FRERMIP
Flood and Riverbank Erosion Risk Management Investment Program

Bangladesh Water Development Board
Asian Development Bank

Flood and Riverbank Erosion Risk Management Investment Program – Project 1

ADB Loan No. 3138-BAN (SF)

Institutional Strengthening and Project Management Consultants (ISPMC)

QUARTERLY PROGRESS REPORT NO. 05

FOR

JULY - SEPTEMBER 2016

Prepared by:

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FRERMIP
Flood and Riverbank Erosion Risk Management Investment Program

Reference:
ISPMC – FRERMIP 255

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24 November 2016

To
Mr. A M Aminul Haque,
Project Director,
Flood and Riverbank Erosion Risk Management Investment Program
152/3/B Bir Uttam, Kazi Nuruzzaman Road, Panthopath,
Firoz Tower, (12th Floor) Dhaka-1205, Bangladesh

Subject : **Re-Submission of Quarterly Progress Report No. 05 July-September 2016**

Reference: **As per Institutional Strengthening and Project Management Consulting Services Contract, Clause 9 (i), Page 35**

Dear Sir,

Please find enclosed Quarterly Progress Report No. 05 for the period July to September 2016 for the Flood and Riverbank Erosion Risk Management Investment Program (FRERMIP) – Project 1. This report has been prepared in close discussion with your office, using information available in the Development Project Performa and considering the Facility Administration Memorandum.

The quarterly progress report documents the status of project and progress made during the reporting quarter. When required, it identifies changes to the key assumptions and possible risks to project implementation. This report was prepared by ISPMC with contributions, assistance and cooperation of the Bangladesh Water Development Board (BWDB).

The report is being re-submitted primarily to add ADB disbursements details to the report. We appreciate the efforts of the BWDB FREMIP Accounts Officer in providing these values.

We look forward to further comments from BWDB, ADB and others on this report.

Yours sincerely,

Sharif Al Kamal
Deputy Team Leader

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As per enclosed Distribution List

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12. Executive Engineer, SMO, BWDB, Manikganj

Development Partners:

13. Country Director, BRM, ADB, Sher-e-Bangla Nagar, Dhaka
    (Attn.: Mr. Zahir Uddin Ahmad, PIO; 2 copies)

15. Embassy of the Kingdom of the Netherlands, Gulshan, Dhaka
    (Attn.: Mr. Pieter de Vries)

ABBREVIATIONS AND ACRONYMS

ADB (BRM)	-	Asian Development Bank (Bangladesh Resident Mission)
ADG	-	Additional Director General
BDT	-	Bangladesh Taka
BWDB	-	Bangladesh Water Development Board
CbFRM	-	Community-based Flood Risk Management
CDMU	-	Community Disaster Management Unit
CEGIS	-	Center for Environmental and Geographic Information Services
DG	-	Director General
DDM	-	Department of Disaster Management
DPP	-	Development Project Performa
EKN	-	Embassy of the Kingdom of the Netherlands
GOB	-	Government of Bangladesh
GON	-	Government of the Netherlands
ha	-	hectare
km	-	Kilometer
JICA	-	Japan International Cooperation Agency
Mil	-	Million (1,000,000)
INGO	-	Implementation Non-Government Organization
ISPMC	-	Institutional Strengthening and Project Management Consultants
MIS	-	Management Information Systems
MoDM	-	Ministry of Disaster Management
MoWR	-	Ministry of Water Resources
O&M	-	Operation and Maintenance
PD	-	Project Director (BWDB and DDM)
PMO	-	Project Management Office (BWDB)
PMU	-	Project Management Unit (DDM)
PPTA	-	Project Preparatory Technical Assistance
QPR	-	Quarterly Progress Report
RNE	-	Royal Netherlands Embassy
SMO	-	Sub-Project Management Office
ToR	-	Terms of Reference
UNDP	-	United Nations Development Programme
USD	-	United States Dollars
WARPO	-	Water Resources Planning Organization

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Table 1 Project Progress at a Glance

1. Basic Data

ADB Loan Agreement Number	3138-BAN(SF)
ADB Grant Agreement Number	0396-BAN(EF)
Project Name	Flood and Riverbank Erosion Risk Management Investment Program - Project 1
Country	Bangladesh
Borrower	People's Republic of Bangladesh
Executing Agency	Bangladesh Water Development Board
Implementing Agency	Department of Disaster Management

2. Financing

Modality and Sources	Projects ($ million)			Amount ($ million)
	I	II	III	
Asian Development Bank (ADB)	65	100	90	255
Government of The Netherlands (GON)	15.3	0	0	15.3
Government of Bangladesh (GOB)	23.3	45.3	34.8	103.4
Total	103.6	145.3	124.8	373.7

3. Milestones

Milestone	Date of		
	Approval	Signing	Effectiveness
ADB Loan Agreement	2014 June 27	2014 August 14	2014 August 15

Milestone	Project		
	I	II	III
Estimated Completion Date	2019 June 30	2021 December 31	2023 June 30

Milestone	Date
Last ADB Review Mission	2016 August 30 - 2016 September 04

4. Assets

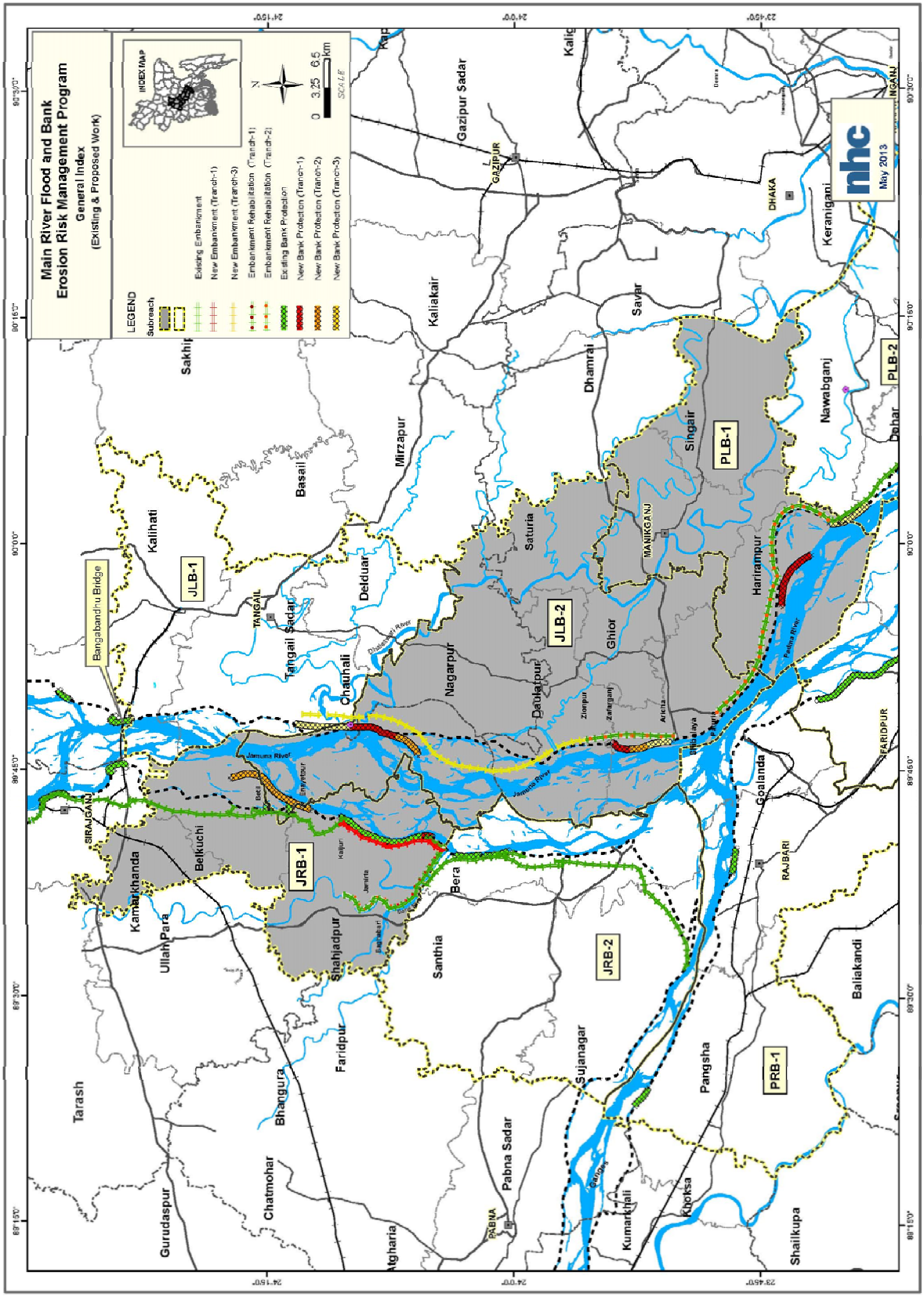
Proposed Project Assets	Goods	Services	Works	eXtra	Total	Available
Project Program Best Estimate (BDT Mil)	1478	1380	3435	1401	7694	8286

Primary Component	Secondary Component		Assigned Weight (%)	Progress Actual (%)	Progress Weighted (%)
1. Establishment & Recruitment	1.1	PMO Establishment and Staffing	2	100	2
	1.2	ISPMC Consultants Recruitment	2	100	2
	1.3	NGO Recruitment	2	50	1
2. Implementation; Tranche-1	2.1	Detailed Design	2	100	2
	2.2	Tender Documents Preparation	6	60	4
	2.3	Tendering and Contract Award	6	55	3
	2.4	Land Acquisition and Resettlement	8	25	2
	2.5	Project Management	6	40	2
	2.6	Physical Completion of Works	32	40	13
	2.7	Financial Disbursements	4	10	0
3. Knowledge Base & Capacity	3.1	Knowledge Base & Tech. Studies	4	35	1
	3.2	CBFRM Activities	6	10	1
	3.3	MIS Project Mgmt Module	4	0	0
4. River Study, Piloting & Master Plan	4.1	Long-term stabilization study	4	55	2
	4.2	Land recovery piloting	2	10	0
5. Preparation; Project-2	5.1	Feasibility Study; Project-2	6	15	1
	5.2	Detailed Design; Project-2	4	0	0
Totals			**100**		**37**

5. Physical and Financial Progress

Financial Indicator	BDT Million	US$ Million	% of Total
Estimate Project Cost (Source: DPP Page 1)	8,286	103.57	100
Physical Progress	2,826	35.33	34
BWDB Expenditures	2,292	28.65	28
ADB Disbursement	2,266	28.94	27
Total Reimbursement	1,238	15.84	15

Figure 1 Project Location Map



INTRODUCTION

1.1 *Background*

The people in Bangladesh are often detrimentally affected by flooding and riverbank erosion along its four main rivers: Jamuna, Ganges, Padma and Meghna. Over 5,000 hectares (ha) of floodplain land is lost annually due to riverbank erosion, affecting over 55,000 people[1]. The risk associated with flooding and riverbank erosion increases with the growth of the population, and the high population density of Bangladesh restricts the scope for moving people away from disaster prone areas. Riverbank erosion increasingly threatens embankments required for flood protection. The threat of flooding and riverbank erosion discourages investment and leads to lower economic growth in riverine areas. Effective riverbank erosion and flood protection management is essential for the economic growth and poverty reduction in affected areas.

Starting in 2004, geotextile bag revetments were used systematically to protect long reaches of the Pabna Project and Meghna-Dhonagoda Irrigation Project (MDIP) against riverbank erosion. Between 2004 and 2011, this protection method was used along 17 km of the lower Jamuna River and some 11 km around the MDIP. Geobag revetments were incorporated into the Guideline for Riverbank Protection approved by BWDB in 2010. Following a feasibility study completed in December 2013, the Government of Bangladesh (GOB) and Asian Development Bank (ADB) agreed to continue riverbank protection for more systematic river stabilization along the lower Jamuna and upper Padma rivers from Bangabandhu (Jamuna) Bridge to Chandpur including reclaiming floodplain land lost during the widening process since the 1960s.

The Project Preparatory Technical Assistance (PPTA) implemented from 2012 to 2013 provides the key concept for FRERMIP and is documented in the Final Report, Feasibility Study, 2013 (Ref. 5). The ADB Facility Administration Memorandum, June 2014 (Ref. 1) is the key document prescribing the loan objectives and procedural details.

The loan for Project 1 of the Flood and Riverbank Erosion Risk Management Investment Program (FRERMIP) was signed on 14 August 2014, and the contract with the main consultant (ISPMC) was signed on 8 September 2015. This first project lays the foundation for systematic river stabilization supported by FRERMIP over three successive projects (tranches) to be implemented over a period of around ten years. The first project, scheduled to be completed in June 2019, will provide structural and non-structural flood and riverbank erosion risk management measures in three high priority subproject areas (**Figure 1**). Subsequent projects will extend the protected reaches with the goal to substantially stabilize the lower Jamuna and parts of the Padma River, based on an adaptive approach with designs adjusted to changing river conditions.

FRERMIP will provide a defined boundary between river and floodplain, and thus contribute to a more secure and improved livelihood for people living along the main rivers of Bangladesh, which will trigger faster economic growth and accelerate poverty reduction. The outcome of the program will be reduced flood and riverbank erosion risks in the subproject reaches.

1.2 *The Project*

The project has three funding partners, two international donors, plus the local counterpart: Asian Development Bank (ADB), Government of Netherlands (GON) and Government of Bangladesh (GOB).

[1] Provided by Dr. M. Sarker based on his River Study Technical Note 2: Holistic River Morphology Analysis for the Brahmaputra River System

The project scope and implementation arrangements have not changed from those outlined in the ADB Report and Recommendation of the President (Ref. 2). The anticipated outputs of the project are still to provide:

1. flood and riverbank erosion risk mitigation functioning at priority river reaches
2. a strengthened institutional system for flood and riverbank erosion risk management
3. an operational program management system

Under Project 1, about 20 km of riverbank protection[2] and 23 km of flood embankments (rehabilitation and new; refer to the Project Map, **Figure 1**) will be implemented.

Project outputs will also include community capacity development for flood risk management activities and sustainable operation and maintenance (O&M) of infrastructure required for flood and erosion risk management. There is also a livelihood enhancement component for project-affected people.

The project will result in an improved knowledge base and enhanced institutional capacity in sustainable asset management, and better strategic management of the main rivers. The project will actively promote a sound and sustainable program management system which will facilitate the implementation process. **Table 1** placed at the beginning of the report, provides a summary of project information including salient reference data, estimates of project assets and physical progress, and a reimbursement summary in Bangladesh Taka (BDT) and US dollars (USD).

Despite some delays in the bidding process for key work contracts, it is still expected that all project outputs for Project-1 can be fully achieved by the scheduled closing date of 30 June 2019.

1.3 *Overall Progress*

The Project-1 has been very successful in building riverbank protection during the dry season 2015/16. In total, 17 km riverbank protection (underwater with temporary wave protection above low water level) was completed by July 2016. At two sites, concrete blocks for permanent wave protection will be required, with one site having already cast around 32% of the total required quantities. The remainder will be completed during the upcoming dry season.

The overall weighted physical project progress is presented in **Table 1** and shows that the progress achieved to the end of the reporting period is around 37%. The progress was computed by identifying major project activities and assigning a weighting factor to each which quantifies the time/effort/resources required to complete the individual tasks. Compared to the total estimated projected cost, physical progress is 34%, BWDB expenditure is 28%, ADB (plus GON) disbursement is 27%, and total reimbursement is 15%.

1.4 *This Report*

Quarterly Progress Report No. 5 covers the period 01 July to 30 September 2016. The report describes activities carried out during the quarter, which primarily included preparation of the draft initial river management master plan.

[2] The length of protection work has increased from 15 to around 20 km due to changes in the river morphology between feasibility study and work start.

2. PROJECT ACTIVITIES

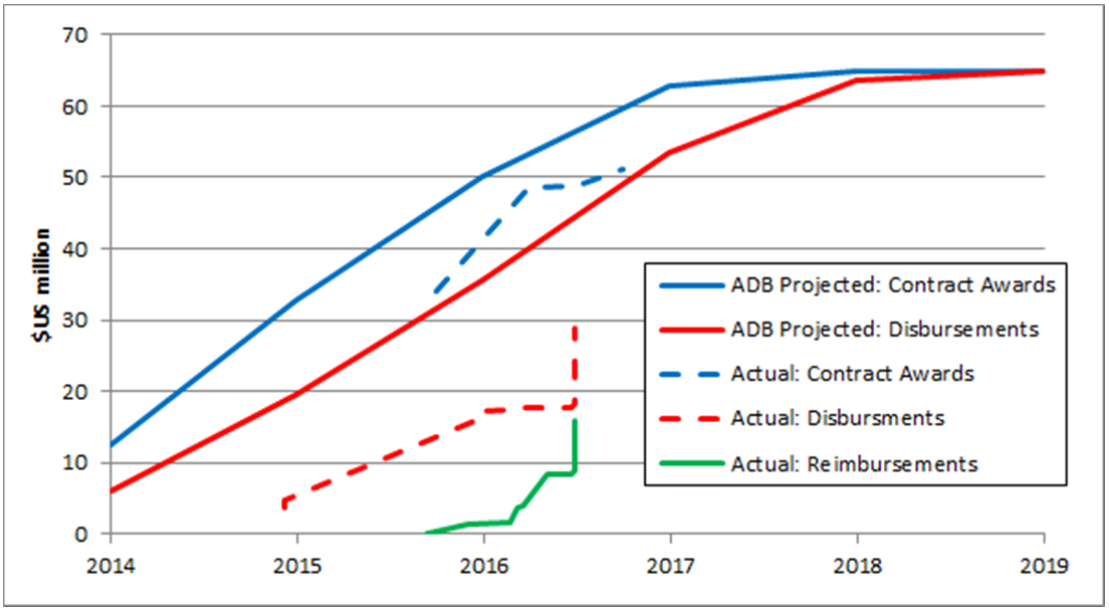
2.1 *INTRODUCTION*

The BWDB FRERMIP Project Management Office (PMO) started functioning in April 2014. Since that time, the office has been engaged in procurement activities associated with all Project-1 goods, services and works, and since November 2015 with construction of works at three sites (through two Sub-project Management Offices (SMOs)). To date, a total of almost 17 km of riverbank protection has been constructed under the project: 6.8 km at Chauhali, 1.2 km at Zaffarganj and 8.7 km at Harirampur. During the reporting period, construction activities were largely dormant due to high water levels and river velocities, persistent rain and poor access conditions. However, it is expected that construction activities will resume by mid-October at the two remaining sites: Chauhali and Zaffarganj. The need for adaptation work of the underwater protection and additional repair work to the temporary wave protection at Harirampur has been assessed based on three bathymetric surveys conducted in July, August, and September.

The Institutional Strengthening and Project Management Consultants (ISPMC) have been working since September 2015 and has completed the following activities: prepared the Project Inception Report, supported overall project management, advised on design and construction issues, and prepared the terms of reference for a number of supporting studies. The ongoing River Study is now in the final stages of preparing a long-term river stabilization plan, a framework for the long-term sector road map, and a preliminary river management master plan. The River Study group plan to complete 39 Technical Notes: 7 complete, 11 nearly complete, 8 with substantial progress, and 13 not yet started. Refer to **Appendix-D** for individual titles and status.

The current status of implementation activities are discussed in the following sections, and detailed and summary tables are provided in **Appendix-A and Appendix-B**, respectively. The status of contractual awards and disbursements as projected by ADB and as actually achieved is shown in **Figure 2,** along with actual total reimbursements.

Figure 2 Contract and Disbursement Implementation



2.2 *PROJECT ASSET IMPLEMENTATION*

2.2.1 Introduction

Tables A-1 and A-2 show the type, number and total cost of assets currently included in the program, by the implementing agency. A total of 23 Km of embankment worth BDT 935 Mil (including associated structures), and around 17 km of riverbank revetment worth BDT 2,067 Mil plus BDT 1182 Mil for geo-bags are included in the current work program. Similar details on an individual contract basis are provided in **Table B-4**. This detailed table also shows that the best estimate of final cost for all project assets currently identified is BDT 7694 Mil (Goods BDT 1478 Mil, Services BDT 1380 Mil and Works BDT 3435 Mil, plus BDT 1401 Mil of additional assets included in the DPP).

Using cross-link tables that connect these category items (and Asset Types) with other financial indicators, it is relatively easy to produce tables which show project progress based on ADB Financial Categories (**Table A-3**) or DPP Components (**Table A-4 and A-5**).

The PMO expects to spend BDT 2600 million during the 2016/17 fiscal year, mostly for work contracts related to the ongoing revetment work at Chauhali and Zaffarganj, and 23 Km of new embankment construction in Koitola.

2.2.2 Design Activities

Feasibility level designs for all civil works in the current Project-1 were prepared during the Project Preparatory Technical Assistance (PPTA) study (Ref. 5) completed in December 2013. This initial design work included the collection of all required data, and an estimate of cost. Detailed designs for all revetment works in Manikganj and Tangail SMOs were subsequently prepared by BWDB Design Circle 1 in August 2014.

During the contract start, the design office updated the design based on the latest dry season surveys. In coordination with technical and steering committee, the location of the works and the length at the three sites was adjusted to reflect the actual morphological situation. The ISPMC supported the process through technical memos indicating issues critical for sustainable design.

The Design Circle-I has completed all designs and drawings required for the 2016/17 construction program including 12.5 km of new embankment, 5 km of road, 10.5 km of embankment re-construction, and 4 appurtenant regulators. Contractor mobilization and first limited work is still expected to start during the first and second quarter of in 2017 to make some use of the dry season. The Koitola Division has prepared the design and bidding documents for 1 Km of new riverbank protection work. It is also planned that 10 Km of riverbank protection maintenance work will be done at Kaijuri, which in places shows degradation of the permanent wave protection. While the upstream half of the existing work is covered by thick deposits, the downstream part is subject to direct flow attack and requires priority attention.

A summary of the design progress for the 2016/17 fiscal year is given in **Table 2** and details for each individual asset are available in **Table B-1**.

Table 2 2016/17 Design Progress Summary

Recipient Executing Agency	Total Packages	Design Data Collected/Submitted			Design under Process	
		Survey	Hydrology	Geotech	Design	Drawings
Koitola SMO	11	11	11	11	11	11
Manikganj SMO	1	1	1	1	1	1
Totals	**12**	**12**	**12**	**12**	**12**	**12**

2.2.3 Bidding Activities

No major contracts have been awarded during this quarter. One tender was floated on 27September for supply of Geobags at Koitola. Since the end of 2015, the ISPMC has assisted the PMO by preparing Terms of References (ToRs) for six of the Supporting Studies (**Section 2.3.1**). An Expression of Interest has been received for one of these studies: Community-based Flood Risk Management. Detailed cost estimates and bidding documents are currently under preparation for the embankments and appurtenant regulators in Koitola, and will be finished during the next quarter.

A summary of tendering progress, by primary component, is given in **Table 3** Bidding progress details, on an individual contract package basis, are given in **Table B-2.** These tables only include new contracts for the 2016/17 fiscal year.

Table 3 2016/17 Tendering Progress Summary

Component	Expression of Interest Received	Tender Floated	Tender Received	Notice of Award Issued
Goods; B: Materials	na	1	0	0
Goods; C: Vehicles & Equipment	na	0	0	0
Services; D: Consulting Services	1	0	0	0
Works; A: Civil Works	na	0	0	0
Totals	**1**	**1**	**0**	**0**

na – not applicable

2.2.4 Implementation Activities

Very little construction progress was made during the reporting quarter at the on-going river revetment works at Chauhali, Zaffarganj and Harirampur, due to high water levels and river velocities, persistent rain, and poor site access conditions. However, completion of the work contracts is expected at Chauhali, Zaffarganj, and Harirampur during the dry season 2016/17. Possible additional work at Harirampur will be assessed as soon as water levels drop allowing an accurate bathymetric survey to be conducted.

It is not expected that construction of the embankment, road and appurtenant regulators will start until early 2017 due to necessary contractual procedures. The completion of the embankment work is expected to take minimum two full dry seasons, which is available before the end of the project in June 2019.

Table 4 shows the implementation progress summary, including all on-going (new for FY 2016/17 and carry-over contracts) and completed contracts. Details on an individual contract basis are available in **Table B-3**.

Table 4 Implementation (Physical) Progress Summary

Component	On-going & Complete Contracts	Best Estimate of Final Cost (BDT Mil)	Value of Cumulative Progress to Date (BDT Mil)	Projected Cumulative Progress to Next Qtr. (BDT Mil)
Goods; B: Materials	4	1,344	1097	1,112
Goods; C: Vehicles & Equip.	12	63	46	46
Services; D: Consult. Service	7	1,253	210	267
Services; G: Program Mngt.	4	3	3	3
Works; A: Civil Works	13	3014	752	1302
Totals	**40**	**5,676**	**2,107**	**2,729**

2.2.5 Environmental Management

Since construction works were either stopped or substantially limited during the rainy season, no Environment Management Plan (EMP) monitoring activities were planned or executed during the reporting period. Monitoring of the EMP will continue starting in December 2016 at ongoing construction works.
The ADB requirement of a semi-annual environment monitoring report for the period of January – June 2016, has already been satisfied by the three Environmental Management Plan (EMP) Compliance Monitoring Reports previously submitted to the Project Director PMO FRERMIP: 28 February, 25 March and 07 June.

2.2.6 Resettlement Services

During the quarterly period July to September 2016, the first phase of river bank protective construction works was completed at 3 sites and the resettlement surveys continued to identify the resettlement impacts on land, trees and structures at Chauhali, Zaffarganj, and Harirampur sites.

After overcoming their initial problem of staffing of key personnel, the work of the resettlement Implementation Non-government Organization (INGO) started in earnest during this quarter. The progress was largely hampered due to high flood in the project sites that delayed the physical measurement. Despite the difficulties some progress has been achieved, and draft Resettlement Plans have been completed in Zaffarganj. The resettlement activities in Harirampur were focused on the collection of the mouzas maps and delineation of the required area.

The Resettlement Plan (RP) prepared during PPTA for Koijuri to Bagabari (23 km) embankment construction needs to be updated. The INGO mobilized a team in Shajadpur to conduct the necessary socio-economic and census surveys as well as Land market price survey.

During the quarter, the regular supervision from ISPMC was limited due to the absence of a National Resettlement Specialist, the replacement of whom has not yet been approved.

Despite the limited staff resources, the ISPMC initiated 3 meetings during the quarter. On 14 July, 24 July and 11 August, meetings were held to review the INGO's progress, and plan future actions to facilitate preparation of RPs and necessary surveys prior to embankment construction work. These meetings were attended by ISPMC representatives, INGO staff, the Chief Resettlement Officer PMO, and SMO Executive Engineers.

Resettlement activities performed during the reporting quarter and projected for the next quarter, for each site, is summarized in **Table 5**. **Appendix-E** provides a list of all pertinent field visits, meetings, and correspondence related to resettlement activities.

Table 5 Progress of Resettlement Activities

Sites	Resettlement Activities	Achievements during past quarter	Projected progress during next quarter
Chauhali	• Riverbank protection resettlement impacts	• Surveys completed • Resettlement Plan submitted to PMO	• Completion & Approval of RP • Compensation Payment
Zaffarganj	• Riverbank protection resettlement impacts	• Survey completed • Resettlement Plan submitted to PMO & ADB	• Revision & Approval of RP • Compensation Payment
Harirampur	• Riverbank protection resettlement impacts	• Collection of maps completed • Surveys started	• Completion of Surveys • Preparation and approval of RP • Compensation Payment
Benotia shifted to Koijuri, Sirajganj	• Riverbank protection resettlement impacts	• Assessed need for protective works	• Completion of Surveys • Preparation of RP
Koijuri to Bagabari Shajadpur, Sirajganj	• Embankment construction resettlement impacts • Resettlement Site Preparation • Relocation of Project Affected Persons	• Started socio-economic, census and land price surveys • Visited proposed resettlement sites	• Complete socio-economic, census and land price surveys • Submit updated RP • Compensation Payment • Finalize relocation sites • Assist resettlement of Project Affected Persons

2.2.7 Livelihood Development

The main objective of the ILRP will be to improve, or at least restore, the income and livelihood of all project affected people.

An INGO will be engaged to implement the Income Livelihood Restoration Plan (ILRP) under the Livelihood Development support study. The initial ToR dated 22 February 2016 was revised and resubmitted to the PMO on 25 May. ADB's approval of the ToR has still not been received.

Gender issues were considered during recent Focus Group Discussions with char people (**Section 2.3.3** under Regional Planning and Social Development).

2.2.8 Community-Based Flood Risk Management (CbFRM)

The ISPMC National CbFRM Specialist has been provided with office accommodation at the Department of Disaster Management (DDM) since mid-June, which will provide improved liaison with DDM personnel, and help to expedite ongoing activities.
It is encouraging that the newly appointed DDM Project Manager has quickly grasped essential aspects of the project and has demonstrated his keen interest in accelerating its implementation.

The contractual procedures for engaging the CbFRM NGO consultant has not progressed during the last five months. An Expression of Interest (EoI) was received on 26 April 2016 and an Evaluation Committee was formed to shortlist the 42 respondents but has not yet met. On 21 September, that committee was cancelled by the Senior Assistant Chief, Ministry of Disaster Management and Relief (Ref. 51.00.0000.241.18.015.15-636), and a new committee is currently being formed. The ADB has asked that a member from PMO or ISPMC be included in this new evaluation committee.

A request from the DDM Project Implementation Unit (PIU) for office equipment procurement has recently been submitted to BWDB PMO. The ISPMC consultant has already prepared a draft bid document for the procurement of the office equipment, which already includes initial changes requested by ADB. The draft bid document awaits its review by the PMO.

2.2.9 Management Information Systems (MIS)

Two draft Terms or Reference (ToR) had been prepared by the MIS Specialist for the two original Supportive Studies included in the DPP: Annual Development Plan (ADP) MIS and Asset MIS. However, thereafter further discussion with BWDB revealed that a very comprehensive and robust Asset MIS has already been developed under the Water Management Improvement Project (WMIP). The WMIP Asset MIS was developed over 7 years at a cost of BDT 10 Million, and was completed in April 2014. Although the MIS does not incorporate the most recent technologic innovations, and does not presently embrace hazard-risk principles, the WMIP Asset MIS does provide a comprehensive base from which to provide Asset MIS services to all BWDB projects.

Given that a suitable Asset MIS already exists, the ISPMC recommends complimenting that existing system by adding a risk-based O&M module which would prioritize all monitoring and O&M activities based on risk reduction. The ADP MIS is not included in the WMIP Asset MIS and could proceed as originally planned.

The FRERMIP database used to monitor project implementation has been updated to include all project expenditures. Previously, only bills submitted for reimbursement were monitored. The interface for entering reimbursements has also been improved to better accommodate reimbursements in both BDT and US$.

A preliminary FRERMIP website has been developed. The website is driven using a simple database which contains information on: events, projects (major construction works), reports, and links. The database tables can also be linked to a set of attachments (report PDF files, and photos). The database will allow quick, standard, and accurate updating of the website contents. The contents of the database (text, photos and reports) still need to be populated before the website can function properly. This will be done during the next quarter with input from the BWDB PMO.

2.3 *OTHER PROJECT ACTIVITIES*

2.3.1 Supporting Studies

As specified in the DPP, there are a total of nine supporting studies (service contracts) funded under FEREMIP to help implement and expedite project outputs. Implementation non-government organizations (INGOs) or consulting firms will eventually be engaged to complete these supporting studies.

Six Terms of Reference (ToR) for these supporting studies have been developed by the ISPMC and submitted to PMO. Two supporting studies have already been awarded: for Resettlement Implementation and Erosion Prediction Services. The status of these studies is summarized in **Table 6.**

The contractual procedures for these service contracts include the development, advertisement, receipt and evaluation of an Expression of Interest (EoI), to obtain a short-list of technically competent INGOs, who then must submit a formal tender document. The tender process is further exacerbated by the need to get ADB concurrence at least 4 times during the contractual procedures: ToR approval, EoI evaluation approval, Tender document approval, and Tender evaluation approval. As a result, these service contracts can take a minimum of one year to complete (refer to **Figure 3**) and therefore it is unlikely, that any of the INGOs for the remaining 7 Support Studies will be selected before the end of the 2016/17 fiscal year.

Figure 3 Resettlement Implementation Support Contractual Procedures

Contractual Activity	Date	Duration (Days)
ADB ToR Concurrence	22-Apr-2015	
Expression of Interest Notice	09-Jun-2015	48
Expression of Interest Receipt	09-Jul-2015	30
Expression of Interest Evaluation	24-Aug-2015	46
ADB Bid Document Concurrence	22-Oct-2015	59
Tender Notice	11-Nov-2015	20
Tender Receipt	10-Dec-2015	29
Tender Evaluation Complete	11-Jan-2016	32
ADB Evaluation Concurrence	04-Mar-2016	53
Approval by Competent Authority	15-Mar-2016	11
Notification of Award	16-Mar-2016	1
		329

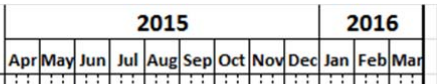


Table 6 Status of Supporting Studies

Pkg.	Study Name	Present Status
S-02	Resettlement Plan Implementation	Resettlement INGO signed contract with BWDB on 16 March 2016 and is working at present.
S-03	Livelihood Development Services	ToR submitted to PMO on 25 May 2016. ADB concurrence under process.
S-04	Community-based Flood Risk Management (CbFRM) Services	EOI received on 26 April 2016, and evaluation under process.
S-05	Participatory O&M Support Services	ToR sent to ADB for concurrence on 06 June 2016.
S-06	Multi-Beam Eco Sounding Survey	ToR under preparation. A demonstration survey planned for next quarter.
S-07	Erosion Prediction Services	CEGIS signed current contract with BWDB on 10 May 2016 and work is in progress.
S-08	ADP MIS	ToR to be completed by mid-October.
S-09	Asset MIS	Asset MIS exists under WMIP. ISPMC recommends complimenting existing MIS by adding a risk-based O&M module.
S-10	Environmental Management Services: Fish Sanctuary Development Bio-diversity and Aquaculture Program	Original ToR prepared in February 2016, and then put on hold. Revised ToR to be included in draft EIA for Tranche-2 in January 2017.

2.3.2 Capacity Building

The current primary activity under the Capacity Building Program is the Training Program. A summary of Training Program progress is shown in **Table 7**. This is followed by a summary description of other activities under the Capacity Building program. Details of the Capacity Building program are provided in **Appendix-F.** Descriptions of the 2016 Europe and China Study Tours completed during the reporting quarter are provided in **Appendix-G** and **Appendix-H**, respectively. A Capacity Development Plan from the start of next quarter until the end of the project in December 2018 is given in **Appendix-I**.

Table 7 Summary of Capacity Building Progress

Types of Trainings	Total[1]	Discussed	Prepared	Approved	Completed
Capacity Building PMO					
A. Local Training	34	6	4	2	2
B.1. Overseas Training	3	2	1	1	1
B.2. Overseas Tours	3	3	1	1	1
Capacity Building ISPMC					
C. Workshops, training and seminars		4	4	4	4
D. Conferences and study tours		1	1	1	1

1. Values specified in DPP

Other Capacity Strengthening activities

- **Establishment of the Office of Chief Engineer River Management (CE-RM)** The Office of the CE-RM and the position of the Chief Engineer were approved by MoWR, and the Ministry of Establishment. The file rests with the MoF. DG BWDB informed that the issue of approval of the needs based set-up with the Secretary of Financed.
- **Assign dedicated Design Circle for design work for main rivers.** This is an internal BWDB organisational decision by the DG BWDB. The DG indicated that decision making will take place once the office of the CE-RM is established.
- **Introduce practice of framework DPP for planning of works on main rivers.** During a meeting DG BWDB agreed that river training and bank protection work need the flexibility that the current DPP process does not offer. This issue will continue to be pursued.

2.3.3 River Study

The River Study is proceeding unabated with the preparation of the long-term river stabilization plan, a framework for preparing long-term sector road map, and the preliminary river management master plan. In addition, the planning of pilot works (structural measures) worth around US$ 5 Mil has been initiated to test approaches and technologies for potential future use along major rivers.

The main focus of FRERMIP is the river stabilization with the preliminary master plan derived from it but with a wider focus on activities that become feasible as a direct result of the river stabilization. A master plan requires details about the main river after river stabilization in order to plan for water uses and other potential economic activities on the adjacent floodplain of the North-Central Zone. The draft initial Master Plan with essential gaps was handed over during the recent ADB Review Mission in June 2016 for their initial review. Work is ongoing to improve the draft. Preparations are also well underway on a draft Strategic (Framework) Plan that will be presented on 11 November during ADB's next Review Mission.

A large number of Technical Notes (39) are currently being prepared, reviewed and finalized. The titles and status of these Technical Notes is available in **Appendix-D**. Most notes are internal working documents and not formal deliverables under the contract. However, it has been agreed to share them with the PMO to document the status of the work. Comments will be invited for formal deliverables.

The main components being considered and studied are discussed below:

River Training

Issues to be studied include:

- the effect of narrowing the river on upstream water levels
- the river corridor and planform; answering the question whether the future river is capable of discharging large design floods
- the impact of river management on the sensitive char environment and char inhabitants
- how to maintain or improve the performance of important tributaries and distributaries

Work in the present reporting period has focused on the description of the morphology of the main river system:

- **General morphological characteristics and their changes over time.** This analysis will form a baseline for subsequent analyses of morphological impacts of interventions
- **Char age analyses.** Results of these analyses will be considered in recommendations for preferred future planforms

- **Dynamics of distributary offtakes.** Jamuna and Padma offtakes are unstable, and the study proves the benefit for offtake flow of more stable offtakes
- **Stability of large bifurcating main channels.** At least one stable bifurcation is an essential element in the future Jamuna planform. The study includes existing examples to understand how to keep such bifurcations stable
- **Potential reduction of low water levels after reducing the width of the active river corridor.** It is important to limit this negative impact, so this study will provide very important input to the decision on the preferred future active corridor width.

Flood Embankments

Flood embankments are currently at risk of being eroded away by the shifting river channels. Once the main river is controlled, new improved embankments can be constructed, which in addition to providing flood protection can also serve as transportation routes especially over newly reclaimed land. However, it is important that gates and fish passes are strategically incorporated into the flood embankments, to prevent the separation of the floodplain environment from the river. Recent research suggests that wide embankments are necessary, especially on unconsolidated, uniform char soils, to guard against seepage failure. Roads may be accommodated on the embankment landside, and social forestry may be accommodated on its landside slope.

The study of flood management has made good progress through the finalization of a Technical Note. Specific flood protection solutions will subsequently need to be tested in mathematical models, before proposed alignments, crest levels and locations of hydraulic structures are finalized at the feasibility level for subsequent projects.

Land Reclamation

Reclaimed land is an important generator of economic benefits of the river stabilization. In particular, land with close connection to land infrastructure and navigation routes, where a river port can be established will be very attractive to industries. The Government of Bangladesh has a strong focus on industrialization and establishment of economic zones of the new reclaimed land. However, there are clear policies of providing khash land for the landless and obligations to provide a means of living for the char people. It also remains important to plan for the preservation of the unique riverine ecosystem, and this valuable source of fish and recreational area.

In the current reporting period, Technical Notes have been prepared, dealing with spatial planning issues to be resolved, with the possibilities of providing faster amelioration of erosion protected char land for agricultural use, and with the impacts that river stabilization would have on fisheries and possible mitigation in the form of stimulated aquaculture.

Water Resource Management

In the previous reporting period, additional hydro-morphological data (water level, discharge and bathymetry) for the Main Rivers and the three major offtakes (Old Brahmaputra, Dhaleswari and the Arial Khan) have been collected. Collection of most recent data (2012 – 2015) for additional offtakes and rivers around Dhaka City circular routes have now been almost completed, with some data still missing. The continued work is proceeding with the somewhat incomplete dataset.

Off takes and Distributaries

Improved performance of offtakes and their distributaries is a major potential benefit of the river training. The Dhaleswari System with its multiple offtakes will be the focus of the study, but also the Old Brahmaputra and Arial Khan will be included to some extent. After main river stabilization, offtake performance can be improved to provide adequate dry season flow and sufficient flood flow capacity. With proper design these offtakes may provide improved navigation, fisheries, and water

quality in the rivers around Dhaka (in particular, augmentation of the Buriganga River flow) while restricting suspended sediment loads that can restrict conveyance capacity.

In the reporting period, mathematical modelling of offtakes as well as studies of offtake dynamics based on satellite images have continued and have been documented.

Cross Border Navigation

The "Protocol on Inland Water Transit and Trade" between Bangladesh and India facilitates bilateral trade and commerce using cross border inland waterways. It has opened up excellent opportunity of trade between the two countries. Each country shall ensure smooth navigation in the major river routes within its geographical jurisdiction and extend necessary navigational facilities. Narayanganj, Khulna, Mongla, and Sirajganj shall be used by Indian vessels as port of calls in Bangladesh; and Kolkata, Haldia, Karimgonj and Pandua by Bangladesh vessels in India. The main river management will ensure these navigational facilities to benefit both the countries.

No further activities were performed on this topic during this reporting period.

Pilot Works

According to ADB's Facility Administration Manual (Ref. 1), the pilot works consists of two components:

(a) land recovery works along the main river using building with nature concept with less costly riverbank protection works, vegetation, and other minor structures. This is largely for stabilizing existing sediment deposited areas (attached chars) from erosions and for stimulating further deposition

(b) pilot-based construction of structures in medium/small rivers, which may include rather major structural works (and may be in combination with vegetation type of softer works) for river training to stabilize riverbanks, leading thalwegs towards the middle of the river to stimulate deeper thalwegs, and may also be for stimulating sediment deposition near river banks.

Smaller rivers where selected to avoid the risk of failure and negative publicity, however provide the problem that any work here is only partly representative for the main rivers due to the largely different river characteristics.

Based on the above guidelines, and consultation with BWDB and the co-financier, two works have been selected: a permeable spur and jute-based grout-filled mattresses. These works are explained below.

Work 1 – Permeable Spur

The design of permeable spurs have been fully developed for the Brahmaputra through major pilot works under FAP21 (1994 - 2001), the only aspect of relevance to be tested was associated with the end sections in the river. A number of possible sites with limited risk were identified along the Old Dhaleswari River, and a flood season survey was conducted to provide design data for one: at Bend No. 3 of the 'Old Dhaleswari River' (8 km upstream of Ghior Bridge).

The following investigations along the 'Old Dhaleswari River', for the reach from Ghior Bridge to the Jamuna River offtake (30 km) have been completed during this quarter:

Survey Data

- A cross-section survey (54 sections) for reaches: 0 to 10 km, and 20 to 24 km
- River bathymetry survey at 200 m spacing (151 sections)

Hydraulic Data

- three water Level gauges were installed, and readings will be recorded for three months
- River discharges were measured at three places, at three distinct water level stages

Geotechnical Data

- Soil boring of 10 boreholes up to 30m depth, and 12 boreholes up to 10 m depth
- Performed all relevant laboratory tests. No tri-axial tests were conducted as no clay was detected in any of the bore-logs.

It is expected that the preliminary design will be reviewed and approved by BWDB design and field officials during the next quarter for subsequent public consultation and implementation. It is understood that the pilot will not contribute to the Project-2 design, due to its limited relevance to the river stabilization strategy and absence of field monitoring data to confirm its performance..

Work 2 – Jute-based Grout-filled Mattress

During the participation in the International Conference on Scour and Erosion in Oxford in September 2016, the Project Director and Director General visited the facility of a grout-filled mattress producer in England, who demonstrated the possibility of using woven jute material instead of the commonly applied geosynthetics. This alternative material not only provides great potential for reducing the cost of permanent wave protection, (typically 55% of the Geobag revetment cost), but also has the potential to develop an innovative technology with world-wide applications using a product widely grown in Bangladesh. The performance of grout-filled mattresses was proven by JMRMEP (1.5 km length of wave protection), which are still performing well after 10-years. The new piloting would specifically look at the development of the jute material as well as optimizing the mattress thickness, drainage characteristics, and modes of construction.

Acknowledging fully the need for minimizing the risk of failure, several secure sites have been considered and preliminarily discussed with PMO. It is tentatively suggested to use jute-based grout-filled mattresses of different designs for the permanent wave protection at Harirampur riverbank revetment, and along the Hurashagar River embankment. To is intended to install a first test section along the Harirampur bend during the dry season 2016/17 to develop the technology for general application. This pilot test will be highly relevant for the overall goal of river stabilization, supporting the local jute industry, and providing the opportunity to incorporate the technology during Project-2.

Regional Planning and Social Development

Regional planning has been incorporated into a number of Technical Notes:

TN 1 Background Data, River Use, Studies and Plans
TN5 Upper Meghna - Present Conditions and Issues
TN 9 Use of Reclaimed Land

TN9 concentrates on the potential uses of land to be stabilised and reclaimed by FRERMIP and allied projects through a study of GoB policy, and an assessment of potential issues and land uses. TN9 then proposes a process for planned development. Further work on this is planned for early 2017.

Much of the land to be stabilised and reclaimed is char land and therefore a programme of focus group discussions with the aim of assessing char dwellers' perceptions regarding developments on their land has been initiated. This social impact assessment (through focus group discussions) aims to ascertain current living conditions and what potentially affected people think about the proposed interventions in regards to their future aspirations.

A total of 10 Focus Group Discussions (FGDs) have been conducted in 7 Chars covering four districts: Dhaka, Manikgonj, Faridpur and Madaripur. Out of 10 Focus Group Discussions: 3 were held with only women; 3 were held with only men, and 4 were held with both women and men. The discussions targeted people who living in the char and whose livelihoods depend on agriculture production on char land.

People living on char land feel vulnerable because of river erosion and flood damage. Many have had to move multiple times. They are enthusiastic about river bank and flood protection, and are also in favour of additional employment opportunities in their char lands.

Environmental Studies
A first draft of the Strategic Environmental and Social Assessment (SESA) was submitted to the PMO for review and external distribution. By the end of the reporting period comments on the SESA were still awaited.

A first draft of a related Technical Note on impacts on Fisheries was finalized and submitted for internal review in August 2016.

2.3.4 Feasibility Study

The feasibility study work will continue during the next quarter making use of the flood season survey to confirm the site selection for proposed riverbank revetment.

In late August, a PowerPoint presentation was given to the Department of Environment (DoE) personnel, and in early September the Scoping Report and ToR for the Environmental and Social Impact Assessment (ESIA) was approved by DoE. Subsequently, the ISPMC Environmental Specialists conducted several field visits in the Harirampur area.

During the next reporting quarter, a draft ESIA report for the Tranche-2 feasibility study will be prepared.

3. ADMINISTRATIVE ARRANGEMENTS

3.1 *Establishment of Project Offices*

The PMO and two ISPMC offices are fully operational. The project management team of the ISPMC and the BWDB PMO Office are both located in the Firoz Tower, 152/3/B Bir Uttam, Kazi Nuruzzaman Road (Green Road), Dhaka-1205. The ISPMC River Study Team is located at the Banani Office: House 45 (2nd Floor) Road 27, Banani, Dhaka.

Appendix-C Table C-1: Utilization of Consultant Person-Months details the time spent by all international and national specialists to the end of the reporting period. A total of 23 international specialists expended 51 person-months (29% of total), and 35 national specialists expended 154 person-months (32% of total), up to the end of the September 2016.

3.2 *Important Events*

An ADB Review Mission was held from 30 August to 04 September. During the mission they following activities were reviewed:

- Ongoing and projected Project 1 physical works
- Other Project 1 activities
- Studies and Preparations for Tranche-2

- Safeguard Requirements
- Project Management

4. FINANCIAL ARRANGEMENTS

4.1 *Statements of Expenditure*

Using the project implementation database, the ISPMC tracks expenditures paid to contractors, suppliers and consultants for project works, goods and services. The database also tracks reimbursement bill applications submitted to ADB. This will help verify figures provided by the PMO.

BWDB expenditures by individual contract are provided in **Table B-5**. Only the total expenditures values are exactly correct. The individual donor values have been calculated using total expenditure values and percent distribution by financial component.

Financial reimbursement on an individual contract basis is shown in **Table B-6.** The table shows the total amount which was claimed for reimbursement from ADB plus the distribution for each funding partner: ADB, GON and GOB. A summary of reimbursement applications for line of credit (L/C), direct payment and imprest amounts is shown in **Table B-7.** This table also shows the total amount claimed and the reimbursement amounts paid by ADB in both BDT and US$. Tables that show details of each individual bill by contract or application are also available, if and when required, to verify these two summary tables.

Table B-8 shows the total ADB (plus GON) disbursement to the project. Total disbursement is the addition of all deposits to the ADB Loan Account and the Grant Imprest Account, plus the ADB & GON portions of all reimbursed Direct Payment and L/C applications.

Reimbursement bill values are also summarized by ADB Financial Category **(Table A-3)** and by DPP Component **(Table A-4 and A-5)**. **Table A-5** indicates that to date, total expenditure is BDT 2292 Mil (28% of projected available funds; BDT 8286 Mil), and that the total value of reimbursed bills is BDT 1238 Mil (15% of available funds).

5. ISSUES FOR DISCUSSION AND AGREEMENT

5.1 *Compliance with Covenants*

The loan covenants are provided in the Loan Agreement, Program Agreement, and Grant Agreement (Ref. 3) and are in general being followed. With respect to Schedule 5, land acquisition and resettlement, the preparation of resettlement and land plans, is on the critical path if the ongoing five riverbank protection work contracts are intended to be completed during the dry season 2016/17.

5.2 *Construction Schedule*

The change of the embankment design from the government approved approach (Aide Memoire 11 February 2013, and DPP) has caused implementation delay. The completion of 23 km of embankment work is expected to start during the first half of 2017, without much progress during the 2016/17 fiscal year. The completion is expected to take a minimum of two full dry seasons, which means the construction work will continue until June 2019. Apart from the design, a related critical element is the handing over of the site, which can only be partially done, as some parts of the land acquisition process are presently incomplete.

6. REFERENCES

1. ADB, 2014: Facility Administration Manual, Bangladesh: Multitranche Financing Facility - Flood and Riverbank Erosion Risk Management Investment Program, 2014 June

2. ADB, 2014: Report and Recommendation of the President to the Board of Directors, Proposed Multitranche Financing Facility People's Republic of Bangladesh: Flood and Riverbank Erosion Risk Management Investment Program, 2014 June

3. ADB, 2014: Loan Agreement, Program Agreement, and Grant Agreement; Flood and Riverbank Erosion Risk Management Investment Program – Project 1, between the People's Republic of Bangladesh and Asian Development Bank, 2014 August 14

4. BWDB, 2014: Development Project Proposal, Flood and Riverbank Erosion Risk Management Investment Program – Tranche 1, 2014 May

5. NHC, 2013: Project Preparatory Technical Assistance 8054 BAN, Main River Flood and Bank Erosion Risk Management Program, Main Report, 2013 December

TABLES

Appendix-A Work Program Summaries

Table A-1 Project Program Summary

Component	Asset Type	Units	Quantity (Units) BWDB	DDM	MAN	KOI	TAN	Totals
A: Civil Works								
A1: Embankment Works	Cons/ReCon: Embank	km	0.0	0.0	0.0	10.5	0.0	**10.5**
	New: Embank	km	0.0	0.0	0.0	12.5	0.0	**12.5**
	New: Infrastr	BDTM	0.0	0.0	5.0	0.0	0.0	**5.0**
	New: Regulator	No	0.0	0.0	0.0	4.0	0.0	**4.0**
	New: Road	km	0.0	0.0	0.0	5.0	0.0	**5.0**
	Repair: Regulator	No	0.0	0.0	0.0	3.0	0.0	**3.0**
A2: Riverbank Prot Works	New: Revetment	km	0.0	0.0	9.0	1.0	7.0	**17.0**
A3: Emerg & Adaptation	Emerg: AdpRivProt	BDTM	54.0	0.0	0.0	0.0	0.0	**54.0**
A4: Pilot Land Recovery	New: RivTrnWrk	BDTM	380.0	0.0	0.0	0.0	0.0	**380.0**
B: Materials								
B1: Geotextile, Civil Works	Procure: GeoBag	Mil	0.0	0.0	3.0	0.0	1.9	**4.9**
B2: Geotextile, Emerg	Procure: AdpGeoBag	Mil	0.0	0.0	0.8	0.0	0.0	**0.8**
C: Vehicles & Equipment								
C1: Vehicles/Transport	Procure: Veh/Trans	No	16.0	0.0	0.0	0.0	0.0	**16.0**
C2: Office Equipment	Procure: Equip	BDTM	13.1	0.0	0.0	0.0	0.0	**13.1**
C3: Survey Equipment	Procure: Equip	BDTM	11.0	0.0	0.0	0.0	0.0	**11.0**
C4: DDM Office Eqpt	Procure: Equip	BDTM	0.0	0.6	0.0	0.0	0.0	**0.6**
D: Consulting Services								
D1: ISPM; Consultant Serv.	Service: Feasi.Stud	BDTM	173.0	0.0	0.0	0.0	0.0	**173.0**
	Service: Instit.Cap	BDTM	387.0	0.0	0.0	0.0	0.0	**387.0**
	Service: Riv.Stabil	BDTM	458.0	0.0	0.0	0.0	0.0	**458.0**
D2: INGO BWDB	Service: Liveli.Sup	BDTM	65.1	0.0	0.0	0.0	0.0	**65.1**
	Service: O&M	BDTM	24.0	0.0	0.0	0.0	0.0	**24.0**
	Service: Resettle.S	BDTM	17.5	0.0	0.0	0.0	0.0	**17.5**
D3: INGO DDM	Service: CBFRM	BDTM	0.0	66.9	0.0	0.0	0.0	**66.9**
D4: Survey & Investigation	Service: EvironMngt	BDTM	59.8	0.0	0.0	0.0	0.0	**59.8**
	Service: Eros.Pred	BDTM	143.5	0.0	0.0	0.0	0.0	**143.5**
E: Capacity Development								
E1: BWDB Training & Study	Service: Training	BDTM	68.4	0.0	0.0	0.0	0.0	**68.4**
E2: DDM Training	Service: Training	BDTM	0.0	1.6	0.0	0.0	0.0	**1.6**
E3: MIS Development	Service: Instit.Cap	BDTM	34.4	0.0	0.0	0.0	0.0	**34.4**
F: Land Acqn & Resettle								
F1: Land Compensation	Compensate: Land.Acqu	BDTM	884.8	0.0	0.0	0.0	0.0	**884.8**
F2: Resettle Benefits	Compensate: Resettle.B	BDTM	29.7	0.0	0.0	0.0	0.0	**29.7**
G: Program Management								
G1: Staff Salaries BWDB	Service: Prog.Mngt	BDTM	83.7	0.0	0.0	0.0	0.0	**83.7**
G2: Office Opns BWDB	Service: Prog.Mngt	BDTM	49.6	0.0	0.0	0.0	0.0	**49.6**
G3: Office Opns DDM	Service: Prog.Mngt	BDTM	0.0	12.1	0.0	0.0	0.0	**12.1**
G4: BWDB River Surveys	Service: Riv.Surv	BDTM	8.1	0.0	0.0	0.0	0.0	**8.1**
	Service: LandSurvey	BDTM	0.2	0.0	0.0	0.0	0.0	**0.2**
X: Misc. Costs								
X1: Misc. Costs	Compensate: CD&SD	BDTM	72.3	0.0	0.0	0.0	0.0	**72.3**
	Compensate: Interest	BDTM	199.2	0.0	0.0	0.0	0.0	**199.2**

The unit BDTM refers to an estimated tost cost of Bangladesh Taka 1 Million.

Table A-2 Project Cost Summary

Cost (BDT Mil)

Component	Asset	BWDB	DDM	MAN	KOI	TAN	Totals
A: Civil Works							
A1: Embankment Works	Cons/ReCon: Embank	0	0	0	220	0	**220**
	New: Embank	0	0	0	371	0	**371**
	New: Infrastr	0	0	5	0	0	**5**
	New: Regulator	0	0	0	135	0	**135**
	New: Road	0	0	0	198	0	**198**
	Repair: Regulator	0	0	0	6	0	**6**
A2: Riverbank Prot Works	New: Revetment	0	0	1,054	181	832	**2,067**
A3: Emerg & Adaptation	Emerg: AdpRivProt	54	0	0	0	0	**54**
A4: Pilot Land Recovery	New: RivTrnWrk	380	0	0	0	0	**380**
							3,435
B: Materials							
B1: Geotextile, Civil Works	Procure: GeoBag	0	0	818	0	365	**1,182**
B2: Geotextile, Emerg	Procure: AdpGeoBag	0	0	233	0	0	**233**
							1,415
C: Vehicles & Equipment							
C1: Vehicles/Transport	Procure: Veh/Trans	45	0	0	0	0	**45**
C2: Office Equipment	Procure: Equip	9	0	0	0	0	**9**
C3: Survey Equipment	Procure: Equip	9	0	0	0	0	**9**
C4: DDM Office Eqpt	Procure: Equip	0	1	0	0	0	**1**
							63
D: Consulting Services							
D1: ISPM; Consultant Serv.	Service: Feasi.Stud	173	0	0	0	0	**173**
	Service: Instit.Cap	387	0	0	0	0	**387**
	Service: Riv.Stabil	458	0	0	0	0	**458**
D2: INGO BWDB	Service: Liveli.Sup	65	0	0	0	0	**65**
	Service: O&M	24	0	0	0	0	**24**
	Service: Resettle.S	16	0	0	0	0	**16**
D3: INGO DDM	Service: CBFRM	0	67	0	0	0	**67**
D4: Survey & Investigation	Service: EvironMngt	60	0	0	0	0	**60**
	Service: Eros.Pred	87	0	0	0	0	**87**
							1,337
E: Capacity Development							
E1: BWDB Training & Study	Service: Training	68	0	0	0	0	**68**
E2: DDM Training	Service: Training	0	2	0	0	0	**2**
E3: MIS Development	Service: Instit.Cap	34	0	0	0	0	**34**
							104
F: Land Acqn & Resettle							
F1: Land Compensation	Compensate: Land.Acqu	885	0	0	0	0	**885**
F2: Resettle Benefits	Compensate: Resettle.B	30	0	0	0	0	**30**
							914
G: Program Management							
G1: Staff Salaries BWDB	Service: Prog.Mngt	84	0	0	0	0	**84**
G2: Office Opns BWDB	Service: Prog.Mngt	50	0	0	0	0	**50**
G3: Office Opns DDM	Service: Prog.Mngt	0	12	0	0	0	**12**
G4: BWDB River Surveys	Service: Riv.Surv	8	0	0	0	0	**8**
	Service: LandSurvey	0	0	0	0	0	**0**
							154
X: Misc. Costs							
X1: Misc. Costs	Compensate: CD&SD	72	0	0	0	0	**72**
	Compensate: Interest	199	0	0	0	0	**199**
							272
Grand Totals		**3,197**	**81**	**2,109**	**1,110**	**1,197**	**7,694**

Table A-3 ADB Categories with Bill Amounts by Donor

all Values in BDT Mil

Code	Categories	Total Cost Est.	Value of Physical Progress	Reimbursed Bill Amount			
				ADB	GON	GOB	Total
Component							
1	Works	3,435	752	431.2	0.0	42.6	**473.8**
2	Materials	1,415	1,097	636.2	0.0	0.0	**636.2**
3A	Vehicles - BWDB	45	35				
3B	Equipment - BWDB	18	11	2.1	0.0	0.1	**2.2**
3C	Equipment -DDM	1	0				
4	Resettlement	30	0				
5	Training	104	15	8.1	0.0	0.5	**8.6**
6A	Consulting Services - Project Management - BWDB	1,018	195	14.4	81.8	14.4	**110.5**
6B	Consulting Services - NGO Services - BWDB	252	15	4.0	0.0	0.6	**4.6**
6C	Consulting Services - Project Management - DDM	67	0				
7A	Project Management - BWDB	58	24	2.1	0.0	0.3	**2.4**
7B	Project Management - DDM	12	0				
8	Interest	199	10				
9	Unallocated	1,041	673				
Totals		***7,694***	***2,826***	***1,098.0***	***81.8***	***58.5***	***1,238.4***
Grand Total		**7,694**	**2,826**	**1,098.0**	**81.8**	**58.5**	**1,238.4**

Table A-4 DPP Categories with Bill Amounts by Donor

all Values in BDT Mil

Code	Categories	Total Cost Est.	Value of Physical Progress	Reimbursed Bill Amount			
				ADB	GON	GOB	Total
Revenue Component							
4826	Interest & Service Charge for Netherland Grant	199	10				
4840	Capacity Development Program	104	15	8.1	0.0	0.5	**8.6**
4849	Resettlement Support Program	30	0				
4874	ISPMC; Implementation Consultant Services	387	77	5.5	31.1	5.5	**42.0**
4874	ISPMC; River Stabilization and Land Recovery Study	458	92	6.5	36.8	6.5	**49.7**
4874	ISPMC; Feasibility of Tranch-2/3 Project	173	26	2.4	13.9	2.4	**18.8**
4874	Resettlement Implementation Support	16	2				
4874	Livelihood Support Program	65	0				
4874	Environmental Management Program	60	0				
4874	Community-based Flood Management Program (DDM)	67	0				
4874	Particiatory Regular O&M Training Support	24	0				
4886	Land/River Survey and Data Processing	8	2	0.4	0.0	0.1	**0.5**
4886	Survey and Investigation Data Processing	87	12	4.0	0.0	0.6	**4.6**
4700	PMO Salaries and Allowances	84	36				
4800	PMO Operational Expenses	50	21	1.7	0.0	0.2	**1.9**
4899	PMU DDM Oprational Expenses	12	0				
Revenue Totals		***1,824***	***294***	***28.5***	***81.8***	***15.8***	***126.1***
Capital Component							
6807	Transport Vehicles (Jeep 5, Motorcyle 10 and Speed Boat 1)	45	35				
6819	Computer and Office Equipment BWDB	9	4	2.1	0.0	0.1	**2.2**
6819	Computer and Office Equipment DDM	1	0				
6851	Survey Equipment	9	7				
6901	Land Acquisition (136 ha)	885	637				
7016	Construction of Inspection Bangalow at Manikganj	5	0				
7041	Regulator (new 4 and repair 3) in JRB1	140	0				
7081	Embankment (23 km) along RB Jamuna and LB Baria-Hurasagar, with Road (5 km)	789	0				
7081	Protective Works at RB Jamuna at Kaijuri, LB Jamuna at Chaulhali, Jafforganj & Harirampur (15 km)	3,249	1,849	1,067.4	0.0	42.6	**1,110.0**
7081	Land Recovery/River Training Works	380	0				
7081	Adaptive Protection and Emergency	287	0				
7091	CD and SD	72	0				
Capital Totals		***5,870***	***2,532***	***1,069.5***	***0.0***	***42.8***	***1,112.2***
Grand Total		**7,694**	**2,826**	**1,098.0**	**81.8**	**58.5**	**1,238.4**

Table A-5 DPP Categories with Budget, Progress, Expenses and Bills

all Values in BDT Mil

Code	Categories	Total Cost		Total to Date		
		Budget	Revised Est.	Progress	Expenses	Bills
Revenue						
4826	Interest & Service Charge for Netherland Grant	199.2	199.2	10.0	10.0	
4840	Capacity Development Program	104.4	104.5	15.1	14.7	8.6
4849	Resettlement Support Program	29.7	29.7	0.0		
4874	ISPMC; Implementation Consultant Services	406.4	386.9	77.4	57.9	42.0
4874	ISPMC; River Stabilization and Land Recovery Study	484.0	458.2	91.6	68.6	49.7
4874	ISPMC; Feasibility of Tranch-2/3 Project	178.1	173.1	26.0	25.9	18.8
4874	Resettlement Implementation Support	17.5	16.2	2.4	1.6	
4874	Livelihood Support Program	65.1	65.1	0.0		
4874	Environmental Management Program	59.8	59.8	0.0		
4874	Community-based Flood Management Program (DDM)	66.9	66.8	0.0		
4874	Particiatory Regular O&M Training Support	24.0	24.0	0.0		
4886	Land/River Survey and Data Processing	8.0	8.3	2.5	2.5	0.5
4886	Survey and Investigation Data Processing	86.7	86.7	12.2	11.5	4.6
4700	PMO Salaries and Allowances	83.7	83.7	36.0		
4800	PMO Operational Expenses	49.6	49.6	21.3	5.8	1.9
4899	PMU DDM Oprational Expenses	12.1	12.1	0.0	0.0	
		1,875.1	***1,823.8***	***294.4***	***198.6***	***126.1***
Capital						
6807	Transport Vehicles (Jeep 5, Motorcyle 10 and Speed Boat 1)	64.1	44.9	34.5	34.9	
6819	Computer and Office Equipment BWDB	8.9	8.6	4.4	4.4	2.2
6819	Computer and Office Equipment DDM	0.6	0.6	0.0		
6851	Survey Equipment	8.9	8.9	6.7	6.7	
6901	Land Acquisition (136 ha)	884.8	884.8	637.0	636.5	
7016	Construction of Inspection Bangalow at Manikganj	5.0	5.0	0.0		
7041	Regulator (new 4 and repair 3) in JRB1	140.6	140.5	0.0		
7081	Embankment (23 km) along RB Jamuna and LB Baria-Hurasagar, with Road (5 km)	788.8	789.2	0.0		
7081	Protective Works at RB Jamuna at Kaijuri, LB Jamuna at Chaulhali, Jafforganj & Harirampur (15 km)	3,266.0	3,249.2	1,849.1	1,411.0	1,110.0
7081	Land Recovery/River Training Works	379.8	379.8	0.0		
7081	Adaptive Protection and Emergency	279.1	286.6	0.0		
7091	CD and SD	72.3	72.3	0.0		
		5,899.0	***5,870.3***	***2,531.8***	***2,093.6***	***1,112.2***
Totals		**7,774.0**	**7,694.1**	**2,826.2**	**2,292.1**	**1,238.4**

Appendix-B Work Program Details

Table B-1 Design Progress Details

Description	Total	Design Data Collection			Prog (%)		Remarks
		Surv	Hydraul	Geotech	Desn	Dwg	
Component A: Civil Works							
Koitola SMO							
Cons/ReCon: Embank: 4.8 km: Embankment Reconst. (4.8 km): Baghabari - Verakhola; km 12.5-17.3		c	c	na	100	100	Dwgs Complete
Cons/ReCon: Embank: 5.7 km: Embankment Reconst. (5.7 km): Baghabari - Verakhola; km 17.3-23		c	c	na	100	100	Dwgs Complete
New: Embank: 5 km: Embankment (5 km): Kaijuri - Bhatpara; km 0-5		c	c	na	100	100	Dwgs Complete
New: Embank: 3.5 km: Embankment (3.5 km): Bhatpata - Gala; km 5-8.5		c	c	na	100	100	Dwgs Complete
New: Embank: 4 km: Embankment (4 km): Gala - Verakhola; km 8.5-12.5		c	c	c	100	100	Dwgs Complete
New: Regulator: 1 No: Kaijuri Reg 2V 1.5x1.8m		c	c	c	100	100	Dwgs Complete
New: Regulator: 1 No: Rohindakandi Reg 2V 1.5x1.8m		c	c	c	100	100	Dwgs Complete
New: Regulator: 1 No: Verakhola Reg 2V 1.5x1.8m		c	c	c	100	100	Dwgs Complete
New: Regulator: 1 No: Andhar Manik Reg 4V 1.5x1.8m		c	c	c	100	100	Dwgs Complete
New: Road: 5 km: Road (5 km): Kaijuri - Bhatpara; km 0-5		c	c	na	100	100	Dwgs Complete
New: Revetment: 1 km: Revetment (1 km): Koijhuri/Verkola		c	c	na	100	100	Desn. & Dwg. Complete
Koitola SMO Totals	***11***	***11***	***11***	***11***	***11***	***11***	
Manikganj SMO							
New: Infrastr: 5 BDTM: Construction of Inspection Bungalow		c	na	na	100	100	Dwgs Complete
Manikganj SMO Totals	***1***	***1***	***1***	***1***	***1***	***1***	
Component Totals	***12***	**12**	**12**	**12**	**12**	**12**	

Legend:
n - not commenced c - completed
p - partially completed na - not applicable/required

Table B-2 Tender Progress Details

Package Code	Description	Dates												
		ISPMC ToR	ADB ToR	EoI Notice	EoI Received	BWDB EoI Eval	ADB EoI Eval.	ADB Bid Doc.	Tender Notice	Tender Received	Eval. Comp.	ADB Concur.	Appr.Compl. Authority	Notif. Award
Goods; B: Materials														
G-04.1	Supply of Geobags; Chauhali & Harirampur							13Sep16	27Sep16	14Nov16				
Component Totals		***0***	***0***	***0***	***0***	***0***	***0***	***1***	***1***	***0***	***0***	***0***	***0***	***0***
Goods; C: Vehicles & Equipment														
G-06.4	2017 Supply of Boat;													
G-06.5	2017 Supply of Motorcycles;													
G-07.3	2017 Office Equipment; BWDB PMO													
G-08.2	2017 Supply of Survey Equipments;													
G-09	2017 Supply of Office Equip; DDM;													
Component Totals		***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
Services; D: Consulting Services														
S-03	Livelihood Development;	25May16												
S-04	Community Based Flood Risk Mngmt;	30Sep15	01Mar16	28Mar16	26Apr16									
S-07.3	2017 Data Processing;													
Component Totals		***2***	***1***	***1***	***1***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
Works; A: Civil Works														
W-01	Embankment, Road & 2 Reg.; km 0-5													
W-02	Embankment; km 5-8.5													
W-03	Embankment; 8.5-12.5													
W-04	Embankment & 1 Regulator; km 12.5-17.3													
W-05.1	Embankment & 1 Regulator; km 17.3-23													
W-11	Revetment; Koijhuri/Verkola													
W-13	Emergency/Adaptive 2; Koijhuri-Benotia Revetment													
W-16	Construction of Inspection Bungalow;													
Component Totals		***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
Project Totals		**2**	**1**	**1**	**1**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**

Abbreviations:

ADB - Asian Development Bank
BDT - Bangladesh Taka
Comp. - Completion
Concur. - Concurrence
Doc. - Document
Eval. - Evaluation
EoI - Expression of Interest
Notif. - Notification
ToR - Terms of Reference

Table B-3 Implementation Progress Details, by Contract

Contract Code	Description	Contractor	Best Estimate of Final Cost (BDT Mil)	Value of Cumulate Progress during Qtr%	30-Sep-2016 Current Qtr (%)	30-Sep-2016 Current Qtr (BDT Mil)	31-Dec-2016 Next Qtr (%)	31-Dec-2016 Next Qtr (BDT Mil)	Remarks
Goods									
B: Materials									
G-01	Supply of Geobags: Chouhali, Sirajganj	BJ Geo-Textile	365.0	0	100	365.0	100	365.0	Implemenation Complete
G-02	Supply of Geobags: Zaforganj, Harirampur, Manikganj	BJ Geo-Textile	472.6	0	97	458.5	100	472.6	Implementation Started
G-03	Supply of Geobags: Harirampur, Manikganj	DFL-DCTL(JV)	274.0	0	100	274.0	100	274.0	Implemenation Complete
G-04.1	Supply of Geobags: Chauhali & Harirampur		232.6	0	0	0.0	0	0.0	Tender Floated
Component Totals			***1,344.2***			***1,097.4***		***1,111.6***	
C: Vehicles & Equipment									
G-05	2016 Supply of Jeep:	Pacific Motors Ltd.	5.5	0	100	5.5	100	5.5	Implemenation Complete
G-06.1	2015 Supply of Jeeps:		20.8	100	100	20.8	100	20.8	Implemenation Complete
G-06.2	2016 Supply of Jeep:	Progoti Industries	6.9	90	100	6.9	100	6.9	Implemenation Complete
G-06.3	2016 Supply of Motorcycles:	Atlas Bangladesh Ltd.	1.3	95	100	1.3	100	1.3	Implemenation Complete
G-06.4	2017 Supply of Boat:		6.9	0	0	0.0	0	0.0	Contract Not Yet Started
G-06.5	2017 Supply of Motorcycles:		3.5	0	0	0.0	0	0.0	Contract Not Yet Started
G-07.1	2015 Office Equipment: BWDB PMO	Logitech Computer Ltd.	2.2	0	100	2.2	100	2.2	Implemenation Complete
G-07.2	2016 Office Equipment: BWDB PMO	Source & Service	2.2	0	100	2.2	100	2.2	Implemenation Complete
G-07.3	2017 Office Equipment: BWDB PMO		4.2	0	0	0.0	0	0.0	Contract Not Yet Started
G-08.1	2016 Supply of Survey Equipments:	Logitech Computers Ltd.	6.7	0	100	6.7	100	6.7	Implemenation Complete
G-08.2	2017 Supply of Survey Equipments:		2.2	0	0	0.0	0	0.0	Contract Not Yet Started
G-09	2017 Supply of Office Equip; DDM:		0.6	0	0	0.0	0	0.0	Contract Not Yet Started
Component Totals			***63.0***			***45.6***		***45.6***	
Goods Totals			***1,407.2***			***1,143.1***		***1,157.2***	
Services									
D: Consulting Services									
S-01	ISPMC; Tranche 1:	NHC (JV) Mott MacDonald	1,018.2	4	19	195.0	24	245.9	Satisfactory Progress
S-02	Resettlement Implementation Support:	VRDS-HCL-JV	16.2	10	15	2.4	25	4.1	Satisfactory Progress
S-03	Livelihood Development:		65.1	0	0	0.0	0	0.0	Contract Not Yet Started
S-04	Community Based Flood Risk Mngmt:		66.8	0	0	0.0	0	0.0	EoI Received
S-07.1	2015 Erosion & Morphological Chg:	CEGIS	4.6	0	100	4.6	100	4.6	Implemenation Complete
S-07.2	2016 Erosion Prediction:	CEGIS	25.3	30	30	7.6	50	12.6	Implementation Started
S-07.3	2017 Data Processing:		56.8	0	0	0.0	0	0.0	Contract Not Yet Started
Component Totals			***1,253.0***			***209.6***		***267.2***	
G: Program Management									
S-06.1	River Survey Work: left bank Padma & Jamuna	M/S Hasib Enterprise	0.1	0	100	0.1	100	0.1	Implemenation Complete
S-06.2	Survey Work for Land Acquisition: Hat-Pachi to Dombaria	Md. Salim Ektiar	0.2	0	100	0.2	100	0.2	Implemenation Complete
S-06.3	Land/River Survey Work: Jamuna at Chouhali 7km	M/S Biplob Enterprise	0.1	0	100	0.1	100	0.1	Implemenation Complete
S-06.4	2017 Bathymetric River Survey: Dhaka, Pabna and Mymenshingh	RAC Office	2.0	100	100	2.0	100	2.0	Implemenation Complete
Component Totals			***2.5***			***2.5***		***2.5***	
Services Totals			***1,255.5***			***212.1***		***269.7***	
Works									
A: Civil Works									
W-01	Embankment, Road & 2 Reg.: km 0-5		414.0	0	0	0.0	0	0.0	Dwgs Complete
W-02	Embankment: km 5-8.5		105.5	0	0	0.0	0	0.0	Dwgs Complete
W-03	Embankment: 8.5-12.5		119.8	0	0	0.0	0	0.0	Dwgs Complete
W-04	Embankment & 1 Regulator: km 12.5-17.3		144.6	0	0	0.0	0	0.0	Dwgs Complete
W-05.1	Embankment & 1 Regulator: km 17.3-23		139.7	0	0	0.0	0	0.0	Dwgs Complete
W-06	Revetment: Jamuna at Chauhali, R1; km 0-2.5	I-J (JV)	386.9	1	24	92.9	60	232.2	Satisfactory Progress
W-07	Revetment: Jamuna at Chauhali, R2; km 2.5-7.0	I-J (JV)	445.2	1	24	106.8	70	311.6	Satisfactory Progress
W-08	Revetment: Jamuna at Zaffarganj, km 6.1-8.1	WEL-NZK-PTSL (JV)	557.8	1	10	55.8	47	262.2	Satisfactory Progress
W-09	Revetment: Padma at Harirampur, R1; km 0-3.5	M.M.Builders & Engineers Lt	271.3	1	100	271.3	100	271.3	Construction Complete
W-10	Revetment: Padma at Harirampur, R2; km 3.5-7	M.M.Builders & Engineers Lt	224.9	1	100	224.9	100	224.9	Construction Complete
W-11	Revetment: Koijhuri/Verkola		180.6	0	0	0.0	0	0.0	ADB Bid Doc. Concurrenc
W-13	Emergency/Adaptive 2: Koijhuri-Benotia Revetment		18.4	0	0	0.0	0	0.0	Design Not Yet Started
W-16	Construction of Inspection Bungalow:		5.0	0	0	0.0	0	0.0	Dwgs Complete
Component Totals			***3,013.7***			***751.6***		***1,302.1***	
Works Totals			***3,013.7***			***751.6***		***1,302.1***	
ProjectTotals			**5,676.4**			**2,106.8**		**2,729.0**	

Filter: (FY <= '16/17')

Table B-4 Project Program by Contract

Code	Description	Cost (BDT Mil)
Goods		
Component B1: Materials Geotextile, Civil Works		
G-01	Geobags 1.25x1.00m; Chouhali, Sirajganj	364.97
G-02	Geobags 1.25x1.00m; Zaforganj & Harirampur, Manikganj	472.64
G-03	Geobags 1.25x1.00m; Harirampur, Manikganj	274.01
G-04.2	Supply of Geobags; Koitola;	70.85
		1,182.47
Component B2: Materials Geotextile, Emerg		
G-04.1	Supply of Geobags; Chauhali & Harirampur	232.60
Component C1: Vehicles & Equipment Vehicles/Transport		
G-05	2016 Supply of Jeep;	5.49
G-06.1	2015 Supply of Jeeps;	20.78
G-06.2	2016 Supply of Jeep;	6.93
G-06.3	2016 Supply of Motorcycles;	1.31
G-06.4	2017 Supply of Boat;	6.92
G-06.5	2017 Supply of Motorcycles;	3.46
		44.89
Component C2: Vehicles & Equipment Office Equipment		
G-07.1	Supply of Office Equip.; BWDB PMO	2.20
G-07.2	2016 Office Equipment; BWDB PMO	2.18
G-07.3	2017 Office Equipment; BWDB PMO	4.25
		8.62
Component C3: Vehicles & Equipment Survey Equipment		
G-08.1	Supply of Survey Equipments;	6.75
G-08.2	Supply of Survey Equipments;	2.15
		8.90
Component C4: Vehicles & Equipment DDM Office Eqpt		
G-09	Supply of Computers & Photocopiers;	0.58
Goods Total		**1,478.06**
Services		
Component D1: Consulting Services ISPM; Consultant Serv.		
S-01	Implementation Consultant Services; Feasibility Study Tranche-2; River Stabilization & Land Recovery;	1,018.19
Component D2: Consulting Services INGO BWDB		
S-02	Resettlement Plan;	16.20
S-03	Livelihood Development;	65.13
S-05	Community Based O&M Training;	24.00
		105.33
Component D3: Consulting Services INGO DDM		
S-04	Cb Flood Risk Mngmt;	66.78
Component D4: Consulting Services Survey & Investigation		
S-07.1	2015 Erosion & Morphological Chg; Jamuna, Ganges, Padma R	4.60
S-07.2	2016 Erosion Prediction;	25.25
S-07.3	2017 Data Processing;	56.83
S-10	Environmental Management Services;	59.78
		146.46
Component E3: Capacity Development MIS Development		
S-08	MIS Development, Support 1;	12.88
S-09	MIS Development, Support 2;	21.52
		34.40
Component G4: Program Management BWDB River Surveys		
S-06.1	River Survey Work; Padma LB & Jamuna LB	0.15
S-06.2	Survey Work for Land Acquisition; Hat-Pachi to Dombaria	0.20
S-06.3	Land/River Survey Work; Jamuna at Chouhali 7km	0.15
S-06.4	Bathymetric River Survey; Dhaka, Pabna and Mymenshingh	1.99
S-06.5	2018 Bathymetric River Survey;	5.86

Table B-4 Project Program by Contract

Code	Description	Cost (BDT Mil)
Services		
Component G4: Program Management BWDB River Surveys		
		8.35
Services Total		**1,379.51**
Works		
Component A1: Civil Works Embankment Works		
W-01	Embankment (5 km); Kaijuri - Bhatpara; km 0-5 Road (5 km); Kaijuri - Bhatpara; km 0-5 Kaijuri Reg 2V 1.5x1.8m; Rohindakandi Reg 2V 1.5x1.8m;	414.03
W-02	Embankment (3.5 km); Bhatpata - Gala; km 5-8.5	105.52
W-03	Embankment (4 km); Gala - Verakhola; km 8.5-12.5	119.82
W-04	Embankment Reconst. (4.8 km); Baghabari - Verakhola; km 12.5-17.3 Verakhola Reg 2V 1.5x1.8m;	144.61
W-05.1	Embankment Reconst. (5.7 km); Baghabari - Verakhola; km 17.3-23 Andhar Manik Reg 4V 1.5x1.8m;	139.70
W-05.2	Regulator Repair (3 Nos.); Bherakhola, Andermanik & Lochna	5.75
W-16	Construction of Inspection Bungalow;	5.00
		934.43
Component A2: Civil Works Riverbank Prot Works		
W-06	Revetment (2 km); Chauhali; km 0- 2.5	386.94
W-07	Revetment (4.5 km); Chauhali; km 2.5-7.0	445.15
W-08	Revetment (2 km); Zaffarganj; km 6.1-8.1	557.84
W-09	Revetment (3.5 km); Harirampur; km 0-3.5	271.28
W-10	Revetment (3.5 km); Harirampur; km 3.5-7	224.88
W-11	Revetment (1 km); Koijhuri/Verkola	180.62
		2,066.71
Component A3: Civil Works Emerg & Adaptation		
W-12	Emergency/Adaptive 1; Riverbank Protection	17.82
W-13	Koijhuri-Benotia Revetment; Riverbank Protection	18.36
W-14	Emergency/Adaptive 3; Riverbank Protection	17.82
		54.00
Component A4: Civil Works Pilot Land Recovery		
W-15	River Training Pilot Work; & Land Recovery	379.80
Works Total		**3,434.94**
eXtra		
Component E1: Capacity Development BWDB Training & Study		
X-05	BWDB Training and Study Tours;	68.45
Component E2: Capacity Development DDM Training		
X-06	DDM Training;	1.60
Component F1: Land Acqn & Resettle Land Compensation		
X-07	Land Compensation;	884.79
Component F2: Land Acqn & Resettle Resettle Benefits		
X-08	Resettlement Benefits;	29.70
Component G1: Program Management Staff Salaries BWDB		
X-02	BWDB Staff Salaries;	83.67
Component G2: Program Management Office Opns BWDB		
X-03	BWDB Office Operations;	49.60
Component G3: Program Management Office Opns DDM		
X-04	DDM Office Operations;	12.07
Component X1: Misc. Costs Misc. Costs		
X-01	ADB Interest & Service Charge;	199.20
X-09	CD and SD;	72.33
		271.53
eXtra Total		**1,401.41**
Project Total		***7,693.91***

Table B-5 BWDB Expenditure Summary by Contract

all Values in BDT

Code	Description	ADB	GON	GOB	Total
Goods					
B1 Geotextile, Civil Works					
G-01	Supply of Geobags; Chouhali, Sirajganj	225,127,351	0	0	225,127,351
G-02	Supply of Geobags; Zaforganj, Harirampur, Manikganj	291,544,165	0	0	291,544,165
G-03	Supply of Geobags; Harirampur, Manikganj	212,048,484	0	0	212,048,484
Component Total		***728,720,000***	***0***	***0***	***728,720,000***
C1 Vehicles/Transport					
G-05	2016 Supply of Jeep;	1,940,400	0	4,989,600	6,930,000
G-06.1	2015 Supply of Jeeps;	5,940,900	0	15,276,600	21,217,500
G-06.2	2016 Supply of Jeep;	1,537,200	0	3,952,800	5,490,000
G-06.3	2016 Supply of Motorcycles;	366,940	0	943,560	1,310,500
Component Total		***9,785,440***	***0***	***25,162,560***	***34,948,000***
C2 Office Equipment					
G-07.1	2015 Office Equipment; BWDB PMO	2,087,749	0	109,882	2,197,630
G-07.2	2016 Office Equipment; BWDB PMO	2,066,333	0	108,754	2,175,087
Component Total		***4,154,081***	***0***	***218,636***	***4,372,717***
C3 Survey Equipment					
G-08.1	2016 Supply of Survey Equipments;	6,409,650	0	337,350	6,747,000
Component Total		***6,409,650***	***0***	***337,350***	***6,747,000***
Goods Total		***749,069,171***	***0***	***25,718,546***	***774,787,717***
Services					
D1 ISPM; Consultant Serv.					
S-01	ISPMC; Tranche 1;	19,811,498	112,773,141	19,811,498	152,396,137
Component Total		***19,811,498***	***112,773,141***	***19,811,498***	***152,396,137***
D2 INGO BWDB					
S-02	Resettlement Implementation Support;	1,409,400	0	210,600	1,620,000
Component Total		***1,409,400***	***0***	***210,600***	***1,620,000***
D4 Survey & Investigation					
S-07.1	2015 Erosion & Morphological Chg;	4,002,000	0	598,000	4,600,000
S-07.2	2016 Erosion Prediction;	6,016,050	0	898,950	6,915,000
Component Total		***10,018,050***	***0***	***1,496,950***	***11,515,000***
G4 BWDB River Surveys					
S-06.1	River Survey Work; left bank Padma & Jamuna	122,778	0	16,742	139,520
S-06.2	Survey Work for Land Acquisition; Hat-Pachi to Dombaria	170,702	0	23,278	193,980
S-06.3	Land/River Survey Work; Jamuna at Chouhali 7km	128,040	0	17,460	145,500
S-06.4	2017 Bathymetric River Survey; Dhaka, Pabna and Mymenshingh	1,753,294	0	239,086	1,992,380
Component Total		***2,174,814***	***0***	***296,566***	***2,471,380***
Services Total		***33,413,762***	***112,773,141***	***21,815,613***	***168,002,517***
Works					
A2 Riverbank Prot Works					
W-06	Revetment; Jamuna at Chauhali, R1; km 0-2.5	107,820,969	0	10,663,612	118,484,581
W-07	Revetment; Jamuna at Chauhali, R2; km 2.5-7.0	150,089,907	0	14,844,057	164,933,964
W-08	Revetment; Jamuna at Zaffarganj, km 6.1-8.1	50,763,313	0	5,020,547	55,783,860
W-09	Revetment; Padma at Harirampur, R1; km 0-3.5	132,483,167	0	13,102,731	145,585,898
W-10	Revetment; Padma at Harirampur, R2; km 3.5-7	179,724,100	0	17,774,911	197,499,011
Component Total		***620,881,456***	***0***	***61,405,858***	***682,287,314***
Works Total		***620,881,456***	***0***	***61,405,858***	***682,287,314***
eXtra					

Table B-5 BWDB Expenditure Summary by Contract

all Values in BDT

Code	Description	ADB	GON	GOB	Total
E1	***BWDB Training & Study***				
X-05	BWDB Training and Study Tours;	13,820,185	0	882,139	14,702,324
Component Total		***13,820,185***	***0***	***882,139***	***14,702,324***
F1	***Land Compensation***				
X-07	Land Compensation;	0	0	636,499,000	636,499,000
Component Total		***0***	***0***	***636,499,000***	***636,499,000***
G2	***Office Opns BWDB***				
X-03	BWDB Office Operations;	5,146,597	0	701,809	5,848,406
Component Total		***5,146,597***	***0***	***701,809***	***5,848,406***
G3	***Office Opns DDM***				
X-04	DDM Office Operations;	506	0	69	575
Component Total		***506***	***0***	***69***	***575***
X1	***Misc. Costs***				
X-01	ADB Interest & Service Charge;	10,000,000	0	0	10,000,000
Component Total		***10,000,000***	***0***	***0***	***10,000,000***
eXtra Total		***28,967,288***	***0***	***638,083,017***	***667,050,305***
Project Total		**1,432,331,677**	**112,773,141**	**747,023,035**	**2,292,127,853**

The donor values are calculated using Total Expenditure and percent distribution by Financial Component.

Table B-6 Rebisbursement Summary by Contract

Code	Description	Total Amount (BDT	ADB (BDT)	GON (BDT)	GOB (BDT)
Goods					
B1	***Geotextile, Civil Works***				
G-01	Supply of Geobags; Chouhali, Sirajganj	224,418,868	224,418,868	0	0
G-02	Supply of Geobags; Zaforganj, Harirampur, Manikganj	290,627,707	290,627,707	0	0
G-03	Supply of Geobags; Harirampur, Manikganj	121,162,390	121,162,390	0	0
		636,208,965	***636,208,965***	***0***	***0***
C2	***Office Equipment***				
G-07.1	2015 Office Equipment; BWDB PMO	2,197,630	2,087,749	0	109,882
		2,197,630	***2,087,749***	***0***	***109,882***
Goods Total		***638,406,595***	***638,296,713***	***0***	***109,882***
Services					
D1	***ISPM; Consultant Serv.***				
S-01	ISPMC; Tranche 1;	110,537,444	14,369,868	81,797,709	14,369,868
		110,537,444	***14,369,868***	***81,797,709***	***14,369,868***
D4	***Survey & Investigation***				
S-07.1	2015 Erosion & Morphological Chg;	4,600,000	4,002,000	0	598,000
		4,600,000	***4,002,000***	***0***	***598,000***
G4	***BWDB River Surveys***				
S-06.1	River Survey Work; left bank Padma & Jamuna	141,500	124,520	0	16,980
S-06.2	Survey Work for Land Acquisition; Hat-Pachi to Dombaria	200,000	176,000	0	24,000
S-06.3	Land/River Survey Work; Jamuna at Chouhali 7km	149,860	131,877	0	17,983
		491,360	***432,397***	***0***	***58,963***
Services Total		***115,628,804***	***18,804,265***	***81,797,709***	***15,026,831***
Works					
A2	***Riverbank Prot Works***				
W-06	Revetment; Jamuna at Chauhali, R1; km 0-2.5	108,172,481	98,436,958	0	9,735,523
W-07	Revetment; Jamuna at Chauhali, R2; km 2.5-7.0	136,802,834	124,490,579	0	12,312,255
W-08	Revetment; Jamuna at Zaffarganj, km 6.1-8.1	55,783,860	50,763,313	0	5,020,547
W-09	Revetment; Padma at Harirampur, R1; km 0-3.5	27,127,898	24,686,387	0	2,441,511
W-10	Revetment; Padma at Harirampur, R2; km 3.5-7	145,953,531	132,817,713	0	13,135,818
		473,840,604	***431,194,950***	***0***	***42,645,654***
Works Total		***473,840,604***	***431,194,950***	***0***	***42,645,654***
eXtra					
E1	***BWDB Training & Study***				
X-05	BWDB Training and Study Tours;	8,591,416	8,075,931	0	515,485
		8,591,416	***8,075,931***	***0***	***515,485***
G2	***Office Opns BWDB***				
X-03	BWDB Office Operations;	1,886,868	1,660,444	0	226,424
		1,886,868	***1,660,444***	***0***	***226,424***
eXtra Total		***10,478,284***	***9,736,375***	***0***	***741,909***
Project Total		**1,238,354,287**	**1,098,032,302**	**81,797,709**	**58,524,276**

Table B-7 Reimbursement Summary by Application

Acct. Type	Applic. No.	Date	Page	Cat	Rate of US Dollar	Total Amount (BDT)	Total Amount (US$)	Reimburs (%)	ADB Amount (BDT)	ADB Amount (US$)
L/C	**001**	**30-Jun-2016**	**01**	**2**	77.80	514,159,476	6,608,734	100	514,159,476	6,608,734
Imprest	**006**	**14-Sep-2015**	**01**	**7A**	77.80	596,191	7,663	88	524,648	6,744
			02	**6B**	77.80	4,600,000	59,126	87	4,002,000	51,440
			03	**3B**	77.80	2,197,630	28,247	95	2,087,749	26,835
			04	**7A**	77.80	457,804	5,884	88	402,868	5,178
			05	**7A**	77.80	200,000	2,570	88	176,000	2,262
			06	**7A**	77.80	149,860	1,926	88	131,877	1,695
						8,201,485	***105,416***		***7,325,141***	***94,153***
Imprest	**008**	**03-Dec-2015**	**01**	**1**	78.74	77,441,455	983,509	91	70,471,724	894,993
			02	**2**	78.74	23,896,480	303,486	100	23,896,480	303,486
						101,337,935	***1,286,995***		***94,368,204***	***1,198,479***
Dir.Pay.	**009**	**23-Feb-2016**	**01**	**6A**	77.57	18,202,930	234,649	13	2,366,381	30,504
Imprest	**011**	**07-Mar-2016**	**01**	**1**	78.74	154,166,641	1,957,920	91	140,291,643	1,781,707
			02	**2**	78.74	887,099	11,266	100	887,099	11,266
			03	**6A**	78.74	4,597,309	58,386	13	597,650	7,590
			04	**7A**	78.74	800,964	10,172	88	704,848	8,952
						160,452,013	***2,037,744***		***142,481,241***	***1,809,515***
Dir.Pay.	**012**	**20-Mar-2016**	**01**	**6A**	77.57	27,049,703	348,691	13	3,516,461	45,330
Imprest	**013**	**05-May-2016**	**01**	**1**	78.60	242,232,508	3,083,883	91	220,431,582	2,806,333
			02	**2**	78.40	97,265,910	1,240,637	100	97,265,910	1,240,637
			03	**5**	78.60	624,855	7,950	94	587,364	7,473
			04	**7A**	78.74	173,409	2,202	88	152,600	1,938
						340,296,682	***4,334,672***		***318,437,456***	***4,056,381***
Dir.Pay.	**014**	**23-Jun-2016**	**01**	**5**	78.40	7,966,561	101,614	94	7,488,568	95,517
Dir.Pay.	**015**	**29-Jun-2016**	**01**	**6A**	77.57	33,356,861	429,995	13	4,336,392	55,899
Dir.Pay.	**016**	**29-Jun-2016**	**01**	**6A**	77.57	27,330,641	352,313	13	3,552,983	45,801
Project Totals						**1,238,354,287**	**15,840,823**		**1,098,032,302**	**14,040,314**

Table B-8 ADB & GON Disbursement Details

Bangladesh Bank Disbursements

ADB Loan Account

Date	US$	Rate	BDT
09-Dec-14	3,682,433.00	77.80	286,493,287
17-Dec-15	11,069,711.00	78.80	872,293,227
20-Dec-15	1,198,478.59	78.75	94,380,189
30-Jun-16	3,889,762.94	78.40	304,957,414
	19,840,385.53		**1,558,124,118**

Grant Imprest Account

Date	US$	Rate	BDT
09-Dec-14	1,189,354.00	77.80	92,531,741
17-Dec-15	20,651.00	78.80	1,627,299
	1,210,005.00		**94,159,040**

Reimbursement

Dir.Pay Applic	Date	Category	BDT/US$	Total (BDT)	Total US$	ADB & GON %	ADB & GON (BDT)	ADB & GON US$
9	23-Feb-16	6A	77.57	18,202,930	234,649	87	15,836,549	204,145
12	20-Mar-16	6A	77.57	27,049,703	348,691	87	23,533,242	303,361
14	23-Jun-16	5	78.4	7,966,561	101,614	94	7,488,567	95,517
15	29-Jun-16	6A	77.57	33,356,861	429,995	87	29,020,469	374,096
16	29-Jun-16	6A	77.57	27,330,641	352,313	87	23,777,658	306,512
1	30-Jun-16	2	77.8	514,159,476	6,608,734	100	514,159,476	6,608,734
				628,066,172	**8,075,996**		**613,815,961**	**7,892,365**

Total Disbursement

Currency	ADB & GON
BDT Mil	2,266
US$ Mil	28.94

Total Disbursement is the sum of the ADB Loan and Grant Imprest Account deposits, plus the total ADB & GON Reimbursment amount.

Appendix-C Administrative Details

Table C-1 Utilization of Consultant Person-Months

No.	Position	Firm	Name	Person-Months		
				Contract	Used	Balance
	MAIN TEAM - INTERNATIONAL					
I-1	Team Leader / River Mangement Specialist	NHC	Knut Oberhagemann	35.0	8.09	26.91
I-2	Institutional Development Specialist	EMM	Robert A. van de Putte	5.0	0.76	4.24
I-3	Morphologist	DELTARES	Eric Mosselman	5.0	1.67	3.33
I-4	River Engineer	NHC	Bruce Walsh	10.0	1.77	8.23
I-5	Construction / Quality Control Engineer	EMM	R. Mahendrarajah	24.0	0.00	24.00
I-6	Flood Disaster Risk Management Specialist	NHC	Dave Burkholder	8.0	2.49	5.51
I-7	Social Development / Resettlement Specialist	EMM	Jean Louis Leterme	8.0	4.09	3.91
I-8	Economist	NHC	John D. M. Roe	3.0	1.33	1.67
I-9	Financial Management Specialist	EMM	J. Spurr	1.5	0.00	1.50
I-10	Hydrologist	NHC	Derek Stuart	3.0	1.34	1.66
I-11	Environmental Specialist	EMM	Wandert Benthem	7.0	1.57	5.43
I-12	Information and Data Management Specialist	NHC	Dave Burkholder	4.0	3.77	0.23
I-13	Int'l Construction Advisor-Engineer	NHC	Graeme Vass	12.0	2.59	9.41
I-14	Junior Engineer	NHC	Jesper Mathiesen	2.0	1.36	0.64
			Totals	**127.50**	**30.84**	**96.66**
	MAIN TEAM - NATIONAL					
N-1	DTL / Flood & Erosion Risk Management Spec.	EMM	Sharif Al Kamal	37.0	11.38	25.62
N-2	Institutional / Capacity Development Specialist	RPMC	Dr. M. A. Qassem	10.0	4.03	5.97
N-3	River Engineer (Morphologist)	CEGIS	Dr. Maminul Haque Sarker	8.0	5.70	2.30
N-4	Community-based Flood Risk Management Spec.	RPMC	Quazi Towfique Islam	36.5	12.06	24.44
N-5	Resettlement Specialist	EMM	Shireen Akhter	15.0	1.86	13.14
N-6	Project Economist	RPMC	Amiul Islam	7.0	3.92	3.08
N-7	Procurement Specialist	RPMC	A. Abdullah Chowdhury	8.0	0.00	8.00
N-8	Construction Engineer	RPMC	Mirza Harunar Rashid	30.0	7.70	22.30
N-9	Financial Management Specialist	EMM	Md. Habibur Rahman/**Ektedar Rahman**	12.0	2.31	9.69
N-10-1	River Engineer Flood Management Infr.- 1	RPMC	Mukhles uz zaman	15.5	8.60	6.90
N-10-2	River Engineer Flood Management Infr. -2	RPMC	Md. Motiur Rahman	13.5	4.28	9.22
N-11	Social Development and Gender Specialist	EMM	Ruh Afza Ruhi/**Begum S. Nahar**	12.0	3.48	8.52
N-12	Environment Specialist	RPMC	Dr. Md. Nurul Islam/**Md. Amir Faisal**	16.0	2.97	13.03
N-13	Training Coordinator	EMM	Jahangir Kabir/ **Shameem Ahmed**	14.0	8.01	5.99
N-14	Information and Data Management Specialist	EMM	Asrafuzzamen	15.0	0.00	15.00
N-15	Hydraulic Structural Engineer	RPMC	Md. Dabir Uddin	12.0	0.00	12.00
N-16	Road Engineer	RPMC	Zakir Hossain	6.0	0.00	6.00
N-17	Geotechnical Engineer	EMM	Md. Korban Ali	7.0	0.00	7.00
N-18-1	Site Engineer 1 (PRB-1)	RPMC	Md. Nurul Amin	33.0	10.46	22.54
N-18-2	Site Engineer 2 (JLB-2 Chauhali)	RPMC	KM Nazmul Haque/ **Ekram Sarder**	33.0	8.20	24.80
N-18-3	Site Engineer 3 (JLB-2 Zaffarganj)	EMM	Md Faridul Alam	33.0	7.64	25.36
N-18-4	Site Engineers 4 (PLB-1 Harirampur)	EMM	Abdul Jalil/**Saiful Islam**	36.0	6.97	29.03
			Totals	**409.50**	**109.57**	**299.93**

Table C-1 Utilization of Consultant Person-Months cont.

	RIVER STUDY TEAM - INTERNATIONAL					
IR-1	Task Leader / Flood & River Management Spec.	NHC	Carsten Stuab	10.0	7.21	2.79
IR-2	Institutional Development Specialist	EMM	Robert A. van de Putte	3.0	0.33	2.67
IR-3	Morphologist	DELTARES	Sanjay Giri	7.0	0.93	6.07
IR-4	River Engineer (River Training)	NHC	Gerritt Klaassen	7.0	3.25	3.75
IR-5	Water Resources Management Specialist	DELTARES	W. J. Oliemans	5.0	0.79	4.21
IR-6	Economist	EMM	Alexander Mueller	4.0	0.00	4.00
IR-7	Social / Regional Development Specialist	NHC	Mark Hopkins	5.0	5.01	-0.01
IR-8	Environmental Specialist	EMM	Wandert Benthem	4.0	1.66	2.34
IR-9	Hydrologist	NHC	Malcolm Leytham	2.0	0.93	1.07
			Totals	**47.00**	**20.11**	**26.89**
	RIVER STUDY TEAM - NATIONAL					
NR-1	Water Resources Management Specialist	RPMC	G M Akram Hossain	10.0	9.49	0.51
NR-2	Flood Management Specialist	RPMC	Md. Makbul Hossain	6.0	7.55	**-1.55**
NR-3	River Engineer (Morphologist)	CEGIS	Dr. Maminul Haque Sarker	9.0	2.41	6.59
NR-4	Economist	EMM	Dr. Shaker Ahmed	4.0	0.00	4.00
NR-5	Regional / Spatial Planner	RPMC	Dr. Shamim M Haque	4.0	3.37	0.63
NR-6	Institutional Development Specialist	RPMC	Dr. M. A. Qassem	4.0	4.00	0.00
NR-7	River Engineer	RPMC	Md. Motiur Rahman Jewel	8.0	7.71	0.29
NR-8	Hydrologist	EMM	Imdadul Haque Siddiqui	6.0	0.00	6.00
NR-9	Social Development and Gender Specialist	EMM	Ruh Afza Ruhi/**Begum S. Nahar**	5.0	3.38	1.62
NR-10	Environment / Climate Change Specialist	EMM	Md. Rakibul Haque	5.0	0.00	5.00
NR-11	Water Supply and Water Quality Specialist	EMM	Md. Mozammel Hossain	5.0	0.00	5.00
NR-12	Agriculture Specialist	RPMC	Dr Quazi Reasul Islam	4.0	3.12	0.88
NR-13	Fishery Specialist	RPMC	Dr. Md. S. Howlader	3.0	3.00	0.00
			Totals	**73.00**	**44.04**	**28.96**

Appendix-D River Study, Technical Notes Progress

NUMBERING: The notes are given a number and a date when they are issued. Simple chronological numbering.

Status & No.		Tentative title	TOR	Main author(s)	Contribution from	Approval	Comments / updated status
		Task 3 (ToR 6) Pilot works					
2		Selection of pilot works	6.1	MZ	SG	CS	One site selected, topographic survey and geotechnical investigation done.
3		Design and cost estimate pilot works	6.2	MZ	GJK	BW	Preliminary design completed for one site.
3		Monitoring plan for pilot works	6.4	MZ	SG	GJK	
4		Pilot works: Construction and as- built drawings	6.3	MZ	Main team	BW	Not yet due
4		Monitoring and analysis pilot works flood season 2017	6.4	SG+MHS	MHS	GJK	Not yet due
4		Monitoring and analysis pilot works flood season 2018	6.4	SG+MHS	MHS	GJK	Not yet due
4		Pilot work: lessons learnt and recommendations	6.5	GJK	MHS, SG	CS, KO	Not yet due
		Task 4 and 5 (ToR 4, 5 and 7) River Stabilization Plan and Preliminary River Management Master Plan					
1	1	Background data, river use, studies and plans	5.1, 5.2	MH	AH and others	CS	Completed & submitted to PMO
1	2	Holistic river morphology analysis for the Brahmaputra river system (past changes and possible futures). Part I	4.1	MHS	EM/SG, GJK	EM	Completed & submitted to PMO
1	3	River bifurcations: Theory and model experience	4.2, 4.5	EM	GJK?	GJK	Completed & submitted to PMO
1	4	Environmental and social aspects of river stabilization: Remedial measures		WB/MH			Completed & submitted to PMO
1	5	Upper Meghna - present conditions and issues	5.5	JAA/MHS		CS	Completed & submitted to PMO
2	6	Main river flood risk and management		MHo		CS	Second draft 10 Sep under review
2	7	Distributaries: Water resources preparation and baseline	4.7, 5.3	WO	others	CS	Draft report completed
2	8	Offtakes part 1 Updated planform studies	4.7	MHS	EM	EM	Draft report completed
1	9	Use of reclaimed land		MH	SN, others	CS	Completed & submitted to PMO
2	10	Intermediate and final planform alternatives	4.2	GJK	EM/SG, MHS	GJK/CS	Home office time required to reach target
3		River cross section analyses	4.3, 4.4	YB/MK	GJK, CS	CS	Analyses ongoing
3		Feasible techniques and methods for river bank protection and river stabilization	4.6, 30	GJK+MZ		CS	Home office time required to reach target
2		River bifurcations: Field experience	4.2, 4.5	MHS		GJK	Draft report completed
1		Char characteristics and dynamics – past and present conditions on basis of satellite imagery	4.1, 4.2, 4.10	MHS	EM/SG	EM	Completed
4		Char characteristics and dynamics – future conditions for different alternatives	4.2, 4.3, 4.4, 4.5	MHS	WO	EM	This note is required during feasibility studies for Trenche 2
2		Offtakes part 2 Numerical model studies and generic guidelines	4.7	SG	GJK, modelers	CS	First draft under review
2		Confluences: 2D hydraulic modelling (Underwater apron for Chandpur town protection)	7.2	MRJ/AT		SG/CS	Draft report completed

4		Confluences: analysis and future studies	7.1, 7.3, 7.4	EM/SG	Modelers	CS	Work in progress
2		Charland amelioration and agriculture development		QRI		CS	Draft report completed
2		Charland development: Preliminary economic assessment	4.11, 5.8, 5.10	JR/AI	others		Draft report completed
3		Holistic river morphology analysis for the Brahmaputra river system (past changes and possible futures). Part II	4.1	MHS	EM/SG, GJK	EM	CEGIS working on this note
3		River bifurcations: Model simulations	4.2, 4.5	NHC		EM	Work in progress
3		Impact of future stabilization works (results of 1D model/approach) – part of more comprehensive note on impact including flood levels, land use changes charland and floodplain land	4.3, 4.4	EM/SG/WB	many others	GJK	work in progress
4		Lessons from Yellow River	4.2, ...	CY		GJK	Chinese engineer pending Variation Order
3		Optimum width, planform and embankment alignment	4.5, 4.8	CS	EM, GJK, ML	KO	In progress
4		Design of offtakes for future planforms	4.7	GJK	EM, MZ	CS, KO	
4		Stabilization and maintenance of a fluvial inland waterway	4.10	EM	EM	GJK	
4		Long-term phased implementation plan	4.13	CS	GJK, BW	KO	
4		Upper Meghna - improvement measures	5.5, 5.7	MZ	MHS	CS, KO	
4		Distributaries: Water balance, potential measures and study plan	4.7, 5.3, 5.6	WO	ML, AH	CS	In progress
4		Economic analysis different alternatives	4.11, 5.8, 5.10	JR	WO, others	CS, KO	In progress
2		Baseline study on river fishery and aquaculture	4.12, 5.9	SH	WB, others	WB	Draft reviewed
1	**-**	**Strategic Environmental and Social Assessment (SESA)**	**4.12, 5.9**	**WB/MH**	**others**	**CS, KO**	Completed & submitted to PMO
1	**-**	**Initial Environmental Examination (IEE) of river stabilization works at Project-2 sites**		**WB**		**KO**	Completed & submitted to PMO
3	**-**	**Priliminary River Management Master Plan**	**5**	**CS/All**		**KO**	Preliminary draft submitted in June
3	**-**	**River Stabilization Plan**	**4.9, 4.13**	**CS+GJK**	**MZ, BW**	**KO**	Draft in form of Powerpoint from GJK

Status:

1 - Complete
2 - Nearly Complete
3 - Substantial Progress
4 - Not Yet Started

Abbreviations:

AH = Akram Hossain
AI = Aminul Islam
AT = Angela Thompson
BW = Bruce Walsh
CS = Carsten Staub
CY = Chinese Engineer
EM = Erik Mosselman
MK = Mariam Khanam
ML = Malcolm Leytham
MRJ = Motiur Rahman Jewel
MZ = Mukhles uz Zaman
NHC = Home office NHC
QI = Quasi Islam
SG = Sanjay Giri

Appendix-E Resettlement Field Visits, Meetings and Correspondence

Resettlement Field Visits

List of field visits by ISPMC Resettlement Specialist

- 27 October 2015 to Chauhali and Zaffarganj, reconnaissance trip before work construction starts, Shireen report
- 9 December 2015 to Chauhali, starts works, JLL,/Shireen Field report
- 14-15 February 2016 to Chauhali and Harirampur, JLL, Towfique, ++ Field visit report issued
- 8 March 2016 to Zaffarganj before work starts, Protection works inauguration JLL ++
- 23 March Chauhali, sites reconnaissance with INGO JLL, BSN
- 30-31 May Chauhali and Zaffarganj, INGO activities follow up JLL , BSN
- 16-17 October 2016, Harirampur JLL with team Engineers
- 23 October 2016 , Zaffarganj checking demarcated area JLL with Jesper , INGO, XEN

Resettlement Meetings

List of meetings held with INGO, ISPMC-FRERMIP and PMO (attendance list and photos with INGO)

- 20 March 2016 : Meeting INGO at PMO office
- 03 April 2016 : ISPMC-FRERMIP office, first meeting team of INGO experts
- 23 May 2016 : Meeting INGO team at PMO office Preparation field trip
- 09 June 2016 : Meeting INGO at ISPMC-FRERMIP consultant office
- 14 June 2016 : Meeting at PMO with INGO to report about field trip and update of progress of preparation of RPs
- 14 July 2016 : Meeting at PMO office with CRO, XEN Manikganj and INGO meeting minutes issued/circulated
- 24 July 2016 : Meeting at PMO office, INGO with CRO and XEN Manikganj, Tangail , Koijuri, meeting minutes issued and sent to CRO
- 11 August 2016 : Meeting at PMO office with CRO and INGO, meeting minutes sent to CRO on 20 August 2016
- 20 October 2016 : PMO office discussion about land area discrepancies in Zaffarganj RP with CRO, INGO, XEN, Jesper, JLL

Resettlement Correspondence

SL.	Reference number	Subject	Date
1	ISPMC_FRERMIP_017	Establishment of AD line Chauhali and Zaffarganj	29-Oct-2015
2	ISPMC_FRERMIP_043	Field visit report from Shireen Akhter, The nation resettlement specialist	14-Dec-2015
3	ISPMC_FRERMIP_070	Request for approval of replacement of key Expert of FRERMIP ISPMC.	24-Jan-2016
4	ISPMC_FRERMIP_083	Alternatives to Access the land required for riverbank protection works.	10-Feb-2016
5	ISPMC_FRERMIP_096	Field observations at Riverbank Protection Work Sites at Harirampur and Chauhali.	24-Feb-2016
6	ISPMC_FRERMIP_131	Preparation of Resettlement Plans.	17-Apr-2016
7	ISPMC_FRERMIP_140	Compliance to ADB Resettlement Guideline at Zaffarganj.	11-May-2016
8	ISPMC_FRERMIP_176	Progress in preparing Resettlement plan for Zaffarganj and Chauhali.	23-Jun-2016
9	ISPMC_FRERMIP_191	Draft Meeting minutes of the INGO Progress.	18-Jul-2016
10	ISPMC_FRERMIP_210	Status of RP implementation.	29-Aug-2016
11	ISPMC_FRERMIP_222	Status of RP implementation	10-Oct 2016
11	Email JLL to CRO	Draft Meeting minutes of the INGO held on 24 July 2016	27-Jul-16 2016
12	Email BSN to CRO	Sent Meeting minutes held on 11 august of PMO and INGO copied PD and DTL	20 August 2016
14	Email CRO to DTL	from CRO to DTL with Zaffarganj RP to check if replies to comments are ok	10 October 2016
15	ISPMC-FRERMIP 227	To PD Letter asking for Table of comments for RP Zaffarganj	19 October 2016
16	ISPMC-FRERMIP 233	To PD Letter reminding about Table of comments	30 October 2016

Appendix-F Capacity Building Program

Capacity Building PMO

In the DPP a total of 34 local training courses (A), 3 international training courses (B.1.)and 3 study tours (B.2.) is included. Progress to date is as follows:

A. Local Training

Two **River Engineering Training courses** were completed in April 2016 under BWDB's Capacity Development Program. The Department of Water Resources Engineering (BUET) conducted the training and Mr. A. M. Aminul Haque, Addl. Chief Engineer/Project Director, FRERMIP and Ms. Natsuko Totsuka, Head of ADB Mission were present in the inaugural session. The training was held in two batches at a total cost of BDT 1,726,976.

Two **Training courses on River Training Techniques** are ready for implementation. The draft program schedule was submitted by the BUET on 18-05-2016 and the courses are planned for the end of October 2016.

Two **Training courses on Project Management** are currently discussed with different service providers and 3 Training providers submitted a programme and budget for a 5 day course and this has been discussed with the Project Director.

Two **Training courses on Leadership:** Training providers have submitted a programme and budget for a 5 day course. These are discussed with the Project Director for finalizing programme and implementation of the training from the budget of FY 2016-2017.

B.1. Overseas Training

One **Overseas Training on River Morphodynamics and Erosion Protection Practices** (4 weeks). The contract agreement was signed between UNESCO-IHE and PMO, BWDB, on 29th June 2016 and first payments (BDT= 7,488,566.51) made in favour of UNESCO-IHE from the training budget of FY 2015-2016.

The list of participants of the BWDB Engineers is as follows:

1. Muhammad Jahangir Alain, Executive Engineer, PMO -FRERMIP, BWDB, Dhaka.
2. Gourab Kumer Saha, Assistant Engineeer, Design Circle-VI, BWDB, Dhaka.
3. M. Nazmul Islam, Assistant Engineer, Planning-1, BWDB, Dhaka.
4. Md. Arif Hossen, Assistant Engineer, O & M Directorate, BWDB, Dhaka.
5. A.K.M. Maminul Islam, Asstt. Engineer, Directorate of Project Evaluation, BWDB, Dhaka.
6. Sarder Udoy Raihan, Assistant Engineer, FFWC, BWDB, Dhaka.
7. Ms. Umme Salma, Assistant Engineer, Design Circle-4, BWDB, Dhaka.
8. Abu Sayeed Md. Masum, Sub-Divisional Engineer, Design Circle-5, BWDB, Dhaka.

The course includes River Morphology, Erosion Control and Bank Protection, River training techniques (including the use of Geo-bags and their Design) and Quality control/O&M. The course took place at the UNESCO-IHE in the Netherlands and started on 12 September and continued up to 07 October 2016. A group of high profile Lecturers and resource persons are involve as trainer/ Lecturers under the leadership of Dr. Alessandra Crosato, including Professor Chris Zevenbergen, Alessandro Cattapan, Dr Ilyas Masih, Dr Jaap Evers, Dr Erik Mosselman.

B.2. Overseas Study Tours

Study Tour China

The Study Tour to China on ''Study of the Management of Yellow and Yangtse Rivers and Flood and Erosion Protection Works'' was undertaken in August 2016 (15-23 August 2016). The contract agreement was signed on 27th June 2016 and the payments (BDT= 49,94,864) made from the budget of FY 2015-2016.

Thes Study Team included 10 high officials from the Ministry of Water Resources, Economic Relation Division, Planning Division and Bangladesh Water Development Board as listed below:

1. Md. Anwar Hossain, Joint Chief, Agriculture, Water Resources & Rural Institution Division, Planning commission, Ministry of Planning, Sher-e-Bangle Nagar, Dhaka.
2. Mantu Kumar Biswas, Joint Chief, Ministry of Water Resources, Bangladesh Secretariat, Dhaka.
3. Hosneara Akhter, Deputy Secretary, Ministry of Water Resources, Bangladesh Secretariat, Dhaka.
4. Md. Waliullah Mia, Deputy Secretary, Economic Relation Division, Sher-e-Bangle Nagar, Dhaka.
5. Md Abdul Hai Baqui, Additional Director General (Western Region), BWDB, Dhaka.
6. A.M. Aminul Haque, Project Detector, PMO, FRERMIP, BWDB.
7. K. MAanzur Hasan, Chief Monitor, BWDB, Dhaka.
8. Kazi Tofail Hossain, Superintending Engineer, Design Circle-ll, BWDB,Dhaka.
9. Mohammad Harun-Ur-Rasheed, Superintending Engineer, Design Circle-l, BWDB, Dhaka.
10. Md. Abdul Motin Sarkar, Superintending Engineer, Dhaka O&M Circle, BWDB, Dhaka.

The objective of the study visit was to learn from the management of the Yellow River by channelization and bank protection, which has similarity with the Brahmaputra-Jamuna river.

A summary report of the study tour is attached.

Study Tour USA

Preparation of the **Study Tour to the Mississippi River** is on-going. The study tour is expected to take place by spring 2017.

Study Tour India

Preparation of the **Study Tour to the Ganges River** is on-going. The study tour is expected to take place by April 2017, and will also include participation in an international conference.

Capacity Building ISPMC

C. Workshops, training and seminars

Capacity Development Material for BWDB: The ISPMC has started preparing a general capacity development presentation about BWDB's activities. A draft has been discussed with BWDB's upper level management on 26 June 2016. The presentation is expected to be completed during the next quarter.

Film about riverbank protection and river training: The ISPMC has retained the services of a subcontractor to prepare a film about FRERMIP riverbank protection and future stabilization activities. The film shooting was completed on 4 and 5 June to capture large major construction activities. The film is expected to be completed during the following quarter and used during the ISCE conference (point E) and for and overall presentation of BWDB's work (point F).

Environmental Training: Although awareness of environmental issues is increasing, there is limited appreciation of how such issues might be most effectively addressed. In order to ensure effective and timely implementation of the EMP, in particular, and to enhance the environmental

management capacity of PMO/SMO staff members (involved in environmental management works), and Contractors and their staff (involved in construction and construction related activities), Training held on 26/4/2016 at Chauhali Site Office, Batch 1, 27/4/2016 at Harirampur Site Office -Batch 2 and 28/4/2016 at Jaffarganj Site Office- Batch 3. Cost paid from ISPMC Provisional Sums: Line-1.

Training Modules designed for the Training Program included:

1. Understanding of Issues/Parameters related to FRERMIP,
2. Preparation and Understanding of Environmental Management plan (EMP),
3. Environmental Supervision and Monitoring for FRERMIP,
4. In-depth discussion of Technical Specifications for Environmental Management & Safety,
5. Environmental Training related to Work Good Practice for Contractors & their Staff,
6. Contractor's Self-Monitoring and Supervision.

Benefit achieved with respect to environmental knowledge and skill development from this training program was evaluated by administering question - answer sessions and group discussion. Participants have demonstrated substantial understanding of the environmental issues and their management related to the subprojects of FRERMIP, they have expressed their satisfaction of this training program.

D. Conferences and Study Tours

The DG BWDB, Project Director and Team Leader participated in the **8th International Conference on "Scour and Erosion"** (ICSE), held at Oxford, UK, held from 12-15 September 2016. The PD supported by the Team Leader presented a paper on "Development of Low Cost Riverbank Protection in Bangladesh". The visit was financed from ISPMC budget, provisional sums of international and national conferences and study tours.

The conference provided a platform for scientists and engineers from around the world to exchange ideas and share advances in research and practice on the scientific and engineering challenges related to scour and erosion. The broad topics covered in ICSE conferences include fundamental mechanisms of erosion and scour, modelling (both physical and numerical) of erosion and scour processes and engineering applications that involve scour and erosion processes which knowledge is very important for Bangladesh. The ICSE conferences have been well attended by scientists and engineers from broad areas such as civil engineering, hydraulic engineering, coastal and offshore Engineering. One of the strong features of the ICSE conferences has been the cross disciplinary collaborations. Over 130 papers were presented at the conference on a variety of relevant topics. The conference included an optional technical site visit to HR Wallingford and its physical modelling facilities, including the Fast Flow Facility, and a tour of UK Ship Simulation Centre.

The BWDB discussed plans to pitch the next conference of ICSE in Bangladesh. However, the management decided to hold the next conference at Korea.

After the International Conference the Bangladesh Team also visited the following works in Germany, The Netherlands and Sweden:

a. Coastal and river flood defense works at the north-western German coast, including multiple lines of embankments and the Ems closure dam near Leer on 17 and 18 September.

b. On 19 September Visited the IHE at Delft, The Netherlands to discuss and overview the ongoing training Course on River Morphodynamics and erosion protection practices.

c. Visited the University of Rostock to discuss the construction and supervision of flood embankments incorporating sand cores on 20 September,

d. Visited urban flood control and drainage works in Stockholm and holding discussion with the consultant's study team leader of the FRERMIP, whose home office is in Stockholm.

Local conference: A Local conference held on 25-May-16 based on the capacity assessment of target participants (PMO, PIUs, contractor/s, and other stakeholders, Cost in BDT= 54,901 made from ISPMC Provisional Sums: Line-2: International and Local Conferences and study tour.

Other Capacity Building activities

1. Establishment of the Office of Chief Engineer River Management (CE-RM)
In recognition of the importance of the management of the main rivers in Bangladesh, BWDB is in the process to establish the office of the Chief Engineer River Management (CE-RM), as part f the needs based set-up. The establishment of the office of the CE-RM itself is the responsibility of the Government of Bangladesh and BWDB. Because the office of the CE-RM is the envisaged counterpart of FRERMIP and is important for the transfer of specialised knowledge to BWDB, however, this is of direct interest for FRERMIP, and the Institutional Capacity Development specialists continuously promote it. Once established, the staff of the CE-RM will benefit of specialised training.
The Office of the CE-RM and the position of the Chief Engineer were approved by MoWR, and the Ministry of Establishment. The file rests with the MoF. DG BWDB informed that the issue of approval of the needs based set-up with the Secretary of Financed.

2. Assign dedicated Design Circle for design work for main rivers
Due to the specialist nature of the designs for the main rivers specialisation of BWDB design staff is required. A discussion was held with CE Design in February 2016, who proved to be receptive to the idea of specialisation to strengthen the technical capabilities of the Design Office. Assigning a dedicated Design Circle for design work for the main rivers can is an internal BWDB organisational decision and requires a decision by the DG, who confirmed his interest during a meeting in October 2016. Decision making will take place once the office of the CE-RM is established.

3. Introduce practice of framework DPP for planning of works on main rivers
GoB planning and budgeting procedures are lengthy and rigid, while the main rivers are highly dynamic and may change rapidly. Planning and budgeting procedures are not commensurate with the needs for flood management and riverbank protection. A framework DPP with block allocations provides the required flexibility. The Institutional Development Specialists regularly discuss this issue with BWDB management, but decision making rests with the Planning Commission and the Ministry of Finance. DG BWDB informed that LGED does not get block allocations anymore, but agreed that river training and bank protection work need the flexibility that the current DPP process does not offer. This issue will continue to be pursued.

Appendix-G 2016 Europe Study Tour

The purpose of the study tour was to attend the international conference on scour and erosion in Oxford, England, and visit flood protection infrastructure in England and in continental Europe: Germany, the Netherlands, Denmark and Sweden. The participants were the Director General, BWDB and the Project Director FRERMIP, accompanied by the Team Leader ISPMC.

The conference started with the welcome reception on 11 September and ended on 15 September. A paper on development of low-cost riverbank protection in Bangladesh, prepared by Project Director and Team Leader was presented on 12 September. In addition, the BWDB together with BUET applied to host the next conference in Bangladesh in 2018. The organizing committee ranked Bangladesh second and awarded the conference to Taiwan. During the conference a specialist training course on the use of geotextile material in river engineering was discussed with Dr. Heibaum from the German Federal Waterways Engineering and Research institute (Bundesanstalt für Wasseerbau, BAW).

Figure 1. Conference dinner in Oxford on 14 September 2016

On the last day of the conference, the company Proserve in Knilworth, located one hour north of Oxford was visited for a discussion and demonstration of permanent wave protection consisting of grout-filled mattresses made of jute fiber. The very convincing demonstration and discussion on implementation in different places, was very well received. The BWDB study team contemplated on using this technology as part of the pilot works for different designs in the area of Harirampur.

Figure 2. Demonstration of grout filled mattress section made of jute fibers

On 16 September, the team visited the Thames barrier together with directors from Mott MacDonald. The around 500m wide barrier was opened in the early 1980s and built at cost of around GBP 500 million. Today, the replacement would cost GBP 2 billion, but prevents damages of up to GBP 20 billion associated with flooding of the City of London. The barrage is monthly tested to guarantee operation against storm surges. After this visit, the team flew to Germany.

Figure 3. Thames barrage, 16 September 2016

On 17 September, a number of river barriers were visited in northern Germany. These were barriers mostly for flood protection and drainage purposes in existing embankments:

(i) Smaller structures for drainage canals including pump stations and sluice gates

(ii) Larger structure closing tidal rivers

Figure 4. Sluice gate with road bridge for draining a canal into the tidal river Ems

Figure 5. Windmill for draining areas below sea level in northern Germany

Figure 6. Ems barrier, about 500m long with two navigation openings (on the left hand side)

On 18 September the team travelled along the Dutch North Sea coast to visit a number of barriers and closure dams. This included the 30km long Afsluitdijk and the Storm Surge Barrier at Neeltje Jans.

Figure 7. 30km long Afsluitdijk between North Sea and Zuidersee

Figure 8. Storm Surge Barrier at Neeltje Jans

On 19 September the UNESCO-Institute for Water Education (IHE) at Delft, in the Netherlands, was visited and different aspects of the ongoing BWDB training on 'River Morphodynamics and Erosion Protection Practices', and possible future training were discussed. During the discussion the DG and PD reminded the eight BWDB students to study hard and make maximum use out of the training. The students requested for two field trips, one to the Rhine River and the other, as suggested by their professor, to the storm surge barrier of Venice. This was positively received. In the evening, the team reached Lübeck and drove to Rostock the next morning for a meeting with the university.

The University Rostock has built three test dikes (embankments) with granular material, mostly dredged sands, for detailed performance investigations. These embankments have provided deeper insight into the seepage and settlement behavior of granular soils. Recommendations are provided in the South Baltic Guideline for the Application of Dredged Materials, Coal Combustion Products and Geosynthetics in Dike Construction, copies of which were handed out to the BWDB members. It was further discussed to conduct training on embankment construction, both in Bangladesh and in Europe, using resource persons from the University of Rostock.

On 20 September, the Vattenfall lab was visited in Älvkarleby in Sweden. The lab uses the latest technology to construct and test physical hydraulic models, and is associated with all research activities of the energy provider Vattenfall.

On 21 September, the Study Team Leader presented key elements of the initial master plan and discussed them with the BWDB team. In the evening the team left for Bangladesh.

Figure 9. Test dikes with dredge fill material in Rostock

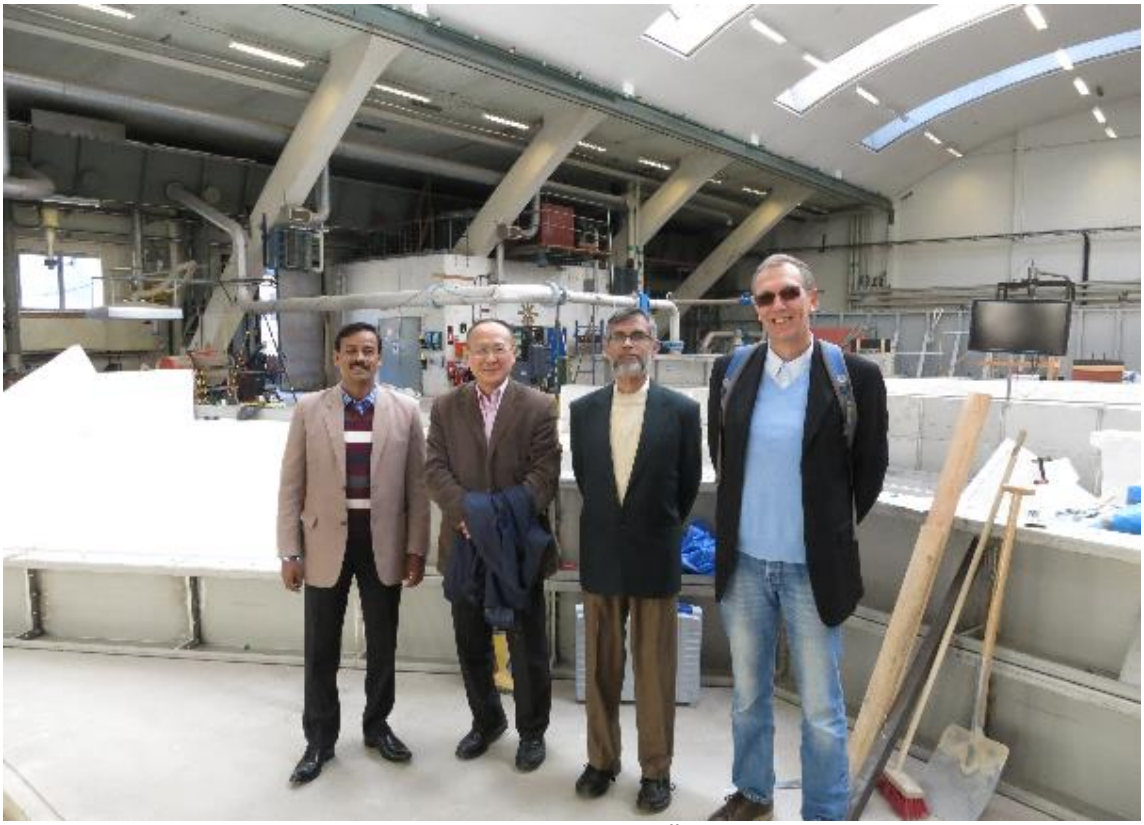


Figure 10. Vattenfall lab in Älvkarleby

Appendix-H 2016 China Study Tour

Nine participants attended a Study Tour on "Study of the Management of Yellow and Yangtze Rivers, and flood and erosion protection works" under FRERMIP on 16-24 August 2016:

1. Md. Anwar Hossain, Joint Chief, Agriculture, Water Resources & Rural Institution Division, Planning commission, Ministry of Planning, Sher-e-Bangle Nagar, Dhaka.
2. Mantu Kumar Biswas, Joint Chief, Ministry of Water Resources, Bangladesh Secretariat, Dhaka.
3. Hosneara Akhter, Deputy Secretary, Ministry of Water Resources, Bangladesh Secretariat, Dhaka.
4. Md. Waliullah Mia, Deputy Secretary, Economic Relation Division, Sher-e-Bangle Nagar, Dhaka.
5. Md Abdul Hai Baqui, Additional Director General (Western Region), BWDB, Dhaka.
6. A. K. MAanzur Hasan, Chief Monitor, BWDB, Dhaka.
7. Kazi Tofail Hossain, Superintending Engineer, Design Circle-ll, BWDB,Dhaka.
8. Mohammad Harun-Ur-Rasheed, Superintending Engineer, Design Circle-l, BWDB, Dhaka.
9. Md. Abdul Motin Sarkar, Superintending Engineer, Dhaka O&M Circle, BWDB, Dhaka.

This Study Tour was organized by a private firm "The Bridge". Their proposed technical programme together with the actual deliverables are shown in the following table:

Sl No.	Training Subject	Duration	Subject Taught or Discussed
A	Meeting Session in Beijing on River management and flood and erosion protection works by Mr. Peng Jingiun.	Meeting Session was cancelled.	
B	Meeting Session on Yellow River management and protection works by Dr. Su Yangbo at YRCC and YR Institute of Hydraulic Research.	Meeting session was continued for about two hours.	Preliminary ideas and information on Yellow River. Erosion Protection Works was not included in this session.
C	Visit to Xiaolongdi dam for practical knowledge gathering on Dam Protection Works and discussion session with authority of the Dam.	Visit to Xiaolongdi dam site.	Dam site was visited under the guidance of Dam authority.
D	Visit to Changling River and Three Gorges Dam and Discussion session with authority of Dam.	Visit to Three Gorges Dam site.	No meeting with Dam authority. A tourist guide showed and briefed participants on the dam.
E	Meeting Session in Beijing by Dr. Wan Yunyang on River Management and flood and erosion protection works.	Meeting session was about one hour.	Mr. Wan Yuanyang gave presentation on:"Impacts on the silting of the Deepwater Navigation Channel in the Changjiang Estuary". Physical Model of Yangtze Estuary was visited. Erosion Protection Works was not included in this session.

Observation by Tour Component

B. Meeting Session on Yellow River

The 2 hour meeting included two presentations: flooding and siltation problems along the Yellow River, and how to manage it. The Yellow River in one of the largest rivers in the world with a length of 5,464 km and a total basin area of 7,95,000 square kilometers.

The major challenges facing the Yellow River and possible solutions are:

- Making sure that the Yellow River Dike does not breach.
- Sufficient flow in Lower Reaches of Yellow River.
- Adequate water quality along river.
- Making sure that riverbed does not to rise further by:
  - Reduction of sediment flowing into downstream reach.
  - Silt retention and sediment-water regulation in Middle reach.
  - Estuary harnessing.
  - Sediment scouring by water diversion and increasing discharge.

C. Visit to Xiaolongdi Dam

There was no discussion session with authority of the Dam. Dam was visited under the guidance of Authority of the Dam.

Xiaolangdi Project is located 40 km north of the ancient city of Luoyang in central China's Henan Province. It is a multipurpose structure.The project is the largest of its kind on the Yellow River, and is second only to the Three Gorges project on the Yangtze. It includes underground generating units, and silt-discharge channels.

The plant will only be utilised at full capacity at periods of peak demand and during the flood season. At most times, only two of the six generators will be on line to limit water discharge to 400 m^3/s.

D. Visit to Changling River and Three Gorges Dam

There was no discussion session with authority of the Dam. A tourist guide showed and briefed participants on the dam.

The Three Gorges Dam spans the Yangtze River and is the world's largest power station in terms of installed capacity (22,500 MW). An important function of the dam is to control flooding, which is a major problem for the seasonal river of the Yangtze. The reservoir's flood storage capacity is 22 cubic kilometres. This capacity will reduce the frequency of major downstream flooding from once every ten years to once every 100 years.

Millions of people live downstream of the dam, and many large, important cities (Wuhan, Nanjing & Shanghai) are situated adjacent to the river. China's most important industrial area are built beside the river.

E. Meeting Session in Beijing by Dr. Wan Yunyang on River Management

Mr. Wan Yuanyang presented an Article on “Tripod measured residual currents and sediment flux: Impacts on the silting of the Deepwater Navigation Channel in the Changjiang Estuary”. After presentation, Physical Model of Yangtze River Estuary was visited.

The Changjiang River is the largest river in Changjiang Estuary. The total sediment discharge is around 0.486 billion tons annually, which is about 2.7% of the entire world’s annual suspended sediment transport. In order to create a deep navigation channel, an engineering project called the Deepwater Navigation Channel (DNC) currently is currently being constructed. The third phase is

currently ongoing. Since the completion of phase 2, the annual amount of dredging required to maintain the DNC is far greater than the original estimation of 30 million m^3.

General Observations by Md. Harun-Ur-Rasheed, SE, Design Circle-l, BWDB, Dhaka

- The problem of Yellow River is very complicated. It is extremely difficult to control and the tasks are very monumental not only because of the more sand and less water and the disequilibrium between sediment and discharge, but also because of changing and fluctuating bed situation of the "Hanging River".
- The Yellow River is different from clear water river. Sedimentation problem of Yellow River are much more serious and complicated than that of Brahmaputra-Jamuna. But they arrived at a solution using the Xialongdi Dam.
- One of the major advantages to manage the Yellow River and Yangtze River is that they are not a Trans-Boundary River.
- The Lower Reach of Yellow River flows through a relatively plain land. In this reach, Yellow River is termed as a "Hanging River", because its bed is 4 to 6 meter higher than adjacent ground. They have constructed a strong levee on both banks with a series of groynes in most of the concave bends and critical locations. They are now constructing a Standardized Embankment. In 50 consecutive years, no dyke breaches have occurred in the lower reaches during the summer and autumn flood.
- Terrain of Bangladesh is relatively plain. We may use the experience of Yellow River in our country. However, more observation, study, experiment and model tests are needed to apply the experience of Yellow River in our country.
- Yellow River is managed by Yellow River Conservancy Commission. Its manpower is 40,000. Whereas BWDB has less than 9000 staff.
- Fund generation strategies for construction of The Three Gorges Dam is a lesson learning for Bangladesh. Bangladesh can follow the example of Three Gorges Dam for accumulating fund for its large, mega projects.
- The example of experiment of "residual currents and sediment flux" may be used to determine the mechanism of sedimentation in South West Area of Bangladesh, and different offtakes of Old Brahmaputra River, Pungli River, Dhaleswari River, Arial khan River etc.
- The study tour allowed us to observe the latest technology of their fast growing nation. The Yellow River and Yangtze River are unique in the world. Xiaolongdi Dam and The Three Gorges Dam are also unique creations of man. Experience gained will be very much helpful in our professional career.

Selected Photos

Figure 1 Briefing on Xialongdi Dam of Yellow River

Figure 2 Xialongdi Dam on Yellow River

Figure 3 Xialongdi Dam on Yellow River

Figure 4 Standardized Embankment of Yellow River

Figure 5 The Three Gorges Dam on Yangtze River

Figure 6 Navigation Locks at The Three Gorges Dam on Yangtze River

Figure 7 Meeting Session in Shanghai Estuary and Coastal Science Research Centre

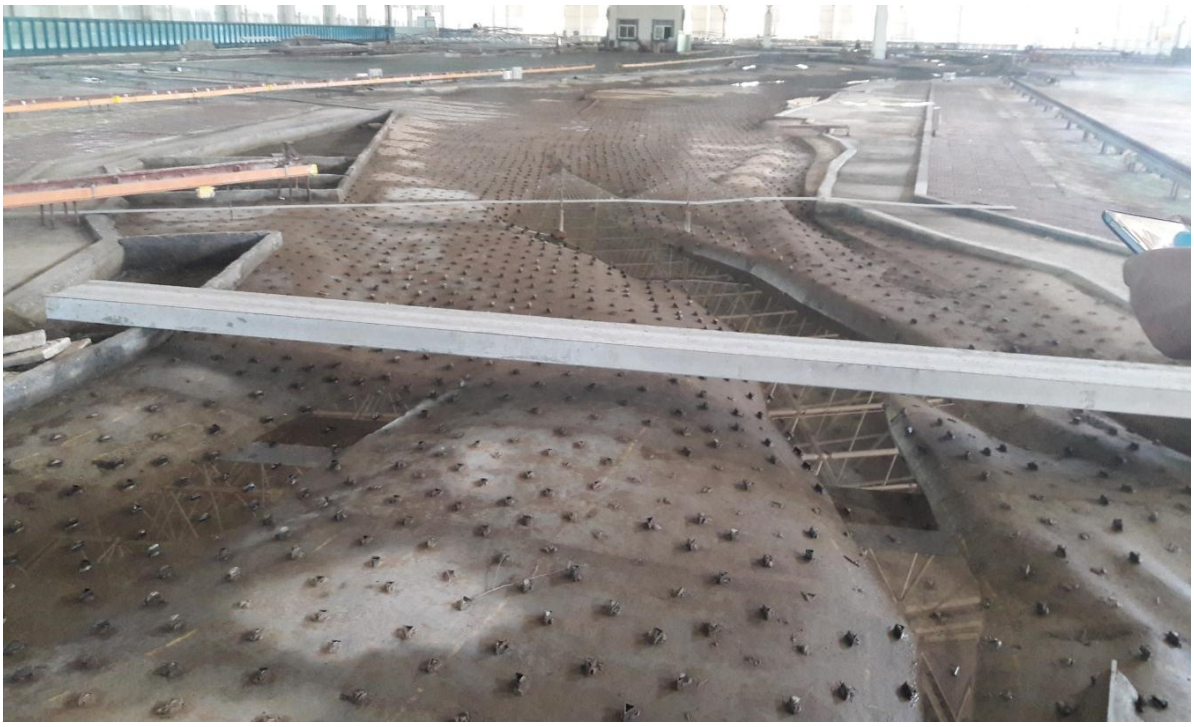


Figure 8 Yangtze River Model in Shanghai Estuary and Coastal Science Research Centre

Appendix-I Capacity Development Plan

October 2016 - December 2018 (Tranche - 1)

1. Background

FRERMIP includes a component capacity development for BWDB staff as well as for DDM staff. Capacity development includes a series of national and international training courses and study tours, support to organisational changes in BWDB and support to changing planning and budgeting procedures.

The capacity development component has started activities with the start of the project. Current progress is documented in the Quarterly Progress Report for the period July - September 2016. The present capacity development plan for the remainder of phase 1 of the project has been drafted based on initial experiences. It is envisaged that training activities will terminate at the end of FY 2017 - 2018 (June 2018).

The present document was prepared in line with the terms of reference of the Institutional Development Specialists.

2. Training activities

2.1. Capacity Building PMO

A. Local Courses

Riverbank Geotechnical Stability:

Two courses on River Bank Geotechnical Stability are included in the DPP. One of these courses will be held at BUET as part of the regular training programme that is initiated in late 2015. A more in-depth course with specialist input is proposed for selected BWDB staff.

Description of the in-depth course

Associated with increasing riverbank protection alongside the main rivers is the reconstruction of degraded flood embankment lines. While embankments in the past often eroded and had to be rebuild on an ad-hoc basis and were often densely populated with squatter communities, the reconstructed embankments alongside stable riverbanks will not face these problems. This means that higher standard embankments, designed for many decades of service need to be build. Furthermore, the embankment will provide much needed access to the areas alongside the riverbanks, often neglected and with insufficient access.

As a consequence of the increased embankment design standard, a state-of-the-art design approach is asked for. This includes the identification of different load cases, the skillful combination of relevant load cases, and advanced analysis of geotechnical and internal failure modes. Apart from the traditional slip-circle analysis following the modified Bishop method, sheet failure modes according to Janbu, and Morgenstern Price, as well as seepage and settlement analysis will be required. The BWDB Design Circle does not have access to the international state-of-the-art design skills and software.

The embankment design training is planned to be conducted at two consecutive levels:

(i) Training in Dhaka to a wide number of designers from all circles, providing the different design offices with relevant software and skills to use it, and a

(ii) Study tour for the best performing trainees to visit embankment works overseas.

The training in Dhaka is planned for the FY 2016/17, specifically the month of January 2017, to include the concrete case to review the 23km long embankment designed to be built at Kaijuri under FRERMIP.

The consultant has identified a suitable person with the following detailed tasks:

(i) Initial knowledge test and evaluation (one day)
(ii) Discussion with design staff on general embankment design issues (one day)
(iii) Field visits to different embankments alongside the main rivers, to identify issues and soil conditions (four days)
(iv) Training on identifying geotechnical parameters for embankment design relevant to the soil conditions in Bangladesh (two days).
(v) Training on slope stability analysis using different approaches with a recommended software package (two days)
(vi) Training on embankment specifications including soil types, workmanship, settlement, drainage provisions, and instrumentation for monitoring (two days)
(vii) Training on seepage analysis for different soil and design conditions (two days).
(viii) Final test and evaluation of trainees (one day)

The total training will comprise 15 working days (three calendar weeks). The best performing participants will be invited to participate in an overseas study tour.

River Bank Protection

Two courses on River Bank Protection are included in the DPP. One of these courses will be held at BUET as part of the regular training programme that is initiated in late 2015. A more in-depth course with specialist input is proposed for selected BWDB staff.

Description of the in-depth course

The success of riverbank protection depends fundamentally on the use of geosynthetics, prominently used as geotextile filters and sand-filled geotextile bags. However, there is a much broader range of applications. As discussed with Project Director and Director General BWDB during the Oxford conference, the project plans to train BWDB design engineers in the details of geotextile applications.

The embankment design training is planned to be conducted at two consecutive levels:

(i) Training in Dhaka to a wide number of designers from all circles, and a
(ii) Study tour for the best performing trainees to visit different types of riverbank protection works in Europe, with special focus on older work to explain performance changes and maintenance requirements over time.

The training in Dhaka is planned for the third quarter of FY 2016/17, to include the concrete case of ongoing design works of the design office.

The resource person will be the leading geotextile specialist of the Federal Waterways Engineering and Research Institute of Germany (Bundesanstalt für Wasserbau), who has advised JMREMP during the initial phase of developing the geotextile bag technology (refer to Special Report 26, Sand-filled geotextile bags, March 2008). with the following detailed tasks:

(i) Geosynthetics – material properties and general applications (one day)
(ii) Geosynthetics in hydraulic engineering (one day)
(iii) Field visits to different riverbank protection sites alongside the main rivers, to identify issues with the use of geosysthetics (three days)

(iv) Review and assessment of the use of geosysthetics for river engineering in Bangladesh, including development of a simplified design approach (two days).
(v) Determination of key considerations for updates guidelines and manual on riverbank protection (two days)
(vi) Final test and evaluation of trainees and reporting (one day)

The total training will comprise 10 working days (two calendar weeks). The best performing participants will be invited to participate in an overseas study tour.

River Training Techniques:
Two courses on Training Techniques are included in the DPP. One of these courses will be held at BUET as part of the regular training programme that is initiated in late 2015. A more in-depth course with specialist input is proposed for selected BWDB staff.

Description of the in-depth course
River training and the provision of a stable river corridor play a fundamental importance for defined distributary off takes and regulated inflow. The off take structures have the main function to act as barrier during high flood flows, preventing excessive flooding on the floodplains. At the same time the barriers have to provide unimpeded and dry season flow and avoid entrainment of excessive amounts of coarse sediment. During the Europe trip with Project Director and Director General BWDB, a large number of barriers were visited to compare different approaches and designs. Of specials importance are operation in silt laden water and navigation. To provide the design office with a first overview of these types of structures, an international resource person will conduct a first training on planning and design principles.

The training is planned to be conducted at two consecutive levels:
(i) Training in Dhaka to a wide number of designers from all circles, and a
(ii) Study tour for the best performing trainees to visit different types of barriers in Europe, with special focus on design, operation and maintenance, and navigation requirements.

The training in Dhaka is planned for the FY 2016/17, specifically the month of March 2017, to developed a concrete example for a smaller distributary.

The resource person will be and experience designer with practical experience and the following detailed tasks:
(i) General planning principles (one day)
(ii) Foundation and structural components (one day)
(iii) Mechanical components (one day)
(iv) Field visits to different regulators and pump station sites, to identify issues with the use of geosysthetics (three days)
(v) Review and assessment of the existing work, including development of an initial planning and design approach for distributary offtakes (two days).
(vi) Determination of key considerations for updates guidelines and manual on river training (two days)
(vii) Final test and evaluation of trainees and reporting (one day)

The total training will comprise 10 working days (two calendar weeks). The best performing participants will be invited to participate in an overseas study tour.

River Survey and Evaluation and Underwater Investigations
The analysis of river processes is fundamental to assess the stability of existing riverbank protection works, the risk to its stability during flood season conditions, the amount of adaptation works, and future larger scale changes potentially endangering the work in future. To this end the trainees will participate in regular flood season surveys conducted from June to October in the river reach from Jamuna Bridge to Harirampur, and at additional locations of interest.

The purpose of the course is to provide the participants with advanced skills in the assessment of riverbank protection performance. The course will specifically address dry season investigations through systematic diving and flood season investigations involving the following suite of survey techniques.

- Provide an overview of survey techniques and methodology through participation in regular flood season surveys during the flood season 2017 and 2018;
- Provide data processing skills in preparing bathymetric maps, ADCP transect plots, and float tracks
- Sharpen the evaluation skills in comparing different survey data and changes to the as-built-conditions for established riverbank protection works, as well as on larger scale river changes based on float tracks and ADCP transects. The added benefit of this training is that systematic monitoring of established riverbank protection work in the whole reach will be provided for two flood seasons.

Construction Management
The purpose of this course is to train practitioners in the application of FIDIC contract documents. The course will be given by a specialised national training organisation.

Project Management
Two **t**raining courses on Project Management are currently discussed with the Bangladesh Institute of Management (BIM). Terms of reference were prepared in October 2016 focusing on the following relevant project management skills of BWDB staff:

- Understanding a project: its activities, objective and context.
- Scheduling work (preparing weekly/monthly work plans) and delegating tasks.
- Coordinate work and the availability of instruments and resources.
- Give clear orders and instructions and verify that these are understood.
- Monitor progress and check completion
- Monitor budgets.
- Be receptive to feedback (from outsiders) and act on it.
- Communicate with staff, give clear feedback on performance.
- Motivate staff and build teams
- Awareness of management styles and expectations of staff

The aim of the training is to strengthen basic skills of BWDB staff in management to help them to implement projects effectively and efficiently. It is envisaged that 2 trainings (each for 20 BWDB staff) will be given. The duration of the training will be 5 days.

BIM has been requested to submit a detailed proposal, including description of the modules, resource persons and costs.

Leadership

Two training courses on Leadership are currently discussed with the Bangladesh Institute of Management (BIM). Terms of reference were prepared in October 2016 focusing on the following relevant project management skills of BWDB staff:

- Communicate a clear vision why the project / organisation exists.
- Explain goals, plans and roles of staff.
- Act as a link with the outside world, communicate clearly with all relevant stakeholders.
- Create a positive team feeling and open / positive organisational culture.
- Inspire people and give opportunities for further (professional) development.
- Give opportunities / room to realise potential.
- Explain a longer term perspective.
- Take risks and give backing to good people, give clear feedback on performance
- Be a role model.
- Awareness of leadership styles and expectations of staff.

The aim of the training is to strengthen basic leadership skills of BWDB staff to help them to develop into leaders in the organisation. It is envisaged that 2 trainings (each for 20 BWDB staff) will be given. The duration of each training will be 5 days

BIM has been requested to submit a detailed proposal, including description of the modules, resource persons and costs.

Other Local Training Courses
Discussions revealed that the relevance of the training courses on Strategic Management and Resettlement should be reviewed. It is proposed that this is done during the Mid-Term Review.

Training DDM staff
The involvement of and cooperation with DDM is presently of limited scope. Moreover, DDM has recently benefited from a substantial UNDP led project with an important component of staff development. Further training will be undertaken when a clear need has been identified. This will be reviewed during the Mid-Term Review.

B.1. Overseas Courses

One **Overseas Training on River Morphodynamics and Erosion Protection Practices** (4 weeks) is scheduled for FY 2016/17. The course includes River Morphology, Erosion Control and Bank Protection, River training techniques (including the use of Geo-bags and their Design) and Quality control/O&M. The course is currently being held at UNESCO-IHE in the Netherlands, with 8 BWDB participants.

The recent ADB Review Mission expressed opposition to the proposed overseas training on **Financial Management**. The purpose would be better served by organizing a local course at the ADB Resident Mission in Dhaka. The ISPMC has omitted this overseas training course from its current tentative program, but it may be reconsidered in future if the benefits from the overseas training become more evident.

B.2. International Technical Study Tours
A study tour was made to the Yellow and Yangtse Rivers in China in August 2016. Two more international technical study tours are included in the DPP. These study tours are scheduled for FY 2016 -2017.

Technical Study Tour USA
Preparation of the **Technical Study Tour to the Mississippi River** is on-going. The study tour is expected to take place by spring 2017.

Technical Study Tour India
Preparation of the **Technical Study Tour to the Ganges River** is on-going. The study tour is expected to take place in April 2017, and will also include participation in the International Conference on the Status and Future of the World's Large Rivers. For this conference two papers are submitted and have been accepted.

Other Technical Study Tours
In addition to the two technical study tours included in the DPP a second, more technically focused study tour, is suggested to the **Yellow and Yangtse Rivers**. This study tour will cover in detail more technical aspects of river stabilisation of the Yellow and Yangtze Rivers.

2.3 Capacity Building ISPMC

C. Workshops, training and seminars

- A workshop on Capacity Building will be held on 28 October 2016. DG BWDB has agreed to assist in the workshop. Participants will include senior staff of BWDB and selected external resource persons.
- In December 2016 a workshop will be held on the initial draft Master Plan
- In January 2017 a workshop will be organised for site selection for project 2
- In May 2017 a workshop will be organised to discuss the feasibility study for project 2.
- Four other workshops on subjects still to be determined are envisaged.

Field Training Europe
It is suggested by the ISPMC that the best 6 students of the courses on River Bank Geotechnical Stability, River Bank Protection and River Training techniques could be invited to participate in the study tour. The study tour will visit flood and erosion protection works mainly in North-West Europe (UK, Netherlands, Germany). Aim of the study tour is to demonstrate state of the art technology for river bank protection and river training.

D. Conferences and Study Tours
Senior project staff will participate in (three) international conference and seminars relevant for FRERMIP, to share experiences with relevant organisations in other countries. The conferences and seminars are still to be identified. Participation in the conferences and seminars will be combined with a brief tour to visit projects and works relevant for FRERMIP.

Other capacity building activities
The main other capacity building activities include the establishment of the office of the Chef Engineer River Management (CE-RM), assigning a dedicated Design Circle for work on river management designs and promoting planning and budgeting with framework DPP's with block allocations.

The Institutional Development Specialists will continue to pursue these changes. The establishment of the office of CE-RM depends on approval of the needs-based organisational set-up by the Finance Ministry. The approval of a dedicated Design Circle is in principle an internal decision of BWDB, and can be taken even before the office of CE-RM.

The FRERMIP capacity strengthening specialists will organise regular workshops with senior BWDB staff to highlight different issues relevant for capacity strengthening. On 28 October a workshop was held chaired by DG BWDB. Discussions centred mostly around essential issues such as staff development and its relation to promotion policy, induction of young engineers in the organisation and strengthening the communication of BWDB's role and contribution to Bangladesh society in general, and to higher authorities specifically. It is envisaged that such workshops will be organised at regular intervals.

3. Scheduling of activities

The activities included in the capacity development plan are tentatively scheduled as is shown in table 1.

Table 1: Tentative scheduling training activities FY 2016/17 and FY 2017/18

Sl.	As per DPP: Detail Training Plan (BWDB)	Courses	Trainees	Compl. up to Sep/16	FY 2016/17 Q2	FY 2016/17 Q3	FY 2016/17 Q4	FY 2017/18 Q1	FY 2017/18 Q2	FY 2017/18 Q3	FY 2017/18 Q4	FY 2018/19 Q1	FY 2018/19 Q2	Yet to be Compl.	Program Totals	Observations
Capacity Building PMO																
A- Local Training																
1	River Engineering	2	20	2										0	2	
2	River Training Techniques	2	20			1		1						2	2	BUET
3	Riverbank Geotechnical Stability	2	20			1		1						2	2	BUET
4	Riverbank Protection	2	20			1		1						2	2	BUET
5	Stratergic Planning	2	20											0	0	To be reconsidered during MTR/ BIM
6	Survey and Evaluation	2	20					1			1			2	2	
7	Underwater Investigations	1	20											0	0	Scope yet to be finalized
8	Resettlement	2	15											0	0	To be reconsidered during MTR
9	Environment	2	15											0	0	One training done by ISPMC at 3 sites
10	Leadership	2	20				1	1						2	2	Venue: To be decided
11	Project Management	2	20				1	1						2	2	Venue: To be decided
12	Construction Management	2	20		1					1				2	2	Venue: Bagyakult Training Centre
13	Technology Transfer (counterpart)	9	9											0	0	Scope yet to be finalized
14	Capacity Building for DDM	2	15											0	0	To be reconsidered during MTR
B- Overseas Training																
B.1	River Morphology	1	8	1										0	1	IHE (Netherlands)
B.2	River Training Techniques	1	8					1						1	1	IHE (Netherlands)
B.3	Financial Management	1	5											0	0	To be reconsidered during MTR
C- Overseas Study Tour																
C.1	North America[1]	1	10			1								1	1	
C.2	China[1]	1	10	1					1					1	2	Additional Technical China Tour scheduled
C.3	India[1]	1	10				1							1	1	
PMO Totals		**40**	**305**	**4**										**18**	**22**	
Capacity Building ISPMC																
C. Workshops, Traininig and Seminars (Under provisional Sum, line-1)																
	Workshops Capacity Strengthening			1	1		1		1		1			4	5	
	Workshop initial Master plan				1									1	1	
	Workshop site selection project 2					1								1	1	
	Workshop feasibility study						1							1	1	
	Other workshops							1	1	1			1	4	4	Subjects to be determined as per need
	Training: Environment at 3 sites			1										0	1	Chauhali, Harirampur & Zaffarganj
D. Conferences and Study Tours (Under provisional Sum, line -2)																
	International Conference on Scour and Erosion			1										0	1	12-15 Sep-16 at Oxford,UK 3 Persons
	Study Tour NW Europe								1					1	1	6 participants plus 1 group leader
	International Conferences and Seminars							1	1					2	2	Subjects to be determined
ISPMC Totals				**3**										**14**	**17**	

[1] To include one official from MoWR, Planning Commision, ERD and IMED, and six from BWDB.

4. Budget

The budget required to executed the capacity development plan is presented in Table 2A (US$) and 2B (BDT).

Table 2A: Budget Capacity Development October 2016 - December 2018 (US$)

Item	Allocation DPP	Expenditures up to 30 Sept 2016	Budget Oct 16 - June 17	Budget July 17 - June 18	Budget July 18 - Dec 18	Balance
Capacity Building PMO						
A. Local Training Courses						
Course River Bank Geotechnical Stability			53500			
Course River Bank Protection			45500			
Course River Training Techniques			45500			
Course Survey and Evaluation / Underwater Inv.				19400		
Courses Leadership			10300	10300		
Courses Project Management			10300	10300		
Course Contruction Management			19400	19400		
Total A: Local Training Courses			184500	59400	0	
B.1. Overseas Training Courses						
Course River Training Techniques (IHE)				140000		
Total B.1: Overseas Training Courses			0	140000	0	
B.2. Overseas Study Tours						
Study Tour China				90000		
Study Tour North America			100000			
Study Tour India			85000			
Total B.2: Overseas Study Tours			185000			
Total budget A+B.1+B.2 Capacity Building PMO	940000	189524	369500	199400	0	181576
Capacity Building ISPMC						
C. Workshops, Training, Seminars						
BWDB management Round Tables (4)			1500	3000	1500	
Workshop Initial Master plan			2000			
Workshop Initial Master plan			2000			
Workshop Feasibility study			2000			
Other workshops (4)				4500	1500	
Total Workshops, Training, Seminars	80000	19607	7500	7500	3000	42393
D. Conferences and Study Tours						
International conferences and seminars (2)				60000		
Study Tour Europe				40000		
Total International Conferences and Seminars	90000	30000	0	100000	0	-40000
Total budget Capacity Building ISPMC	170000	49607	7500	107500	3000	2393
Total Budget Capacity Building	1110000	239131	377000			183969

Note: Total PMO budget for Capacity Strengthening in the DPP is 1.4 million. This includes 0.46 million for the development of a MIS. This activity is not included in the Capacity Development Plan.

Table 2B: Budget Capacity Development October 2016 - December 2018 (BDT lakh)

Item	Allocation DPP	Expenditures up to 30 Sept 2016	Budget Oct 16 - June 17	Budget July 17 - June 18	Budget July 18 - Dec 18	Balance
Capacity Building PMO						
A. Local Training Courses						
Course River Bank Geotechnical Stability			42,80			
Course River Bank Protection			36,40			
Course River Training Techniques			36,40			
Course Survey and Evaluation / Underwater Inv.				15,52		
Courses Leadership			8,24	8,24		
Courses Project Management			8,24	8,24		
Course Contruction Management			15,52	15,52		
Total Local Training Courses			147,60	47,52	0,00	
B.1. Overseas Training Courses						
Course River Training Techniques (IHE)				112,00		
Total Overseas Training Courses				112,00		
B.2. Overseas Study Tours						
Study Tour China				72,00		
Study Tour North America			80,00			
Study Tour India			68,00			
Total Overseas Study Tours			148,00	72,00	0,00	
Total budget Capacity Building PMO	752,00	151,62	295,60	231,52	0,00	73,26
Capacity Building ISPMC						
C. Workshops, Training, Seminars						
BWDB management Round Tables (4)			1,20	2,40	1,20	
Workshop Initial Master plan			1,60			
Workshop Initial Master plan			1,60			
Workshop Feasibility study			1,60			
Other workshops (4)				3,60	1,20	
Total Workshops, Training, Seminars	64,00	15,69	6,00	6,00	2,40	33,91
D. Conferences and Study Tours						
International conferences and seminars (2)				48,00		
Study Tour Europe				32,00		
Total International Conferences and Seminars	72,00	24,00		80,00		-32,00
Total budget Capacity Building ISPMC	136,00	39,69	6,00	86,00	2,40	1,91
Total Budget Capacity Building	888,00	191,30	301,60			75,18

Note: for conversion US$/BDT the rate used in the DPP is used: 1 US$ = BDT 80.00