



Technical Assistance Report

Project Number: 40535
Capacity Development Technical Assistance (CDTA)
March 2009

People's Republic of Bangladesh: Developing Innovative Approaches to Management of Major Irrigation Systems

CURRENCY EQUIVALENTS

(as of 23 March 2009)

Currency Unit	–	taka (Tk)
Tk1.00	=	\$0.0145
\$1.00	=	Tk69.02

ABBREVIATIONS

ADB	–	Asian Development Bank
BWDB	–	Bangladesh Water Development Board
IEE	–	initial environmental examination
NGO	–	nongovernment organization
NWMP	–	National Water Management Plan
O&M	–	operation and maintenance
PPP	–	public–private partnership
TA	–	technical assistance

TECHNICAL ASSISTANCE CLASSIFICATION

Type	–	Capacity development technical assistance
Targeting Classification	–	Targeted intervention – Geographic
Sector	–	Agriculture and natural resources
Subsector	–	Water resource management
Themes	–	Sustainable economic growth, private sector development
Subthemes	–	Fostering physical infrastructure development, public–private partnerships

NOTES

- (i) The fiscal year (FY) of the Government and its agencies ends on 31 December. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2008 ends on 31 December 2008.
- (ii) In this report, "\$" refers to US dollars.

Vice–President	Xiaoyu Zhao, Operations 1
Director General	K. Senga, South Asia Department (SARD)
Director	T. Matsuo, Officer-in-Charge, Agriculture, Natural Resources, and Social Services Division, SARD
Team leader	P. Bozakov, Senior Water Resources Management Specialist, SARD

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I. INTRODUCTION

1. The loan for the Second Command Area Development Project¹ is included in the country operations business plan 2008–2010 for Bangladesh.² A technical assistance project³ provided by the Asian Development Bank (ADB) prepared an investment project that will enhance food security and rural incomes by improving the productivity of selected major irrigation systems and support to bringing the National Water Policy into operation. During project preparation, the following major constraints to the efficient performance of these systems were identified: (i) the limited capacity of public agencies in effective management and operation and maintenance (O&M) of large irrigation schemes, and (ii) inadequate O&M planning and funding mechanisms that result in chronic system deterioration. To address these, it is proposed to reform irrigation service delivery by introducing public–private partnerships (PPP) and performance-based service agreements for the management and O&M of major irrigation systems, and establish transparent performance monitoring and evaluation systems that will allow rapid feedback and corrective measures. An ADB fact-finding mission was fielded in September 2008 to consult with the Government and agree on the outcome, outputs, activities, cost, financing and implementation arrangements, and terms of reference of a capacity development technical assistance project—Developing Innovative Approaches to Management of Major Irrigation Systems.⁴ The design and monitoring framework is in Appendix 1.

II. ISSUES

2. About 44% of Bangladesh's poor people live in rural areas with low agricultural productivity and unreliable food supplies. Therefore, promoting agricultural growth is a critical element of the Government's strategy aimed at food security and poverty reduction. Efficient and sustainable irrigation systems are central to boosting agricultural productivity and improving rural livelihoods.

3. **Water Management and Food Security.** Bangladesh has a net cultivable area of about 8 million hectares (ha), with currently about 4.5 million ha irrigated. The irrigated area contributes an estimated 13 million tons (t) of cereals (mainly rice). While about 90% of this irrigated area is provided by the private sector, mainly from groundwater with minimal public sector financing, the National Water Management Plan (NWMP) recognizes that the area that can be irrigated by groundwater in the future is limited to a further 1 million ha, which can contribute an added 5 million t to food production. At current consumption rates, this would feed an additional population of around 30 million people, the estimated increase in population over 15 years.⁵ The NWMP also acknowledges the low irrigation intensities and productivity of the existing major surface water schemes and, because of the pressing need to increase food production and rural incomes, suggests urgently enhancing the performance of these schemes by rehabilitating water management infrastructure and improving management and O&M. This represents a sound strategy given the cost effectiveness and rapid impact of investments.

4. Deterioration of infrastructure leads to a reduced irrigated area and insufficient supply of irrigation water, resulting in low yields and reduced farm production, household incomes, and demand for labor. Failure to rehabilitate infrastructure and properly manage and maintain the

¹ To better reflect the design, impact, and outcome of the loan Project, the project title was changed to Enhancing the Performance of Major Water Management Systems Project.

² ADB. 2007. *Country Operations Business Plan Bangladesh 2008–2010*. Manila. The sum of \$50 million from the Asian Development Fund has been allocated for the loan scheduled for approval in 2010.

³ ADB. 2005. *Technical Assistance to the People's Republic of Bangladesh for Preparing the Second Command Area Development Project*. Manila.

⁴ The technical assistance first appeared in the business opportunities section of ADB's website on 8 October 2008.

⁵ By 2050, the population is forecast to increase to 230 million from the current 135 million.

large-scale surface water schemes also has direct negative impacts on food production and poverty. Successful infrastructure rehabilitation will also bring substantial social benefits as a result of increased farm and rural incomes. The need for efficient O&M is established and indicates the high costs to communities and the national economy as a whole of failing to adequately finance and implement O&M.⁶ Finally, there is an urgent need to improve scheme performance by replacing the current management system that lacks (i) transparent service agreements incorporating recipient feedback needed for accountable service delivery, (ii) the skill mix required to efficiently manage the system with adequate participation by water users, (iii) performance-oriented organizations that can provide cost-effective system management, and (iv) sound monitoring and management information systems that are needed to improve irrigation management and to ensure effective system performance based on scientific performance standards and continuous feedback from water users.

5. **Policy Framework.** In 1999, the Government declared a national water policy that aims to redress management and institutional-related performance problems associated with large-scale surface water schemes. The policy directs that these schemes “will be gradually placed under private management through leasing, concession, or management contracts under open bidding procedures, or jointly managed by the project implementation agency along with local government and community organizations.”⁷ This directive is reinforced in the NWMP, which states that “...existing and new schemes over 5,000 ha will be progressively transferred to autonomous operating authorities...” The policy further emphasizes stakeholders’ participation in the planning design, construction, and O&M of these schemes. The National Poverty Reduction Strategy, formulated in 2005, emphasizes agriculture and rural development for jobs, food security, and sustainable livelihood opportunities for the rural poor. The strategy also highlights water resource management as a priority for targeted pro-poor growth in its overarching goal of a 50% reduction in poverty by 2015. While the long-term aims of the policy matrix are clear, the short-term steps are less so and, as a result, progress in regard to large-scale schemes has been limited.

6. **ADB Support.** ADB supports the Government’s efforts to (i) expand access to irrigation; (ii) decentralize irrigation system planning, implementation, and management; and (iii) foster sustainable O&M by encouraging stakeholder empowerment and efficient public investment in large (i.e., command) and small-scale water management schemes. ADB also provides assistance for the implementation of the National Water Policy and NWMP, both encompassing key principles of integrated water resource management, sustainable service delivery, and active user participation in water management.

7. **Lessons.** Several major initiatives in the irrigation subsector are ongoing.⁸ The recently completed Command Area Development Project⁹ provided the following lessons that have been

⁶ The Government has gradually increased O&M funds from \$10.0 million in 2001 to \$24.0 million in 2005. A further increase of about 15% was introduced in 2007. However, the pace of institutional change in the underresourced water management organizations remains slow.

⁷ Government of Bangladesh. 1999. *National Water Policy*. Dhaka.

⁸ ADB. 1995. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People’s Republic of Bangladesh for the Command Area Development Project*. Manila (Loan 1399-BAN); ADB. 2002. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People’s Republic of Bangladesh for the Jamuna-Meghna River Erosion Mitigation Project*. Manila (Loan 1941-BAN, command area development component); ADB. 2005. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People’s Republic of Bangladesh for the Southwest Area Integrated Water Resources Planning and Management Project*. Manila (Loan 2200-BAN); ADB. 2001. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People’s Republic of Bangladesh for the Second Small-Scale Water Resources Development Sector Project*. Manila (Loan 1831-BAN).

incorporated into the technical assistance (TA) project design: (i) project beneficiaries need to be fully involved in project planning, implementation, and O&M; (ii) inadequate and deferred O&M seriously compromised the productivity and effectiveness of the rehabilitated infrastructure; and (iii) a joint management system is needed to fully utilize the potential of past investments. The ongoing Second Small Scale Water Resources Development Sector Project,¹⁰ funded by ADB and the Government of the Netherlands, involves stakeholder-driven planning, design, implementation, and O&M of water management schemes with command areas of less than 1,000 ha. The Water Management Improvement Project, financed by the International Development Association and the Government of the Netherlands, supports system improvement, management transfer, and improved O&M of medium-scale (1,000 ha–5,000 ha) schemes, and addresses institutional weaknesses within the Bangladesh Water Development Board (BWDB). The Government of the Netherlands also finances the Integrated Planning for Sustainable Water Management Project that focuses on promoting integrated and participatory rehabilitation of medium-scale water management schemes. The governments of Bangladesh and the Netherlands support the strengthening of the BWDB and the Water Resources Planning Organization management through a joint project.

8. These investments also provide a number of lessons: (i) project planning needs to reflect diverse stakeholder interests; (ii) beneficiaries need to be involved from the early stages of the project cycle through O&M; (iii) careful monitoring of scheme performance is required since O&M management and funding remain weak; and (iv) finalization of the BWDB's institutional strategy is needed to strengthen its resources, capacity, and commitment to beneficiary participation along with the poverty and social agenda.

9. Within this context, the Government requested support from ADB to improve system performance and productivity of selected major water management schemes under the Second Command Area Development Project (footnote 1). The Project will put into operation key Government directives in the water sector by introducing PPP models in the management and O&M of large-scale irrigation systems, and through physical rehabilitation. The loan Project will comprise the following parts: (i) enhanced water management including participatory project planning, rehabilitation of priority infrastructure, and introduction of effective system management and O&M; (ii) support for sustainable livelihood encompassing agricultural services, fisheries development, and pro-poor income-generating activities; and (iii) effective project management and water management institutions. The impact of the Project will be sustainable livelihoods improvement and reduced poverty in the project areas. The outcome of the Project is the realization of the full production potential of the selected schemes through improved water management, upgraded infrastructure, and efficient O&M. ADB's safeguard policies have been addressed through initial environmental examinations, resettlement plans, a resettlement framework, a social development strategy, and a gender action plan.¹¹

III. THE TECHNICAL ASSISTANCE

10. During the project preparatory TA (footnote 3), the following major constraints to the sustainable performance of large irrigation systems were identified and need to be addressed: (i) the limited experience of the BWDB in effective management and O&M of large-scale schemes; (ii) a skill mix within the BWDB that is not appropriate to efficiently plan, implement,

⁹ Loan 1399-BAN for SDR20.4 million was approved in 1996. The objective of the project was to increase agricultural production within the Meghna-Dhonagoda Irrigation Project and Pabna Irrigation and Rural Development Project through system rehabilitation and on-farm development.

¹⁰ ADB. 2001. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the People's Republic of Bangladesh for the Second Small-Scale Water Resources Development Sector Project*. Manila (approved in July 2001).

¹¹ The financial and management capacity of the Executing Agency (BWDB) has been also assessed.

and manage major irrigation schemes with active participation of beneficiaries in the entire project cycle; and (iii) inadequate O&M planning and funding mechanisms that result in chronic system deterioration.

11. In order to reform irrigation service delivery, improve the sustainability and implementation effectiveness of the ensuing loan project, and further support the implementation of Government strategies in the water sector, this TA project will be implemented. The TA will (i) assess existing O&M planning, financing and implementation procedures, policy framework, institutional setup, and capacities; (ii) propose new service agreements and alternative management models, including PPPs and independent service providers that would manage and operate the systems (e.g., private sector operators, autonomous authorities, nongovernment organizations [NGOs], contractors, and joint management by local government institutions); (iii) propose alternative financing arrangements to make up the difference between the O&M requirements and the available funding; and (iv) develop new models for O&M and performance monitoring.

A. Impact and Outcome

12. The impact of the TA will be support to bringing the National Water Policy into operation and implementing the NWMP and the Guidelines for Participatory Water Management in order to enhance the performance of major irrigation systems. The TA outcome will be effective and sustainable implementation of the ensuing loan project (Enhancing the Performance of Major Water Management Systems) with active participation of beneficiaries, private sector operators, and local government institutions. The TA and the loan project will contribute to the implementation of the Government's strategy for poverty reduction through improved service delivery and water resources management resulting in increased agricultural production. The specific outputs will comprise (i) regulatory and institutional measures for participatory O&M planning and implementation; (ii) models for effective O&M planning, implementation, and funding by beneficiaries and the Government; (iii) innovative mechanisms for irrigation service delivery, efficient management, and O&M of large irrigation systems; and (iv) detailed project implementation and management arrangements. It is anticipated that these new management concepts will be replicated throughout Bangladesh and in the region.

B. Methodology and Key Activities

13. In collaboration with the BWDB, the TA will (i) assess the existing O&M planning and financing procedures, institutional setup, and capacities; (ii) propose alternative service delivery agreements and management arrangements, including full participation of beneficiaries, PPPs, and independent entities that would manage and operate the systems (e.g., private sector operators, autonomous authorities, NGOs,¹² civil contractors, and joint management by local government institutions); (iii) propose alternative and transparent O&M financing arrangements to make up the difference between the actual O&M requirements and the currently available funding; (iv) propose new arrangements for O&M planning, implementation, and participatory performance monitoring, taking account of the legal implications and contractual and financial risks; (v) assess the financial and economic impacts of the proposed management and O&M models at farm, project, and national level; (vi) propose systems for performance benchmarking of the irrigation service providers, and a participatory system for monitoring and evaluation; (vii) develop an exit strategy that will be implemented after the completion of the loan Project; and (viii) propose a high-level project supervisory body that will include key stakeholders (e.g., water users, water management organizations, local government institutions, civil society, and

¹² During the implementation of the loan project, NGOs will be also involved in the mobilization of beneficiaries, resettlement, support to and capacity building of water management groups, and implementation of agriculture and income-generation programs.

the private sector). Lessons from ADB operations, experiences of other funding agencies, and best international practices will be incorporated into the outputs of the TA.¹³

C. Cost and Financing

14. The total cost of the TA is estimated at \$880,000 equivalent. ADB's technical assistance funding program will finance \$750,000 equivalent. The Government will fund the remaining \$130,000 equivalent through provision of office space, counterpart staff, surveys, data collection, and analysis. Specific cost estimates and a financing plan are provided in Appendix 2.

D. Implementation Arrangements

15. The TA will be implemented over 7 months from August 2009 to February 2010. The BWDB will be the Executing Agency for the TA, responsible for day-to-day implementation. The BWDB will appoint a TA director at the level of superintending engineer, and he or she will have a background in participatory water management. The TA steering committee established during the implementation of the project preparatory TA (footnote 3) will continue to guide the TA.¹⁴ ADB will closely monitor the TA implementation through regular administration missions.

16. Consulting services will be provided for a total of 44 person-months, comprising 14 person-months of international and 30 person-months of national consultants. The outline terms of reference for consultants is in Appendix 3. ADB will engage individual international consultants. National consultants will be recruited by ADB through a consulting firm using ADB's quality and cost-based system and biodata technical proposals. All consultants will be recruited by ADB following its *Guidelines on the Use of Consultants* (2007, as amended from time to time). Procurement of equipment for the TA will follow ADB's *Procurement Guidelines* (2007, as amended from time to time).

E. Reports and Workshops

17. The consultants will produce the following reports: (i) inception report at the end of the first month of TA implementation, to present the initial TA findings and detailed work and staff schedules; (ii) midterm report at the end of the third month, presenting the review and analysis of the system performance, management, O&M, and funding; (iii) draft final report at the end of the sixth month, to present the new management models, funding, contractual and implementation arrangements, policy initiatives, performance monitoring and evaluation systems, and required support to project implementation; and (iv) final report at the end of the seventh month, incorporating stakeholders' comments. These reports will be discussed at workshops organized after the submission of the inception, midterm, and draft final reports.

IV. THE PRESIDENT'S DECISION

18. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of \$750,000 on a grant basis to the Government of Bangladesh for Developing Innovative Approaches to Management of Major Irrigation Systems, and hereby reports this action to the Board.

¹³ Collaboration will be sought through the pilot and demonstration activity component of the Multi-Donor Trust Fund under the Water Financing Partnership Facility with (i) the International Water Management Institute, the regional knowledge hub for the reform of irrigation service delivery; (ii) the Food and Agriculture Organization, regarding the benchmarking of service providers; and (iii) reputed NGOs on the participatory preparation of irrigation service agreements. Outputs of these joint activities will be incorporated into the TA reports.

¹⁴ The steering committee is chaired by the secretary of the Ministry of Water Resources with participation by representatives of the ministries of agriculture, communications, fisheries and livestock, environment and forest, finance and planning, land, local government, rural development and cooperatives, and women's affairs.

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and/or Indicators	Data Sources and/or Reporting Mechanisms	Assumptions and Risks
<p>Impact</p> <p>Support to the operationalization of the NWPo and implementation of the NWMP and GPWM to enhance the performance of major irrigation schemes</p>	<p>Within the implementation of the ensuing loan project:</p> <p>(i) enhanced performance of major irrigation schemes (M&E systems and measurable indicators will be established by the TA)</p> <p>(ii) increased agricultural production and rural incomes (M&E system will be established under the Project)</p> <p>(iii) institutional arrangements consistent with NWPo established</p> <p>(iv) partnerships for efficient water management established with private sector and NGOs</p>	<p>State and district statistics on human development, agriculture and incomes</p> <p>BWDB working papers and reports</p> <p>Review missions</p> <p>BM&E reports</p>	<p>Assumptions</p> <p>The Government and BWDB will accept the terms, conditions and implementation arrangements for the loan project.</p> <p>The project remains feasible taking into account rising food prices and production costs</p> <p>Risks</p> <p>Slow progress with institutional reforms and capacity building within BWDB</p> <p>Major natural disasters</p>
<p>Outcome</p> <p>Effective and sustainable implementation of the loan project with active participation of beneficiaries, private sector operators and local government institutions</p>	<p>Agreement reached on the proposal loan design, implementation arrangements and financing plan</p> <p>Agreement reached on the management and O&M arrangements and financing</p> <p>Water management groups that will participate in project planning, implementation and O&M established</p>	<p>TA reports</p> <p>Relevant BWDB reports</p> <p>Government endorsement the TA recommendations</p>	<p>Assumptions</p> <p>BWDB and beneficiaries adopt the recommended project implementation arrangements</p> <p>The Government, BWDB, and beneficiaries adopt the models for sustainable O&M planning, implementation and funding</p> <p>BWDB will, where impacts are unavoidable, implement ADB's safeguard requirements on resettlement, environment, and indigenous peoples</p>
<p>Outputs</p> <p>1. Regulatory and institutional measures for participatory O&M planning and implementation developed</p> <p>2. Sustainable models for O&M planning, implementation, and funding by beneficiaries</p>	<p>Draft regulatory and institutional framework established for policy dialogue with the Government</p> <p>Project implementation arrangements prepared</p>	<p>Government consultation papers and reports</p> <p>TA reports</p> <p>Workshops with key stakeholders</p> <p>Aide memoire of ADB missions</p>	<p>Assumptions</p> <p>Political and security conditions are conducive to the TA field activities.</p> <p>The Government and the BWDB provide necessary support and information.</p> <p>Participatory process for subproject planning is duly followed.</p>

Design Summary	Performance Targets and/or Indicators	Data Sources and/or Reporting Mechanisms	Assumptions and Risks
<p>and the Government introduced</p> <p>3. Innovative mechanisms for efficient management and O&M of major irrigation systems designed</p> <p>4. Overall project scope including detailed implementation and management arrangements developed and agreed with the Government</p>	<p>Enhanced concepts and procedures for O&M planning and financing proposed by TA</p> <p>Detailed implementation plan for efficient system management by autonomous operating entities developed by TA</p> <p>Overall project scope, components, implementation arrangements, and financing plan agreed with the Government</p>		<p>The BWDB and local government institutions support the participatory project planning process.</p>
<p>Activities with Milestones</p> <p>1. Regulatory and institutional measures for participatory O&M planning and implementation developed.</p> <p>1.1 Assess existing policy, regulatory, and legal documents related to water sector development, water resources and system management, O&M planning, financing, implementation, monitoring and evaluation (September 2009)</p> <p>1.2 Assess existing institutional set up of BWDB and capacity for effective system management and O&M including willingness of beneficiary participation for secondary and tertiary system O&M (September 2009)</p> <p>1.3 Propose composition and terms of reference of a high-level project supervisory body that would include key stakeholders (December 2009)</p> <p>2. Sustainable models for O&M planning, implementation, and funding by beneficiaries and the Government introduced</p> <p>2.1 Field studies (Manu and Muhuri irrigation systems) to review existing O&M procedures including frequency, type of maintenance, funding sources, use of measurement yardsticks/costing and institutional responsibilities (September 2009)</p> <p>2.2 Estimate O&M costs for selected subprojects after completion of infrastructure rehabilitation (October 2009)</p> <p>2.3 Design innovative approaches for O&M in line with government policies and best international practices (November 2009)</p> <p>2.4 Develop O&M strategy and propose cost estimate and beneficiary contribution (January 2010)</p> <p>3. Innovative mechanisms for efficient management and O&M of major irrigation systems designed</p> <p>3.1 Assess the financial and management capacity of prospective independent system operators, develop the setup, staff resources, responsibilities, and funding requirements for such entities, and estimate the corresponding establishment and recurrent costs (October 2009)</p> <p>3.2 Propose viable alternative models through which independent</p>		<p>Inputs</p> <ul style="list-style-type: none"> • ADB will provide (i) \$750,000 grant financing, (ii) TA inception and review missions, and (iii) support and supervision as required from ADB headquarters and the Bangladesh Resident Mission. • Consultants to facilitate BWDB in organizing milestone workshops including inception (end of first month following TA commencement), midterm (end of third month after TA commencement) and final (end of sixth month after TA commencement). • The Government will provide in-kind contributions estimated at \$130,000 equivalent comprising provision of (i) office space and facilities, (ii) counterpart staff, (iii) information and materials as required, and (iv) other counterpart support • The Government and local stakeholders will contribute their time to participate in TA training and workshops and other consultations. • Consultant inputs comprising 14 person-months of international consultants to be engaged as individuals recruited directly by ADB and 30 person-months of national consultants recruited through a consulting firm. 	

Design Summary	Performance Targets and/or Indicators	Data Sources and/or Reporting Mechanisms	Assumptions and Risks
<p>entities (including private sector, beneficiary groups, NGOs etc.) could be engaged to provide irrigation services and manage, operate, and maintain major schemes (November 2009)</p> <p>3.3 Develop alternative arrangements for bridging actual O&M costs, government financing, and beneficiaries' contribution using interim financing facility that will be provided by ADB under the loan project (December 2009)</p> <p>3.4 Develop an exit strategy that will be implemented after the completion of the loan Project and the withdrawal of the external O&M financing (December 2009)</p> <p>4. Project Scope</p> <p>4.1 Refine safeguard frameworks and plans by incorporating impacts of proposed O&M strategy and update capacity-building programs for agencies involved in social and environmental safeguard assessments (November 2009)</p> <p>4.2 Prepare detailed procurement plan for goods, services, and civil works under the evolving loan project (November 2009)</p> <p>4.3 Detailed implementation and management arrangements developed and agreed with the Government (December 2009)</p> <p>4.4 Assess financial and economic impacts of the proposed management models at farm, project, and national levels and estimate required external funding for O&M of two subprojects. Propose financing and transaction models and cash flow lines (December 2009)</p> <p>4.5 Revise project costs and financing based on updated concepts including engineering design, implementation and proposed management and O&M arrangements (January 2010)</p> <p>4.6 Assist BWDB in preparation of DPP for two subprojects; propose service delivery agreements and contractual arrangements for involvement of independent management entities (February 2010)</p>			

ADB = Asian Development Bank, BM&E = benefits monitoring and evaluation, BWDB = Bangladesh Water Development Board, GPWM = Guidelines for Participatory Water Management, M&E = monitoring and evaluation, NGO = nongovernment organization, NWPo = National Water Policy, NWMP = National Water Management Plan, O&M = operation and maintenance, TA = technical assistance, TPP = Technical Project Proposal.

COST ESTIMATES AND FINANCING PLAN

(\$'000)

Item	Total Cost
A. Asian Development Bank Financing ^a	
1. Consultants	
a. Remuneration and Per Diem	
i. International Consultants	412.0
ii. National Consultants	179.0
b. International and Local Travel ^b	55.0
c. Reports and Communications	5.0
2. Equipment ^c	10.0
3. Training, Seminars, and Conferences ^d	5.0
4. Surveys ^e	25.0
5. Miscellaneous Administration and Support Costs ^f	10.0
6. Representative for Contract Negotiations	5.0
7. Contingencies ^g	44.0
Subtotal (A)	750.0
B. Government Financing	
1. Office Accommodation and Transport	60.0
2. Remuneration and Per Diem of Counterpart Staff	30.0
3. Others	40.0
Subtotal (B)	130.0
Total	880.0

^a The technical assistance is financed on a grant basis by the technical assistance (TA) funding program of the Asian Development Bank (ADB).

^b Travel within Bangladesh includes vehicle rental and operation and local airfares.

^c Additional to the equipment procured during the project preparatory TA. Including computers and peripherals and internet connections. Procurement of equipment will follow ADB's *Procurement Guidelines* (2007, as amended from time to time). Equipment purchased under the project preparatory TA and under this capacity development technical assistance will be handed over to the Bangladesh Water Development Board after the completion of the TA studies.

^d Includes workshops with the Bangladesh Water Development Board, water management organizations, and beneficiaries.

^e Includes socioeconomic and technical surveys and investigations.

^f Including minor office renovation and provision of support staff.

^g Includes 2 person-months (national) that will be allocated as and when necessary during TA implementation.

Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

A. General

1. The technical assistance (TA) will propose alternative management arrangements at the main, secondary, and tertiary system levels, including full participation of beneficiaries, public–private partnerships (PPPs), and independent entities that would manage and operate the systems (e.g., private sector operators, autonomous authorities, nongovernment organizations [NGOs], civil contractors, and joint management by local government institutions).

2. The required consulting services are summarized in Table A1. International consulting services (14.0 persons-months) will be directly recruited by ADB as individual consultants. National consultants will be recruited by ADB through a consulting firm using ADB’s quality and cost-based system and biodata technical proposals. All consultants will be recruited by ADB following its *Guidelines on the Use of Consultants* (2007, as amended from time to time). Procurement of equipment for the TA will follow ADB’s *Procurement Guidelines* (2007, as amended from time to time). An international O&M specialist will act as team leader and a national water resources specialist will be deputy team leader. The TA will undertake the tasks outlined below, which may be adjusted by the Asian Development Bank (ADB) as needed, in consultation with the Government of Bangladesh and the Bangladesh Water Development Board (BWDB), the Executing Agency.

Table A1: Consulting Services Inputs

Category	Person-Months
A. International	
1. Team Leader and O&M Specialist	6.0
2. Water Management Institutions Specialist	2.0
3. Procurement Management Specialist	2.0
4. Policy and Regulatory Framework Adviser	1.0
5. Project Economics and Finance Specialist	2.0
6. PPP Specialist	1.0
Subtotal (A)	14.0
B. National	
1. Deputy Team Leader and Water Resources Specialist	7.0
2. O&M Engineer	4.0
3. Procurement Specialist	3.0
4. Institutional Specialist	3.0
5. Planning and Implementation Specialist	2.0
6. Social Development and Resettlement Specialist	2.0
7. Financial Specialist	2.5
8. Environmentalist	1.0
9. Project Economist	1.5
10. Legal Specialist	2.0
11. Unallocated	2.0
Subtotal (B)	30.0
Total	44.0

O&M = operation and maintenance, PPP = public–private partnership.

Note: The unallocated person-months will be utilized as and when necessary during TA implementation.

B. Scope of Services

3. **Part A: Analysis of Policy, Regulatory, and Institutional Environment.** The TA will review and analyze the policy, regulatory, and institutional environment for effective management and O&M of major water management schemes. The consultants will:

- (i) assess the Government of Bangladesh's policy, regulatory, and legal documents related to water sector development, water resources and system management, O&M planning, financing, implementation, monitoring, and evaluation;¹
- (ii) review the current BWDB procedures for system management, O&M planning, funding and financial management (including O&M budget allocation and expenditures), implementation, performance monitoring, and the relevant institutional responsibilities and institutional setup;
- (iii) study the current management practices and O&M procedures in the two prioritized subprojects (the Manu River Irrigation Project and Muhuri Irrigation Project) and related institutional responsibilities;
- (iv) through reputed national institutes and/or qualified consulting companies, undertake (a) detailed field studies to determine the system performance in the two project areas, actual O&M needs (e.g., routine, periodic, and emergency maintenance), actual frequency of maintenance activities, and appropriateness of yardsticks and cost estimates; (b) the existing institutional capacity for effective system management and O&M; and (c) the willingness of beneficiaries to participate in the O&M of irrigation infrastructure at the lower system level;
- (v) assess (a) the current O&M financing arrangements at each of the subprojects, including the rate of collection of irrigation service charges, the capacity and commitment of water users to provide up-front deposits for O&M and increase their contribution; and (b) the current level of government funding and procedures for allocation and release of government funds; and
- (vi) analyze (a) the current system management guidelines, rules and practices, and performance monitoring and evaluation systems for the two subprojects; and (b) the quality of existing system O&M manuals and the degree of their application in day-to-day management and O&M.

4. Part B: Development of New Approaches to Management and O&M of Major Irrigation Systems The TA consultants will propose alternative management and O&M arrangements at the main, secondary, and tertiary system levels, with full participation of beneficiaries and involving public–private partnerships (PPPs) and/or public–community partnerships, and independent entities that would manage, operate, and maintain the selected water management systems (e.g., private sector operators, autonomous authorities, NGOs,² civil contractors, joint management by local government institutions, and the BWDB). The proposed arrangements will be in line with the Government of Bangladesh’s water sector policies.

5. System Management and O&M. The TA team will propose new models for irrigation service delivery, system management, and O&M, and will suggest improvements to the system design to enhance water management and O&M during project implementation. The TA will (i) design innovative approaches for prioritizing, planning, and implementing O&M in line with government policies and best international practices; (ii) develop an O&M strategy and a methodology for sound engineering estimate of O&M requirements, disaggregated to routine, periodic, replacement, and upgrading activities, and estimate their corresponding costs and

¹ The most relevant documents include the National Water Policy (1999), National Water Management Plan (2001), Guidelines for Participatory Water Management (2002), the BWDB Act 2000, and the Water Act (currently undergoing major revisions).

² Bangladesh Rural Advancement Committee and the Rangpur Dinajpur Rural Service have, in principle, indicated their interest to participate in project implementation. In 2003, the Rangpur Dinajpur Rural Service submitted a proposal to the BWDB to undertake the management and O&M of two districts within the Teesta Barrage Project; the BWDB did not accept this proposal.

propose contributions by stakeholders; (iii) estimate the actual costs for O&M for the two selected subprojects after the completion of infrastructure rehabilitation; and (iv) develop alternative arrangements to narrow and eventually close the gap between the actual O&M requirements, government financing, and beneficiaries' contribution using an interim O&M financing facility that will be provided by ADB under the loan project. Additional sources for supplementary O&M financing (e.g., PPPs for fisheries and sand mining in water bodies) will also be explored.

6. Management and Implementation Arrangements. The TA will develop management concepts for the major water management schemes in the following ways:

- (i) Propose viable alternative models through which independent entities could be engaged to provide irrigation services and manage, operate, and maintain major schemes. The main options include (a) involvement of private sector operators and beneficiaries, (b) establishment of autonomous authorities, and (c) engagement of NGOs³ or of consortia of civil contractors and water management specialists, local government institutions, and the BWDB.
- (ii) Assess the financial and management capacity of prospective independent system operators, develop the setup, staff resources, responsibilities, and funding requirements for such entities, and estimate the corresponding establishment and recurrent costs.
- (iii) Propose detailed participatory implementation arrangements that will be followed under the loan project, taking into account the newly developed management models.
- (iv) Assess the staff and resources requirement for the establishment of (a) project offices at the BWDB and subproject levels, (b) safeguard management, and (c) monitoring and evaluation units.
- (v) Propose training programs and external support for these units by consultants and/or contracted staff.

7. The consultants will also prepare a general framework and activity schedule for consultation with, and mobilization of, beneficiaries to allow them to effectively take part in project planning, implementation, and O&M.

8. Contractual Arrangements, Procurement, and Contract Documents. Under this subcomponent, the TA will assist the BWDB in the preparation of development project proforma for the two subprojects, and propose service delivery agreements and detailed contractual arrangements for the involvement of independent entities in the management of major irrigation systems. The consultant will prepare the prequalification, procurement, and long-term (2–4 years) performance-based contract documents, including documents for build–operate–maintain contracts. These documents will incorporate the proposed procedures for planning, prioritization, and implementation of O&M, and scheme performance monitoring and evaluation. The consultants will also prepare a detailed plan for procurement of goods, services, and civil works under the evolving loan project, and requests for proposals for consulting and NGO services in accordance with ADB's *Guidelines on the Use of Consultants* (2007, as amended from time to time) and ADB's *Procurement Guidelines* (2007, as amended from time to time).

9. Economics, Financing, and Risk Management. The TA team will (i) assess the costs and benefits associated with the new management and O&M systems and improved system performance; (ii) compare these costs and benefits to the existing arrangements; and (iii)

³ During project implementation, NGOs will be also involved in the mobilization of beneficiaries, resettlement, support to water management groups, and implementation of agriculture and income-generation programs.

assess the financial and economic impacts of the proposed management models at farm, project, and national levels. The team will also estimate the required external funding for the O&M of the two subprojects that will be provided through an ADB-funded facility, and propose the financing and transaction models and cash flow lines. The risks associated with the implementation of the new management and O&M concept will be identified and appropriate financial and risk management and risk allocation mechanisms will be proposed.

10. **Safeguards Assessments.** Safeguards frameworks and related plans have been prepared by the project preparatory technical assistance,⁴ following ADB's policies on involuntary resettlement, indigenous peoples, and the environment; the ADB's *Involuntary Resettlement Policy* (1995); and policies of the Government of Bangladesh. In respect of environmental impacts, frameworks and plans have been prepared in accordance with the Government's requirements and ADB's *Environmental Assessment Guidelines*.⁵ The TA will refine these safeguard frameworks and plans by incorporating the impacts of the proposed O&M strategy, and will update the capacity-building programs for agencies involved in social and environmental assessments and resettlement.

11. **Performance Monitoring and Evaluation.** The TA will develop a performance categorization (ranking) format for water management projects, transparent and participatory performance monitoring and evaluation systems for the two subprojects, and systems for performance benchmarking of the irrigation service providers and participatory system monitoring and evaluation.⁶ The TA will also assess the financial and economic impacts of the proposed farm, project, and national management and O&M models and propose indicators and systems for future monitoring and evaluation. These proposals will also include indicators for the performance of the system—including headworks; main, secondary, and tertiary systems; and O&M—and will allow feedback from water users and key stakeholders. These monitoring and evaluation systems will be linked to the implementation structures and performance-based contracts that will be used for the planning, implementation, management, and O&M of the two subprojects. Finally, the TA team will develop an exit strategy that will be implemented after the completion of the loan Project and the withdrawal of the external O&M financing.

12. **Stakeholder Participation.** The TA will consult central and project stakeholders, water management organizations, local government institutions, participating communities, private sector operators, and NGOs.⁷ Participatory TA implementation will be applied to mobilize the effective input of stakeholders and to promote partnership and a sense of ownership. Project beneficiaries and other stakeholders will be consulted through focused group discussions and individual and group interviews. Socioeconomic surveys will be conducted, as required, to update and supplement the data collected during project preparation. In addition, the consultants will organize three tripartite workshops with the stakeholders at key stages of TA implementation. Separate workshops will be held in each of the subproject areas.

13. **Policy Dialogue.** The TA team will identify follow-up policy and regulatory actions, and institutional arrangements that will be needed to effectively implement and institutionalize the new approaches to management and O&M of the systems.

⁴ ADB. 2006. *Technical Assistance to the People's Republic of Bangladesh for Preparing the Second Command Area Development Project*. Manila (completed in June 2008).

⁵ ADB. 2003. *Environmental Assessment Guidelines*. Manila.

⁶ The proposed monitoring and evaluation systems should provide feedback for prioritized O&M planning and will use the experience gained under the World Bank Water Management Improvement Project.

⁷ Subcontracting NGOs for developing participatory water management concepts and O&M, and involvement of the poorest and vulnerable groups in O&M of the systems through contractors, contracting societies, and community-based contracts, will have to be considered.

C. Reporting and Workshops

14. The consultants will produce the following reports⁸ at key stages of TA implementation.
- (i) Inception report at the end of the first month of TA implementation, to present the initial TA findings and assessments, methodologies for improvement of system management and O&M, and detailed work and staff schedules. The inception report will be discussed with stakeholders at an inception workshop that will be held 2 weeks after the submission of the report.
 - (ii) Midterm report at the end of the third month, presenting progress and review and analysis of the system performance, management, O&M, and funding, and outline scenarios for improving the existing practices and management arrangements, and plans for the remaining project period. The midterm report and its preliminary recommendations will be discussed with stakeholders at a midterm workshop that will be held 2 weeks after the submission of the report.
 - (iii) Draft final report at the end of the sixth month, to present the new management models; O&M procedures; funding, contractual, and implementation arrangements; risk analyses; policy initiatives; performance monitoring and evaluation systems; and required support for project implementation. These issues will be discussed at the final tripartite workshop.
 - (iv) Final report to be submitted 2 weeks after the final tripartite workshop. It will take into account the comments and views expressed at the workshop and all other official comments.

D. Facilities to be Provided by the Bangladesh Water Development Board

15. The BWDB will provide the following facilities to the TA team: (i) access to subproject sites, survey and design data, project reports, records, and other information required for the TA studies; (ii) office space; (iii) equipment, furniture, and facilities used by the recently completed TA 4740-BAN: Second Command Area Development Project (footnote 4); and (iv) four counterpart technical staff⁹ who will work with the consultants throughout the TA implementation.

E. Outline Terms of Reference for Key Technical Assistance Specialists

16. **Operation and Maintenance Specialist and Team Leader** (international, 6 person-months). The team leader, in consultation with ADB and the TA project director, will coordinate the TA activities with the agencies concerned and development partners. He or she will provide overall guidance and leadership for all of the TA activities and will (i) guide the preparation of TA methodologies and work and staff schedules, monitor TA progress, and prepare key TA reports; (ii) lead the assessment of the Government of Bangladesh's policy, regulatory, and legal documents related to water sector development, institutional and technical developments, system management, O&M planning, financing, implementation, and performance monitoring and evaluation; (iii) review the performance of similar projects and synthesize relevant lessons; and (iv) guide the preparation of institutional and project implementation agendas.

17. **Water Management Institutions Specialist** (international, 2 person-months). Specific tasks will include (i) assessing the existing water management institutions and their functions related to system management, O&M planning, and implementation; (ii) analyzing the BWDB institutional setup, responsibilities, and operational guidelines, and identifying areas for

⁸ The consultants will submit 15 copies of these reports. Three digital copies of the final version of each report will be submitted on CD-ROM.

⁹ Two irrigation engineers, one procurement specialist, and an economist.

institutional strengthening and improvement; (iii) assessing the institutional arrangements at each of the subprojects and commitment of water users to participate in, and finance, O&M; (iv) reviewing the management guidelines, rules, and practices in the two subprojects; (v) developing alternative irrigation service and management models through which independent entities could be engaged to manage, operate, and maintain these schemes; (vi) developing detailed participatory implementation arrangements that will be followed under the loan project, taking into account the new management and O&M models; (vii) assessing staff requirements for project offices at the BWDB and subproject levels, safeguard management, and monitoring and evaluation units; and (viii) developing training programs.

18. **Procurement Management Specialist** (international, 2 person-months). The specialist will (i) propose tripartite service agreements between the BWDB, independent service providers, and water users organizations, and detailed contractual arrangements for the involvement of independent entities in the management and O&M of major irrigation systems; (ii) prepare the prequalification, procurement; and (iii) prepare a detailed plan for procurement of goods, services, and civil works under the evolving loan project, as well as requests for proposals for consulting NGOs services in accordance with ADB's *Guidelines on the Use of Consultants* and *Procurement Guidelines*.

19. **Policy and Regulatory Framework Adviser** (international, 1 person-month). The adviser will (i) assess the government policy, regulatory, and legal documents related to water sector development and ensure that the evolving project design appropriately adheres to these positions; (ii) support the TA team in identifying and defining practicable service delivery and system management alternatives and identifying those most suitable; (iii) support the team's analysis of the O&M and institutional setup of the BWDB; (iv) advise on the opportunities and alternatives for enhancing water management; (v) advise on an appropriate O&M framework based on best international practices; and (vi) propose the composition and terms of reference of a high-level project supervisory body that would include key stakeholders.

20. **Project Economics and Finance Specialist** (international, 2 person-months). The specialist will (i) assess the costs and benefits associated with the new management and O&M systems and improved system performance; (ii) compare these costs and benefits to the existing arrangements; (iii) assess the financial and economic impacts of the proposed management models at farm, project, and national level; (iv) as necessary, suggest revisions to project costs and financing based on the updated engineering concepts, cost updates, implementation arrangements, and any modifications to the financing plan resulting from the proposed management and O&M arrangements; (v) propose systems for performance benchmarking of the irrigation service providers, and participatory system monitoring and evaluation; (vi) assess the risks associated with the implementation of the new management and O&M concepts and propose appropriate financial, risk management, and risk allocation mechanisms; and (vii) update the cost estimates and a financing plan for the loan project.

21. **Public-Private Partnership Specialist** (international, 1 person-month). The PPP specialist will (i) review experience of past PPP projects in the water sector and other relevant projects, and document the key lessons learned; (ii) assess the strengths, weaknesses, opportunities, and perceived threats of adopting PPPs for water management and O&M in the context of the existing legal and institutional structures, human resources, and technical capacity of the relevant state departments; (iii) review the risks involved with involvement of private operators and assess risk allocation; (iv) recommend a range of appropriate measures for O&M cost recovery and sustainable financing; and (v) support the preparation of service agreements between the BWDB, private sector operators, and water users.