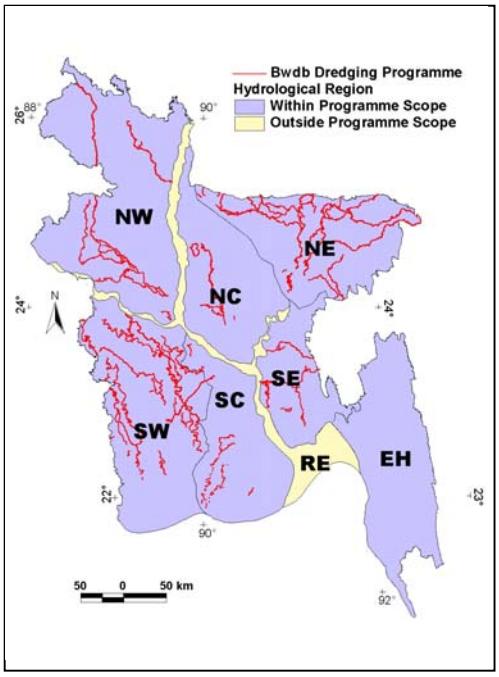
## River Dredging for Navigation Ref: **MR 011**

### Basic Data

NWMP Sub-sector **Main River Development**

Region(s) **National coverage**




### Relevance to NWPo

Article 4.2(l) states that GoB will de-silt watercourses to maintain navigation channels and proper drainage. Article 4.4.6 of the National Shipping Policy – 2000 states that the main part of the inland riverways will be kept navigable. To do this, a Five Year Dredging Plan will be prepared, to be implemented by BIWTA (Bangladesh Inland Water Transport Authority) using both public and private dredging capacity. Some new dredgers will be acquired.

### Purpose of Programme

This Programme MR 011 covers dredging for navigation purposes in the main rivers. It will complement the regional river improvement Programme MR 006. Other elements of dredging for navigation are provided for under MR 006: Regional River Management and Improvement.

Inland water transport (IWT) is an important transport mode, especially during the monsoon season. In 1997 it accounted for 17% of the total national passenger movements of 90 sector billion passenger – km and 28% of the total freight movement of 12 billion tonne – km. The sector comprises modern steel ships, launches, ferries and traditional country boats. There are five main transport corridors, of which the four radiating from Dhaka to Chittagong (EH Region), the NW, Khulna (SW Region) and Sylhet (NE Region) are considered important by BIWTA. Of these, the Dhaka-Khulna route (which continues to Calcutta) is the most important for passengers and freight combined, while that to Chittagong is the most important for freight. IWT is particularly important in the Meghna Basin extending up into NE Region, and in the SW and SC Regions.

Navigable routes (those maintained by BIWTA) total 5,968km in the wet season, but this shrinks to 3600km in the dry season, due to reduced draught. The wet season breakdown by navigation class is as follows:-

| Class and draught | Total km |
|---|---|
| Trunk Route Class I (12 feet) | 683 |
| Transit Route Class II (6 feet) | 1,000 |
| Secondary Route Class III (3 feet) | 1,885 |
| Class IV (less than 3 feet) | 2,400 |
| Total | **5,968** |

Maintenance of this network requires regular dredging, due to the huge sediment load coming into Bangladesh from upstream. Owing to Revenue Budget funding and other constraints, inadequate GoB dredging effort has resulted in a progressive reduction in the total length of navigable waterway. By the late 1980s/early 1990s BIWTA's annual dredging output had fallen from the mid-1980s level of about 3Mm$^3$ to around 2Mm$^3$, although in the late 1990s it recovered to some 2.7Mm$^3$.

Under Bangladesh conditions, especially in the monsoon season, IWT is a cost-effective and convenient form of transport for bulk goods and in those regions such as South Central where a dense network of river channels or other conditions make road transport more difficult. IWT development is an integral part of GoB's transport policy. Such development cannot be sustained without maintaining the IWT route network. Dredging is the principal means of achieving this aim.

However, with the recent completion of the World Bank IWT III Project and the postponement of the proposed World Bank IWT IV Project, little effort is going into capital dredging or other substantial IWT improvements at present, although the need is fully recognised in the National Shipping Policy.

No detailed plan has been prepared so far, although outline proposals (Nov 1999) set out a seven-year national programme involving the dredging of 363Mm$^3$. This would require an average annual output of around 52Mm$^3$, almost six times the existing national dredging capacity of 8.8Mm$^3$ and ten or more times the present annual output. The main rivers proposed for the IWT capital dredging include the Meghna, Padma, Brahmaputra, Kushiyara (NE Region), Titas (SE), Madhumati (SW) Buriganga and Bhairab (NC), Arial Khan and Tetulia (SC) and various others.

**Programme Outline**

This Programme seeks to restore the IWT waterways in a cost-effective manner, with a structured approach recognising both the technical and management issues that have to be overcome. A comprehensive national dredging management plan, covering both capital and maintenance dredging and with adequate Revenue Budget funding for the latter, is clearly essential if the existing IWT commercial route network is to be kept in full operation.

The programme therefore supports the preparation of the management plan and makes provision for both capital dredging of selected major waterways, much of it being deferred maintenance, as well as an adequate level of maintenance dredging thereafter.

Crucial institutional issues need also to be resolved in the management plan, particularly concerning the future role of the private sector and cost recovery from IWT users. Other important factors include the future role of IWT in an integrated national transport network and, in some locations, the disposal of dredge spoil. The plan will need to be well coordinated with BWDB's river development programmes.

**Financing Arrangements**

Both capital and maintenance dredging would be funded by GoB. Private sector participation in dredging is being promoted under the World Bank Private Sector Infrastructure Development Project. Increased cost recovery from IWT users should receive emphasis as part of the overall institutional development of the IWT sector.

## Objectives and Indicators

| Objective | Suffix | Indicators/Means of Verification | Due |
|---|---|---|---|
| • Comprehensive management plan for physical works and institutional measures | I1 | • Physical programmes agreed with BWDB<br>• Report agreed by GoB | 2004 |
| • Achievement of capital and annual maintenance plans | I2 | • Audit reports<br>• Evaluation reports | 2011 |
| • Cost effective maintenance of navigation routes | I3 | • Records of length, draft and duration maintained vs. expenditure | 2011 |
| • Navigation traffic enabled | K | • Surveys and revenues | 2025 |
| • Bangladesh's main and regional rivers comprehensively developed for sustainable multi-purpose use | D | • Returns per unit of water<br>• River maintenance costs<br>• Quality and Quantity of in-stream flows | 2025 |

## Institutional Arrangements

BIWTA would be the executing agency, but with increased private sector participation in dredging operations. Close liaison would be maintained with BWDB, as the manger of the nation's waterways.

## Existing Documentation

NWMP DSR §6.10, BIWTA data and reports, IWT III Project reports, the November 1999 inter-ministerial report on dredging, Dredging Programme Identification Final Report, December 1997, Bangladesh Transport Sector Study, December 1994, the BIWTA Master Plan (1989), the National Water Resources Database (NWRD).

## Linkages

There will be substantial linkages with any of the main river barrage developments which may go ahead (MR 003–005) and other main river interventions, with MR 006: Regional River Management and Improvement and with EE 011: Private Sector Participation (PSP) in Water Management, in this case with increased PSP in dredging operations.

## Risks and Assumptions

The key assumption is that the assumed major increase in GoB's capital and maintenance dredging will be achieved. Re-siltation of the dredged waterways and inadequate maintenance dredging by BIWTA to combat this are the main risks. GoB Revenue Budget constraints may depress maintenance dredging activity.

## River Dredging for Navigation

Ref : **MR 011**

| | | | |
|---|---|---|---|
| Cluster : | **Main Rivers** | Region(s) : | **All** |
| Focus/Foci : | **In-stream Interests** | Location : | **Selected locations on the major rivers** |
| Start Year[1] : | **2002** Duration[2] : **10 year(s)** | Agency(s) Responsible : | **IWTA** **(Lead)**<br>BWDB (Supporting) |
| Short Description : | This Programme seeks to restore the IWT waterways in a cost-effective manner, with a structured approach recognising both the technical and management issues that have to be overcome. A comprehensive national dredging management plan would be prepared covering short to long-term dredging requirements, as well as dredger operations and the role of the private sector. The programme also makes provision for both capital dredging of the major rivers, much of it being deferred maintenance, and maintenance dredging thereafter. Dredging of other waterways is included in MR 006. | | |

## MIS Links

| | | | |
|---|---|---|---|
| Cost Calculation : | MR Programme costing.xls | Map : | MR 011 Map.jpg |
| Disb't Schedule : | MR Programme costing.xls | Description : | MR 011 PgP.doc |

## Finance

| | Costs | | Private | Funding (%) GoB | Beneficiaries | Expected by Programme Year |
|---|---|---|---|---|---|---|
| Total Capital[3] | **1,542.00** | MTk | **0%** | **100%** | **0%** | **10** |
| Ultimate Recurring | **116.70** | MTk/yr | **n/a** | **75%** | **25%** | **11** |

Date of Data : **31** (dd) **07** (mm) **01** (yy)

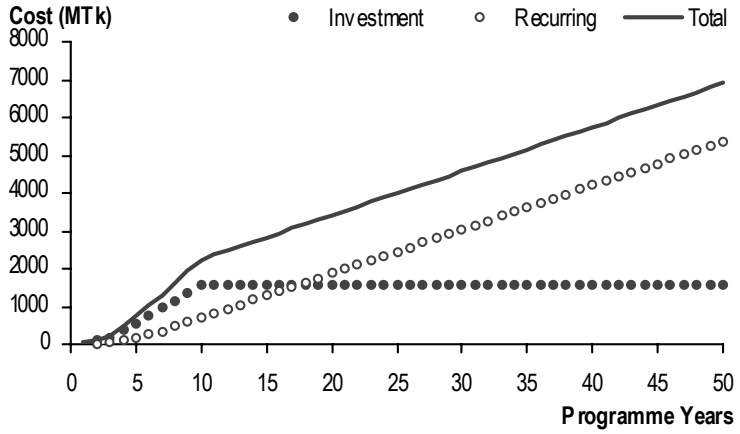
Status : **Identified**

Financial Base Year: **mid-2000**

Planned Expenditure (to date) : **0** MTk

Actual Expenditure[4] (to date) : **0** MTk

**Stacked Cumulative Cash Flow Chart**




## Monitoring

| Objective | Indicator | Present Status[5] |
|---|---|---|
| • Comprehensive management plan for physical works and institutional measures | • Physical programmes agreed with BWDB<br>• Report agreed by GoB | NYD |
| • Achievement of capital and annual maintenance plans | • Audited reports<br>• Evaluation reports | NYD |
| • Cost effective maintenance of navigation routes | • Records of length, draft and duration maintained vs expenditure | NYD |
| • Navigation traffic enabled | • Surveys and revenues | 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 | **MR 011** |
| Title | **River Dredging for Navigation Programme** |

*Assumptions:*

Taka/US$ 51.000 | TA duration 2.0 years | Investment duration 8.0 years | All prices in mid-2000 values

| Item | Unit | Quantity | Rate US$ | Rate Tk'000 | Amount TkM | O&M % | O&M/yr TkM |
|---|---|---|---|---|---|---|---|
| **Technical Assistance** | *Preparation of national dredging plan* | | | | | | |
| Expatriate consultants (all-in rate) | p-m | 24.0 | 20,000 | | 24.5 | | |
| Senior National consultants (all-in rate) | p-m | 48.0 | | 150 | 7.2 | *0.0%* | - |
| Mid-level National consultants (all-in rate) | p-m | 92.0 | | 90 | 8.3 | *0.0%* | - |
| Sub-totals | | | | | 40.0 | | - |
| Other general TA programme costs | | *25%* | | | 10.0 | | - |
| Specific other TA programme costs | | Specialist advice | | | 10.0 | *0.0%* | - |
| **Total TA Costs** | | | | | **60.0** | | **-** |
| **Other Programme Costs** | | | | | | | |
| 1. Preliminary dredging programme in main rivers | | | | | 117.0 | *0.0%* | - |
| 2. Capital dredging in main rivers | | | | | 1,365.0 | *0.0%* | - |
| 3. Maintenance dredging in the main rivers (ultimate value) | | | | | - | *0.0%* | 116.7 |
| 4. | | | | | - | *0.0%* | - |
| 5. | | | | | - | *0.0%* | - |
| 6. | | | | | - | *0.0%* | - |
| 7. | | | | | - | *0.0%* | - |
| 8. | | | | | - | *0.0%* | - |
| 9. | | | | | - | *0.0%* | - |
| 10. | | | | | - | *0.0%* | - |
| **Total Other Programme Costs** | | | | | 1,482.0 | | 116.7 |
| **Overall Programme Costs** | | | | | **1,542.0** | | **116.7** |

Notes:

**Assumed proportions** of the estmates below: 58.3% in major rivers, and 41.7% in regional rivers

| | | | |
|---|---|---|---|
| Main Rivers | 4,627 | km2 | 58.3% |
| Wide regional rivers | 2,846 | km2 | 35.9% |
| Medium regional rivers | 459 | km2 | 5.8% |

| **Dredging volumes and timing** | | | | | TkM | Years Starting | Ending | Total |
|---|---|---|---|---|---|---|---|---|
| Prelim dredging prog, assuming | 2 | Mm3 at Tk | 100 | per m3 | 200 | 2 | 3 | 2 |
| Capital dredging prog, assuming | 23.4 | Mm3 at Tk | 100 | per m3 | 2,340 | 4 | 10 | 7 |
| | | | | | | Start | Full | |
| Maintenance dredging, assuming | 2 | Mm3 at Tk | 100 | per m3 | 200 | 2 | 8 | 7 |

*Reference NWMP estimates based on BIWTA proposals* *Reference DSR Main Report Chapter 6*