

## Annex III. Project Ideas

### Project Idea for Water Sector Technology

#### A.1 Project Title:

Tidal river management including computer simulation of tidal flow

#### A.2 Introduction/Background (Briefly describe the project and how it developed):

Construction of peripheral embankment along the banks of the coastal rivers under Coastal Embankment Project (CEP) has prevented intrusion of silt laden saline water into the poldered area. Moreover, upstream flow of these rivers reduced drastically due to construction and operation of Farakka Barrage. As a result silt coming up with saline water during high tide in dry season being deposited in the river bed starting from the downstream of the sluice gates. This is the identified main reason of drainage congestion/ water logging in the coastal polders. The solution to this problem is the operation of Tidal River Management (TRM) using indigenous method with medium and long term program

#### A.3 Purpose and Objectives of the project

Major objectives are:

- Operationalization of Tidal River Management (TRM) using indigenous method with medium and long- term programme
- Medium and long-term indigenous and modern technology though improved planning, design, construction and gate improvement

#### A.4 Relationship to the country's sustainable development priorities:

Country social development priorities:

- Will provide healthy, economic and agricultural productive environment.
- Will provide early cropping in greater areas

Country economic development priorities:

- Will increase agricultural productivity, which will contribute to the country's goal of attaining food security.
- Will reduce economic loss caused by weather extreme events

Country environmental development priorities

- Will reduce siltation process. Will increase river cross section by bed erosion and will increase tidal prism.
- Will reduce drainage congestion / water logging.
- Will increase ground level of the TRM basin.
- Will provide quick drainage
- Will increase operating efficiency

#### A.5 Project Deliverables e.g. Value/Benefits/Messages:

TRM has the benefits of (i) reducing siltation in the river, increasing drainage capacity and tidal prism, (ii) reducing drainage congestion / water logging within the polder and peripheral rivers, (iii) increasing ground level of the TRM basin, (iv) providing quick drainage and (v) increasing operating efficiency.

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During the 60's and '70s, 123 polders of varying sizes and extending up to 100 km inland were constructed to protect low lying coastal areas against tidal flood and salinity intrusion. These polders, of which forty-nine are sea-facing, provide a first line of defense for millions of people in the coastal belt. All these polders are not functioning the way these were intended due to siltation in the river bed causing water logging with loss of agricultural production. These problems are being addressed by introducing an age-old approach that is practiced in the Netherlands, the Tidal River Management (TRM) to take advantage of the natural tide movement in rivers to address the drainage problems in the polders. During flood tide, the tide is allowed to enter into an embanked low-lying area (tidal basin) where the sediment carried in by flood tide is deposited. During ebb tide, water flows out of the tidal basin with greatly reduced sediment load and eventually erodes the downstream river bed. The natural movement of flood and ebb tide along the tidal basin and along the downstream river maintains a proper drainage capacity in that river.

**A.7 Timelines (What are the timelines e.g. one quarter, one year, multiple years?):**

Multiple Years

**A.8 Budget/Resource requirements (What is the budget? How is the project to be funded? (Staff, Engage consultants, partnership, etc.) :****A.9 Capital Costs:**

- Approx cost = Tk 50.00 lakhs/ polder
- Approx cost model simulation = Tk 25.00 lakhs/ polder
- Approx cost of TRM operation = Tk 1200 lakhs/ TRM basin
- New sluices: TK 100.00 lakhs per vent

**Total: Taka 1375 lakh/ TRM basin; (USD 1718750)**

**Operational and Maintenance Costs:**

- Rehabilitation / repair of sluice gate = Tk 25 lakh /per vent(Approx)
- Approx planning and design cost = Tk 30 Lakhs
- Approx cost for installation of up-graded gates & hoists= Tk 3.0 lakhs/ no

**Total: Taka 58 lakh; (USD 72500)**

**A.9. Measurement/Evaluation (What tangible evaluation of accomplishments are there?):**

Solving of water logging problem in the polder areas.

**A.10 Possible Complications/Challenges (What are the potential challenges and complications?):**

TRM is already being used in a number of polders in Bangladesh. But it has to be improved to respond to some of the issues such as acceptability of TRM by the local communities. The economic, technical and environmental barriers those are identified in the transfer and diffusion of technology related to Tidal river management including Computer simulation of tidal flow includes;

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- Acceptability of the TRM by the local land owners poses to be a major obstacle.
- Further technological improvement for effective sediment deposition in the tidal basin to increase acceptability by the land owners.
- Lack of dealing with the problem with the polders as a whole instead of individually as an alternative to the present problem of water-logging.

**A.11 Responsibilities and Coordination**

- The Ministry of Water Resources
- Ministry of Fisheries and Livestock
- Ministry of Environment and Forests
- Local Government Engineering Department
- Bangladesh Water Development Board (BWDB)
- Water Resource Planning Organisation (WARPO)
- River Research Institute (RRI)
- Bangladesh Haor and Wetland Development Board (BHWDB)
- Institute of Water Modeling for mathematical water modeling (IWM)
- Center for Environmental and Geographic Information Services (CEGIS)