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. 09

FOR

JULY-SEPTEMBER 2017

Prepared by:

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FRERMIP
Flood and Riverbank Erosion Risk Management Investment Program

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Reference:
ISPMC – FRERMIP
424
12 November 2017

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 : **Submission of Quarterly Progress Report No. 09 July-September 2017.**

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. 09 for the period July to September 2017 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).

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

Yours sincerely,
JV Northwest Hydraulic Consultants – Euroconsult Mott MacDonald

Knut Oberhagemann
Team Leader

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As per enclosed Distribution List

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ABBREVIATIONS AND ACRONYMS

ADB (BRM)	-	Asian Development Bank (Bangladesh Resident Mission)
BDT	-	Bangladesh Taka
BWDB	-	Bangladesh Water Development Board
CbFRM	-	Community-based Flood Risk Management
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
GFM	-	Grout Filled Mattress
GOB	-	Government of Bangladesh
GON	-	Government of the Netherlands
ha	-	hectare
INGO	-	Implementation Non-Government Organization
ISPMC	-	Institutional Strengthening and Project Management Consultants
JLB-2	-	Jamuna Left Bank 2 Sub-Project
JRB-1	-	Jamuna Right Bank 1 Sub-Project
JVT	-	Joint Verification Team
km	-	Kilometer
LA	-	Land Acquisition
MDIP	-	Meghna-Dhonagoda Irrigation Project
Mil	-	Million (1,000,000)
MIS	-	Management Information Systems
MoDM	-	Ministry of Disaster Management
MoWR	-	Ministry of Water Resources
O&M	-	Operation and Maintenance
PM	-	Project Manager (DDM)
PD	-	Project Director (BWDB)
PIRDP	-	Pabna Irrigation and Rural Development Project
PLB-1	-	Padma Left Bank 1 Sub-Project
PMO	-	Project Management Office (BWDB)
PMU	-	Project Management Unit (DDM)
PPTA	-	Project Preparatory Technical Assistance
QPR	-	Quarterly Progress Report
SMO	-	Sub-Project Management Office
ToR	-	Terms of Reference
USD	-	United States Dollars

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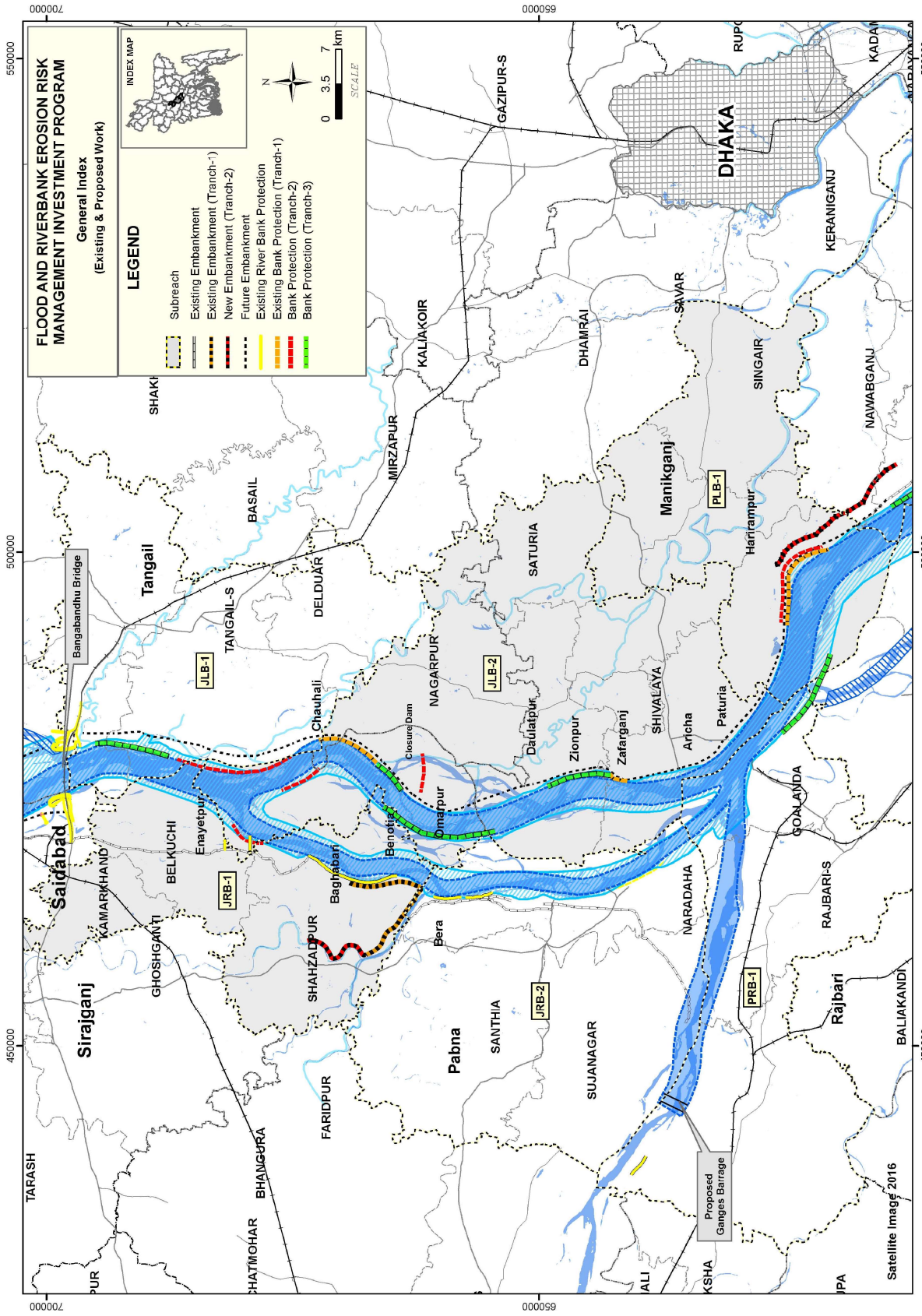


Table 1. Progress at a Glance

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)	58	100	90	248
Government of The Netherlands (GON)	15.3	0	0	15.3
Government of Bangladesh (GOB)	23.3	45.3	34.8	103.4
Total	96.6	145.3	124.8	366.7

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	23-30 July 2017

4. Assets and Physical Progress

Proposed Project Assets	Goods	Services	Works	eXtra	Total	Available
Project Program Best Estimate (Tk Mil)	1399	1232	3532	2514	8677	8685

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	65	4
	2.3	Tendering and Contract Award	6	60	4
	2.4	Land Acquisition and Resettlement	8	75	6
	2.5	Project Management	6	75	5
	2.6	Physical Completion of Works	32	80	26
	2.7	Financial Disbursements	4	75	3
3. Knowledge Base & Capacity	3.1	Knowledge Base & Tech. Studies	4	60	2
	3.2	CBFRM Activities	6	35	2
	3.3	MIS Project Mgmt Module	4	10	0
4. River Study, Piloting & Master Plan	4.1	Long-term stabilization study	4	90	4
	4.2	Land recovery piloting	2	25	1
5. Preparation; Project-2	5.1	Feasibility Study; Project-2	6	60	4
	5.2	Detailed Design; Project-2	4	0	0
Totals			**100**		**66**

5. Financial Progress

Financial Indicator	BDT Million	US$ Million	% of Total
Estimated Project Cost (Source: DPP Page 1)	8,685	108.56	100
Physical Progress	5,460	68.25	63
PMO Expenditures	4,549	56.86	52
ADB Disbursement	3,799	48.48	44
Total Reimbursement	2,522	32.20	29

1. 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 Irrigation and Rural Development Project (PIRDP) 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. This initiative includes reclaiming floodplain land lost during the widening process which has persisted since the 1960s[1].

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. The first 17 km of riverbank protection, concentrating on the critical underwater part, were completed during the dry season 2015/16. This first project lays the foundation for systematic river stabilization supported by FRERMIP over three successive projects 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 sub-projects: Jamuna Left Bank 2 (JLB-2), Jamuna Right Bank 1 (JRB-1) and Padma Left Bank 1 (PLB-1); refer to **Figure 1.1** and **Ref 5.** 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 contribute to 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 sub-project reaches.

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

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).

The project scope and implementation arrangements have not fundamentally changed from those outlined in the ADB Report and Recommendation of the President (**Ref.** 2), with the exception of the postponement of some activities due to the reduction of available project financing. 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

Under Project-1, 18 km of riverbank protection[2] and 23 km of flood embankments (rehabilitation and new; refer to the Project Map (**Figure 1.1)** will be implemented. Project outputs will also include community capacity development for flood risk management activities and 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. Progress at a Glance**, placed at the beginning of the report, provides a summary of project information including salient reference data, estimates of project assets, plus physical and financial progress indicators, in Bangladesh Taka (BDT), US dollars (USD) and percent completion.

Delays in the bidding process for key work contracts, namely 23 km of embankment construction, requires that Project-1 will be extended by a minimum of one construction season, until June 2019. The Project Management Office (PMO) has revised the current DPP to this end, which was approved by the Ministry of Water Resources on 15 June 2017. The revised DPP also addresses the reduced level of loan funding by deferring a number of activities to Project-2[3] and increasing budgets to reflect revised resettlement and construction costs. A zero-cost Variation Order for the ISPMC was accepted on 27 July 2017. The PMO still expects that the modified Project outputs (**refer to Appendix-A, Table A-5**) can be fully achieved by the original scheduled closing date of 30 June 2019.

1.3 *Overall Progress*

Project-1 was very successful in its core activity, the construction of riverbank protection, during the dry season 2015/16. The progress during 2016/17 dry season concentrated on the continuation of the ongoing contract works. In total, 18 km riverbank protection (underwater with temporary or permanent wave protection above low water level) has been substantially completed. There was significant damage to the permanent wave protection at Chauhali, which may require a major design change for future works. The BWDB has formed an investigation committee to provide recommendations. This notwithstanding, the underwater protection has performed very well, despite deep scouring to, in places, 25 m below the original apron setting level.

[2] The length of protection work has increased from 15 to 18 km due to changes in the river morphology at Chauhali and Harirampur between the feasibility study and work start.

[3] Project support service contracts deferred due to lack of funding include: S-05 Participatory O&M, S-08 Annual Development Plan MIS, S-09 Asset MIS, and S-10 Environment Management (**Ref. 4**).

The overall weighted project progress is presented in **Table 1. Progress at a Glance** and shows that the weighted progress achieved to the end of the reporting period is around 66%. Compared with the total estimated projected cost, the physical progress is 63%, PMO expenditure is 52%, ADB (plus GON) disbursement is 44%, and total reimbursement is 29%.

1.4 *This Report*

Quarterly Progress Report No. 9 covers the period 01 July to 30 September 2017. The report describes activities carried out during the quarter, which primarily included some residual emergency repair works, river monitoring surveys, and Project-2 feasibility study activities.

2. PROJECT ACTIVITIES

2.1 *Introduction*

The BWDB FRERMIP Project Management Office (PMO) started functioning in April 2014. That office was initially engaged in preconstruction and procurement activities, and since November 2015 with construction activities at three sites (through two Sub-Project Management Offices (SMOs)). At the end of the second construction season, a total of 18 km of riverbank protection has been constructed under the project: 7.2 km at Chauhali, 2.0 km at Zafarganj and 8.8 km at Harirampur.

During the reporting period, some residual emergency repair works continued into July. These repair works concentrated primarily in a reach downstream of Solimabad. This reach is located 2 km downstream of Chauhali revetment works. A number of slope failures occurred during the dry season and at the beginning of the flood season along this reach. The first major adaptation works will be implemented during the upcoming 2017/18 dry season.

The Institutional Strengthening and Project Management Consultants (ISPMC) have been working since September 2015 and have completed the following activities: prepared the Project Inception Report and the first River Study team report (Strategic Framework on River Stabilization), supported overall project management and capacity building activities, advised on design and construction issues, and prepared the terms of reference for several supporting studies. The remaining River Study work is ongoing and the updated feasibility study is under preparation **(Section 2.3.10)**.

The status of implementation activities in the reporting quarter is discussed in the following sections, and summary and detailed tables are provided in **Appendix-A** and **Appendix-B**, respectively. The history of contractual awards and disbursements, as projected by ADB and as actually achieved, is shown in **Figure 2.1,** along with the actual total reimbursements. The graph has not been corrected for the expected reduction in loan amount from US$ 65 to around 58 million.

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. The cost of the proposed 23 km of embankment (plus associated structures) has recently been revised to BDT 1,221 million based on detailed cost estimates from the PMO and the Koitola SMO (**Table A-5**). The 18 km of riverbank revetment is expected to cost BDT 1842 million, plus BDT 1153 million for geo-bags. 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 8677 million (Goods BDT 1399 million, Services BDT 1232 million and Works BDT 3532 million, plus BDT 2514 million of additional assets included in the DPP; primarily land acquisition).

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**). Note that **Table A-5** also contains the revised DPP values.

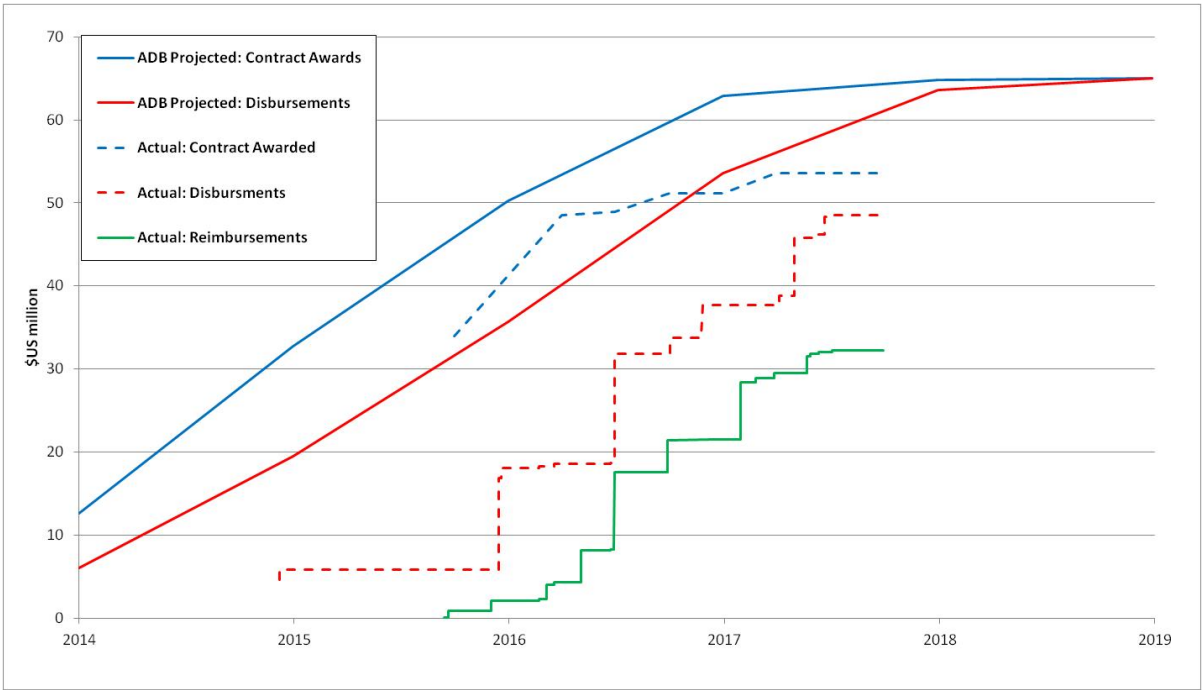


Figure 2.1. Contract, Disbursement and Reimbursement History of ADB Loan

To date, the PMO has expended BDT 4549 million, BDT 550 million under Revenue Categories, and BDT 3999 million under Capital Categories. The Capital Categories are mostly related to the ongoing riverbank protection works at Chauhali and Zafarganj and Harirampur, and land acquisition for the embankment in Koijuri (subproject JRB-1).

One of the main reasons for revising the DPP was because the available loan amount from ADB had reduced from US$65 million to US$58 million. However, the revised total DPP amount in BDT actually increased from BDT 8286 to BDT 8685 million. The Government of Bangladesh contribution has increased significantly due primarily to the large increase in land acquisition costs from BDT 885 ($US11 million) to BDT 2083 million ($US26 million).

2.2.2 Design Activities

The ISPMC is in the process of completing a review of the proposed tender designs and technical specifications for the 23 km of embankment works, which includes alternative cost effective work methods. It is hoped that with these cost saving measures, that the bid values received from contractors will be closer to the available budgeted amounts (**refer to Section 2.2.3).**

Due to the slope failures that occurred to permanent wave protection works in Chauhali and elsewhere, on 04 July the BWDB formed a committee to assess the cause of the slope failures. The committee members include two professors from BUET.

Based on results of the 2016 flood season bathymetric surveys, the ISPMC recommended the implementation of adaptation works at Chauhali and Harirampur to strengthen the launched apron,

in locations with more than a 30 m slope length and 15 m vertical height. However, given the priority of emergency repair works, the adaptation works was deferred to the 2017/18 dry season. It is planned that the adaptation works will be designed based on a high-resolution multi-beam echo-sounder survey.

A complete history of design progress details, on an individual asset basis, is given in **Table B-1**.

2.2.3 Bidding Activities

No major contracts have been awarded during this quarter. The 5 tenders for construction of the Koitola embankment have been received twice and both times the quoted values were considered excessively high compared to the estimated values. It is intended to retender for a third time after reviewing the design and technical specifications. It is hoped that the revised tender notice will be issued by the end of October so that the construction works may still be initiated by the start of 2018. Again, electronic tendering will be allowed.

A complete history of bidding progress details, on individual contract basis, is given in **Table B-2**.

2.2.4 Implementation Activities

The construction works at Chauhali, Zafarganj and Harirampur have been essentially completed. The length of river bank protection works, has been extended from the original envisioned length (18 km from 16 km) to accommodate rapidly changing river morphology.

However, over the two previous flood seasons massive scour has occurred along the Chauhali bank protection, which caused the river bed to lower by up to 22 m in places over a length of about 4 km. A total of 13 slope failures occurred at Chauhali during the reporting quarter. All are categorized as Mode 2 & 3 failures described as follows: "slope failure occurred in the permanent protection work mostly because the design was based on insufficient geotechnical understanding, which, in combination with the failure of the 'berm', caused a slip circle failure". All these failures except one have been repaired using boat dumping and slope pitching. A detailed chronologic history of the failures that occurred at Chauhali is provide in **Appendix-G**.

Solimabad, located 2 km downstream of the original Chauhali reach, has been severely damaged due to river erosion during 2017. Up to the end of the reporting period, emergency protection work has been installed along parts of the eroding riverbank consisting of a total of 113,000 geo-bags designed for a 2 km reach. A bathymetric survey was conducted on 29-September-2017, so it should be possible to determine the performance of these emergency works.

At Zafarganj, permanent wave protection was completed during the 2016/17 work period and the overall length of the protection works was increased by 600 m. The flow conditions at Zafarganj during the 2017 flood season were favorable. A char diverted the main flow away from the bank line. As a result, no significant scouring along the protected length has occurred.

The bank protection works at Harirampur performed well during the 2017 flood with no major bank failures reported. The scour hole has not moved during the flood season and has not significantly deepened, but rather has had a tendency to fill up, especially at the upstream end, where a char has been moving downstream into the scour hole.

For the adaptation and repair works in the 2017/18 construction period, a total budget of BDT 10 crore is available for all three riverbank protection sites. This budget is sufficient for the procurement and placement of around 170,000 additional geo-bags.

Extensive flood season monitoring, building on the survey methodology applied during the 2016 flood season, has been conducted during the 2017 flood season. Apart from a large survey covering the lower Jamuna accompanied by several rounds of discharge measurements, regular surveys at the newly protected sites have been conducted. The riverbank protection work at Chauhali, Zafarganj and Harirampur was surveyed in May, June, July and August 2017, using a single-beam echo-sounder. A multi-beam echo-sounder (MBES) survey is to be conducted at Chauhali during the end of the flood season of 2017 to provide a baseline for detailed planning of the adaptation works. This MBES will be able to distinguish between geo-bags and sand and will permit the detailed assessment of the geometry in the failure zones.

Table B-3 shows implementation details for goods, services and works contracts, on an individual contract basis. The table includes new, carried-over and completed contracts. It shows actual progress during the reporting quarter and projected progress for the next quarter. The best estimate of final cost has been updated as per the revised DPP.

2.3 *OTHER PROJECT ACTIVITIES*

Other project activities that are documented in the following sections include:

1. Support Studies
2. Environmental Management
3. Resettlement Services
4. Livelihood Development
5. Gender and Development
6. Community-Based Flood Risk Management
7. Capacity Building
8. River Study
9. Pilot Works
10. Project-2 Feasibility Study
11. 2017 Flood Survey Monitoring Program

2.3.1 Supporting Studies

According to the revised DPP, there are a total of 6 service contracts for supporting studies. The status of all support studies is summarized in **Table 2.**

Table 2. Supporting Studies

Pkg.	Study Name	Present Status
S-02	Resettlement Plan Implementation	Resettlement INGO signed contract with BWDB on 16 March 2016, and work is ongoing **(refer to Section 2.3.3)**.
S-03	Livelihood Development Services	The ToR was submitted to PMO on 25 May 2016 and was sent to ADB shortly after for their concurrence. A meeting is schedule between ISPMC and ADB for 08 October 2017 to discuss this issue.
S-04	CbFRM Services	The Expression of Interest (EoI) was evaluated by DDM on 27 March 2017, and all pertinent documents were sent to ADB for their concurrence on 11 May 2017. ADB approval is expected early next quarter **(refer to Section 2.3.6)**.
S-05	Multi-Beam Echo Sounding (MBES) Survey	The finalized MBES Survey ToR was submitted to the PMO on 27 July 2017, and was sent to ADB shortly after for their concurrence.
S-06	Erosion Prediction Services	CEGIS is conducting the study. The progress of work for their current contract is estimated to be 75 percent.
S-07	Asset MIS	It has been decided that due to time and funds constraints that the Asset MIS component will be deferred to Project-2. In Project-2, the new component will be properly renamed as the Risk-Based O&M System since an existing SIMS (Scheme Database Inventory and Mapping System) already provides a convenient means of displaying asset and scheme data.

2.3.2 Environmental Management

In July 2017, it was decided by the BWDB PMO that the biodiversity/fisheries study would be deferred until Project-2 due to current budget constraints. The Terms of Reference for this study had previously been prepared by the ISPMC Environmental Specialists.

The January-June 2017 Semi-annual Environmental Monitoring Report for ongoing construction works at Chauhali, Harirampur and Zafarganj was submitted to the PMO in July 2017.

2.3.3 Resettlement Services

A number of pending reports on resettlement activities were completed during the reporting quarter. The draft semi-annual report for July - December 2016 was entrusted to the ISPMC's National Resettlement Expert for finalization and submitted to ADB through the PMO on 31 July 2017. The semi-annual report for January - June 2017 was also prepared and submitted to ADB during the current quarter. The ISPMC has provided guidance to the INGO in the proper preparation of these progress reports, and has directed the INGO to prepare the reports themselves in future.

The INGO has not yet finalized the monthly progress report for February - March 2017. Their report covered two months, while separate monthly reports are required. During a previous visit by the ADB consultant, concern was raised regarding prompt, complete and accurate reporting by the INGO. The ISPMC has provided the INGO with a new format and guided them to prepare a more

comprehensive monthly progress report. Subsequently, the INGO submitted two monthly progress reports (July and August 2017) using the new format, with further refinement expected.

During the quarter, the additional Resettlement Plan (RP) of Zafarganj for 0.6 km was submitted to ADB and it has been approved. The draft RP for the 23 km embankment from Koijuri to Baghabari has been submitted to ADB for approval, and the INGO is currently working to accommodate ADB's comments. The INGO has conducted the necessary surveys and identified the Project Affected Persons (PAPs) so that they can be issued with ID cards prior to payment of additional compensation. Payments of land compensation by the District Commissioner, as well as issues addressing social safeguard compliance of ADB policy are also in progress.

During the quarter, the ISPMC participated in three coordination meetings (01 August, 28 August, and 07 September) to review the INGO's progress, to address the corrective measures stipulated by ADB for Chauhali and Zafarganj, and to plan future actions. Details regarding the Corrective Action Plan to comply with the Loan Agreement are provided in **Appendix-E**. These actions include the preparation of RPs and completion of all necessary surveys prior to the start of embankment construction. These meetings were attended by the PD, SE and the Chief Resettlement Officer (CRO) of PMO, INGO staff, ISPMC representatives, and SMO Executive Engineers.

During the quarter, the previous CRO, Mr. Majibur Rahman was transferred and replaced by Mr. A. M. Mustofa Sorwar. Also during the quarter, both the INGO Team Leader (TL) and Deputy Team Leader (DTL) left the INGO. To date, a new DTL joined the INGO team, but no TL has yet been recruited. The rapid changes of the INGO's key staff members continues, which impacts on both quality and progress of the work, as the replacement process takes time and new staff members need time to become familiar with the project.

During this quarter, ISPMC participated in two meetings with ADB's Safeguard Specialist and the CRO to make sure the corrective action plan is being properly implemented, and that its progress is being reported to ADB on a regular basis. Based on those meetings, an updated list of progress for the corrective action plan has been submitted to ADB with a revised deadline.

Resettlement activities performed during the reporting quarter and projected for the next quarter, at each site, are detailed in **Appendix-E**.

2.3.4 Livelihood Development

The main objective of the Income Livelihood Restoration Plan (ILRP) is to improve, or at least restore, the income and livelihood of all project affected people.

The ISPMC prepared the Terms of Reference (ToR) for the engagement of an INGO who will provide Livelihood Development services to people in the project areas. The Livelihood Development ToR was initially submitted to the PMO on 25 May 2016, and subsequently forwarded to ADB for their concurrence. No approval or official comments have been received from ADB since that time in spite of regular requests by both the ISPMC and PMO. The ISPMC will meet with the ADB Bangladesh Resident Mission (BRM) representative in early October to attempt to expedite the approval process.

2.3.5 Gender and Development

ADB BRM has recently informally requested that Gender and Development issues be documented in a separate section of the Quarterly Progress Report. The ADB BRM has also proposed a new format for documenting Gender Action Plan (GAP) activities and issues.

In compliance with the ADB BRM requests, details regarding the GAP are provided in **Appendix-F**.

2.3.6 Community-Based Flood Risk Management (CbFRM)

During the reporting quarter, all required documents related to the procurement of equipment and DDM PIU operational expenses, along with the Statement of Expenditure, have been submitted to ADB for their review and approval.

All documents related to selecting the Community based Flood Risk Management (CbFRM) NGO including: the Request for Proposal (RFP), NGO budget, Narrative Evaluation Criteria, Expression of Interest (EoI) shortlist report, and EoI evaluation spreadsheets, have been submitted to ADB for their review and approval. There has been several iterations to this review process, with the latest re-submission of revised documents occurring on 14 September. It is anticipated that ADB concurrence will be received early next quarter.

Immediately following ADB concurrence, the DDM PIU will issue the Request for Proposal (RFP) to the six shortlisted NGOs with a 28 day submission deadline. It may then be still possible to finalize the CbFRM NGO selection by the end of this year.

2.3.7 Capacity Building

From 5 June - 2 July 2017, a 4 week overseas training course entitled “River Morphodynamics and River Training” was organized and conducted by UNESCO-IHE in the Netherlands for 8 BWDB Engineers. The Overseas Training Course included lectures on:

- River Morphology
- Erosion Control and Bank Protection
- Backwater and Bed Level Changes
- Effects of Water Withdrawal
- Resilient Cities
- Environmental Impact Assessment
- Bank Protect Techniques
- Examples from Bangladesh
- Sediment Transport
- Flood Protection
- Effects of Dredging & Widening
- Scour Protection
- Interventions for River Navigation
- Field Measurements
- Measuring Techniques

During the course, the trainees participated in 3 field trips in the Netherlands and Belgium to provide practical experience on a variety of river training topics. Lecturers included a group of very high profile International resource persons, including Dr. Erik Mosselman, the ISPMC International Morphologist.

During the quarter, detailed preparations were made for two overseas study tours: USA and Canada, and Australia.

1. The 14 day USA and Canada Study Tour is planned for 5 - 18 October 2017 and will include 10 high level Bangladesh government officials. Tour members will visit the US Army Corp of Engineers in New Orleans to learn about their successful river management along the lower Mississippi River. Participants will also visit Vancouver, Canada to meet with Northwest Hydraulics (lead ISPMC consultant) personnel, tour their numeric and physical hydraulic modeling facilities, and learn about a series of innovative flood risk management studies along the Fraser River.

2. The Overseas Study Tour to Australia is in the final stages of organization. The 14 day tour is tentatively scheduled for November 2017 and will include 5 BWDB officials. Participants will visit

a large geotextile factory, share experiences with Australian experts on riverbank protection using this technology and visit a number of sites where geotextile technology is being successfully used. They will also visit a number of coastal management and protection projects to observe both traditional structures which absorb or reflect wave energy, as well as more natural and self-sustaining techniques that also preserve and protect beaches, estuaries and salt marshes.

A summary of the Training Program progress is shown in **Table 3** , and details are provided in **Appendix-I**.

Table 3. Summary of Capacity Building Progress

Type of Training	Course Implementation Progress				
	Total	Discussed	Prepared	Approved	Completed
Capacity Building PMO					
A. Local Training	34	34	17	7	7
B. Overseas Training	2	2	2	2	2
C. Overseas Tours	4	4	3	2	2
PMO Totals	**40**	**40**	**22**	**11**	**11**
Capacity Building ISPMC					
Line 1:					
A. Workshops	9	5	3	3	3
B. Training	4	4	4	4	4
C. Seminars	1	0	0	0	0
Line- 2:					
A. Conferences	4	4	4	4	4
B. Study Tours	1	1	0	0	0
ISPMC Totals	**19**	**14**	**11**	**11**	**11**

2.3.8 River Study

The River Study Team has four key deliverables out of which, two have been essentially complete, and two are still under process:

1. **"Long-Term Strategic and Holistic River Stabilization and River Training Plan":** This plan summarizes the work of the following three deliverables. The plan was initially presented in the national stakeholder workshop in December 2016, and formally submitted to BWDB in May 2017. A revised plan was presented to a truncated Technical Advisory Committee (TAC) meeting, headed by the BWDB Director General, and in the presence of the ADB Review Mission, on 26 July. The Technical Advisory Committee subsequently accepted the plan during a meeting on 17 September 2017.

2. **"River Stabilization Plan**": This plan provides the corridor and investment program for stabilization Jamuna and Padma rivers. Amongst others, it provides important background on the sustainable width of the flood and dry season river corridors as well as the main channels (**Figure 2.2)**. Channel widths are important for both environmental and navigational purposes. The plan also includes the analysis of sediment required to build up recovered char land to floodplain levels. The report clearly acknowledges its limitations depending on the political decision and funding for the proposed program.

   A draft plan is expected during the following quarter and will be presented at the national stakeholder workshop at the end of November.

3. "**Initial Master Plan**": The plan focuses on productive land-use for the north central region including the recovered char areas. Importantly, guided peri-urban development is expected to help propel Bangladesh into a middle income status.

4. "**Strategic Environment and Social Assessment**": The assessment pertains fundamentally to the environmental aspects of river stabilization and water resources development in the North Central Region. This document was originally submitted to the Bangladesh Department of the Environment in July 2016, and subsequently submitted to the Netherland's Commission for Environment Assessment (NCEA) for their review in March, 2017. The NCEA submitted its advisory report in July, 2017 and work to incorporate NCEA's comments into the final report is currently in process.

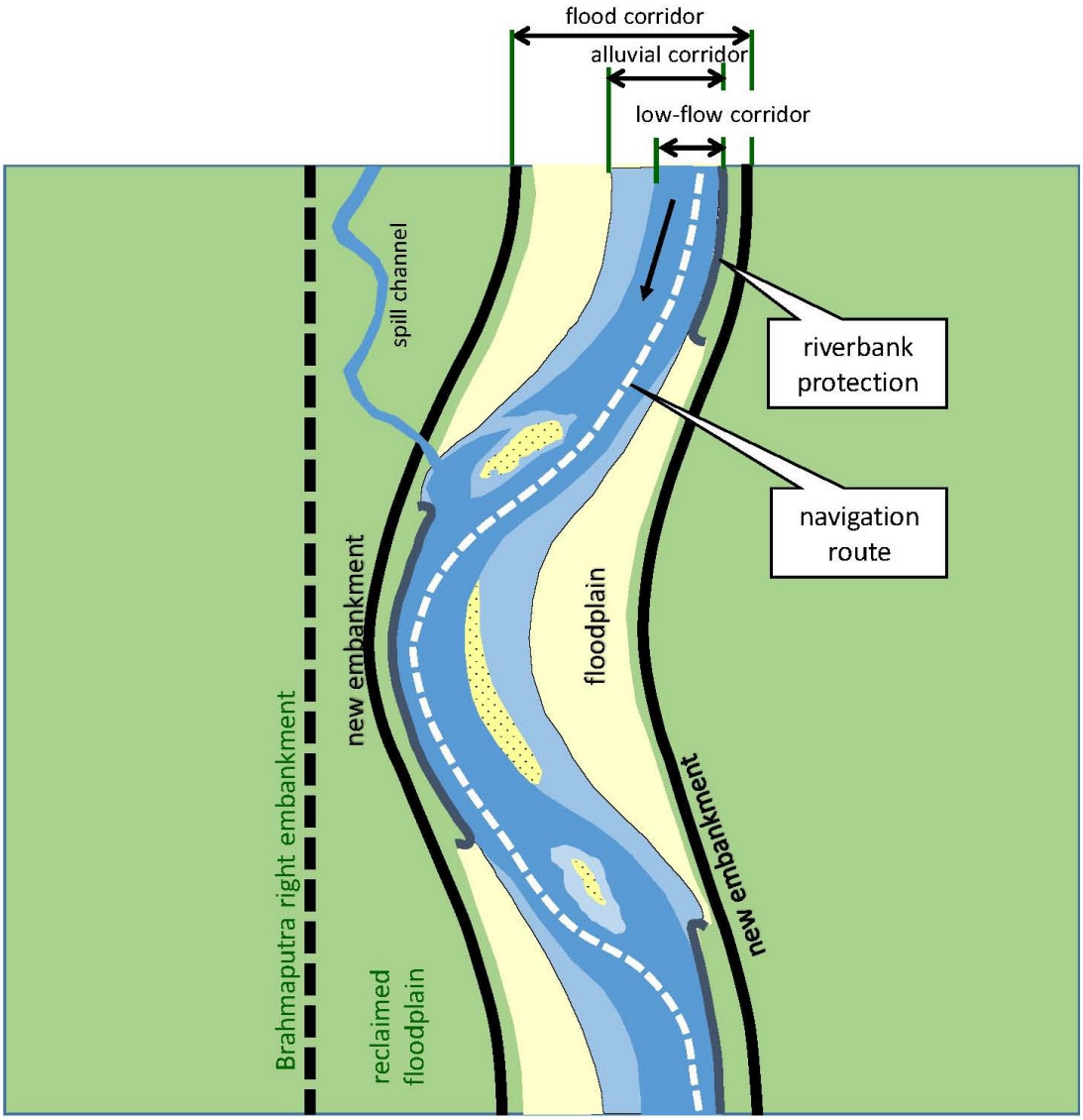


Figure 2.2. Simplified Planform depicting Main Features of Future River

While the River Study Team has made progress on a substantial number of background documents, the full resources for finalization have only been available since July 2017 as part of ISPMC's Variation Order #1. The Variation Order allocates additional identified resources, such as climate

change and dredging specialists, but also allows home office work, which will greatly improve efficiency and progress.

Out of a total of 34 background Technical Notes, 8 have been completed and the remaining are still in draft form. The status of individual Technical Notes and where they fit into the key deliverables are shown in **Appendix-D**. All River Study documents are expected to be finalized during the first quarter of 2018.

Four international ISPMC members, including the Team Leader, Environmental Expert, Morphologist, and Numerical Modeller participated in a meeting with NCEA (Netherlands Commission for Environmental Assessment) in the Netherlands on 11 July 2017. The participants discussed NCEA's preliminary review of the Strategic Environmental and Social Assessment (SESA) that the ISPMC Environmental team prepared for the long-term stabilization of the Jamuna/Padma river system in July 2016. On 22 July 2017, the draft NCEA review report was received by the PMO. The ISPMC Environmental Specialists are currently addressing comments identified in the NCEA report. A revised draft SESA report is being prepared in close collaboration with the ISPMC River Study team currently preparing the River Stabilization Plan and the revised Master Plan, and is expected to be completed by the end of 2017.

Additional data collection on environmental (e.g. migratory birds) and fisheries aspects took place throughout the reporting period. This data included the location of suitable fish sanctuaries and the design of fish-friendly regulators which will be included in the Project-2 Environmental Impact Assessment and the SESA. To date, 11 Project-2 fish sanctuary sites have been identified.

2.3.9 Pilot Works

In September, a detailed Memo was prepared by the ISPMC for the "Design of Grout-filled Jute Mattress" which will be the primary component of the proposed Pilot Works Program. The Memo provided design details pertaining to the implementation piloting of grout-filled jute mattresses at two sites as per decision of the Technical Advisory Committee: Harirampur and Hurashagar. At the riverbank at Harirampur, the mattresses would provide wave protection above low water. At the Hurashagar site, the mattresses would provide wave protection along the embankment. The Harirampur site will be 1.6 km in length **(Figure 2.3)** and the Hurashagar site will be 1.3 km in length **(Figure 2.4)**.

The purpose of the pilot test is to refine the technology of traditional grout-filled mattresses, installed at the Meghna Bridge and the Pabna Irrigation and Rural Development Project (PIRDP) in Bangladesh. At both sites, the mattresses have performed for more than 10-years under fluctuating water levels, with the latter having demonstrated its flexibility by adjusting to some slope movement.

The new technology would use jute instead of a synthetic fiber, which will require a number of adjustments to the system. The parameters to be tested in this pilot project include: cement:sand mix ratio, drainage systems, mat flexibility, under-layers, and mat thicknesses.

In addition to construction activities, this pilot program will also include a strong monitoring, evaluation and adaptation component. The monitoring program will include the installation of piezometers and inclinometers, and a multi-beam echo-sounder survey. Monitoring will be conducted with strong involvement from the BWDB design office.

The ISPMC has also prepared a bid document for the PMO to forward to ADB for approval and subsequent bidding.

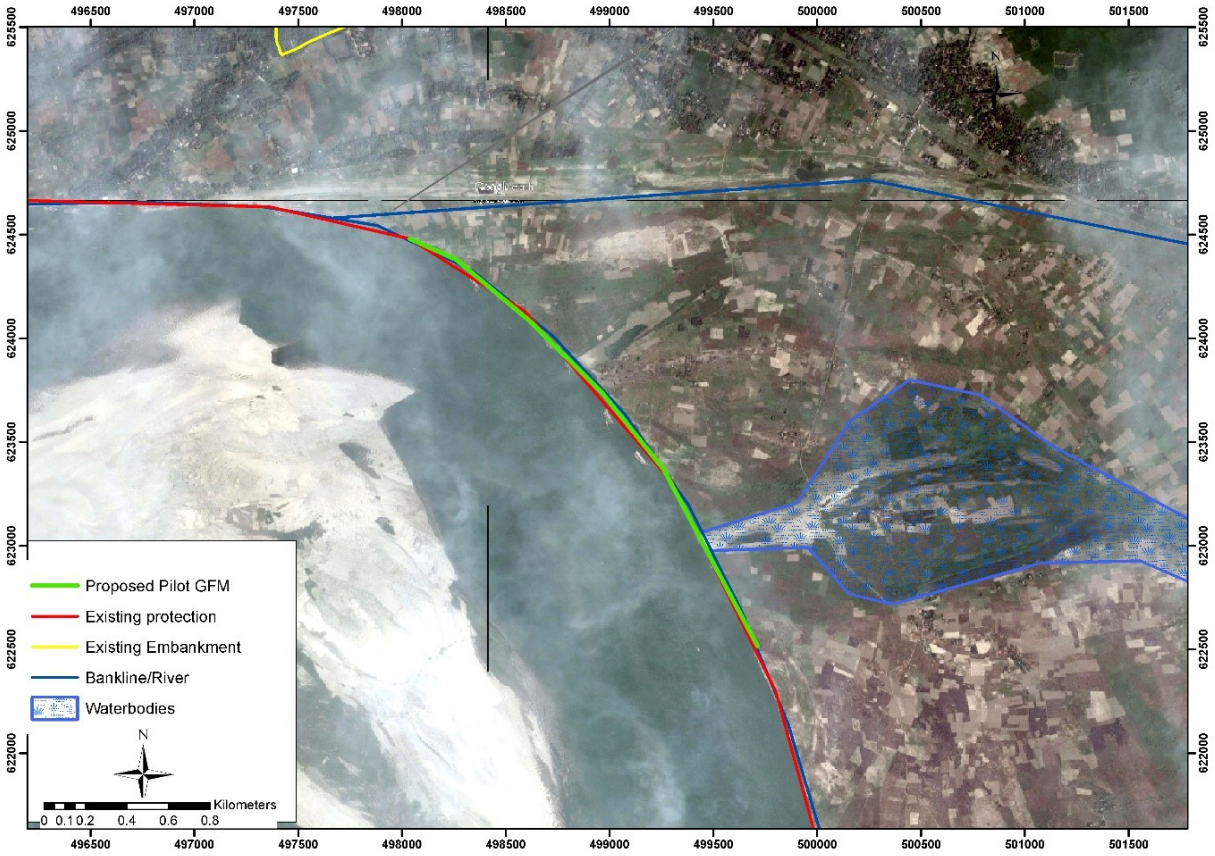


Figure 2.3 Planned Pilot Works in Harirampur

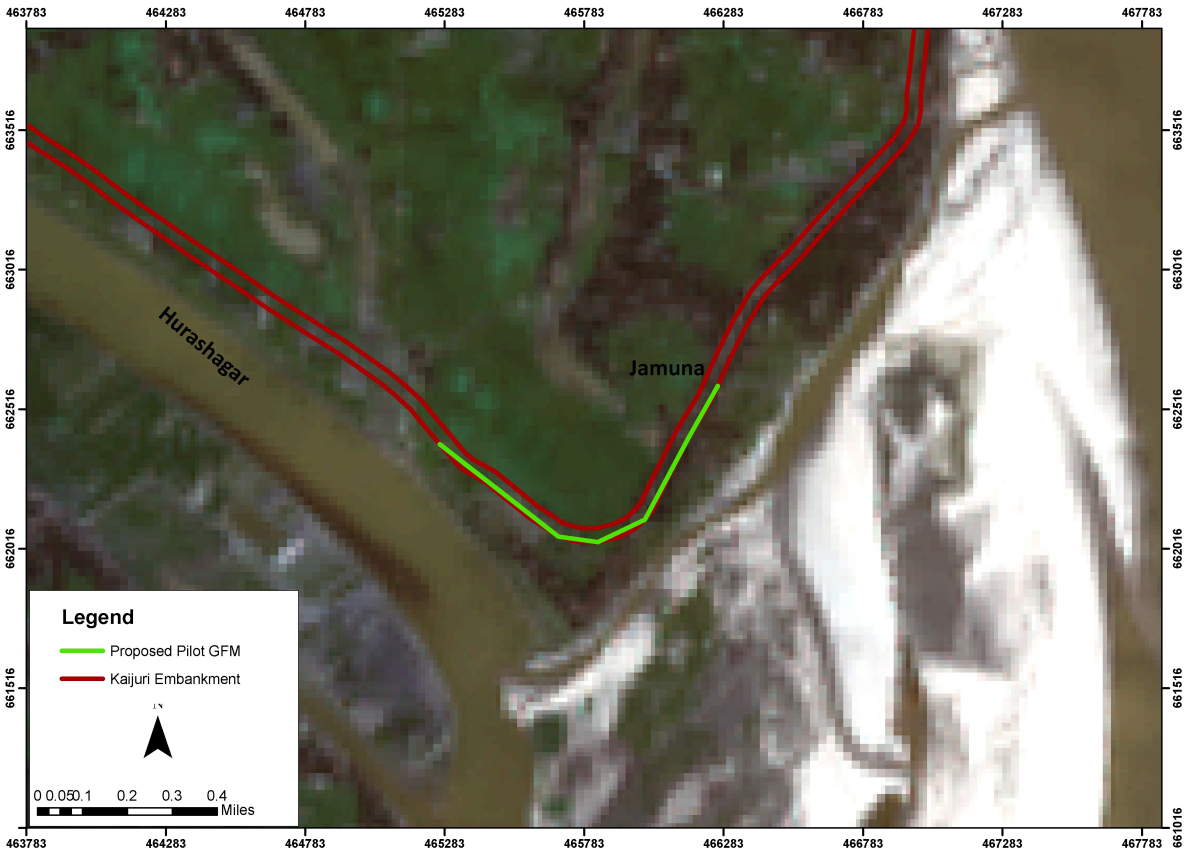


Figure 2.4 Planned Pilot Works in Hurashagar

In mid July, the ISPMC finalized a Technical Note documenting the results of a 3D numerical modelling analysis of the top-blocked semi-permeable spurs. Analysis results did not show a clear advantage of top-blocked semi-permeable spurs over more conventional permeable spurs. In fact, the top-blocked semi-permeable spurs actually indicated additional erosion potential. The note recommended to build one or two pilot structures at the end of the systematic protection in the Lower Bhadra River (being implemented by BWDB under the Blue Gold Program). The joint decision by Blue Gold and FRERMIP is still pending.

The Grout-filled Jute Mattress pilot program has been designed for a total estimated cost of US$ 4 million. However, the program may be increased to US$ 5 million, if the alternative top-blocked semi-permeable spurs pilot program is ultimately dropped.

2.3.10 Project-2 Feasibility Study

The ISPMC is currently preparing a feasibility study for Project-2 expanding the report on site selection and initial economic assessment submitted during the previous quarter. The feasibility study will identify all structural components proposed for Project-2 including their preliminary design and cost estimate. The feasibility study will include environmental and social impact assessments and propose a plan to monitor and manage all negative impacts. It is intended that a draft feasibility study will be submitted to the PMO and ADB for their concurrence and necessary action by the end of November 2017.

Project-2 will continue to increase river stability and reduce flood risk along the Jamuna, Padma and Meghna Rivers. Four sub-projects are proposed for Project-2, and the salient features and primary work items are summarized in
Table 4**.** Topographic, hydraulic and geotechnical data required for the preliminary design and cost estimates is currently being collected.

An environmental impact assessment for Project-2 is being prepared which includes the collection of baseline data, public consultation, identification of positive and negative impacts and possible mitigation measures, and development of an environmental management and monitoring plan. The baseline (pre-implementation) condition of the proposed closure dam location and embankment alignment at Harirampur under Project-2 was documented by the ISPMC environment team during their field visit on 26 - 27 September 2017.

On 27 September, a stakeholder consultation meeting was held at Boyra, Harirampur to assess the opinion of the prospective beneficiaries regarding the proposed embankment. The overall response from stakeholders was very positive. Additional similar consultation meetings are planned during the next reporting period.

Similarly, a social impact assessment is being prepared which will include all necessary resettlement activities, including a gender action plan, and possible livelihood development initiatives. A detailed resettlement questionnaire survey is planned which will identify the scope of resettlement activities: number of people displaced, and land and assets to be acquired.

Based on the proposed Project-2 technical requirements, and its environmental and social impacts, a cost benefit analysis will be prepared to confirm that Project-2 is economically viable.

Table 4. Project-2 Work Items and Scope of Works

Sub-Project	Work Item	Scope of Works
JRB-1 (Jamuna Right Bank)	• Kaijuri Embankment • Fish Passes • River Protection	• 6 km rehab. along Hurasagar • 2 Nos. • 4 km Enayetpur - Kaijuri reach
JBLB-2 (Jamuna Left Bank)	• River Training • Land Recovery	• 14.5 km bifurcation stabilization • 5.5 km closure dam and katkin plantation
PLB-1 (Padma Left Bank)	• Embankment • Fish Passes • Riverbank Protection	• 17 km rehab. from Harirampur to Dohar • 5 Nos. • 9 km
MLB-2 (Meghna Left Bank)	• Scour Apron	• 2 km near Chandpur Town

2.3.11 2017 Flood Survey Monitoring Program

The 2017 flood survey monitoring program consists of two components: general river monitoring and site monitoring.

1. The purpose of the general river monitoring is to provide general flow patterns along the protected sites, and other reaches especially along the lower Jamuna. General river monitoring focuses on discharge measurements and float tracking and a one-time large-scale bathymetry, which provide indications about the flow distribution and morphological changes between consecutive flood seasons.

2. Site monitoring provides specific information on newly constructed works regarding: scour development and flow velocities. Site monitoring is also used to define required parameters for the design of adaptation works and the improvement of design formulae.

The flood season is normally limited between July to October but the ISPMC has also included April to July surveys in the monitoring report. The program includes bathymetric, ADCP discharge and float track surveys. A summary of survey activities is provided in **Table 5**, and salient details are provide in **Appendix-H**.

It is intended to finalize the 2017 Flood Survey Monitoring Memo by mid January 2018, incorporating more survey information including results of a diving survey.

Table 5. Summary of 2017 Flood Season Survey Program

Survey Type	Location	Proposed	Completed
Bathymetric Single Beam	Chauhali	4	4
	Zafarganj	2	1
	Harirampur	2	1
	Solimabad	2	2
	Full River	1	1
Bathymetric Multi-Beam	Chauhali	1	0
Topographic Land Survey	Chauhali	1	1
	Solimabad	1	1
ADCP Discharge	Full River	2	2
Float Track	Chauhali	3	3
	Solimabad	1	1
	Full River	2	2

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 and Feasibility teams are located at the Banani Office: House 47 (8th Floor) Road 27, Banani, Dhaka.

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. Up to the end of the September 2017, a total of 25 international specialists have expended 177 person-months (54% of total), and 35 national specialists have expended 459 person-months (58% of total).

Table C-2 shows the Work Schedule from the Inception Report against major tasks as specified in the original ISPMC Terms of Reference. It is intended to revise the Work Schedule for the Mid-Term Report which is to be finished by late January.

3.2 *Important Events During This Quarter:*

11 July 2017	Four international ISPMC members, including the Team Leader and the Environmental Expert, participated in a meeting with NCEA (Netherlands Commission for Environmental Assessment) in the Netherlands.
27 July 2017	The ISPMC Variation Order was approved which allows the consultant to reallocate their available resources to better accommodate changing project priorities.
23 - 30 July 2017	ADB FRERMIP, Project-2 Consultation Mission. The Mission monitored on-going Project-1 activities, but their main focus was on the Project-2 preparation work.

4. FINANCIAL ARRANGEMENTS

4.1 *Statements of Expenditure*

Using the project implementation database, and with help from the FRERMIP PMO, the ISPMC tracks fiscal progress compared to BWDB PMO expenditures paid to contractors and suppliers, all reimbursement bill applications approved by ADB, and all ADB (and GON) disbursements (deposits) to the project.

Table A-5 shows cumulative totals to date for progress, expenses and reimbursements, for all DPP categories. As of the end of the reporting quarter, the 2017/18 fiscal targets had not yet been finalized, so they values are not included in the current report.

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

Financial reimbursement on an individual contract basis is shown in **Table B-6.** The table shows the total bill claim amount, plus the reimbursed amount (BDT) by both ADB and GON. 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 bill amount claimed and the reimbursement amounts paid by ADB and GON in both BDT and US$.

Reimbursement values (BDT) are also summarized by ADB Financial Category **(Table A-3),** and by DPP Component **(Table A-4 and A-5)**.

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 and GON portions of all reimbursed Direct Payment and L/C applications.

A summary of the financial progress is also available in **Table 1. Progress at a Glance** which shows that the progress of PMO expenditure is 52%, the ADB disbursement is 44% and the total reimbursement is 29%. The history of project disbursements and reimbursements (US$) is shown in **Figure 2.1** in **Section 2.1.**

5. ISSUES FOR DISCUSSION AND AGREEMENT

5.1 *Slope Instability at Chauhali*

Repeated slope instability problems at Chauhali has affected 4 km of the concrete block protection, primarily along the downstream reach. The upstream 2 km, having received only temporary protection of the upper slope and not exhibiting a deep channel, are yet unaffected by localized slope failures.

The BWDB has constituted a committee to investigate the failure of the upper slope at Chauhali including a hydraulic specialist and a geotechnical specialist from BUET. To aid in the investigation, BWDB hydrology drilled a number of bore holes, and prepared bore logs from the soil samples. This investigation should provide useful insight into why the failures occurred, and how to change the existing riverbank protection design to reduce the reoccurrence of these failures in the future.

5.2 *Preparation of Project-2*

Based on the Aide Memoire from the recently completed ADB Mission (23-27 July 2017), it is intended that the ISPMC will prepare a draft of the Project-2 feasibility study by the end of November 2017. It was also originally intended to prepare draft copies of the Environmental Impact Assessment (EIA), Land Acquisition Plan, Resettlement Plan, Facility Administration Manual (FAM), and Development Project Performa (DPP) so that these documents would be available during the proposed ADB Project-2 Fact Finding Mission scheduled for mid November 2017. The challenge to the envisaged schedule lies in the accessibility of the area for the necessary field work, considering that the 2017 flood exhibited the highest ever measured water level in the Jamuna River.

5.3 *Construction Schedule for Embankment*

The construction of 23 km of embankment remains on the critical path with respect of future disbursements and project completion date. Bids for embankment construction have already been received twice, and have been rejected by the BWDB both times. If the revised Tender Notice is issued by the end of October, it is still unlikely that full mobilization of the contractors can be achieved before the end of December. This poses significant risks to the successful Project-1 completion by its current scheduled date of June 2019.

5.4 *PMO Under-Staffing*

The staffing of the BWDB PMO has recently reduced due to the transfer of key people who have not yet been replaced. **Table 6** shows the proposed and actual staffing for senior personnel in the PMO. It is not possible for the current reduced PMO staff to properly handle all their required duties.

Table 6. Proposed and Actual PMO Staffing

Position	Proposed[1]	Actual
Project Director	1	1
Superintending Engineer	2	1
Executive Engineer	4	2
Deputy Director (Accounts)	1	1
System Analyst	1	0
Sub-Divisional Engineer	2	1
Assistant Engineer	2	0
Totals	**13**	**6**

1. Source: Revised DPP

6. REFERENCES

1. ADB, 2014: Facility Administration Manual, Bangladesh: Multi-Project 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 Multi-Project 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 – Project 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

APPENDICES

Appendix-A Work Program Summaries

Table A-1 Project Program Summary

Quantity (Units)

Component	Asset Type	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	7.8	0.0	0.0	**7.8**
	New: Regulator	No	0.0	0.0	0.0	4.0	0.0	**4.0**
A2: Riverbank Prot Works	New: Revetment	km	0.0	0.0	9.0	0.0	7.0	**16.0**
A3: Emerg & Adaptation	Emerg: AdpRivProt	BDTM	80.9	0.0	0.0	0.0	0.0	**80.9**
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	2.7	0.0	1.9	**4.7**
B2: Geotextile, Emerg	Procure: AdpGeoBag	Mil	0.8	0.0	0.9	0.0	0.0	**1.6**
C: Vehicles & Equipment								
C1: Vehicles/Transport	Procure: Veh/Trans	No	12.0	0.0	0.0	0.0	0.0	**12.0**
C2: Office Equipment	Procure: Equip	BDTM	4.4	0.0	0.0	0.0	0.0	**4.4**
C3: Survey Equipment	Procure: Equip	BDTM	6.7	0.0	0.0	0.0	0.0	**6.7**
C4: DDM Office Eqpt	Procure: Equip	BDTM	0.0	0.5	0.0	0.0	0.0	**0.5**
D: Consulting Services								
D1: ISPM; Consultant Serv.	Service: Feasi.Stud	BDTM	170.0	0.0	0.0	0.0	0.0	**170.0**
	Service: Instit.Cap	BDTM	387.0	0.0	0.0	0.0	0.0	**387.0**
	Service: Riv.Stabil	BDTM	461.0	0.0	0.0	0.0	0.0	**461.0**
D2: INGO BWDB	Service: Liveli.Sup	BDTM	65.1	0.0	0.0	0.0	0.0	**65.1**
	Service: Resettle.S	BDTM	16.2	0.0	0.0	0.0	0.0	**16.2**
D3: INGO DDM	Service: CBFRM	BDTM	0.0	64.4	0.0	0.0	0.0	**64.4**
D4: Survey & Investigation	Service: Eros.Pred	BDTM	55.9	0.0	0.0	0.0	0.0	**55.9**
E: Capacity Development								
E1: BWDB Training & Study	Service: Training	BDTM	63.9	0.0	0.0	0.0	0.0	**63.9**
E3: MIS Development	Service: Instit.Cap	BDTM	12.9	0.0	0.0	0.0	0.0	**12.9**
F: Land Acqn & Resettle								
F1: Land Compensation	Compensate: Land.Acqu	BDTM	2,083.	0.0	0.0	0.0	0.0	**2,083.**
F2: Resettle Benefits	Compensate: Resettle.B	BDTM	28.4	0.0	0.0	0.0	0.0	**28.4**
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	31.0	0.0	0.0	0.0	0.0	**31.0**
G3: Office Opns DDM	Service: Prog.Mngt	BDTM	0.0	5.1	0.0	0.0	0.0	**5.1**
G4: BWDB River Surveys	Service: Riv.Surv	BDTM	7.8	0.0	0.0	0.0	0.0	**7.8**
	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	12.1	0.0	0.0	0.0	0.0	**12.1**
	Compensate: Interest	BDTM	199.2	0.0	0.0	0.0	0.0	**199.2**

Abreviations:
DDM - Department of Disaster Managment
MAN - Manikganj SMO
KOI - Koitola SMO
TAN - Tangail SMO

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	511	0	**511**
	New: Embank	0	0	0	484	0	**484**
	New: Infrastr	0	0	8	0	0	**8**
	New: Regulator	0	0	0	226	0	**226**
A2: Riverbank Prot Works	New: Revetment	0	0	1,010	0	832	**1,842**
A3: Emerg & Adaptation	Emerg: AdpRivProt	81	0	0	0	0	**81**
A4: Pilot Land Recovery	New: RivTrnWrk	380	0	0	0	0	**380**
							3,532
B: Materials							
B1: Geotextile, Civil Works	Procure: GeoBag	0	0	788	0	365	**1,153**
B2: Geotextile, Emerg	Procure: AdpGeoBag	25	0	175	0	0	**200**
							1,353
C: Vehicles & Equipment							
C1: Vehicles/Transport	Procure: Veh/Trans	35	0	0	0	0	**35**
C2: Office Equipment	Procure: Equip	4	0	0	0	0	**4**
C3: Survey Equipment	Procure: Equip	7	0	0	0	0	**7**
C4: DDM Office Eqpt	Procure: Equip	0	0	0	0	0	**0**
							46
D: Consulting Services							
D1: ISPM; Consultant Serv.	Service: Feasi.Stud	170	0	0	0	0	**170**
	Service: Instit.Cap	387	0	0	0	0	**387**
	Service: Riv.Stabil	461	0	0	0	0	**461**
D2: INGO BWDB	Service: Liveli.Sup	65	0	0	0	0	**65**
	Service: Resettle.S	16	0	0	0	0	**16**
D3: INGO DDM	Service: CBFRM	0	64	0	0	0	**64**
D4: Survey & Investigation	Service: Eros.Pred	56	0	0	0	0	**56**
							1,219
E: Capacity Development							
E1: BWDB Training & Study	Service: Training	64	0	0	0	0	**64**
E3: MIS Development	Service: Instit.Cap	13	0	0	0	0	**13**
							77
F: Land Acqn & Resettle							
F1: Land Compensation	Compensate: Land.Acqu	2,083	0	0	0	0	**2,083**
F2: Resettle Benefits	Compensate: Resettle.B	28	0	0	0	0	**28**
							2,111
G: Program Management							
G1: Staff Salaries BWDB	Service: Prog.Mngt	84	0	0	0	0	**84**
G2: Office Opns BWDB	Service: Prog.Mngt	31	0	0	0	0	**31**
G3: Office Opns DDM	Service: Prog.Mngt	0	5	0	0	0	**5**
G4: BWDB River Surveys	Service: Riv.Surv	8	0	0	0	0	**8**
	Service: LandSurvey	0	0	0	0	0	**0**
							128
X: Misc. Costs							
X1: Misc. Costs	Compensate: CD&SD	12	0	0	0	0	**12**
	Compensate: Interest	199	0	0	0	0	**199**
							211
Grand Totals		**4,209**	**70**	**1,980**	**1,221**	**1,197**	**8,677**

Abreviations:
DDM - Department of Disaster Managment
MAN - Manikganj SMO
KOI - Koitola SMO
TAN - Tangail SMO

Table A-3 ADB Categories: Reimbursed Amount, by Donor

all Values in BDT Mil

Code	Categories	Total Cost Est.	Value of Physical Progress	PMO Expenses	Reimbursed Amount		
					ADB	GON	Total
Component							
1	Works	3,531.7	1,786.0	1,678.8	1,129.4	0.0	**1,129.4**
2	Materials	1,352.7	1,292.5	1,130.3	1,014.8	0.0	**1,014.8**
3A	Vehicles - BWDB	34.5	34.5	34.9	1.5	0.0	**1.5**
3B	Equipment - BWDB	11.1	11.1	11.1	10.6	0.0	**10.6**
3C	Equipment -DDM	0.5	0.5	0.5			
4	Resettlement	28.4	2.8	2.0	1.2	0.0	**1.2**
5	Training	76.8	35.1	33.8	31.8	0.0	**31.8**
6A	Consulting Services - Project Management - BWDB	1,018.2	665.5	403.0	46.2	263.1	**309.3**
6B	Consulting Services - NGO Services - BWDB	136.8	32.4	22.9	14.2	0.0	**14.2**
6C	Consulting Services - Project Management - DDM	64.4	0.0				
7A	Project Management - BWDB	38.9	22.7	17.4	9.0	0.0	**9.0**
7B	Project Management - DDM	5.1	2.5	0.5			
8	Interest	199.2	71.7	70.0			
9	Unallocated	2,178.9	1,502.5	1,143.6			
Grand Total		**8,677.2**	**5,460.0**	**4,548.9**	**2,258.7**	**263.1**	**2,521.8**

Table A-4 DPP Categories: Reimbursed Amount, by Donor

all Values in BDT Mil

Code	Categories	Total Cost Est.	Value of Physical Progress	PMO Expenses	Reimbursed Amount		
					ADB	GON	Total
Revenue Component							
4826	Interest & Service Charge for Netherland Grant	199.2	71.7	70.0			
4840	Capacity Development Program	76.8	35.1	33.8	31.8	0.0	**31.8**
4849	Resettlement Support Program	28.4	2.8	2.0	1.2	0.0	**1.2**
4874	ISPMC; Implementation Consultant Services	387.3	244.0	153.3	17.6	100.1	**117.7**
4874	ISPMC; River Stabilization and Land Recovery Study	461.2	336.7	182.6	20.9	119.2	**140.1**
4874	ISPMC; Feasibility of Tranch-2/3 Project	169.6	84.8	67.1	7.7	43.8	**51.5**
4874	Resettlement Implementation Support	16.2	8.9	4.7	4.1	0.0	**4.1**
4874	Livelihood Support Program	64.7	0.0				
4874	Community-based Flood Management Program (DDM)	64.4	0.0				
4886	Land/River Survey and Data Processing	8.0	6.3	4.4	0.4	0.0	**0.4**
4886	Survey and Investigation Data Processing	55.9	23.5	18.1	10.1	0.0	**10.1**
4700	PMO Salaries and Allowances	83.7	44.3				
4800	PMO Operational Expenses	30.9	16.4	13.0	8.5	0.0	**8.5**
4899	PMU DDM Oprational Expenses	5.1	2.5	0.5			
Revenue Totals		***1,651.4***	***877.3***	***549.7***	***102.4***	***263.1***	***365.5***
Capital Component							
6807	Transport Vehicles (Jeep 5, Motorcyle 10 and Speed Boat 1)	34.5	34.5	34.9	1.5	0.0	**1.5**
6819	Computer and Office Equipment BWDB	4.4	4.4	4.4	4.2	0.0	**4.2**
6819	Computer and Office Equipment DDM	0.5	0.5	0.5			
6851	Survey Equipment	6.7	6.7	6.7	6.4	0.0	**6.4**
6901	Land Acquisition (136 ha)	2,083.1	1,458.2	1,143.6			
7016	Construction of Inspection Bangalow at Manikganj	7.8	0.0				
7041	Regulator (new 4 and repair 3) in JRB1	225.8	0.0				
7081	Embankment (23 km) along RB Jamuna and LB Baria-Hurasagar, with Road (5 km)	995.4	0.0				
7081	Protective Works at RB Jamuna at Kaijuri, LB Jamuna at Chaulhali, Jafforganj & Harirampur (15 km)	2,994.7	2,938.7	2,727.3	2,129.0	0.0	**2,129.0**
7081	Land Recovery/River Training Works	379.8	0.0				
7081	Adaptive Protection and Emergency	280.9	139.7	81.9	15.3	0.0	**15.3**
7091	CD and SD	12.1	0.0				
Capital Totals		***7,025.7***	***4,582.7***	***3,999.3***	***2,156.4***	***0.0***	***2,156.4***
Grand Total		**8,677.2**	**5,460.0**	**4,548.9**	**2,258.7**	**263.1**	**2,521.8**

Table A-5 DPP Categories: Key Physical and Financial Indicators

all Values in BDT Mil

Code	Categories	Total Cost		Total to Date		
		Budget (RDPP)	Revised Est.	Progress	Expenses	Reimburs
Revenue						
4826	Interest & Service Charge for Netherland Grant	199.2	199.2	71.7	70.0	0.0
4840	Capacity Development Program	76.9	76.8	35.1	33.8	31.8
4849	Resettlement Support Program	28.4	28.4	2.8	2.0	1.2
4874	ISPMC; Implementation Consultant Services	387.3	387.3	244.0	153.3	117.7
4874	ISPMC; River Stabilization and Land Recovery Study	461.2	461.2	336.7	182.6	140.1
4874	ISPMC; Feasibility of Tranch-2/3 Project	169.7	169.6	84.8	67.1	51.5
4874	Resettlement Implementation Support	17.5	16.2	8.9	4.7	4.1
4874	Livelihood Support Program	64.7	64.7	0.0	0.0	0.0
4874	Environmental Management Program	0.0	0.0	0.0	0.0	0.0
4874	Community-based Flood Management Program (DDM)	64.4	64.4	0.0	0.0	0.0
4874	Particiatory Regular O&M Training Support	0.0	0.0	0.0	0.0	0.0
4886	Land/River Survey and Data Processing	8.0	8.0	6.3	4.4	0.4
4886	Survey and Investigation Data Processing	55.8	55.9	23.5	18.1	10.1
4700	PMO Salaries and Allowances	83.7	83.7	44.3	0.0	0.0
4800	PMO Operational Expenses	30.9	30.9	16.4	13.0	8.5
4899	PMU DDM Oprational Expenses	5.1	5.1	2.5	0.5	0.0
		1,652.8	***1,651.4***	***877.3***	***549.7***	***365.5***
Capital						
6807	Transport Vehicles (Jeep 5, Motorcyle 10 and Speed Boat 1)	34.9	34.5	34.5	34.9	1.5
6819	Computer and Office Equipment BWDB	4.4	4.4	4.4	4.4	4.2
6819	Computer and Office Equipment DDM	0.5	0.5	0.5	0.5	0.0
6851	Survey Equipment	6.7	6.7	6.7	6.7	6.4
6901	Land Acquisition (136 ha)	2,083.1	2,083.1	1,458.2	1,143.6	0.0
7016	Construction of Inspection Bangalow at Manikganj	7.8	7.8	0.0	0.0	0.0
7041	Regulator (new 4 and repair 3) in JRB1	225.9	225.8	0.0	0.0	0.0
7081	Embankment (23 km) along RB Jamuna and LB Baria-Hurasagar, with Road (5 km)	995.2	995.4	0.0	0.0	0.0
7081	Protective Works at RB Jamuna at Kaijuri, LB Jamuna at Chaulhali, Jafforganj & Harirampur (15 km)	3,000.8	2,994.7	2,938.7	2,727.3	2,129.0
7081	Land Recovery/River Training Works	379.8	379.8	0.0	0.0	0.0
7081	Adaptive Protection and Emergency	280.9	280.9	139.7	81.9	15.3
7091	CD and SD	12.1	12.1	0.0	0.0	0.0
		7,032.2	***7,025.7***	***4,582.7***	***3,999.3***	***2,156.4***
Totals		**8,685.0**	**8,677.2**	**5,460.0**	**4,548.9**	**2,521.8**

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							
BWDB PMO							
New: RivTrnWrk: 380 BDTM: River Training Pilot Work: & Land Recovery		c	c	na	100	100	Dwgs Complete
BWDB PMO Totals	***1***	***1***	***1***	***1***	***1***	***1***	
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	Desn. & Dwg. Complete
Cons/ReCon: Embank: 5.7 km: Embankment Reconst. (5.7 km): Baghabari - Verakhola; km 17.3-23		c	c	na	100	100	Desn. & Dwg. Complete
New: Embank: 5 km: Embankment (5 km): Kaijuri - Bhatpara; km 0-5		c	c	na	100	100	Desn. & Dwg. Complete
New: Embank: 3.5 km: Embankment (3.5 km): Bhatpata - Gala; km 5-8.5		c	c	na	100	100	Desn. & Dwg. Complete
New: Embank: 4 km: Embankment (4 km): Gala - Verakhola; km 8.5-12.5		c	c	na	100	100	Desn. & Dwg. Complete
New: Regulator: 1 No: Kaijuri Reg 2V 1.5x1.8m		c	c	c	100	100	Desn. & Dwg. Complete
New: Regulator: 1 No: Rohindakandi Reg 2V 1.5x1.8m		c	c	c	100	100	Desn. & Dwg. Complete
New: Regulator: 1 No: Verakhola Reg 2V 1.5x1.8m		c	c	c	100	100	Desn. & Dwg. Complete
New: Regulator: 1 No: Andhar Manik Reg 4V 1.5x1.8m		c	c	c	100	100	Desn. & Dwg. Complete
Koitola SMO Totals	***9***	***9***	***9***	***9***	***9***	***9***	
Manikganj SMO							
New: Infrastr: 7.8 BDTM: Construction of Inspection Bungalow		c	na	na	100	100	Dwgs Complete
New: Revetment: 2 km: Revetment (2 km): Zaffarganj; km 6.1-8.1		c	c	na	100	100	Desn. & Dwg. Complete
New: Revetment: 3.5 km: Revetment (3.5 km): Harirampur; km 0-3.5		c	c	na	100	100	Desn. & Dwg. Complete
New: Revetment: 3.5 km: Revetment (3.5 km): Harirampur; km 3.5-7		c	c	na	100	100	Desn. & Dwg. Complete
Manikganj SMO Totals	***4***	***4***	***4***	***4***	***4***	***4***	
Tangail SMO							
New: Revetment: 2.5 km: Revetment (2 km): Chauhali; km 0- 2.5		c	c	na	100	100	Desn. & Dwg. Complete
New: Revetment: 4.5 km: Revetment (4.5 km): Chauhali; km 2.5-7.0		c	c	na	100	100	Desn. & Dwg. Complete
Tangail SMO Totals	***2***	***2***	***2***	***2***	***2***	***2***	
Component Totals	***16***	**16**	**16**	**16**	**16**	**16**	

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-01	Supply of Geobags; Chouhali, Sirajganj							14Dec26	31Dec14	19Feb15	04Aug15	29Apr15	07Jan15	01Jul15
G-02	Supply of Geobags; Zaforganj, Harirampur, Manikganj							14Dec26	31Dec14	19Feb15	04Aug15	29Apr15	07Jan15	01Jul15
G-03	Supply of Geobags; Harirampur, Manikganj							15May19	19May15	06Jul15	08Dec15	27Aug15	22Sep15	27Sep15
G-04.1	Supply of Geobags; Chauhali-Harirampur-Koijuri-Benotia							13Sep16	27Sep16	14Nov16	19Dec16	20Jan17	31Jan17	12Feb17
Component Totals		*0*	*0*	*0*	*0*	*0*	*0*	*4*	*4*	*4*	*4*	*4*	*4*	*4*
Goods; C: Vehicles & Equipment														
G-05	2016 Supply of Jeep;							26Feb16	29Feb16	31Mar16	13Apr16	19Apr16	19Apr16	07Jun16
G-06.1	2015 Supply of Jeeps;								01Jun16	05Jun16	09Jun16	12Jun16	16Jun16	30Jun16
G-06.2	2016 Supply of Jeep;								10Mar16	24Mar16	14Apr16	21Apr16	28Apr16	05May16
G-06.3	2016 Supply of Motorcycles;								10Mar16	24Mar16	14Apr16	21Apr16	28Apr16	05May16
G-07.1	2015 Office Equipment; BWDB PMO								13Apr15	17May15				28May15
G-07.2	2016 Office Equipment; BWDB PMO							10Apr15	03Jan16	04Feb16	29Feb16	28Mar16	28Mar16	30Mar16
G-08	2016 Supply of Survey Equipments;							10Apr15	03Jan16	04Feb16	29Feb16	14Mar16	14Mar16	16Mar16
G-09	2017 Supply of Office Equip; DDM; DDM								01Jun17	08Jun17	08Jun17	15Jun17	22Jun17	22Jun17
Component Totals		*0*	*0*	*0*	*0*	*0*	*0*	*3*	*8*	*8*	*7*	*7*	*7*	*8*
Services; D: Consulting Services														
S-01	ISPMC; Tranche 1;			23Oct14	15Dec14				01Apr15	01Jun15				08Sep15
S-02	Resettlement Implementation Support;		22Apr15	09Jun15	09Jul15	24Aug15		22Oct15	11Nov15	10Dec15	11Jan16	04Mar16	15Mar16	16Mar16
S-03	Livelihood Development;	25May16												
S-04	Community Based Flood Risk Mngmt;	30Sep15	01Mar16	28Mar16	26Apr16									
S-06.1	2015 Erosion & Morphological Chg;								23Dec14	01Jan15				29Jan15
S-06.2	2016 Erosion Prediction;		23Feb16						23Feb16	15Mar16	24Mar16	28Mar16	09May16	10May16
Component Totals		*2*	*3*	*3*	*3*	*1*	*0*	*1*	*4*	*4*	*2*	*2*	*2*	*4*
Works; A: Civil Works														
W-01	Embankment, & 2 Reg.; km 0-5							04Oct16						
W-02	Embankment; km 5-8.5							04Oct16						
W-03	Embankment; 8.5-12.5							04Oct16						
W-04	Embankment & 1 Regulator; km 12.5-17.3							04Oct16						
W-05	Embankment & 1 Regulator; km 17.3-23							04Oct16						
W-06	Revetment; Jamuna at Chauhali, R1; km 0-2.5							30Mar15	04May15	08Jun15	28Jul15	14Aug15	22Sep15	23Sep15
W-07	Revetment; Jamuna at Chauhali, R2; km 2.5-7.0							30Mar15	04May15	08Jun15	28Jul15	14Aug15	22Sep15	23Sep15
W-08	Revetment; Jamuna at Zaffarganj, km 6.1-8.1							11May15	22Jun15	27Jul15	08Oct15	04Dec15	03Feb16	03Feb16
W-09	Revetment; Padma at Harirampur, R1; km 6.7-10.2							11May15	22Jun15	27Jul15	04Nov15	10Dec15	30Dec15	30Dec15
W-10	Revetment; Padma at Harirampur, R2; km 3.2-6.7							11May15	22Jun15	27Jul15	04Nov15	10Dec15	30Dec15	30Dec15
W-14	River Training Pilot Work;	04Oct17												
W-15	Construction of Inspection Bungalow;													
Component Totals		*1*	*0*	*0*	*0*	*0*	*0*	*10*	*5*	*5*	*5*	*5*	*5*	*5*
Project Totals		**3**	**3**	**3**	**3**	**1**	**0**	**18**	**21**	**21**	**18**	**18**	**18**	**21**

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

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

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-2017 Current Qtr (%)	30-Sep-2017 Current Qtr (BDT Mil)	31-Dec-2017 Next Qtr (%)	31-Dec-2017 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	100	472.6	100	472.6	Implemenation Complete
G-03	Supply of Geobags: Harirampur, Manikganj	DFL-DCTL(JV)	315.1	0	100	315.1	100	315.1	Implemenation Complete
G-04.1	Supply of Geobags: Chauhali-Harirampur-Koijuri-Benotia	DIRD	174.7	10	80	139.7	100	174.7	Satisfactory Progress
Component Totals			***1,327.4***			***1,292.5***		***1,327.4***	
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:	Progoti Industries	20.8	0	100	20.8	100	20.8	Implemenation Complete
G-06.2	2016 Supply of Jeep:	Progoti Industries	6.9	0	100	6.9	100	6.9	Implemenation Complete
G-06.3	2016 Supply of Motorcycles:	Atlas Bangladesh Ltd.	1.3	0	100	1.3	100	1.3	Implemenation Complete
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-08	2016 Supply of Survey Equipments:	Logitech Computers Ltd.	6.7	0	100	6.7	100	6.7	Implemenation Complete
G-09	2017 Supply of Office Equip; DDM: DDM	DDM	0.5	100	100	0.5	100	0.5	Implemenation Complete
Component Totals			***46.1***			***46.1***		***46.1***	
Goods Totals			***1,373.5***			***1,338.6***		***1,373.5***	
Services									
D: Consulting Services									
S-01	ISPMC; Tranche 1:	NHC (JV) Mott MacDonald	1,018.2	3	65	665.5	75	762.7	Satisfactory Progress
S-02	Resettlement Implementation Support:	VRDS-HCL-JV	16.2	15	55	8.9	60	9.7	Satisfactory Progress
S-03	Livelihood Development:		64.7	0	0	0.0	0	0.0	Contract Not Yet Started
S-04	Community Based Flood Risk Mngmt:		64.4	0	0	0.0	0	0.0	EoI Received
S-06.1	2015 Erosion & Morphological Chg:	CEGIS	4.6	0	100	4.6	100	4.6	Implemenation Complete
S-06.2	2016 Erosion Prediction:	CEGIS	25.3	5	75	18.9	90	22.7	Satisfactory Progress
Component Totals			***1,193.4***			***698.0***		***799.8***	
Services Totals			***1,193.4***			***698.0***		***799.8***	
Works									
A: Civil Works									
W-01	Embankment, & 2 Reg.: km 0-5		293.6	0	0	0.0	0	0.0	Retendered
W-02	Embankment: km 5-8.5		133.4	0	0	0.0	0	0.0	Retendered
W-03	Embankment: 8.5-12.5		139.4	0	0	0.0	0	0.0	Retendered
W-04	Embankment & 1 Regulator: km 12.5-17.3		335.9	0	0	0.0	0	0.0	Retendered
W-05	Embankment & 1 Regulator: km 17.3-23		318.8	0	0	0.0	0	0.0	Retendered
W-06	Revetment: Jamuna at Chauhali, R1; km 0-2.5	I-J (JV)	386.9	1	98	379.2	100	386.9	Satisfactory Progress
W-07	Revetment: Jamuna at Chauhali, R2; km 2.5-7.0	I-J (JV)	445.2	1	98	436.2	100	445.2	Satisfactory Progress
W-08	Revetment: Jamuna at Zaffarganj, km 6.1-8.1	WEL-NZK-PTSL (JV)	492.8	2	92	453.4	100	492.8	Satisfactory Progress
W-09	Revetment: Padma at Harirampur, R1; km 6.7-10.2	M.M.Builders & Engineers Lt	268.9	0	100	268.9	100	268.9	Construction Complete
W-10	Revetment: Padma at Harirampur, R2; km 3.2-6.7	M.M.Builders & Engineers Lt	248.3	0	100	248.3	100	248.3	Construction Complete
W-14	River Training Pilot Work:		379.8	0	0	0.0	0	0.0	Dwgs Complete
W-15	Construction of Inspection Bungalow:		7.8	0	0	0.0	0	0.0	Dwgs Complete
Component Totals			***3,450.8***			***1,786.0***		***1,842.0***	
Works Totals			***3,450.8***			***1,786.0***		***1,842.0***	
ProjectTotals			**6,017.7**			**3,822.5**		**4,015.3**	

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	315.11
		1,152.72
Component B2: Materials Geotextile, Emerg		
G-04.1	Supply of Geobags; Chauhali & Harirampur	174.67
G-04.2	Supply of Geobags;	25.30
		199.97
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
		34.51
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
		4.37
Component C3: Vehicles & Equipment Survey Equipment		
G-08	Supply of Survey Equipments;	6.75
Component C4: Vehicles & Equipment DDM Office Eqpt		
G-09	Supply of Computers & Photocopiers; DDM	0.50
Goods Total		**1,398.82**
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;	64.73
		80.93
Component D3: Consulting Services INGO DDM		
S-04	Cb Flood Risk Mngmt;	64.40
Component D4: Consulting Services Survey & Investigation		
S-05	Multi-beam Echo Sounding & River Sur;	26.00
S-06.1	2015 Erosion & Morphological Chg; Jamuna, Ganges, Padma R	4.60
S-06.2	2016 Erosion Prediction;	25.25
		55.85
Component E3: Capacity Development MIS Development		
S-07	MIS Development, Support 1;	12.88
Services Total		**1,232.24**
Works		
Component A1: Civil Works Embankment Works		
W-01	Embankment (5 km); Kaijuri - Bhatpara; km 0-5 Kaijuri Reg 2V 1.5x1.8m; Rohindakandi Reg 2V 1.5x1.8m;	293.63
W-02	Embankment (3.5 km); Bhatpata - Gala; km 5-8.5	133.37
W-03	Embankment (4 km); Gala - Verakhola; km 8.5-12.5	139.42
W-04	Embankment Reconst. (4.8 km); Baghabari - Verakhola; km 12.5-17.3 Verakhola Reg 2V 1.5x1.8m;	335.93
W-05	Embankment Reconst. (5.7 km); Baghabari - Verakhola; km 17.3-23 Andhar Manik Reg 4V 1.5x1.8m;	318.81
W-15	Construction of Inspection Bungalow;	7.80
		1,228.96
Component A2: Civil Works Riverbank Prot Works		

Table B-4 Project Program, by Contract

Code	Description	Cost (BDT Mil)
Works		
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	492.80
W-09	Revetment (3.5 km); Harirampur; km 0-3.5	268.85
W-10	Revetment (3.5 km); Harirampur; km 3.5-7	248.28
		1,842.02
Component A3: Civil Works Emerg & Adaptation		
W-11	Emergency/Adaptive 1; Riverbank Protection	44.75
W-12	Koijhuri-Benotia Revetment; Riverbank Protection	18.36
W-13	Emergency/Adaptive 3; Riverbank Protection	17.82
		80.93
Component A4: Civil Works Pilot Land Recovery		
W-14	River Training Pilot Work; & Land Recovery	379.80
Works Total		**3,531.72**
eXtra		
Component E1: Capacity Development BWDB Training & Study		
X-05	BWDB Training and Study Tours;	63.90
Component F1: Land Acqn & Resettle Land Compensation		
X-07	Land Compensation;	2,083.11
Component F2: Land Acqn & Resettle Resettle Benefits		
X-08	Resettlement Benefits;	28.36
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;	30.94
Component G3: Program Management Office Opns DDM		
X-04	DDM Office Operations;	5.10
Component G4: Program Management BWDB River Surveys		
X-10.1	River Survey Work; Padma LB & Jamuna LB	0.15
X-10.2	Survey Work for Land Acquisition; Hat-Pachi to Dombaria	0.20
X-10.3	Land/River Survey Work; Jamuna at Chouhali 7km	0.15
X-10.4	Bathymetric River Survey; Dhaka, Pabna and Mymenshingh	1.99
X-10.5	2018 Bathymetric River Survey; Manikganj	5.51
		8.00
Component X1: Misc. Costs Misc. Costs		
X-01	ADB Interest & Service Charge;	199.20
X-09	CD and SD;	12.10
		211.30
eXtra Total		**2,514.37**
Project Total		***8,677.15***

Table B-5 BWDB PMO 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	316,703,598	0	0	316,703,598
G-02	Supply of Geobags; Zaforganj, Harirampur, Manikganj	417,777,105	0	0	417,777,105
G-03	Supply of Geobags; Harirampur, Manikganj	313,997,430	0	0	313,997,430
Component Total		***1,048,478,133***	***0***	***0***	***1,048,478,133***
B2 Geotextile, Emerg					
G-04.1	Supply of Geobags; Chauhali-Harirampur-Koijuri-Benotia	81,860,650	0	0	81,860,650
Component Total		***81,860,650***	***0***	***0***	***81,860,650***
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	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***
C4 DDM Office Eqpt					
G-09	2017 Supply of Office Equip; DDM; DDM	473,955	0	24,945	498,900
Component Total		***473,955***	***0***	***24,945***	***498,900***
Goods Total		***1,151,161,909***	***0***	***25,743,491***	***1,176,905,400***
Services					
D1 ISPM; Consultant Serv.					
S-01	ISPMC; Tranche 1;	52,396,048	298,254,426	52,396,048	403,046,522
Component Total		***52,396,048***	***298,254,426***	***52,396,048***	***403,046,522***
D2 INGO BWDB					
S-02	Resettlement Implementation Support;	4,131,467	0	617,346	4,748,813
Component Total		***4,131,467***	***0***	***617,346***	***4,748,813***
D4 Survey & Investigation					
S-06.1	2015 Erosion & Morphological Chg;	4,002,000	0	598,000	4,600,000
S-06.2	2016 Erosion Prediction;	11,749,843	0	1,755,724	13,505,567
Component Total		***15,751,843***	***0***	***2,353,724***	***18,105,567***
Services Total		***72,279,358***	***298,254,426***	***55,367,117***	***425,900,902***
Works					
A2 Riverbank Prot Works					
W-06	Revetment; Jamuna at Chauhali, R1; km 0-2.5	313,030,085	0	30,959,019	343,989,104
W-07	Revetment; Jamuna at Chauhali, R2; km 2.5-7.0	361,565,560	0	35,759,231	397,324,791
W-08	Revetment; Jamuna at Zaffarganj, km 6.1-8.1	385,248,148	0	38,101,465	423,349,613
W-09	Revetment; Padma at Harirampur, R1; km 6.7-10.2	244,469,460	0	24,178,298	268,647,758
W-10	Revetment; Padma at Harirampur, R2; km 3.2-6.7	223,389,944	0	22,093,511	245,483,455
Component Total		***1,527,703,196***	***0***	***151,091,525***	***1,678,794,721***
Works Total		***1,527,703,196***	***0***	***151,091,525***	***1,678,794,721***
eXtra					

Table B-5 BWDB PMO 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;	31,793,771	0	2,029,390	33,823,161
Component Total		***31,793,771***	***0***	***2,029,390***	***33,823,161***
F1	***Land Compensation***				
X-07	Land Compensation; Tangail and Manikganj	0	0	1,143,588,000	1,143,588,000
Component Total		***0***	***0***	***1,143,588,000***	***1,143,588,000***
F2	***Resettle Benefits***				
X-08	Resettlement Benefits;	2,036,260	0	0	2,036,260
Component Total		***2,036,260***	***0***	***0***	***2,036,260***
G2	***Office Opns BWDB***				
X-03	BWDB Office Operations;	11,445,018	0	1,560,684	13,005,702
Component Total		***11,445,018***	***0***	***1,560,684***	***13,005,702***
G3	***Office Opns DDM***				
X-04	DDM Office Operations;	396,506	0	54,069	450,575
Component Total		***396,506***	***0***	***54,069***	***450,575***
G4	***BWDB River Surveys***				
X-10.1	River Survey Work; left bank Padma & Jamuna	122,778	0	16,742	139,520
X-10.2	Survey Work for Land Acquisition; Hat-Pachi to Dombaria	170,702	0	23,278	193,980
X-10.3	Land/River Survey Work; Jamuna at Chouhali 7km	128,040	0	17,460	145,500
X-10.4	2017 Bathymetric River Survey; Dhaka, Pabna and Mymenshingh	1,753,294	0	239,086	1,992,380
X-10.5	2018 Bathymetric River Survey; Manikganj	1,731,756	0	236,149	1,967,905
Component Total		***3,906,571***	***0***	***532,714***	***4,439,285***
X1	***Misc. Costs***				
X-01	ADB Interest & Service Charge;	70,000,000	0	0	70,000,000
Component Total		***70,000,000***	***0***	***0***	***70,000,000***
eXtra Total		***119,578,126***	***0***	***1,147,764,857***	***1,267,342,983***
Project Total		**2,870,722,590**	**298,254,426**	**1,379,966,990**	**4,548,944,006**

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

Table B-6 Reimbursement Summary, by Contract

Code	Description	Total Bill Amount (BDT	Reimbursed Amount (BDT		
			ADB	GON	Total
Goods					
B1	***Geotextile, Civil Works***				
G-01	Supply of Geobags; Chouhali, Sirajganj	314,186,236	314,186,236	0	314,186,236
G-02	Supply of Geobags; Zaforganj, Harirampur, Manikganj	417,697,207	417,697,207	0	417,697,207
G-03	Supply of Geobags; Harirampur, Manikganj	267,640,452	267,640,452	0	267,640,452
		999,523,895	***999,523,895***	***0***	***999,523,895***
B2	***Geotextile, Emerg***				
G-04.1	Supply of Geobags; Chauhali-Harirampur-Koijuri-Benotia	15,301,650	15,301,650	0	15,301,650
C1	***Vehicles/Transport***				
G-05	2016 Supply of Jeep;	5,490,000	1,537,200	0	1,537,200
C2	***Office Equipment***				
G-07.1	2015 Office Equipment; BWDB PMO	2,197,630	2,087,749	0	2,087,749
G-07.2	2016 Office Equipment; BWDB PMO	2,175,087	2,066,333	0	2,066,333
		4,372,717	***4,154,081***	***0***	***4,154,081***
C3	***Survey Equipment***				
G-08	2016 Supply of Survey Equipments;	6,747,000	6,409,650	0	6,409,650
Goods Total		***1,031,435,262***	***1,026,926,476***	***0***	***1,026,926,476***
Services					
D1	***ISPM; Consultant Serv.***				
S-01	ISPMC; Tranche 1;	385,381,816	46,221,603	263,107,585	309,329,187
D2	***INGO BWDB***				
S-02	Resettlement Implementation Support;	4,748,813	4,131,467	0	4,131,467
D4	***Survey & Investigation***				
S-06.1	2015 Erosion & Morphological Chg;	4,600,000	4,002,000	0	4,002,000
S-06.2	2016 Erosion Prediction;	7,000,000	6,090,000	0	6,090,000
		11,600,000	***10,092,000***	***0***	***10,092,000***
Services Total		***401,730,629***	***60,445,070***	***263,107,585***	***323,552,654***
Works					
A2	***Riverbank Prot Works***				
W-06	Revetment; Jamuna at Chauhali, R1; km 0-2.5	217,117,316	193,710,770	0	193,710,770
W-07	Revetment; Jamuna at Chauhali, R2; km 2.5-7.0	344,230,501	302,787,707	0	302,787,707
W-08	Revetment; Jamuna at Zaffarganj, km 6.1-8.1	195,799,810	178,177,828	0	178,177,828
W-09	Revetment; Padma at Harirampur, R1; km 6.7-10.2	268,647,758	244,469,460	0	244,469,460
W-10	Revetment; Padma at Harirampur, R2; km 3.2-6.7	245,483,455	210,293,789	0	210,293,789
		1,271,278,841	***1,129,439,554***	***0***	***1,129,439,554***
Works Total		***1,271,278,841***	***1,129,439,554***	***0***	***1,129,439,554***
eXtra					
E1	***BWDB Training & Study***				
X-05	BWDB Training and Study Tours;	33,782,556	31,755,602	0	31,755,602
F2	***Resettle Benefits***				
X-08	Resettlement Benefits;	1,209,410	1,209,410	0	1,209,410
G2	***Office Opns BWDB***				
X-03	BWDB Office Operations;	9,686,643	8,524,245	0	8,524,245

Table B-6 Reimbursement Summary, by Contract

Code	Description	Total Bill Amount (BDT	Reimbursed Amount (BDT		
			ADB	GON	Total
G4	***BWDB River Surveys***				
X-10.1	River Survey Work; left bank Padma & Jamuna	141,500	124,520	0	124,520
X-10.2	Survey Work for Land Acquisition; Hat-Pachi to Dombaria	200,000	176,000	0	176,000
X-10.3	Land/River Survey Work; Jamuna at Chouhali 7km	149,860	131,877	0	131,877
		491,360	***432,397***	***0***	***432,397***
eXtra Total		***45,169,968***	***41,921,655***	***0***	***41,921,655***
Project Total		**2,749,614,699**	**2,258,732,754**	**263,107,585**	**2,521,840,338**

Table B-7 Reimbursement Summary, by Application

Acct. Type	Applic. No.	Date	Page	Cat	Rate of US Dollar	Total Bill Amount (BDT)	Total Bill Amount (US$)	Reimburs (%)	ADB Reimbursed Amount (BDT)	ADB Reimbursed Amount (US$)	Grant Applic. No.	Reimburs (%)	GoN Reimbursed Amount (BDT)	GoN Reimbursed Amount (US$)	Total Reimbursed Amount (BDT)	Total Reimbursed Amount (US$)
L/C	**BW001**	**30-Jun-2016**	**01**	**2**	77.80	667,502,605	8,579,725	100	667,502,605	8,579,725		0	0	0	667,502,605	8,579,725
Dir.Pay.	**BW002**	**22-Sep-2015**	**01**	**2**	77.80	27,665,835	355,602	100	27,665,835	355,602		0	0	0	27,665,835	355,602
Dir.Pay.	**BW003**	**22-Sep-2015**	**01**	**2**	77.80	35,827,904	460,513	100	35,827,904	460,513		0	0	0	35,827,904	460,513
Imprest	**BW006**	**14-Sep-2015**	**01**	**7A**	77.80	596,191	7,663	88	524,648	6,744		0	0	0	524,648	6,744
			02	**6B**	77.80	4,600,000	59,126	87	4,002,000	51,440		0	0	0	4,002,000	51,440
			03	**3B**	77.80	2,197,630	28,247	95	2,087,749	26,835		0	0	0	2,087,749	26,835
			04	**7A**	77.80	457,804	5,884	88	402,868	5,178		0	0	0	402,868	5,178
			05	**7A**	77.80	200,000	2,570	88	176,000	2,262		0	0	0	176,000	2,262
			06	**7A**	77.80	149,860	1,926	88	131,877	1,695		0	0	0	131,877	1,695
						8,201,485	***105,416***		***7,325,141***	***94,153***			***0***	***0***	***7,325,141***	***94,153***
Imprest	**BW008**	**03-Dec-2015**	**01**	**1**	78.74	77,441,455	983,509	91	70,471,724	894,993		0	0	0	70,471,724	894,993
			02	**2**	78.74	23,896,480	303,486	100	23,896,480	303,486		0	0	0	23,896,480	303,486
						101,337,935	***1,286,995***		***94,368,204***	***1,198,479***			***0***	***0***	***94,368,204***	***1,198,479***
Dir.Pay.	**BW009**	**23-Feb-2016**	**01**	**6A**	77.57	18,202,930	234,649	13	2,366,381	30,504	**BW010**	74	13,470,168	173,641	15,836,549	204,145
Imprest	**BW011**	**07-Mar-2016**	**01**	**1**	78.74	154,166,642	1,957,920	91	125,963,608	1,599,741		0	0	0	125,963,608	1,599,741
			02	**2**	78.74	887,099	11,266	100	887,099	11,266		0	0	0	887,099	11,266
			03	**6A**	78.40	4,597,309	58,639	13	597,650	7,623	**ED002**	74	3,402,009	43,393	3,999,659	51,016
			04	**7A**	78.74	800,964	10,172	88	704,848	8,952		0	0	0	704,848	8,952
						160,452,013	***2,037,997***		***128,153,205***	***1,627,582***			***3,402,009***	***43,393***	***131,555,214***	***1,670,975***
Dir.Pay.	**BW012**	**20-Mar-2016**	**01**	**6A**	77.57	30,049,770	387,364	13	3,512,027	45,273	**ED003**	74	19,991,540	257,706	23,503,567	302,979
Imprest	**BW013**	**05-May-2016**	**01**	**1**	78.60	242,232,508	3,083,883	91	207,335,427	2,639,716		0	0	0	207,335,427	2,639,716
			02	**2**	78.40	97,265,910	1,240,637	100	97,265,910	1,240,637		0	0	0	97,265,910	1,240,637
			03	**5**	78.60	624,855	7,950	94	587,364	7,473		0	0	0	587,364	7,473
			04	**7A**	78.74	173,409	2,202	88	152,600	1,938		0	0	0	152,600	1,938
						340,296,682	***4,334,672***		***305,341,300***	***3,889,763***			***0***	***0***	***305,341,300***	***3,889,763***
Dir.Pay.	**BW014**	**23-Jun-2016**	**01**	**5**	78.40	7,966,561	101,614	94	7,488,568	95,517		0	0	0	7,488,568	95,517
Dir.Pay.	**BW015**	**29-Jun-2016**	**01**	**6A**	77.57	37,052,991	477,641	13	4,336,393	55,899	**ED004**	74	24,684,081	318,196	29,020,474	374,096
Dir.Pay.	**BW016**	**29-Jun-2016**	**01**	**6A**	77.57	30,310,811	390,729	13	3,552,983	45,801	**ED005**	74	20,224,672	260,711	23,777,655	306,512

Table B-7 Reimbursement Summary, by Application

Acct. Type	Applic. No.	Date	Page	Cat	Rate of US Dollar	Total Bill Amount (BDT)	Total Bill Amount (US$)	Reimburs (%)	ADB Reimbursed Amount (BDT)	ADB Reimbursed Amount (US$)	Grant Applic. No.	Reimburs (%)	GoN Reimbursed Amount (BDT)	GoN Reimbursed Amount (US$)	Total Reimbursed Amount (BDT)	Total Reimbursed Amount (US$)
Imprest	**BW017**	**29-Sep-2016**	**01**	**1**	78.40	208,446,710	2,658,759	91	189,686,506	2,419,471		0	0	0	189,686,506	2,419,471
			02	**2**	78.40	56,809,500	724,611	100	56,809,500	724,611		0	0	0	56,809,500	724,611
			03	**3A**	78.40	5,490,000	70,026	28	1,537,200	19,607		0	0	0	1,537,200	19,607
			04	**3B**	78.40	8,922,087	113,802	95	8,475,983	108,112		0	0	0	8,475,983	108,112
			05	**5**	78.40	6,096,985	77,768	94	5,731,166	73,102		0	0	0	5,731,166	73,102
			06	**6A**	78.40	36,141,795	460,992	13	4,698,433	59,929	**ED006**	74	26,744,928	341,134	31,443,362	401,063
			08	**6B**	78.40	8,620,000	109,949	87	7,499,400	95,656		0	0	0	7,499,400	95,656
			09	**7A**	78.40	1,584,307	20,208	88	1,394,190	17,783		0	0	0	1,394,190	17,783
			10	**7A**	78.40	1,585,375	20,222	88	1,395,130	17,795		0	0	0	1,395,130	17,795
			11	**7A**	78.40	1,595,731	20,354	88	1,404,243	17,911		0	0	0	1,404,243	17,911
			12	**7A**	78.40	304,456	3,883	88	267,922	3,417		0	0	0	267,922	3,417
			13	**7A**	78.40	884,047	11,276	88	777,961	9,923		0	0	0	777,961	9,923
						336,480,994	***4,291,849***		***279,677,635***	***3,567,317***			***26,744,928***	***341,134***	***306,422,563***	***3,908,451***
Imprest	**BW018**	**08-Dec-2016**	**01**	**6A**	78.40	5,385,000	68,686	13	804,655	10,263	**ED007**	74	4,580,345	58,423	5,385,000	68,686
Dir.Pay.	**BW019**	**09-Jan-2017**	**01**	**5**	78.95	1,599,534	20,260	94	1,503,562	19,044		0	0	0	1,503,562	19,044
Imprest	**BW020**	**02-May-2017**	**01**	**1**	78.84	214,208,421	2,717,002	91	194,929,663	2,472,472		0	0	0	194,929,663	2,472,472
			02	**1**	78.84	248,912,255	3,157,182	91	226,510,152	2,873,036		0	0	0	226,510,152	2,873,036
			03	**2**	78.84	89,668,562	1,137,349	100	89,668,562	1,137,349		0	0	0	89,668,562	1,137,349
			04	**6A**	78.84	33,754,290	428,139	13	4,388,058	55,658	**ED008**	74	24,978,174	316,823	29,366,232	372,481
			05	**6A**	78.84	3,033,444	38,476	13	453,273	5,749		74	2,580,170	32,727	3,033,444	38,476
			06	**7A**	78.84	1,542,815	19,569	88	1,357,677	17,221		0	0	0	1,357,677	17,221
						591,119,787	***7,497,717***		***517,307,385***	***6,561,484***			***27,558,345***	***349,550***	***544,865,730***	***6,911,034***
Dir.Pay.	**BW021**	**26-Feb-2017**	**01**	**6A**	77.57	43,623,862	562,381	13	4,754,404	61,292	**ED009**	74	27,063,531	348,892	31,817,935	410,184
Dir.Pay.	**BW022**	**06-Apr-2017**	**01**	**6A**	77.58	10,914,447	140,695	13	1,248,698	16,097	**ED010**	74	7,107,971	91,627	8,356,669	107,724
			02	**6A**	77.58	31,422,484	405,059	13	3,594,977	46,342		74	20,463,714	263,793	24,058,691	310,135
			03	**6A**	77.58	27,536,950	354,972	13	3,150,441	40,612		74	17,933,279	231,173	21,083,720	271,785
						69,873,881	***900,727***		***7,994,115***	***103,050***			***45,504,965***	***586,593***	***53,499,080***	***689,643***
Imprest	**BW023**	**22-Jun-2017**	**01**	**1**	78.84	125,870,850	1,596,535	91	114,542,474	1,452,847		0	0	0	114,542,474	1,452,847
			02	**2**	78.84	15,301,650	194,085	100	15,301,650	194,085		0	0	0	15,301,650	194,085

Table B-7 Reimbursement Summary, by Application

Acct. Type	Applic. No.	Date	Page	Cat	Rate of US Dollar	Total Bill Amount (BDT)	Total Bill Amount (US$)	Reimburs (%)	ADB Reimbursed Amount (BDT)	ADB Reimbursed Amount (US$)	Grant Applic. No.	Reimburs (%)	GoN Reimbursed Amount (BDT)	GoN Reimbursed Amount (US$)	Total Reimbursed Amount (BDT)	Total Reimbursed Amount (US$)
Imprest	**BW023**	**22-Jun-2017**	**03**	**4**	78.84	1,209,410	15,340	100	1,209,410	15,340		0	0	0	1,209,410	15,340
			04	**5**	78.84	1,518,029	19,255	94	1,426,947	18,099		0	0	0	1,426,947	18,099
			05	**6A**	78.84	16,135,219	204,658	13	2,216,757	28,117	**ED011**	74	12,618,463	160,052	14,835,220	188,169
			06	**6B**	78.84	3,128,813	39,686	87	2,722,067	34,526		0	0	0	2,722,067	34,526
			07	**7A**	78.84	303,043	3,844	88	266,678	3,383		0	0	0	266,678	3,383
						163,467,014	***2,073,402***		***137,685,983***	***1,746,398***			***12,618,463***	***160,052***	***150,304,446***	***1,906,449***
Dir.Pay.	**BW024**	**06-Jun-2017**	**01**	**5**	80.63	7,976,591	98,928	94	7,497,996	92,993		0	0	0	7,497,996	92,993
Dir.Pay.	**BW025**	**07-Jun-2017**	**01**	**6A**	77.58	29,445,241	379,571	13	3,368,766	43,426	**ED012**	74	19,176,051	247,194	22,544,817	290,620
Dir.Pay.	**BW026**	**31-Mar-2017**	**01**	**6A**	77.58	20,192,316	260,294	13	2,310,158	29,780	**ED013**	74	13,150,130	169,515	15,460,287	199,295
Dir.Pay.	**BW027**	**06-Jul-2017**	**01**	**6A**	77.58	7,582,956	97,750	13	867,549	11,183	**ED014**	74	4,938,357	63,659	5,805,906	74,842
Dir.Pay.	**BW028**	**06-Jul-2017**	**01**	**5**	80.00	8,000,000	100,000	94	7,520,000	94,000		0	0	0	7,520,000	94,000
Project Totals						**2,749,614,699**	**35,104,483**		**2,258,732,754**	**28,819,041**			**263,107,585**	**3,378,658**	**2,521,840,338**	**32,197,699**

Table B-8 ADB & GON Disbursement Details

ADB Disbursements

ADB Loan Account

Appl. No	Date	US$	Rate	BDT
WL001	09-Dec-2014	3,682,433.00	77.85	286,677,409
Wl007	17-Dec-2015	11,069,711.00	78.70	871,186,256
BW006	15-Oct-2015	94,110.00	77.80	7,321,766
BW008	20-Dec-2015	1,198,478.59	78.70	94,320,265
BW013	30-Jun-2016	3,889,762.94	78.40	304,957,414
BW011	02-Oct-2016	1,627,548.73	78.40	127,599,820
BW017	27-Nov-2016	3,567,316.77	78.65	280,569,464
BW018	04-May-2017	10,263.46	78.40	804,655
BW020	02-May-2017	6,561,484.21	78.84	517,307,415
BW023	22-Jun-2017	1,746,397.55	78.84	137,685,983
		33,447,506.25		**2,628,430,448**

Grant Imprest Account

Appl. No	Date	US$	Rate	BDT
WG002	09-Dec-2014	1,189,354.00	77.85	92,591,209
WG007	17-Dec-2015	20,651.00	78.70	1,625,234
WG008	04-Oct-2016	319,995.00	78.40	25,087,608
ED002	24-Nov-2016	43,392.97	78.63	3,411,989
ED006	24-Nov-2016	341,134.29	78.63	26,823,389
ED007	04-May-2017	58,422.77	78.40	4,580,345
ED008	02-May-2017	349,549.87	78.84	27,558,512
ED011	22-Jun-2017	160,051.52	78.84	12,618,462
		2,482,551.42		**194,296,748**

Reimbursement

Dir.Pay Applic	Date	Category	ADB & GoN US$	ADB & GoN (BDT)
BW002	22-Sep-2015	2	355,602	27,665,835
BW003	22-Sep-2015	2	460,513	35,827,904
BW009/BW010	23-Feb-2016	6A	204,145	15,836,549
BW012/ED003	20-Mar-2016	6A	302,979	23,503,567
BW014	23-Jun-2016	5	95,517	7,488,568
BW015/ED004	29-Jun-2016	6A	374,096	29,020,474
BW016/ED005	29-Jun-2016	6A	306,512	23,777,655
BW001 (LC)	30-Jun-2016	2	8,579,725	667,582,527
BW019	20-Jan-2017	5	19,044	1,503,562
BW021/ED009	10-Mar-2017	6A	410,184	31,819,987
BW022/ED010	06-Apr-2017	6A	689,589	53,499,087
BW024	06-Jun-2017	5	92,993	7,497,996
BW025/ED012	07-Jun-2017	6A	290,620	22,544,814
BW026/ED013	22-Jun-2017	6A	199,295	15,460,289
BW027/ED014	06-Jul-2017	6A	74,843	5,805,907
BW028	06-Jul-2017	2	94,000	7,520,000
Totals			**12,549,656**	**976,354,720**

Total Disbursement

Currency	ADB & GON
BDT Mil	3,799
US$ Mil	48.48

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

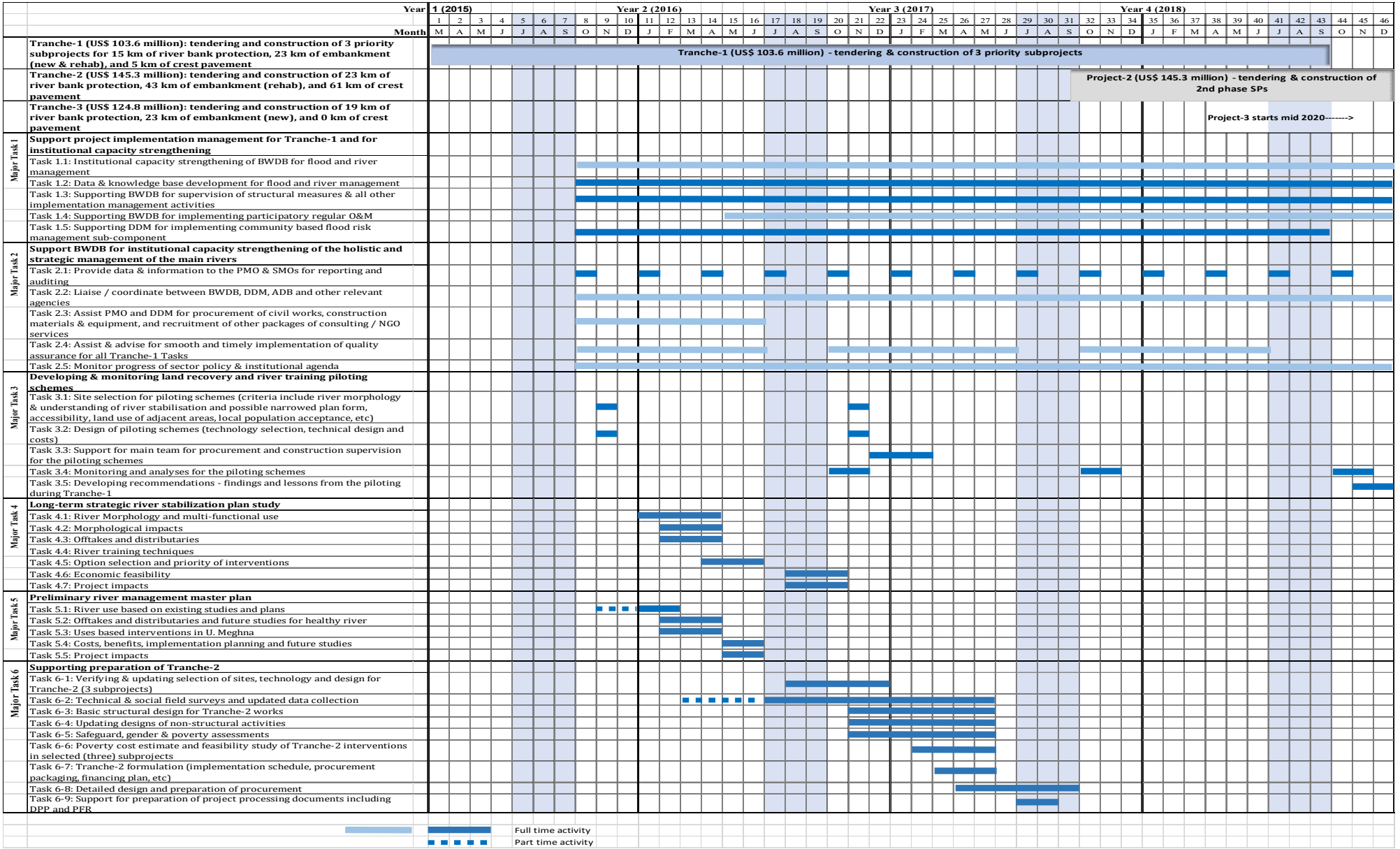
Table C-1 Utilization of Consultant Person-Months

No.	Position	Firm	Name	Person-Months		
				Contract	Used	Balance
	MAIN TEAM - INTERNATIONAL					
I-1	Team Leader / River Mangement Specialist	NHC	Knut Oberhagemann	31.50	17.40	14.10
I-2	Institutional Development Specialist	EMM	Robert A. van de Putte	4.50	1.47	3.03
I-3	Morphologist	DELTARES	EriK Mosselman	4.50	1.79	2.71
I-4	River Engineer	NHC	Bruce Walsh	9.00	2.03	6.97
I-5	Construction / Quality Control Engineer	EMM	Basistha Adhikari	21.60	0.87	20.73
I-6	Flood Disaster Risk Management Specialist	NHC	Dave Burkholder	10.80	6.78	4.02
I-7	Social Development / Resettlement Specialist	EMM	Jean Louis Leterme	8.80	7.95	0.85
I-8	Economist	NHC	John D. M. Roe	3.30	0.00	3.30
I-9	Financial Management Specialist	EMM	J. Spurr	0.00	0.00	0.00
I-10	Hydrologist	NHC	Derek Stuart	5.00	2.65	2.35
I-11	Environmental Specialist	EMM	Wandert Benthem	7.00	2.56	4.44
I-12	Information and Data Management Specialist	NHC	Dave Burkholder	6.00	4.01	1.99
I-13	Int'l Construction Advisor-Engineer	NHC	Graeme Vass	3.00	3.00	0.00
I-14	Junior Engineer	NHC	Jesper Mathiesen	5.50	5.16	0.34
I-15	Numerical Modeller	NHC	Angela Thompson	5.00	5.00	0.00
I-16	River Engineer	NHC	Brad Hall	4.50	2.12	2.38
			Totals	**130.00**	**62.80**	**67.20**
	MAIN TEAM - NATIONAL					
N-1	DTL / Flood & Erosion Risk Management Spec.	EMM	Sharif Al Kamal	37.40	22.50	14.90
N-2	Institutional / Capacity Development Specialist	RPMC	Dr. M. A. Qassem	10.00	9.80	0.20
N-3	River Engineer (Morphologist)	CEGIS	Dr. Maminul Haque Sarker	8.80	7.02	1.78
N-4	Community-based Flood Risk Mngt. Spec.	RPMC	Quazi Towfique Islam	36.00	21.84	14.16
N-5	Resettlement Specialist	EMM	Shireen Akhter	13.50	1.86	11.64
N-6	Project Economist	RPMC	Amiul Islam	7.70	7.00	0.70
N-7	Procurement Specialist	RPMC	A. Abdullah Chowdhury / **Md Abdullah Sadeque**	9.00	1.66	7.34
N-8	Construction Engineer	RPMC	Mirza Harunar Rashid	29.00	18.20	10.80
N-9	Financial Management Specialist	EMM	Md. Habibur Rahman/**Ektedar Rahman**	11.00	2.95	8.05
N-10-1	River Engineer Flood Management Infr.- 1	RPMC	Mukhles uz zaman	12.50	12.49	0.01
N-10-2	River Engineer Flood Management Infr. -2	RPMC	Md. Motiur Rahman	20.50	13.60	6.90
N-11	Social Development and Gender Specialist	EMM	Ruh Afza Ruhi/**Begum S. Nahar**	16.00	8.49	7.51
	Resettlement Specialist	EMM	Ruh Afza Ruhi/**Begum S. Nahar**		3.46	-3.46
N-12	Environment Specialist	RPMC	Dr. Md. Nurul Islam/**Md. Amir Faisal**	16.00	10.78	5.22
N-13	Training Coordinator	EMM	Jahangir Kabir/ **Shameem Ahmed**	20.00	15.33	4.67
N-14	Information and Data Management Specialist	EMM	Asrafuzzamen	0.00	0.00	0.00
N-15	Hydraulic Structural Engineer	RPMC	Md. Dabir Uddin	5.00	0.00	5.00
N-16	Road Engineer	RPMC	Zakir Hossain	6.00	1.53	4.47
N-17	Geotechnical Engineer / **Geotecnical Expert (Local)**	EMM	Md. Korban Ali / **Md. Shamsul Islam**	7.00	0.75	6.25
N-18-1	Site Engineer 1 (PRB-1)	RPMC	Md. Nurul Amin	34.00	21.38	12.62
N-18-2	Site Engineer 2 (JLB-2 Chauhali)	RPMC	KM Nazmul Haque/ **Ekram Sarder**	18.00	8.20	9.80
N-18-3	Site Engineer 3 (JLB-2 Zaffarganj)	EMM	Md Faridul Alam	36.00	17.47	18.53
N-18-4	Site Engineers 4 (PLB-1 Harirampur)	EMM	Abdul Jalil/**Saiful Islam**	36.00	8.04	27.96
			Totals	**389.40**	**214.35**	**175.05**

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

	RIVER STUDY TEAM - INTERNATIONAL					
IR-1	Task Leader / Flood & River Management Spec.	NHC	Carsten Stuab	11.00	10.13	0.87
IR-2	Institutional Development Specialist	EMM	Robert A. van de Putte	2.70	0.33	2.37
IR-3	Morphologist	DELTARES	Sanjay Giri	6.30	2.83	3.47
IR-4	River Engineer (River Training)	NHC	Gerritt Klaassen	7.70	6.37	1.33
IR-5	Water Resources Management Specialist	DELTARES	W. J. Oliemans	4.50	1.58	2.92
IR-6	Economist	EMM	Alexander Mueller/**John D.M. Roe**	3.60	2.47	1.13
IR-7	Social / Regional Development Specialist	NHC	Mark Hopkins	5.50	5.01	0.49
IR-8	Environmental Specialist	EMM	Wandert Benthem	3.60	1.93	1.67
IR-9	Hydrologist	NHC	Malcolm Leytham	2.00	1.94	0.06
			Totals	**46.90**	**32.55**	**14.31**
	RIVER STUDY TEAM - NATIONAL					
NR-1	Water Resources Management Specialist	RPMC	G M Akram Hossain	10.00	9.97	0.03
NR-2	Flood Management Specialist	RPMC	Md. Makbul Hossain	6.60	7.55	**-0.95**
NR-3	River Engineer (Morphologist)	CEGIS	Dr. Maminul Haque Sarker	8.10	2.66	5.44
NR-4	Economist	EMM	Dr. Shaker Ahmed	3.60	0.00	3.60
NR-5	Regional / Spatial Planner	RPMC	Dr. Shamim M Haque	4.00	3.37	0.63
NR-6	Institutional Development Specialist	RPMC	Dr. M. A. Qassem	4.00	4.00	0.00
NR-7	River Engineer	RPMC	Md. Motiur Rahman Jewel	12.00	7.84	4.16
NR-8	Hydrologist	EMM	Imdadul Haque Siddiqui	0.00	0.00	0.00
NR-9	Social Development and Gender Specialist	EMM	Ruh Afza Ruhi/**Begum S. Nahar**	5.00	5.00	0.00
NR-10	Environment / Climate Change Specialist	EMM	Md. Rakibul Haque	2.50	0.00	2.50
NR-11	Water Supply and Water Quality Specialist	EMM	Md. Mozammel Hossain/ **Dr. Khairul Bashar**	5.00	3.63	1.37
NR-12	Agriculture Specialist	RPMC	Dr Quazi Reasul Islam	4.00	3.34	0.66
NR-13	Fishery Specialist	RPMC	Dr. Md. S. Howlader	5.00	5.00	0.00
			Totals	**69.80**	**49.31**	**17.43**

Table C-2 Work Schedule from Inception Report



Appendix-D Status of River Study Technical Notes

Table D-1 Status of River Study Technical Notes

No.	Tentative Title	Main Author(s)	Review/Approval	Annexes - River Stabilization Plan						Annexes- Preliminary River Management Master Plan							Status
				A	B	C	D	E		A	B	C	D	E	F	G	
				Background information	Morphology - General	Morphology - Bifurcations & Offtakes	River Stabilization Plan Development	Pilot Works		Flood Management	Distributary Water Resources	Socio-Economics	Environment & Fisheries	Impact Assessment	Use of Reclaimed Land	Economic Analyses	
1	Background data, river use, studies and plans	MH	CS	x													Completed
2	Holistic river morphology analysis for the Brahmaputra river system (past changes and possible futures). Part I	MHS	CS/EM		x												Completed
3	Holistic river morphology analysis for the Brahmaputra river system (past changes and possible futures). Part II	MHS	EM		x												Scope of work to be clarified.
4	Upper Meghna - present conditions and issues	JAA/MHS	CS		x												Completed
5	Char characteristics and dynamics – past and present conditions on basis of satellite imagery	MHS	GJK		x												Final draft submitted for review.
6	River bifurcations: Theory and model experience	EM	KO			x											Completed
7	River bifurcations: Field experience	MHS	CS/BH			x											Final draft submitted for review.
8	River bifurcations: Simplified numerical modelling	AT	SG/GJK			x											Completed
9	Reach 3 and bifurcation: numerical modelling	AT/SG	KO/EM			x											Draft report ready by 10-Nov.
10	Offtakes part 1 Updated planform studies	MHS	CS/EM			x											Final draft expected on 07-Nov.
11	Offtakes part 2 Numerical model studies and generic guidelines	MY	EM			x											Draft expected by end of Nov.
12	Nomenclature of river corridors	EM	BH				x										Draft expected on 3-Nov.
13	River Stabilization Plan	GJK	BH				x										Comprehensive full draft finalized by end of Nov.
14	River stabilization of other main rivers	CS/GJK	BH				x										Scope of work to be clarified.
15	Earlier proposals and attempts for stabilization Jamuna River (including Capital dredging)	GJK/CS	BH				x										Draft available by Jan 2018.
16	Confluences: 2D hydraulic modelling (Underwater apron for Chandpur town protection)	MRJ/AT	SG				x										Draft complete, and to be reviewed by mid-Nov.
17	Intermediate and final planform alternatives	MRJ	GJK				x										Needs clarification from PMO.
18	Feasible techniques and methods for riverbank protection and future channel narrowing	BW	GJK/BH				x										Some draft text completed.

No.	Tentative Title	Main Author(s)	Review/Approval	Annexes - River Stabilization Plan					Annexes- Preliminary River Management Master Plan							Status
				A	B	C	D	E	A	B	C	D	E	F	G	
				Background information	Morphology - General	Morphology - Bifurcations & Offtakes	River Stabilization Plan Development	Pilot Works	Flood Management	Distributary Water Resources	Socio-Economics	Environment & Fisheries	Impact Assessment	Use of Reclaimed Land	Economic Analyses	
19	Main river flood risk and management	MHo	CS						x							Needs input from TN20.
20	Flooding numerical modelling	DS/SG	BH						x							Final draft finished by end of Nov.
21	Distributaries: Water resources preparation and baseline	WO	ML							x						Final draft finished by 20-Nov-2017.
22	Distributaries: Water balance, potential measures and study plan	WO	ML							x						Final draft finished by 20-Nov.
23	Socio-economic Aspects	MH/SN	JLL								x					Draft report expected by 24-Nov.
24	Environmental and social aspects of river stabilization: Remedial measures	AF/SH	WB									x				Completed
25	Fisheries Impacts of FRERMIP and their Management	SH	CS/WB				x					x				Final draft submitted for review.
26	Sediment management	GJK/MHS	BH										x			Submitted for review.
27	Long-term effects of river narrowing on water levels	EM	KO										x			Completed
28	Future conditions affecting flows	MCC	ML										x			Draft expected by 16-Nov.
29	Use of reclaimed land	MH	CS											x		Completed
30	Charland amelioration and agriculture development	QRI	CS											x		Basic text completed.
31	Charland development: Preliminary economic assessment	JR/AI	KO											x		Submitted for review.
32	Economic analysis different alternatives	JR	KO												x	Due in 2018, when alternatives finalised.
33	Proposed pilot works for Old Dhaleswari River	MZ/GJK	KO					x								To be replaced by Memo.
34	Design and cost estimate pilot works	MZ/JM	KO					x								To be replaced by Memo.

Abbreviations:

AF = Amir Faisal
AI = Aminul Islam
AT = Angela Thompson
BH = Brad Hall
BW = Bruce Walsh
CS = Carsten Staub
DS = Derek Stuart
EM = Erik Mosselman
GJK = Gerrit Klaassen
JAA = Jakia Akter
JLL = Jean Louis Leterme
JM = Jesper Mathiesen
JR = John Roe
KO = Knut Oberhagemann
MCC = Mariza Costa-Cabral
MH = Mark Hopkins
MHo = Makbul Hossain
MHS = Mamin H. Sarker
ML = Malcolm Leytham
MRJ = Motiur Rahman Jewel
MY = Mohamed Yossef
MZ = Mukhles uz Zaman
QRI = Qazi Reasul Islam
SG = Sanjay Giri
SH = Shajahan Howlader
SN = Shamsun Nahar
WB = Wandert Bernthem
WO = William Oliemans

Appendix-E Detailed Resettlement Progress

Acronyms Associated with Resettlement Activities

CCL	Cash Compensation under Law
char	low-lying island or bar
DC	District Commissioner
DP	Displaced Person
Dhara	A collection of official government forms
GRC	Grievance Redress Committee
EP	Entitled Person
khas	government land
ID	Identification
INGO	Implementation Non-Government Organization
JVT	Joint Verification Team
JRB-1	Jamuna Right Bank, Phase-1
LA	Land Acquisition
PAP	Project Affected Person
PM	Prime Minister
PMO	Project Management Office
PVAT	Property Valuation Assessment Team
RP	Resettlement Plan
XEN	Executive Engineer

Detailed Resettlement Progress by Individual Site

Sites	Resettlement Activities	Progress During Current Quarter	Projected Progress During Next Quarter
Chauhali	• Acquisition of a strip of land for Riverbank Protection • Assessment of Resettlement Impacts	• JVT at Chauhali completed • PVAT Meeting held at XEN-Tangail office on 18-Sep-2017 for 36 EPs (Sirajganj part) • LA plan already submitted to DC office and DC office issued 7-Dhara notices to EPs • Formation of Safeguard Committees (JVT, PVAT, GRC) done • RP approved • ID cards issued to PAPs • Compensation payment started • Market Survey done at Chauhali (Sirajganj part)	• Estimate for CCL of Tangail part not received DC office, XEN-Tangail to follow up • Information campaign to be started • Payment of compensation to 36 PAPs to be completed • INGO to ensure payment to 36 EPs from Sirajganj-part, and another 5 EPs having bank accounts • Agriculture vulnerable payment to be paid immediately after CCL payment • INGO to organize meetings with each GRC at each site every month and report to PMO

Detailed Resettlement Progress by Individual Site

Sites	Resettlement Activities	Progress During Current Quarter	Projected Progress During Next Quarter
Zafarganj	• Acquisition of a strip of land for Riverbank Protection • Assessment of Resettlement Impacts	• JVT at Zafarganj 1.4 km and 0.6 km reach completed • RP for Zafarganj 1.4 km and 0.6 km reach approved by ADB • Information campaign completed • ID cards issued to PAPs • Payment of compensation completed • DC office handed over Zafarganj 0.6 km reach land to BWDB on 08-Aug-2017	• 12 pending payments have to be completed by mid-October 2017 • Follow-up to be done for CCL payment by DC • INGO to organize meetings with each GRC at each site every month and report to PMO
Harirampur	• Acquisition of a strip of land for Riverbank Protection • Assessment of Resettlement Impacts	• RP approved • Received approval from MOWR for reach-1 khas land • Request for reach-2 khas land submitted to MOWR • Proposal for reach-3 khas and char land under process • LA proposal submitted • All maps collected, and land to be acquired delineated	• Household Survey to be completed • Start compensation payment planning process • INGO to organize meetings with each GRC at each site every month and report to PMO

Detailed Resettlement Progress by Individual Site

Sites	Resettlement Activities	Progress During Current Quarter	Projected Progress During Next Quarter
Koijuri to Baghabari, Shahjadpur, Sirajganj	• Acquisition of land for Embankment Construction • Assessment of Resettlement Impacts • Resettlement site preparation • Relocation of PAP	• ID cards issued to 816 PAPs, out of 866 • Information brochure distributed at Embankment JRB-1 to 866 squatters • DC office issued 6-Dhara notices to PAPs who will lose land • JVT meeting for squatters held on 30-Aug-2017 • Market Survey for squatters complete at Embankment JRB-1	• Updated RP to be approved • ID cards to be issued to PAPs • Information campaign ongoing • Start Payment of Compensation; DC to issue 7-Dhara notices to EPs • Finalize relocation sites for squatters • Start to assist resettlement of PAPs • Resettlement Questionnaire to be completed for all PAPs • Squatters database list for Koitala, Pabna to be completed • INGO to organize meetings with each GRC at each site every month and report to PMO

Corrective Action Plan to comply with the Loan Agreement
Chauhali, Tangail

No.	Corrective Actions	Dateline and related remarks	Responsible Party	Status as on 30 September 2017	Revised Deadline
1	Based on the RP verify DPs with and without title that need to received compensation and other entitlement, the inventory should be able to show the following group of DPs	Submitted to on the last week of June 2017	BWDB assisted by the INGO	Inventory DPs has been submitted on 22 June 2017	
	Identified DPs with titleholder that have been included in the list of DC and received notification and verified by JVC and payment should be from Government budget			In progress from government budget through DC	
	Identify DPs with titleholders that includes in the DC list but compensation for loss other properties such as tree, structures, moving grants, and transition allowance due loss income but will not be paid by DC and should be paid by the Project budget			In progress from government budget through DC	
	Identify DPs with titleholder but were not included in the list of DC (because during DC and JVC survey, these DPs have moved) and identify compensation and other entitlement for these DPs that should be paid by the project budget			For 36 EPs pending payment in progress; PVAT meeting held on 18 September 2017. Now waiting to get the rate from PWD to confirm the price; then payment will be done	20 October 2017
	Identify DPs without titleholders that needs to be pay full compensation and entitlement by the project budget – should describe detail compensation and entitlement that should be paid e.g. loss tree, structures, moving grants, and transition allowance due loss income			Identified DPs and payment from Project Budget	
	Identify as clearly as possible where the source of funding that will be used for paying compensation and other entitlement either government budget or project budget under the ADP 2017/2018				
2	Continue with actions to follow up approval from the Prime Minister and obtain Prime Minister Approval	31 July 2017	BWDB	Follow up is ongoing for approval from the Prime Minister and obtain PM's	

No.	Corrective Actions	Dateline and related remarks	Responsible Party	Status as on 30 September 2017	Revised Deadline
	for land acquisition			Approval for land acquisition	
3	Expedite completion of DC tasks including JVC tasks to complete the process under LA Act	15 August 2017	Respective DCs submit to BWDB And BWDB will provide the required budget	ongoing	
	Submission DC budget to compensate DPs with title holders received by BWDB for Chauhali	16 August 2017		Yet to be received	
4	Transfer Fund from BWDB to Respective DCs	First week of September 2017	BWDB	Yet to be done	
5	Payment Compensation and other entitlement by DC to DPs with titleholders	September 2017	Respective DC in close coordination with BWDB	Pending payment CCL for structures to 27-EPs within 20 October 2017	20 October 2017
6	Payment compensation and other entitlement to the DPs without title from project budget	September 2017	BWDB assisted by INGO	Payment Resettlement Grant has been done at Chauhali among 52-EPs and pending payment CCL for structures to 9- EPs within 20 October 2017	20 October 2017
7	Submit letter to ADB to report the progress in implementing Corrective Actions in monthly basis	5 July, 5 August, 5 Sept, 2017	BWDB	Monthly Report of July and August already submitted to ADB.	Monthly report of Sept. by 15 Oct. 2017
8	Submit report to ADB on completion of implementation the corrective actions for Chauhali	10 October 2017	BWDB		30 October 2017

Corrective Action Plan to comply with the Loan Agreement
Zafarganj 1.4 km, Manikganj

No.	Corrective Actions	Dateline and related remarks	Responsible Party	Status as on 30 September 2017	Revised Deadline
1	Inventory DPs to show the following list of group of DPs:	Submitted to ADB 18 June 2017	BWDB assisted by the INGO	Inventory DPs has been submitted on 22 June 2017	NA
	Identified DPs received resettlement Grant			Identified DPs and payment from government budget through DC	
	Identify DPs that will received land compensation through DC			Identified DPs and payment from government budget through DC	
	Identify DPs with titleholders that loss other properties such as tree, structures, moving grants, and transition allowance due loss income but will not be paid by DC and those who will be paid by DC			NA	
	Identify DPs with title holders but were not included in the DC list for payment			NA	
	Identify DPs without title that have received full compensation and other entitlements			Identified DPs and payment from Project Budget	
	Identify DPs without title that have not received/ have not been paid a compensation and other entitlements, and describe clearly what needs to be paid			Identified DPs and payment from Project Budget	
	Identify as clearly as possible where the source of funding that will be used for paying outstanding compensation and other entitlement for each group listed above (either from government budget through DC or project budget				
2	Submission Estimate from DC to BWDB for paying compensation and other entitlement based on Joint Verification Committee	15 June 2017	BWDB has to urge respective DCs submit on time	BWDB is pursuing DC office to get Estimate for LA case	30 Sept.
3	Transfer of fund from BWDB to respective DC	20 June 2017	BWDB	After receiving Estimate from DC office then fund	15 Oct.

No.	Corrective Actions	Dateline and related remarks	Responsible Party	Status as on 30 September 2017	Revised Deadline
				will be transferred to DC's Account	
4	Payment compensation to DPs by DC	20 to 25 June 2017	Respective DC in close coordination with BWDB	Notice u/s 3 & 6 already issued	
5	Payment Compensation and other entitlement to DPs without titleholders by the Project	Complete by 25 June 2017	BWDB assisted by INGO	87 EPs received resettlement benefit on 15.04.2017; 12 EPs payment pending (10wage earner & 2 title holders)	A JVT needs to be organized after CCL payment
6	Submit report to ADB on completion of implementation the corrective action plan for Zafarganj 1.4 km	9 July 2017	BWDB	Monthly Report of July and August already submitted to ADB.	Sep. Monthly report by 15 Oct 2017

Corrective Action Plan to comply with the Loan Agreement
Zafarganj 0.6 km, Manikganj

No.	Corrective Actions	Dateline and related remarks	Responsible Party	Status as on 30 September 2017	Revised Deadline
1	Based on the RP verify DPs with and without title that need to receive compensation and other entitlement, the inventory should be able to show the following group of DPs	Submitted to 18 June 2017	BWDB assisted by the INGO	Inventory DPs has been submitted on 22 June 2017	NA
	Identified DPs with titleholder that have been included in the list of DC and received notification and verified by JVC and payment should be from Government budget			In progress from government budget through DC	
	Identify DPs with titleholders that includes in the DC list but compensation for loss other properties such as tree, structures, moving grants, and transition allowance due loss income but will not be paid by DC and should be paid by the Project budget			In progress from government budget through DC	
	Identify DPs with titleholder but			NA	

No.	Corrective Actions	Dateline and related remarks	Responsible Party	Status as on 30 September 2017	Revised Deadline
	were not included in the list of DC survey and verification committee. Detail list of compensation and other entitlement for these DPs should be identified and whether these compensation and entitlement should be paid by the project budget				
	DPs without titleholders that needs to be pay full compensation and entitlement by the project budget – should describe detail compensation and entitlement that should be paid e.g. loss tree, structures, moving grants, and transition allowance due loss income			Identified DPs and payment from Project Budget	
	Identify as clearly as possible where the source of funding that will be used for paying compensation and other entitlement, and indicate how much payments can be made under the available project budget under the ADP 2016/2017 and how much fund needed under ADP 2017/2018				
2	Expedite completion of DC tasks to complete the process under LA Act	25 June 2017	Respective DCs submit to BWDB Needs BWDB's efforts to ensure respective DCs to submit the required budget to BWDB	Done	
	Submission DC budget to compensate DPs with title holders received by BWDB For Zafarganj 0.6 km	25 June 2017		Done	
3	Transfer Fund from BWDB to Respective DCs from budget under 2017/2018 ADP - As the available government fund can only cover payment for titleholder DPs for	First week of September 2017	BWDB	Done	

No.	Corrective Actions	Dateline and related remarks	Responsible Party	Status as on 30 September 2017	Revised Deadline
	Zafarganj 1.4 km section				
4	Payment Compensation and other entitlement by DC to DPs with titleholders	September 2017	Respective DCs in close coordination with BWDB	Notice u/s 3, 6 & 7 already issued; Payment in progress as per government process	
5	Payment compensation and other entitlement to the DPs without title from project budget under ADP 2016/2017	30 June 2017	BWDB assisted by INGO	26 EPs received payment of resettlement benefit	
6	Payment compensation and other entitlement to the DPs without title from project budget under ADP 2017/2018	September 2017	BWDB assisted by INGO	NA	
7	Submit letter to ADB to report the progress in implementing Corrective Actions in monthly basis	5 July, 5 August, 5 Sept, 2017	BWDB	Progress as on 12 Sept. 2017 submitted to ADB. This one is progress as on 30 September 2017	15 October 2017
8	Submit report to ADB on completion of corrective action for implementing RP for Zafarganj 1.4 km	10 October 2017	BWDB		30 October 2017

Appendix-F Gender Action Plan

Output/Activities		Indicators and Targets	Responsibility	Time frame	Progress since Inception
Output I: Integrated flood and riverbank erosion disaster risk mitigation measures for the subproject areas developed, implemented and maintained					
Sub-Component A1: Infrastructure improvement					
Activity:	**A1-1 Construction of riverbank protection structures using appropriate technology and methods** **A1-2 Rehabilitation/construction of embankments**				
Tasks:	• Ensure women benefit from employment in construction • Emphasize gender aspect of labor standard including equal wage for women and men for equal work • Occupational health and safety, safe water supply, sanitation • Separate toilet for women, where identified	• Include specific condition of contract in contractors' bid document with provision of 15% women in unskilled labor • Orient field staff to supervise, verify and ensure that the conditions are met • Incorporate relevant sex disaggregated information in field monitoring reports and contractors' compliance reports	PMO and work contractors	Entire Project-1 period	• Not done. During Feasibility Study the plan was to make a geo-textile bag filling 125 kg but detailed design proposed 250 kg. So, it is not possible to include women for this work

Output/Activities		Indicators and Targets	Responsibility	Time frame	Progress since Inception
Sub-Component A2: Community-based Flood Risk Management					
Activity:	**A2-1. Formulating community disaster management units**				
Tasks:	• Form 40 Community Disaster Management Units (CDMUs) consisting of 15 volunteers (male and female) each • Identify specific risks for women and men; disaster response mechanism, risk reduction measures and disaster preparedness measures on household and village level, specifically related to flood and erosion warning; and Identify location and build community flood markers for flood warning information through Community flood risk assessment • Integrate strategy and action in community risk reduction plan and disaster resilience action plans to address specific needs of women and men	• 40 Units established with minimum 33% women as general members and in leadership in the units (unit records) • Community flood risk assessment report prepared containing risks, coping mechanism, and needs of women and men and recommended response • Community risk reduction plan prepared for 40 Units through participation of women volunteers specifying roles, targets and benefits for women and men	PMU-DDM and community disaster management NGO	End of Project-1	• These issues have been incorporated to the INGO TOR but INGO not yet recruited; so, work is yet to be started

Output/Activities		Indicators and Targets	Responsibility	Time frame	Progress since Inception
Activity:	**A2-2. Capacity development for community disaster management Unit**				
Tasks:	• Establish community-based flood warning dissemination procedures; including indigenous techniques • Establish and disseminate regular warning messages relevant to local context/language and linked with the national warning network • Where possible, conduct separate sessions with community women for flood risk mapping and needs assessment	• 50% of the units have flood warning mechanisms after three years (field survey at the end of each Project) • 50% of the households, including 75% of women-headed households, and poor women living on the embankment, have increased resilience through preventive measures at household level after three years (field survey at the end of each Project)	PMU-DDM and community disaster management NGO	End of Project -1	• Not yet started
Sub-Component A3: Participatory Regular O&M					
Activity:	A3-1 Capacity development of communities				
Tasks:	• Include women in the planning phase • Training of CDMU members, both female and male beneficiaries, in water management and O&M • Training on gender and different social awareness issues using the guidelines for gender requirements • Ensure gender- friendly time and venue for training	• 30% women participation in planning phase, as recorded in meeting minutes • 30% women members in management committee, as reflected in members' list • Women constitute 30% of all community training for O & M	PMO and community disaster management NGO	End of Project-1	• Deferred to Project-2 due to fund constraints

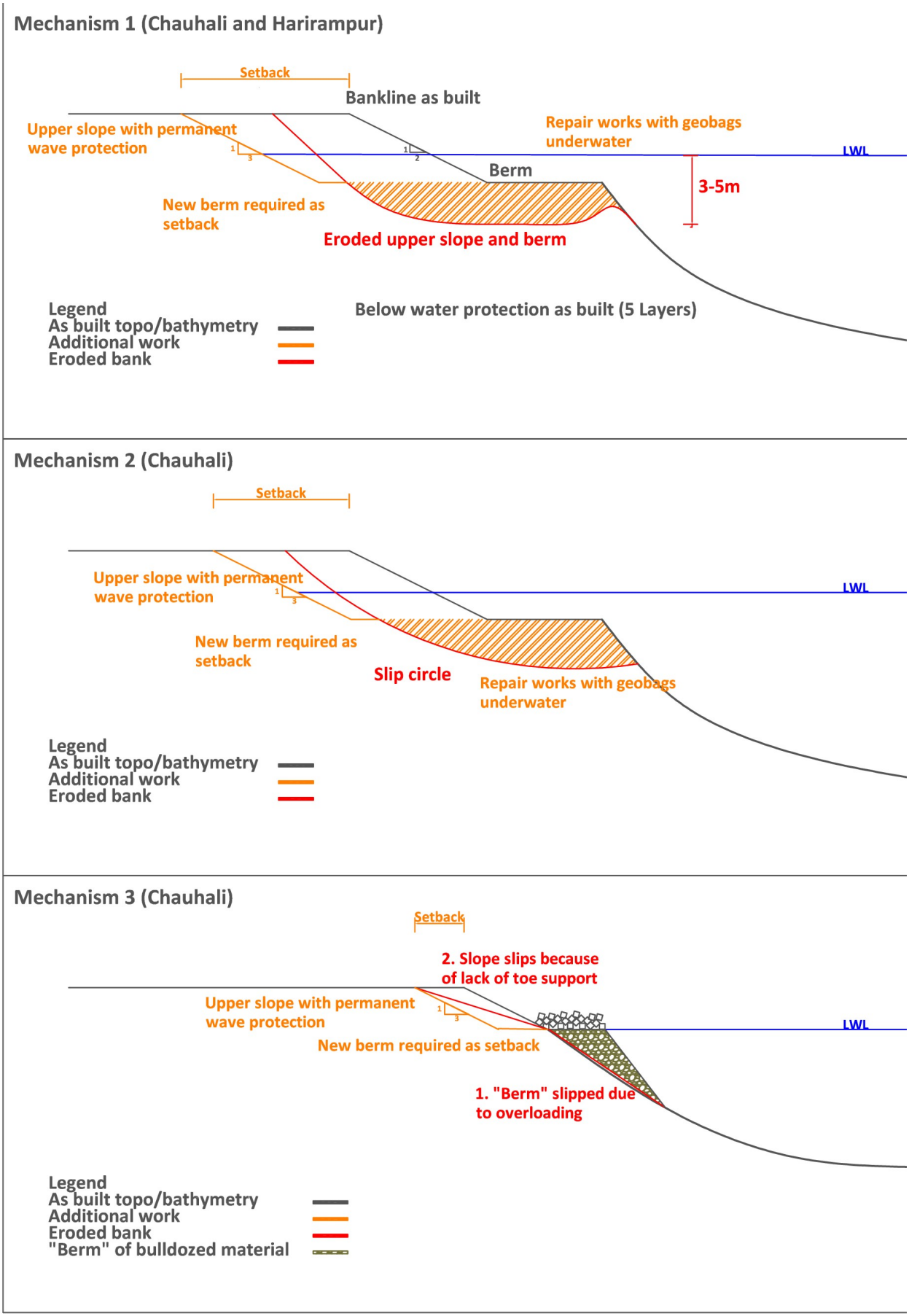
Output/Activities		Indicators and Targets	Responsibility	Time frame	Progress since Inception
Sub-Component A4: Livelihood support for project affected people					
Activity:	A4-1. Construction of resettlement areas with basic infrastructure and facilities				
Tasks:	• Ensure effective consultation with women in the affected areas and maintain sex-disaggregated data on Project Affected Persons (PAPs) along with entitlement benefits, as per Resettlement Plan (RP) • Assure that gender issues are considered when planning resettlement villages and community facilities • Employ willing women in labor-intensive geo-textile bag filling, head loading, embankment and roadside tree planting, and in maintenance activities	• Full compensation for 100% women PAPs, as per RP entitlement. • 33% women involved in planning meetings • 15% to 20% women wage earners engaged in the project construction activities • At least 50% women participants will operate livelihood support programs in 3 community groups in and around resettlement areas.	PMO and Partner NGOs	By June 2018	• These issues have been incorporated in the TOR of INGO for Livelihood Development • INGO TOR is submitted to ADB for approval

Output/Activities		Indicators and Targets	Responsibility	Time frame	Progress since Inception
Activity:	**A4-2. Support for project affected people**				
Tasks:	• Establish contact with local representatives of the Departments of Agriculture, Fisheries, Cooperatives, Women's Affairs and so on to integrate with and build social networking at the local level • Establish the priority groups of abandoned, divorced, separated, widowed, and deserted women • Provide special training and financial support for women-headed households and for women in ultra-poor households • Ensure Gender-friendly time and venue for training • Training on skills and leadership development, gender equality and other social awareness issues • Ensure adequate follow-up to help women manage their IGAs	• Groups organized covering 90% women-headed households and women in ultra-poor households who are living on the embankment, as established by resettlement surveys, for special training and financial support. • Organize and impart training on skills and leader development to 30 persons including 10 women.	PMO and resettlement NGOs	End of Project-1	• INGO for Resettlement supposed to do this work, but not yet started

Output/Activities		Indicators and Targets	Responsibility	Time frame	Progress since Inception
Output II: Strengthening Institutional System for Flood and Riverbank Erosion Risk Management					
Sub- Component B1: Institutional capacity strengthening for flood and riverbank erosion risk management					
Activity:	**B1-1 Capacity enhancement of BWDB**				
Tasks:	• Integrate a gender-specific module in the BWDB training • Include women in the training program	• 10% women in training programs • Gender aspects integrated in the relevant training program/module	BWDB	End of Project-1	• Gender specific course has been implemented for BWDB officials in last quarter • Women are included in training
Activity:	**B1-2 Support the initial set-up of the office of the chief engineer river management**				
Tasks:	• Deploy women staff	• Give priority to women having required qualification for staff positions (approximately 10%)	BWDB	Entire Project-1 period	• Work is in progress
Output III: Efficient program management system established					
Component C: Program Management					
Activity:	**C-1: Implementation management**				
Tasks:	• Establish ADP MIS system with sex disaggregated data base for project reporting	• Identify gender indicators, incorporate in monitoring system and ensure regular reporting on progress of GAP implementation based on gender analysis	BWDB	By Dec 2016	• Deferred to Project-2 due to fund constraints
Activity:	**C1-2: Preparation for Projects 2 and 3**				
Tasks:	• Incorporate gender issues in the planning process	• Prepare gender action plans for Project-2	BWDB	By Dec 2016	• Draft gender action plans for Project-2 prepared

Appendix-G Chronologic History of Failures at Chauhali

Type	Description
Mode 1	This type of failure occurs in situations with high flow velocity and insufficient protection of the upper slope with a weak temporary wave protection. At too high velocities, especially at angular flow attack, a single layer does not provide sufficient protection from winnowing, which leads to shifting of single bags and consequently to erosion of larger parts of the bank. In the effect, the bankline is shifted and steep slopes occur, with the erosion of portions of the bank below low water level.
Mode 2	This type of failure is called “Slip-circle” failure. It occurs when the riverbank slope cannot sustain its self-weight, creating a semi-circular failure pattern. Sustaining the self-weight of the bank slope grossly depends on the soil properties of the riverbank, thus the vulnerability of the protection work to this type of failure is subject to proper geotechnical investigation.
Mode 3	This type of failure occurs when the berm under the LWL washes away due to overloading or poor condition of the berm material, which causes the loss of toe support for the slope. Dumping unnecessary load on the “berm” causes this type of failure.


Mechanism 1 (Chauhali and Harirampur)
Setback
Bankline as built
Upper slope with permanent wave protection
Repair works with geobags underwater
LWL
Berm
3-5m
New berm required as setback
Eroded upper slope and berm
Below water protection as built (5 Layers)
Legend
As built topo/bathymetry
Additional work
Eroded bank
Mechanism 2 (Chauhali)
Setback
Upper slope with permanent wave protection
LWL
New berm required as setback
Slip circle
Repair works with geobags underwater
Legend
As built topo/bathymetry
Additional work
Eroded bank
Mechanism 3 (Chauhali)
Setback
2. Slope slips because of lack of toe support
Upper slope with permanent wave protection
LWL
New berm required as setback
1. "Berm" slipped due to overloading
Legend
As built topo/bathymetry
Additional work
Eroded bank
"Berm" of bulldozed material

Date Chainage Strip No.	Failure Mode Type	Description	Protective Measures	If repair works completed before failure
4 February, 2017 2.340-2.390 22	1	Slope failure occurred in the temporary protection work before block pitching started. Possible reason might be bulldozing the existing geobags on the berm which caused the berm slip due to overloading. As a result, there were no toe support. Also, the contractor had deposited huge bulk of sand over the bank in that area, which might have contributed to the failure.	Slope was rebuilt and CC blocks were placed. Underwater dumping for Strip No. 22 was completed on 24 May 2017.	No (Repair dumping started on 18 May 2017)
23 February, 2017 4.445-4.365 11	1	Slope failure occurred in the temporary protection work before block pitching started. Possible reason might be bulldozing the existing geobags on the berm.	Slope was rebuilt and CC blocks were placed. Underwater dumping for Strip No. 11 was completed on 16 May 2017.	No (Repair dumping started on 5 May 2017)
2 May, 2017 4.270-4.345 13	2	Slope failure occurred in the permanent protection work mostly because of design faults. Block pitching done without proper geotechnical investigation, as a result slip-circle failure occurred as the slope was unable to carry its self-weight.	CC blocks were removed from 15m upstream and downstream length and geobags were placed instead. Underwater dumping for Strip No. 13b was completed on 6 May 2017.	No (Repair dumping started on 6 May 2017)
7 May, 2017 2.550-2.570 18	1 and 3	Underwater block pitching was not found. Above water protection was not disturbed. Possible reason is berm slipping due to overloading.	Underwater dumping was done immediately over the berm before any further damage to the above water work.	No (Repair dumping started on 10 May 2017)

Date Chainage Strip No.	Failure Mode Type	Description	Protective Measures	If repair works completed before failure
16 May, 2017 2.330-2.380 22	2	Slope failure occurred in the permanent protection work mostly because of design fault, mostly due to block pitching without proper geotechnical investigation, which caused slip circle failure. Also, there was a block construction site on the bank in that area. A pond like water body was present there due to use of water in the construction yard, which might have contributed to the failure.	Remaining CC blocks were removed to prevent further loss. Slope was prepared again and geobags were placed. Underwater dumping in strip no. 22 ended on 24 May 2017.	No (Repair dumping started on 18 May 2017)
3 June, 2017 2.112-2.084 24 and upstream	3	Failure occurred after CC block pitching. No guide wall was found in the underwater portion of the eroded area, which indicates that berm slipped due to overloading which might have resulted from dumping CC blocks on the berm.	Slope was prepared again.	Partially (Repair of strip 24 dumping completed on 02 June 2017, but no dumping happened upstream of strip 24)
8 June, 2017 1.857-1.780 Not within the Repair Strips (38 m downstream of Strip No. 27)	2 and 3	Slope failure occurred in the permanent protection work mostly because of design based on insufficient geotechnical investigation, which, in combination with the failure of the “berm”, caused slip circle failure.	Slope was prepared again and underwater dumping completed on 21 June 2017.	Not within the repair strips, failure due to eroded berm, not previously damaged bank protection.
23 June, 2017 0.863-0.833 Not within the Repair Strips	2 and 3	Slope failure occurred in the permanent protection work mostly because of design based on insufficient geotechnical investigation, which, in combination with the failure of the “berm”, caused slip circle failure.	No protective measures taken till date, as no laborers are available on site	Not within the repair strips, failure due to eroded berm, not previously damaged bank protection.
23 June, 2017 4.180-4.070 Not within the repair strip	2 and 3	Slope failure occurred in the permanent protection work mostly because of design based on insufficient geotechnical investigation, which, in combination with the failure of the “berm”, caused slip circle failure.	No protective measures taken till date, as no laborers are available on site	Not within the repair strips, failure due to eroded berm, not previously damaged bank protection.

Date Chainage Strip No.	**Failure Mode Type**	**Description**	**Protective Measures**	**If repair works completed before failure**
25 June, 2017 0.763-0.718 37 and 38	2 and 3	Slope failure occurred in the permanent protection work mostly because of design based on insufficient geotechnical investigation, which, in combination with the failure of the "berm", caused slip circle failure.	No protective measures taken till date, as no laborers are available on site	Partially (Repair dumping of strip 37 completed on 13 June 2017, dumping of strip 38 not started)
27 June, 2017 2.785-2.755 16	2 and 3	Slope failure occurred in the permanent protection work mostly because of design based on insufficient geotechnical investigation, which, in combination with the failure of the "berm", caused slip circle failure.	No protective measures taken till date, as no laborers are available on site	Yes (Repair dumping completed on 11 May 2017)
3 July, 2017 3.260-3.170 Not within the repair strip	2 and 3	Slope failure occurred in the permanent protection work mostly because of design based on insufficient geotechnical investigation, which, in combination with the failure of the "berm", caused slip circle failure.	Repair boat dumping and slope pitching performed.	N/A
7 July, 2017 2.915-2.830 14	2 and 3	Slope failure occurred in the permanent protection work mostly because of design based on insufficient geotechnical investigation, which, in combination with the failure of the "berm", caused slip circle failure.	Repair boat dumping and slope pitching performed.	Partially completed, repair dumping started on 29 April 2017.
18 July, 2017 2.120-2.140 24	2 and 3	Slope failure occurred in the permanent protection work mostly because of design based on insufficient geotechnical investigation, which, in combination with the failure of the "berm", caused slip circle failure.	Repair boat dumping and slope pitching performed.	Yes, Repair dumping completed on 2 June 2017.

Date Chainage Strip No.	Failure Mode Type	Description	Protective Measures	If repair works completed before failure
19 July, 2017 2.915-2.935 15	2 and 3	Slope failure occurred in the permanent protection work mostly because of design based on insufficient geotechnical investigation, which, in combination with the failure of the "berm", caused slip circle failure.	Repair boat dumping and slope pitching performed.	Partially completed, repair dumping started on 6 May 2017.
20 July, 2017 2.490-2.570 19	2 and 3	Slope failure occurred in the permanent protection work mostly because of design based on insufficient geotechnical investigation, which, in combination with the failure of the "berm", caused slip circle failure.	Repair boat dumping and slope pitching performed.	Partially completed, repair dumping started on 6 May 2017.
21 July, 2017 2.050-2.100 25	2 and 3	Slope failure occurred in the permanent protection work mostly because of design based on insufficient geotechnical investigation, which, in combination with the failure of the "berm", caused slip circle failure.	Repair boat dumping and slope pitching performed.	Partially completed, repair dumping started on 21 May 2017.
23 July, 2017 2.205-2.235 23	2 and 3	Slope failure occurred in the permanent protection work mostly because of design based on insufficient geotechnical investigation, which, in combination with the failure of the "berm", caused slip circle failure.	Repair boat dumping and slope pitching performed.	Yes, Repair Dumping completed on 28 May 2017.
25 July, 2017 1.715-1.680 Not within the Repair strips	2 and 3	Slope failure occurred in the permanent protection work mostly because of design based on insufficient geotechnical investigation, which, in combination with the failure of the "berm", caused slip circle failure.	Repair boat dumping and slope pitching performed.	N/A

Date Chainage Strip No.	**Failure Mode Type**	**Description**	**Protective Measures**	**If repair works completed before failure**
31 July, 2017 2350-2310 24	2 and 3	Slope failure occurred in the permanent protection work mostly because of design based on insufficient geotechnical investigation, which, in combination with the failure of the "berm", caused slip circle failure.	Repair boat dumping and slope pitching performed.	Yes, Repair Dumping completed on 2 June 2017.
31 July, 2017 3150-3110 Not within the Repair strips	2 and 3	Slope failure occurred in the permanent protection work mostly because of design based on insufficient geotechnical investigation, which, in combination with the failure of the "berm", caused slip circle failure.	Repair boat dumping and slope pitching performed.	N/A
31 July, 2017 3400-3300 Not within the Repair strips	2 and 3	Slope failure occurred in the permanent protection work mostly because of design based on insufficient geotechnical investigation, which, in combination with the failure of the "berm", caused slip circle failure.	Repair boat dumping and slope pitching performed.	N/A
31 July, 2017 3140-3100 Not within the Repair strips	2 and 3	Slope failure occurred in the permanent protection work mostly because of design based on insufficient geotechnical investigation, which, in combination with the failure of the "berm", caused slip circle failure.	Repair boat dumping and slope pitching performed.	N/A
13 August, 2017 2820-2785 15	2 and 3	Slope failure occurred in the permanent protection work mostly because of design based on insufficient geotechnical investigation, which, in combination with the failure of the "berm", caused slip circle failure.	Repair boat dumping not performed due to unavailability of sand.	Dumping partially completed on 9 May 2017.

Appendix-H 2017-18 Flood Survey Monitoring Program

The 2017-18 Flood Season Monitoring Program has two main components:

1. General River Monitoring
2. Site Monitoring

The ISPMC retained the services of the survey company Survey and Data Consultants on the clearance of the Project Director (reference PMO-FRERMIP/C-2/615, dated 24 July 2017). The Survey and Data Consultants conducted Site Monitoring and General River Monitoring from August to October 2017.

General River Monitoring

Purpose

The purpose of the general river monitoring was to provide information about the general flow patterns alongside the protected sites and in different reaches especially along the lower Jamuna. Specific objectives include the following:

1. Analyze Project-2 works
2. Study flow through the Jamuna Bridge, with special attention to the riverbank alongside the Dhaleswari, which has started eroding heavily as a consequence of the capital dredging pilot project
3. Assess flow at the bifurcation about 20 km downstream of the bridge, specifically with respect to the stability of the location of the bifurcation and the amount of flow into the different channels
4. Determine the impact of the Chauhali revetment on the downstream channel pattern and the potential of reclaiming land
5. Analyze the left channel flow diversion along the Solimabad Channel and the main channel downstream of Chauhali site
6. Assess the impact of flow and discharge along the Koitola-Koijuri riverbank protection
7. Analyze exposure of Zafarganj to future flows
8. Assess the potential navigation route alongside the Harirampur works

Monitoring Plan

The general river monitoring focused on monthly discharge measurements and float tracking, which provided indications about the flow distribution in the eastern and western channels, and how flow patterns change over time and with different discharges (Figures 1 and 2). In addition, one larger scale bathymetric survey was conducted in August 2017, to provide relevant bed bathymetry, and also permit more detailed numerical modeling (Figure 3).

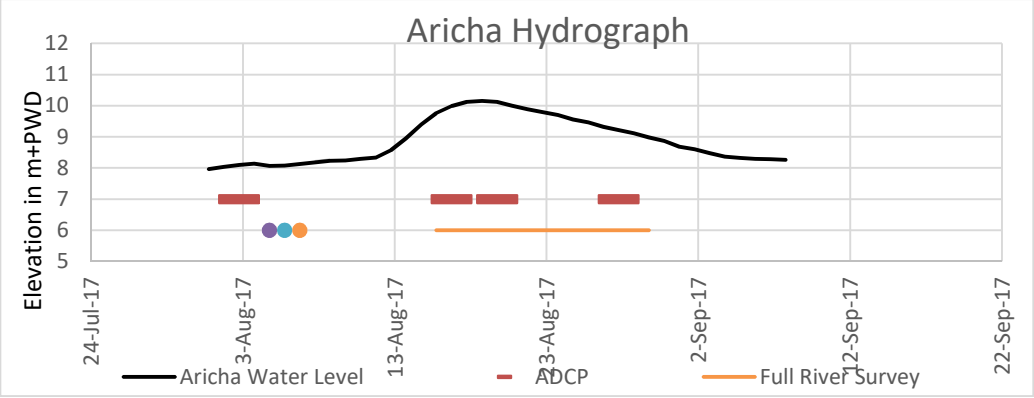


Figure 1. Discharge measurements and float tracks during different times of the 2017 flood

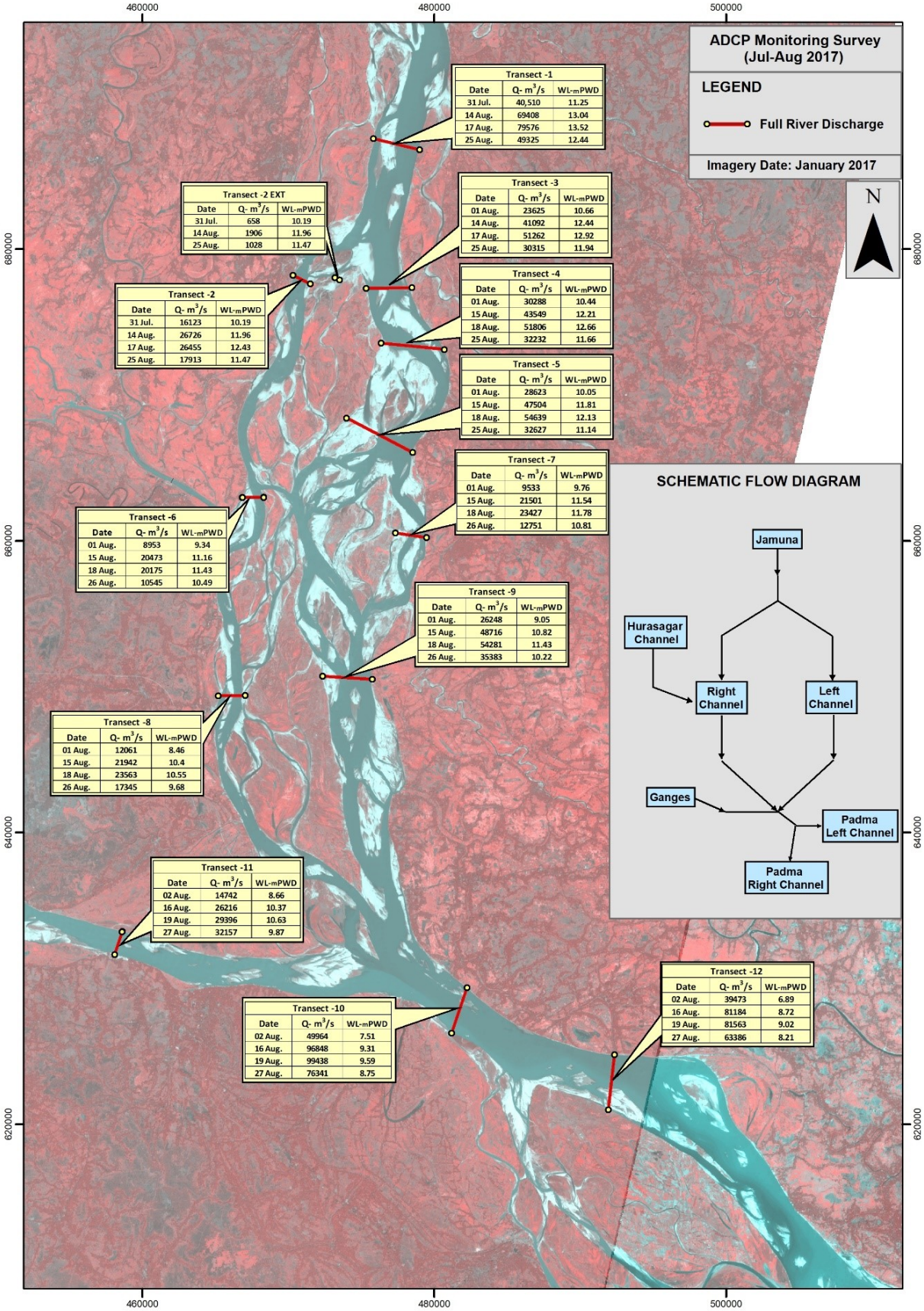


Figure 2. General River monitoring coverage area

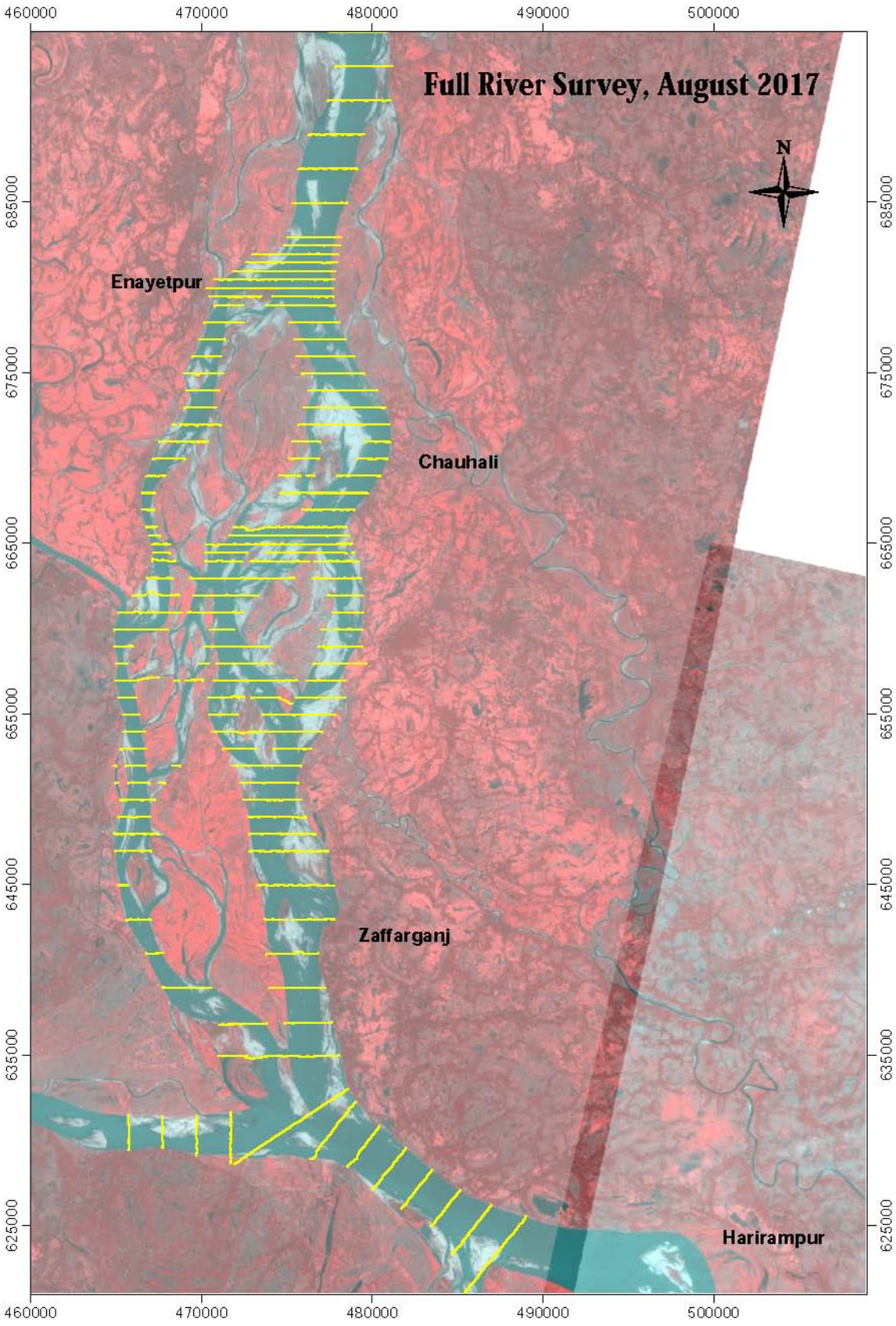


Figure 3. Large-scale bathymetric survey of the Lower Jamuna

Site Monitoring

Purpose

The purpose of the site monitoring was to provide specific information about:

1. the scour development alongside the falling aprons of the newly built works
2. flow velocities over the newly built work
3. hydraulic parameters for design formulae

Monitoring Plan

The flood season is normally limited between July to October, but the ISPMC also incorporated April to July survey results in the monitoring report. Before August 2017, the contractor's surveyor did a survey at the Chauhali site. ISPMC started surveys from August to October 2017.

For the full river, the ISPMC surveyor took ADCP discharge, bathymetry and float track measurements. For regular three sites and Solimabad they performed a bathymetry and float track surveys. Table 1 below summarizes all survey works in the 2017-18 Flood Season Monitoring Program.

Table 1 Summary of Survey Activities in the 2017-18 Flood Season Monitoring Program

Survey Item	Site	April	May	June	July	August	September	October
Bathymetry Survey	Chauhali		3/05/2017 to 8/05/2017	9/6/2017 to 10/6/2017	1/7/2017	4/8/2017		Schedule at Mid October
	Zafarganj					5/8/2017		Schedule at Mid October
	Harirampur					6/8/2017 to 8/8/2017		Schedule at Mid October
	Solimabad	10/4/2017					24/9/2017 to 28/9/2017	
	Full River					15/8/2017 to 29/8/2017		
Topographic Survey	Chauhali	9/4/2017 to 12/4/2017						
	Solimabad	7/4/2017						
ADCP Survey	Full River				31/7/2017 to 2/8/2017	1. 14/8/2017 to 16/8/2017 2. 17/8/2017 to 19/08/2017 3. 25/08/2017 to 27/08/2017		
Float track	Chauhali		10/5/2017	4/6/2017	1. 10/7/2017 2. 17/7/2017			
	Solimabad				17/7/2017			
	Full River				31/7/2017 to 3/8/2017	16/8/2017 to 17/8/2017		

Note: Survey conducted by

1. Contractor's Surveyor
2. ISPMC Surveyor
3. ISPMC Junior Engineer

Table I-1: Implementation Progress of Training Activities

Capacity Building PMO

Sl.	Description	Total		Implementation Progress				Date				Implementation Progress / Plan
		Course	Trainees	Discussed	Prepared	Approved	Completed	FY 15-16	FY 16-17	FY 17-18	FY 18-19	
A. Local Training												
1	River Engineering	2	40	2	2	2	2	3-9 & 24-30 Ap. 16				By BUET: FY 2015-2016
2	River Training Techniques	2	40	2	2	2	2		12-16 & 18-23 Feb.17			By BUET : FY 2016-2017
3	Riverbank Geotechnical Stability	2	40	2	2					Nov-2017		Back to Back, US resource Person geotechnical training including software use
4	Riverbank Protection	2	40	2	2					Nov-2017		Geotextile, B. Walsh & Mr. Michel- hydraulic design/ Slope Protection, (Special Training on barriers)
5	Strategic Planning	2	40	2						Nov- Dec-17		Back to back, Combined:
6	Survey and Evaluation	2	40	2						Dec-17		Back to back, Combined: Mr. Atique, Mr Ghani.
7	Underwater Investigations	1	20	1						Nov-Dec-17		
8	Resettlement	2	30	2						Oct-Nov-17		To be reconsidered during Mid-Term Review (MTR)
9	Environment	2	30	2						Nov-Dec-17		One training done by ISPMC- 3 sites, CEGIS interested
10	Leadership	2	40	2	2					Jan-18		
11	Project Management	2	40	2	2					Jan-18		
12	Construction Management	2	40	2	2					Nov-17		Mr. Bruce Hunter-RTW, (To be prepared soon)
13	Technology Transfer (counterpart)	6		6								Organized by-ISPMC
	Followup Workshop on River Stability and Training	1	110	1	1	1	1		08-Dec-2016,			BWDB Board Hall.
	Training for Task Force on Sand-fill of Geotextile bags	1	30	1	1	1	1		22 Dec-16			held on May-2017 at Seminar Room, BWDB Design Office, Dhaka, successfully organized by ISPMC.
	Demonstration Presentation on Use.	1	30	1	1	1	1					
14	Capacity Building for DDM	2	30	2						No Target		Dr. Towfique, To be reconsidered during MTR
Sub Total		**34**	**640**	**34**	**17**	**7**	**7**					
B. Overseas Training												
1	River Morphology	1	8	1	1	1	1	Sep-16				Completed by IHE (Netherlands) on Sep-2016 (FY: 15-16 & 16-17)
2	River Training Techniques	1	8	1	1	1	1			June-July-17		Completed by IHE (Netherlands) on 5 June- 2 July- 2017 (FY: 16-17)
Sub Total		**2**	**16**	**2**	**2**	**2**	**2**					
C. Overseas Study Tour												
C-1	Study Tour-1 (Australia)	1	5	1	1					Nov-Dec-17		To be held on Nov- Dec -2017
C.2	Study Tour-2[1] (North America)	1	10	1	1	1	1		Oct 2017			Completed on 5 - 21 October 2017
C.3	Study Tour-4 (China)	1	10	1	1	1	1	June '16				Completed on June '16- FY 2015-16
C.4	Study Tour - 3	1	10	1						June -18		To be held on 'June -2018
Sub Total		**4**	**35**	**4**	**3**	**2**	**2**					
Totals		**40**	**691**	**40**	**22**	**11**	**11**					

[1] Included official from MoWR-1, Planning Commision-1, ERD-1 and IMED-1, and six from BWDB.

Table I-1: Implementation Progress of Training Activities continued ...

Capacity Building, ISPMC, Under DPP provisional Sum

BWDB Capacity Development Program		Total		Implementation Progress				Date				Observations/ Plan
Sl.	Description	Courses	Trainees	Discussed	Prepared	Approved	Completed	FY 15-16	FY 16-17	FY 17-18	FY 18-19	
Line-1: Workshops, Traininig and Seminars (DPP provisional Sum)												
A.	Workshops											
1	Workshop on Draft Inception Report	1	123	1	1	1	1	09-Dec-2015,				Pan Pacific Sonargaon, Dhaka
2	Workshops Capacity Strengthening	5	30	1	1	1	1		28-Oct-16			1. 28-Oct-2016, - Pan Pacific Sonargaon, Dhaka
3	River Stabilization and Preliminary River Management Master Plan for the Jamuna-Padma-Meghna Rivers	1	140	1	1	1	1		07-Dec-2016,			Pan Pacific Sonargaon, Dhaka
4	Workshop site selection project 2	1		1								Subjects to be determined as per need
5	Workshop feasibility study	1		1								
Sub Total		9	293	5	3	3	3					
B.	Training:											
1	Training on Environment at 3 sites	3	30	3	3	3	3	26-28 Ap-2016				Chauhali, Harirampur & Zaffarganj, 26-28 April-16
2	Training: Gender Awareness for BWDB Engineers	1	30	1	1	1	1		31 July			31 July-17 BWDB Design office Conference room. Green Road, Dhaka.
Sub Total		4	60	4	4	4	4					
C.	Seminars											
1		1										Subjects to be determined
Sub Total		1	0	0	0	0	0					
Line- 1 Totals		14	353	9	7	7	7					

Table I-1: Implementation Progress of Training Activities continued ...

Capacity Building, ISPMC, Under DPP provisional Sum

BWDB Capacity Development Program		Total		Implementation Progress				Date				Observations
Sl.	Description	Courses	Trainees	Discussed	Prepared	Approved	Completed	FY 15-16	FY 16-17	FY 17-18	FY 18-19	
Line- 2: Conferences and Study Tours (DPP provisional Sum)												
A.	**Conferences**											
1	International Conference on Scour and Erosion	1	3	1	1	1	1		12-15 Sep-16,			Completed, Oxford,UK
2	International Conferences and Seminars	1	3	1	1	1	1		17-22 Ap-17			Completed, Conference, Delhi (BWDB officials were not particpeed)
3	Local conference: based on the capacity assessment of target participants (PMO, PIUs, contractors & other stakeholders	1	20	1	1	1	1	Mar-16				Pan Pacific Sonargaon
4	Local conference: DG Presentation	1	20	1	1	1	1	Jun-16				Hotel Lake Castle
Sub Total		**4**	**46**	**4**	**4**	**4**	**4**					
B.	**Study Tours**											
1	Study Tour NW Europe	1	7	1								Subjects to be determined
Sub Total		**1**	**7**	**1**	**0**	**0**	**0**					
Line- 2 Totals		**5**	**53**	**5**	**4**	**4**	**4**					
ISPMC Totals		**19**	**406**	**14**	**11**	**11**	**11**					

Appendix-J Capacity Building: Overseas Training

The 4 week **"River Morphodynamics and River Training"** course was organized and conducted by: UNESCO-IHE, Delft in the Netherlands from 5 June to 2 July 2017, under the Capacity Building Component of FRERMIP Project-1. The team consisted of **8 BWDB Engineers** as follows:

1. Md. Ahsan Habib, Executive Engineer, Construction Division, BWDB, Bera, Pabna
2. Md. Raqib Hossain, Sub-Divisional Engineer, Directorate of Planning-01, BWDB, Dhaka
3. A F M Tauhid Jaman, Sub-Divisional Engineer, ECRRP, BWDB, Dhaka
4. Md. Shahinur Rahman, Sub-Divisional Engineer, Directorate of Planning-03, BWDB, Dhaka
5. Goutam Biswas, Sub-Divisional Engineer, Design Circle-4, BWDB, Dhaka
6. Md. Sazzad Hossain, Sub-Divisional Engineer, Design Circle-2, BWDB, Dhaka
7. Hasnin Fatema Kanon, Sub-Divisional Engineer, Design Circle-2, BWDB, Dhaka
8. Khan Mohammad Waliuzzaman, Sub-Divisional Engineer, Design Circle-4, BWD13, Dhaka

Lecture Team: A group of high profile International resource persons were involved with leadership and coordination by Dr. Alessandra Crosato, and including Professor Chris Zevenbergen, Alessandro Cattapan, Dr. Ilyas Masih, Dr. Jaap Evers, Dr. Erik Mosselman, and Dr. Iacopo Carnacina.

The daily activities for the River Morphodynamics and River Training course included:

June 06:	Assoc.Prof. Crosato: River Morphology; Sediment transport and bank protection Dr. Carnacina: Low environmental impact structures
June 07:	FIELD TRIP ZBALAND EASTERN SCHELDT BARRIER AND WATERSNOOD MUSEUM
June 08:	Assoc.Prof. Crosato: Sediment balance & Flooding; Backwaters and bed level changes Dr. Carnacina: Flooding
June 09:	Prof: Zevenhorgon: Room for the river concept
June 10 & 11:	**Weekend**
June 12:	Assoc.Prof. Crosato: Short-term river response; 1D River adaptation Dr. Carnacina: Small-scale morphology
June 13:	Dr. Carnacina: Flood protection
June 14:	FIELD TRIP THE NETHERLANDS: ROOM FOR THE RIVER
June 15:	Assoc.Prof. Crosato: 1D Effects of dredging & widening; 1D Effects of water withdrawal Dr. Carnacina: Scour protection, Self-study based on exercise
June 16:	Prof: Zevenhorgon: Resilient cities
June **17 & 18**	**Weekend**
June 19:	Assoc.Prof. Crosato: 2D River Morphology; Interventions to improve river navigation
June 20:	Dr. Evers Environ: Impact Assessment
June 21:	Assoc.Prof. Crosato: 2D effects of interventions; Case study analysis Dr Carnacina: Field measurements.
June 22:	Dr Carnacina: Bank protect techniques
June 23:	Dr. Carnacina: Bank protect techniques
June 24 & 25:	**Weekend**
June 26:	FIELD TRIP BELGIUM, HET SWH AND BRUGE CITY
June 27:	FIELD TRIP BELGIUM: SCHELDT RIVER AND ANVERS CITY
June 28:	Dr. Mosselman: Discussion with example from Bangladesh Dr. Carnacina: Experience on measuring techniques
June 29:	Dr. Mosselman: Discussion with example from Bangladesh Assoc.Prof. Crosato: Discussion result of Self-study
June 30:	Certificate awarding and Closure

Achievements: Experience gained will help participants in their practical work in Bangladesh, to solve river related problems, and improve the river management systems in Bangladesh.

Photo 1. In the Classroom, Delft Institute for Water Education

Photo 2. Near Eastern Scheldt Barrier (North Sea), Zeeland, Netherlands

Photo 3. Watersnood Museum

Photo 4. Watersnood Museum

Photo 5. Dordrecht Biesbosch Museum, Netherlands

Photo 6. Room for the River Project, Nijmegen, Netherlands

Photo 7. Participants with Certificates in Delft Institute for Water Education

Appendix-K Capacity Building: Overseas Study Tours

Study Tour-2 (North America)

An Overseas Study Tour to America and Canada entitled "Mississippi River Management, and allied Erosion Protection Work" under BWDB Capacity Development Program of Flood and Riverbank Erosion Risk Management Investment Program (FRERMIP), BWDB is in the final stage of planning. 10 senior government officials plan to participate in the Overseas Study Tour from 5-20 October 2017:

1. Dr. Zafar Ahmed Khan, Senior Secretary, Ministry of Water Resources
2. A N Shamsuddin Azad Chowdhury, Member, Agriculture, Water Resources and Rural Institution Division
3. Md. Mofizul Islam, Secretary In Charge, Implementation Monitoring and Evaluation Division
4. Md. Mahfuzur Rahman, Director General,BWDB
5. Dr. Jiban Ranjan Majumder, Chief ADB Wing, Economic Relations Division
6. Mantu Kumar Biswas, Joint Chief, Ministry of Water Resources
7. Nasreen Afroz, Director (Joint Secretary), Prime Minister's Office
8. A. M. Aminul Haque Project Director, Project Management Office, FRERMIP, BWDB
9. Kazi Tofail Hossain, Chief Monitoring, BWDB
10. Md. Monirul Islam, Superintending Engineer, Project Management Office, FRERMIP, BWDB

The Study Tour participants will visit New Orleans located along the lower Mississippi River, where the team will learn about river management, dredging, flood control, bank protection and other relevant subjects from the U.S. Army Corps of Engineers.

The study tour team will also visit the headquarters of Northwest Hydraulic Consultants (NHC; the lead ISPMC consultant) in Vancouver, Canada. NHC has been working with Bangladesh Water Development Board (BWDB) since 1970 on a number of projects and have made a significant and positive contribution to the Water Sector in Bangladesh and successfully executed similar works all over in the world. NHC specialists will share their expertise in both physical and 2D & 3D numeric modeling, plus hybrid solutions which involve both types of modeling. Participants will also visit the Fraser River and cities situated on its flat flood plain. They will also learn about a series of innovative flood risk management studies along the Fraser River.

Study Tour-1 (Australia)

The Overseas Study Tour to Australia is in the final stage of program and budget approval by the BWDB, with a tentative date around November 2017. The duration of the Australian Study Tour will be 14 days and will include 5 senior BWDB officials. The study tour will include a geotextile and coastal management component.

Participants will visit a large geotextile factory, share experiences with Australian experts on riverbank protection using this technology and visit a number of sites where geotextile technology is being successfully used. Geotextiles were originally developed as an alternative to granular soil filters, but now geotextiles have many civil engineering applications including: roads, airfields, railroads, embankments, retaining structures, reservoirs, canals, dams, bank protection, coastal engineering and construction site silt fences. Geotextiles are used for sand dune armoring, and to protect upland coastal property from storm surge, wave action and flooding. Geotextiles have also been used as matting to stabilize flow in stream channels and swales. Geotextiles allow planting on steep slopes, further stabilizing the slope.

There are many techniques of coastal management including 'hard' and 'soft' construction and planning approaches. Hard construction is the more traditional response to erosion and involves the construction of structures which stop wave energy reaching the shore, or absorb and reflect the energy. These have often caused problems themselves, such as increasing erosion elsewhere. Soft construction techniques have become more popular by promoting natural systems such as beaches and salt marshes which protect the coast, and are usually cheaper to construct and maintain than hard construction techniques, and may be self-sustaining.

A tentative daily program is as follows:

Day	Date	Transport	Activities	Venue
1	Saturday	Flight	Start from Dhaka for Perth, Australia	Flight
2	Sunday	Flight Car	Arrive Perth, Hotel Check in, Rest+ Discussion with guide to sharing ideas about the tour & Implementation plan (hotel lobby)	Perth
3	Monday	Car	Daylong short course on scour and erosion and use of geotextile in shore protection work organized by school of Civil, Environment.	
4	Tuesday	Car Flight	Mining Engineering and the center for offshore foundation systems at the University of Western Australia at Perth Fly for Melbourne, Hotel check-in, Rest	 Melbourne
5	Wednesday	Car	Visit Anglesea, Fair heaven, Skenes Creek coastal erosion zone	
6	Thursday	Car Flight	Visit Apollo Bay, Marengo, Port Fairy & Portland Erosion Zone Fly For Brisbane	
7	Friday	Car	Visit to Geofabrics Australia international Geotextile factory in southern Queensland	Brisbane
8	Saturday	Car	Site visit to Gold Coast and Broadwater coastal protection work in Queensland	
9	Sunday	Car	Visit to Bank Protection works by Geotextile Geotextile at Maroochy River, Maroochydore in Queensland	
10	Monday	Car/ Train	Visit to shore protection work at north Kirra, Gold Coast in Queensland Drive to Sydney, New south Wales from Gold Coast	
11	Tuesday	Car/ Train	Visit the coastal COMS Shoreline Position & Monitoring systems	Sydney
12	Wednesday	Car/ Train	Visit the Belongil Beach, Lennox Head, Brooms Head & other coastal erosion zones	
13	Thursday		Preparation for back to Dhaka	
14	Thursday	Car/ Flight	Fly from Sydney for Dhaka	Flight

Appendix-L Photo Library

Photo 1. Chief Planning, Chief Monitoring and Chief Engineer Design at Chauhali, 1 Oct 2017

Photo 2. Temporarily protection at bridge after slope failure at Chauhali, 1 Oct 2017

Photo 3. Chauhali upstream temporary wave protection of 2km length without damages, 1 Oct 2017

Photo 4. Chauhali local failure of upper slope with temporary repair works, 1 Oct 2017

Photo 5. Chief Planning, Chief Monitoring and Chief Engineer Design at Solimabad, 1 Oct 2017

Photo 6. Solimabad, ongoing emergency works, 1 Oct 2017

Photo 7. Visit of temporarily protected school at Zafarganj by Chief Planning, Chief Monitoring and Chief Engineer Design, 1 Oct 2017

Photo 8. Upstream termination of Zafarganj work with offtake channel protection, 1 Oct 2017