



Irrigation Management Improvement Project Project Management & Design Consultants

Annual Report
March 2015 – March 2016

May 2016

Bangladesh Water Development Board

- Mott MacDonald Ltd (UK) in association with:
- Euroconsult Mott MacDonald (Netherlands)
 - Northwest Hydraulic Consultants (Canada)
 - SODEV Consultant Ltd (Bangladesh)



Irrigation Management Improvement Project
Asian Development Bank (Loan 3135-BAN)

Project Management & Design Consultant

PMDC Annual Report
March 2015 – March 2016

May 2016

Bangladesh Water Development Board
People's Republic of Bangladesh

Project Management Unit (PMU), Hasan Court (3rd floor), 23/1 Motijheel, Dhaka-1000

This report was prepared at the request and with the financial support of the ADB. The views expressed are those of the Consultants and do not necessarily reflect those of the Government of Bangladesh or the ADB.

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Key Data

Name of Project:	Irrigation Management Improvement Project (IMIP)
Implementing Parties:	Government of Bangladesh (GoB) <i>Bangladesh Water Development Board (BWDB)</i>
Contractor:	<i>Mott MacDonald Ltd UK</i> in association with: <i>Euroconsult Mott MacDonald, Netherlands</i> <i>Northwest Hydraulic Consultants, Canada</i> <i>SODEV Consultant Int. Ltd, Bangladesh</i>
Contracting Authority:	Asian Development Bank (ADB) Loan No. 3135-BAN
Start/ End Date:	1 st March 2015 to 28 th February 2020
Beneficiaries:	Farmers
Locations/ Schemes:	Muhuri Irrigation Project (MIP) Ganges Kobadak Irrigation Project (GKIP) Teesta Barrage Project (TBP)

Distribution List

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GLOSSARY & ABBREVIATIONS

ADB	Asian Development Bank
Aman	Rice grown during the wet season (Kharif), and harvested early (July-August). Yields: (i) Broadcast 1.25t/ha; (ii) Transplanted, high yielding variety, 2.5t/ha
BADC	Bangladesh Agricultural Development Corporation
BARI	Bangladesh Agriculture Research Institute
BDT	Bangladesh Thaka (also Tk)
Bell	Saucer-shaped low-lying area with pond of static water as opposed to moving water in rivers and canals.
Bigha	Unit of measurement of land (usually 0.1338 ha, 0.333 acre)
BMDA	Barindh Multi-Purpose Development Authority
Boro	Irrigated rice grown in the dry season (Rabi). Transplanted in December/January and harvested in April / May. Typical yield: Transplanted, high yielding variety, 4.25 t/ha.
BREB	Bangladesh Rural Electrification Board
BWDB	Bangladesh Water Development Board
CAD	Command Area Development
CAD-I	First Command Area Development Project
CAD-II	Second Command Area Development Project
C-IMO	(Construction Phase) Irrigation Management Organisation
DAE	Department of Agricultural Extension
Decimal	Unit of measurement of land (equivalent to 0.016 ha, 0.01 acre)
DED	Detailed engineering design
District	Second administrative unit of the government comprising 6-9 Upazilas. There are 64 districts in Bangladesh.
DMF	Design and Monitoring Framework
DPP	Development Project Proposal
DSU	Design Support Unit
EA	Executing Agency
FFA	Framework Financing Agreement
FGD	Focus Group Discussion
GKIP	Ganges-Kobadak Irrigation Project
GoB	Government of Bangladesh
HYV	High Yielding Variety
ICC	Implementation Coordination Committee
ICM	Integrated Crop Management
IMIP	Irrigation Management Improvement Project
IMO	Irrigation Management Operator
IEE	Initial Environment Examination
IRR	Internal Rate of Return
ISC	Irrigation Service Charge
IWRM	Integrated Water Resources Management
IWM	Institute of Water Modelling
KAP	Knowledge, Attitudes & Practices
Khal	Natural or man-made water channel (canal)
Kharif	Wet (monsoon) season
LLP	Low Lift Pump
MFF	Multi-tranche Financing Facility
MFLW	More Food for Less Water
M-IMO	(Management Phase) Irrigation Management Organisation
MIP	Muhuri Irrigation Project

MoEF	Ministry of Environment & Forests
MoWR	Ministry of Water Resources
MOM	Management, Operation and Maintenance
MS	Main Service
MRIP	Manu River Irrigation Project
NWMP	National Water Management Plan
NWP	National Water Policy
NGO	Non-governmental Organization
NPRS	National Poverty Reduction Strategy
O&M	Operation and Maintenance
PRA	Participatory Rural Appraisal
PFR	Periodic Financing Request
PAM	Project Administration Manual
PIU	Project Implementation Unit
PM	Person Months
PMDC	Project Management and Design Consultant
PME	Project Monitoring and Evaluation (system)
PMF	Program Management Facility
PMU	Project Management Unit
PPP	Public Private Partnership
PPMS	Project Performance Management System
PPTA	Project Preparatory Technical Assistance
PSC	Project Steering Committee
PWD	Public Works Datum
PWM	Participatory Water Management
Rabi	Dry / winter cropping season (November to March)
RF	Resettlement Framework
RP	Resettlement Plan
SCADA	Supervisory Control and Data Acquisition
SRI	System of Rice Intensification
TA	Technical Assistance
TBP	Teesta Barrage Project
Tk	Bangladesh Taka (also BDT)
ToR	Terms of Reference
Union	Subdivision of Upazila. There are 4,889 unions in Bangladesh.
Union Parishad	Local government institution at Union level. The Union Parishad consists of an elected council & chairman, and is the oldest government institution in Bangladesh
Upazila	Administrative unit, sub-division of District and lowest administrative tier of the government. In all, there are 482 upazilas in Bangladesh.
Upazila Parishad	Second tier of local government institution at Upazila. According to the Upazila Parishad Act 2009, Upazila Parishad consists one elected Chairman and two Vice-chairmen, Chairmen of UPs and Mayor of Municipalities within each Upazila including the representative from the line agencies with an Upazila Nirbhai Officer as the Secretary. The Upazila Parishad runs the local administration.
WARPO	Water Resources Planning Organisation
WMA	Water Management Association
WMF	Water Management Federation
WMG	Water Management Group
WMO	Water Management Organization
XEN	Executive Engineer

FARM CATEGORIES

Land Holding		Farm Category
(ac)	(ha)	
<0.01	< 0.01	Landless
0.01 – 0.49	0.01 - 0.19	Marginal Farmer
0.50 – 2.49	0.20 – 1.00	Small Farmer
2.50 – 7.49	1.01 – 3.03	Medium Farmer
>7.50	>3.03	Large Farmer

LAND CATEGORIES

Depth of Monsoon Flooding		Land Category
(m)	(ft)	
0	0	High land
0-0.9	0-3	Medium high land
0.9-1.8	3-6	Medium low land
1.8-3.0	6-10	Low land
>3.0	>10	Very low land

UNIT CONVERSION TABLE

Length

1 inch (in)	0.0254 m
1 foot (ft)	0.3048 m
1 metre (m)	3.28 feet (ft)

Area

1 acre	4046.86 m ²
1 acre	0.4046 ha
1 square metre (m ²)	0.00024 acres
1 hectare (ha)	2.47 acres

Volume

1 cubic foot (ft ³)	0.0283 m ³
1 cubic metre (m ³)	35.315 cubic feet (ft ³)

Capacity

1. imperial gallon	0.0045 m ³
1. US gallon	0.0037 m ³
1 pint	0.5681 l
1 US gallon (dry)	0.0044 m ³
1 litre (l)	0.22 imp. gallon
1 litre (l)	0.264 U.S. gallon
1 hectolitre (hl)	100 litres
1 litre (l)	1.760 pints
1 cubic metre (m ³)	1000 l

Mass

1 ounce	28.3286 g
1 pound	0.4535 kg
1 long ton	1016.05 kg
1 short ton	907.185 kg
1 gram (g)	0.0353 ounces (oz)
1 kilogram (kg) 1000 g	2.20462 pounds
1 ton 1000 kg	0.984 long ton
	1.102 short ton

Pressure

1 pound force/in ²	6894.76 N/m ²
1 pound force/in ²	51.7 mm Hg
1 Pascal (PA)	1 N/m ²
1 atmosphere	760 mm Hg
	14.7 pound force/in ² (lbf/in ²)
1 atmosphere	1 bar
1 bar	10 metres
1 bar	100 kpa

Energy

1 B.t.u.	1055.966 J
1 foot pound-force	1.3559 J
1 B.t.u.	0.25188 Kcalorie
1 B.t.u.	0.0002930 kWh
1 Joule (J)	0.000947 B.t.u.
1 Joule (J)	0.7375 foot pound-force (ft.lbf)
1 kilocalorie (Kcal)	4185.5 J
	= 3.97 B.t.u.

1 kilowatt-hour (kWh)	3600000 J
	= 3412 B.t.u.

Power

1 Joule/sec	0.7376 foot pound/sec
1 foot pound/sec	1.3557 watt
1 Kcal/h	0.001162 kW
1 watt (W)	1 Joule/sec
	= 0.7376 foot pound/sec (ft lbf/s)
1 horsepower (hp)	745.7 watt
	550 ft lbf/s
1 kilowatt (kW)	860 Kcal/h
	= 1.34 horsepower

Temperature

⁰ C (Celsius or centigrade-degree) ⁰ C	= 5/9 x (⁰ F - 32)
⁰ F (Fahrenheit degree) ⁰ F	= 1.8 x ⁰ C + 32
K (Kelvin) K	= ⁰ C + 273.15

I. INTRODUCTION

A. Scope of this Report

1. The Project Management and Design Consultant (PMDC) contract for the Irrigation Management Improvement Project (IMIP) was awarded to Mott MacDonald in February 2015 and the consultancy first mobilised Bangladesh at the beginning of March. As previously agreed with the IMIP Project Director (PD), this first annual report covers the PMDC services for the first 13 months of the project, from 1 March 2015 to 31 March 2016, to bring annual reporting in line with quarterly reporting.
2. The report records the progress made on the project to date and sets out a plan for the coming year on how the PMDC can continue to support the successful implementation of IMIP.

B. Background to Project and Scope of Consultancy

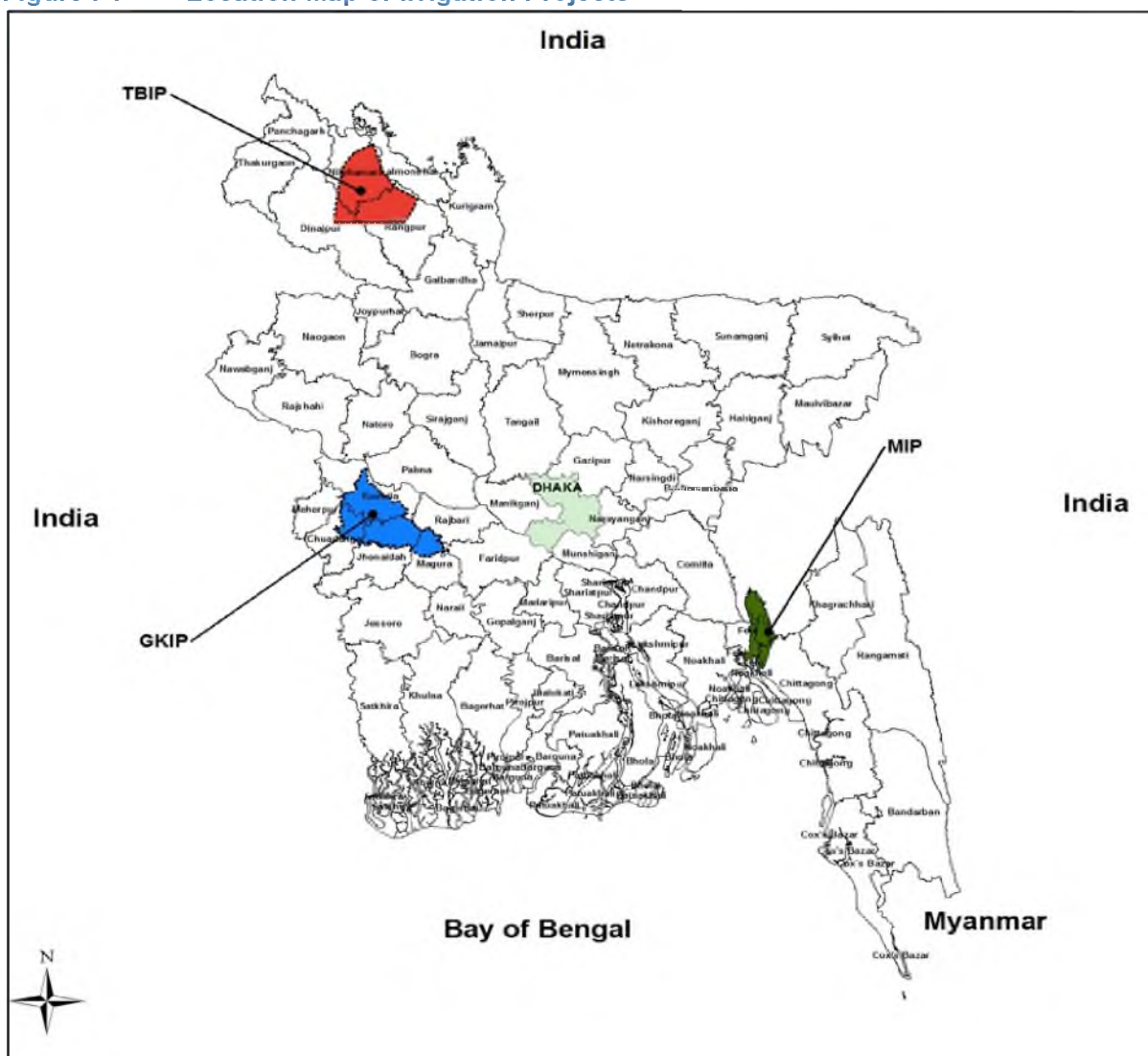
3. IMIP has been designed to support the Government of Bangladesh's (GoB) policy aim to sustain high (4.5%) growth in the agricultural sector through establishing performance-based irrigation management and agricultural services, and rehabilitating and modernising irrigation infrastructure. More specifically, the Project is tasked with:
 - i. carrying out engineering works to rehabilitate and modernise the Muhuri Irrigation Project (MIP);
 - ii. appointing and supporting a "construction phase" Irrigation Management Operator (C-IMO) for MIP to be responsible for management, operation and maintenance (MOM) of secondary and tertiary level irrigation infrastructure as well as provision of agricultural services and collection of irrigation service charges;
 - iii. reviewing the performance of the C-IMO, the effectiveness of its management systems, agricultural services and irrigation service charge collection;
 - iv. appointing a "management phase" Irrigation Management Operator (M-IMO) to take over from the C-IMO at the end of its contract and be responsible for the long-term management of the secondary and tertiary systems of MIP;
 - v. raising awareness and providing training and support for all stakeholders affected by the new management arrangements; and,
 - vi. preparing feasibility studies, detailed designs, and tender documents in support of the Government's plans to implement similar programmes in the Ganges-Kobadak (GKIP) and Teesta Barrage (TBP) irrigation projects.
4. A location map of the three irrigation projects (MIP, GKIP & TBP) is given in **Figure I-1**. The Bangladesh Water Development Board has been appointed as the Executing Agency (EA) for the Project and has, in turn, established a Project Management Unit (PMU) to oversee implementation. The Project's Design and Monitoring Framework (DMF) is given in **Annex B**. An abridged version of the PMDC's terms of reference (ToR) is given in **Annex A** and the services to be provided by the PMDC can be summarised as follows:

MS-1 Strengthened Project Management
5. The PMDC will support the PMU in: (i) planning; (ii) project implementation; (iii) development of a Project Performance Management System (PPMS); (iv) development of a financial management system; (v) establishing and supporting the Project Steering Committee (PSC); and, (vi) procurement of civil works contracts (namely CW1, CW2, CW3 & CW8) for MIP.

MS-2 Rehabilitation and Modernisation of Irrigation Infrastructure

6. The PMDC will be responsible for preparing detailed designs for the outstanding works in CW8 for MIP and preparing corresponding bills of quantities and tender documents for the works to be constructed under the supervision of the C-IMO.
7. With respect to GKIP and TBP, the PMDC is responsible for preparing: (i) systems assessments, taking into account the findings of the More Food for Less Water (MFWL) study; (ii) feasibility studies, including sustainable MOM strategies, costs, safeguards and economic and financial assessments; (iii) detailed engineering designs and bidding documents; (iv) a draft DPP and Project Administration Manual (PAM) for financing through the ADB; and, (v) organising supporting studies (technical, managerial, institutional and social). The PMDC will also assist the PMDC with procurement activities.

Figure I-1 Location Map of Irrigation Projects



MS-3 Improved Management of Large Irrigation Projects

8. This element of the project is key to the development of sustainable (ie self-financing) management and operation of large irrigation schemes which is responsive to the needs of farmers. It is anticipated that the idea of developing a management model based on Public Private Partnership (PPP) will encounter some opposition from stakeholders who enjoy considerable benefits under the existing system and the project has therefore adopted a two-stage approach with the appointment of a C-IMO for the first five years, followed by an M-IMO with a 15-year lease agreement. The PMDC will support the establishment of the IMOs

through: (i) consultations and awareness raising initiatives to ensure widespread understanding and support for the new management structures; (ii) advising on measures to improve service delivery to farmers; (iii) building capacity in the new PPP Cell within the BWDB to manage the IMOs; and, (iv) reviewing the performance and experience of the C-IMO and using the lessons learned to refine the proposals for the M-IMO contract.

MS-4 Institutional Development, Awareness and Training

9. In further support of MS-3, the PMDC will promote a broad programme of institutional capacity change / development through informal and formal training of key stakeholders, including farmers, pump operators, water management organisations, BWDB staff, district and Upazilla government offices and DAE. Activities include: (i) an institutional review and assessment of capacity and needs for MOM; (ii) training and resource need assessment of relevant institutions; (iii) preparation of training plans and budgets; and, (iv) implementation of training, institutional development and awareness together with the PMU, the MIP Project Implementation Unit (PIU), the C-IMO and concerned BWDB staff.