

FINANCIAL ANALYSIS

A. Introduction

1. The financial analysis has been conducted in accordance with Asian Development Bank (ADB) guidelines.¹ As the additional financing of \$14.6 million (including a \$13.5 million loan from ADB) will not provide for any new assets or activities other than those agreed in the ongoing project, approved in 2014, the financial analysis focused on (i) assessing the capacity of the Bangladesh Water Development Board (BWDB) to operate and maintain the assets created under the project in addition to its existing network of assets, and (ii) reviewing the status of the agreed actions related to financial sustainability under the ongoing project.

2. The main assets to be created under the project are the physical rehabilitation and modernization of irrigation infrastructure, including (i) repairing or resectioning 17 kilometers (km) of coastal embankments, (ii) repairing about 373 km of canals with ancillary facilities, (iii) developing about 18,000 hectares (ha) of modern and highly efficient piped water distribution system to improve timely water access and reduce water losses, (iv) providing prepaid card meters to allow water allocations to be on a volumetric basis and ensure full and transparent payment and accounting, (v) fully electrifying pumping to reduce the operational costs and increase management flexibility, and (vi) piloting solar panels and pumps for about 60 ha.

3. As envisaged as part of the ongoing project, for the level 1 assets (a coastal barrage), the BWDB will be responsible for operation and maintenance (O&M) after the project closes. For the level 2 (the repaired irrigation canals) and level 3 assets (on-farm pipes and pumps) created under the project, a new irrigation management operator (IMO), which could be a private organization or a public-private partnership, will carry out the required O&M. Farmers who will use project assets will participate with the IMO on O&M by paying an irrigation service fee through the prepaid meter system for use of project assets and water.

B. Assessment of Bangladesh Water Development Board's Capacity to Operate and Maintain Level 1 Project Assets

4. The BWDB has in place an asset management policy. For capital asset management purposes, the BWDB takes advantage of the following systems:

- (i) A geographic information system-based digital land information system on BWDB acquired land in Dhaka city and its surrounding.
- (ii) A hydrological information management system used for flood forecasting and warning purposes.²
- (iii) Thirty-six auto real-time data acquisition system stations established for collecting real-time water-level data and viewing hydrographs online.³

5. To further strengthen the BWDB's capacity to manage its network of assets, another ADB project in Bangladesh, the Flood and Riverbank Erosion Risk Management Investment Program, will provide support to the BWDB to improve the asset management systems (footnote 3).

¹ ADB. 2019. [Financial Analysis and Evaluation Technical Guidance Note](#). Manila.

² Bangladesh Water Development Board. www.hydrology.bwdb.gov.bd.

³ Supported by ADB. Forthcoming. *Periodic Financing Request Report for a Proposed Loan to the People's Republic of Bangladesh for the Flood and Riverbank Erosion Risk Management Investment Program (Tranche 2)*. Manila (for approval in 2021).

6. Nevertheless, the BWDB's financial capacity to fund the O&M of the level 1 assets largely depends on the government's budgetary allocations to the BWDB. Examining the BWDB's past budget performance with regards to O&M, budget allocations increased from Tk3,500 million in fiscal year (FY) 2014 to Tk8,105 million in FY2019, yielding an average growth rate of around 18% (Table 1). The O&M funds received from the government are on average a low percentage (12%) of the O&M funds requested by the BWDB. There is therefore substantial risk that the BWDB will be unable to fund even the relatively small Tk6.8 million annual increment (the average funds required for O&M on level 1 assets during FY2023–FY2027).

Table 1: Bangladesh Water Development Board Operation and Maintenance Budget Performance
(Tk million)

Year	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	Average	CAGR (%)
O&M funds requested	36,254	37,116	41,979	42,084	42,408	57,370	42,868	9.6
O&M funds received	3,500	4,219	4,465	4,416	5,856	8,105	5,094	18.3
O&M funds spent	3,500	4,211	4,462	4,412	5,854	8,105	5,091	18.3
% of needs received	10	11	11	10	14	14	12	7.9
Utilization rate (% of needs spent)	100	100	100	100	100	100	100	

BWDB = Bangladesh Water Development Board, CAGR = compound annual growth rate, O&M = operation and maintenance.

Source: BWDB.

C. Assessment of Irrigation Management Organization's Capacity to Operate and Maintain Level 2 and Level 3 Project Assets

7. As agreed under the ongoing project, a new management-phase irrigation management operator (M-IMO), which is expected to be a private organization recruited through a public–private partnership agreement, will be responsible for the O&M of the level 2 and level 3 assets. The M-IMO will be financed from collection of irrigation service fees from the farmers. The farmers are already paying a high cost for diesel pumping, which the project will replace with cheaper to operate electric pumps. The agreed rate of the irrigation service fees will cover the M-IMO costs, O&M, and electricity fees.

8. At the time of the financial analysis, the level 2 and level 3 assets are being constructed by the construction-phase irrigation management operator (C-IMO). The C-IMO together with the BWDB have developed an asset management plan, an irrigation scheme administration manual, an irrigation scheme maintenance manual, and an irrigation scheme operation manual. Some of these documents are still in the draft stage and will need to be finalized. Together, these manuals will (i) provide a technical plan for the organizations that will operate and maintain project assets and (ii) help ensure sustainability of the project assets. Moreover, an irrigation service fee has been prepared and approved by the first Implementation Coordination Committee with farmers' representatives. The volume-based fee has been applied for the 66 schemes which were operational in the 2021 irrigation season, but it will still need to be applied to the remaining schemes and adjusted in future years. However, the project has also faced some delays, which is why the independent panel of experts has not been recruited to date. The panel's role will be to (i) assess the project readiness to transfer the long-term management, operation, and maintenance (MOM) of the assets to the M-IMO; and (ii) advise on measures to remedy deficiencies in the proposed MOM plan or propose alternative solutions.

9. The M-IMO will spend Tk141.1 million in 2024 on O&M for level 2 and level 3 assets. In 2028, 5 years after the close of the Irrigation Management Improvement Project, the BWDB will require Tk176.8 million for O&M on all project assets. This assumes that inflation in Bangladesh will be 5.8% per year.⁴ The annual water tariff for a farmer on a typical 0.2 ha farm could be as high as Tk13,566. Across the entire 18,000 ha project area, the total tariffs in 2024 would be Tk244 million. This level of tariff still provides a typical farmer, who at present without the project uses or pays for the services of an electric pump or diesel pump to provide water, with an annual net income increase of about Tk7,100–Tk8,300. This tariff would more than cover the O&M costs for level 2 and level 3 assets.

Table 2: Operation and Maintenance Financial Requirements and Farmer Tariff Revenue, 2024–2028
(Tk million)

Item	2024	2025	2026	2027	2028	Average
O&M financial requirements – level 2 assets ^a	40.2	42.5	45.0	47.6	50.4	45.16
O&M financial requirements – level 3 assets ^a	100.9	106.8	112.9	119.5	126.4	113.35
Total O&M financial requirements	141.1	149.3	157.9	166.3	176.8	165.63
Farmer tariff revenue per 18,000 ha ^b	244.0	258.0	273.0	289.0	306.0	274.00

ha = hectare, O&M = operation and maintenance.

^a O&M financial requirements assumed to increase by 5.8% per year.

^b Farmer tariff assumed to increase by 5.8% per year.

Source: Asian Development Bank estimates.

10. The worst case assumes a new M-IMO cannot be engaged for level 2 and level 3 project assets, in which case the BWDB would collect the farmer tariffs through the prepaid meter systems and fund all required O&M of project assets.

D. Financial Sustainability Risk and Mitigating Actions

11. Based on the above analysis, including the low O&M budget performance of the BWDB in the past and the project delays in constructing and operating the first irrigation schemes, the financial sustainability risk of the project is assessed *substantial* and will need to be closely monitored.

12. To improve the financial sustainability of the project, ADB and the BWDB have developed a time bound action plan to implement the pending actions agreed as part of the original financing (Table 3). The action plan proposes that the project extends the consultancy contract for project management and institutional development. This consultancy will then be able to assist the project management unit with recruiting and contracting an M-IMO, which will be accountable for the recurrent O&M of project assets. The action plan also requires the establishment of an independent panel of experts, who will guide the project management unit on the structure of the M-IMO, its business model for operations, and the terms and conditions in the tender for an M-IMO. The independent panel of experts will be supported under ADB technical assistance. The action plan also extends the time for completing the remaining civil works on the project, in particular the on-farm pumps and improved electrification in the project area. The action plan will be included in the additional loan financing agreement and will be monitored through quarterly progress reports. Furthermore, as part of the loan agreement, the Government of Bangladesh will provide assurances that it will allocate in its annual budget adequate resources for the BWDB to carry out the required maintenance and repair works after the project is completed.

⁴ ADB. 2021. [Asian Development Outlook Supplement](#). Manila.

Table 3. Action Plan to Mitigate the Risk of Bangladesh Water Development Board Not Being Able to Fund Its Operation and Maintenance Needs

Maintenance Needs																																																	
	2020					2021												2022												2023					2024														
	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	
1 Project Management and Institutional Development																																																	
PMDC contract																																																	
2 Rehabilitation and Modernization of Large-scale Schemes																																																	
CW-03																																																	
CW-04																																																	
CW-05																																																	
CW-06																																																	
CW-07																																																	
3 Performance-based Irrigation Management																																																	
C-IMO contract																																																	
C-IMO operates the 81 schemes from CW-03																																																	
PMDC report on PPP modality about M-IMO																																																	
Recruitment of PoE by ADB																																																	
Irrigation management review by PoE																																																	
M-IMO Tender document preparation by PMDC																																																	
Revision by EA / incorporation of comments																																																	
ADB review, no objection to draft RFP, advertisement																																																	
Bid preparation, prebid conference, submission, proposal opening																																																	
Technical evaluation, ADB review and approval																																																	
Financial evaluation and final ranking, ADB review and approval																																																	
Contract negotiations																																																	
Handover C-IMO/M-IMO																																																	

ADB = Asian Development Bank, C-IMO = construction-phase irrigation management operator, CW = civil works, EA = executing agency, M-IMO = management-phase irrigation management operator, PMDC = Project Management and Design Consultant, PoE = panel of experts, PPP = public-private partnership, RFP = request for proposal.

Source: ADB.