

<b>Main Rivers Studies and Research Programmes</b>	<b>Ref: MR 001</b>
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**Basic Data**NWMP Sub-sector      **Main River Development**Region(s)              **Nationwide****Relevance to NWPo**

NWPo §3(f) states that a key Policy objective is to develop a state of knowledge and capability that will enable the country to design water resources management plans by itself. § 4.2(j) and (k) provide for development of the main rivers for multi-purpose use, which will be the main subject covered by this Programme. Research and information management for such tasks is covered under §4.15.

**Purpose of Programme**

Management of the major rivers potentially requires major investments. The purpose of this Programme is to establish a cost-effective approach to long-term development of the river systems for multi-purpose use. The studies will each contribute to the understanding of individual river development prospects as well as to an overall integrated development plan, set within the context of the international water-sharing issues that Bangladesh has to deal with. Prospects for hydro-power development within Bangladesh will also be considered.

**Programme Outline**

The Programme will include the following seven studies:

- (i) **GDA Feasibility Study of Integrated Development Project:** This study will be in three parts (a) Detailed studies of the **barrage sites, Gorai headworks**, and the three promising **link channels**, including surveys, geotechnical investigations and modelling studies, with due attention given to morphological impacts on river regime, environmental and social impact assessment of construction works, construction methods and phasing, and operational requirements; Detailed studies of the **polder improvement works**, involving extensive hydrodynamic and morphological modelling of the river systems under alternative configurations and development sequences, taking into consideration the impacts of sea-level rise, changes in tidal range and anticipated variations in salinity boundaries, all under different augmentation scenarios. Additional data collection will be required for calibration of models; and (c) **Overall implementation planning and assessment studies**, including detailed arrangements for programme implementation, overall environmental, social and economic impact assessments, institutional and financing aspects, risk assessment and recommended action plan. The studies are expected to take three years from commissioning.

- (ii) **NE & SE Regional Development Options Study for Meghna:** An inter-regional study of potential development of the Meghna river to serve the needs of the NE and SE regions by means of a barrage and/or by river pumping, including consideration of a barrage downstream of the Bhairab Bridge. Water management issues in these regions of relevance to this study include effective management of the haor basins, flood management and drainage congestion, arsenic contamination of aquifers and gassy aquifers, remedial actions for public sector schemes and erosion control. The study will lead to a development of a long-term strategic plan for development and management of the Meghna river system.
- (iii) **NE & SE Feasibility Study of Integrated Development Project:** This study will follow from the strategic study above on the basis of the identified development proposals for the Meghna River.
- (iv) **Brahmaputra Barrage Study:** Brahmaputra Barrage Study will be carried out under this programme. Depending on the outcome of this study, feasibility study and detailed engineering will be carried out for harnessing and development of water of the Brahmaputra to cater the present and future demands of the NW, NC and NE regions. On the basis of the outcome of the this study, implementation works will be taken up (MR 005).
- (v) **Review and update of Master Plan for major river training:** The aim of the study would be to develop a cost-effective and affordable strategy for dealing with erosion in each of the major rivers. It would include a review and update of the existing Brahmaputra River Training Study Master Plan for erosion control in the Brahmaputra, and the commissioning studies for other major rivers. The review would include re-examination of China-Bangladesh Joint Expert Team proposals for canalisation and the results of pilot works on alternative river training techniques. Both structural and non-structural solutions to erosion management would be investigated in the light of past investments and attention would be given to both short and long-term planning perspectives, as they may affect development sequencing.
- (vi) **Hydropower Master Development Plan:** This plan would overview the relatively modest prospects for hydro-power development in Bangladesh and set guidelines for future works. The potential role for hydro-electric power within the context of overall energy development requirements would be reviewed. The possibility of further development of large schemes would be considered in the context of possibly detrimental social and environmental impacts that could arise. Emphasis would be given to examining the prospects for mini- or micro-schemes in the CHT and the potential for encouraging private investment in these.

## Financing Arrangements

Financing would be by GoB, with the potential for donor assistance.

## Objectives and Indicators

Objective	Suff ix	Indicators/Mean of Verification	Due
<ul style="list-style-type: none"> <li>Timely completion of the Programme studies and investigations</li> </ul>	I1	<ul style="list-style-type: none"> <li>Progress of the work based on regular monitoring</li> </ul>	2010
<ul style="list-style-type: none"> <li>A sound basis for strategic decision-making and the planning of future Main River development accepted by the due authorities</li> </ul>	K	<ul style="list-style-type: none"> <li>Strategy reports</li> <li>Formal agreement of the reports</li> </ul>	2011
<ul style="list-style-type: none"> <li>Bangladesh's main and regional rivers comprehensively developed for sustainable multi-purpose use</li> </ul>	D	<ul style="list-style-type: none"> <li>Returns per unit of water</li> <li>River maintenance costs</li> <li>Quality and Quantity of in-stream flows</li> </ul>	2025

## Institutional Arrangements

In accordance with the NWPo, WARPO is responsible for preparation of national and regional development plans, whereas BWDB are to set their own plans within the framework established by WARPO. Thus, primary responsibility for the studies would be as follows:

Study	Responsibility
<ul style="list-style-type: none"> <li>GDA Feasibility Study of Integrated Development Project</li> </ul>	BWDB
<ul style="list-style-type: none"> <li>NE &amp; SE Regional Development Options Study for Meghna</li> </ul>	WARPO
<ul style="list-style-type: none"> <li>NE &amp; SE Feasibility Study of Integrated Development Project</li> </ul>	BWDB
<ul style="list-style-type: none"> <li>Brahmaputra Barrage study</li> </ul>	BWDB
<ul style="list-style-type: none"> <li>Review and update of Master Plan for major river training</li> </ul>	WARPO
<ul style="list-style-type: none"> <li>Hydropower Development Master Plan</li> </ul>	WARPO

The nature of these studies is that each will require extensive consultation with different organisations and stakeholders. It will be incumbent on those responsible to ensure that this is achieved.

## Existing Documentation

There are many previous reports relating to the previous studies conducted on these issues. These include DSR Chapter 6, the FAP 4, FAP5 and FAP6 Regional Study Reports, the FAP1 BRTS 1994 report, the Expert Studies Group reports of 1984 to 1986, and other information held on the National Water Resources Database (NWRD).

## Linkages

The Programme findings would have a direct influence on the need and justification for, and the planning of, the Main River Development interventions covered by Programmes MR 002 to MR 003, MR 005, and MR 007 to MR 012. The studies would draw upon information obtained in Programme EE 008: Water Resources Management Research and Development Studies.

## Risks and Assumptions

The main risk is that inadequacy of timely and detailed data makes it difficult to produce the clear findings and detailed strategy and plans required. A key assumption is that current efforts to engender information exchange between the co-riparian States will bear fruit.

**Main Rivers Studies and Research Programmes**

Ref :

**MR 001**

Cluster :	Main Rivers	Region(s) :	All			
Focus/Foci :	Studies and Research	Location :	Nationwide			
Start Year <sup>1</sup> :	2002	Duration <sup>2</sup> :	10 year(s)	Agency(s) Responsible :	WARPO (Lead)	BWDB (Supporting)
Short Description :	This Programme comprises a series of studies to establish a cost-effective approach to long-term development of the river systems for multi-purpose use. The studies will each contribute to the understanding of individual river development prospects as well as to an overall integrated development plan, set within the context of the international water-sharing issues. Topics covered include a regional development plan for the Meghna and Brahmaputra rivers, master planning of major river training and hydro-power development, Brahmaputra Barrage study, and feasibility studies of development of the Ganges Dependent Area.					

<b>MIS Links</b>	Cost Calculation :	MR Programme costing.xls	Map :	MR 001 Map.jpg
	Disb't Schedule :	MR Programme costing.xls	Description :	MR 001 PgP.doc

Finance					
	Costs		Private	Funding (%)	Expected by
				GoB	Beneficiaries
	ProgrammeYear				
	Total Capital <sup>3</sup>	2,000.00 MTk	0%	100%	0%
	Ultimate Recurring	0.00 MTk/yr	n/a	n/a	n/a
Date of Data :	31	07	01	Stacked Cumulative Cash Flow Chart	
	(dd)	(mm)	(yy)		
Status :	Identified				
Financial Base Year:	mid-2000				
Planned Expenditure (to date) :	0 MTk				
Actual Expenditure <sup>4</sup> (to date) :	0 MTk				

Cost (MTk)

● Investment ○ Recurring — Total

Programme Years	Investment (MTk)	Recurring (MTk)	Total (MTk)
0	150	0	150
5	750	0	750
10	1950	0	1950
50	1950	0	1950

0 500 1000 1500 2000 2500

0 5 10 15 20 25 30 35 40 45 50

Programme Years

**Monitoring**

Objective	Indicator	Present Status <sup>5</sup>
• Timely completion of the Programme studies and investigations	• Progress of the work based on regular monitoring	NYD
• A sound basis for strategic decision-making and the planning of future Main River development accepted by the due authorities	• Strategy reports • Formal agreement of the reports	NYD

Notes : 1. Indicative 2. Until commissioning 3. Inclusive of planning, design supervision 4. For future monitoring purposes and NWMP updates  
5. Present Status keys: NYD- Not yet due, IP- In progress, D- Done

# National Water Management Plan

## Programme Costing Sheet

Programme Ref	<b>MR 001</b>
Title	<b>Main Rivers Studies and Research Programmes</b>

### Assumptions:

Taka/US\$	51.000	TA duration	10.0	years	All prices in mid-2000 values
		Investment duration	10.0	years	

Item	Unit	Quantity	Rate		Amount TkM	O&M %	O&M/yr TkM
			US\$	Tk'000			
<b>Technical Assistance</b>							
<i>Project management assistance to WARPO</i>							
Expatriate consultants (all-in rate)	p-m	40.0	20,000		40.8	0.0%	-
Senior National consultants (all-in rate)	p-m	80.0		150	12.0	0.0%	-
Mid-level National consultants (all-in rate)	p-m	-		90	-	0.0%	-
Sub-totals					52.8		-
Other general TA programme costs		25%			13.2		-
Specific other TA programme costs					34.0	0.0%	-
<b>Total TA Costs</b>					<b>100.0</b>		-
<b>Other Programme Costs</b>							
1. GDA Feasibility Study of Integrated Development Project					900.0	0.0%	-
2. NE & SE Regional Development Options Study for Meghna					100.0	0.0%	-
3. NE & SE Feasibility Study of Integrated Development Project					350.0	0.0%	-
4. Brahmaputra Barrage study					325.0	0.0%	-
5. Review and update of Master Plan for major river training					150.0	0.0%	-
6. Hydropower Master Development Plan					75.0	0.0%	-
7.							
8.					-	0.0%	-
9.					-	0.0%	-
10.					-	0.0%	-
<b>Total Other Programme Costs</b>					<b>1,900.0</b>		-
<b>Overall Programme Costs</b>					<b>2,000.0</b>		-

### Provisional Breakdown of Costs

Item	Expat	Snr Nationa	Mid-Level	Other TA	Other Costs	Total
Rate	20,000	150	90	25%		
Unit	US\$/p-m	'000Tk/p-m	'000Tk/p-m	TkM	TkM	TkM
GDA Feasibility Study of Integrated Development Project	230.0	650.0	1,200.0	110.0	350.0	900.0
NE & SE Regional Development Options Study for Meghna	40.0	120.0	240.0	9.9	50.5	100.0
NE & SE Feasibility Study of Integrated Development Proj	120.0	360.0	733.0	30.0	200.0	350.0
Brahmaputra Barrage study	205.0	435.0	877.0	36.1	145.0	325.0
Review and update of Master Plan for major river training	50.0	150.0	284.0	12.0	90.0	150.0
Hydropower Master Development Plan	25.0	75.0	142.0	6.0	45.0	75.0
						<b>1,900.0</b>