Moreover, other internal rivers like Titas, Buri, Howrah, etc. are eroding at different locations scattered all over the district. Sarail, Nasirnagar, Bancharampur and Nabinagar upazilas of Brahmanbaria district are inhabited by several haors and beels. The Nasirnagar upazila of Brahmanbaria district is governed by the characteristics of the Haors and mostly remains submerged in water for about 6-7 months. Most importantly, homesteads of several localities including Suchiura, Dighar, Jethagram, Bhubon, Shampur, Kifatnagar, Norha, Harinber, Haripur, Mohakalpara, Rampur etc. of Nasirnagar upazila experiences sever homestead erosion due to wave action generated in the nearby haors and flooded areas. Due to its location in floodplain area, the area remains under water during monsoon months. To address the above-mentioned water management problems, Brahmanbaria Water Development Division prepared and submitted several DPPs to the concerned authority. In light of those DPPs BWDB decided to conduct this comprehensive feasibility study for construction of bank protection works, homestead protection (from wave), khal and beel.

The project planning followed a participatory bottom-up approach with due consideration to the local needs and underlying principles of IWRM. Water management issues and problems have been identified through field visits, discussion with local people and field survey. Remedial measures are devised with due professional judgement with necessary analysis supported by mathematical modelling technology. It is anticipated that the proposed interventions would have no or negligible adverse impact on the wider environment. Necessary EMP has been formulated to mitigate the residual impacts if there is any.

- Project Preparation

In view of the above, BWDB prepared a PFS to execute the feasibility study project.

In view of the above, BWDB prepared a PFS to execute the feasibility study project.

Appraisal: The DPEC meeting was held on 11/04/2022

* **Credit Negotiation-N/A**
* **Credit Agreement-N/A**
* **Credit Effectiveness-N/A**
* **Loan Disbursement-N/A**

* **Loan Conditionalities-N/A**

* **Project Approval:** The project was approved by Honorable State Minister, MoWR on 06/10/2022

* **Others (if any).**

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)

5.1	Project Management	5.12	Project aid disbursement and re-imbursment
5.2	Project Director		
5.3	Land Acquisition	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 clamity	5.19	Approval
5.10	Project financing, allocation and release.	5.20	Others.
5.11	Design formulation/approval		

This is a consultancy service procurement project. No such problems were occurred.

6. Remarks & Recommendations of the Project Director:

The study was approved by the Ministry of Water Resources (MoWR) vide memo number: 42.00.0000.040.014.013.21-305, dated 06/10/2022. The study was completed on 30th June, 2023.

The main objective of the study is to develop and manage water resources in the area with emphasis on flood management, drainage improvement, erosion protection especially due to wave action and irrigation development. This study also aims to devise a plan for safe harvesting of boro crops, explore the potential of fishery, agriculture, tourism and restore the environment and ecosystem including livelihood improvement of the area.

The study has been framed to attain its objectives through two components: Mathematical Modelling Component and ESIA Component. Under Mathematical Modelling Component, detailed hydro-morphological analysis of the concerned area was done through mathematical modelling. Based on the outputs of the mathematical modelling, project interventions have been proposed. Under ESIA Component of the project, detailed environmental and social impact assessment (ESIA) has been completed to analyse the impact of the proposed interventions on the environment and the society of the project area.

The project planning followed a participatory bottom-up approach with due consideration to the local needs and underlying principles of IWRM. Water management issues and problems have been identified through field visit, discussion with local people and field survey. Remedial measures are devised with due analysis supported by mathematical modelling technology. It is anticipated that the proposed interventions would have no or negligible adverse impact on the wider environment. The proposed interventions are: river bank revetment works, Home Stead protection, re-excavation of khal, re-excavation of beel, construction of new drainage structures, rehabilitation of existing BWDB structures etc.

The study proposed a 4-year investment project considering the recommended work quantity for Brahmanbaria O&M Division. Financial and economic analysis of the proposed interventions are performed to assess the economic viability of the project. The project is economically feasible to implement based on financial and economic analysis.

ESIA objectives of the project have been achieved through the IEC selection, Impact-EMP quantification of the proposed bank protection, khal/beel re-excavation, and homestead protection. After that, an Environmental Monitoring Plan has been suggested for the negative impacts of the proposed interventions suggested by the technical study team. This will be possible to bring down the magnitude of the temporary negative impacts like deterioration of air and water quality, noise pollution, construction waste, soil erosion, loss of crop production, vegetation damage, and dispossession/displacement at the pre-construction and construction phases through the implementation of the environmental management plan.

All the objetivess have been achieved though accomplishment of design of proposed interventions, cost estimate and ESIA. It is anticipated that the project output would help in DPP preparation and implementation of the subsequent investment project.

Date: 22/10/2023

Signature and seal of the Project Director

(Ali Ahsan Nishat)
Executive Engineer
Office of Chief Engineer (Civil) Planning
BWDB, Dhaka.

7. Remarks/Comments of Agency Head

Riverbank erosion along the left bank of Meghna river and in other internal rivers and homestead erosion due to wave action in the haor prone areas in Brahmanbaria district are major water management problem in the district. These problems are leading to subsequent loss of infrastructures, existing settlements and fertile agriculture lands. So, the need of erosion management along the left bank of Meghna river and other erosion vulnerable locations which is an urgent need. Furthermore, several khals and beels are also proposed for re-excavation that would help mitigate drainage congestion, store water for irrigation and fishery development. In this context, a detailed feasibility study has been carried out to investigate the hydro-morphological condition of the erosion vulnerable locations, flooding and drainage situation for taking suitable management measures. Based on the outcome of this study project, several projects are being formulated by Brahmanbaria O&M Division. It is expected that implementation of projects based on the study outcomes would improve the