# Bangladesh: Irrigation Management Improvement Project

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<th>Irrigation Management Improvement Project</th>
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<td>Project Number</td>
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<td>Country</td>
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## Strategic Agendas
- Environmentally sustainable growth
- Inclusive economic growth

## Drivers of Change
- Governance and capacity development
- Knowledge solutions
- Private sector development

## Sector / Subsector
- Agriculture, natural resources and rural development
  - Agricultural drainage
  - Agricultural production
  - Irrigation
  - Rural flood protection

## Gender Equity and Mainstreaming
- Effective gender mainstreaming

## Description
The project is designed to realize the full production potential of large-scale irrigation schemes in Bangladesh. It will address the recurrent lack of sustainable management, operation, and maintenance (MOM) and increase water productivity by transferring MOM schemes to private operators and introducing innovative infrastructure modernization. The project will focus on modernizing the Muhuri Irrigation Project (MIP) in Chittagong division. It will also finance a feasibility study and detailed design for modernizing the Ganges Kobadak Irrigation Project in Khulna division and the Teesta Irrigation Project in Rangpur division.
The primary sources of water in Bangladesh are local rainfall (about 250 cubic kilometers (km³) annually) and transboundary inflows (about 1,000 km³ annually), derived mainly from the Brahmaputra, Ganges, and Meghna rivers. Bangladesh occupies only 8% of the total drainage area of these rivers but is located at their downstream end. The result is an abundance of fresh water during the summer monsoon months and water shortages during the winter dry months. The impossibility of developing dam facilities prevents flow regulation throughout the year.

Despite being scarce, water is not well managed. Minimal attention is given to water use efficiency and equitable allocation. Many farmers rely on groundwater to supplement the limited and irregular surface water supplies. However, in many areas, the use of groundwater is significant. By constrained by arsenic contamination and aquifer limitations. Consequently, the minimum flows required to meet total dry season demands are less than what is available from surface and groundwater. Competition for water is increasing between sectors including agriculture, domestic and industrial water use, navigation, fisheries, and conservation of natural eco-habitats. Possible changes in temperature and rainfall patterns due to global warming may also modify crop-water requirements and water availability, and adversely widen the current gap between supply and demand.

Performance of irrigated agriculture and large irrigation schemes. In 2010, 31.5% of the population was living below the poverty line. Although agriculture’s share of gross domestic product has declined, it is the primary economic sector in rural areas and provides 63% of rural employment. Bangladesh has a net cultivable area of around 8 million hectares (ha). In FY2012, about 5.3 million ha were irrigated; total rice production was 33.5 million tons with 56% being produced during the dry season. Irrigated agriculture productivity remains chronically low; since FY2004, paddy yields have averaged 3.6 tons/ha. The low land productivity is attributable to unreliable irrigation supply; inadequate agriculture extension services; and poor access to farm inputs, markets, and agricultural credit services. Around 550,000 ha or 11% of the total irrigated area is under large irrigation schemes. However, only 46% of this area is currently irrigated during the dry season.

The lack of efficient and sustainable MOM continues to impact the productivity of large irrigation schemes. In 2012, MOM cost recovery from project beneficiaries of the Muhuri, Ganges-Kobadak, and Teesta irrigation schemes averaged 76% Muhuri 83%, Teesta 38%, and Ganges-Kobadak 20%. As a consequence, the schemes’ infrastructure is degraded and needs rehabilitation and modernization. Other factors include inadequate government financing, lack of beneficiary empowerment and engagement in MOM, and limited capacity of public agencies resulting in weak and unreliable budget for system issues. The project will finance preparation of a modernization strategy, modernize all large surface water irrigation schemes at an estimated total cost of $745 million. The project will support the modernization of the MIP’s infrastructure and MOM, including transferring MOM to the private sector. The project will finance preparation of a modernization strategy, including feasibility studies and detailed designs, for the Ganges-Kobadak and Teesta irrigation projects.

MIP construction was completed in 1986. The design enabled dry season irrigation as well as supplemental wet season irrigation by constructing the Feni Closure Dam and Regulator to create a reservoir downstream of the confluence of the Feni, Muhuri, and Kalidash-Pahalia rivers. The backwater from the barrage enters the natural khals (channels) and canal network by gravity. From there it was to be lifted by about 800 low-lift diesel pumps to irrigate the fields. The project was to increase the dry season rice area from about 6,000 ha to 20,000 ha. Initially, farmers discouraged from cultivating. Opportunities to substantially increase water use efficiency and reduce pumping cost through innovative diesel pumps to irrigate the fields. The project was to increase the dry season rice area from about 6,000 ha to 20,000 ha. Initially, farmers experienced major improvements in production and were able to cultivate much larger areas with rice; however, siltation of the reservoir and channels has reduced the benefits over the years. The area irrigated in the dry season decreased to 11,300 ha. The increased cost of diesel fuel combined with low pump efficiency and decrease in the rice price contributed to discouraging farmers from cultivating. Opportunities to substantially increase water use efficiency and reduce pumping cost through innovative design and implementation and the project prepared for the national reservoirs. The variable performance of participatory irrigation management in improving irrigation MOM is internationally documented and private sector participation through public private partnership (PPP) is seen as an alternative approach. It has demonstrated promising results in a few developing countries such as Brazil, Ethiopia, and Morocco but is still to be developed in Asia. In 2009, the Asian Development Bank (ADB) provided technical assistance (TA) to the Bangladesh Water Development Board (BWDB) to examine alternative approaches of service delivery agreements and management arrangements including PPP for sustainable irrigation MOM in large irrigation schemes. The TA proposed a conceptual framework for engaging a third party operator to address the shortcomings of the MOM’s MOM. It established the basis for the social and economic feasibility of the approach and confirmed farmers’ willingness to pay.

The National Water Policy, adopted in 1999, sets out a comprehensive framework for the water sector in general and for large surface irrigation schemes, including a strategic vision comprising private irrigation development contracts. The government has established policy, legal, institutional, and planning frameworks for the water sector, which provide a suitable environment for developing necessary sector reforms. The Water Act, promulgated in May 2013, revised and consolidated existing laws that govern the ownership, operation, and management of water.

The Sixth Five-Year Plan, 2011 to 2015 recognizes the need to increase agricultural productivity, foster crop diversification, and boost public spending on rural infrastructure. The plan also presents a strategic direction for medium- and large-scale surface water irrigation. At its highest level, the strategy focuses on modernization and improved management of existing irrigation systems and expansion of irrigation areas. To reduce public costs in sustainably operating these schemes and to improve delivery service, the strategy encourages the use of PPP wherever appropriate.

As part of an overall investment program for the water sector, the government has approved an investment plan to rehabilitate and modernize all large surface water irrigation schemes at an estimated total cost of $745 million. The project will support the modernization of the MIP’s infrastructure and MOM, including transferring MOM to the private sector. The project will finance preparation of a modernization strategy, including feasibility studies and detailed designs, for the Ganges-Kobadak and Teesta irrigation projects. The project is consistent with ADB’s Strategy 2020 and country partnership strategy for Bangladesh, 2011 to 2015 by reinforcing core areas of operations (such as infrastructure and water resources management) and investing in irrigation infrastructure modernization.

Impact
Sustained high growth of agriculture in Bangladesh

Project Rationale and Linkage

The PMDC services package was awarded to Mott MacDonald Limited on 18 February 2015. The PMDC third team leader was fielded by Mott MacDonald on 10 April 2018. The Mission was informed that he was dismissed on 12 July 2018 by Mott MacDonald. The team leader position must remain available to support the expert in these specific tasks. The financial management specialist’s input should again be included as loan covenant. Nevertheless, the expert is required to work in close collaboration with all parties and verify the suitability of the PPP specialist will be mobilized in January 2019. The PPP specialist will work in priority on preparation for MIP post C-IMO institutional arrangement for management operation and maintenance. The Mission reminded that the recruitment of a management irrigation management operator was included as loan covenant. Nevertheless, the expert is required to work in close collaboration with all parties and verify the suitability of the approach and interest of private parties for long term leases. The expert is required to study carefully the PPTA report. The current Mission leader, Arnaud Cauchois, remains available to support the expert in these specific tasks. The financial management specialist’s input should again be included as loan covenant. Nevertheless, the expert is required to work in close collaboration with all parties and verify the suitability of the approach and interest of private parties for long term leases. The expert is required to study carefully the PPTA report.

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ADB maintains close dialogue with the government and other stakeholders to ensure commitment remains and the project communication campaign keeps farmers and local politicians engaged.

All procurement of goods and works will be undertaken in accordance with ADB’s Procurement Guidelines. Procurement packages for civil works will be split into smaller packages where necessary. Least-cost selection will be used for small consulting assignments, including external audits, independent safeguards monitoring, and simple studies.

The Muhuri Irrigation Project (MIP) will also recruit a private consulting company or consortium through competitive selection and enter into a 5-year lease contract to maintain the MOM levels established during the 5-year first stage. The contract will be awarded through a competitive tender based on (i) least-cost selection, (ii) construction supervision of MIP civil works, (iii) participatory design of level 3 system modernization, and (iv) revenue collection to recover the cost for MOM, (ii) construction supervision of MIP civil works, (iii) participatory design of level 3 system modernization, and (iv) development of pilot agricultural demonstrations and income generating activities. It is envisaged that after 5 years, the M-IPO will be recruited through a 15-year lease contract to maintain the MOM levels established during the 5-year first stage. The contract will be awarded through a competitive tender based on (i) a fixed fee for the lease with bidders presenting a financial offer for the water charge, or (ii) a predetermined water charge with bidders presenting a financial offer for the lease. After 15 years, the contract will be re-terminated.

For the Muhuri Irrigation Project (MIP), BWDB will recruit a private consulting company or consortium through competitive selection and enter into a 5-year lease contract to maintain the MOM levels established during the 5-year first stage. The contract will be awarded through a competitive tender based on (i) least-cost selection, (ii) construction supervision of MIP civil works, (iii) participatory design of level 3 system modernization, and (iv) development of pilot agricultural demonstrations and income generating activities. It is envisaged that after 5 years, the M-IPO will be recruited through a 15-year lease contract to maintain the MOM levels established during the 5-year first stage. The contract will be awarded through a competitive tender based on (i) a fixed fee for the lease with bidders presenting a financial offer for the water charge, or (ii) a predetermined water charge with bidders presenting a financial offer for the lease. After 15 years, the contract will be re-terminated.

The project is categorized as C. There are no indigenous peoples as defined for operational purposes by the SPS in MIP.

Business Opportunities

Consulting Services
Consultant selection and engagement will be carried out in accordance with ADB’s Guidelines on the Use of Consultants (2012, as amended from time to time). In view of the lack of experience of the Bangladesh Water Development Board with performance-based management contracts and the need to ensure expeditious mobilization, the government requested ADB to recruit the project management and design consultant (PMDC) and the irrigation management operator (IMO). BWDB retains the responsibility for negotiating and signing the contract with the PMDC and IMO, issuing the notice to proceed, and supervising their services. The PMDC and IMO recruitment will adopt a 90:10 quality-cost ratio since a high level of expertise is essential to design performance-based irrigation management approaches for the Ganges-Kobadak and Teesta irrigation projects and to establish a strong and sustainable management organization for the Muhuri Irrigation Project. In addition, incentives linked to the performance of the construction-phase IMO consultant will be paid against achievement of key milestones. BWDB, with support from the PMDC, will monitor the IMO’s performance against the milestones. Least-cost selection will be used for small consulting assignments, including external audits, independent safeguards monitoring, and simple studies.

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Procurement
All procurement of goods and works will be undertaken in accordance with ADB’s Procurement Guidelines. Procurement packages for civil works will be split into eight packages.

Responsibilities

Responsible ADB Officer: Zahir Uddin Ahmad
Responsible ADB Department: South Asia Department
Responsible ADB Division: Bangladesh Resident Mission
Executing Agencies: Bangladesh Water Development Board
3 DIT Extension Avenue
Hoque Chamber, Motijheel Commercial Area
Dhaka, Bangladesh

Timetable

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Financing Plan

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**Project Page**
https://www.adb.org/projects/45207-002/main

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19 January 2020

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