



# Completion Report

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Project Numbers: 35049-023, 35049-033, and 35049-012  
Loan Numbers: 2375 and 2593  
Technical Assistance Number: 4652  
September 2020

## Bangladesh: Padma Multipurpose Bridge Design Project

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**Asian Development Bank**



## CURRENCY EQUIVALENTS

Currency unit      –      taka (Tk)

		<b>At Appraisal</b> (2 November 2007)	<b>At Project Completion</b> (6 November 2012)
Tk1.00	=	\$0.0146	\$0.012281
\$1.00	=	Tk68.645	Tk81.425

## ABBREVIATIONS

ADB	–	Asian Development Bank
BBA	–	Bangladesh Bridge Authority
BDT	–	Bangladesh taka
DDC	–	detailed design consultant
JICA	–	Japan International Cooperation Agency
JMBA	–	Jamuna Multipurpose Bridge Authority
km	–	kilometer
PMBP	–	Padma Multipurpose Bridge Project
PIU	–	project implementation unit
POE	–	panel of experts
SDR	–	special drawing rights
TA	–	technical assistance
TOR	–	terms of reference

## NOTE

- (i) The fiscal year (FY) of the Government of Bangladesh ends on 30 June. “FY” before a calendar year denotes the year in which the fiscal year ends, e.g., FY2018 ends on 30 June 2018.
- (ii) In this report, “\$” refers to United States dollars.

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## CONTENTS

	Page i
BASIC DATA	
MAP	
I. PROJECT DESCRIPTION	1
II. DESIGN AND IMPLEMENTATION	3
A. Project Design and Formulation	3
B. Project Outputs	4
C. Project Costs and Financing	5
D. Disbursements	6
E. Project Schedule	7
F. Implementation Arrangements	7
G. Technical Assistance	8
H. Consultant Recruitment and Procurement	9
I. Safeguards	10
J. Monitoring and Reporting	10
III. EVALUATION OF PERFORMANCE	11
A. Relevance	11
B. Effectiveness	11
C. Efficiency	11
D. Sustainability	12
E. Development Impact	12
F. Performance of the Borrower and the Executing Agency	12
G. Performance of Cofinancier	13
H. Performance of the Asian Development Bank	13
I. Overall Assessment	13
IV. ISSUES, LESSONS AND RECOMMENDATIONS	14
A. Issues and Lessons	14
B. Recommendations	14
APPENDIXES	
1. Revised Design and Monitoring Framework	15
2. Original and Revised Project Cost Estimates	16
3. Project Cost by Financier	17
4. Disbursement of ADB Loan Proceeds	19
5. Contract Awards of ADB Loan Proceeds	20
6. Chronology of Main Events	21
7. Status of Compliance with Loan Covenants	23
8. Technical Assistance Completion Report	31
9. Additional Information	37
10. Additional Studies and Surveys	38
11. Additional Details about the Padma Multipurpose Bridge Project	40



## BASIC DATA

### A. Loan Identification

#### a. Loan 2375

- |    |                                  |  |
|----|----------------------------------|--|
| 1. | Country                          | Bangladesh   |
| 2. | Loan number and financing source | 2375, Special funds  |
| 3. | Project title                    | Padma Multipurpose Bridge Design Project   |
| 4. | Borrower                         | People's Republic of Bangladesh  |
| 5. | Executing agency                 | Bangladesh Bridge Authority (formerly known as the Jamuna Multipurpose Bridge Authority) |
| 6. | Amount of loan                   | SDR11,179,000 (\$17.6 million equivalent)  |
| 8. | Financing modality               | Technical assistance loan  |

#### b. Loan 2593 (Supplementary Loan)

- |    |                                  |   |
|----|----------------------------------|---|
| 1. | Country                          | Bangladesh                                  |
| 2. | Loan number and financing source | 2593, Special funds                         |
| 3. | Project title                    | Padma Multipurpose Bridge Design Project    |
| 4. | Borrower                         | People's Republic of Bangladesh             |
| 5. | Executing agency                 | Bangladesh Bridge Authority                 |
| 6. | Amount of loan                   | SDR6,273,999.43 (\$10.0 million equivalent) |
| 8. | Financing modality               | Technical assistance loan                   |

### B. Loan Data

- |    |                            |   |
|----|----------------------------|---|
| 1. | Appraisal                  |   |
|    | – Date started             | L2375: Not applicable<br>L2593: Not applicable    |
|    | – Date completed           | L2375: Not applicable<br>L2593: Not applicable    |
| 2. | Loan negotiations          |   |
|    | – Date started             | L2375: 8 November 2007<br>L2593: 19 October 2009  |
|    | – Date completed           | L2375: 9 November 2007<br>L2593: 20 October 2009  |
| 3. | Date of Board approval     | L2375: 5 December 2007<br>L2593: 2 December 2009  |
| 4. | Date of loan agreement     | L2375: 12 December 2007<br>L2593: 7 December 2009 |
| 5. | Date of loan effectiveness |   |
|    | – In loan agreement        | L2375: 11 March 2008<br>L2593: 7 March 2010       |
|    | – Actual                   | L2375: 25 August 2008<br>L2593: 23 June 2010      |
|    | – Number of extensions     | L2375: 3<br>L2593: 1                              |

6. Project completion date  
 – Appraisal L2375: 28 February 2010  
 L2593: 28 February 2011  
 – Actual L2375: 6 November 2012  
 L2593: 6 November 2012
7. Loan closing date  
 – In loan agreement L2375: 31 August 2010 (first revised 31 December 2011)  
 L2593: 31 August 2011 (revised 31 August 2012)  
 – Actual L2375: 15 December 2010  
 L2593: 6 November 2012  
 – Number of extensions L2375: 1  
 L2593: 3
8. Financial closing date  
 – Actual L2375: 15 December 2010  
 L2593: 6 November 2012
9. Terms of loan  
 – Interest rate L2375: 1.5% (1% during grace period)  
 L2593: 1.5% (1% during grace period)  
 – Maturity (number of years) L2375: 32  
 L2593: 32  
 – Grace period (number of years) L2375: 8  
 L2593: 8

10. Disbursements

a. Dates

L2375

<b>Initial Disbursement</b> 26 May 2009	<b>Final Disbursement</b> 15 December 2010	<b>Time Interval</b> 18.67 months
<b>Effective Date</b> 25 August 2008	<b>Actual Closing Date</b> 15 December 2010	<b>Time Interval</b> 27.68 months

L2593

<b>Initial Disbursement</b> 13 September 2010	<b>Final Disbursement</b> 6 November 2012	<b>Time Interval</b> 25.81 months
<b>Effective Date</b> 23 June 2010	<b>Actual Closing Date</b> 6 November 2012	<b>Time Interval</b> 28.5 months



## b. Amount (\$ million)

<b>Category</b>	<b>Original Allocation (1)</b>	<b>Increased during Implementation (2)</b>	<b>Canceled during Implementation (3)</b>	<b>Last Revised Allocation (4 = 1+2-3)</b>	<b>Amount Disbursed (5)</b>	<b>Undisbursed Balance (6 = 4-5)</b>
Detailed design consultant	14.6	8.7	0.0	23.3	25.4	(2.1)
Independent checking engineer and panel of experts	2.7	(1.5)	0.0	1.2	1.3	(0.1)
Incremental administrative support	0.1	0.0	0.0	0.1	0.0	0.1
Contingencies	0.0	2.7	0.0	2.7	0.0	2.7
Financing charges during implementation	0.2	0.1	0.0	0.3	0.2	0.1
<b>Total</b>	<b>17.6</b>	<b>10.0</b>	<b>0.00</b>	<b>27.6</b>	<b>26.9</b>	<b>0.7</b>

( ) = negative.

## c. Amount (SDR million)

L2375

<b>Category</b>	<b>Original Allocation (1)</b>	<b>Increased during Implementation (2)</b>	<b>Canceled during Implementation (3)</b>	<b>Last Revised Allocation (4 = 1+2-3)</b>	<b>Amount Disbursed (5)</b>	<b>Undisbursed Balance (6 = 4-5)</b>
Detailed design consultant	9.3	0.0	0.0	9.3	10.9	(1.7)
Independent checking engineer and panel of experts	1.7	0.0	0.0	1.7	0.2	1.6
Incremental administrative support	0.1	0.0	0.0	0.1	0.0	0.1
Contingencies	0.0	0.0	0.0	0.0	0.0	0.0
Financing charges during implementation	0.1	0.0	0.0	0.1	0.1	0.0
<b>Total</b>	<b>11.2</b>	<b>0.0</b>	<b>0.0</b>	<b>11.2</b>	<b>11.2</b>	<b>0.0</b>

L2593

<b>Category</b>	<b>Original Allocation (1)</b>	<b>Increased during Implementation (2)</b>	<b>Canceled during Implementation (3)</b>	<b>Last Revised Allocation (4 = 1+2-3)</b>	<b>Amount Disbursed (5)</b>	<b>Undisbursed Balance (6 = 4-5)</b>
Detailed design consultant	3.8	0.0	0.0	3.8	5.5	(1.7)
Independent checking engineer and panel of experts	0.7	0.0	0.0	0.7	0.7	0.0
Incremental administrative support	0.0	0.0	0.0	0.0	0.0	0.0
Contingencies	0.0	0.0	0.0	0.0	0.0	0.0
Financing charges during implementation	0.1	0.0	0.0	0.1	0.1	0.0
Unallocated	1.7	0.0	0.0	1.7	0.0	1.7
<b>Total</b>	<b>6.3</b>	<b>0.0</b>	<b>0.0</b>	<b>6.3</b>	<b>6.3</b>	<b>0.0</b>

## C. Project Data

### 1. Project cost (\$ million)

Cost	Appraisal Estimate	Revised	Actual
Foreign exchange cost			
Local currency cost			
<b>Total</b>	<b>22.0</b>	<b>34.7</b>	<b>26.9</b>

Note: The project cost at appraisal was not separated by foreign and local currencies.

### 2. Financing plan (\$ million)

Cost	Appraisal Estimate	Revised	Actual
Implementation cost			
Borrower financed	4.4	5.6	...
ADB financed	17.6	27.6	26.9
Other external financing	0.0	1.5	...
<b>Total implementation cost</b>	<b>22.0</b>	<b>34.7</b>	<b>26.9</b>
<b>Total interest during construction cost</b>		0.3	...

... = Data not available

### 3. Cost breakdown by project component (\$ million)

Component	Appraisal Estimate	Revised Estimate	Actual
A. Detailed Design Consultant	16.9	26.8	25.4
B. Independent Checking Engineer and Panel of Experts	3.2	3.2	1.3
C. Incremental Administrative Support	0.5	0.5	0.0
D. Contingencies	1.2	3.9	0.0
E. Financing Charges during Implementation	0.2	0.3	0.2
<b>Total</b>	<b>22.0</b>	<b>34.7</b>	<b>26.9</b>

### 4. Project schedule

Item	Appraisal Estimate	Actual
Date of contract with consultants	March 2008	29 January 2009
Completion of engineering designs	February 2010	December 2010
Civil works contract	Not applicable	Not applicable
Date of award	Not applicable	Not applicable
Completion of work	Not applicable	Not applicable
Equipment and supplies	Not applicable	Not applicable
Consultant recruitment (completion)		
Detailed design consultant	February 2008	January 2009
Panel of Experts	May 2008	July 2009
Checking Engineer	January 2010	April 2010
Start of operations	Not applicable	Not applicable
Completion of tests and commissioning	Not applicable	Not applicable
Beginning of start-up	Not applicable	Not applicable

### 5. Project performance report ratings

Implementation Period	Ratings	
	Development Objectives	Implementation Progress
From 5 December 2007 to 31 December 2007	Satisfactory	Satisfactory
From 1 January 2008 to 31 December 2008	Satisfactory	Satisfactory
From 1 January 2009 to 31 December 2009	Satisfactory	Satisfactory
From 1 January 2010 to 31 December 2010	Satisfactory	Satisfactory

Implementation Period	Development Objectives	Ratings
		Implementation Progress
		Single Project Rating
From 1 January 2011 to 31 December 2011		On Track
From 1 January 2012 to 31 December 2012		On Track
From 1 January 2013 to 31 March 2013		On Track

## D. Data on Asian Development Bank Missions

Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members
<b>TA Loan 2375</b>				
Fact-finding	23–28 July 2007	5	25	ts, fs, sfe, sfs
Consultation 1	27–30 January 2008	4	12	ts, e, sfs,
Consultation 2	16–18 March 2008	1	2	ts
Consultation 3	13 and 27–30 April 2008	2	8	ts, a
Consultation 4	27–29 July 2008	2	6	ts, cs
Project-specific contact	14–16 and 21–23 September 2008	3	12	ts, cs
Inception	26–28 January and 8–10 February 2009	4	16	ts, a, cs,
Review 1	14–16 and 27 April 2009	2	6	ts, sfs
Review 2	16–21 May 2009	3	9	ts, sfs, sfe
Review 3	12–17 September 2009	4	20	ts, sfs, sfe
Review 4	14–18 November and 11–14 December 2009	5	35	ts, sfs, sfe
<b>TA Loans 2375 and 2593</b>				
Review 5	1–4 February 2010	5	15	ts, a, cs
Review 6	25–27 July 2010	3	9	ts, d
Review 7	7–11 November 2010	5	20	ts, a, cs
Project completion review	2–9 February 2020	3	21	ts, a, cs

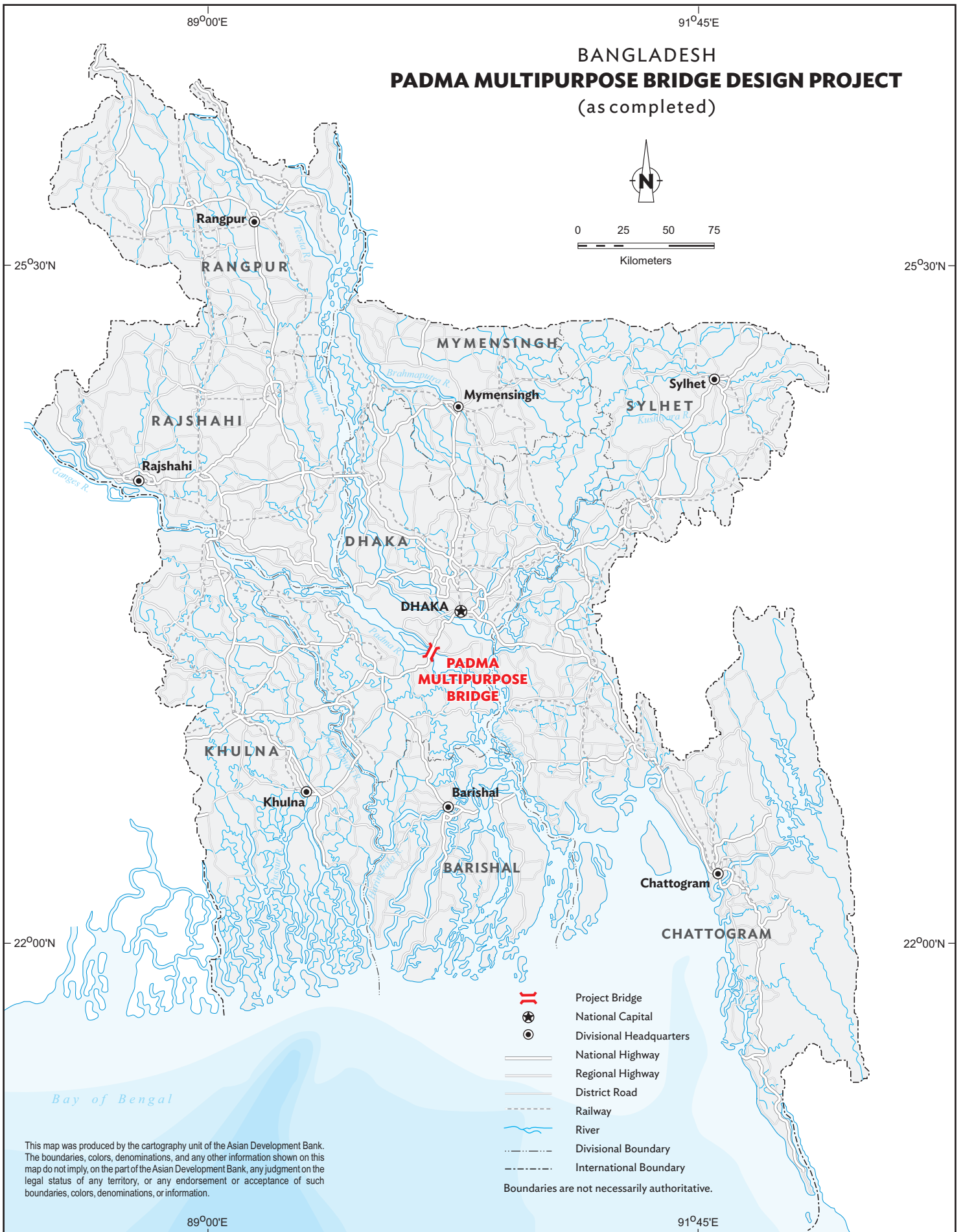
a = project analyst, BAN = Bangladesh, d = director, cs = consultant, e = economist, fs = finance specialist, sfe = safeguards specialist (environment), sfs = safeguards specialist (resettlement), TA = technical assistance, ts = transport specialist.



# BANGLADESH

## PADMA MULTIPURPOSE BRIDGE DESIGN PROJECT

(as completed)



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## I. PROJECT DESCRIPTION

1. The transport system in Bangladesh is extensive and diversified, comprising about 140,000 kilometers (km) of roads; 2,855 km of railroads; 5,970 km of perennial and seasonal waterways linking more than 15 major river ports and terminals spread all over the country; two major seaports; and seven airports. The performance of the road sector has consistently improved in recent decades, aided by the extension of the road network and the demand for road transport. Roads are important for the regional cooperation emphasized in the long-term development strategy of the Asian Development Bank (ADB). At the center of the South Asia growth quadrangle and surrounded by Bhutan, India, Myanmar, and Nepal, Bangladesh can accommodate most intraregional transit shipments in the region.

2. The subcontinent's major rivers—Ganges, Jamuna (Brahmaputra), Meghna, and Padma—geographically divide Bangladesh into four principal zones: north-central (Dhaka Division), east (Chittagong and Sylhet divisions), northwest (Rajshahi Division), and southwest (Barisal and Khulna divisions). The Padma River separates the southwest zone from other parts of the country, including the north-central zone where the national capital of Dhaka is located. Although there have been improvements and developments of the road network in the southwest zone, links with the rest of the country across the Padma River still take place by ferry only. The transport capacity of ferry services is very limited and wait time is extensive. In addition, the riverbanks of the Padma are unstable, and the river width changes frequently, leaving approach ghats not operational seasonally and complicating the expansion of ferry terminals. There is an urgent need to replace dangerous ferry and launch operations between Dhaka and the southwest zone with a safer and more reliable surface transport system.

3. The social, economic, and industrial underdevelopment of the southwest zone—which encompasses Bangladesh's second major port, Mongla; its third main city, Khulna; and the inland port at Benapole—is due in part to the difficult access across the Padma River to the rest of the country. A bridge across the Padma River would strengthen links between the southwest and north-central zones. A highway bridge in particular would enhance freight and passenger transportation between Dhaka and major points in the southwest zone, thereby contributing substantially to the development of the southwest zone as well as to national economic growth. Bangladesh will bestride Asian Highway Route A-1 to connect Asia to Europe, which is planned under the Economic and Social Commission for Central Asia and the Pacific. One section will connect Kolkata in India to Dhaka through Mawa and Bhanga near the Padma River, which will thus become an important highway for goods trade between Bangladesh and India.

4. In 2000, the Government of Bangladesh conducted a prefeasibility study for the construction of a bridge across the Padma River. The prefeasibility report established the technical and economic viability of the project and recommended several potential sites. In 2001, the Japan International Cooperation Agency (JICA) conducted the feasibility study, which (i) recommended the Mawa-Janjira site as the crossing location of the Padma Bridge; (ii) reaffirmed its technical and economic viability; and (iii) recommended the construction of (a) a two-lane dual carriageway, cable-stayed (or extradosed) bridge; (b) a two-lane, dual carriageway approach road; and (c) bank protection works. Given the importance of forming an international transport corridor, a design alternative (a highway bridge with a railway provision) was also recommended.<sup>1</sup> The estimated cost of the ensuing investment project was \$1.26 billion at 2004 prices.

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<sup>1</sup> Japan International Cooperation Agency. 2005. *The Feasibility Study of the Padma Bridge*. Tokyo.

5. The proposed Padma Bridge was a multipurpose structure that would carry (i) a highway, (ii) a single-track railway line, and (iii) utilities such as a gas pipeline and telecommunication cables. It would provide a safer and faster transport link to the southwest region of Bangladesh, which has one of the highest poverty rates in the country. It was estimated that the construction of the bridge would boost the gross domestic product (GDP) of Bangladesh by 1.2%. It would also contribute to the multimodal international transport network by connecting to the trans-Asian railway route and by enabling cargo movement between India and Chittagong, in the south of Bangladesh.

6. The ensuing Padma Multipurpose Bridge Project (investment project) consisted of two phases: (i) phase 1 comprised the design phase through procurement action to award of construction contracts, and (ii) phase 2 comprised the construction. For phase 1, ADB provided a technical assistance (TA) loan for the Padma Multipurpose Bridge Design Project to assist the government.<sup>2</sup> The design project's impact was to facilitate the preparation of an investment loan to construct the Padma Bridge, while its expected outcome was the detailed design of the bridge and other auxiliary works agreed on by the government and ADB. To achieve the impact and outcome, the design project had seven outputs: (i) scheme designs, (ii) technical studies, (iii) detailed design, (iv) tender action, (v) environmental impact assessment, (vi) resettlement plan, and (vii) land acquisition plan. The design project would minimize technical uncertainty and ensure readiness to implement the ensuing investment project.

7. The original TA loan for the design project was approved in December 2007 for SDR11,179,000 (\$17.6 million equivalent) to assist the government in preparing the detailed design of the Padma Bridge including river-training works (RTW) and approach roads, and to assist the Bangladesh Bridge Authority (BBA) in engaging contractors.<sup>3</sup> The design project experienced cost overruns. To ensure completion of the project, ADB provided a supplementary TA loan for the design project in 2009 (footnote 2).

8. As part of the implementation process of phase 2 (the ensuing investment project), the investment loan was approved in 2010 with cofinancing from the Islamic Development Bank, JICA, and the World Bank.<sup>4</sup> However, on 29 June 2012, the World Bank announced the cancellation of its International Development Association loan with immediate effect. In February 2013, the ADB loan was cancelled before it became effective (para. 19).<sup>5</sup> Appendix 9 contains a timeline of the implementation of the various projects and Appendix 11 provides more details about the investment project.

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<sup>2</sup> ADB. 2007. *Report and Recommendation of the President to the Board of Directors: Proposed TA Loan to the People's Republic of Bangladesh for the Padma Multipurpose Bridge Design Project* (formerly known as Padma Multipurpose Bridge Engineering TA Loan); and ADB. 2009. *Report and Recommendation of the President to the Board of Directors: Proposed Supplementary TA Loan to the People's Republic of Bangladesh for the Padma Multipurpose Bridge Design Project*. Manila.

<sup>3</sup> At appraisal, the executing agency for the project preparatory TA and the design project was the Jamuna Multipurpose Bridge Authority (JMBA). After a Cabinet decision in 2007, the JMBA was restructured and renamed the Bangladesh Bridge Authority.

<sup>4</sup> ADB. 2010. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of Bangladesh for the Padma Multipurpose Bridge Project*. Manila.

<sup>5</sup> Following the termination of loan financing for the implementation of the investment project, this project completion report was prepared to assess the performance of the project preparatory TA and the design project.



## II. DESIGN AND IMPLEMENTATION

### A. Project Design and Formulation

9. The design project was formulated in accordance with the government's transport sector development strategy.<sup>6</sup> The strategy addressed three modes of transport: road, railway, and inland waterways. The critical problem in the road subsector was maintenance and improvement of the network to raise the quality and safety of road operations. The construction of the Padma Bridge was incorporated as one of the objectives of the government's strategy on road transport. With respect to the railway subsector, the government emphasized (i) expanding capacity for freight traffic, (ii) regaining passenger traffic, (iii) improving tracks and the signaling system, (iv) adopting a public service obligation to serve local poor people in remote areas, and (v) outsourcing infrastructure development and maintenance works to the private sector, among others. The inland waterway subsector was also facing low demand because of the silting of waterways, lack of ghat berthing facilities, and obstructions caused by low or narrow road bridges and irrigation channel sluice gates. The government was looking into the possibility of promoting private sector investment, promoting water transportation in the south and west zones, and improving the operational efficiency of coastal routes.

10. The design project was also in line with ADB's country strategy for transport sector development. ADB's Bangladesh Country Strategy and Program 2006–2010 spelled out that (i) future ADB assistance in the sector would be linked to (a) continued institutional reform of the Roads and Highway Department, (b) sustainable financing of road maintenance, and (c) improved road safety; (ii) support would be provided for the development of the Padma Bridge, building on lessons learned from the Jamuna Bridge Project; (iii) the project would link the eastern and southwestern parts of Bangladesh at Mawa–Janjira to provide a strategic overland route between Bangladesh and its neighboring countries through India; and (iv) assistance would also be provided to identify opportunities for private sector involvement to ensure that the bridge is operated and managed on a financially sustainable basis.<sup>7</sup>

11. The World Bank also provided \$3 million in the form of project preparation facilities to assist the financing and to expedite the preparation of the investment project. The facilities included (i) environmental impact assessment, independent review, and finalization of the environment management plan; (ii) social–environment assessment, independent review, and finalization of the social and resettlement action plan; (iii) a detailed strategy for financing the project's financial and legal advisory services; (iv) strengthening of the BBA; and (v) additional financing for the panel of experts (POE).<sup>8</sup>

12. The design project had the following components: (i) preparation of the detailed design by a detailed design consultant (DDC), (ii) independent review of the detailed design by a checking engineer and a POE, and (iii) incremental administrative support.

13. The formulation of the terms of reference (TOR) for the design project took into account the lessons learned from the Jamuna Bridge Project that ADB approved in 1994, with cofinancing from the government, the Overseas Economic Cooperation Fund, and the World Bank. It also

<sup>6</sup> Government of Bangladesh. 2004. *National Land Transport Policy*.

Government of Bangladesh. 2005. *Draft Integrated Multimodal Transport Policy*. Dhaka.

<sup>7</sup> ADB. 2005. *Bangladesh: Country Strategy and Program 2006–2010*. Manila; and ADB. 1994. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of Bangladesh for the Jamuna Bridge Project*. Manila.

<sup>8</sup> The World Bank was the cofinancier for the TA supplementary loan, with \$1.5 million.

took into account the TA provided by ADB for the Jamuna Bridge Impact Study in 2001. The TA report recommended various aspects to consider in the design and construction of the bridge. The project completion report of the Jamuna Bridge Project spelled out factors critical for the successful delivery of such a large-scale bridge project. The importance of taking a participatory approach at the predesign stage, the implementation of environmental and social aspects of the project, and the development of institutional capacity are some of the lessons learned that aided the formulation and implementation of the Padma bridge design project.

## **B. Project Outputs**

14. The envisaged outputs of the design project were (i) scheme designs, (ii) technical studies, (iii) a detailed design, (iv) a tender action, (v) an environmental impact assessment, (vi) a resettlement plan, and (vii) a land acquisition plan. The tender process was disrupted by the cancellation of the ensuing investment project, and the DDC was therefore not able to complete all the tasks up to contract preparation and award. Four out of the five output indicators were either partially or substantially achieved or achieved with delay. The performance indicators for outputs (v), (vi), and (vii) are integral to the tender documents.

15. In April 2009, the DDC submitted the inception report, proposing five bridge scheme options and recommending the option of designing the main bridge superstructure as a steel truss acting compositely with a reinforced concrete deck slab. The reasons were that this option best accommodated a fast-track construction program of about 3 years, with rapid field erection outside monsoon seasons, adaptability to increased span lengths, ability for safe carriage of utilities with segregation, and cost effectiveness. The preparation of the detailed design presented engineering challenges such as tackling the risk of deep scour in the Padma River and the severe seismic activity. The technical design of the road was based on the British Standards set by British Standards Institution, the national standards body of the United Kingdom. As the bridge was designed to be part of the freight railway corridor, the design load was 32.5 tons per axle. The DDC submitted the interim report in June 2009 and the final scheme design report in August 2009.

16. The need to conduct additional surveys and studies had an impact on the achievement of the rest of the outputs. The interpretative reports, the detailed design, and the design certificates were affected by the delay and were not finalized within the estimated timeline, i.e., by June 2010 and November 2010. The checking engineer issued the conditional check certificate of the main bridge on 2 December 2010 and the final check certificate on 6 June 2011. For the RTW, the final check certificate was issued in June 2011.

17. The tender documents were to be completed by June 2010. There were four packages: (i) the main bridge, (ii) the RTW, (iii) the Mawa approach roads and selected bridge end facilities, and (iv) the Janjira approach roads and selected bridge end facilities. The DDC submitted the draft prequalification documents for the main bridge package in August 2009. The invitation for the first prequalification process for that package was issued on 11 April 2010. The original application for prequalification was formally withdrawn and the process annulled on 10 October 2010.<sup>9</sup> A revised prequalification document was issued on 12 October 2010 with closing of the submission on 24 November 2010. The DDC submitted the evaluation report of the submissions on 5 January 2011. The draft final bidding documents were issued to the BBA on 31 May 2011. The target date for issuing prequalification documents for the main bridge and approach roads was deferred in order for the DDC to dedicate its resources to necessary field investigation, studies, and comparative analyses of options for bridge type.

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<sup>9</sup> Due to inadequate technical specifications.

18. With respect to the RTW package, the DDC submitted the revised draft of the prequalification documents on 10 May 2010. The invitation for the prequalification process was issued on 25 July 2010. The original deadline for submission was 27 September 2010 but was extended to 7 October 2010. Assessment of the submissions was submitted on 18 December 2010. For the Janjira approach roads, the DDC submitted the final documents on 26 July 2010. The process was annulled, and a revised invitation was issued on 24 October 2010. The final documents were submitted to the BBA on 15 November 2010. For the Mawa approach roads, the draft was submitted on 3 November 2010 and the final documents were submitted to the BBA on 15 November 2010. The DDC issued the draft bid documents to the BBA on 17 February 2011.

19. The government decided to use its own funds to finance the ensuing investment project. Thus, funding from ADB, Islamic Development Bank, JICA, and the World Bank was eventually terminated. The tender action for the next stages was not completed before the procurement process was finalized.<sup>10</sup> The safeguards documents, such as the environmental impact assessment, resettlement plan, and land acquisition plan, were completed.<sup>11</sup> The revised design and monitoring framework, updated through the approval of the supplementary loan, is in Appendix 1.

### C. Project Costs and Financing

20. At appraisal, the design project was estimated to cost \$22 million equivalent, including local taxes, of which ADB was to finance \$17.6 million equivalent from its Special Funds resources. The revised total project cost at the time of the approval of the supplementary loan was \$34.7 million, of which ADB financed \$27.6 million from the original loan and the supplementary loan. The projected and actual project costs are provided in Appendix 2.<sup>12</sup>

21. The design project experienced cost overruns during its implementation, which led to the approval of a supplementary loan. The cost overruns were caused by (i) an increase in the detailed design cost resulting from the underestimation of the consultant's inputs, including remuneration; and (ii) the cost of surveys and studies to be carried out as part of the TOR for the DDC. The cost overrun as a result of higher remuneration was about \$2.3 million, and the overrun as a result of higher costs of surveys and studies was about \$6.4 million. The total amount of the estimated cost overrun was \$8.7 million, and the final amount to be financed by the supplementary loan was increased to \$10 million.

22. **Increase in detailed design cost.** The remuneration rate used for the cost estimate during consultant recruitment was \$20,000 per person-month, a reference rate used by ADB to estimate the costs of consulting services in the transport sector in 2007. The final average remuneration rate of the design consultant's contract exceeded \$25,000. The higher rates quoted by the DDC were considered to reflect the higher qualifications of the consultant's experts, on account of which the design consultant was chosen as the most technically qualified.

23. **Cost of surveys and studies.** The cost estimate of the surveys and studies was \$1.2 million at the time of the project preparatory TA (para. 38) and was increased to \$1.6 million before issuing the request for proposals during the recruitment of the DDC. The original cost estimate of the detailed design consultancy services was based on the project preparatory TA output, which

<sup>10</sup> ADB and WB were to harmonize their requirements on each institution sanction's list before the bidding issuance; however, the project was cancelled before that could take place.

<sup>11</sup> The safeguards categorization for indigenous people in the original TA loan, supplementary TA loan, and the ensuing investment project was C.

<sup>12</sup> Data on the actual total project cost for the cofinancier and for the borrower were not available.

recommended the design–build contracting modality for only some of the project components, so as to attract the interest of the private sector. The TOR of the design consultant required the consultant to study different contracting modalities and to recommend an optimal contracting modality for each project component, with due consideration of the possibility of private sector participation.

24. The contract negotiations with the DDC were concluded in January 2009 with a contract price about \$2.3 million higher than the original estimate (para. 22). The cost of surveys and studies was maintained at \$1.6 million as a provisional sum. However, during contract negotiations, the DDC expressed concern that the amount allocated to surveys and studies would be insufficient to meet all the requirements under the TOR. Furthermore, during the inception stage of the DDC, the BBA, as advised by the panel of experts, requested the DDC to conduct a complete geotechnical investigation and studies and to develop detailed engineering design for all project components (para. 16). The aim was to reduce technical uncertainties as much as possible and to arrive at more reliable cost estimates for the ensuing investment project. Also, the surveys and studies were essential for preparing an engineering design with due consideration of the economy, effectiveness, constructability, functionality, ease in operation and maintenance, and sustainability of the ensuing project. The cost estimate for the surveys and studies was about \$8 million (para. 21). Appendix 10 contains more details of the studies and surveys.

25. A major change was approved in September 2009. The original TA loan also financed the costs of the checking engineer and the POE. Due to currency fluctuations, the ADB financing commitment under the DDC contracts (equivalent to about \$17.5 million) exceeded the loan amount (equivalent to about \$17.3 million). The amount of the original ADB loan was sufficient to finance only the DDC, which had a cost of about \$16.9 million. Hence, a major change in scope was approved to exclude the POE from the categories financed with ADB loan proceeds and to reallocate SDR1,715,000 from the checking engineer and POE categories to the DDC category. Because of the unavailability of ADB funds to finance the POE, the government sought financing from the World Bank's \$3 million project preparation facilities, which were available starting in July 2008 (para. 11). The World Bank finally financed the POE at an estimated cost of about \$1.5 million. Accordingly, the loan agreement was amended on 31 January 2010. Appendix 3 contains details about the project costs.

26. Two minor changes were also approved for the design project. The first, in December 2010, reallocated the unused portion of the DDC's cost, incremental administrative support, and financing charges under the original loan to cover actual disbursements for the checking engineer and to fully use the amount of the loan. The second, in December 2012, reallocated funds from the supplementary loan to cover the shortfall of the DDC services and to fully utilize the loan amount.

#### **D. Disbursements**

27. Appendix 4 presents the projected and actual disbursements. The actual disbursement was distributed following the revised disbursement schedule approved under the supplementary loan. The loan agreements of the original TA loan, signed on 12 December 2007, and the supplementary TA loan, signed on 7 December 2009, provided for the imprest account and statement of expenditure procedure. However, considering the ease of operation, the disbursement type was changed in 2009 to the direct payment procedure, under which ADB made payments directly to the consultant's bank accounts.

28. The original projections of the original TA loan were appropriate. The approval of the supplementary loan led to a change in the projections and cumulative disbursement of ADB loan proceeds.

## **E. Project Schedule**

29. The original deadline for effectiveness of the original TA loan was on 11 March 2008, based on the 90-day effectiveness period after the signing of the loan agreement on 12 December 2007. The government requested a time extension to fulfill the remaining loan effectiveness conditions.<sup>13</sup> ADB granted an interim extension of 15 days, as communicated on 17 March 2008. A second request to extend the period by 2 months (until 26 May 2008) was granted on 4 April 2008 and a third extension to postpone until 26 August 2008 was approved on 25 June 2008. The original TA loan finally became effective on 25 August 2008.

30. The consultancy services of the DDC were planned to be completed by 29 November 2010. However, because the provisional sums and contingencies were insufficient to fund the approved additional studies and non-zero cost variations, an addendum was formally approved and signed on 1 March 2011 with a revised contract amount of \$23,896,755 equivalent and an extension of the consultant services to 15 August 2011. Subsequently there were two more extensions of the contract, to 30 September 2011 and to 31 October 2011.

31. The original TA loan was expected to close on 31 August 2010. Due to the delay in the recruitment process for the DDC, the loan closing date was extended to 31 December 2011. However, after the supplementary loan was approved, it was decided to close the original loan ahead of schedule, on 15 December 2010.

32. The supplementary loan was to close on 31 August 2011. However, variations to both the DDC and the checking engineer contracts were needed to process the remaining claims. To do these variations, the BBA had to revise its technical project proforma for the projects, which, in turn, required the approval of the government's Planning Commission. The loan closing date had to be extended three times, so the supplementary loan was financially closed on 6 November 2012. Delays in loan effectiveness and the need for additional studies contributed to the longer than expected implementation period. The chronology of the design project appears in Appendix 6.

## **F. Implementation Arrangements**

33. The BBA was the executing agency of the design project. At appraisal, a project implementation unit (PIU) was to be established under the BBA. The PIU was composed of one project director; two superintending engineers for the main bridge and RTW; one superintending engineer for settlement work; one deputy director for environment; one deputy director for finance; three executive engineers for the main bridge, RTW, and resettlement works; and six assistant engineers for the main bridge, approach roads, and settlement works. The government also hired one engineer officer, one financial expert, and one environmental expert for the project director's office. Apart from the design consultant, the PIU was supported by two sets of independent monitoring arrangements: (i) checking engineers to independently review the design criteria, specifications, drawings, and other documents submitted by the design consultants and to check the detailed design to ensure that it met project objectives; and (ii) the POE to independently

<sup>13</sup> The additional conditions that delayed loan effectiveness involved the (i) restructuring of the JMBA; and (ii) execution and delivery of a subsidiary loan agreement in a form and substance acceptable to ADB, and effective and binding upon the borrower and the JMBA (Appendix 7; Article VI of the loan agreement).

guide, monitor, and advise on the detailed design. The BBA expanded its staffing to respond to the increased workload, which included selecting consultants, administering contracts, coordinating with government agencies, and organizing aid coordination meetings.

34. The DDC, an international consulting firm associated with national consulting firms, undertook the following, as planned: (i) prepared scheme designs; (ii) conducted necessary technical studies; (iii) developed detailed engineering design and tender documents for the main bridge, approach roads, and RTW; and (iv) assisted the BBA in undertaking tender actions including prequalifying contractors, preparing selection criteria, evaluating tenders, and preparing the final contract documentation, up to the cancellation of the ensuing investment project.

35. The POE, consisting of internationally recognized experts in various specialties, was to be selected by the BBA in consultation with the cofinanciers' group for the investment project, which included ADB, the Japan Bank for International Cooperation, JICA, and the World Bank.<sup>14</sup> The panel composition was expected to include experts with skills in (i) bridge and structural engineering, (ii) highway engineering, (iii) RTW, (iv) environment and resettlement impact assessment, and (v) structured financing for concession arrangements. The World Bank financed \$1.5 million of the cost of the POE under the \$3 million project preparation facilities (para. 25). The POE met monthly, starting in early July 2009, to review and comment on deliverables by the design consultants.

36. A firm of senior engineers was recruited as the checking engineer to review and comment on (i) design drawings; (ii) design statements or reports; (iii) design criteria documents; (iv) site survey and geotechnical investigation reports; (v) materials and workmanship specifications; (vi) wind tunnel test proposals and reports; (vii) scope and requirements of all technical studies and any special investigations proposed; (viii) construction method and erection sequence assumptions; (ix) other reports relating to design and construction; and (x) the design program and project management information. The primary objectives of the independent checking role were (i) to ensure that the design of the main bridge and the RTW satisfied the objectives set down in the TOR for the design phase of the project; and (ii) to enable construction contracts to be awarded for the investment project, with the requirements of the client and potential financiers being fully met.

37. The implementation arrangements were adequate to ensure the generally satisfactory implementation and completion of a project of such a scale. The detailed design consultant, the checking engineer, and the panel of experts were able to conduct the tasks and to coordinate the delivery of the outputs. This contributed satisfactorily to the completion of the design project.

## **G. Technical Assistance**

38. No associated TA was approved with the design project. In 2005, ADB provided project preparatory TA of \$800,000 funded by the Japan Special Fund to complement JICA's feasibility study, particularly for establishing the robust financial viability of the bridge project and for developing a public-private partnership scheme.<sup>15</sup> The outcome of the TA, which was an agreed-upon design for the ensuing investment project, was achieved. The following outputs—(i) the

<sup>14</sup> The Japan Bank for International Cooperation was created on 1 October 1999 through the merger of the Japan Export-Import Bank and the Overseas Economic Cooperation Fund.

<sup>15</sup> ADB. 2005. *Technical Assistance to the People's Republic of Bangladesh for Preparing the Padma Multipurpose Bridge Project (Financed by the Japan Special Fund)*. Manila. The TA completion report is appended to this project completion report since the project preparatory TA is related to the design project and the ensuing investment loan was terminated.

report on technical, economic, and financial viability; (ii) development of a public–private partnership scheme; (iii) environmental assessment; and (iv) resettlement, social, and poverty impact assessment—contributed to the achievement of the outcome. The final TA report confirmed the technical and economic viability of the Padma bridge project. In addition, by incorporating the preparation of the TOR of the design project in the TA scope, the readiness of the design project and of the ensuing investment project was enhanced. The TA completion report appears in Appendix 8. The overall rating of the project preparatory TA is *successful*.

## H. Consultant Recruitment and Procurement

39. **Detailed design consultant.** About 545 person-months of international consulting services and 399 person-months of national consulting services were estimated to be required for the DDC. At the request of the government, ADB was to select the design consultant on behalf of the government, while the government would retain its authority for negotiating and signing the contract. At completion, ADB conducted the recruitment using quality-based selection up to the stage of technical ranking, as envisaged during appraisal. ADB provided the BBA with general guidance on the method for assessing price proposals. The request for proposal was issued in March 2008, 6 months later than the original plan. This delay was mostly caused by the additional time required to fine-tune the TOR. In July 2008, ADB provided the BBA with the technical ranking. Contract negotiations began in October 2008 and concluded in December 2008. The contract was signed on 29 January 2009. The notice to proceed was issued on 3 February 2009, with an estimated 22-month contract period. The design consultants mobilized in February 2009. Owing to the initial delay in recruiting the design consultants (12 months from the original schedule), the implementation period was extended by 1 year, from February 2010 to February 2011.

40. **Panel of experts.** About 50 person-months were estimated for the POE. Recruitment was to be carried out on an individual basis, as no firm would be able to easily assemble under the quality- and cost-based selection method the team of internationally reputable experts required for the POE, each of whose contribution would depend on individual experiences and knowledge. The POE was to consist of not fewer than five and not more than eight individuals, including the chair. It was expected to include some members of the POE for the Jamuna Bridge project, as their experience would be helpful. The estimated cost was \$0.9 million. At completion, the method used was quality-based selection. The POE consisted of 11 reputable international and national experts who provided advisory services to the BBA from the design phase and throughout the implementation of the ensuing investment project. Starting in July 2009, the POE met monthly to review and to comment on deliverables by the DDC.

41. **Checking engineers.** The plan was to recruit a firm of senior engineers as the checking engineers, using the quality- and cost-based selection method. A total of about 70 person-month inputs were estimated. The design consultant prepared the TOR for their services. The estimated cost was \$1.8 million. The BBA conducted the consultant recruitment. The engineers were expected to be appointed by January 2010; however, the contract began in March 2010. Quality-based selection was used given the high-end expertise required for checking the ensuing complex design.

42. The consultant recruitment was conducted with coordination between all cofinanciers and the borrower. The BBA formed a selection committee to evaluate the curriculum vitae of the POE and checking engineer members. The negotiations of the consultant's contract were conducted by a team headed by the executive director of the BBA, as well as BBA officials and other officials representing the Economic Relations Division of the Ministry of Finance and the Roads and Highways Department of the Ministry of Communications.

43. **Procurement.** The compressed timeline set up for the procurement of the main bridge civil works did not result in the advance commencement of the ensuing investment project, as the actions for making land available for the main bridge construction were on the critical path, and not the design and civil works procurement of the main bridge. Considering the longer time required for completing the design of the RTW, the procurement action for any other project components needed to be timed with due consideration for the interlinkage and interfaces among the different components, and preparatory actions required to start construction of each of those components. A small task force consisting of procurement specialists from the three development partners (Islamic Development Bank, JICA, and the World Bank) was formed for the preparation of procurement documents. The procurement did not move forward, as the investment loan was later canceled.

44. The original contract awards projections were inadequate because of the higher than expected contract price negotiated with the DDC (para. 21) (Appendix 4). The consultants performed satisfactorily, delivering the outputs and contributing to the substantial achievement of the impact.

## **I. Safeguards**

45. Three safeguards documents were prepared under the design project: (i) an environmental impact assessment, (ii) a resettlement plan, and (iii) a land acquisition plan. The government, ADB, and all potential cofinanciers for the ensuing investment project agreed to prepare safeguards documents, coordinating closely with all stakeholders to harmonize all cofinanciers' requirements. After mobilization of the DDC, the development partners fielded regular joint missions, primarily focusing on safeguard matters, so that the ensuing project would be in compliance with the various policy requirements of the development partners.

46. Because of the additional studies and surveys, the process of acquiring land for the RTW was slowed down as there were significant changes in the land requirement. During implementation, the preparation of the environmental impact assessment report was on the critical path for processing the loan for the ensuing investment project by the cofinanciers because of (i) the 120-day disclosure period before loan approval and commitment; and (ii) the time required for conducting analyses and studies to select an optimal engineering design option for the RTW, which is needed to precede environmental impact assessment studies. The availability of the resettlement sites for relocating the project-affected people was also on the critical path for starting bridge construction.

## **J. Monitoring and Reporting**

47. ADB fielded regular missions to monitor the implementation of the design project. A Cofinancier Monitoring Committee (CMC), with members from the government, ADB, the Japan Bank for International Cooperation, JICA, and the World Bank was established in April 2008. Its objective was to discuss and to resolve any issue associated with the investment project, its funding, and other related matters.

48. The loan covenants were mostly complied with. Of 44 loan covenants, four were partially complied with and one was not complied with. The DDC submitted progress reports regularly. Missions were conducted regularly to monitor the progress of the design project and the ensuing investment project. The status of compliance with the loan covenants appears in Appendix 7.



### III. EVALUATION OF PERFORMANCE

#### A. Relevance

49. The project is rated *relevant*. The intended outcome of the project was aligned with the government's transport sector strategy. The construction of the Padma Bridge was one of the government's highest priority projects to enhance the transport sector, especially the road and railway subsectors (para. 9). The project was also in line with ADB's Country Strategy and Program 2006–2010 for Bangladesh (para. 10).

50. The modality chosen for the design project was appropriate given the loan amount and the design of the outcomes and outputs. The project results chain was sound, and the design scope and outputs were appropriate for achieving the intended outcome. However, the design and monitoring framework lacked specific indicators to measure the performance of some outputs. During implementation, the scope underwent one major change and two minor changes, mainly with regard to fund allocation (paras. 25 and 26). The design was formulated with the successful separation of the scope from previous feasibility studies, the project preparatory TA, and the ensuing investment project, hence complementing ADB's previous support and contributing positively to the implementation of the ensuing investment project. In addition, the design project complemented the efforts of the World Bank, which also provided funding to expedite the preparation of the investment project (para. 11).

51. Timely actions were taken to improve the scope when needed, in coordination with the cofinancier, the borrower, and the executing agency. The construction of the Padma Bridge entailed innovative engineering solutions because of the particular geographic and geologic location as well as the special features of the project (Appendix 11). The application of the lessons learned from the Jamuna Bridge helped achieve a high-quality result and mitigate certain risks in the design project. This also helped facilitate the preparation of the ensuing investment project and enhance project readiness. The design project resulted in the approval of the cofinanced investment loan. Even though the investment loan was canceled before effectiveness, the government is financing the construction of the Padma Bridge, which underscores the relevance of the project.

#### B. Effectiveness

52. The design project is rated *effective* as it achieved its outcome and most of its output targets. The project outcome, which was the detailed design of the Padma Bridge and other auxiliary works agreed to by the government and ADB, was achieved. The design was also agreed to by the cofinanciers. The detailed design was used in preparing the ensuing project for both the terminated ADB loan and the ongoing government-financed Padma Bridge construction project. The outputs, though delayed, were mostly achieved, with respect to the output indicators (para. 14). The delay made it possible to obtain a more comprehensive design and to complete documentation of the ensuing investment project. Stakeholders coordinated in preparing the safeguards and procurement documents, harmonizing all cofinanciers' requirements. The tender action was substantially completed since the ensuing investment project was canceled before the procurement process was finalized.

#### C. Efficiency

53. The assessment of the efficiency of the design project is based on the cost overruns and delays encountered during the project implementation only. Given the nature of the project, a

quantitative assessment of the cost–benefit analysis will not be conducted. The design project experienced delays in loan effectiveness (para. 29) and during implementation. The delays occurred mainly because of (i) contract negotiations with the DDC that took longer than expected (para. 24), (ii) a prequalification process that took longer than planned (paras. 17 and 18), and (iii) the change in contract type from design–build to design-ready (para. 61), and the consequent need to conduct a full geotechnical investigation and studies and to develop detailed engineering designs for all project components (para. 23). Nonetheless, these efforts helped enhance the readiness of the ensuing investment project and reduce risks and uncertainties during its implementation. The design project likewise experienced cost overruns that led to the approval of the supplementary loan (para. 21). Thus, the design project is rated *less than efficient*.

#### **D. Sustainability**

54. The project's outcome and outputs are *most likely sustainable* considering that the construction of Padma Bridge is ongoing and is using the detailed design prepared under the design project. The government is using its own funds to finance the ensuing investment project, which shows the government's strong commitment to the completion of the project. As shown in Appendix 12, the project was 78% complete as of February 2020. The project also contributed to restructuring the JMBA into the BBA and to strengthening the capacity of the BBA.

#### **E. Development Impact**

55. The design project prepared a technically sound detailed design of the Padma Bridge, the RTW, and the access roads and facilities, and has generally achieved its intended impact of facilitating project preparation for an investment loan to construct the bridge. The other impact performance target of selecting a technically and financially qualified contractor for construction of the Padma Bridge was not achieved because of the cancellation of the ensuing investment project. Nonetheless, the government is financing the construction of the Padma Bridge, which was about 78% complete as of February 2020 (para. 54). Thus, the development impact of the design project is rated *satisfactory*.

56. The construction of the Padma Bridge is intended to significantly (i) benefit various sectors of the economy nationally and regionally; and (ii) bring tangible economic growth and social benefits, particularly to the people in the southwestern region of the country. It is expected that the low-income people in the project area will reap immediate benefits from the bridge construction in the form of employment during construction, additional employment in relocation-related activities, subsistence allowances and other benefits from resettlement, and increased trading income during construction. In the long term, the impact of the bridge on poverty reduction will be even more significant, as the economic benefits generated by the bridge and accruing to the poor will be greater than their share of the GDP. An estimate of multiplier effects on the Padma Bridge investment shows the bridge increasing the national GDP growth rate by 1.2% and the gross product in the southwest region by 35%, as well as generating additional employment opportunities of 743,000 person-years, equivalent to 1.2% of the total labor force of Bangladesh (footnote 1).

#### **F. Performance of the Borrower and the Executing Agency**

57. The borrower complied with most of the loan covenants (para. 48). During the project implementation period, adequate coordination between the executing agency, the cofinanciers, and the consultants helped produce a successful design and ensure that the procurement and due diligence requirements of all cofinanciers were met. The borrower achieved a satisfactory

performance standard in ensuring the quality of the project preparation, successful implementation of the project activities, and project sustainability. The performance of the borrower is rated *satisfactory*.

## G. Performance of the Cofinancier

58. The World Bank was the cofinancier for the supplementary loan. It provided support to the project not only by helping expedite the preparation of the ensuing investment loan in the form of financing \$1.5 million of the cost of the POE, but also by facilitating the extensive coordination needed to ensure that cofinanciers' ideas, objectives, and regulations were harmonized for the ensuing investment project. The World Bank coordinated and synchronized the application of safeguard policies and procedures of the potential cofinanciers. The performance of the cofinancier therefore is *satisfactory*.

## H. Performance of the Asian Development Bank

59. ADB provided its complete technical and financial support to the government's Padma bridge development plan through the implementation of the project preparatory TA and the design project. From the project preparation stage to the project completion stage, ADB contributed to consultant recruitment, the detailed design study, and the preparation of safeguards and procurement documents. ADB carried out several review and consultation missions per year during the implementation period of the design project and for the preparation of the ensuing investment project. Problems that arose during the design project were solved in a timely manner, and ADB provided specific and timely advice to the BBA and the consultants on updating safeguards and bidding documents. The design project contributed positively to the implementation of the investment project. The coordination between ADB, the cofinancier of the design project (i.e., the World Bank), and the cofinanciers of the investment project facilitated the successful implementation of the project. The overall performance of ADB is rated *satisfactory*.

## I. Overall Assessment

60. The design project was essential to processing the ensuing investment project. The government asked ADB and the cofinanciers to prepare the design under a very ambitious timeline. The loan for the ensuing investment project was cancelled; however, the outputs of the design project helped implement the Padma Multipurpose Bridge Project, which is currently under construction and financed by the government. The design project is rated *relevant, effective, less than efficient, and most likely sustainable*. The overall rating of the design project is *successful*.

### Overall Ratings

Criteria	Rating
Relevance	Relevant
Effectiveness	Effective
Efficiency	Less than efficient
Sustainability	Most likely sustainable
<b>Overall Assessment</b>	<b>Successful</b>
Development impact	Satisfactory
Performance of Borrower	Satisfactory
Performance of Executing Agency	Satisfactory
Performance of ADB	Satisfactory

ADB = Asian Development Bank.  
Source: Asian Development Bank.

## IV. ISSUES, LESSONS, AND RECOMMENDATIONS

### A. Issues and Lessons

61. The government accorded very high priority to the implementation of the ensuing project, the Padma Multipurpose Bridge Project. The design project in particular is a highly technical engineering project that entailed challenges and innovative features during the design and the implementation stages. The design of a project of such magnitude needs to take into account (i) the executing agency's capacity, (ii) the country experience with such major projects, and (iii) a realistic time frame. During implementation of the design project and of the investment project, several discussions were held to evaluate the feasibility of the involvement of the private sector and the type of the contract, i.e., design-build. This led to a delay in implementation because of the need to obtain more data through additional surveys and studies. However, the change from design-build to design-ready for the contracting modality reduced risks and uncertainties during implementation. Project readiness had to be ensured from the inception stage to reduce the risk and uncertainties of the project.

62. The presence of various cofinanciers with different procurement policies increases transaction costs because of the need to resolve the differences and to harmonize the independent policies into a single document. Other procurement arrangements should have been explored. Also, the need to harmonize all cofinanciers' requirements should be planned adequately to ensure that all donors' requirements are met.

63. Appropriate management of records is key to ensuring the quality assurance of projects. Project record-keeping and management practices would help reviewers monitor accurately and have a positive impact since information could be used as references for strengthening implementation and evaluation of future projects.

### B. Recommendations

64. **Further action or follow-up.** No further action or follow-up is required for the design project.

65. **Timing of the project performance evaluation report.** The project performance evaluation report shall be prepared after the completion of the ensuing project. The TA loan project may be evaluated after the completion of the investment project, which is expected by 2021.

REVISED DESIGN AND MONITORING FRAMEWORK<sup>a</sup>

Design Summary	Performance Indicators and Targets	Project Achievements
<b>Impact</b> Project preparation for an investment loan to construct the Padma bridge facilitated	Preparation of technically sound detailed design for the Padma bridge, river-training works, and access roads  Selection of a technically and financially qualified contractor for construction of the Padma bridge	<b>Achieved.</b> Technically sound detailed design for the Padma bridge, river-training works, and access roads was prepared.  <b>Not achieved.</b> The ensuing investment project was cancelled before completion of the procurement stage.
<b>Outcome</b> Detailed design of the Padma bridge and other auxiliary works agreed by the Government and ADB	Submission of acceptable detailed design by June 2010	<b>Achieved with delay.</b> Acceptable detailed design was submitted by July 2011. <sup>b</sup>
<b>Outputs</b> Scheme designs  Technical studies  Detailed design  Tender action  Environmental impact assessment  Resettlement plan  Land acquisition plan	i. Scheme design report by August 2009 (original TA loan: June 2008)  ii. Interpretative reports for technical studies (including additional studies) by November 2009 (original TA loan: October 2008)  iii. Detailed design reports and design certificates including the methodology and procedures for poverty impact assessment by June 2010 (original TA loan: June 2009)  iv. Tender documents by June 2010 (original TA loan: August 2009)  v. Construction contract documentation by December 2010 (original TA loan: February 2010)	i. <b>Achieved.</b> The scheme design report was submitted by August 2009.  ii. <b>Partially achieved.</b> Some of the additional surveys and studies were completed 2011.  iii. <b>Achieved with delay.</b> For the main bridge, the checking engineer issued the conditional check certificate on 2 December 2010 and the final check certificate on 6 June 2011. For the RTW, the final check certificate was issued in June 2011.  iv. <b>Substantially achieved.</b> The consultant submitted in time the draft prequalification documents for the main bridge and the RTW. Safeguards documents were prepared. The tender documents and the progress of the tendering process were linked to close coordination with cofinanciers and the borrower. The final tender documents were therefore submitted at a later date. Since the ensuing investment project was cancelled before procurement was finalized, the consultant was not able to complete the tasks entirely.  v. <b>Not achieved.</b> The ensuing project was cancelled before the procurement process was finalized.

ADB = Asian Development Bank, RTW = river-training works, TA = technical assistance.

<sup>a</sup> Revised version of the design and monitoring framework obtained from the report and recommendation of the President relating to the supplementary loan (Loan 2593).

<sup>b</sup> Accepted the detailed design of the main bridge and river-training works by the independent checking engineer by issuing the final check certificate.

Sources: Asian Development Bank and consultant's progress reports.

**ORIGINAL AND REVISED PROJECT COST ESTIMATES**  
(\$ million)

Item	Appraisal Estimate			Revised			Total Cost
	ADB	GOB	Total Cost	ADB	GOB	WB	
<b>A. Consulting Services Costs</b>							
1. Consultants							
a. Detailed design	14.6	2.3	16.9	23.3	3.5	0.0	26.8
b. Independent checking engineer and panel of experts	2.7	0.5	3.2	1.2	0.5	1.5	3.2
c. Incremental administrative support	0.1	0.4	0.5	0.1	0.4	0.0	0.5
<b>Subtotal (A)</b>	<b>17.4</b>	<b>3.2</b>	<b>20.6</b>	<b>24.6</b>	<b>4.4</b>	<b>1.5</b>	<b>30.5</b>
<b>B. Contingencies</b>							
1. Physical	0.0	1.0	1.0	2.6	1.0	0.0	3.6
2. Price	0.0	0.2	0.2	0.1	0.2	0.0	0.3
<b>Subtotal (B)</b>	<b>0.0</b>	<b>1.2</b>	<b>1.2</b>	<b>2.7</b>	<b>1.2</b>	<b>0.0</b>	<b>3.9</b>
<b>C. Financial Charges during Implementation</b>	<b>0.2</b>	<b>0.0</b>	<b>0.2</b>	<b>0.3</b>	<b>0.0</b>	<b>0.0</b>	<b>0.3</b>
<b>Subtotal (C)</b>	<b>0.2</b>	<b>0.0</b>	<b>0.2</b>	<b>0.3</b>	<b>0.0</b>	<b>0.0</b>	<b>0.3</b>
<b>Total (A+B+C)</b>	<b>17.6</b>	<b>4.4</b>	<b>22.0</b>	<b>27.6</b>	<b>5.6</b>	<b>1.5</b>	<b>34.7</b>

ADB = Asian Development Bank, GOB = Government of Bangladesh, WB = World Bank.

Source: Asian Development Bank.

## PROJECT COST BY FINANCIER

Table A3.1: Project Cost at Appraisal by Financier (Loan 2375)

Item	ADB		Government		Total Cost
	Amount {A}	% of Cost Category {A/D}	Amount {B}	% of Cost Category {B/D}	Amount {D}
<b>A. Base Cost</b>					
1. Detailed design consultant	14.6	86	2.3	14	16.9
2. Independent checking engineer and panel of experts	2.7	84	0.5	16	3.2
3. Incremental administrative support	0.1	20	0.4	80	0.5
<b>Subtotal (A)</b>	<b>17.4</b>	<b>84</b>	<b>3.2</b>	<b>16</b>	<b>20.6</b>
<b>B. Contingencies</b>					
1. Physical	0.0	0	1.0	100	1.0
2. Price	0.0	0	0.2	100	0.2
<b>Subtotal (B)</b>	<b>0.0</b>	<b>0</b>	<b>1.2</b>	<b>100</b>	<b>1.2</b>
<b>Total Base Cost (A+B)</b>	<b>17.4</b>	<b>84</b>	<b>4.4</b>	<b>20</b>	<b>21.8</b>
<b>C. Financial Charges During Implementation</b>	<b>0.2</b>	<b>100</b>	<b>0.0</b>	<b>0</b>	<b>0.2</b>
<b>Total Project Cost (A+B+C)</b>	<b>17.6</b>		<b>4.4</b>		<b>22.0</b>
<b>% Total Project Cost</b>		<b>80</b>		<b>20</b>	

ADB = Asian Development Bank.

Source: Asian Development Bank.

**Table A3.2: Project Cost at Appraisal by Financier (Loan 2593)**

Item	ADB		Government		World Bank		Total Cost
	Amount {A}	% of Cost Category {A/D}	Amount {B}	% of Cost Category {B/D}	Amount {C}	% of Cost Category {C/D}	Amount {D}
<b>A. Consulting Services Costs</b>							
1. Detailed design consultant	8.7	88.0	1.2	12.0	0.0	0.0	9.9
2. Independent checking engineer and panel of experts	(1.5)	0.0	0.0	0.0	1.5	100.0	0.0
3. Incremental administrative support	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Subtotal (A)</b>	<b>7.2</b>	<b>73.0</b>	<b>1.2</b>	<b>12.0</b>	<b>1.5</b>	<b>15.0</b>	<b>9.9</b>
<b>B. Contingencies</b>							
1. Physical	2.6	100.0	0.0	0.0	0.0	0.0	2.6
2. Price	0.1	100.0	0.0	0.0	0.0	0.0	0.1
<b>Subtotal (B)</b>	<b>2.7</b>	<b>100.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>2.7</b>
<b>Total Base Cost (A+B)</b>	<b>9.9</b>	<b>78.6</b>	<b>1.2</b>	<b>9.5</b>	<b>1.5</b>	<b>11.9</b>	<b>12.6</b>
<b>C. Financial Charges During Implementation</b>	<b>0.1</b>	<b>100.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.1</b>
<b>Total Project Cost (A+B+C)</b>	<b>10.0</b>		<b>1.2</b>		<b>1.5</b>		<b>12.7</b>
<b>% Total Project Cost</b>		<b>78.7</b>		<b>9.4</b>		<b>11.8</b>	

( ) = negative, ADB = Asian Development Bank.

Source: Asian Development Bank.



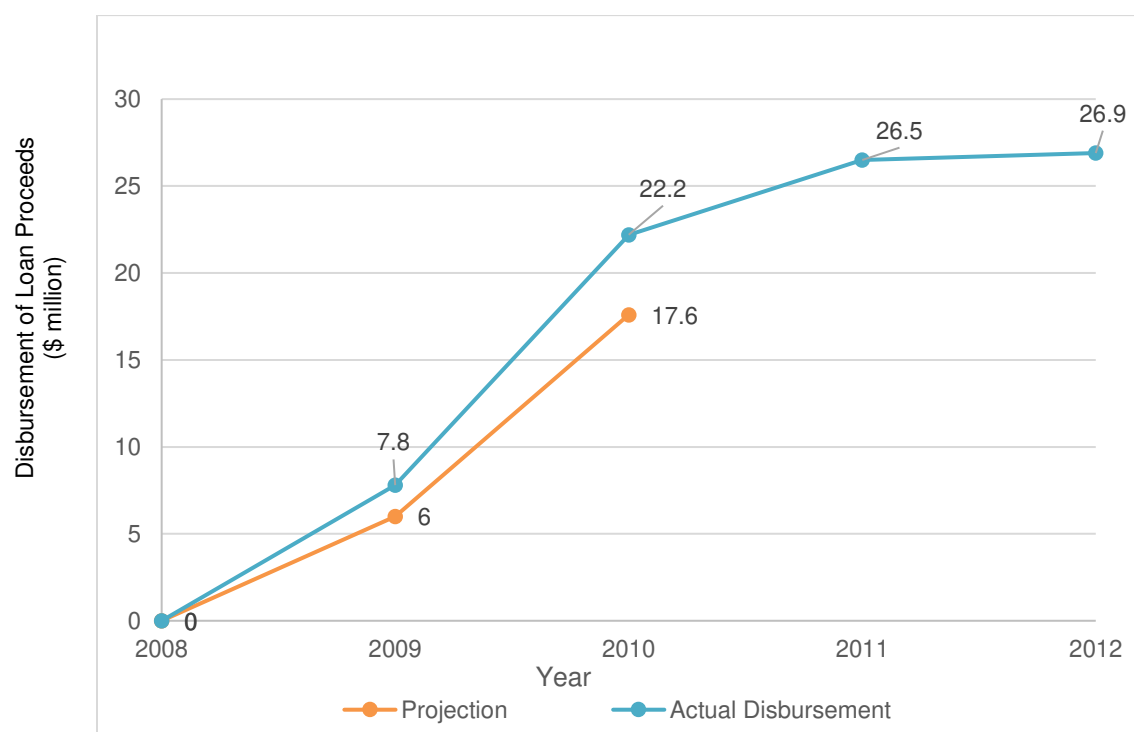
## DISBURSEMENT OF ADB LOAN PROCEEDS

Table A4: Annual and Cumulative Disbursement of ADB Loan Proceeds

Loan Number	Year	Annual Disbursement		Cumulative Disbursement	
		Amount (\$ million)	% of Total	Amount (\$ million)	% of Total
2375	2008	0.0	0.0	0.00	0.00
	2009	7.8	45.6	7.8	45.6
	2010	9.3	54.4	17.1	100.00
	<b>Total</b>	<b>17.1</b>	<b>100.0</b>		
2593	2010	5.1	52.0	5.1	52.0
	2011	4.3	43.9	9.4	95.9
	2012	0.4	4.1	9.8	100.0
	<b>Total</b>	<b>9.8</b>	<b>100.0</b>		

ADB = Asian Development Bank.  
Source: Asian Development Bank.

**Figure A4: Projected and Cumulative Disbursements of ADB Loan Proceeds**  
(\$ million)



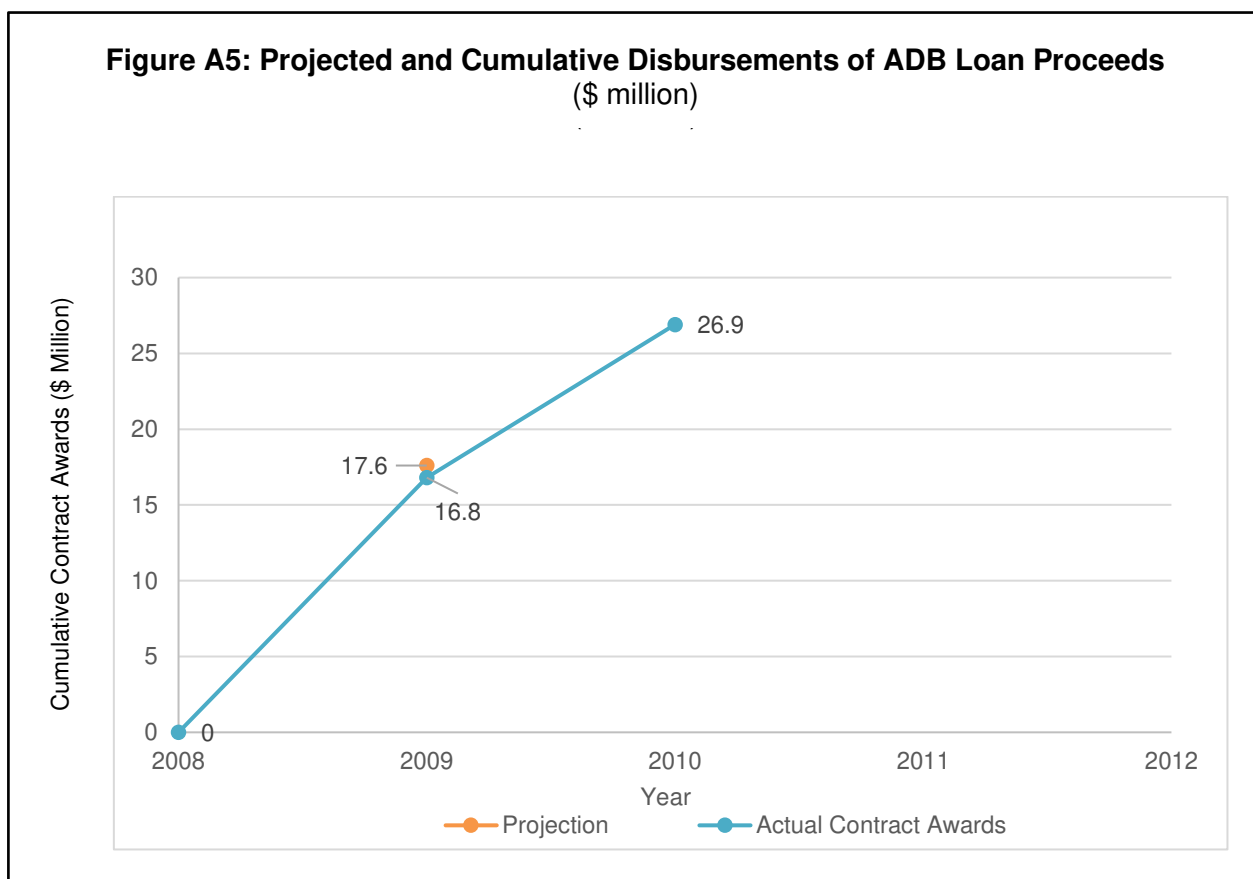
ADB = Asian Development Bank.  
Source: Asian Development Bank.

### CONTRACT AWARDS OF ADB LOAN PROCEEDS

**Table A5: Annual and Cumulative Contract Awards of ADB Loan Proceeds**  
(\$ million)

Loan Number	Year	Annual Contract Awards		Cumulative Contract Awards	
		Amount (\$ million)	% of Total	Amount (\$ million)	% of Total
2375	2008	0.0	0.0	00.0	0.0
	2009	16.8	98.2	16.8	98.2
	2010	0.3	1.8	17.1	100.0
	<b>Total</b>	<b>17.1</b>	<b>100.0</b>		
2593	2010	9.8	100.0	9.8	100.0
	2011	0.0	0.0	9.8	100.0
	2012	0.0	0.0	9.8	100.0
	<b>Total</b>	<b>9.8</b>	<b>100.0</b>		

ADB = Asian Development Bank.  
Source: Asian Development Bank.



ADB = Asian Development Bank.  
Source: Asian Development Bank.

## CHRONOLOGY OF MAIN EVENTS

Date	Event
<b>2005</b>	
22 September	Project preparatory technical assistance (TA) approved
<b>2007</b>	
8–9 November	TA Loan 2375 loan negotiations
5 December	TA Loan 2375 approved
12 December	TA Loan 2375 loan agreement signed
<b>2008</b>	
11 March	90-day period for TA Loan 2375 effectiveness lapsed
17 March	Interim extension of 15 days granted by the Asian Development Bank (ADB) for TA Loan 2375
4 April	TA Loan 2375 loan effectiveness extension until 26 May 2008 granted by ADB
25 June	TA Loan 2375 loan effectiveness extension until 26 August 2008 granted by ADB
30 April	First Cofinanciers Monitoring Committee (CMC) meeting held
18 August	Government of Bangladesh confirmed fulfillment of the TA Loan effectiveness conditions
25 August	TA Loan 2375 effectiveness declared
<b>2009</b>	
29 January	Contract for the design consultancy services signed
3 February	Notice to proceed issued to detailed design consultant (DDC)
15 April	Meeting with CMC held
27 April	Inception report by DDC received
11 May	First Panel of Experts (POE) meeting held
18 June	Interim scheme design for main bridge, approaches, and bridge end facilities (BEF) received
27 July	Procurement strategy report submitted by DDC
8–10 August	Second POE meeting held
27 August	Final scheme design submitted by DDC
12–14 September	Third POE Meeting held
September	Recruitment of checking engineer started
24–26 October	Fourth POE meeting held
26 November	Final scheme design for river-training works (RTW) submitted by DDC
November	Evaluation of proposals of checking engineer
2 December	TA Loan 2593 approved
7 December	TA Loan 2593 signed
13–15 December	Fifth POE meeting held
<b>2010</b>	
30 Jan–1 Feb	Sixth POE meeting held
28 February	TA Loan 2375 original project completion date
9 March	POE appointed
12 March	Checking engineer appointed
5–7 April	Seventh POE meeting held
11 April	Procurement: Invitation for prequalification applications for main bridge issued
27 April	Tender design drawings for approach roads Mawa and Janjira issued by DDC
8 June	Procurement: Responses received for prequalification for main bridge
23 June	Supplementary TA Loan 2593 effectiveness declared
30 June	Request for proposal (RFP) for construction supervision consultant received
11–13 July	Eighth POE meeting held
17 July	Procurement: Final Assessment Report on main bridge prequalification issued to Bangladesh Bridge Authority (BBA) by the DDC
24 July	Procurement: Invitation for prequalification applications for RTW issued
25 July	Procurement: Invitation for prequalification applications for approach road at Janjira side issued
10 August	RFP for management support consultant received
31 August	TA Loan 2375 original closing date
September	Ninth POE meeting held
26 September	Procurement: Submission deadline for responses to prequalification of Janjira approach roads, toll plaza, and selected BEF
27 September	Procurement: Original submission deadline for responses to prequalification of the RTW
29 September	Procurement: Responses received for approach road at Janjira side

<b>Date</b>	<b>Event</b>
24-27 September	Tenth POE meeting held
7 October	Procurement: Responses received for RTW
10 October	Procurement: Prequalification process for main bridge annulled
12 October	Procurement: Re-issuance of invitation for prequalification applications for main bridge
24 October	Procurement: Re-issuance of invitation for prequalification applications for approach road at Janjira side
13–14 November	11th POE meeting held
24 November	Procurement: Responses received for prequalification for main bridge
25 November	Padma Multipurpose Bridge Project approval
2 December	Checking engineer issued main bridge conditional check certificate
15 December	TA Loan 2375 actual closing date
December	Detailed design of the main bridge completed
<b>2011</b>	
7 February	Checking engineer issued RTW conditional check certificate
6 February	Procurement: Invitation for prequalification applications for approach road at Mawa side issued
28 February	TA Loan 2593 original project completion date
24 March	Procurement: Responses received for approach road at Mawa side
29 April	Bid documents to prequalified bidders for Janjira approach roads, toll plaza, and selected BEF issued
27 May	Checking engineer issued RTW final check certificate
6 June	Checking engineer issued main bridge final check certificate
16 August	Procurement: Issuance of invitation for prequalification applications for Service Area-2
31 August	TA Loan 2593 original closing date
31 December	TA Loan 2375 and TA Loan 2593 revised loan closing date
<b>2012</b>	
29 February	TA Loan 2593 loan closing date (second revision)
29 June	World Bank cancelled International Development Association credit to finance Padma Multipurpose Bridge Investment Project
31 August	TA Loan 2593 loan closing date (third revision)
6 November	TA Loan 2593 actual closing
<b>2013</b>	
7 August	ADB cancelled Loan 2701/2702-BAN: Padma Multipurpose Bridge Project

Source: Asian Development Bank.

## STATUS OF COMPLIANCE WITH LOAN COVENANTS

Covenant	Reference in Loan/Project Agreement	Status of Compliance
<p><b>Loan Agreement</b></p> <p><b>Section 6.01</b></p> <p>The following is specified as additional conditions to the effectiveness of this Loan Agreement for the purposes of Section 9.01(f) of the Loan Regulations:</p> <p>(a) the Cabinet of the Borrower shall have approved a restructuring of JMBA whereby (i) the secretary of the bridge division under the Ministry of Communications of the Borrower dealing with JMBA shall head JMBA as the executive director, and (ii) a separate land acquisition, resettlement and environment unit shall have been established and supported by capable quality staff resources; and</p> <p>(b) the Subsidiary Loan Agreement, in form and substance satisfactory to ADB, shall have been duly executed and delivered on behalf of the Borrower and JMBA, and shall have become effective and binding upon the Borrower and JMBA in accordance with its terms, subject only to the effectiveness of this Loan Agreement.</p>	<p>Article VI Effectiveness. Loan 2375</p>	<p>The 90-day period for loan effectiveness was not achieved. The effectiveness of TA Loan 2375 took place on 25 August 2008 (original effective date 11 March 2008). The Supplementary TA Loan 2593 also experienced delay in declaring effectiveness, which resulted in effectiveness being declared only on 23 June 2010 (original effective date 6 March 2010). The additional conditions for loan effectiveness were achieved as follows:</p> <p>(i) A separate division named Bridges Division was created under the Ministry of Communications on 31 March 2008 and a separate land acquisition, resettlement, and environment unit was established in the Bangladesh Bridge Authority effective 18 March 2008.</p> <p>(ii) The subsidiary Loan Agreement was signed by the Ministry of Finance and the Bangladesh Bridge Authority on 10 July 2008.</p>
<p><b>Project Executing Agency</b></p> <p>1. BBA, as the Project Executing Agency, shall be responsible for the overall execution and coordination of the Project.</p>	<p>Schedule 5, Para. 1. Loan 2375/Loan 2593</p>	<p>Complied</p>
<p><b>Project Implementation Unit</b></p> <p>2. JMBA shall establish the PIU for (i) monitoring the process of day to day Project implementation, (ii) provision of assistance to the DC in carrying out the DC's tasks, (iii) coordinating Project activities and functions of the CE and the POE, (iv) processing withdrawal of Loan proceeds, (v) preparation of Project progress and status reports, and (vi) maintenance of accounts and accounting records of the Project. The PIU shall consist of a Project Director, a Deputy Project Director, Project engineers as required, a finance and accounting officer, and an administrative officer.</p>	<p>Schedule 5, Para. 2. Loan 2375</p>	<p>Complied</p>

<b>Covenant</b>	<b>Reference in Loan/Project Agreement</b>	<b>Status of Compliance</b>
<b>Project Implementation Unit</b> 2. The existing PIU established by BBA for the Initial Project shall be responsible for (a) monitoring the process of day to day Project implementation, (b) provision of assistance to the DDC in carrying out the detailed design consultant's tasks, (c) coordinating Project activities and functions of the CE and the POE, (d) processing withdrawal of Loan proceeds, (e) preparation of Project progress and status reports, and (f) maintenance of accounts and accounting records of the Project.	Schedule 5, Para. 2. Loan 2593	Complied
<b>Design Consultants</b> 3. JMBA shall engage a team of consultants as the DC for preparation of scheme designs, implementation of technical studies, development of detailed engineering design and tender documents for the Padma Multipurpose Bridge Investment Project. In addition, the DC shall assist JMBA in undertaking tender actions including contractors' prequalification, preparation of selection criteria, tender evaluation and final contract documentation.	Schedule 5, Para. 3. Loan 2375	Complied However, due to the termination of the ensuing investment project, the DC was not able to undertake all tasks required during tender and contract stage.
<b>Design Consultants</b> 3. The team of consultants engaged as DC by BBA shall assist with the preparation of scheme designs, implementation of technical studies, development of detailed engineering design and tender documents for the Padma Multipurpose Bridge Investment Project. In addition, the DDC shall continue to assist BBA in undertaking tender actions including contractor's prequalification, preparation of selection criteria, tender evaluation and final contract documentation.	Schedule 5, Para. 3. Loan 2593	Complied However, due to the termination of the ensuing investment project, the DC was not able to undertake all tasks required during tender and contract stage.
<b>Checking Engineers</b> 4. JMBA shall engage a team of consultants independent of the PIU as the CE and cause the CE to ensure compliance of the design criteria, specifications, drawings and other related documents with the Project objectives. The terms of reference of the CE shall be developed by the DC and the qualification of the candidates of the CE shall be reviewed by the POE.	Schedule 5, Para. 4. Loan 2375	Complied
<b>Checking Engineers</b> 4. BBA shall cause the team of consultants to be engaged independent of the PIU as CE to ensure compliance of the design criteria, specifications, drawings and other related documents with the Project objectives. The procedure in relation to recruitment of the CE outlined in para. 4 of Schedule 5 of the Initial Loan Agreement shall be followed.	Schedule 5, Para. 4. Loan 2593	Complied
<b>Panel of Experts</b> 5. JMBA shall establish the POE outside the PIU to independently monitor and provide advice and guidance on Project implementation. POE shall consist of internationally recognized individual experts/consultants with such skills as bridge engineering, structural engineering, highway engineering, and structuring and financing concessions. JMBA shall select such experts/consultants from a short list prepared by JMBA and approved by ADB.	Schedule 5, Para. 5. Loan 2375	Complied
<b>Panel of Experts</b> 5. The POE established by BBA shall continue to independently monitor and provide advice and guidance on Project implementation.	Loan Agreement Schedule 5, Para. 5. Loan 2593	Complied

Covenant	Reference in Loan/Project Agreement	Status of Compliance
<p><b>II. Social and Environmental Issues</b></p> <p><i>Environment</i></p> <p>6. The Borrower shall ensure that BBA shall prepare, with adequate public consultation with affected people, an environmental impact assessment (EIA), which shall include an environmental management plan (EMP), in accordance with the environmental assessment requirements of the Borrower and ADB. The Borrower shall ensure that the environmental concerns of affected people will be addressed in the project design.</p>	Schedule 5, Para. 6. Loan 2375/Loan 2593	<p>Complied</p> <p>Environmental impact assessment: <a href="https://www.adb.org/sites/default/files/linked-documents/35049-01-ban-eiaab.pdf">https://www.adb.org/sites/default/files/linked-documents/35049-01-ban-eiaab.pdf</a></p> <p>Environmental action plan: <a href="https://www.adb.org/sites/default/files/linked-documents/35049-01-ban-oth-02.pdf">https://www.adb.org/sites/default/files/linked-documents/35049-01-ban-oth-02.pdf</a></p>
<p><i>Resettlement and Land Acquisition</i></p> <p>7. The Borrower shall ensure that a resettlement plan for Padma Multipurpose Bridge Investment Project shall be prepared based on detailed design of the project and in accordance with the requirements of ADB's Safeguard Policy Statement (2009), and laws and regulations of the Borrower. The Borrower shall also prepare a land acquisition plan. The resettlement plan and land acquisition plan shall be submitted to ADB for approval.</p>	Schedule 5, Para. 7. Loan 2375/Loan 2593	<p>Complied</p> <p>Main bridge and approach roads: <a href="https://www.adb.org/sites/default/files/linked-documents/35049-01-ban-rpab-01.pdf">https://www.adb.org/sites/default/files/linked-documents/35049-01-ban-rpab-01.pdf</a></p> <p>River-training works: <a href="https://www.adb.org/sites/default/files/linked-documents/35049-01-ban-rpab-02.pdf">https://www.adb.org/sites/default/files/linked-documents/35049-01-ban-rpab-02.pdf</a></p> <p>Resettlement site development: <a href="https://www.adb.org/sites/default/files/linked-documents/35049-01-ban-rpab-03.pdf">https://www.adb.org/sites/default/files/linked-documents/35049-01-ban-rpab-03.pdf</a></p>
<p>8. The Borrower shall ensure that land acquisition and resettlement for the Padma Multipurpose Bridge Investment Project shall be implemented in accordance with the requirements of ADB's Safeguard Policy Statement (2009), and laws and regulations of the Borrower, as set out in the resettlement plan and/or the land acquisition plan agreed upon between ADB and the Borrower, which shall include (a) compensation and entitlements to affected people, (b) timely provision of funds and disbursements to affected people, (c) adequate supervision, monitoring, and reporting by the BBA, (d) adequate information dissemination and consultation with affected people, (e) regular reporting of progress to ADB, and (f) establishment of a grievance redress committee in each union where land acquisition will take place.</p> <p>A grievance redress committee shall consist of (a) a representative from BBA at the level of deputy/assistant director, (b) the area manager of the nongovernmental organization concerned, (c) the chairperson of the Union Parishad where the complaint is registered, (d) a representative from affected people, (e) a woman member of the Union Parishad, (f) a representative from the concerned deputy commissioner's office, and (g) a headmaster of the local high/primary school. The grievance redress committee shall be entitled to give a verdict regarding a project-specific definition of entitlements and entitled persons.</p>	Schedule 5, Para. 8. Loan 2375/Loan 2593	<p>Complied</p> <p>Social action plan: <a href="https://www.adb.org/sites/default/files/linked-documents/35049-01-ban-oth-01.pdf">https://www.adb.org/sites/default/files/linked-documents/35049-01-ban-oth-01.pdf</a></p>
<p><i>Other Social Issues</i></p> <p>9. The Borrower shall ensure that all civil works procurement documents to be prepared under the Project shall incorporate provisions and budget to the effect that</p>	Schedule 5, Para. 9. Loan 2593	<p>Complied</p> <p>However, due to the early termination of the ensuing investment project, the civil works</p>

Covenant	Reference in Loan/Project Agreement	Status of Compliance
contractors (a) comply with all applicable labor laws and related international treaty obligations; (b) do not employ child labor, as defined under Bangladesh laws; (c) provide safe and proper working conditions for male and female workers; (d) do not differentiate between wages of male and female workers for work of equal value; (e) implement the provisions set forth in any gender action plan to be prepared; and (f) carry out HIV/AIDS and human trafficking awareness campaigns in the campsites and corridors of influence.		procurement documents were not fully finalized.
<b>III. Other Issues</b> <i>Construction Supervision</i> 10. The Borrower shall adopt Federation Internationale des Ingenieurs Conseils (FIDIC) mechanism for construction supervision of the Padma Multipurpose Bridge Investment Project. All design and construction contracts to be prepared under the Project shall adopt standard FIDIC forms of contract to be applied without modifying normal responsibilities of contract parties.	Schedule 5, Para. 10. Loan 2375/Loan 2593	Data not available
<i>Operation and Maintenance Scheme</i> 11. The Borrower shall develop a technically and financially sustainable operation and maintenance scheme applicable to major bridges including the Padma Multipurpose Bridge.	Schedule 5, Para. 11. Loan 2375/Loan 2593	Data not available
<i>Accounts and Audit</i> 12. Without prejudice to Section 2.09 of the Project Agreement, consolidated accounts for the Project and related financial statements shall be audited annually by private sector auditors acceptable to ADB in addition to audits conducted by the Borrower's controller and the auditor general.	Schedule 5, Para. 12. Loan 2375	Not complied The APFS were only audited by the Foreign Aided Projects Audit Directorate of the Government of Bangladesh.
<i>Reports</i> 12. BBA shall submit or cause to submit monthly progress reports including the status of land acquisition and resettlement, and other activities that will take place concurrently with the Project implementation.	Schedule 5, Para. 12. Loan 2593	Data not available
<i>Project Reviews</i> 13. ADB shall conduct periodic reviews and a midterm review in early 2010 to review the progress of the Project and undertake any necessary midcourse corrections. In addition, ADB shall conduct special reviews as appropriate. The Borrower shall give all possible assistance for carrying out such reviews.	Schedule 5, Para. 1. Loan 2593	Complied. Three missions were conducted in 2010.
<b>Project Agreement</b>		
JMBA/BBA shall carry out the Project with due diligence and efficiency, and in conformity with sound administrative, financial, engineering, environmental and bridge construction practices.	Article 2, Section 2.01 (a) Loan 2375/Loan 2593	Complied
JMBA/BBA shall make available, promptly as needed, the funds, facilities, services, equipment, and other resources which are required, in addition to the proceeds of the Loan, for the carrying out of the Project.	Article 2, Section 2.02, Loan 2375/Loan 2593	Complied
(a) In the carrying out of the Project, JMBA shall employ competent and qualified consultants acceptable to ADB, to an extent and upon terms and conditions satisfactory to ADB.	Article 2, Section 2.03, Loan 2375/Loan 2593	Complied



Covenant	Reference in Loan/Project Agreement	Status of Compliance
(b) Except as ADB may otherwise agree, all consulting services to be financed out of the proceeds of the Loan shall be procured in accordance with the provisions of Schedule 4 to the Loan Agreement. ADB may refuse to finance a contract where consulting services have not been procured under procedures substantially in accordance with those agreed between the Borrower and ADB or where the terms and conditions of the contract are not satisfactory to ADB.		Complied
JMBA/BBA shall carry out the Project in accordance with plans, design standards and specifications acceptable to ADB. JMBA/BBA shall furnish, or cause to be furnished, to ADB, promptly after their preparation, such plans, design standards and specifications, and any material modifications subsequently made therein, in such detail as ADB shall reasonably request.	Article 2, Section 2.04, Loan 2375/Loan 2593	Complied
JMBA/BBA shall take out and maintain with responsible insurers, or make other arrangements satisfactory to ADB for, insurance of the Project facilities to such extent and against such risks and in such amounts as shall be consistent with sound practice.	Article 2, Section 2.05, Loan 2375/Loan 2593	Data not available
JMBA/BBA shall maintain, or cause to be maintained, records and accounts adequate to identify the consulting services and other items of expenditure financed out of the proceeds of the Loan, to disclose the use thereof in the Project, to record the progress of the Project (including the cost thereof) and to reflect, in accordance with consistently maintained sound accounting principles, its operations and financial condition.	Article 2, Section 2.06, Loan 2375/Loan 2593	Complied
(a) ADB and JMBA/BBA shall cooperate fully to ensure that the purposes of the Loan will be accomplished.  (b) JMBA/BBA shall promptly inform ADB of any condition which interferes with, or threatens to interfere with, the progress of the Project, the performance of its obligations under this Project Agreement or the Subsidiary Loan Agreement, or the accomplishment of the purposes of the Loan.  (c) ADB and JMBA/BBA shall from time to time, at the request of either party, exchange views through their representatives with regard to any matters relating to the Project, JMBA and the Loan.	Article 2, Section 2.07, Loan 2375/Loan 2593	Complied  Complied  Complied
JMBA/BBA shall furnish to ADB all such reports and information as ADB shall reasonably request concerning (i) the Loan and the expenditure of the proceeds thereof; (ii) the consulting services and other items of expenditure financed out of such proceeds; (iii) the Project; (iv) the administration, operations and financial condition of JMBA/BBA; and (v) any other matters relating to the purposes of the Loan.	Article 2, Section 2.08 (a) Loan 2375/Loan 2593	Partially complied APFS 2011–2012 could not be found on project files.
Without limiting the generality of the foregoing, JMBA shall furnish to ADB quarterly reports on the execution of the Project and on the operation and management of the Project facilities. Such reports shall be submitted in such form and in such detail and within such a period as ADB shall reasonably request, and shall indicate, among other things, progress made and problems encountered during the quarter under review, steps taken or proposed to be	Article 2, Section 2.08 (b), Loan 2375/Loan 2593	Data not available

Covenant	Reference in Loan/Project Agreement	Status of Compliance
taken to remedy these problems, and proposed program of activities and expected progress during the following quarter.		
Promptly after physical completion of the Project, but in any event not later than three (3) months thereafter or such later date as ADB may agree for this purpose, JMBA shall prepare and furnish to ADB a report, in such form and in such detail as ADB shall reasonably request, on the execution and initial operation of the Project, including its cost, the performance by JMBA of its obligations under the Loan Agreement to the extent they are applicable to JMBA/BBA, this Project Agreement and the accomplishment of the purposes of the Loan.	Article 2, Section 2.08 (c), Loan 2375/Loan 2593	Data not available
JMBA/BBA shall (i) maintain separate accounts for the Project and for its overall operations; (ii) have such accounts and related financial statements (balance sheet, statement of income and expenses, and related statements) audited annually, in accordance with appropriate auditing standards consistently applied, by independent auditors whose qualifications, experience and terms of reference are acceptable to ADB; and (iii) furnish to ADB, promptly after their preparation but in any event not later than six (6) months after the close of the fiscal year to which they relate, certified copies of such audited accounts and financial statements and the report of the auditors relating thereto (including the auditors' opinion on the use of the Loan proceeds and compliance with the financial covenants of the Loan Agreement), all in the English language. JMBA/BBA shall furnish to ADB such further information concerning such accounts and financial statements and the audit thereof as ADB shall from time to time reasonably request.	Article 2, Section 2.09 (a), Loan 2375// Loan 2593	<p>Partially complied APFS FY2011–2012 is missing.</p> <ul style="list-style-type: none"> <li>Four (FY2009, FY2010, FY2011 and FY2013) of five required APFS from effective date to closing were received. FY2012 was missing in ADB files. The APFS were submitted with a delay of 9 days up to 6 months from the required submission date.</li> <li>Audit opinions were all unqualified.</li> <li>Specific opinion on the use of funds and compliance with financial covenants were issued.</li> <li>Issues on compliance with APFS include non-compliance of financial rules and regulations and conditions of contract, specifically important accounting records and documents not maintained properly. Unresolved audit issues include (i) revenue loss for the Government of Bangladesh due to less deduction of VAT and income tax from the consultant's payments, (ii) excess payments on office rentals, (iii) excess claim on office maintenance, and (iv) closing balance not deposited into government account.</li> </ul>
JMBA/BBA shall enable ADB, upon ADB's request, to discuss JMBA/BBA's financial statements for the Project and its financial affairs related to the Project from time to time with the auditors, appointed by JMBA/BBA pursuant to Section 2.09(a) hereabove, and shall authorize and require	Article 2, Section 2.09 (b), Loan 2375/Loan 2593	Complied ADB requested clarifications from the BBA regarding the APFS reviews.

<b>Covenant</b>	<b>Reference in Loan/Project Agreement</b>	<b>Status of Compliance</b>
any representative of such auditors to participate in any such discussions requested by ADB, provided that any such discussion shall be conducted only in the presence of an authorized officer of JMBA/BBA unless JMBA/BBA shall otherwise agree.		
JMBA/BBA shall enable ADB's representatives to inspect the Project and any relevant records and documents.	Article 2, Section 2.10. Loan 2375/Loan 2593	Complied
JMBA/BBA shall, promptly as required, take all action within its powers to maintain its corporate existence, to carry on its operations, and to acquire, maintain and renew all rights, properties, powers, privileges and franchises which are necessary in the carrying out of the Project or in the conduct of its business.	Article 2, Section 2.11 (a), Loan 2375/Loan 2593	Complied
JMBA/BBA shall at all times conduct its business in accordance with sound administrative, financial, environmental and bridge construction practices, and under the supervision of competent and experienced management and personnel.	Article 2, Section 2.11 (b). / Loan 2593	Complied
JMBA/BBA shall at all times operate and maintain its sites, equipment and other property, and from time to time, promptly as needed, make all necessary repairs and renewals thereof, all in accordance with sound administrative, financial, engineering, environmental, bridge construction, and maintenance and operational practices.	Article 2, Section 2.11 (c), Loan 2375 / Loan 2593	Complied
Except as ADB may otherwise agree, JMBA/BBA shall not sell, lease or otherwise dispose of any of its assets which shall be required for the efficient carrying on of its operations or the disposal of which may prejudice its ability to perform satisfactorily any of its obligations under this Project Agreement.	Article 2, Section 2.12, Loan 2375/Loan 2593	Complied
Except as ADB may otherwise agree, JMBA/BBA shall apply the proceeds of the Loan to the financing of expenditures on the Project in accordance with the provisions of the Loan Agreement and this Project Agreement, and shall ensure that all consulting services financed out of such proceeds are used exclusively in the carrying out of the Project.	Article 2. Section 2.13. Loan 2375/Loan 2593	Complied
Except as ADB may otherwise agree, JMBA/BBA shall duly perform all its obligations under the Subsidiary Loan Agreement, and shall not take, or concur in, any action which would have the effect of assigning, amending, abrogating or waiving any rights or obligations of the parties under the Subsidiary Loan Agreement.	Article 2. Section 2.14. Loan 2375/Loan 2593	Complied
JMBA/BBA shall promptly notify ADB of any proposal to amend, suspend or repeal any provision of the JMBA Ordinance and shall afford ADB an adequate opportunity to comment on such proposal prior to taking any action thereon.	Article 2. Section 2.15. Loan 2375/Loan 2593	Complied
This Project Agreement shall come into force and effect on the date on which the Loan Agreement shall come into force and effect. ADB shall promptly notify JMBA/BBA of such date.	Article 3. Section 3.01. Loan 2375/Loan 2593	Complied
All the provisions of this Project Agreement shall continue in full force and effect notwithstanding any cancellation or suspension under the Loan Agreement.	Article 3. Section 3.02. Loan 2375/Loan 2593	Complied

Covenant	Reference in Loan/Project Agreement	Status of Compliance
Any notice or request required or permitted to be given or made under this Project Agreement and any agreement between the parties contemplated by this Project Agreement shall be in writing. Such notice or request shall be deemed to have been duly given or made when it shall be delivered by hand or by mail, telegram, cable, telex, facsimile or radiogram to the party to which it is required or permitted to be given or made at its address hereinafter specified, or at such other address as such party shall have designated by notice to the party giving such notice or making such request.	Article 4. Section 4.01. Loan 2375/Loan 2593	Complied
Any action required or permitted to be taken, and any documents required or permitted to be executed, under this Project Agreement or under Section 7.01 of the Loan Agreement by or on behalf of JMBA may be taken or executed by its Executive Director or by such other person or persons as the Executive Director shall so designate in writing notified to ADB.	Article 4. Section 4.02 (a) Loan 2375/Loan 2593	Complied
JMBA shall furnish to ADB sufficient evidence of the authority of each person who will act under para. (a) of this Section, together with the authenticated specimen signature of each such person.	Article 3. Section 4.02. (b) Loan 2375/Loan 2593	Complied

ADB = Asian Development Bank, APFS = audited project financial statement, BBA = Bangladesh Bridge Authority, CE = checking engineer, DC = design consultant, DDC = detailed design consultant, eOps = electronic operations, FY = fiscal year, JMBA = Jamuna Multipurpose Bridge Authority, PIU = project implementation unit, POE = panel of experts, TA = technical assistance, VAT = value added tax.

Source: Asian Development Bank.

## TECHNICAL ASSISTANCE COMPLETION REPORT

<b>TA Number, Country, and Name:</b> TA 4652-BAN: Padma Multipurpose Bridge <sup>a</sup>		<b>Amount Approved:</b> \$800,000	
		<b>Revised Amount:</b> Not applicable	
<b>Executing Agency:</b> Bangladesh Bridge Authority <sup>b</sup>	<b>Source of Funding:</b> Japan Special Fund	<b>Amount Undisbursed:</b> \$140,722.56	<b>Amount Used:</b> \$659,277.44
<b>TA Approval Date:</b> 22 September 2005	<b>TA Signing Date:</b> 29 January 2006	<b>TA Completion Date</b>	
		<b>Original Date:</b> 31 May 2006	<b>Latest Revised Date:</b> 30 Sep 2007
		<b>Financial Closing Date:</b> 31 July 2008	<b>Number of Extensions:</b> 1
<b>TA Type:</b> Project preparatory technical assistance (TA)			

### Description

Bangladesh is a riverine country and the major rivers flowing through the country are the Ganges, the Jamuna, the Meghna, and the Padma. The Padma River is formed by the confluence of the Ganges and the Jamuna rivers. Historically, this river system has split Bangladesh into several sections: (i) the northwest zone bordered by the Ganges and the Jamuna rivers; (ii) the east zone, which is east of the Jamuna River where the capital, Dhaka, and the major port, Chittagong, are located; and (iii) the southwest zone, which is isolated by the Padma and the Ganges rivers. The connection with the northwest and southwest zones was enhanced with the completion of the construction of the Jamuna Bridge in June 1998 and the Paksey Bridge in April 2004, thus accelerating the socioeconomic development of the northwest zone. The social, economic, and industrial underdevelopment of the southwest zone, which encompasses Bangladesh's second major port, Mongla; its third main city, Khulna; and the inland port at Benapole, is due in part to difficult access across the Padma River to the rest of the country.

Although there have been improvements to and development of the road network of the southwest zone, links with the rest of the country across the Padma River are still only by ferry. The capacity of ferry services is very limited. In addition, the riverbanks of the Padma are very unstable, and the river width changes frequently, leaving approach ghats not operational seasonally. The expansion of existing ferry terminals is made difficult by these conditions. Moreover, there is an urgent need to replace dangerous ferry and launch operations between Dhaka and the southwest region by safer and more reliable surface transport.

The route from Benapole in the southeast through Khulna to Dhaka in the east is the major trade route between India and Bangladesh. The route also has the potential to be extended to Sylhet in the northeast and then to northeast India. From the viewpoint of subregional economic cooperation, this Benapole–Dhaka–Sylhet route will comprise the main corridor connecting West Bengal to northeast India. However, without a fixed crossing over the Padma River, the effectiveness of this major route for regional cooperation will be greatly constrained.

A bridge across the Padma River will certainly (i) strengthen links between the southwest and north-central zones, (ii) enhance freight and passenger transportation between Dhaka and major points in the southwest zone, and (iii) contribute substantially to the development of the southwest zone as well as to national and regional economic growth. The feasibility study carried out by JICA<sup>c</sup> indicated that the construction of Padma Bridge will (i) increase the growth rate of the national gross domestic product by 1.2%, (ii) raise value-added factor income by 1.4%, and (iii) provide 743,000 person-years of new employment opportunities in total. As a result, an increase in economic production, employment, and income might be facilitated to ultimately result in poverty reduction. The bridge will also allow greater mobility for surplus labor force to go to other regions, and will encourage the setting up of new industrial units, thereby generating employment opportunities in the impact zone. The bridge is also important for intermodal connection as it will immediately provide better road access to Mongla Port, which is the country's second largest port, and also connect with a rail link to the port project currently being constructed. From the subregional perspective, it can provide a second access for transit of goods between the South Asia Subregional Economic Cooperation (SASEC) countries. It will also complement the benefits of the Asian Development Bank-financed Southwest Road Network

<sup>a</sup> Formerly *Support for Public–Private Partnership in Padma Bridge*.

<sup>b</sup> At appraisal, the executing agency for this TA was the Jamuna Multipurpose Bridge Authority (JMBA). After a Cabinet decision in 2007, the JMBA was restructured and it was finally known as Bangladesh Bridge Authority.

<sup>c</sup> Japan International Cooperation Agency. 2005. *The Feasibility Study of Padma Bridge in The People's Republic of Bangladesh*. Tokyo.

Development Project, approved in 1999, which intended to improve the national highway connecting Dhaka–Mawa–Bhanga–Bhatiapara–Gopalganj–Khulna/Mongla.

The study of the TA was based on two reports: (i) a feasibility study for Padma Bridge financed by the Japan International Cooperation Agency (JICA), completed in March 2005 (footnote c); and (ii) a study on social and environmental safeguards financed by the Government of Bangladesh, which included the land acquisition plan, the resettlement plan, and the environmental management plan, completed also in 2005. The technical analysis of the feasibility study financed by JICA showed weakness in financial analysis, particularly on the mode of implementation of the ensuing project and the different options for private–public partnership (PPP), among other fields. The analysis conducted by the Bangladesh Bridge Authority (BBA) also needed to be evaluated as a base for harmonizing safeguards documents considering the various potential cofinanciers for the ensuing project. Therefore, the TA built upon both studies in an effort to strengthen the preparation of the detailed design and the ensuing project.

### **Expected Impact, Outcome, and Outputs**

The expected impact of the TA was improved road connectivity to link the economically depressed southwest zone to the economically advanced eastern zone of the country. The expected outcome was the agreed upon design for the ensuing project. The expected outputs were (i) the report on technical, economic, and financial viability; (ii) PPP scheme development; (iii) environmental assessment; and (iv) resettlement, social, and poverty impact assessments.

### **Implementation Arrangements**

The TA implementation period was expected to start in November 2005 and completed by May 2006. The TA budget was \$1,000,000, from which \$480,000 was in foreign exchange cost and \$520,000 in equivalent local currency cost. The TA was financed through an \$800,000 grant from the Japan Special Fund. The government financed \$200,000 equivalent as in-kind contributions in the form of office accommodation, support facilities, counterpart staff, local transportation, maps, reports, and other logistic support. The BBA was the executing agency for the TA (footnote b). The BBA was expected to set up a project implementation unit (PIU) headed by a project director, who will be responsible for day-to-day implementation of the TA, including coordinating with concerned line ministries, agencies, and external funding agencies.

The terms of reference (TOR) focused on seven key aspects: (i) engineering and project management institutional capability assessment, (ii) economic analysis, (iii) financial analysis, (iv) PPP, (v) environmental assessment, (vi) poverty and social assessment, and (vii) resettlement and indigenous people's issues. At appraisal, an international consulting firm (the consultant) was to supply a team with expertise in the areas of (i) road and bridge engineering, (ii) macro and transport economic analysis, (iii) financial analysis of transport projects, and (iv) structuring PPP schemes in roads and bridge projects. National consultants in these fields would be engaged by the consultant, who would have overall responsibility for the TA components. Individual consultants were to be recruited to carry out (i) social analysis, poverty impact, and resettlement studies; and (ii) environmental assessment of the proposed project. It was anticipated that a total of 16 person-months international consulting services and 34 person-months national consulting services were required. The consulting firm was engaged by ADB using the quality- and cost-based selection method, and national consultants for social and environmental safeguards were likewise recruited separately.

The TA was extended from the original closing date of 31 May 2006 to 30 September 2007. The TA account was financially closed in July 2008. Review missions for the TA were performed once a year by ADB. The TA cost at completion was lower than at appraisal, except for the surveys.

### **Conduct of Activities**

The activities to be undertaken at appraisal were (i) the preparation of a report on technical, economic, and financial viability, including cost estimates, contract packaging, and project management recommendations, estimates on economic and financial internal rates of return, distribution analysis, and recommendations on sources of financing; (ii) design of a PPP scheme development, including a viable PPP scheme and formulation of sample bid document; (iii) environmental assessment, including review of previous studies and identification and preparation of remaining requirements to comply with ADB policy; and (iv) preparation of resettlement, social, and poverty impact assessment reports, including review of previous studies and identification and preparation of remaining requirements to comply with ADB policy.

The scope of the TA was performed by the following parties: the consultant firm, comprising four international experts and four national experts in charge of conducting engineering and project management institutional capability assessment, economic analysis, financial analysis, and PPP assessment. Individual consultants were also recruited: (i) international environmental safeguards specialist, (ii) social safeguards specialists, and (iii) an observer from the Jamuna Multipurpose Bridge Authority (JMBA) during the contract negotiations held in February 2006 for the

consultant.<sup>d</sup> Also, a firm was engaged in 2017 under the TA to develop the TOR of the detailed design consultancy for the design project.<sup>e</sup> The consultants were recruited in accordance with ADB's Guidelines on the Use of Consultants.

The consultant was mobilized on 19 April 2006 with 6 months of implementation period. The firm submitted the inception report in May 2006. The draft final report (DFR) was submitted on 6 October 2006. The DFR was not circulated to the other donors that committed their support for the project, i.e., the Japan Bank for International Cooperation (JBIC) and the World Bank. The consultant organized a workshop on 9 October 2006 to present the report, with the participation of officials from ADB, the Ministry of Communications, Embassy of Japan, JMBA, and neighboring municipalities. In view of all the comments received on the DFR and the need to consolidate all comments by all cofinanciers, a donor consultative group was convened on 4 December 2006.<sup>f</sup> During the consultative group meetings, discussions were held on subsequent possible steps for preparation of the Padma Multipurpose Bridge Project, including how to proceed with ADB's TA loan for detailed engineering design programmed in 2007. The strategy, complemented by recommended development programs and action plans, was completed by the consultant after incorporating comments from the consultative group. Comments were all addressed by the consultants and reflected in the final report, which was submitted in May 2007. Workshops were conducted on 18 July 2006 on the Creation of Awareness on PPP, on 7 September 2006 on PPP for the Padma Multipurpose Bridge Project, and in October 2006. The consultant also submitted regularly monthly progress reports.

Additional scope was incorporated in the TA. During the consultative group discussions held in 2007, donors decided that the TOR for the detailed design consultants of the design project should be developed by separate external international bridge design experts. The savings of the TA would be used for the deployment of the firm. The firm was engaged in April 2007. The draft TOR was submitted in June 2007. The draft TOR was circulated to all cofinanciers and all comments received were incorporated in the outline TOR.

The TA helped prepare a potential loan to support the construction of the Padma Bridge, assisting the government with the preparation of detailed engineering and procurement documents. The study under the TA also analyzed (i) the fiscal impacts of such a large expenditure on the country's macroeconomic situation, as well as in which the government could raise the necessary funds to finance its contribution to the project; and (ii) the institutional capabilities to ensure successful implementation of the proposed project. The TA was also designed to help answer the processing needs of other possible cofinanciers such as the JBIC and the World Bank. The TA led to the approval and implementation of the design project.<sup>g</sup> In 2010, the ensuing project for the construction of Padma Bridge was also approved. However, it was cancelled before effectiveness. The government is currently financing the construction of the Padma Bridge. The works are ongoing and scheduled to be completed by 2021.

#### Technical Assistance Assessment Ratings

Criterion	Assessment	Rating
Relevance	The TA outcome was fully aligned with the government's Strategy for Transport Sector Development and with ADB's Bangladesh Country Strategy and Program 2006–2010. The government considered the construction of Padma Bridge as a high priority project in terms of economic growth and poverty reduction at the time of approval and until now. Currently, the government is financing the project. <sup>h</sup> The TA will most likely contribute to the enhancement of subregional economic cooperation, connecting different regions in Bangladesh and with neighboring countries upon the completion of the construction of Padma Bridge. The TA rationale was well articulated, the TA design and results chain were sound, and there were no design deficiencies.	Highly relevant

<sup>d</sup> A minor change was approved in March 2006 to recruit an international environment safeguards specialist, instead of a national expert, due to the lack of qualifying profiles. This contributed partly to the increase in the consultant service cost.

<sup>e</sup> ADB. 2007. *Report and Recommendation of the President to the Board of Directors: Proposed TA Loan to the People's Republic of Bangladesh for the Padma Multipurpose Bridge Design Project* (Formerly known as Padma Multipurpose Bridge Engineering TA Loan). Manila; and ADB. 2009. *Report and Recommendation of the President to the Board of Directors: Proposed Supplementary TA Loan to the People's Republic of Bangladesh for the Padma Multipurpose Design Bridge Project*. Manila.

<sup>f</sup> The consultative group was composed of ADB, Embassy of Japan, JBIC, JICA, and the World Bank.

<sup>g</sup> ADB. 2010. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of Bangladesh for the Padma Multipurpose Bridge Project*. Manila.

<sup>h</sup> After cancellation of the ensuing project.

Criterion	Assessment	Rating
Effectiveness	The outcome and outputs of the TA were achieved. All outputs contributed to the achievement of the outcome. Also, by incorporating the preparation of the TOR of the design project to the TA scope, the readiness of the design project and of the ensuing project was enhanced. The successful completion of the outcome and outputs of the TA led to the implementation of the design project. Although the ensuing loans were terminated, the construction of the Padma Bridge was financed by the government and was 78% complete as of February 2020.	Effective
Efficiency	The TA was closed later than the date estimated at appraisal. However, this helped ensure that the TOR of the design project was ready, also ensuring no duplicate scope of work between the project preparatory TA and the TA loans. Also, extensive coordination between potential cofinanciers was needed to agree on the scope and the actions required for the projects. All of the outputs were realized, with a TA savings of 17.6% recorded.	Efficient
<b>Overall Assessment</b>	The TA produced significant results for the study of the feasibility of the Padma Multipurpose Bridge Project. Based on the outputs achieved, ADB, the government, and the cofinanciers undertook actions to implement the project, which would help develop the country in terms of economic growth and poverty reduction. Given the successful approval of the subsequent design project and the achievement of the outcome and outputs, the overall rating of the TA is <i>highly successful</i> .	Highly successful
<b>Sustainability</b>	The outcome and outputs achieved are sustainable since they led to the implementation of the design project, and eventually to the approval of the ensuing project. The long-term benefits of the TA have continued over time and will help contribute to the social and economic development of the country. The TA was conducted in close coordination with the stakeholders. As a result, the feasibility study was elaborated harmonizing stakeholders' requirements.	Most likely sustainable

#### Lessons Learned and Recommendations

Knowledge building	Workshops were held to inform the outputs of the consultant's report. Workshops could have been held to enhance the executing agency's capacity and knowledge on PPP financing.
Stakeholder participation	Project experience showed the importance of close coordination among cofinanciers for the project to be successfully processed and implemented, with their full support from the commencement of the project
Partnership and cofinancing	Close coordination and communication among cofinanciers are important in harmonizing due diligence requirements by cofinanciers, and in meeting all project expectations.

#### Follow-up Actions

Not applicable
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**Designation and Division:** Transport Specialist, South Asia  
Transport and Communications Division



## DESIGN AND MONITORING FRAMEWORK

<b>Impact</b> Improve road connectivity to link the economically depressed southwest zone to the economically more advanced eastern zone of the country.		
Results Chain	Performance Indicators with Targets and Baselines	Achievements
<b>Outcome</b> Agreed upon design for the ensuing loan project	a. Submission of acceptable technical, economic, and financial analyses b. Preparation of environmental assessment, environmental mitigation, and social and resettlement plan	a. Achieved b. Achieved
<b>Outputs</b> 1. Report on technical, economic, and financial viability 2. PPP scheme development 3. Environmental assessment 4. Resettlement, social, and poverty impact assessment	1-4.a. Final report to be completed within 6 months of the start of consultants' services	Achieved with delay. The consultants started their services in April 2006. According to the performance indicator, the final report was to be submitted by October 2006. The draft final report was timely submitted on 6 October 2006. Due to the need to incorporate all potential cofinanciers' comments and to harmonize all cofinanciers' due diligence requirements, various workshops and discussions were held. The final report was submitted in May 2007. The RAP and LAP were prepared in line with ADB's guidelines. The preparation of the TOR for the design project was added to the TA scope. The draft TOR was submitted in June 2007.
<b>Actual Key Activities with Milestones</b> a. Submission of final report, which included (i) review of engineering preliminary facility design and drawings and construction plans and cost estimate; (ii) economic evaluation and socioeconomic impact; (iii) financial analysis and evaluation; (iv) public-private partnership; (v) environmental, social, and resettlement issues, review, analysis, evaluations and safeguards measures; (vi) project implementation and operation; and (vii) conclusions and recommendations, among others. The final report was submitted in May 2007. b. Submission of TOR of the detailed design consultant for the design project. Draft report submitted in June 2007.		
<b>Actual Inputs</b> Japan Special Fund (funded by the Government of Japan): \$659,277.44 Government: Actual amount is not available.		

ADB = Asian Development Bank, LAP = land acquisition plan, PPP = public-private partnership, RAP = resettlement action plan, TA = technical assistance, TOR = terms of reference.

Source: Asian Development Bank.

**Table A8.1: Technical Assistance Cost by Activity**  
(\$'000)

Item	Amount		Actual
	Original Foreign Currency	Original Local Currency	
1. Consultants	400.0	160.0	487.3
2. Equipment	25.0	10.0	34.2
3. Training, seminars, and conferences	0.0	10.0	7.2
4. Surveys	0.0	100.0	129.0
5. Miscellaneous TA administration	0.0	10.0	0.0
6. Contract negotiations	5.0	0.0	1.6
7. Contingency	50.0	30.0	0.0
<b>Total</b>	<b>480.0</b>	<b>320.0</b>	<b>659.3</b>

TA = technical assistance.

Source: Asian Development Bank estimates.

**Table A8.2: Technical Assistance Cost by Financier**  
(\$'000)

Japan Special Fund	
1. Original	800.0
2. Revised	NA
3. Actual	659.3
4. Unused	140.7

NA = not applicable.

Source: Asian Development Bank estimates.

### ADDITIONAL INFORMATION

Status	Type	Approval Number	Project No.	Name	Approval Date	Closing Date	Total Project Amount (\$ million)	Cofinancing (\$ million)	GOB Counterpart (\$ million)
Completed	PPTA	4652	35049-012	Padma Multipurpose Bridge Project <sup>a</sup>	22 September 2005	31 July 2008	0.8	-	-
Completed	TA loan	2375	35049-023	Padma Multipurpose Bridge Design Project <sup>b</sup>	12 December 2007	15 December 2010	22.0	-	4.4
Completed	TA loan	2593	35049-033	Padma Multipurpose Bridge Design Project <sup>b</sup> (Supplementary Loan)	7 December 2009	06 November 2012	12.7	1.5 (WB)	1.2
Cancelled	Loan	2701	35049-013	Padma Multipurpose Bridge Project	25 November 2010	February 2013	2,915.0	1,640.0 (1,200.0 from WB, 300.0 from JICA, and 140.0 from IsDB)	660.0
Cancelled	Loan	2702	35049-013	Padma Multipurpose Bridge Project					

GOB = Government of Bangladesh, IsDB = Islamic Development Bank, JICA = Japan International Cooperation Agency, PPTA = project preparatory technical assistance, TA = technical assistance, WB = World Bank.

<sup>a</sup> Formerly Support for Public–Private Partnership in Padma Bridge.

<sup>b</sup> Formerly Padma Multipurpose Bridge Engineering TA Loan.

Source: Asian Development Bank

## ADDITIONAL STUDIES AND SURVEYS

**Table A10.1: Initial Composition of the Surveys and Studies during Appraisal of Supplementary Loan**

Composition of Surveys and Additional Studies	
1	Geotechnical investigations
2	Topographic survey
3	Bathymetric survey
4	River flow, scour, and hydrological studies including physical modeling
5	Wind tunnel testing

Source: Asian Development Bank and consultant's progress reports.

**Table A10.2: Actual Composition of the Surveys and Studies**

Initial Number		Task	Remarks
Traffic and Revenue			
1	TR1	Traffic survey updates	
Main Bridge			
2	MB1	Stage 1 geotechnical investigations	
3	MB2	Stage 2 geotechnical investigation	Substantially completed
4	MB3	Seismic study	
Wind Climate/Wind Tunnel Study			
5	MB4	Wind climate study	
6	MB5	Wind tunnel testing (section model)	Cancelled
7	MB6	Wind tunnel testing (aeroelastic model)	Cancelled
8	MB7	Durability planning study	Cancelled
9	MB8	Traffic load spectrum	Cancelled
Approach Roads			
10	AR1	Topographic features survey–approach roads	
11	AR2	Geotechnical investigations–approach roads	
12	AR3	Hydrology study for approach road structures	
Bridge End Facilities			
13	BE1	Geotechnical investigations for detailed design of toll plaza, service and resettlement areas	
14	BE2	Geotechnical investigations–second stage for buildings	
Safeguard Compliance			
15	SC1	Environmental quality baseline survey	
16	SC2	Census for resettlement plans	
17	SC3	GIS support for land acquisition and resettlement process	
18	SC4	Setting pegs along acquired land boundaries	
River-Training Works			
	Surveys		
19	RT1	Topographic surveys of Padma River floodplains	
20	RT2	Diving along guide bank of Jamuna and Paksey bridges	
21	RT3	Bathymetric survey	
22	RT4	ADCP survey	
23	RT5	Dry season topographic and bathymetry surveys	
24	RT6	August 2010 confirmation bathymetry survey and morphology analysis	
25	RT7	Multibeam survey of existing bank protection	Cancelled
Equipment			
26	RT8	RTK GPS	
Geotechnical Investigations			
27	RT9	North bank first drilling campaign	
28	RT10	Sample analysis for first north bank drilling campaign	
29	RT11	South bank first drilling campaign	
30	RT12	Sample analysis for first south bank drilling campaign	
31	RT13	North bank second drilling campaign	

Initial Number		Task	Remarks
32	RT14	Sample analysis for second north bank drilling campaign	
33	RT15	Second south bank drilling campaign	
34	RT16	Sample analysis for second south bank drilling campaign	
35	RT17	Confirmation testing related to micaceous sand	Cancelled
36	RT18	Independent assessment of potential RTW slope failure	Cancelled
<b>Physical Models</b>			
37	RT19	Pier scour model–Vancouver	
38	RT20	RTW section model–Vancouver	
39	RT21	Comprehensive model–RRI	
<b>Morphology</b>			
40	RT22	River morphology study–projection of future changes to river	
<b>Technology Transfer</b>			
41	TT1	Foreign training	

ADCP = acoustic doppler current profiler, GIS = geographic information system, GPS = global positioning system, RRI = River Research Institute, RTK = real-time kinematic, RTW = river-training works.

Source: Asian Development Bank.

## ADDITIONAL DETAILS ABOUT THE PADMA MULTIPURPOSE BRIDGE PROJECT

1. The Padma Multipurpose Bridge Project (investment project)<sup>1</sup> is considered as one of the most significant development projects in Bangladesh. It was designed to link up the southwestern part of Bangladesh with Dhaka and other parts of the country. In this regard, the project has major regional value and the potential to benefit investment, trade, jobs, and economic growth. The Government of Bangladesh accorded very high priority to the ensuing project, which was also included in the 2010–2012 country operations business plan of the Asian Development Bank (ADB)<sup>2</sup> for Bangladesh as a firm loan for processing in 2010.

2. The investment project was approved in November 2010.<sup>3</sup> The key outputs of the project were (i) the first fixed crossing across the Padma River for road traffic, comprising (a) a two-level steel truss bridge of 6.15 kilometers (km), the top deck to accommodate a four-lane highway and the lower deck to accommodate a single-track railway to be added in the future; (b) 12 km of approach roads, 1.5 km on the Mawa side and 10.5 km on the Janjira side; (c) bridge end facilities including toll plazas and service areas; and (d) river-training works with dredging and bank protection works, 1.5 km on the Mawa side and 12 km on the Janjira side, to regulate river flow and prevent damage to the bridge structure; (ii) cost-recovery mechanisms to ensure investment sustainability; and (iii) institutional capacity building to ensure sustainable asset management.

3. The project was estimated to cost \$2,915 million. Three cofinanciers agreed to commit a total of \$1,640 million through parallel cofinancing: (i) World Bank, \$1,200 million; (ii) Japan International Cooperation Agency (JICA), \$300 million; and (iii) Islamic Development Bank, \$140 million. ADB financed \$615 million and the counterpart financing by the Government of Bangladesh amounted to \$660 million. The ADB loan was to be used to finance (i) part of the cost of the civil works, (ii) financing charges during the implementation of the ADB loans, and (iii) local taxes and duties estimated at \$80 million on ADB-financed expenditures. The government was to finance a large share of land acquisition and resettlement costs in addition to its share of civil works. The loan agreement was planned to be signed on 6 June 2011. However, the World Bank decided to cancel its \$1,200 million International Development Association credit in June 2012. Since the World Bank was the main financier of the project, ADB as a cofinancier was unable to proceed with the transaction given the cross-debarment agreement, alongside with the cofinanciers, i.e., the Islamic Development Bank and JICA. The loan was cancelled in 2013. The government took over the financing of the project and the project is currently being implemented with the engineering design produced under the technical assistance (TA) loan.

4. The Padma River is approximately 100-km long. It is the third largest river in the world (discharging on average 150,000 cubic meters per second of sediment freight or 1 billion tons a year).

5. The planned railway on the Padma Bridge will form part of the Trans-Asian Railway. The bridge has been designed to carry dedicated freight corridors (DFC) for loading for exporting and importing goods with neighboring countries (India, Myanmar, People's Republic of China, among others). Padma Bridge will provide a strategic link for the revival of the Bangladesh Railway system between the east and west parts of the country.

6. The expected benefits of the project are the following:

<sup>1</sup> The Government of Bangladesh adapted the same project name as the investment loan.

<sup>2</sup> ADB. 2009. *Bangladesh: Country Operations Business Plan 2010–2012*. Manila.

<sup>3</sup> ADB 2020. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the People's Republic of Bangladesh for the Padma Multipurpose Bridge Project*. Manila.

- (i) National gross domestic product (GDP) growth of 1.23%
  - (ii) Southwest regional GDP to increase by 2.3%
  - (iii) Poverty alleviation reduction level of 0.84%
7. The project is divided into five separate construction contracts:
- (i) Janjira approach road and selected bridge end facilities contract
  - (ii) Mawa approach road and selected bridge end facilities contracts
  - (iii) Service area-2 contract (including international conference center)
  - (iv) Main bridge and approach viaduct contract
  - (v) River-training works contract

#### **A. Technical Characteristics**

- Total length of the bridge: 9.83 km
- Length of main bridge: 6.15 km
- Viaduct length:
  - Mawa: 1,478.03 meters (m)
  - Janjira: 1,670.03 m
  - Rail viaduct: 532 m
- Total approach road: 12.12 km
- Deck height: 13.6 m
- Navigation clearance: 18.30 m
- Span length: 150 m each
- Bridge width: 21.65 m
- Deck: Composite superstructure (warrant type steel truss girder and concrete slab on upper deck). Deck height: 13.6 m
- Upper deck: 4 lanes carriageway road. Concrete deck slab of 22 m width, with 2.5 m hard shoulder on both sides
- Lower deck: Single track dual gauge railway line. The railway deck is formed by pre-cast segments.
- Utilities to be installed: Gas transmission line 760 millimeters (mm) diameter, 150 mm diameter fiber optic cable and telephone duct and 7 nos. of high voltage electric line platform in river over pile foundation at 2 km downstream of main bridge
- Main bridge piles: Raked steel tubular driven piles with inclination 1H: 6V. 18 piers have 6 nos. of piles and 22 piers have 7 nos. piles.
- Out of 22 piers, 11 piers have 7 nos. of skin grouted piles and the rest, 11 nos., with 7 nos. of non-skin grouted piles.
- Total number of piles in main bridge:  $(18 \times 6) + (22 \times 7) = 262$  nos. Number of piers in main river: 40 nos.
- Total quantity of steel required for fabrication of 262 nos. of piles: 146,000 metric tons (mt)
- Steel truss: 150 m long with the span arrangement of 6 module (6 x 150 m) plus 1 module (5 x 150 m) provided in the bridge. Length of each segment: 1.945 m to 1.990 m
- Ballastless railway track on the railway deck slab. Total: 2,959 nos. railway deck segments required in the bridge
- The main superstructure of the roadway deck slab comprises 41 spans of 150 m long continuous fabricated steel truss composite with reinforced concrete roadway deck slab. The roadway deck panel is 21.65 m wide transversely with 3% two direction cross-fall. Super-T girder is used. The bridge has a total of 83 spans pretensioned

- prestressing concrete super-t girders, 39 spans are on Mawa side and 44 spans at Janjira side.
- Rail viaduct: 532 m long with 14 spans in total
  - Viaduct: 3,148.06 m long, comprising a total of 81 spans
  - River-training works length: Mawa, 3.135 km; Janjira, 13.08 km
  - River-training major works:
    - Dredging
    - Construction of launching apron
    - Protection of lower slope (1:6) by 125 kilogram (kg) geobags
    - Rock riprap dumping over 125 kg geobags
    - 800 kg geobags dumping in lower slope
    - Geotextile sheet placement at low water transition area
    - Cement concrete block dumping on land
    - Cement concrete block dumping on water
    - Cement concrete block placement on embankment riverside slope
    - Construction of crest of the embankment
    - Cement concrete block placement on embankment countryside slope
    - Vetiver plantation at countryside up to 50 m from embankment
    - 5 nos. offtakes provided in 5 branch channels
  - Latest technology of multibeam echo-sounder equipment is being used to closely monitor the quality of the underwater works being constructed (for the first time in Bangladesh).

## B. Special Characteristics

- **Longest driven pile in the world:** Steel tubular pile of 3 m diameter driven up to a maximum depth of 122 m
- **Largest double curvature friction pendulum bearing in the world:** Capacity 98,725 kilonewtons. Friction pendulum bearing (FPB) is a seismic isolation device to isolate the superstructure from ground shaking during strong earthquake. Total 96 nos. of FPB were adopted in the main bridge. There are five types of bearings used (A, B, C, D, and E), among them Type E is mono-directional and others are bi-directional. Dimension of the largest Type B is 2,350 x 2,350 x 507 mm, allowable capacity 98,725 kilonewtons and displacement 330 mm, internal diameter of sliding surface is 12,380 mm, having a weight of 15 tons. These sorts of FPB used in Padma Bridge are the first largest bearing used in the world.
- **Largest single contract of river-training works:** \$1.1 billion
- **Base grouting and skin grouting:** Skin friction of steel tubular driven pile has been enhanced by injecting grout through tube a manchette ducts attached to the pile surface. Skin friction of vertical reinforced concrete bored piles has been enhanced by injecting grout through tube a manchette ducts embedded within the outer zone of the pile.

## C. Costs

- Main bridge cost: BDT121,333,930,682 (about \$1.6 billion equivalent). Works officially commenced on 26 November 2014.



- River-training works cost: BDT87.078 million
- Approach roads, resettlement, land acquisition, and others: BDT93,522 million (84% of costs)
- Total project cost as of February 2020: BDT301,933.88 million or \$3.868 billion equivalent (including value added tax and information technology)

#### D. Current Progress of the Works

Overall progress up to February 2020: 78% completed

- **Main bridge.** Percentage completed: 86.50%
  - Work start date according to work plan: November 2014  
Work end date according to work plan: June 2021
  - River span of main bridge's total pier 40 nos.
  - Total steel pile 262 nos.
  - 262 completed pile driving
  - 35 completed pier column and P1 and P42
  - Janjira viaduct total pier 47 nos., 47 nos. completed pier column
  - Mawa viaduct total pier 44 nos., 44 nos. completed pier column
  - Truss fabrication: Total number of truss span 41.
- **River-training works.** Percentage completed: 70%
  - Work start date according to work plan: November 2014
  - Work end date according to work plan: December 2020
- **Construction supervision consultant (CSC-2) for main bridge and river-training works.** Percentage completed: 86%
  - Work start date according to work plan: November 2014  
Work end date according to work plan: November 2019
  - Status: Supervision of work is going on.
- **Janjira approach road and selected bridge end facilities.** Percentage completed: 100%
  - Work start date according to work plan: October 2013  
Work end date according to work plan: October 2016
  - Status: Work is substantially complete.
- **Mawa approach road and selected bridge end facilities.** Percentage completed: 100%
  - Work start date according to work plan: January 2014  
Work end date according to work plan: July 2017
  - Status: Work is substantially complete.
- **Service Area-2.** Percent Completed: 100%
  - Work start date according to work plan: January 2014  
Work end date according to work plan: July 2017
  - Status: Work is substantially complete.
- **Construction supervision consultant (CSC-1) for approach roads and Service Area-2.** Percent completed: 100%
  - Work start date according to work plan: October 2013  
Work end date according to work plan: October 2018 (including 1-year defect liability period)
  - Status: Work is substantially complete.
- **Land acquisition**
  - Work start date according to work plan: August 2006

- Work end date according to work plan: December 2019
- Status:
  - (i) Munshigonj: Acquisition land = 329.64 hectares. Possession taken by PMBP = 319.92 hectares
  - (ii) Madaripur: Acquisition land = 1,601.19 hectares. Possession taken by PMBP = 553.18 hectares
  - (iii) Shariatpur: Acquisition land = 610.96 hectares. Possession taken by PMBP = 579.95 hectares
- Total proposed land for three districts = 2,693.21 hectares (as per revised development project proposal)
- Total acquisition land for three districts = 2,541.79 hectares
- Total possession of land taken by PMBP in three districts = 1,453.05 hectares
- **Resettlement activities (Compensation and plot handed over)**
  - Work start date according to work plan: June 2009
  - Work end date according to work plan: June 2020
  - Status:
    - (i) BDT6,687.7 million additional grants have been handed over to the project affected people up to January 2020.
    - (ii) Total plot allocated: 2,781 nos. and 2,418 nos. plots have been handed over to the project-affected people, which is recommended by the Project Level Plot Allocation Committee up to January 2020. Of these, it has handed over 742 nos. of plots to landless families without any cost. Moreover, house development facility has been provided to the 951 nos. of affected people.
- **Environmental activities**
  - Work start date according to work plan: June 2009
  - Work end date according to work plan: June 2020
  - Status:
    - (i) 169,957 nos. of tree plantation have been completed up to January 2020 in the resettlement area, approach road, and service areas. Tree plantation and the maintenance work of the planted trees are ongoing.
    - (ii) Memorandum of understanding has been signed with the Zoological Department of Dhaka University to establish a museum in the project area. 2,143 nos. sample of species have been collected and preserved as of January 2020.
    - (iii) For the Consultancy Services for Preparing a Comprehensive Documentation of Padma Multipurpose Bridge Project, negotiation has been signed between Impress Telefilm and the PMBP on 17 February 2016. According to the contract, the 1-hour video recorded for the first 6 months was received.
    - (iv) For the Consultancy Services on Biodiversity Conservation Programme of Padma Multipurpose Bridge Project, the contract agreement has been signed between Sodev Consult International Ltd. and the PMBP on 31 December 2018. Work is ongoing as per contract agreement.
    - (v) Environmental specialists together with the health and safety specialist are performing their job under the supervision of the Management Support Consultant (MSC) and CSC-2 on the project sites.
- **Management support consultancy.** Percent completed: 78%
  - Status: Final Inception Report and Quality Assurance Manual submitted under the MSC Service Contract of PMBP. Work is ongoing.

Source: Bangladesh Bridge Authority.