Water Financing Partner Facility
PILOT AND DEMONSTRATION ACTIVITY

Activity Title: Developing and Pilot Testing a Specialists Course on Riverbank Protection in Bangladesh	
Proposer: Bangladesh University of Engineering and Technology (BUET)	
Request Date: 1/09/2009	
Country: Bangladesh	Region: Southeast Asia
Activity Proposed Start date: 1st February 2009	Activity Proposed duration: one year
Cost Estimate: US$ 49,200	

1. Background and Rationale

Bangladesh is the lower riparian country of some of the largest rivers in the world, namely the Ganges, Brahmaputra, and Meghna. The total catchment area of these rivers covers about 1% of the world's land surface but is home of about 10% of the world's population. This environment is characterized by unpredictable dramatic changes, resulting from tectonics along the Himalayan Mountains and annual monsoons. The combination of mountain instability and monsoon formed the large rivers of Bangladesh and is the major driving factor of their instability. Dating back to the "Great Assam Earthquake" in 1950, the river system in Bangladesh is still adjusting to the entrained sediment loads. This caused substantial widening of the major rivers, leading to more than 1000 km² loss of land over the last 30 years along the Brahmaputra alone. The associated riverbank erosion is a major destabilizing factor in Bangladesh, affecting the important flood protection embankments and all other infrastructure in the vicinity of the rivers. The unpredictable and instable environment is characterized by over-proportionate numbers of poor and lack of development opportunities.

Since independence, Bangladesh is struggling to counter large-scale river erosion, at least along the important places on the banks of the major rivers with little success. Until recently, when the development of a new technology, in combination with knowledge base, largely focusing on prediction, a comprehensive planning framework, and flexible implementation achieved successful and cost-effective protection of longer reaches. Based on these findings and the systematic analysis of the performance of past riverbank protection, new guidelines for riverbank protection were established with the support of BUET. The performance analysis of riverbank protection in large rivers plays a major role in the preparation of these guidelines and makes them a unique document.

BUET intends to develop specialized course for the incorporation of key planning, design, and monitoring elements into a specialist course for the future generation of engineers. This activity is expected to achieve a higher level of education, and over time to contribute the unique Bangladesh experience to the countries knowledge base and international knowledge networks.

2. Objective

The main objective is to develop a specialist's course at post-graduate level on Riverbank Protection alongside alluvial rivers, and run a pilot course for testing and refinement before working on the mainstreaming of the course into the school curriculum. Secondary objectives are: developing of short courses for the engineers & scientists working in water sectors and the broadening of the knowledgebase with potentials for incorporation into a regional knowledge hub.

3. Scope and location of Work / Description of Activities

The developed specialists & short courses at post-graduate level of Department of Water Resource Engineering of BUET, Dhaka, Bangladesh will cover the following topics.

(i) river morphology
(ii) river engineering/training techniques;
(iii) riverbank protection experiences;
(iv) planning of riverbank protection
(v) design of riverbank protection: structural, hydraulic, hydrologic & geotechnical
(vi) monitoring and performance evaluation of riverbank protection

Upon completion of the course design, it will be subjected to pilot testing. Refinement, if necessary, will be done after the pilot run.

After completion, a lecture note will be prepared in bound form for short courses for offering from October 2009. A compact version of the course will be prepared for practitioners, specifically focusing on staff of the Bangladesh Water Development Board, an organization tasked with the implementation of riverbank protection works from May 2009. The scope of work will also include the printing of 250 copies of the existing guideline for students attending the course.

4. Implementation Schedule

Preparation of Specialists Courses:

Start	1 February 2009
Development of course materials	until 31 July 2009
Pilot testing	until 31 August 2009
Approval and discussion in BUET	until 30 September 2009
Start teaching	1 November 2009
Review and update	November–December 2009
Completion	January 2010

Short course for practitioners:

Start of preparation of course materials:	1 Ferbuary 2009
Completion of course materials:	30 April 2009
First course for practitioners:	1 June 2009
Training impact and review of course	July/August 2009
Incorporation into annual short course program	September/October 2009

5. Institutional Management Arrangements

The course materials will be developed by BUET under a contract between Bureau of Testing & Consultation (BRTC) of BUET and the funding agency, i.e., ADB. BUET has conducted similar programs/projects earlier with a very good track record of works. BUET is also the centre of excellence in Bangladesh in this respect. The work will be accomplished following the guidelines practiced at BUET.

The main development work will be undertaken by a team of professors (a team leader will be selected from among the BUET professors) with associated outside relevant researchers and practitioners as mentioned below:

(i) River Morphology
   a. Prof. M. Monowar Hossain, DWRE, BUET
   b. Mr. Maminul Huque Sarker, CEGIS

(ii) River Engineering/training techniques;
   a. Prof. MM Hossain
   b. Prof. M. Mirjahan

(iii) Riverbank Protection techniques & experience;
   a. Prof. Prof. M.A. Matin
   b. Mr. Mukhlsuzzaman former DG, BWDB

(iv) Planning of riverbank protection
   a. Prof. M. A. Matin
   b. Chief , Planning, BWDB
   c. Mr. Mokhlesuzzaman, Former, DG, BWDB

(v) Design of riverbank protection: Structural, hydraulic, geotechnical etc
   a. Prof. AMM Safiullah
   b. Prof. M. Monowar Hossain
   c. Prof. Prof. M. Mirjahan
   d. Prof. MA Matin
   e. Prof. Sarwar Jahan Md. Yasin
   f. Mr. Mokhlesuzzaman, Former DG, BWDB
   g. Chief Engineer, Design, BWDB

(vi) Monitoring and performance evaluation of riverbank protection
   a. Mr. Mokhlesuzzaman
   b. Mr. Abdur Rahman Bhuiyan
   c. Dr. Md. Ataur Rahman

6. Proponents qualification

The BRTC of BUET will engage key experts with experience and qualification stated below:

(i) The Team Leader/Morphological Experts should possess a minimum postgraduate degree with at least 20 years of experience in the relevant fields.
(ii) The River Engineering Experts should possess a minimum postgraduate degree with at least 12 years experience in river related studies.
(iii) The River Bank Protection Experts should have a minimum postgraduate degree with at least 12 year experience in the relevant field.
(iv) The Geotechnical Experts should have a minimum of Postgraduate degree with at least 12 years experience in the relevant field.
(v) The Planning Expert should have a minimum of postgraduate degree with at least 12 years experience in the relevant field.
(vi) Monitoring and performance evaluation expert should posses a minimum postgraduate degree in relevant field with 12 years experience.

7. Expected Results:

Outputs: a Specialists courses

	b	short courses for practitioners
Outcomes:	a	improved knowledge & experience of engineers leading to better and more cost effective river management; contribution to regional knowledge about stabilization of large alluvial rivers
	b	improved knowledge & experience of engineers leading to better and more cost effective river management
Impact:	a	reduced cost
	b	faster reaction to river problems
	c	reduced disaster incidence of flood disaster

8. Measurable Performance Indicators:

Submission of course materials for short & specialists' course
Submission of review report at the end of the project

9. Stakeholder Participation:

- Within the narrow focus group retaining of outside expertise, especially practitioners

10. Scopes for Replication / Use in other Countries

- Within Bangladesh at other universities and as example for outside universities working in the same field
- Contribution to regional knowledge network as in-built replication mechanism
- Highly relevant for Asian countries with large alluvial rivers, such as China, India, Myanmar, Vietnam,

11. Costs Estimates

A. Inputs / Expenditure category	**Total Costs (in US$)**
1. **Conferences, workshops, seminar:** One workshop @ US$ 2000 each -$2500 Workshop related Travel & transport etc -$1600	4,100
1. **Specialists Services (University Professors and Practitioners)**: 160 working days for University Professors and Practitioners@ 150 US$ per day	24,000
2. Services such as translator and assistant researchers: 3 research assistants @ $1,000 each - $3,000 1 translator and general support @500 500	3,500
3. Printing and Reproduction Printing of 200 copies each of guidelines and lecture notes	10,000
4. **Organization of specialists course & short courses and evaluation** Specialists course consist of 30 lectures@ $100 per lecture $3000 Practitioners course consists of 12 lectures @$100/lecture $1200	8,200

Two field visits will be conducted for participants & trainers of the courses for which cost estimate @1500/field visit $3000 One evaluator @ $1000 $1000	