**Government of the People's Republic of Bangladesh**
**Ministry of Local Government, Rural Development and Cooperatives**
**Local Government Division**
**Local Government Engineering Department**

# Guidelines for
# Small Scale Water Resources Development Project

# G1 Policy and Development Process

**November 2017**

## TABLE OF CONTENTS

## LIST OF TABLES



## LIST OF FIGURES

## Document Architecture of the New Sets of Guidelines for SSWRD Project

***Small Scale Water Resources Development (SSWRD) means, from physical points of view, implementing appropriate water management subprojects of small sizes, not exceeding 1000 hectare benefit area by the current definition, to resolve existing water management constraints to agriculture that in turn enhance rural employment leading to reduction of rural poverty. Implementation of SSWR subprojects involve long process from proposal of a subproject from Local Government institutions (Union Parishad and Upazila Parishad) to its final selection, study of feasibility from different considerations (social, environmental, technical, economical), preparing detailed design and costing, constructing required physical works to standard quality and finally its operation and maintenance by its beneficiaries. The process has multiple facets too. It needs to be comprehensively beneficiaries' and other stakeholders' participatory, acceptable to people of widely varying social and socio-economic conditions, friendly to the surrounding environment, etc. Thus, Guidelines for SSWR Development is, of necessity, complex.***

***The long and complex process has been divided into major distinguishable steps and separate Guidelines for works and activities involved in those major steps have been developed. Environmental study applies to the subproject as whole and is of different nature. So, Guidelines for Environmental Assessment is made a separate document. Following this principle, the Ten (10) Guidelines with Alpha-numeric ID Numbers and Names as below constitute the Documentation of Guidelines for SSWR Development.***

***This list will appear in all the individual Guideline Documents with highlight of the current Document name for the user to refer when necessary.***

## The List of New Sets of Guidelines for SSWRD Project

| | |
|---|---|
| G1 | Policy and Development Process |
| G2 | Identification of Subprojects |
| G3 | Participatory Rural Appraisal of Subprojects |
| G4 | Feasibility Study of Subprojects |
| G5 | Environmental Assessment of Subprojects |
| G6 | Detailed Design of Subproject Structures |
| G7 | Construction of Subproject Structures |
| G8 | Operation and Maintenance |
| G9 | Monitoring and Evaluation |
| G10 | Integrated Rural Development Plan between SSWR and Rural Road/Market |

## AMENDMENT AND UPGRADATION RECORDS

This document "**Guidelines for SSWR Development: G1 Overall Development Process for SSWR Subprojects**" has been issued following amendments and upgrading as outlined below:

| Revision | Description | Date |
|---|---|---|
| | Guidelines for the Participatory Process of Small-scale Water Resources Development, initially developed and used for ADB-supported SSWRDSP (1995-2002) and SSWRDSP-2 (2002-2009). The Guideline covered for new subprojects only. | April 1999 |
| A | Subproject Development Process, a detailed and upgraded process contained in the document "Planning and Design Guidelines (updated in 2009)" was used for JICA-supported SSWRDP (2009-20015) and ADB-supported PSSWRDSP (2010-2017). These Guidelines and Subproject Development Process also covered new subprojects only. | May 2009 |
| B | This Guidelines for SSWR Development: **G1 Policy and Development Process** is the ***first*** Document of a set of Documents on Guidelines for SSWR Development finalized and approved by a Working Group of LGED Professionals with proven experience in SSWR development with assistance from Specialist WRD Consultants under the JICA TCP (2012 – 2018). | August 2017 |

# GLOSSARY

| | |
|---|---|
| Aman | Rice grown during the wet season (Kharif), and harvested late (Nov-December). Yields: (i) Broadcast, deep water 1.5t/ha; (ii) Transplanted, local variety 2.2t/ha; (iii) Transplanted, high yielding variety, 3.25t/ha |
| Aus | 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 |
| Beel | Saucer shaped low-lying area with pond of static water as opposed to moving water in rivers and canals. |
| Boro | Irrigated rice grown in the early dry season (Rabi). Transplanted in December-January and harvested in April-May. Yield: Transplanted, high yielding variety, 4.25t/ha |
| District | Second administrative unit of the government comprising 6-9 Upazilas. There are 64 districts in Bangladesh. |
| Haor | Haor is a wetland ecosystem in the north eastern part of Bangladesh. Physically a bowl or saucer shaped shallow depression, also known as a back-swamp |
| Integrated Water Resources Management Unit | Unit comprising two sections: (i) planning & design, and (ii) operation & maintenance, with a mandate to guide LGED's activities in the water sector with specific responsibility to assist in enunciation of policies, formulation of strategies and plans, preparation of new projects, inter-agency coordination and with external agencies, undertake studies and to provide long term support to the completed projects |
| Khal | Natural or man-made channel for water flow |
| Kharif | Wet (monsoon) season |
| Local Stakeholder | Local Stakeholders are inhabitants of an area directly or indirectly affected by water management, be it as beneficiaries or as "project affected people". |
| Project Affected People | People negatively impacted by investment in water management projects and / or subprojects or by the manner in which water regulating infrastructure is managed. |
| Project Consultants | Project implementation consultants working with PMO |
| Project Management Office | A unit comprising LGED staff appointed to manage implementation of a Project |
| Rabi | Dry / winter cropping season (November to March) |
| Stakeholder Groups | Stakeholder groups are collections of individuals who have similar interests concerning water. Among others, such stakeholder groups are men and women, farmers (low, medium low, medium high and high land farmers), fishers, boatmen, landless, elected representatives, LGED employees, BWDB employees, employees of other government departments, contractors, consultants, and development partners. |
| Union | Subdivision of Upazila and the lowest governance institution in the country. |
| 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. |
| Upazila Parishad | 2nd 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 Municipality within each Upazila including representatives from line agencies with an Upazila Nirbhai Officer as the Secretary. The election of the Upazila Parishad was held on 22 January 2009. Upazila Parishad runs the local administration. |

## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| ADB | Asian Development Bank |
| AE | Assistant Engineer |
| BWDB | Bangladesh Water Development Board |
| CA | Community Assistant (Project Based – Subproject Level) |
| CO | Community Organizer |
| CPO | Community Participation Officer (Project based, District level) |
| CS | Construction Supervisor (Project Based – Upazila Level) |
| DAE | Department of Agricultural Extension |
| DDM | Detailed Design Meeting |
| DLIAPEC | District Level Inter-Agency Project Evaluation Committee |
| DOC | Department of Cooperatives |
| DOF | Department of Fisheries |
| DWRA | District Water Resources Assessment |
| EIA | Environmental Impact Assessment |
| EMP | Environmental Mitigation Plan |
| FMC | First Management Committee (of WMCA) |
| FSDD | Feasibility Study and Detailed Design |
| GoB | Government of Bangladesh |
| IEE | Initial Environmental Examination |
| JICA | Japan International Cooperation Agency |
| JICA TCP | JICA Technical Cooperation Project "Capacity Development Project for Participatory Water Resources Management through Integrated Rural Development" |
| ICM | Integrated Crop Management |
| IWRMU | Integrated Water Resources Management Unit (of LGED) |
| LCS | Labour Contracting Society |
| LGED | Local Government Engineering Department |
| MC | Management Committee (of WMCA) |
| MIS | Management Information System |
| MLGRDC | Ministry of Local Government, Rural Development and Cooperatives |
| NGO | Non-Governmental Organization |
| O&M | Operation and Maintenance |
| PAP | Project Affected Person |
| PE | Performance Enhancement |
| PEA | Performance Enhancement Appraisal |
| PM | Planning Meeting |
| PMO | Project Management Office |
| PRA | Participatory Rural Appraisal |
| QC | Quality Control |
| SAE | Sub-Assistant Engineer |
| SAPROF | Special Assistance for Project Formulation |
| SP | Subproject |
| SSWR | Small Scale Water Resources |
| SSW-1 | SSWR Development Project Phase I (ADB), 1996-2002 |
| SSW-2 | SSWR Development Project Phase II (ADB), 2002-2009 |
| SSW-3 | SSWR Development Project (JICA), 2009-2015 |
| SSW-4 | Participatory SSWR Project (ADB) 2010-2017 |
| TA | Technical Assistance |
| UDCC | Union Development Coordination Committee |
| UE | Upazila Engineer |
| UP | Union Parishad (local council) |
| UzP | Upazila Parishad |
| WMCA | Water Management Cooperative Association |
| XEN | Executive Engineer (usually used in LGED) |

# FARM, LAND AND SUBPROJECT CATEGORIES

## FARM CATEGORIES

| Land Holding | | Farm Category |
|---|---|---|
| (ac) | (ha) | |
| <0.51 | < 0.21 | Landless |
| 0.51 – 1.00 | 0.21 - 0.40 | Marginal Farmer |
| 1.01 – 2.49 | 0.41 – 1.00 | Small Farmer |
| 2.50 – 7.49 | 1.01 – 3.03 | Medium Farmer |
| >7.50 | >3.03 | Large Farmer |

## LAND CATEGORIES

| Depth of Average Monsoon Flooding | | Land Category |
|---|---|---|
| (m) | (ft) | |
| <0.3 | <1.0 | Highland |
| 0.3-0.9 | 1.0-3.0 | Medium Highland |
| 0.9-1.8 | 3.0-5.9 | Medium Lowland |
| >1.8 | >5.9 | Lowland |

## SUBPROJECT CATEGORIES AND TYPES WITH USUAL WORKS AND OBJECTIVES

| Category | | Type | | Typical Works with Objectives |
|---|---|---|---|---|
| I | Simple (without Regulation of Water Flow) | DR | Drainage | Re-excavate drainage *khals* to increase capacity of drainage systems to benefit agriculture as well as fisheries and local navigation |
| | | TI | Tidal Irrigation | Re-excavate existing *khals* to enhance tidal flux (volume and propagation) in the *khals* in dry season to benefit irrigated agriculture in fresh water tidal areas as well as fisheries and local navigation (also increases drainage capacity) |
| II | Complex (with Regulation of Water Flow using gated or other kind of structures) | FM | Flood Management | Rehabilitate and construct embankments and/or sluices/regulators to reduce extent and duration of flooding of farmland inside the subproject |
| | | FMD | Flood Management and Drainage | Rehabilitate and construct embankments, sluices/ regulators and re-excavate *khals* to reduce extent and duration of flooding of farmland and increase drainage capacity of khal system of the subproject |
| | | FMDTI | Flood Management, Drainage and Tidal Irrigation | Rehabilitate and construct embankments, sluices/ regulators and re-excavate *khals* to reduce extent and duration of flooding of farmland, increase drainage capacity and tidal flow capacity of khal system of the subproject. |

| Category | | Type | | Typical Works with Objectives |
|---|---|---|---|---|
| | | | | Sluices/regulators of these subprojects will have arrangements of automatic flow of drainage and tidal inflow at the gates. |
| | | WC | Water Conservation | Develop water retention capacity of existing *haors*, *beels* and *khals* to increase availability of surface water for irrigation in dry season by installing gated water retention structures (also *Rubber Dams* at appropriate sites) and by re-excavating *khals* and suitable water bodies |
| | | FMDWC | Flood Management, Drainage and Water Conservation | Combination of works involved in FMD and WC type of subprojects outlined above |
| | | CAD | Command Area Development | Development of existing irrigation schemes by providing better water distribution systems over the command area and, as agreed, pumping facilities. Works may include: improved canal network, lining of canals, installation of buried pipelines, installation of control structures, construction of pump house, etc. |
| | | DRCAD | Drainage and Command Area Development | Development of existing irrigation schemes by providing better water distribution systems including drainage improvement measures for the command area and, as may be agreed, pumping facilities. Works may include: improved canal network, lining of canals, installation of buried pipelines, installation of control structures, construction of pump house, headwater tanks, regulators/sluices in drainage khals, etc.. |
| | | FMDCAD | Flood Management, Drainage and Command Area Development | Development of existing irrigation schemes by providing better water distribution systems together with flood management and drainage improvement facilities forr the command area and, as may be agreed, pumping facilities. Works may include: improved canal network, lining of canals, installation of buried pipelines, installation of control structures, construction of pump house, headwater tanks, etc and construction / rehabilitation of embankments, sluices /regulators in drainage khals, etc.. |
| III | Performance Enhancement | Any Type of Existing Subprojects | | Any of the above described works for existing (developed and handed over) subprojects for which additional works are desirable to consolidate planed benefits / result in additional benefits |

# I. INTRODUCTION

## 1.1 Preamble

1. This Guideline for Small Scale Water Resources Development (SSWRD) Project **"G1: Policy and Development Process"** is an introductory document for whole new set of Guidelines for SSWRD Project and outlines the policy background, overview and development process of the subproject.

## 1.2 Background on Development of New Sets of Guidelines

2. The small scale water resource development (SSWRD) Projects have been conducted since 1996 with the aim of poverty reduction through enhancing agricultural production and raising famer's income by way of addressing water constraints on cropping such as shortage in dry season and water logging in monsoon season targeting at small size subproject area, not exceeding 1000ha. For facilitating the effective project management of SSWRD Projects, a number of guidelines and manuals on participatory planning, feasibility study, designing and O&M have been developed by the assistance of development partners i.e. ADB and JICA. However there are following issues;

- They are not holistically systematized or consistent as it was developed from time to time by each phased projects funded by different development partners.
- Most of them haven't been revised nor updated even there exist a lot of lesson learned, accumulated know-how or advance in technology to be reflected.
- It is required to strengthen substantial "Participatory" process through more proactive involvement of beneficiary farmers and stakeholders to assure sustainable and functional O&M system.
- Without systematized and consistent documentations, it is difficult to develop capacity development program for the staff who engage in SSWRD project especially for new comer staff.

3. The JICA Technical Cooperation Project named "Capacity Development Project for Participatory Water Resources Management through Integrated Rural Development" (JICA TCP) has been launched from October 2012, which is a joint project with JICA and LGED. One of the objectives of the JICA TCP is to addresses these issues through development of systematized set of documentations to guide more effective project management and assure sustainable O&M system and subsequently to establish Participatory Small Scale Water Resources Management (PSSWRM) Model.

4. In light of this, the "Working Group on SSWRD Guideline Development" was set up in LGED to develop new set of Guidelines for SSWRD Project within the scope of JICA TCP. Finally the WG had developed new set of Guidelines for SSWRD Project which consists of 10 documents with alpha-numeric ID Numbers as below and they were finalized and formulated as official documents in LGED.

**List of New Set of Guidelines for SSWRD Project**

| Category | Sr. No. | Name of Guideline |
|---|---|---|
| Overall | G1 | Policy and Development Process |
| Planning and Design | G2 | Identification of the Subproject |
| | G3 | Participatory Rural Appraisal of Subproject |
| | G4 | Feasibility Study of Subproject |
| | G5 | Environment Assessment of Subproject |
| | G6 | Detailed Design of Subproject Structure |
| Construction | G7 | Construction of Subproject Structure |
| O&M | G8 | Operation & Maintenance |
| M&E | G9 | Monitoring & Evaluation |
| Integrated Approach | G10 | Integrated Rural Development Plan between SSWR and Rural Road/Market |

### 1.3 The Rational and Main Points of New Guidelines

5. The rational and main points of new set of Guidelines which had been discussed in the Working Group are as described in the matrix below.

| No. | Area | Main Point | Background/Issue |
|---|---|---|---|
| 1 | Overall | The new set of guidelines for SSWRD project which is holistically systematized and standardized and covers the whole process through planning and design, construction, O&M and monitoring has been developed for the first time in LGED. | Such kind of guidelines for the SSWRD project has not yet been developed. |
| 2 | Overall | The new set of guidelines has been reflected a lot of lesson learned, accumulated know-how or advance in technology. | There exists the guidelines in some areas, but they haven't been revised nor updated even there exist a lot of lesson learned, accumulated know-how or advance in technology to be reflected. |
| 3 | Overall | The new set of guidelines can be a basis on capacity development of LGED officials in better project management of SSWRD project. | The capacity development program on project management does not exist in LGED. |
| 4 | Overall | "Substantial" Participatory: Assuring involvement of most of the beneficiaries through SP development process by "In-depth"/"Village-wise" approach.<br>- PRA: Identify all the villages in SP area. FGDs will be covered all the benefited villages.<br>- Planning/Design: Discussion will be conducted in Village-wise, i.e. at least one representative will be invited from all the villages.<br>- O&M stage: Village representative | So far It has been gone through the participatory process but it was not always full participation. The fact is that some beneficiaries are not well informed the project benefit and does not contribute to the O&M activities. |

| No. | Area | Main Point | Background/Issue |
|---|---|---|---|
| | | should play a role as a focal point for inter-communication | |
| 5 | Process | Following new categories are introduced;<br>1. New Simple Subproject (No regulation on water flow)<br>2. New Complex Subproject (With regulation on water flow) | There was not this kind of categorization. |
| 6 | Process | The new step of "Pre-feasibility Study" is introduced. WMCA institutional development can start after this analysis. | i) Currently start of WMCA institutional development has to wait for full completion of feasibility study. It causes the delay of the project.<br>ii) It is required a scheme to pre-screen a non-feasible subproject before unnecessary spending for the full feasibility study. |
| 7 | Process | The same consultant become to be able to conduct whole planning and design process through Participatory Rural Appraisal (PRA) - Feasibility study (FS) - Detailed Design (DD). | As the PRA was conducted by NGO, there were some problems such as time consuming and some duplication with FS. |
| 8 | Process | SP handover will be done just after completion of construction work. 1 year join O&M activities will be conducted after the handover. | Current Practice: SP handover to WMCA is done after completion of 1 year joint OM activities |
| 9 | Planning & Design | The existing “Planning & Design Guideline” has been separated into 2 documents, i.e. “G4: Feasibility Study of SP” and “G6: Detailed Design of SP Structure”. | The existing “Planning & Design Guideline” mainly covers engineering analysis in feasibility study level. It is required to cover analysis in detailed design level such as hydraulic design by computer program. |
| 10 | Planning & Design | Making use of satellite image (such as Google Map) open to the public is suggested in planning stage. | Hand writing map has been used in planning stage such as PRA. |
| 11 | Design | The new Guideline "G6: Detailed Design" shows methodology for detailed engineering design of the structures. Salient features are as below;<br>- Hydraulic design of hydraulic structure with its spread sheet program such as stilling basin.<br>- Design concept of retention level of water retention structure: the level should be decided in consideration of channel’s longitudinal section and bank elevation (If retention level higher, higher channel dike and land acquisition will become necessary, and vice versa).<br>- Sample drawings are given. | The guideline for engineering design existed but it did not always cover sufficient information on detailed design. |

| No. | Area | Main Point | Background/Issue |
|---|---|---|---|
| | | - Design of buried pipe irrigation system by CAD type SP | |
| 12 | Construction | The new Guideline "G7: Construction of Subproject Structure" has been developed. Salient features are as below; | There was no guideline for construction stage. |
| | | - Standard tender document templates for procurement of civil work package are given. | Preparation of tender document is one of the time consuming work. |
| | | - Revised procurement policy on Labour Contracting Society (LCS) has been introduced, i.e. large earth work can be procured to the civil work contract with contractor, not by the LCS. | The earth work has been done by LCS in the context of poverty reduction but the following issues were pointed out;<br>a. Efficiency: The LCS work is inefficient because it is done by only human power comparing excavator. Also contract package is limited to less than 5 Lac BDT and time consuming.<br>b. Quality: Quality control is an issue due to insufficient supervision system and unqualified labour parties.<br>c. Social Needs: It has passed over 20 years since introduction. Beneficiaries become to be able to find more favourable jobs. |
| | | - The check list of final inspection of hydraulic structure and CAD system are given. | It is required to strengthen proper inspection system by LGED before handing over to the WMCA. |
| 13 | O&M | The existing Guideline for O&M has been revised as "G8: O&M" to upgrade the contents. Salient features are as below; | |
| | | - The In-depth/Village-wise approach is proposed, through which village representatives are supposed to act as a focal point of inter-communication between MC and beneficiaries to enhance O&M activities including increase of collection rate of subscription. | Some of the WMCAs have an issue in inter-communication. |
| | | - The format of O&M plan is provided. | Even the format of O&M plan was not shown in the current guideline. Some of the WMCAs cannot develop O&M plan. |

| No. | Area | Main Point | Background/Issue |
|---|---|---|---|
| | | - The importance of opening the Operational Account in 1st year joint O&M stage is mentioned. | Some of the WMCAs which are weak in financial management and do not have even operational account. |
| | | - The technical guidance on CAD system O&M is given. | Existing O&M Guideline does not refer to CAD system O&M which is different from others. |
| 14 | Monitoring and Evaluation | The guideline includes the way to strengthen monitoring completed subproject by making use of new integrated IWRM Unit Management Information System which is connected to all the local offices for timely data update. | The monitoring system for the completed subproject has not yet been developed. |

### 1.4 In-Depth/Village-wise Approach

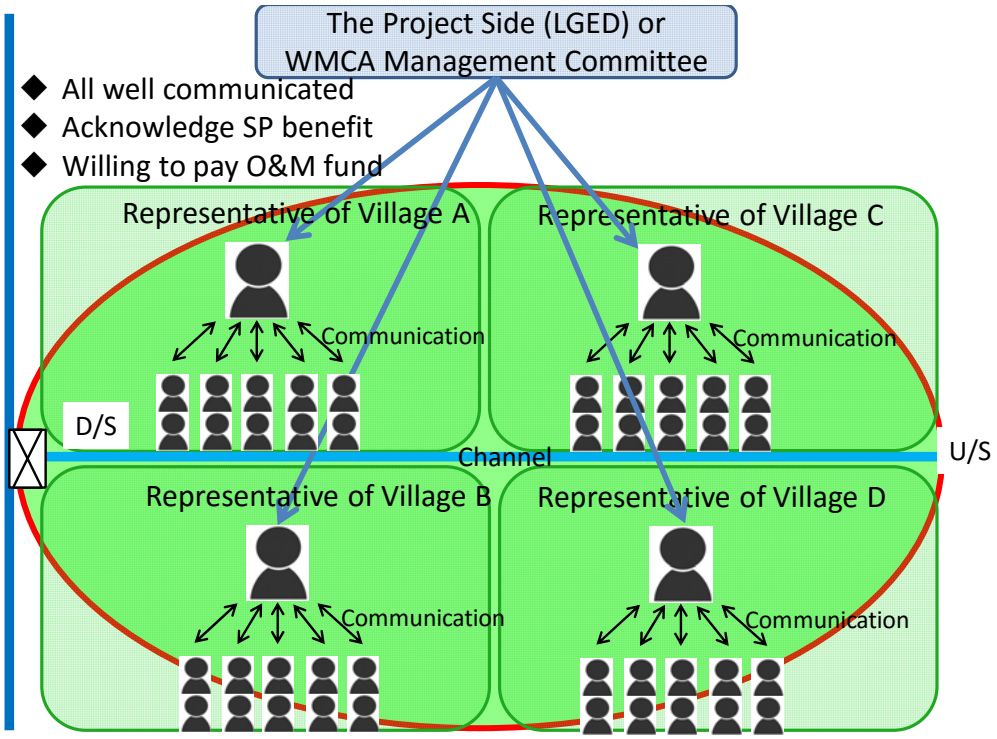
6. The SSWRD Project requires over 70% of participation of beneficiaries in the planning stage and also more participation in the O&M stage. However the subproject area spread over the wide range of rural area, even it is “small scale” (the average subproject area is about 400-500ha and the number of beneficiaries is a few thousand.), sometimes the project has been faced with the difficulties in assuring substantial participation in these board areas. Therefore the “In-depth/Village-wise Approach” has been introduced by the JICA TCP as an effective communication system to assure the further participation of beneficiaries.

7. In this country there exist the traditional communities in the rural area such as “Gram” or “Para” separately from the government administrative system such as “Union” or “Ward”. These traditional communities have been naturally formed for ages and normally have their own social system including conflict resolution. According to the sociological study it is said that this kind of traditional community can be noted as important target unit for the rural development.

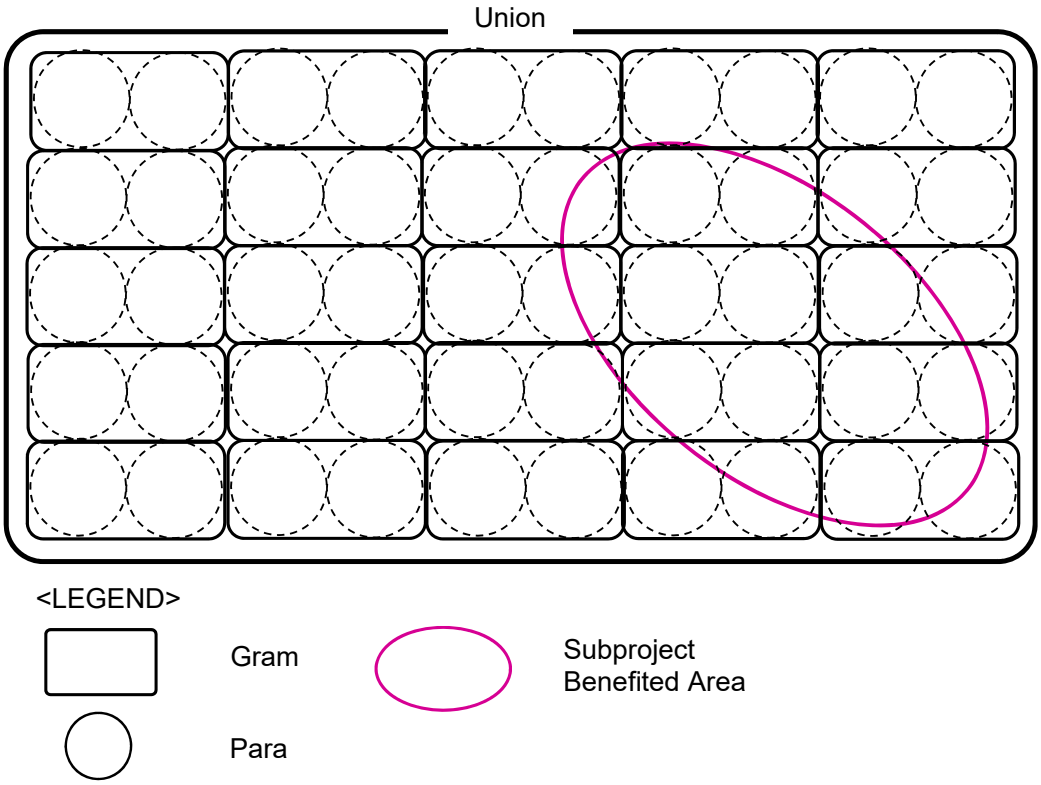
8. JICA TCP focused attention to the function of this traditional community unit of “Gram” (called “Village” in English in this document) which has been historically developing strong ties between the villagers. This unit can be a minimum target unit of rural community in the planning stage such as PRA. The “In-depth/Village-wise Approach” aims at i) smooth consensus formation on the project implementation through effectively conducting “Village-wise” discussion with beneficiaries in planning stage, and ii) revitalizing O&M activities by WMCA through facilitating close communication between beneficiaries and WMCA Management by placing the Representative of Village as a focal point.

9. The position/status of Village Representative may not always be an official as this approach is a suggestion as one of the ways for effective project management. Therefore the Guideline indicate the no concrete way to identify Village Representative and leave room for flexibility to be able to judge on a case-by-case basis; i.e. Village Representative may be identify automatically (as it is assumed that each village has their head or representative since it has been served as a body which organizes the villagers.), or need to be selected by the election, or can be officially stipulated in the By-law of the WMCA.

Expected Image by In-depth/Village-wise Approach




The Image of Typical Composition of Gram and Para in Rural Area




* It is said that there exist 20 to 30 “Gram” in one Union and several “Para” in one Gram.

## 1.5 Interactive Approach

10. The JICA TCP introduced an "Interactive Approach" which suggests more proactive inter-communication with stakeholders on SSWRD Project such as LGED, WMCA, Union Parished and field officials of the Nation Building Department. The basic concept is that it is important to discuss the issues on O&M of developed SSWRD system with all the related stakeholders and discuss how to solve them, and suggest possible support within the scope of their regular work basis by the government officials or through the discussion on Union Development Coordination Committee (UDCC), unlike conventional approach such as one-off and one-way training. JICA TCP conducted the nationwide "Interactive Workshop" for 28 subproject and WMCAs to discuss current issues and countermeasure to resolve them as a starting point, by which the effectiveness of the approach had been properly validated.

## 1.6 Integrated Rural Development Plan between SSWRD and Rural Road/Market

11. The JICA TCP also introduced the integrated rural development plan between SSWRD and rural road/market development. The concept is that the beneficiary farmers will be able to receive more benefits such as increase of selling price of agricultural products and frequency of trader's visits through resolving the problems of road connectivity and rural market environment by integrated development between SSWRD and rural road and market development. The details are shown in the Guideline **G10: Integrated Rural Development Plan between SSWRD and Rural Road/Market Development**.

## 1.7 PSSWRM Model

12. The final objective of the JICA TCP is to establish the Participatory Small Scale Water Resources Management (PSSWRM) Model. The Model elements to be deserved as a model which have been made clear by the Project is as follows and these concepts have been included in the Guidelines;

- Assure more Effective Project Management through;
  - New set of guidelines for SSWRD Project which guide effective and efficient way on project management including "In-depth/Village-wise" Approach
  - Training Program on SSWRD Project Management
  - Using Upgraded MIS
- Integrated Development Approach between SSWRD and Rural Road/Market Development
- More proactive involvement of Union stakeholders incl. UDCC to support WMCA O&M activity
- Enhance functioning of O&M by WMCA through;
  - In-depth/Village-wise Approach: "Substantial Participation" by all the beneficiaries
  - Interactive Approach: Think and work together with WMCA, LGED, and Union stakeholders

# II. HISTORICAL AND POLICY BACKGROUND FOR SSWRD PROJECT

## 2.1 Historical Background

13. In 1950s and earlier, there was practically no water resources development activity in the geographical area that is now Bangladesh and adjoining eastern Indian States. There was only an Irrigation Department in the Provincial Government of the then East Pakistan. Two catastrophic floods happened in consecutive years of 1954 and 1955 that caused severe damage to lives and properties in the area. In 1956, Government obtained services of a UN Technical Assistance Mission (Kug Mission) to study floods in the area. The Mission submitted its report in 1957 suggesting need for hydrological investigations and setting up an autonomous Water and Power Development Authority to undertake among others, in the water sector, study and implementation of flood embankments along major rivers and implement flood control, drainage and irrigation (FCDI) projects. In pursuance of the recommendation of Krug Mission, the East Pakistan Water And Power Development Authority (EPWAPDA) was created and studies on a Master Plan for integrated FCDI development in the country and implementation of potential FCDI projects commenced. The Master Plan focussed on major projects including 3 Barrages on the three big rivers of the country.

14. The Master Plan was reviewed by World Bank in the process of its commitment for financing the projects as requested by the Government and the recommendation came in 1972, after independence of Bangladesh, that the implementation plan exceeded capacity of EPWAPDA and smaller water resources development projects with irrigation components should be preferred large FCDI projects as envisaged in the Master Plan. Throughout 1970s and 1980s, medium to small size FCDI projects with irrigation components were implemented under Bangladesh Water Development Board (erstwhile EPWAPDA).

15. As need for growing food grain (rice) increased, small irrigation schemes based on surface water pumped from locally available sources like small rivers, khals, beels, etc were implemented under a Government funded Program channelled through Local Governments at *Thanas* (present Upazilas). The Program was called *Thana Irrigation Program (TIP).* Nature of these small schemes gradually expanded to cover other types of water related problems to agriculture like re-excavation of khals to improve drainage of rain water from crop fields, installing small gated regulators to prevent flooding of crops from external water entering into crop fields, etc. These small scale water management schemes were done with Government funds under the Works Program Wing (WPW) of the Ministry of Local Governments.

16. Towards mid-1980s, a Grant Fund was available from Government of Sweden for a Rural Employment Sector Program (RESP) for implementation under the Works Program Wing of the Ministry of Local Governments. A rural Infrastructure Development Project (IDP) was implemented under this Program in the relatively poor (for being more flood affected) Greater Faridpur and Kurigram districts. This IDP had a water resources component under which more comprehensive and beneficiaries' participatory water resources management schemes were implemented. The Works Program Wing eventually developed into the present LGED by early 1990s and also by the time more numbers of small scale water resources management schemes were being implemented under LGED.

17. With the experience of the large to medium water resources management projects having persisting shortfall of funds from Government for their operation and maintenance and, as a result, failing persistently to render planned benefits, further investments in such projects proved unworthy. In this background, Asian Development Bank, a principal donor agency in water resources development sector came up to support the first big project for small scale water resources development with LGED as the Executing Agency, with the *concept of establishing and institutionalizing an association of subproject beneficiaries through which the*

*beneficiaries would participate in the process of planning, design and construction of small scale subprojects, of sizes less than 1000 ha in area, and upon completion of their construction by the Government, will take full responsibilities including generation of required funds for operation, maintenance and management of the subprojects.*

18. This first project titled as Small Scale Water Resources Development Sector Project (SSWRDSP) was supported by ADB, Government of The Netherlands and IFAD and covered 37 western districts of the country and implemented 285 small scale subprojects together with establishing, institutionalizing and training one Water Management Cooperative Association (WMCA) of the beneficiaries in each subproject over a 6-year period (1995-2002). Since then, four SSWR Development Projects have been completed during the 23 year (1995-2018) period – three with ADB support and one with JICA support.

## 2.2 Bangladesh Water Act, 2013

19. The Government of Bangladesh enacted the maiden Water Act of the country, The Bangladesh Water Act 2013, to meet the expedient necessity to make provisions for the integrated development, management, abstraction, distribution, use, protection and conservation of water resources. Small Scale Water Resources Development and Management, for that matter, shall be done under the ambit of the Bangladesh Water Act 2013. Sections of the Water Act pertinent to SSWR development are shown below in brief descriptions:

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|---|---|
| *Right to water and use thereof* | • All rights over surface water, ground water, sea water, rain water and water in atmosphere within the state territory shall, on behalf of the people, vest upon the State.<br>• Right to potable water and to water for hygiene and sanitation shall be treated with the highest priority.<br>• All rights over the surface water on any private land shall remain with the owner of such land .provided that the Executive Committee may, for preventing wastage and misuse and for protection and conservation thereof, issue a protection order to the owner without discrimination.<br>. |
| *Power to adopt National Water Policy* | • Government may, by notification in official Gazette, adopt a National Water Policy.<br>• The Government may make arrangement for public hearing in the manner prescribed by rules to make opinions of the communities and organizations concerned with water resources and shall, by taking due consideration of the opinions received in public hearing, finalize the National Water Policy.<br>• In the National Water Policy, Government may include the policies of pricing of water to be determined by the appropriate authorities.<br>• Until a National Water Policy is adopted under this Act, the National Water Policy, which was adopted by the Government immediately before commencement of this Act, shall remain in force subject to being consistent with the provision of this Act. |
| *Approval of National Water Resources Plan* | • As soon as possible after commencement of this Act, a National Water Resources Plan shall be prepared by WARPO under the Water Resources Planning Act 1992 and approved, after prescribed procedures are followed, by the National Water Resources Council.<br>• The National Water Resources Plan, in addition to the requirements mentioned in Water Resources Planning ACT 1992, shall contain the following matters:<br>- Description of water resources in present geographical location,<br>- Analyses of economic, natural, social, political, environmental, ecological and institutional elements, characteristics and impacts of water resources,<br>- Scientific analysis of all data and information on water resources<br>- Development of overall planning, infrastructure for abstraction, distribution, use, protection and conservation of water resources and formulation of instructions thereof for short, medium and long terms, |

- Coordination with concerned Ministration, Division and Organizations involved in the management of water resources,
- Present and future use of water resources,
- Integrated use of surface and ground water with the highest possible use of rain water,
- Assessment of availability of water,
- Determination of water quality standard
- Basin-wise development plan, and
- Fixation of priority of water use.

- Until National Water Resources Plan is adopted under this Act, the NWMP made by WARPO immediately before commencement of this Act shall continue to have effect, mutatis mutandis.

*Clearance Certificate on WRD Projects*

- All organizations, or appropriate authorities or LGIs that are involved in water resources development projects shall apply for and be issued clearance certificate in a manner and under conditions that may be prescribed by the rules.

*Ensuring normal flow of water course*

- No person or organization shall stop natural flow of any water course or create obstacles to such flow or divert or attempt to divert the direction of any water course by constructing any structure in it or on its bank – provided that (i) for the interest of development of the water course or to prevent erosion of the bank thereof, any of such works may be taken up with permission of appropriate authority, and (ii) provided that any flood control embankment may be built to save people and their properties with permission of appropriate authority..

*Protection of Flood Control Embankment*

- To ensure sustainability of flood control embankments, no person shall be allowed to construct any house, establishment or any other structure either on or on the slope of embankments
- To make flood control embankments strong and to materialize Government programs, suitable trees may be planted alongside the embankment in a well organized and planned manner with permission of the appropriate authority.
- To make the best use of land thereof, a flood control embankment may be used as a street or road with due permission of the appropriate authority.

## 2.3 National Water Policy

20. The National Water Policy (NWP, 1999) adopted by the Government immediately before enactment of the Bangladesh Water Act 2013 provides guidance for water resource development and represents the first step in establishing the policy, legislative and regulatory framework required for the effective and equitable management of the nation's water resources. Sections pertinent to small scale water resources development are given below:

- WARPO will prepare, and periodically update, a NWMP addressing the overall resource management issues in each region and the whole of Bangladesh.

*Planning and Management of Water Resources*

- Sector agencies of the government and local bodies will prepare and implement sub-regional and local water-management plans in conformance with the NWMP and approved government project appraisal guidelines.
- BWDB will implement all major surface water development projects and other FCDI projects with command area above 1,000 hectares. The Local Governments will implement FCDI projects having a command area of 1,000 hectares or less after identification and appraisal through an Interagency Project Appraisal Committee.

*Water Rights and 7Allocation*

- In general, the priority for allocating water during critical periods in the water shortage zones will be in the following order: domestic and municipal uses, non-consumptive uses (e.g. navigation, fisheries and

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| | wild-life), sustenance of the river regime, and other consumptive and non-consumptive uses such as irrigation, industry, environment, salinity management, and recreation. |
| *Public and Private Involvement* | • The management of public water schemes, barring municipal schemes, with command area up to 5,000 ha will be gradually made over to local and community organizations and their O&M will be financed through local resources.<br>• Public water schemes, barring municipal schemes, with command area of over 5,000 ha will be gradually placed under private management, through leasing, concession, or management contract under open competitive bidding procedures, or jointly managed by the project implementing agency along with local government and community organizations.<br>• Ownership of FCD and FCDI projects with command area of 1,000 ha or less will gradually be transferred to the local governments, beginning with the ones that are being satisfactorily managed and operated by the beneficiary/ community organizations. |
| *Public Water Investment* | • Planning and feasibility studies of all projects will follow the Guidelines for Project Assessment (GPA), the Guidelines for People's Participation (GPP), the Guidelines for Environmental Impact Assessment (EIA), and all other instructions that may be issued from time to time by the government.<br>• Interests of low-income water users, and that of women, shall be adequately protected in water resource management. |
| *Water and Agriculture* | • Improve efficiency of resource utilization through conjunctive use of all forms of surface water and groundwater for irrigation and urban water supply.<br>• Strengthen crop diversification programs for efficient water utilization. |
| *Water and Fisheries and Wildlife* | • Water bodies like baors, haors, beels, roadside borrow pits, etc. will, as far as possible, be reserved for fish production and development. Perennial links of these water bodies with the rivers will also be properly maintained.<br>• Water development plans will not interrupt fish movement and will make adequate provisions in control structures for allowing fish migration and breeding. |
| *Water and Navigation* | • Water development projects should cause minimal disruption to navigation and, where necessary, adequate mitigation measures should be taken.<br>• Minimum stream-flows in designated rivers and streams will be maintained for navigation after diversion of water for drinking and municipal purposes. |
| *Water for the Environment* | • Give full consideration to environmental protection, restoration and enhancement measures consistent with the National Environmental Management Action Plan (NEMAP) and the NWMP.<br>• Adhere to a formal environmental impact assessment (EIA) process, as set out in EIA guidelines and manuals for water sector projects, in each water resources development project or rehabilitation program of size and scope specified by the Government from time to time.<br>• Protect against degradation and resuscitate natural water-bodies such as lakes, ponds, beels, khals, tanks, etc. affected by man-made interventions or other causes. |
| *Preservation* | • Haors that naturally dry up during the winter will be developed for dry |

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|---|---|
| *of Haors, Baors, and Beels* | season agriculture.<br>• Take up integrated projects in those water bodies for increasing fish production. |
| *Economic and Financial Management* | • Water charges realized from beneficiaries for O&M in a project would be retained locally for the provision of services within that project.<br>• Effective beneficiary participation and commitment to pay for O&M will be realized at the project identification and planning stages by respective public agencies. |
| *Research and Information Management* | • Develop a central database and management information system (MIS) consolidating information from various data collection and research agencies on the existing hydrological systems, supply and use of national water resources, water quality, and the eco-system. |
| *Stakeholder Participation* | • The "Guidelines for People's Participation (GPP) in Water Development Projects" be adhered to as part of project planning by all institutions and agencies involved in public sector management of water resources.<br>• Guidelines for formation of water user groups (WUG) and similar community organizations will be formulated.<br>• Generally 25% of the earthwork of any public water project will be offered to specific target groups or beneficiaries.<br>• New projects proposed by a community or local institution will be considered for implementation on a priority basis only when the beneficiaries have mobilized a certain percentage of the total cost as their contribution to the project. |

## 2.4 Cooperative Societies Act, 2001 and Cooperative Societies Rules, 2004

21. All public sector water resources management projects need to ensure people's participation in planning and other relevant matters. For SSWR Development Projects, it is required that the beneficiaries undertake responsibilities for operation, maintenance and management of the subprojects after implementation by the Government. SSWR Projects therefore undertake institutionalization of beneficiaries' and local stakeholders' participation throughout planning, design and construction of SSWRD subprojects along with developing their capacity to undertake operation and maintenance of the subproject infrastructure after those are handed over to them for the purpose. For this, associations of subproject stakeholders are developed in the name style of "Water Management Co-operative Association (WMCA)", one in each subproject. The WMCAs are statutory bodies formed, registered and administered under the Co-operative Societies Act and Rules there under. Some provisions of the Co-operative Societies Act 2013 and the Co-operative Society Rules 2004 pertinent to WMCA development and management are shown below in brief descriptions (Refer to the Official Gazette of the Act and the Rules for details):

| | |
|---|---|
| *Classification of Co-operative Societies* | • **Primary Co-operative Society:** Any Co-operative Society formed by at least 20 individual persons with the objective for improvement of socio-economic condition of its members through legal means. **Water Management Co-operative Association**, by definition, is a primary co-operative society.<br>• There can be Co-operative Societies of other kinds and levels like (i) Two-Tier Co-operative Society with a lower tier at village level and the upper tier at Upazila level, (ii) Central Co-operative Society having at least 10 member primary societies under it, (iii) National Co-operative Society having at least 10 Central Co-operative Societies under it, etc.<br>. |

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*Power for Exemption*

- Government may, by notification in official Gazette, exempt any particular Co-operative Society or a class there of from any or all of the rules made under the Act either with or without any conditions. .

*Registration*

- Any Co-operative Society can apply to the "Registrar " in prescribed forms following prescribed procedures and paying prescribed registration fees along with three copies of Bye-Law of the Society and other required documents if any. The Registrar may ask for additional documents if he considers it appropriate.
- If the Registrar is satisfied with the application and supporting documents, he will grant Registration and issue a Registration Certificate within 60 days of the application.
- If the Registrar is not satisfied with the application and supporting documents, he will inform about not granting of Registration with the reasons in writing within 30 days of the application.

*Management Committee*

- All powers and responsibilities of a Co-operative Society are vested in its Management Committee (MC).
- The First Management Committee (FMC) proposed along with the application for registration gets approved for 2 years by the Registrar along with registration of the Society. The regular MC of the Society shall be elected during the tenure of the FMC.
- MC is elected under the provisions of the Co-operative Societies Act, Rules made under it and the Bye-Law of the Society in its General Meeting for a period of three years.
- Number of MC members of a Society shall be mentioned in the Bye-Law but shall be between 6 and 12.

*Bye-Law*

- Bye-Law is the constitution of the Co-operative Society framed to administer its organizational and financial functions conducive to the purpose of the society.
- Bye-Law of the Society gets approved from the Registrar at the time of registration of the co-operative Society. It contains its amendment procedure.

## 2.5 Memorandum of Understanding

22. Implementation of SSWRD Project cross cuts activities of a good number of Government Departments and Agencies. Therefore, co-ordination with each of such Departments/Agencies is a necessity for smooth implementation of the Project and, on the other hand, the WMCAs need to draw co-operation and support of the Departments/Agencies for smooth operation and functioning of the subprojects to the optimum benefits for the people. In recognition of these issues, Memorandum of Understanding (MOU) has been established between LGED and about 11 such Departments/Agencies to ensure necessary co-ordination and support. The MOUs identify the areas of co-operation, list the various acts and services to be rendered by each party and undertakes to render them as and when required through mutual discussions. The Departments/Agencies with which LGED has MOUs for implementation of SSWRD Projects are named below:

| Department/Agency | | Area of Co-operation | Date First Signed & Current Status |
|---|---|---|---|
| 1 | Rural Development Academy (RDA), Bogra | Residential Trainings to WMCAs and LGED field staff on Rural Development, | October, 1998 |

| | | | |
|---|---|---|---|
| | Ministry of Local Government, Rural Development and Co-operatives | Irrigation Technology and Water Management. | Effective and In force |
| 2 | National Institute of Local Government (NILG)<br>Ministry of Local Government, Rural Development and Co-operatives | Trainings, Seminars, Knowledge Sharing between LGI Representatives and LGED professionals, particularly, on SSWR Development Projects implementation. | October 2001<br><br>In force |
| 3 | Department of Co-operatives (DoC)<br>Ministry of Local Government, Rural Development and Co-operatives | Providing Supervision, Training and Support to WMCAs (primary Co-operative Societies formed at SSWRD Subprojects) for their smooth running under the Co-operative Societies Act and Rules. | December 1997<br><br>Effective and In force |
| 4 | Water Resources Planning Organization (WARPO)<br>Ministry of Water Resources | Establishing a framework of collaborating relationship to share and exchange data and information from the national water resources database (NWRD) related to SSWR development. | April 2000<br><br>Effective and In force |
| 5 | Directorate of Agricultural Extension (DAE) | Establishing technical co-operation through exchange of data and information, supporting improved agricultural practice in the subproject areas through providing required extension services, trainings and any technical services required by SSWRD projects and the WMCAs established under them towards achieving project objectives of sustained agricultural production increase. .. | August 2002<br><br>Effective and In force |
| 6 | Directorate of Fisheries (DoF) | Establishing technical co-operation through exchange of data and information, providing trainings, demonstrations and any technical support required by SSWRD projects and the WMCAs established under them towards achieving project objectives regarding Fisheries – mitigation of loss in capture fisheries and increase production, in possible cases, through culture programs.. | November 2002<br><br>Effective and In force |
| 7 | Directorate of Women Affairs | Establishing co-operation through exchange of data and information, preparing plans with WMCAs and providing trainings to the poor and destitute women for skill development to undertake IGAs for poverty reduction and to support women participation in WMCA activities. | July 2003<br><br>Effective and In force |
| 8. | Directorate of Environment (DoE) | To establish co-operation in the areas of Environmental Impact Assessment, Environmental Management Plan and Long Term Impact Monitoring of SSWRD projects, strengthening existing Environmental Laboratories for testing water and soil samples, capacity enhancement in environment related matters through organizing trainings, seminars and workshops and other | January 2004<br><br>Effective and In force |

| | | | |
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| | | possible areas as may be considered appropriate. | |
| 9 | Bangladesh Fisheries Research Institute (BFRI), Mymensingh | Establishing co-operation through exchange of data and information, providing training and demonstration on technologies in fisheries sector, extension of new technologies in field level through trials, and any technical support required by SSWRD projects and the WMCAs established under them towards achieving project objectives regarding Fisheries. . | March 2004<br><br>Effective and In force |
| 10 | Bangladesh Water Development Board (BWDB) | To establish co-operation and collaboration between the two agencies in water resources development and management in an integrated manner through extending mutual co-operation and support; sharing of data, information and experience; developing easy communication and consultation and data exchange between corresponding offices of the two agencies at districts and headquarters and participating in seminars, workshops, etc for sharing og knowledge, technical know-how and experiences. | July 2006<br><br>Effective and In force |
| 11 | Bangladesh University of Engineering and Technology (BUET) | Establish co-operation and collaboration through exchange of ideas and sharing knowledge for development and management of country's water resources, participation in lectures, seminars, workshops on latest water resources development methods and technologies, and organizing short courses to enhance capacity of the professionals of LGED. | January 2006<br><br>Effective and In force |

# III. OVERVIEW OF SUBPROJECT DEVELOPMENT AND SUPPORT

## 3.1 Small Scale Water Resources Subprojects Development

23. This document outlines the usual processes to be adopted for the development of new SSWR subprojects as well as the processes for performance enhancement of existing (handed over) subprojects. It builds on previous versions of this document but incorporates up-to-date experiences and lessons learned from implementation of four SSWRD projects over the last 20 years.

24. The engineering interventions required in a water development subproject depend on the existing problems in the subproject area. The problems, however, may vary according to topography, hydro-geological conditions, and land use of a particular subproject area. SSWRD projects are generally with the primary objective of increasing agricultural production through improved water management but they cut across fisheries sector and therefore are significant for fisheries also.

25. Taking into account the prevailing water management problems and the requirements identified in the course of implementing the previous SSWRD projects, new subprojects for SSWR development are grouped into five basic types which are again divided into two categories. The details of related structures are shown in the Guideline ***G8: Operation and Maintenance.***

**Category-I: Simple Subprojects (without flow regulation)**

- ***Drainage improvement:*** Re-excavate drainage channels to increase capacity of drainage systems to benefit agriculture as well as fisheries and local navigation.
- ***Tidal irrigation:*** Re-excavate existing tidal channels to increase availability of dry season tidal fresh water both in quantity and propagation deeper inland for irrigation.

**Category-II: Complex Subprojects (with flow regulation)**

- ***Flood management:*** Rehabilitate / construct embankments and/or sluices/ regulators to reduce extent and duration of flooding of farmland.
- ***Water conservation:*** Develop water retention capacity of existing baors, beels, and channels to increase availability of irrigation water by installing water retention structures and/or by re-excavating the bed of water bodies and channels.
- ***Command area development:*** Improve existing irrigation schemes by providing better water distribution systems (improved canal network, lining of canals, installing buried concrete or PVC pipelines, installing head water tanks and/or distribution control structures, etc.) to extend irrigated areas.

**Category-III: Performance Enhancement**

- ***Performance Enhancement:*** Rehabilitate and construct structure to enhance the system performance in the existing Subproject.

26. In case of combination of problems and benefits, the five basic types may lead to ten common types of subprojects. Physical works that may be required for the combined type

subprojects will also be combination of work requirements of the basic types and can be drawn from the above listing.

27. The Categories and Types of subprojects, including usually found combination Types are further detailed in *Table III-1* below along with involved works and their purposes and functions. It is to be noted that there are only four basic Types of subprojects – DR, FM, WC and CAD. However, there can be subprojects with problems relating to two or more of the basic subproject Types. Thus, there can be several combination Types of subprojects as shown in the Table.

**Table III-1 Subproject Categories and Types with Usual Works Required**

| Category | | Type | | Typical Works with Objectives |
|---|---|---|---|---|
| I | Simple (without Regulation of Water Flow) | DR | Drainage | Re-excavate drainage *khals* to increase capacity of drainage systems to benefit agriculture as well as fisheries and local navigation |
| | | TI | Tidal Irrigation | Re-excavate existing *khals* to enhance tidal flux (volume and propagation) in the *khals* in dry season to benefit irrigated agriculture in fresh water tidal areas as well as fisheries and local navigation (also increases drainage capacity) |
| II | Complex (with Regulation of Water Flow using gated or other kind of structures) | FM | Flood Management | Rehabilitate and construct embankments and/or sluices/regulators to reduce extent and duration of flooding of farmland inside the subproject |
| | | FMD | Flood Management and Drainage | Rehabilitate and construct embankments, sluices/ regulators and re-excavate *khals* to reduce extent and duration of flooding of farmland and increase drainage capacity of khal system of the subproject |
| | | FMD TI | Flood Management, Drainage and Tidal Irrigation | Rehabilitate and construct embankments, sluices/ regulators and re-excavate *khals* to reduce extent and duration of flooding of farmland, increase drainage capacity and tidal flow capacity of khal system of the subproject. Sluices/regulators of these subprojects will have arrangements of automatic flow of drainage and tidal inflow at the gates. |
| | | WC | Water Conservation | Develop water retention capacity of existing *haors*, *beels* and *khals* to increase availability of surface water for irrigation in dry season by installing gated water retention structures (also *Rubber Dams* at appropriate sites) and by re-excavating *khals* and suitable water bodies |
| | | FMD WC | Flood Management, Drainage and Water Conservation | Combination of works involved in FMD and WC type of subprojects outlined above |
| | | CAD | Command Area Development | Development of existing irrigation schemes by providing better water distribution systems over the command area and, as agreed, pumping facilities. |

| Category | | Type | | Typical Works with Objectives |
|---|---|---|---|---|
| | | | | Works may include: improved canal network, lining of canals, installation of buried pipelines, installation of control structures, construction of pump house, etc. |
| | | DR<br>CAD | Drainage and Command Area Development | Development of existing irrigation schemes by providing better water distribution systems including drainage improvement measures for the command area and, as may be agreed, pumping facilities. Works may include: improved canal network, lining of canals, installation of buried pipelines, installation of control structures, construction of pump house, headwater tanks, regulators/sluices in drainage khals, etc.. |
| | | FMD<br>CAD | Flood Management, Drainage and Command Area Development | Development of existing irrigation schemes by providing better water distribution systems together with flood management and drainage improvement facilities forr the command area and, as may be agreed, pumping facilities. Works may include: improved canal network, lining of canals, installation of buried pipelines, installation of control structures, construction of pump house, headwater tanks, etc and construction / rehabilitation of embankments, sluices /regulators in drainage khals, etc.. |
| III | Performance Enhancement | Any Type of Existing Subprojects | | Any of the above described works for existing (developed and handed over) subprojects for which additional works are desirable to consolidate planed benefits / result in additional benefits |

28. The development processes attempt to reduce time and costs to prepare subprojects, particularly for the simpler Category-1 subprojects. They provide for some support to be shifted to the post-construction stage of development, with increased focus on O&M. Performance enhancement allows LGED to address the deficiencies of failing or defunct subprojects, and also to enhance productivity of good subprojects, rewarding high performing WMCAs and “building on success”.

29. The details of division of responsibility between PD-PMO staff and the IWRMU remain to be worked out, but broadly the PD-PMO, as project fund administrator, is responsible for implementation while the IWRMU bears the responsibilities of post-development monitoring and controlling of O&M works. The IWRMU has oversight functions including some quality control aspects and is also the custodian of reports and MIS data with the responsibility of ensuring that these are obtained and maintained. As maintenance is not funded by development partners all maintenance works must be coordinated and controlled by the IWRMU.

30. Five basic principles underpin LGED’s approach to water resource management:

(i) Subprojects must be identified by local people, and initially processed through their elected representatives in the Union Parishad.
(ii) Local people, beneficiaries as well as project affected people, must be involved in all stages of subproject development.

(iii) The overall participatory process is a combination of two parallel but interrelated processes addressing *Institutional* aspects and *Technical* aspects.
(iv) Support is provided for both initial development (engineering and institutional) and subsequent construction and for initial operation and maintenance, with the degree of support depending on the complexity of the required interventions.
(v) For completed subprojects LGED may support performance enhancement through rehabilitation and new engineering works and institutional capacity development.

31. Key institutional aspects include subproject identification by beneficiaries and submission through local government institutions, analysis to establish social and environmental acceptability, formation and registration of the WMCA, mentoring to strengthen institutional, management and social processes including election of office-bearers for the management of WMCA, transparency in fund raising and use, development of O&M strategies, performing sustainable O&M and performance enhancement, and periodic grading (evaluation) of the WMCA institution based on performance.

32. Key technical aspects include initial development of information database, subproject processing, analysis to establish technical and economic feasibility, preliminary and then detailed design, contractual process, construction, trial operation and rectification of defects, development of O&M strategies, sustainable O&M, performance enhancement and periodic grading of subproject.

33. For all new subprojects the development process comprises four distinct stages:

(i) Stage 1: Identification, Reconnaissance, Prefeasibility and Clearance (3-6 months)
(ii) Stage 2: Feasibility, Detail Design and Institutional Establishment (8-10 months)
(iii) Stage 3: Construction and First Year Operation & Maintenance (12-30 months)
(iv) Stage 4: Sustained Operation and Maintenance (intermittent support)

34. During reconnaissance new subprojects are categorised as either *Category 1: Simple Subprojects* without regulation on water flow, or *Category 2: Complex Subprojects* requiring regulation of water flow using gated structures and requiring operation of the gates (***Table III-1***). For the simple subprojects, usually involving improvement of drainage and/or propagation of tidal water, works comprise only earthworks and construction of a WMCA office and development of the subprojects may be expected to take just two-thirds the time required for a complex subproject. This is because development activities are less onerous – for example feasibility and detailed design work is less and construction quicker.

35. As the number of completed subprojects handed over to WMCAs has grown it has become apparent that additional efforts are desirable either to enhance performance of successful subprojects or to address shortcomings in defunct / non-performing subprojects. The Performance Enhancement process, *Category 3* in ***Table III-1***, addresses this and comprises a 2-stage process as follows:

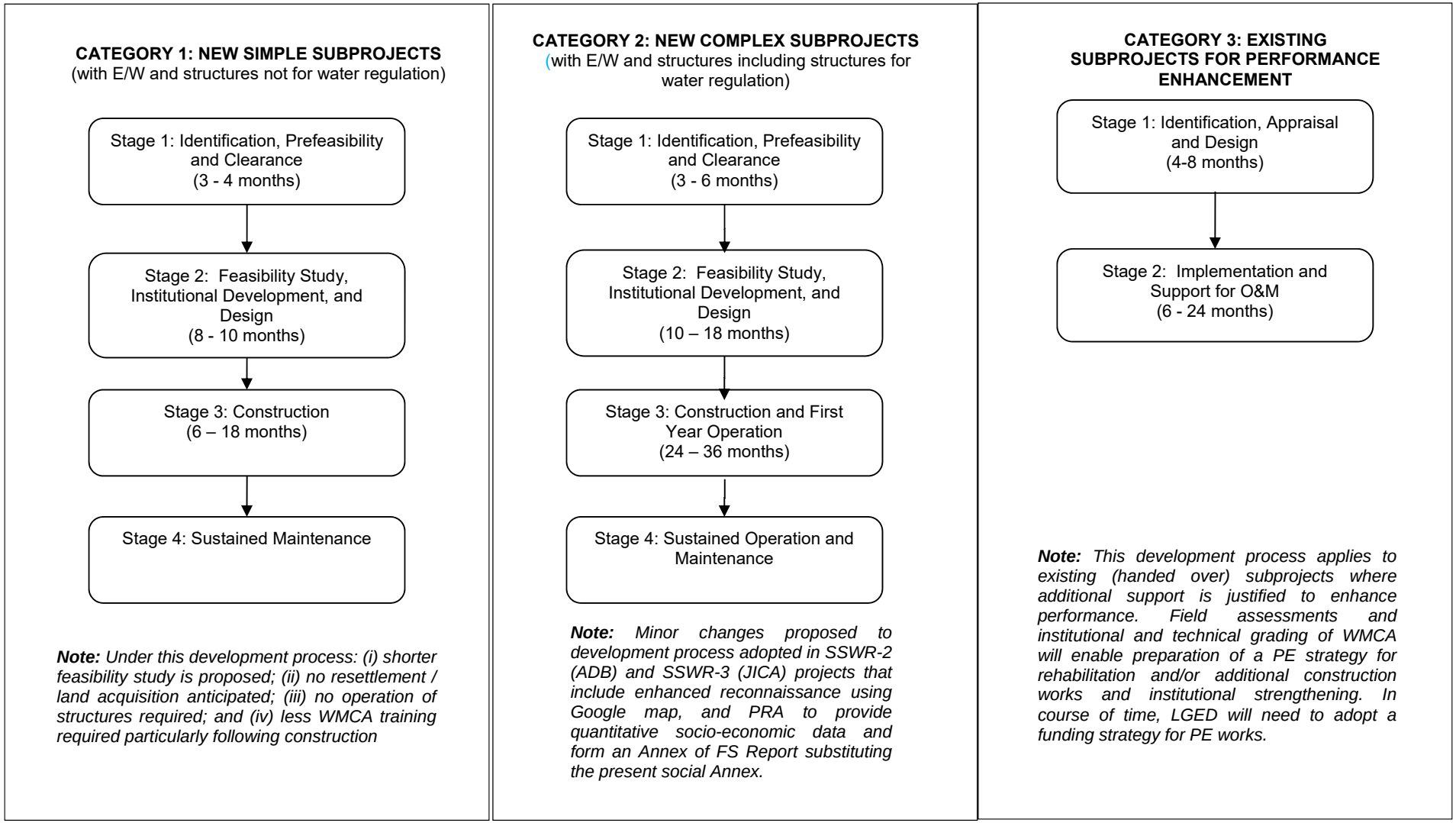
(i) Stage 1: Identification, Appraisal and Design (4 - 8 months)
(ii) Stage 2: Implementation and Support for O&M (12 - 24 months).

**Table III-2 Subproject Categories and Development Process**

| Category of Subproject | | Description | Development Process |
|---|---|---|---|
| ***A. New Subprojects*** | | | |
| 1 | Simple (No Regulation on Water Flow) | Subprojects where earthworks and WMCA office building and/or structures not for regulation of water flow are involved. | 4 stage development process with stages 1-3 being simpler and expected to take a shorter time, 18-24 months. |
| 2 | Complex (With Regulation on Water Flow) | Subprojects where earthworks and/or structures including one or more gated or other kind of structures to regulate water flows are involved. Subprojects may be of any combination of Drainage Improvement, Tidal Irrigation, Flood Management, Water Conservation and Command Area Development. | 4 stage development process with stages 1-3 having their usual complexity and expected to take a longer time, 24-36 months due to more time required for feasibility, detailed design and construction. |
| ***B. Existing*** *(Handed over)* ***Subprojects*** | | | |
| 3 | Performance Enhancement (With or Without Regulation on Water Flow) | Existing subprojects where additional investment in infrastructure (including farm level multi-functional structures) is requested and justified by expected additional agricultural, fisheries production and/or other economic/social benefits. | 2 stage development process taking 12-24 months. Only a brief appraisal of PE works and impacts, detail design and construction of works are involved. |

36. An overview of the subproject development and performance enhancement processes is shown in ***Figure III-1*****.**

**Figure III-1 Subproject Categories and Development Process – Overview of Stages**



# IV. DEVELOPMENT PROCESS FOR NEW SUBPROJECTS

## 4.1 Introduction

37. The sequence of activities and interaction between the technical and institutional processes for all new subprojects are presented in a flow line diagram in ***Figures IV-1*** to ***IV-4*** and described below by activity Steps[1]. The activities and steps are more or less the same for both *Category-1* (simple subprojects *'without flow regulation'*) and *Category 2* (complex subprojects '*with flow regulation'*) subprojects but the complexities and time requirement for stakeholder consultations, feasibility analyses, design preparation and construction are rather different.

38. ***Exhibit G1-A*** presents the key personnel likely to be involved in a SSWR development project, while in ***Exhibit G1-B*** a responsibility matrix for each Stage and each Step of the subproject development process is given.

39. To qualify for being implemented, a subproject will have to meet the *Eligibility Criteria* tabulated below in ***Table IV-1.*** These may vary for specific Projects depending on requirements as agreed with Development Partners. For CAD subprojects, some additional specific criteria are given in the Table.

**Table IV-1 Eligibility Criteria[2] for Development of a Subproject**

| Nr | Criteria | Requirement |
|---|---|---|
| **General Criteria (all new SPs)** | | |
| 1 | Beneficiary Demand | Request for the subproject must emanate from the beneficiaries. |
| 2 | Area Limitation | The benefited area served by the subproject should be more than 50 ha (some development partner may have different lower limit requirement) and must not exceed 1,000 ha. |
| 3 | Administrative Boundary | The subproject should usually fall within one district. However, for a potential subproject falling in two districts, inter-district coordination mechanism should first be resolved during the reconnaissance stage. |
| 4 | Land holding | More than 40% of the subproject benefit area will be operated/owned by landless sharecroppers and marginal or small farmers (up to 1.0 ha). |
| 5 | Fishery Livelihoods | No more than 30% of the households shall depend on subsistence capture fisheries as their main livelihood. |
| 6 | WMCA and Works | Each new subproject will entail rehabilitating / upgrading an existing water resource system where a WMCA has not previously been established or no work has been carried out by the IWRMU. |
| 7 | Technically and Economically Feasible | Each subproject shall be technically feasible and economically viable with an economic internal rate of return (EIRR) of at least 12% and a development cost of not more than $1,500 / ha for CAD subprojects, $1,000 / ha for subprojects with structures for regulation of water flow, and $600 / ha for subprojects having no water regulating structures, without prior approval of appropriate competent authority[3]. |
| 8 | Inclusive Development | At least 70% of direct beneficiary households (owners and sharecroppers/leaseholders) have enrolled representation in the WMCA. |

[1] In this document, "Steps" are numbered for easy reference. Steps are not necessarily in sequence, and some Steps are performed in parallel.

[2] The percentage figures given may change for any particular project as mutually agreed with the Development Partner(s)

[3] The threshold figures may be updated from time to time.

| Nr | Criteria | Requirement |
|---|---|---|
| 9 | Resettlement | Each subproject shall be socially and culturally sound requiring no displacement of people or impingement on sensitive areas. Resettlement and asset acquisition costs shall not exceed 20% of the engineering base costs. |
| 10 | Environment | An Initial Environmental Examination (IEE) shall be undertaken with consultation with beneficiaries and project affected people, and conclude that any negative consequences can be mitigated to an acceptable level. No subproject shall be approved that involves any of the following:<br>• Location in nature reserves.<br>• Any significant loss of primary forest, mangroves or sensitive wetland.<br>• Any permanent negative effect on known rare or endangered species.<br>• Any significant impacts on air quality and water quality.<br>• Any permanent damage to cultural relics and archaeological sites. |
| 11 | O&M Costs | The routine maintenance costs as well as the periodic maintenance costs (less any matching funding assistance that may be available from GoB from time to time) of the subproject shall be fully borne by the WMCA. The WMCA shall agree to this condition and shall raise funds for O&M in an equitable manner from benefiting land owners or cultivators. |
| 12 | Char Lands | To ensure sustainability, subprojects should not be taken in Char lands (unstable land in or along a river course) and other area vulnerable to river erosion and requiring significant river bank protection works (however, subprojects may be allowed in Char lands that have become significantly stable over the years). |
| 13 | Submersible Embankments | Subprojects involving submersible embankments in the deeply flooded part of the Northeast Region will be considered only if the beneficiaries have the capacity of ensuring sustained maintenance of submersible embankments. |
| 13 | DLIAPEC Approval | The subproject shall be consistent with the District Water Resources Assessment (where finalized) and approved by the District Level Inter-agency Project Evaluation Committee in respect of non-duplication and non-overlapping.. |
| **Additional Criteria for CAD Subprojects** | | |
| 1 | Water Source | The water source must be perennial with sufficient water in an adjacent river / khal even in a dry year to meet demand. Highly unstable rivers should also be avoided. |
| 2 | Other Users | Increased pumping from the water source must not adversely impact on other users (whether for domestic, agricultural or fishery use). |
| 3 | Existing Irrigation System | There should be an existing low lift irrigation system (open channel / pipe) in the subproject area demonstrating community interest and ability to manage an irrigation system. |
| 4 | Groundwater Pumping | If the command area is already irrigated by either: (i) small privately (household) owned shallow wells; or (ii) a few number of deep tubewells it should not be developed as a CAD subproject. |
| 5 | Flooding / Land Elevation | Irrigation facilities should not extend over land which is extensively flooded in the monsoon. If the proposed subproject contains extensive low and bottom lands (say >40%) it should not be developed as a CAD subproject. |
| 6 | Power Source and Pumps | Reliable power supply must be available – assuming electric pumps this implies that a suitable power line is available within (about) 3 km. Also the local community must demonstrate ability to procure the required pumps and, if appropriate, electrical connection. |

40. Eligibility criteria will be checked for proposed subprojects during the initial selection steps so that only potentially qualified subprojects are taken for further studies. This will be discussed further under steps for pre-screening and reconnaissance. However, eligibility relating to some of the criteria like land holding proportion, fisheries livelihood, etc would be known only after detail data collection and study under subsequent stages. For these, only approximate information from field inquiry and professional judgment will be used at the

selection stage which will be confirmed or corrective measures incorporated in case of non-conformity later after adequate data and analyses are done.

### 4.2 STAGE 1: Subproject Identification, Reconnaissance and Clearance

41. **STEP 1- Subproject Identification**: Given that SSWR development has been on-going in Bangladesh for more than 20 years. There is no general need to build awareness using mass media. However, as new projects are initiated, the IWRMU shall issue to Union Parishads a letter explaining that local stakeholders through the Union Parishad can propose new SSWR subprojects. This may be followed up with workshops at Upazillas with elected representatives of all Union Parishads of the Upazilla and knowledgeable /respected village leaders..

42. When the Union Parishad receives a request from local people, they discuss the problem and solution suggested by them, formulate a subproject concept and fill out the ***Subproject Identification Form (Form 1)***, presented in the appended ***Exhibit G1-C***, that LGED sends to each UP. The subproject will usually fall within 1-2 Wards of the Union, and the concerned Ward Member(s) are required to check and certify widespread support for the subproject. The Union Parishad then adopts a resolution whereupon it submits the subproject proposal to the Upazila Engineer, LGED. The subproject proposal is also discussed in a Union Development Coordination Committee meeting and comments and suggestions, if any from the UDCC, are passed to the Upazila Engineer.

43. In case the proposed subproject area falls in two Unions, Chairman of the Union having majority of the subproject area will take the initiative, co-ordinate with Chairman of the other Union and process ***Form 1*** incorporating information of both the Unions. The issue including discussion and opinion of the other Chairman will be mentioned in the resolution of the UP.

44. The District Water Resources Assessments may also support identification of new subprojects. For example, priority subprojects indicated in the “indicative inventory” list annexed to the DWRAs may be sent to the field for the Union Parishad to re-confirm their needs, if not already addressed under some projects, and submit the subproject proposal duly in Form-1 to the Upazila Engineer by adopting a UP resolution.

45. **STEP 2- Site Visit by Upazila Engineer and Technical Proposal**: In response to the Union Parishad proposal, the Upazila Engineer along with SAE in-charge of water resources works and the Community Organizer, will visit the area of the proposed subproject to assess the problems and possible solutions. The UP Chairman (both the Chairmen if the subproject is in two Unions) will be requested to participate in the visit. During this field visit, the team will meet with people of different social groups, both inside and outside the area to find out people’s opinion about the proposed subproject. They will make a special effort to meet people who are likely to be impacted negatively due to implementation of the subproject and identify such groups and the negative impacts. The UE will check the physical works proposed by the UP and he may add new works and/or drop any work according to the judgement of the visiting team. All works so decided will be defined by taking GPS co-ordinates at start point, end point and intermediate points as may be considered necessary. The location/alignment of the works with GPS values are to be shown in the subproject proposal map to be prepared after the field visit.

46. When the Upazila Engineer is convinced that the subproject has both technical and social potential, he will complete the ***Subproject Technical Proposal (Form 2)*** and submit the subproject proposal to the Upazila Parishad. The ***Form 2*** presented in ***Exhibit G1-D*** appended to this document is designed to provide some more technical information about the proposed subproject.

47. **STEP 3- Approval of Proposal by Upazila Parishad**[4]: The subproject proposal will then be discussed in a meeting of the Upazila Parishad. This meeting includes all Union Parishad Chairmen under the Upazila and, accordingly, include the adjacent Union Parishads that might be negatively impacted by the proposed subproject. If the subproject area is in two Unions, the Upazila Parishad will discuss and obtain agreement from both the Chairmen. If the Upazla Parishad meeting does not find any ambiguity or opposition to the proposal, the proposed subproject will be approved. The Upazila Engineer will then forward the subproject proposal, along with Upazila Parishad's approval to the District Executive Engineer, LGED. If the Upazila Parishad meeting finds any ambiguity, contradiction or opposition in the proposal, it will return the proposal to the Upazila Engineer to either drop it or resubmit it after necessary modification.

48. **STEP 4-Proposal Reviewed by Executive Engineer**: The Executive Engineer, LGED will review the proposal sent by Upazila Engineers in the context of these Guidelines and the water resources development strategy of the District as per DWRA studies and, if satisfied that the proposal contributes to the development objectives of the District, the Executive Engineer will forward it to the IWRMU, LGED Dhaka.

49. **STEP 5 - Pre-Screening and GIS Mapping**: Pre-screening is a desk assessment to ensure that all relevant materials were submitted and that the subproject proposal is likely to meet the *Eligibility Criteria* (ref: ***Table IV-1***). Pre-screening is done in IWRMU (P&D Section) with support from Project Consultants of ongoing Projects. The basic criteria on the basis of which proposals are pre-screened include: (i) documentation and maps adequate to provide a reasonable understanding of the problems/ constraints and proposed intervention, (ii) site visit undertaken by the LGED Upazila Engineer, and (iii) Upazila Parishad discussed the subproject in its meeting and the outcome provided in ***Form 2***. Pre-Screening is done using a standard ***Form 3*** which is appended to this document in ***Exhibit G1-E***.

50. Map of proposed subproject attached (in 1:50,000 scale Upazila Base Map) in the proposal will usually give an approximate indication of the subproject area. However, more detail maps will be prepared using GIS[5] over imagery showing the subproject boundary, khal and embankment alignments, roads, homestead areas, low-lying (beel) areas, agricultural fields, ponds, etc. and enabling the gross and net beneficiary areas to be determined accurately. If the subproject area falls in two Unions, the Union boundary must be shown visibly. These maps may be printed in A3 sheets for use in field reconnaissance. Contours may be digitized from the 4 inch to 1 mile (1:15,840) Water Development Maps (1965) with 1 ft contours[6]. As accurate digital elevation models (DEMs) become more readily available[7], land types (flooding types) may be quickly determined without the need of field topographic survey (like the 4 inch to 1 mile map with contour lines).

51. **STEP 6- Intensive Reconnaissance**: If the subproject proposal passes pre-screening, the PMO will organize field reconnaissance visit to the subproject area. The reconnaissance team will verify the subproject boundary and main physical features. If the subproject falls in two Unions, the reconnaissance team will discuss and advise on possible co-ordination between the two Unions on WMCA formation, sharing of LCS works and other

[4] Up to January 2009, proposals were presented to the Upazila Development Coordination Committee Meetings. With an elected local government now at the Upazilas, proposals will be presented to the Upazila Parishad.
[5] GIS software may be *Global-Mapper*, *Arcview* or just *Google earth*.
[6] Digitised maps (DEMS) based on the 4 inch to 1 mile maps are available from CEGIS but have not been made easily / freely available to LGED.
[7] JICA technical cooperation with Survey of Bangladesh under the Improvement of Digital Mapping System (IDMS) Project, 2008-2016, is expected to result in accurate DEMs becoming more readily available

interests if any. The field visit will include discussions with local stakeholders, develop a strong understanding of the constraints and the benefits from the proposed engineering works, confirm that the *Eligibility Criteria* (ref: ***Table IV-1***) are likely to be met, and culminate in a public *Farmer Meeting* on the last day. The reconnaissance team will ensure that independent discussions are held with stakeholders that are potentially negatively affected including fishermen and/ or those living upstream or downstream. To facilitate reconnaissance standardized checklists of information / criteria that are considered essential shall be consulted.

52. Intensive reconnaissance will confirm the subproject concept and if there is broad popular support for the proposed subproject. Following the field work a Reconnaissance Report will be prepared. The length of the report will vary according to the category/ type and size of subproject, but it will typically follow the following format:

(i) *Summary information* – location (including mention of two Unions if applicable), area, likely subproject category and type, coordinates, names of sponsors, any changes made to the submitted technical proposal, engineering works and likely cost, a risk assessment and recommendation on whether to proceed or not.
(ii) *Technical assessment* of soils, water resources, land types and cropping, subproject concept and engineering works proposed, and potential agricultural and fishery impacts/ benefits.
(iii) *Social and institutional assessments* (taking into considerations the case of two Unions if applicable) covering livelihoods, local demand for subproject, identification of "Village" in the area and environmental aspects.
(iv) *Mapping* and supporting data.

53. The duration and number of field visits required for the reconnaissance study will depend on the complexity and size of the subproject. Typically 1-2 days will be required for simple subprojects involving '*no flow regulation'* and 2-3 days for complex subprojects involving *'flow regulation'* and CAD subprojects.

54. Multi-disciplinary teams are used for reconnaissance, formed from among the staff of the IWRMU Planning and Design Section, PMO-Project Consultants and LGED Upazila staff including the SAE and Community Organiser. Project consultants will usually include a Water Resource Planning Engineer, an Agriculturalist, a Sociologist and a Fisheries Specialist.

55. **STEP 7–Participatory Rural Appraisal (PRA):** Following reconnaissance, the subproject proposals that get recommendation to proceed are assigned to eligible private sector FSDD firms[8] contracted for conducting PRA, feasibility studies and detail design of subprojects. The FSDD firms are given copies of the Reconnaissance Reports for their allocated subprojects and briefed by the PMO and Project Consultants.

56. Immediately after assignment of the subproject, the FSDD firm will undertake PRA for each of the subprojects to confirm if there is widespread local support for the subproject and to identify people, if there are any, who might be adversely affected by the subproject implementation. The PRA team will obtain quantitative data in specified forms on socio-economic composition and profile of the farmers and other beneficiaries of the subproject area. The PRA should preferably be done by the contracted FSDD firm unless specific requirements otherwise are there. The guideline for conducting PRA is given in document ***G3: Guidelines for Participatory Rural Appraisal*** of Subprojects. The PRA should be conducted through "Village"-wise, i.e. covering all the small villages "Gram" in the subproject

[8] FSDD firms are contracted under framework contracts to undertake PRA, feasibility studies, detailed design and tender document preparation and consultations with farmers

area. The PRA studies will be reviewed by PMO/Project Consultants. It would be a concise report suitable to be attached in the prefeasibility/feasibility report as an Annex. If PRA indicates wide spread support from local stakeholders and no significant adverse impact, the PMO issues instruction to FSDD firm to proceed with the subproject for prefeasibility analyses.

57. **STEP 8 – Planning Meeting and Pre-Feasibility Study**: If instructed by PMO after the PRA report, the FSDD firm will send a multidisciplinary Team of Consultants for a detail field visit, collection of agro-fisheries and environmental data and discussion with farmers and other local people. The FSDD firm will then prepare a detail conceptual planning of the subproject including locations, numbers and approximate dimensions of necessary hydraulic structures, construction/ repair-rehabilitation of embankments, excavation /re- excavation of khals and other farm level rural infrastructure, etc that gives a total subproject cost. Similarly, an estimate of subproject benefits will also be prepared based on agro-fisheries data collected and information received from field visit. Thus a conceptual plan for development of the subproject with required hydraulic structures, embankments, khals, etc is prepared along with assessment of expected benefits thereof.

58. With the conceptual planning of the subproject infrastructure and assessment of expected benefits, a subproject ***Planning Meeting*** is held at the subproject site with the beneficiaries through "Village"-wise approach, i.e. inviting beneficiaries from all the small villages and the Union level stakeholders, particularly the SAAO concerned for the subproject area, where the proposed engineering works are presented and the benefits anticipated from the subproject explained. If the subproject area extends over two Unions, the beneficiaries and Union level stakeholders (UP Chairmen, Members, SAAO) of both the Unions will participate in the planning meeting. The beneficiaries are also informed of the development process of the subproject including the requirement to form a Water Management Cooperative Association (WMCA) by the beneficiaries and raise the necessary upfront contribution for O&M of the subproject infrastructures before starting construction of the subproject. The notional amount of required upfront O&M contribution for the subproject and its sharing by the beneficiary farmer households on the basis of their lands benefitted will be explained in the meeting. The meeting may suggest modifications in the conceptual plan presented. Also there may be group of people who apprehend adverse impacts. Their concerns, the apprehended impacts and possible corrective measures that they think of should be described in the resolution of the meeting. Nevertheless, the *Planning Meeting* will adopt a broadly unanimous resolution to accord agreement to the conceptual planning of the subproject including modifications, if any, suggested in the meeting.

59. The Team of FSDD firm will discuss the prefeasibility status of the subproject including PRA findings and outcome of the Planning Meeting with UE and XEN, LGED. After the Planning Meeting, a *Prefeasibility Report* of the subproject is prepared by incorporating recommendations from the Planning Meeting and other additional data/information that might have accrued. The *Prefeasibility Report* will include boundary and scope of the subproject, engineering works as agreed by the beneficiaries and likely subproject cost, the expected benefits arising from the subproject, the preliminary economic viability index, etc with a digital index map of the subproject showing all the planned water management and other rural infrastructures.

60. **STEP 9- Proposal Cleared by DLIAPEC Meeting**: If, as an outcome of the intensive reconnaissance and the subsequent prefeasibility study and the Planning Meeting, the proposed subproject with its development plan prove to have widespread local support and likely to be economically viable, the Prefeasibility Report of the subproject is forwarded to the Executive Engineer, LGED for submission to, and clearance by, the *District Level*

*Inter-Agency Project Evaluation Committee (DLIAPEC)*[9]. The DLIAPEC meeting helps prevent duplication / overlap with other projects or activities of the various government agencies and Departments.

### 4.3 STAGE 2: Feasibility, Design and Institutional Establishment

61. After clearance of the subproject by DLIAPEC, the process of institutional development for the subproject is commenced through starting formation of a Water Management Cooperative Association at the subproject under the legal framework of the Cooperative Societies Act 2001 and the Cooperative Societies Rules 2004 in parallel with the technical process of feasibility study. The two processes are carried out in parallel but are discussed separately below.

#### 4.3.1 Technical Processes

62. **STEP 10- Feasibility Study:** Additional detailed data collection and surveys for appraisal and detailed design are undertaken by the FSDD firms. Social and socio-economic data will have largely been collected during PRA and Pre-feasibility Study. The focus at this level is largely on topographic surveys, water level and flow data and data required for appreciation of the constraints to water management, land use, agriculture, fisheries, and environment together with some other farm level facilities like, say, small access roads, culverts, community yards for crop processing, drying, etc. The collected data and information will be used to prepare a Feasibility Study to determine investment costs and accruable benefits.

63. While the duration and scope of the feasibility study will depend on the complexity – category and type - of the proposed subproject, the format of the Feasibility Study Report will be similar for all subprojects and comprise the following major heads:

(a) Introduction
(b) Subproject Overview and Development Concept
(c) Proposed Engineering Works and Costs
(d) Physical Environment (soils, land categories, water resources)
(e) Social Environment (land holdings, livelihoods, gender and poverty)
(f) Subproject Impacts/ Benefits and Management Measures (land category change, cropping and agriculture, fisheries, social and socio- economic impact, likely environmental impact)
(g) Stakeholder Interest and Social Viability
(h) Institutional Development
(i) Operation and Maintenance
(j) Implementation Plan and Economic Appraisal
(k) Recommendations and Conclusion

64. Standard Excel Spreadsheet Programs have been developed to facilitate subproject appraisal including changes in land type, pre-project and post-project production in agriculture and fisheries and economic viability indices (EIRR, NPV, B/C ratio). The PMO-Project Consultants and the IWRMU's Planning and Design Section will provide oversight guidance and quality control for the FSDD consultants works and the Superintending Engineer (P&D), IWRMU will accord approval to the FS Reports.

[9] The members of the DLIAPEC Meeting are: the LGED district Executive Engineer (Convener), one representative of the Deputy Commissioner, the BWDB Executive Engineer, the Deputy Director of DAE, district level officials of Livestock, Fisheries and Cooperative offices, the Executive Engineer of Bangladesh Agricultural Development Corporation (BADC), and concerned Upazila Engineer (Member Secretary).

65. **STEP 11- Detailed Design and Tender Document Preparation**: Engineering Designs, Drawings, Bills of Quantities and Tender Documents will be prepared by the FSDD firms and reviewed by the PMO-Project Consultants and the IWRMU's Planning and Design Section. Bill items should conform as far as possible to the latest LGED Schedule of Rates. This is facilitated by using LGED's Rate Schedule Estimate Preparation System, RSEPS – a Microsoft access program. Standard tender documents and specification of works are available for different size and cost categories of subprojects as well as for works to be done by LCS.

66. As the draft detail design of subproject infrastructure is being progressed, it is required that land for the WMCA office is identified. The WMCA office should be located at a well accessed and central place of the subproject area and requires at least 12 decimals (485 $m^2$) of land. Standard designs for WMCA office are available for both high and low lying areas - for low lying areas the office is raised on concrete columns. If specific Projects have special multi-function requirements of the WMCA offices, appropriate standard designs would be developed by respective PMO-Project Consultants and the IWRMU Planning and Design Section.

67. Following completion of preparation, the draft detailed designs will be presented to a ***Design Discussion Meeting (DDM)*** participated by the Managing Committee of WMCA, the beneficiaries from all the small villages including Village Representatives, the UP and UDCC members and knowledgeable village leaders. The DDM will be chaired by the Chairman of the WMCA. The design-drawings will be presented in large size (A1) maps and explained by the Design Engineer of the FSDD firm while the agriculturist, fisheries specialist and sociologist of the firm will assist him. The DDM will usually be attended by a planning / design engineer from the PMO-Project Consultants. If modifications in design of some structures are suggested by local stakeholders in the DDM, the Design Engineer will give due consideration to the suggestions and get all necessary explanations and data for the proposed modification and, if satisfied, will incorporate appropriate modification. Minutes of the DDM, signed by the Chairman of the DDM and the Upazila Engineer, will be copied to the IWRMU Planning and Design Section and the PMO.

68. **STEP12 - Safeguard Study:** Depending on requirements of development partner / GoB, Safeguards studies may be carried out by the FSDD firm as part of the Feasibility Study, or by a separate private firm/ NGO in which case a stand-alone separate report will be prepared.

69. Safeguards will cover environmental impact and mitigation, identification of any subproject affected persons and land acquisition.

70. As a minimum an Initial Environmental Examination[10] is prepared. The IEE will investigate and highlight all positive and negative environmental impacts that may arise as a result of subproject design, construction or post-construction operations. For all identified potential negative environmental impacts, the IEE will propose actions to be taken to mitigate these impacts to an acceptable level. If negative environmental impacts are significant and/ or unable to be mitigated to a satisfactory level, the subproject may be rejected.

71. The mitigation measures proposed in the IEE should be taken into consideration while preparing the engineering designs and discussed during the Detailed Design Meeting.

[10] The concerned Development Partners' requirements for Environmental Impact Assessment as well as Guidelines of DOE will govern the manner in which IEEs are prepared.

72. Most of the subprojects, including all *'without Flow Regulation'* types, will only require an IEE. In absence of any significant environmental impact, the IEE will be regarded as the final Environmental Assessment Report. A few of the subprojects, those that have significant negative impacts and those that involve construction of new embankments may require an Environmental Impact Assessment (EIA) to fulfil development partner safeguard conditions.

73. Any significant adverse impacts identified in the IEE (or EIA) reports are discussed in detail with the subproject affected persons for preparing suitable and acceptable mitigation options (see ***Box 2***). For example, the adverse impact of fisheries can be mitigated with fish friendly structures, fish friendly operation of regulator gates and training on culture fisheries. Other mitigation measures can include Integrated Crop Management practices, enabling country boat navigation by appropriate design of regulators, tree plantation, compost preparation for organic fertilizers use, etc.

BOX 2

Process to Incorporate Environmental Mitigation Measures

1. The proposed mitigation measures, if any, are first prepared as part of the Initial Environmental Examinations.

2. The mitigation measures are taken into consideration by designers while preparing the engineering designs and are an agenda item during the detailed design meeting discussions. The minutes specifically document discussion on issues associated with mitigation measures.

3. Based on this discussion, the proposed mitigation measures are revised.

4. The final Environmental Mitigation Plan includes the outcome of the design discussions and is signed at the same time as the Implementation Agreement.

5. The Mitigation Measures are implemented and monitored during construction and operation stages.

74. **STEP 13- Finalisation of Land Acquisition and PAP Compensation Plan:** A detailed inventory of individuals whose assets, crops or property are affected by the proposed subproject engineering works will be surveyed/ collected including land plans on *mouza* map (scale 1:330) and a subproject land acquisition/ resettlement and PAP compensation plan prepared.

### 4.3.2 Institutional Processes

75. **STEP 14- Formation of Organizing Committee:** In parallel with the technical process outlined in Steps 9 through 12, there will be an institutional process that also commence from the beginning of Stage-2. The first step in establishing the WMCA are discussions with beneficiaries leading to identification of respected local persons and formation of an Organizing Committee[11]. The formal appointment of OC members should be through an open public meeting of beneficiaries convened by the district Executive Engineer. The members shall be drawn in such a way that all villages of the subproject area are equitably represented in the OC. This should happen as soon as possible, preferably within two weeks of the DLIAPEC clearance. The tenure of this committee will be three months,

[11] The Organizing Committee is composed of 6-9 members drawn from the local stakeholders. At least one third of the members should be women. Members should have adequate literacy level, and no family relationship between one another. (Source: DOC Circular, 1 Mar. '04)

during which they will undertake activities leading towards formation of a WMCA for the subproject. The tasks of the Organizing Committee are to:

(i) Carry out Information Campaign and Household Inventory (see below) about the subproject and WMCA through wide publicity throughout the subproject area and among the beneficiaries.
(ii) Prepare the draft By-Laws of the WMCA, following the LGED Guidebook.
(iii) Promote WMCA Membership - enrol beneficiary households as members of the WMCA, by selling of shares.
(iv) Open a Capital Account in the name of WMCA with the nearest bank for deposition of share capital.
(v) Prepare a beneficiary list including names of beneficiaries and holdings – this is required for collection of O&M contributions (see below).
(vi) Establish an office of the WMCA at a central location, in rented accommodation. The office must not be set up in a private house, or in the office of the Union Parishad.
(vii) Maintain registers and books of accounts essential for a primary cooperative society (e.g. membership register, share register, book of proceedings, etc).

76. If desired and included for in a Project's design[12], a locally hired Community Assistant (CA), with intimate knowledge of the subproject area and the local people, may be recruited and trained by the Project. The CA will inform the local stakeholders of what steps they need to take and to assist community in organizing themselves. The CA will work closely with the Upazila-based LGED Community Organizer (CO) in providing guidance, motivation, and support to the local community. If Projects so require, Facilitators hired by the Project may be used as alternative to CAs.

77. Village Representatives will be introduced to act as focal person of respective village ("Gram") facilitating (i) communication between peoples of respective villages and the WMCA and (ii) making water management interest of the respective Villages considered in O&M plans. The detail on the position/status of Village Representative can be referred to sub chapter **1.4. In-depth/Village-wise approach**.

78. **STEP 15- Information Campaign and Household Inventory:** Supported by LGED and Project staff the Organizing Committee will carry out an information campaign at village level to ensure that all potential beneficiaries are made aware of the proposed subproject and promote wider understanding of the roles and responsibilities of local stakeholders. The information campaign may also be supported by folk drama programs, the Member Education Program, and LGED's quarterly newsletter in the water sector (*Pani Barta*). It is also recommended that a "**S*ubproject Fact Sheet***", a colour leaflet presenting the main features of the proposed subproject are prepared and distributed. Along with the information campaign an inventory is prepared of all households inside the subproject area and those that are Project Affected outside the area. In the process, beneficiaries, other relevant stakeholder groups, and respected local leaders will be identified and kept informed.

79. **STEP 16 - Prepare List of Beneficiaries:** A list of beneficiaries, ideally with a beneficiary (cadastral) map showing land holding location/ area, and how much each will contribute to the O&M costs will be prepared by the CO (and CA if appointed). These documents will be presented at a special General Meeting of the WMCA for discussion and approval.

[12] The experience with community assistants on the SSW-3 Project supported by JICA was disappointing. It was generally felt that District Based General Facilitators would have been much more useful.

80. **STEP 17 - Election of the First Management Committee:** Towards the end of its three-month tenure, the Organizing Committee will convene a General Meeting of the members of the WMCA to approve the draft By-Laws and elect a First Management Committee (FMC)[13]. The tenure of the elected FMC will be two years[14], during which the FMC will accelerate the institutional development of the WMCA carrying out the following activities:

(i) Continue to Promote WMCA Membership – enrolling members with a focus on beneficiaries, appointing a Cashier/Accountant, and conducting regular meetings.
(ii) Open a Fixed Deposit O&M Account in the name of WMCA for deposition of upfront O&M contribution – this account is jointly operated by the WMCA Chairman/ Secretary and the concerned LGED District Executive Engineer.
(iii) Open an Operating O&M Account in the same bank where the Fixed Deposit O&M Account has been opened. To this account, the profit from Fixed Deposit Account will be transferred so that the WMCA can use it for O&M works. O&M contribution collected for specific works or usual annual O&M collection will be kept in the Operating O&M Account. This account will be operated under joint signature of the Chairman and Secretary of the WMCA.
(iv) Collect O&M contribution from land owner beneficiaries and deposit into the Joint Fixed Deposit O&M Account[15]. The contribution is currently fixed at 3% of earthworks cost plus 1.5% of concrete/ permanent works cost.
(v) Resolving and mediating conflict.
(vi) Obtain registration of the WMCA from the District Cooperative Officer.
(vii) Sign Environmental Mitigation Plan.
(viii) Sign subproject Implementation Agreement in a public forum.
(ix) Oversee Stage 3 (Construction and First Year Joint-O&M) activities that fall within its period of tenure.

81. The FMC towards the end of its period of tenure will make necessary arrangements and conduct statutory election as per the Cooperative Societies Act and Rules, observing due process. The FMC will hand over the charge of the WMCA to the elected Management Committee (MC). This will end the term of the FMC. From then on, the elected MC will conduct the affairs of the WMCA as per the Cooperative Societies Act and the Rules and By-Laws of the WMCA. The period of tenure of each MC is three years.

82. **STEP 18 - Sign Implementation Agreement:** The activities related to Stage 2 of the subproject development process culminate in signing of the Implementation Agreement. This is a tripartite Agreement signed by the WMCA represented by the First Management Committee, the Executive Engineer of LGED and the Union Parishad Chairman. It defines the relationship between the parties, the rights and responsibilities of the WMCA and of LGED, and method of settlement of disputes. The standard format of IA is ***Form 4*** shown in ***Exhibit G1-F*** appended to this document.

[13] The FMC is normally composed of 12 members elected from the WMCA members. The FMC includes 1 Chairman, 1 Vice-Chairman, 1 Secretary, 1 Cashier and 8 members. At least one third of the FMC should be women. Members should have adequate literacy level, and no family relationship between one another. (Source: DOC Circular, 1 March 2004)
[14] As per The Cooperative Societies Act, 2013
[15] The upfront fund collected is deposited to the joint fixed deposit O&M account of the WMCA and District Executive Engineer of LGED. WMCA will maintain the record of members who contributed. The interest from the funds may be used for O&M of the subproject after its hand-over to the WMCA.

However, the IA cannot be signed unless the 12 pre-requisites (see ***Box-3***) are fulfilled. The pre-requisites are set to have the WMCA raised to an adequately enabled position in respect to its working ability to undertake responsibility of the subproject's O&M and management.

***BOX 3***
***Pre-conditions for Signing of Implementation Agreement***

*(1) An Organizing Committee (6-9 members) must have been constituted to frame By-laws for formation of WMCA in subproject area.*

*(2) Within 3 months (tenure of Organizing Committee), By-laws to be approved in a general meeting of local stakeholders, and First Management Committee to be elected. Members of the committee to be aged over 21yrs and receptive to training. At least 30% of the committee to be women.*

*(3) A minimum 70% of beneficiaries (including small and marginal farmers to have enrolled as members of the WMCA.*

*(4) Shares and savings to be collected from members regularly to build up WMCA capital.*

*(5) WMCA's monthly meetings for all members and weekly meetings for household clusters must have been held regularly for at least three months. Records to be kept of these meetings.*

*(6) WMCA office is to be established in a neutral locality. Union Parishad office or a member's house should not be used.*

*(7) WMCA to appoint its own Accountant / Cashier with qualification not be less than SSC and at least 30 years old.*

*(8) All WMCA books and records to be kept in a secured place as per Co-operative Rules.*

*(9) FMC to arrange for registration of WMCA as per Co-operative Act.*

*(10) Upfront O&M contribution for maintenance of infrastructures to be raised by WMCA and be kept as Fixed Deposit in a joint Bank account managed by XEN LGED and WMCA.*

*(11) Planning Meeting must have approved the infrastructure proposed for the subproject..*

*(12) For any negatively affected persons mitigation plan to be approved by the WMCA*

### 4.4 STAGE-3: Construction and First-Year Joint O&M

83. **STEP 19 - Land Acquisition and PAP Compensation:** Land required for permanent works of the subproject, as has been finalized in Step 13, shall be acquired in accordance with the land acquisition / resettlement process agreed for the project and payments made to the affected persons. Similarly, Project Affected Persons, if any, shall be compensated before start of construction works.

84. **STEP 20 - Tender Documents and Tendering:** Procurement for construction under National Competitive Bidding will follow the Public Procurement Rules 2008. Construction of concrete structures, irrigation canals and pipelines, WMCA office building and major (bulk) earthworks where excavation by machine is required, or where the section of khal to be re-excavated is wide, will be done through local contractors. Tender documents will typically be prepared by the FSDD firms/ Project Consultants and issued to District Executive Engineers by the PMO. The District Executive Engineers are the procuring entity and will implement the tender process and award contracts following administrative approval from the PMO. be avoided.

85. **STEP 21- Smaller Earthworks by Labour Contracting Societies:** To direct benefits of the project's investment to local poor and the vulnerable including women headed households, earthworks will usually be carried out by Labour Contracting Societies (LCS)

following LGED's LCS Management Guidelines. However, major (bulk) earthworks and earthworks in khal re-excavation where section of the khal is quite wide and/or deep cannot be done properly by LCS. These earthworks are appropriate to be done by tendered contract awarded to local contractors. That is to say, earthworks that are proportionate to locally available labourers will only be done by LCS. When LCS are formed, the list of vulnerable persons that is maintained by the Union Parishad will be used as a starting point in developing the roster of individuals invited to participate in carrying out the earthwork. Use of excavators within LCS contracts should, preferably, be avoided.

86. Reference lined sections and/or concrete block sections with concrete-post elevation markers should be compulsorily included in all khal re-excavation earthwork contracts including LCS contracts.

87. Depending on the requirements of any particular project, training on the use of labour shall be given first to the concerned District and Upazila LGED staff who become responsible for organizing, managing and delivery of works carried out by LCS groups.

88. **STEP 22- Main Construction by Contractor:** Construction of hydraulic and other structures, lined irrigation canals, buried irrigation pipelines, WMCA office buildings and large earthworks (large volumes or involving wide and/or deep khals/rivers) will be done through procured Contractors.

89. Construction and supervision of all works of subprojects, by contractor or by LCS, is the responsibility of the District Executive Engineers covering all aspects of construction including setting out, line and level control, materials and workmanship, implementation progress and financial payments. Under the Executive Engineer concerned LGED staff include: (i) Assistant Engineer at District level; (ii) Sub-Assistant Engineers of which there are usually three in each Upazila who would focus on construction of structures / WMCA office / pipelines; and (iii) a competent Work Assistants designated by the Upazila Engineer to assist with supervision of earthworks and to ensure that payments to labourers are in accordance with agreements.

90. Development partner funded projects will usually provide additional resources to the existing LGED construction supervision arrangements, for example at Upazila level in the form of a full time Construction Supervisor on site during construction as well as PMO and Project Consultancy staff to make intermittent visits, prepare variation orders and, often, to check final payment work quantities.

91. To try and ensure quality construction, construction contracts will include Performance Security Deposit and Retention Money, in accordance with the Public Procurement Rules 2008.[16] Payment of the last instalment to the contractor will only be effected after approval of the works by the concerned Executive Engineer and any other designated persons as may be required under a specific project.

92. Contractors will provide construction work records with photographs in the presence of LGED engineers. As-built drawings should be prepared after completion of the engineering infrastructure. Unless provision is made for this to be done under contract, this is the responsibility of the IWRMU Planning and Design Section. Copies of as-built drawings

[16] Although there are several ways to obtain the required protection, the Performance Security Deposit (normally 10%) is usually taken at the beginning of the contract and released on completion of the works and/ or at the end of the 1-year Maintenance Period. The Retention Money (normally 10% of the running bills) is released 50% at completion of the works and 50% at the end of the 1-year Maintenance Period.

should be handed over to the WMCA and Upazila Engineer. This is particularly important if there have been substantial changes to the tender drawings.

93. **STEP 23- Local Stakeholder Participation during Construction:** The participation of local stakeholders during construction primarily involves: (i) ensuring access to land, and (ii) monitoring construction related activities.

94. The WMCA will be involved in monitoring construction. The Implementation Agreement includes detailed procedures for this, allowing only the LGED to issue instructions to the contractor, while giving the WMCA and Union Parishad members the right to lodge written complaints to LGED. To ensure their independence, the WMCA Management Committee members cannot work as contractors in any of the construction works under the subproject. The WMCA will establish a *Construction Monitoring Committee*, consisting of five members from the WMCA, and two from the Union Parishad. The five members from the WMCA will be encouraged to subsequently join the O&M Subcommittee to ensure continuity and retention of knowledge and skills.

95. Upgrading embankments and channel re-excavation can involve disputes over land. It is the WMCA's responsibility to ensure that these disputes are resolved and that the subproject infrastructure can be built as planned. If necessary the Union Parishad members and/ or Chairman can be invited to help resolve such disputes (*see **Box 4** below*).

***BOX 4***
***Conflict Resolution***

The main aim of the institutional activities is to create a strong and broad-based water management organization. The organization will become the platform for all water resource management decisions affecting the subproject. This includes resolving the inevitable conflicts of interest between the various stakeholders.

For purposes of conflict resolution, the Union Parishad will be involved in accordance with their mandate. In general, the Union Parishad will act in an advisory capacity to the WMCA and to promote this role, the members of the Union Parishad will be provided with training.

For conflicts that cannot be resolved at the Union Parishad level, the matter will be raised to the Upazila Conflict Resolution Committee, a committee established for this purpose through a notice in the official gazette issued by the MLGRDC. The members will include relevant Upazila officers and the local Union Parishad Chairman. The committee would be authorized to conduct inquiries and to take measures to enforce its decisions and to take pre-emptive action.

96. **STEP 24- Institutional Support and Training for WMCAs:** In continuation of the activities initiated with their registration, and parallel to construction activities, the WMCA will continue to develop their capital resource base through the sale of shares and by encouraging members to make savings. These funds will be deposited into the Capital Account of the WMCA managed by the WMCA Management Committee. At the discretion of the WMCA these capital funds will be used to generate income through various means ranging from financing viable income generating activities (IGA) through providing credit to small farmers and businesses – the micro-credit.

97. The Project together with Department of Cooperatives (DOC) will provide periodic training on the management of WMCAs, including procedures and arrangements for elections[17]. In accordance with standard practice, DOC will also initiate regular inspection and audit of WMCAs upon their registration. Other key trainings for the WMCAs during

[17] The period of tenure for WMCA Management Committees is three years within which time elections must be held.

Stage 3 include Micro-credit Management, Gender and Development and Environmental issues.

98. **STEP 25- Agriculture and Fisheries Support:** While construction is ongoing, the WMCA will receive support from the Department of Agriculture Extension (DAE) and the Department of Fisheries (DOF) to prepare agriculture, and where relevant, fisheries development plans. These plans are intended to assist beneficiaries in optimizing benefits that accrue from the project investment in water management infrastructure. To facilitate implementation of these plans and to target trainings to, the WMCA will be encouraged to form subcommittees – Agriculture Subcommittee and Fisheries Subcommittee.

99. Project support is likely to include for Agriculture and Fisheries Facilitators at District level to ensure development and implementation of plans, identification of interested local beneficiaries and formation of the subcommittees. Training will be organized with DAE and DOF for representatives of WMCAs to act as champions to support improved practices. Training in fisheries will be targeted to professional fishermen in the subproject area.

100. **STEP 26- Poverty Reduction Plan:** Poverty reduction accrues from LCS works and local employment opportunities, micro-credit, increased local economic activities and from routine O&M carried out by the WMCA. If required by project, poverty reduction plans may be formulated to try and maximise the poverty reduction impact and trickle down of benefits.

101. **STEP 27- Establish O&M Subcommittee and Prepare Draft O&M Plan:** The O&M Subcommittee will be established for each subproject when construction progress reaches about 70%. The subcommittee, with support from the O&M Unit of IWRMU and Project Consultants, will prepare a draft O&M plan. This will be done in training workshops usually at District level, with follow-up in the field. The O&M plans reflect the categories of subproject: (i) for subprojects with flow regulation, O&M plans will include operation calendar of each structure to guide gates operation as well as maintenance; (ii) for subprojects with no flow regulation, O&M plans will include only maintenance plan.

102. Due to the onerous O&M requirements of CAD subprojects covering pumping and water distribution and deliveries, O&M Plans for these are relatively complex and separate trainings should be provided. This may include exchange visits to high performing CAD subprojects.

103. **STEP 28- Implement Environmental Mitigation Plan:** Implementation of subproject Environmental Mitigation Plan will require monitoring. Some mitigation measures involve provision of training programs, mainly related to agriculture and fisheries, and their timely delivery. This will be monitored by the PMO. Some mitigation measures involve operation of the infrastructure; for example, keeping gate of sluices open for some period during the breeding season to allow fish fry to enter the subproject area, or holding an extra amount of water in the area in order to support the fisheries habitat. In this case, the implementation of the mitigation measure rests with the WMCA, and monitoring is carried out by the LGED Sociologists and the Community Organizers.

104. **STEP 29- Joint Inspection of Works upon Completion:** Following completion of works by the Contractor, a joint inspection is carried out by Executive Engineer, LGED together with Project Consultants, WMCA Management Committee, Construction Monitoring Committee and the Contractor. The joint inspection will particularly focus on construction of gates of hydraulic structures – their easy and flawless lifting and closing and leak-proof water sealing and appropriate painting, greasing, etc. For hydraulic structures, if defects/outstanding works are such that they prevent immediate putting of the structures to use, those defects/outstanding works must be rectified by the Contractor immediately making the structures fully fit-for-use and handover to the WMCA. Any other minor defects/

outstanding works to be rectified in the maintenance (defects liability) period shall be identified and their committed dates of rectification, decided based on functioning of the structures, shall be mentioned in the joint inspection report. If the immediate rectification needs mentioned above have been addressed and the works are otherwise considered substantially complete, then a Handover Certificate may be issued by the District Executive Engineer mentioning in it the committed dates of rectification of the defects/outstanding works by the Contractor.

105. **STEP 30- Handover and Lease Agreement:** After all defects/ outstanding works of all hydraulic structures have been rectified/completed and the hydraulic structures are fully fit-for-use which will be physically checked jointly by Upazila Engineer, MC of WMCA and the O&M Subcommittee and a Handover Certificate issued by the Executive Engineer, the WMCA enters into a formal tripartite user-right Handover and Lease Agreement with LGED and the Union Parishad on the use of embankments, structures, drainage khals, irrigation canals / pipelines and other facilities[18]. The yet other minor defects/outstanding works mentioned in the joint inspection report will be rectified by the Contactor within the 12-month defects liability period. This Handover Lease Agreement will be signed provided the following conditions are met:

(i) A O&M Subcommittee has been established by the WMCA.
(ii) An O&M Plan, satisfactory to the IWRMU-O&M Unit, will have been prepared by the O&M Subcommittee and agreed upon by the General Meeting of the WMCA.
(iii) Any outstanding land or asset issues are resolved.
(iv) Subproject infrastructure has been designed and constructed as per the contract to the satisfaction of the WMCA and all gates of hydraulic structures are checked for full length opening and closing easily and in a leak-proof condition and defects, if any found, rectified to make them fully fit-for-use and functional. The standard format for Handover and Lease Agreement is in ***Form 5*** given in ***Exhibit G1-G*** appended to this document.

106. **STEP 31- Joint O&M:** Operation and maintenance of the subproject infrastructure will be supported by LGED for 12 months after completion of construction (date of the Completion Certificate). The WMCA and its O&M Subcommittee will remain associated with LGED in a joint O&M program from the date of Handover Lease Agreement. During this period, LGED will assist/ advise the WMCA and O&M subcommittee on operation of gates of the sluices/regulator/WRS structures, implementation of the O&M plan and its modification as required, joint walkthroughs/ inspections of engineering works and training and discussions on how to maximise benefit from the subproject infrastructure.

### 4.5 Stage 4: Sustained Operation and Maintenance

107. The main activities of Stage 4 are concerned with building capacity for operation and maintenance, agricultural and fishery extension support, and grading of subprojects to assess performance and focus on support needs. Collected data are entered into the Management Information System (MIS) database.

108. **STEP 32- Final O&M Plans and Training**: The draft O&M Plans prepared in Stage-3 during classroom training of O&M Subcommittees should be reviewed and amended as necessary in light of the first year of operation and maintenance of the subproject. This is best done by the O&M Subcommittee at the subproject level with support from Project / LGED staff. Additional classroom trainings should be held as appropriate, particularly for the

[18] Public water bodies over 8 ha may be leased to WMCAs from the Ministry of Land, and up to 8 ha from the Ministry of Youth and Sports.

complex subprojects including CAD subprojects. These may focus on how operation of gates of the sluices/ regulators/ WRS and the irrigation systems may be improved to maximize crop and fishery production.

109. O&M activities include: (i) operation of gates of hydraulic structures according to the Gates Operation Schedule provided in the draft O&M Plan for each structure which might have been modified based on 1st year's joint O&M program; (ii) collection of funds for O&M in a manner decided and agreed by local beneficiary stakeholders of the WMCA; (iii) pre- and post-monsoon Joint Walkthrough surveys to assess condition and maintenance needs; and (iv) carrying out maintenance works as and when required.

110. **STEP 33- Subproject O&M Support & Grading:** Upazila and District Office of LGED under administration of the IWRMU support field operation with a focus on: (i) strengthening the WMCA institution, O&M Subcommittee, fund collection and use, conflict resolution and membership; (ii) improving system operations to maximise production; (iii) to assess infrastructure condition and ensure system maintenance, both routine and periodic, by the WMCA with walkthroughs, good planning and timely maintenance; and (iv) to support Agricultural & Fishery livelihood activities and Gender. Firms may be able to support these activities.

111. Based on the outcome by the JICA TCP, The support by Union stakeholders such as Union Parished and field offices of Nation Building Departments (NBDs) will be also highly expected, and the Subproject O&M issues can be discussed in the Union Development Coordination Committee (UDCC) meeting.

112. To inform the managers of the level of O&M support required as well as the success of subproject investments, and to better target Government O&M funds [19] to support maintenance, it will be assessed/graded: (i) subproject institutions – WMCA and the Subcommittees; (ii) the condition and performance of engineering infrastructure; and (iii) O&M performance. Simple, standardized reports (with grading assessments) will be filled out and submitted to LGED at district and central (IWRMU) level as well as to the PMO through new IWRM-MIS.

113. O&M funding support is available from LGED-IWRMU subject to maintenance funding criteria being met for which information is collected primarily by the O&M grading assessments. These criteria include: (i) subproject originally developed by LGED; (ii) WMCA is registered with DoC and has a standing Management Committee; (iii) LGED funds are only to support periodic and/ or emergency maintenance; (iv) the WMCA has an O&M account; and (v) the WMCA makes a contribution to the maintenance cost. In addition, priority will be given to subprojects where the investment is likely to be low-risk and lead to increased production. Subprojects are not eligible for O&M funding support in the first 3-years after handover.

114. Performance Enhancement (PE) supports may also be available from development partner funded projects for construction of additional engineering infrastructure within a subproject area if it would further enhance agriculture (and fishery) production in subprojects. To assess eligibility and determine required PE works a rigorous Performance Enhancement Assessment (PEA) is carried out (*Refer Chapter V*).

115. **STEP 34- Agriculture and Fisheries Support:** Support for agriculture and fisheries will continue parallel with O&M support, and include refinement and implementation of the

[19] Government O&M funds may not be used for routine maintenance, but may be used to support periodic maintenance (matching fund concept) and to fund emergency maintenance where infrastructure has failed for some reason

agriculture, and where relevant, fisheries development plans prepared in Stage 3. LGED and project efforts will be supported by work of the extension officers of DAE and DoF.

116. **STEP 35- WMCA Monitoring Support by DoC**: These supports to WMCA will be provided by the DoC which is supported by the Water Cell established in it with assistance from LGED's SSWRD Projects in recognition of the increasing workload being put onto the existing facilities of DoC due to the WMCAs. The DoC (Water Cell) will oversee management of the WMCAs, audit WMCA accounts and micro credit activities annually and assist in elections of the MC every three years. The DoC (Water Cell) maintains its own data base to monitor the WMCA institutions. However support will also be provided by LGED and project retained staff.

117. During the first and subsequent years of operation, the WMCA is likely to spend considerable time resolving conflicts of interests between the various stakeholders. If the WMCA is unable to resolve a conflict it would invite others to mediate. Normally this would start with the Union Parishad Chairman. If it cannot be solved at the Union Parishad level, the matter will be referred to the Upazila Conflict Resolution Committee (*see* ***Box 4***).

118. The WMCAs may have access to funding from the Livelihood Improvement Trust (LIT) established by LGED. Activities from the LIT fund could include productive micro-infrastructure, livelihood support (inputs, tools, equipment, etc.) for productive activities, and skills development. Support to micro-credit activities can also be provided to WMCAs who decide to carry out this activity.

119. **STEP 36- Effects Monitoring and Evaluation:** This is likely to be required by Development Partners and include an annual assessment of agriculture and fishery production from subprojects. These EME assessments may be combined with, or made separate from, the O&M grading assessments. Over several years these assessments allow a picture to develop of the changes that occur as a result of the investment in water management infrastructure.

120. **STEP 37- Benefit Monitoring and Evaluation (Impact Survey):** These comprise establishment of a pre-project baseline with impact surveys following about five years after construction. The surveys are usually contracted to an Impact Monitoring firm and supervised by the PMO-Project Consultants. The surveys cover social-economic aspects, water resource management, agriculture, fisheries and environment. They are carried out over a representative sample of 5-10% of implemented subprojects.

121. **STEP 38- Management Information System:** The new database system called IWRM-Management Information System (MIS) has been developed through merging the conventional module and new one by JICA TCP. The conventional database had been maintained jointly by project and LGED staff and records project implementation, which comprises the following modules: (i) Planning; (ii) Design & Construction; (iii) Institutional Development; (iv) O&M (during implementation); (v) Enhancement and (vi) Training. The new database comprises the following modules: (i) General; (ii) O&M; and (iii) Enhancement (Performance Enhancement).

122. The new database system uses MS-SQL software for enhanced security, and allows direct entry of data and printing out of data reports by Districts as well as Dhaka head office based staff.

123. The new IWRM-MIS inform the progress and success of LGED's SSWR Development activities.

**Figure IV-1 Subproject Development Process Stage 1- Identification, Prefeasibility and Clearance (3-6 months)**

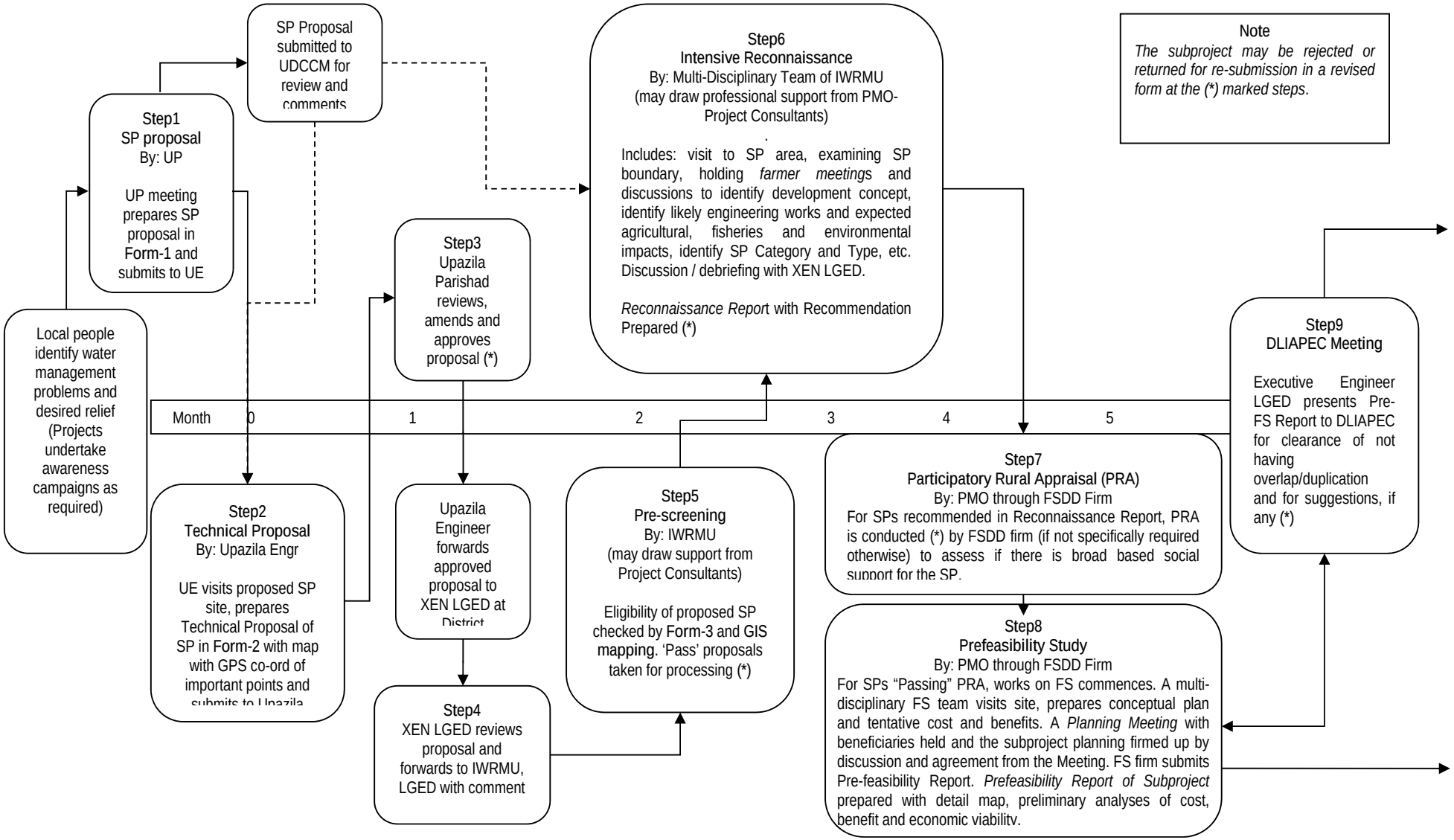


**Figure IV-2 Subproject Development Process Stage 2–Feasibility Study, Design and Institution Establishment (8-18 months)**

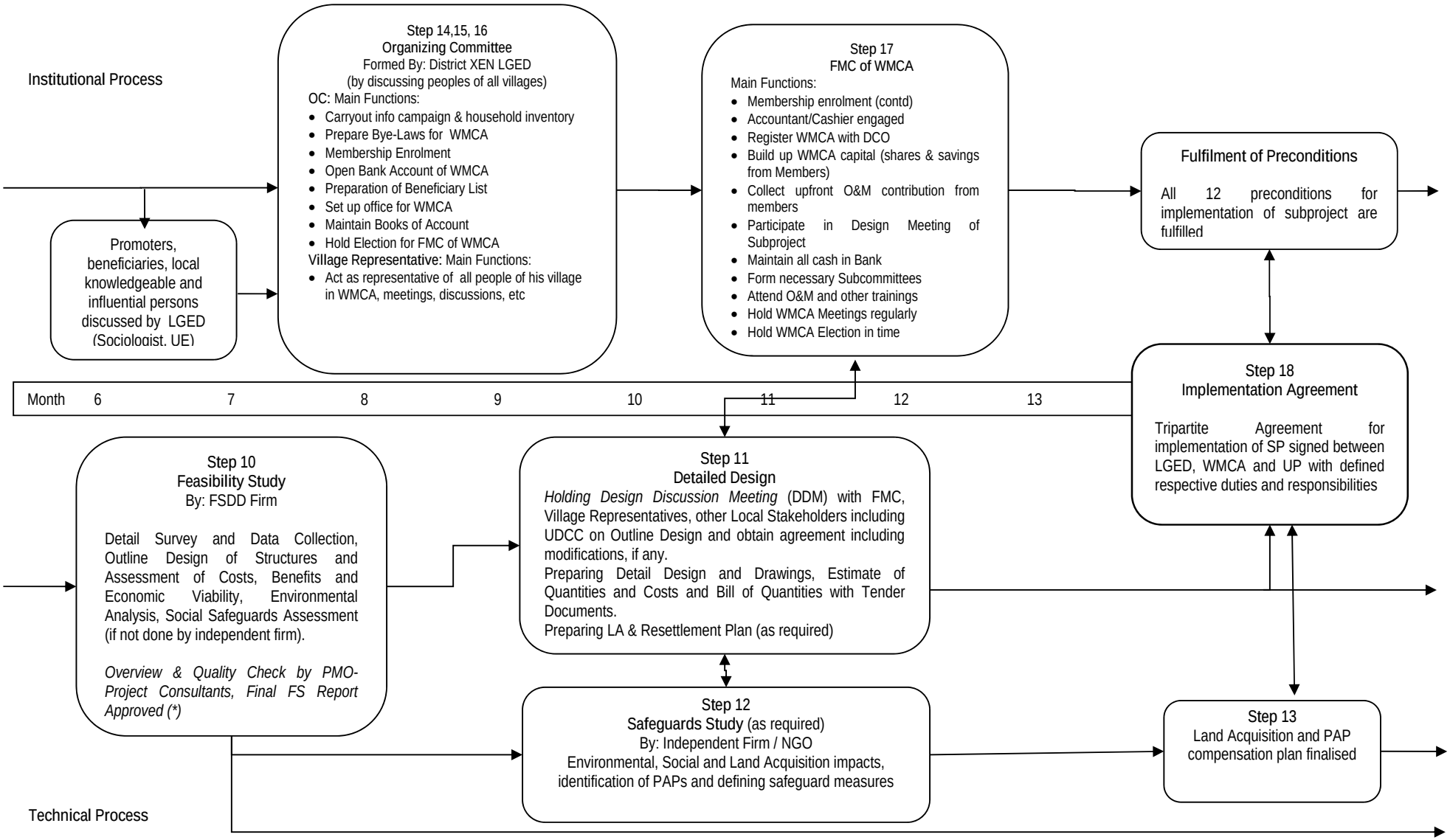


**Figure IV-3 Subproject Development Process Stage 3 - Construction and First Year O&M (6-36 months)**

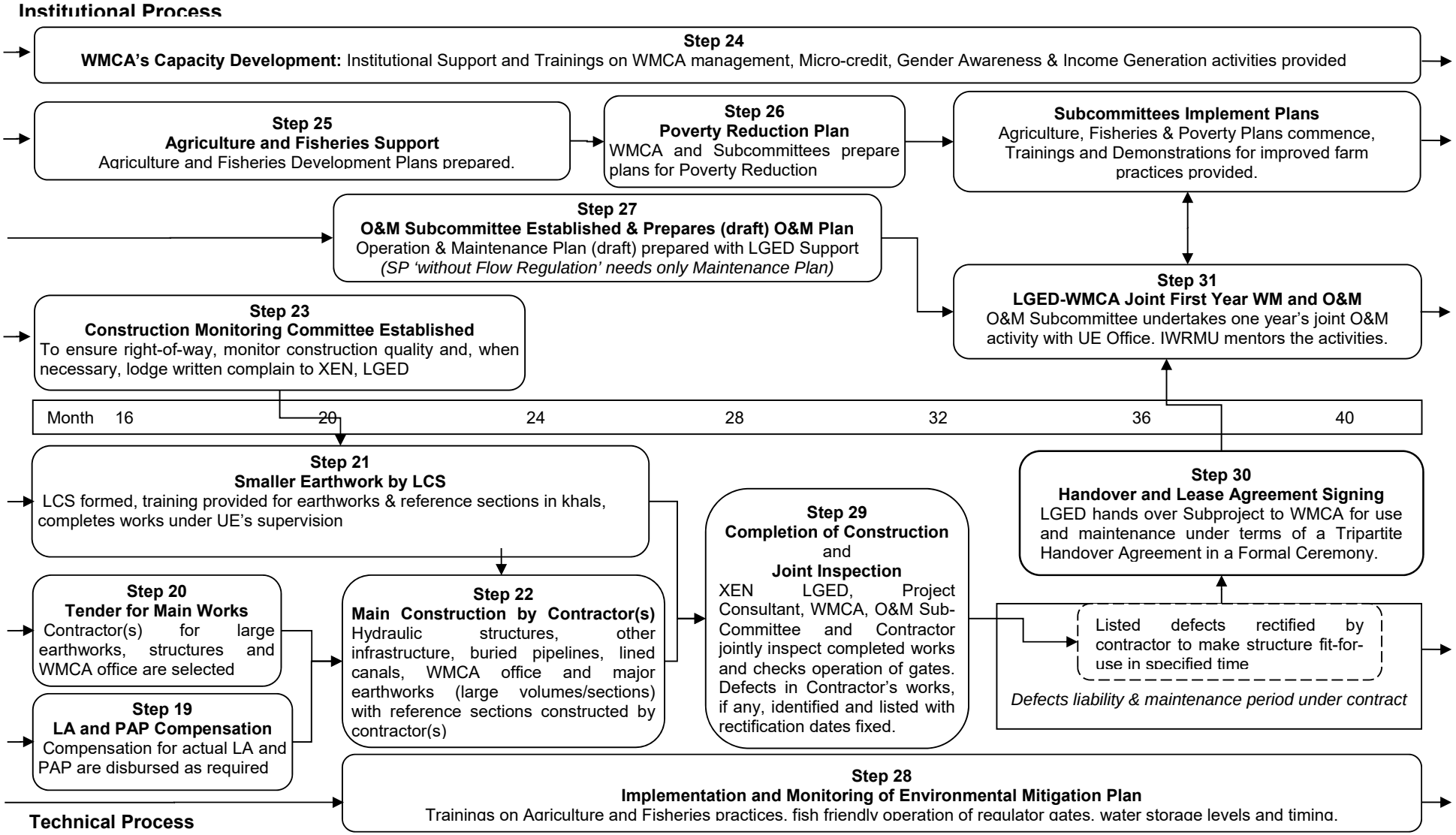
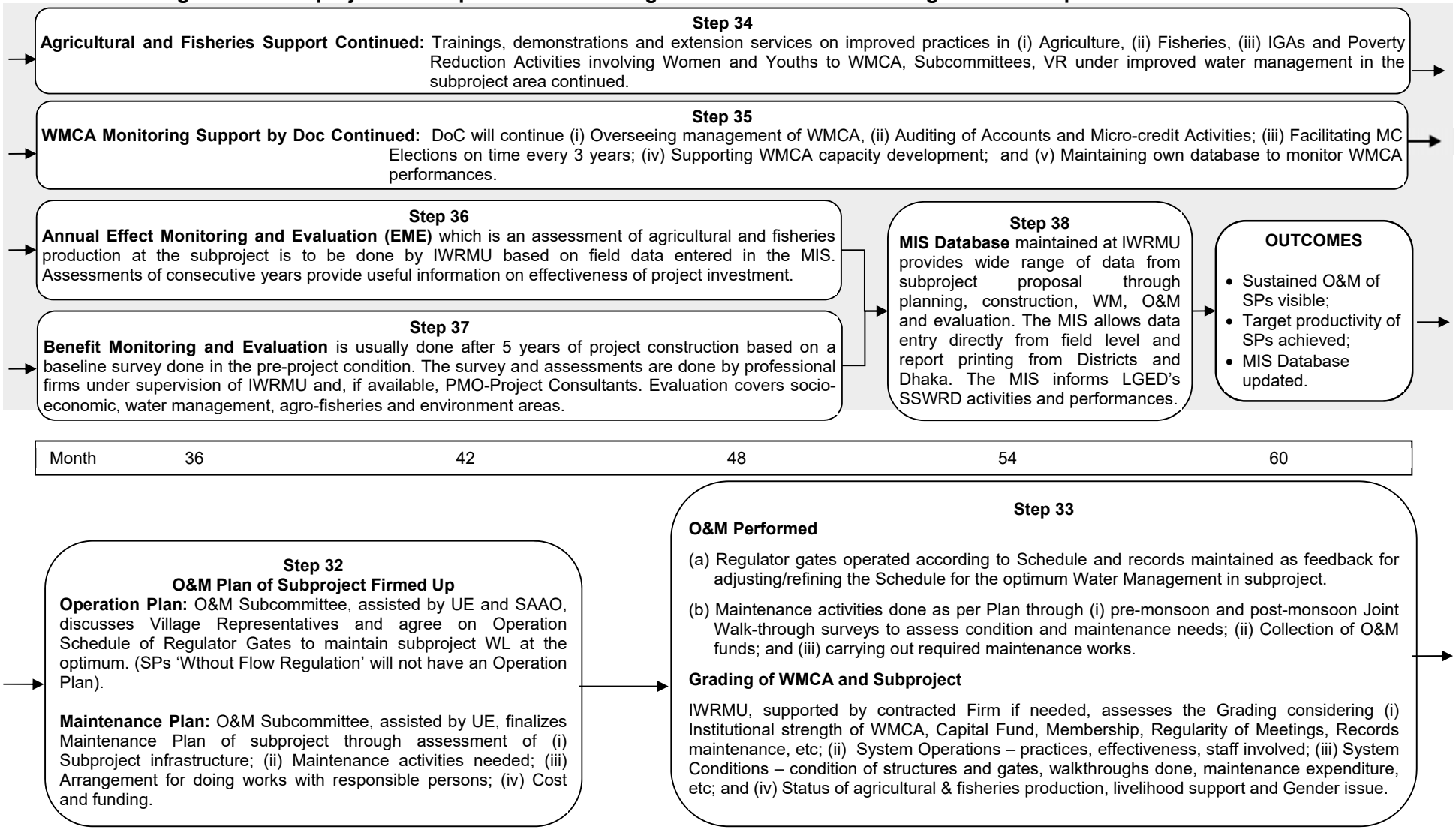


**Figure IV-4 Subproject Development Process Stage 4 - Sustained Water Management and Operation & Maintenance**



# V. PERFORMANCE ENHANCEMENT

## 5.1 Introduction

124. For some subprojects rehabilitation and/ or extension or improvement works may be required which are too extensive in scope to be covered by periodic maintenance, but which are desired as they will enhance subproject performance and provide additional agricultural and fisheries benefits. Without being exhaustive such potential works could include:

- Major works to existing structures such as crest level changes, provision of additional spans (vents) or works to rectify damage due to erosion of part of the structure.
- Construction of additional/ new structures for better water control and/ or for improved access within the subproject area.
- Construction of WMCA offices where these were not previously provided.
- For CAD subprojects, extension of buried pipelines or open (lined) canals; replacement of concrete pipelines with uPVC pipes; and construction of associated and additional structures such as flow control structures at the head of major branch pipelines.
- Additional works to extend and/ or strengthen embankments or deepen khals, provided these were not included in the originally funded subproject.
- Construction of facilities for drying and processing of agricultural produce/ seeds, etc.

125. Performance Enhancement engineering infrastructure works may be costly and the beneficiary funding contribution shall be as for "new" subprojects, i.e. a percentage of the proposed works, currently 3% of earthworks and 1.5% of concrete/ permanent works.

126. To qualify for performance enhancement a subproject will have to meet the eligibility criteria tabulated below, *Table V-1*. These may vary between projects as agreed with development partners.

**Table V-1: Eligibility Criteria of Subprojects for Performance Enhancement**

| Nr | Criteria | Requirement |
|---|---|---|
| 1 | Existing Handed-over Subprojects | The subproject must have been developed by LGED under a previous SSWR development project (SSW-I, SSW-II, etc), and properly handed over to the WMCA for management, operation and maintenance. |
| 2 | Beneficiary Request | The request for performance enhancement must emanate from the beneficiaries. |
| 3 | Status of WMCA and Contribution | Preference shall be given to subprojects where WMCAs have demonstrated capability and commitment though MC elections, membership, fund collection, etc. If necessary, the beneficiaries must agree to update the WMCA and hold election for a fresh MC. Nevertheless, the beneficiaries must agree to make the required upfront contribution for the PE infrastructure works[20]. |
| 4 | Nature of Engineering Works | Performance enhancement works shall not include any (routine or periodic) maintenance works – for example re-excavation of a khal already excavated by LGED is not permissible[21]. Works may however include any of the following: (i) new structures/ works which will increase |

[20] Upfront contribution shall be as for new subprojects, currently 3% of earthworks cost and 1.5% of concrete/ permanent works cost, or as mutually agreed with Development Partners for a particular project.
[21] Khal re-excavation may be supported by LGED using funds allocated for maintenance.

| Nr | Criteria | Requirement |
|---|---|---|
| | | production in the subproject – for example a new regulator, extension of a khal/ embankment, provision of an office building or a pump station; (ii) rehabilitation of structures where this is clearly beyond the scope of WMCA/ periodic maintenance. |
| 5 | Economically Feasible | The proposed works shall be economically viable and/ or be within cost limits specified |

127. The sequence of activities and the interaction between the technical and institutional processes for performance enhancement are presented on *Figure V-1* and *Figure V-2* and are described below for each activity Step[22].

## 5.2 STAGE 1: Identification, Screening and Appraisal

### 5.2.1 Technical Process

128. **STEP 1- Identification of PE Subproject:** There are two routes for identification of subprojects for performance enhancement. By the first route (Step1A), the failed / poorly performing subprojects are identified by LGED where the main reason for poor performance is engineering infrastructure deficiency/ failure which LGED has some responsibility to address. The second route (Step1B) may be, for any subproject, where the WMCA requests additional engineering works to further boost agriculture production and subproject performance.

129. Where performance enhancement is requested by the WMCA it should convene an extra General Meeting among its members to seek support for submitting an application. The application should describe the works required and be sent together with the resolution of the General Meeting to the concerned Upazila Engineer with a copy to the Union Parishad.

130. **STEP 2- Completing and Forwarding PE Application:** The Upazila Engineer assisted by his staff will prepare the PE application with justification, scope of engineering works required and status of the WMCA – membership, whether there is a standing/ elected Management Committee, etc. Where the application originates from the WMCA, the WMCA application shall be appended to that prepared by the Upazila Engineer.

131. If substantial new works are proposed it shall also be presented for discussion and comment in a meeting of the Upazila Parishad. The completed application shall be sent to the District Executive Engineer for review/ comment and forwarding to the IWRMU/ PMO. Standard format shall be used for the application.

132. **STEP 3- Screening of Application:** The application shall be checked for completeness and meeting of eligibility criteria by the IWRMU/ PMO–Project Consultants and registered in the MIS. A field visit may be made to check the application.

133. **STEP 4- Appraisal and Justification Report**: If the application passes screening then appraisal is required to: (i) complete institutional, technical and O&M grading surveys, and (ii) assess the necessity, eligibility, local stakeholder demand and cost and technical feasibility of the proposed engineering works.

[22] In this document, “Steps” are numbered for easy reference. Steps are not necessarily in sequence, and some Steps are performed in parallel.

134. The grading survey process is a tool to allow for consistent appraisal of the existing status/ condition of WMCAs and subproject engineering infrastructure. Each category of subproject has its own grading checklists.

135. Depending on the cost of the proposed works, economic appraisal should be carried out. The following is suggested, or as otherwise agreed with development partners.

| PE Cost for subproject | | Economic Appraisal Requirement |
|---|---|---|
| Tk | US$ | |
| < 4.0 million | < 50,000 | None |
| > 4.0 million | > 50,000 | Cost / benefit analysis required |

136. Appraisal shall be carried out by a multi-disciplinary team usually comprising at least a hydraulic engineer, agriculturalist and sociologist from a Performance Enhancement Appraisal (PEA) firm. For relatively minor performance enhancement, appraisal may be assigned to the PMO/ Project Consultants together with LGED staff.

137. Appraisal shall include beneficiary consultations culminating in a special General Meeting of local stakeholders for discussion and approval of the proposed PE works. The minutes of the meeting shall be signed by the WMCA Chairman and the Upazila Engineer.

138. The multi-disciplinary team will then prepare a Justification Report detailing the grading assessment results, proposed works, costs, expected benefits and justification. Depending on scope and complexity, the appraisal and preparation of the Justification Report may take just a few days or several weeks.

139. If required the Justification Report may be sent to the concerned Development Partner for concurrence.

140. **STEP 5- Field Survey, Detailed Design and Tender Documents:** Field survey and detailed design shall be carried out and cost estimates and tender documents prepared for the proposed engineering works by PEA firm or PMO/project consultants as the case may be.

### 5.2.2 Institutional Process

141. **STEP 6- Preconditions Fulfilled by WMCA:** Parallel to the technical processes outlined above, the WMCA shall fulfil the preconditions for PE works. These include, as required: (i) re-election of the Management Committee; (ii) re-establishment of subcommittees, in particular the O&M subcommittee; (iii) reappointment of necessary staff such as gate operator and bookkeeper/ accountant; (iv) updating of records; and (v) collection and deposit of the required upfront contribution to the fixed deposit bank account jointly controlled by the WMCA and the District XEN.

142. As required, institutional support/ training shall be given to the WMCA, the MC, the subcommittees- particularly the O&M subcommittee to enable them to manage WMCA activities and its accounts, and fulfil all preconditions including collecting the required fund contribution.

143. **STEP 7- Sign PE Agreement:** Following completion of appraisal and subject to the preconditions for performance enhancement works being fulfilled, a PE Agreement is signed by the Management Committee, the Executive Engineer of LGED and the Union Parishad Chairman. It defines the relationship between the parties, the rights and responsibilities of the WMCA and of LGED, and settlement of disputes.

## 5.3 STAGE 2: Implementation and Sustainable WM and O&M

### 5.3.1 Technical Process

144. **STEP 8- Tendering and Award of Major Works:** Procurement for construction under National Competitive Bidding will follow the Public Procurement Rules 2008. Construction of structural works and any major (bulk) earthworks, including reference lined sections and/ or concrete block sections with pre-cast post elevation markers in cases of re-excavation of khals, will be awarded to local contractors. Tender documents will typically be prepared by the PEA firms/ Project Consultants and issued to District Executive Engineers by the PMO. The District Executive Engineers are the procuring entity and will implement the tender process and award contracts following administrative approval from the PMO.

145. If any land is required for the permanent works it shall be acquired in accordance with the resettlement/ land acquisition process agreed for the project. Similarly, any project affected persons shall be compensated. This shall be done before start of construction works.

146. **STEP 9- Labour Contracting Society Works:** To direct benefits to local poor and vulnerable including women headed households, smaller earthworks will usually be carried out by Labour Contracting Societies (LCS) following LGED's LCS Management Guidelines. When LCSs are formed, the list of vulnerable persons that is maintained by the Union Parishad will be used as a starting point in developing the roster of individuals invited to participate in carrying out the earthwork. Use of excavators within LCS contracts should be avoided. Works by LCS and tendered works should not overlap.

147. For khal re-excavation works, reference lined sections and/ or concrete block sections with pre-cast post elevation markers if applicable, must be included in LCS contracts.

148. If earthwork by LCS is involved, training on use of labours may be provided to the concerned District and Upazila LGED staff who become responsible for the organization and delivery of works carried out by LCS groups.

149. **STEP 10- Construction of Major Engineering Works:** Implementation of construction is the responsibility of the District Executive Engineers who responsible for all aspects of construction including setting out, line and level control, materials and workmanship, implementation progress and financial payments. Other concerned LGED staff include: (i) the Assistant Engineer at District level; (ii) Sub-Assistant Engineers at Upazila level; and (iii) Works Assistants designated by the Upazila Engineer to assist with supervision of earthworks and to ensure that payments to labourers are in accordance with agreements.

150. Development partner funded projects will usually provide additional resources to the existing LGED construction supervision arrangements, for example at Upazila level in the form of a full time Construction Supervisor on site during construction as well as PMO-Project Consultancy staff to make intermittent visits and check quality and final payments.

151. To try and ensure quality construction, construction contracts will include a Performance Security Deposit and Retention Money, in accordance with the Public Procurement Rules 2008.[23] Payment of the last instalment to the contractor will only be

[23] Although there are several ways to obtain the required protection, the Performance Security Deposit (normally 10%) is normally issued at the beginning of the contract and released on completion of the works and/ or at the end of the 1-year Maintenance Period. The Retention money

effected after approval of the works by the concerned Executive Engineer and any other designated persons as may be required under a specific project.

152. Contractors will provide construction work records with photographs in the presence of LGED engineers. As-built drawings should be prepared after completion of the engineering infrastructure. Unless provision is made for this to be done under contract, this is the responsibility of the IWRMU Planning and Design Section. Copies of as-built drawings should be handed over to the WMCA and Upazila Engineer. This is particularly important if there have been substantial changes to the tender drawings.

153. The WMCA will be involved in monitoring construction and this will be done by the Construction Monitoring Committee. It is the WMCA's responsibility to ensure that any disputes that may arise are resolved and that the works can be built as planned. If necessary the Union Parishad Chairman can be invited to help resolve such disputes.

154. **STEP 11- Joint Inspection and Defects Rectification:** Following completion of the works a joint inspection is carried out by Executive Engineer, LGED together with Project Consultants, WMCA Management Committee and the Construction Monitoring Committee and the Contractor. The joint inspection will particularly focus on construction of gates of hydraulic structures – their easy and flawless lifting and closing and leak-proof water sealing and appropriate painting, greasing, etc. For hydraulic structures, if defects/outstanding works are such that they prevent immediate putting of the structures to use, those defects/outstanding works must be rectified by the Contractor immediately making the structures fully fit-for-use and handover to the WMCA. Any other minor defects/ outstanding works to be rectified in the maintenance (defects liability) period shall be identified and their committed dates of rectification, decided based on functioning of the structures, shall be mentioned in the joint inspection report. If the immediate rectification needs mentioned above have been addressed and the works are otherwise considered substantially complete, then a Completion Certificate may be issued by the District Executive Engineer mentioning in it the committed dates of rectification of the defects/outstanding works by the Contractor.

155. **STEP 12 - Handover PE Works and Amendment in Lease Agreement:** With the Contractor having completed the immediate rectifications needed to make the structures, etc fully fit-for-use which will be physically checked jointly by Upazila Engineer, MC of WMCA and the O&M Subcommittee, the PE works are handed over to the WMCA ceremonially along with amendment of the previous Lease Agreement to include the new infrastructure components in it.

### 5.3.2 Institutional Process

156. **STEP 13- Updated O&M Plan:** The WMCA and O&M Subcommittee with support from the IWRMU (O&M Section) and Project Consultants will review and update its O&M plan to take into account the completed performance enhancement works. Classroom trainings may be arranged if required, for example if new O&M subcommittees have been formed. Training may focus on how operations can maximize crop and fishery production.

157. **STEP 14- O&M Support and Grading:** This is the responsibility of the IWRMU (O&M section) as well as LGED staff at District and Upazila level, with support from Project Consultants and/ or O&M firms when applicable.

158. Subproject O&M support activities may include: (i) strengthening the WMCA institution, O&M subcommittee, fund collection and use, conflict resolution and membership;

(normally 10% of the running bills) is released 50% at completion of the works and 50% at the end of the 1-year Maintenance Period.

(ii) improving system operations to maximise production according to the revised O&M Plan; and (iii) assessment of infrastructure condition and ensuring system maintenance – routine and periodic - by the WMCA with walkthroughs, good planning and timely maintenance.

159. To inform managers of the exact level of support required as well as the success of the performance enhancement investment, O&M grading will assess and grade: (i) the subproject institutions – WMCA and subcommittees; (ii) the condition and performance of engineering infrastructure; and (iii) O&M performance.

160. Simple, standardized grading assessment reports will be used and submitted to LGED at district and central (IWRMU) level as well as to the PMO and entered into MIS. O&M grading should be carried out within 1-2 years after completion of performance enhancement works, and prior to any O&M funding support.

161. **STEP 15- Institutional Support:** Depending on need/grading results institutional support will be provided to the WMCA. This support may be to assist the WMCA, including closer supervision and training, to further develop their capital resource base through increasing member enrolment, the sale of shares and by encouraging members to make savings, and/ or for microcredit activities.

162. The DoC (Water Cell) will check WMCA accounts and micro credit activities annually and assist in elections of the MC every three years. The DoC (Water Cell) maintains its own data base to monitor the WMCA institutions. However support will also be provided by LGED and by project retained staff.

163. **STEP 16- Agriculture and Fisheries Support:** Support to the WMCA for agriculture and fisheries development will continue parallel with O&M support, and include refinement and implementation of the agriculture, and where relevant, fisheries development plans prepared previously. LGED and project efforts will be supported by the extension officers of DAE and DoF.

164. **STEP 17 - Monitoring and MIS Updating:** The IWRMU will monitor all completed PE subprojects, ensuring that data is entered into its MIS database, including findings on performance enhancement and O&M grading assessments.

**Figure V-1 PE Stage 1 – Identification, Screening and Appraisal of PE Subprojects (4-8 months)**

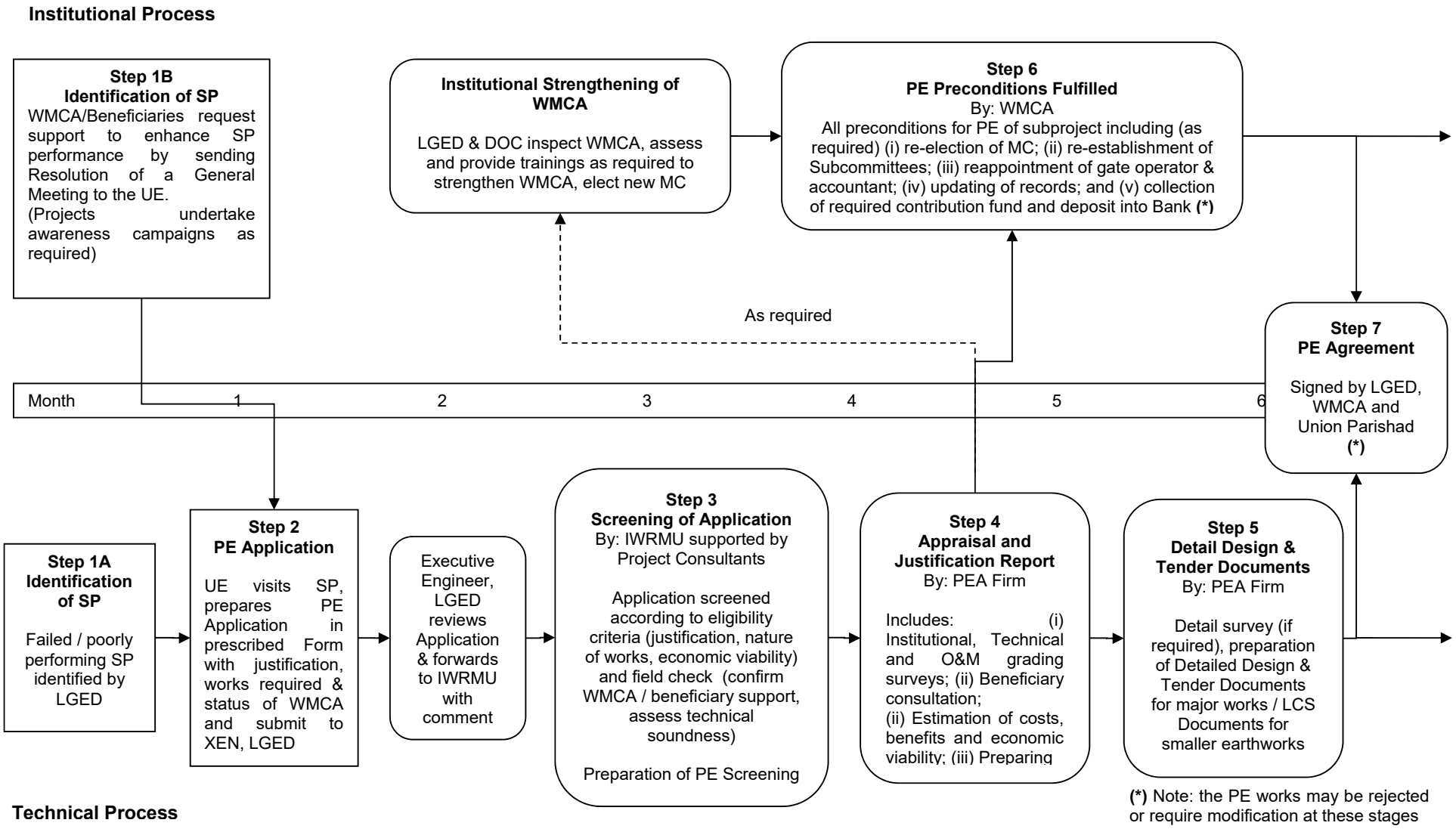
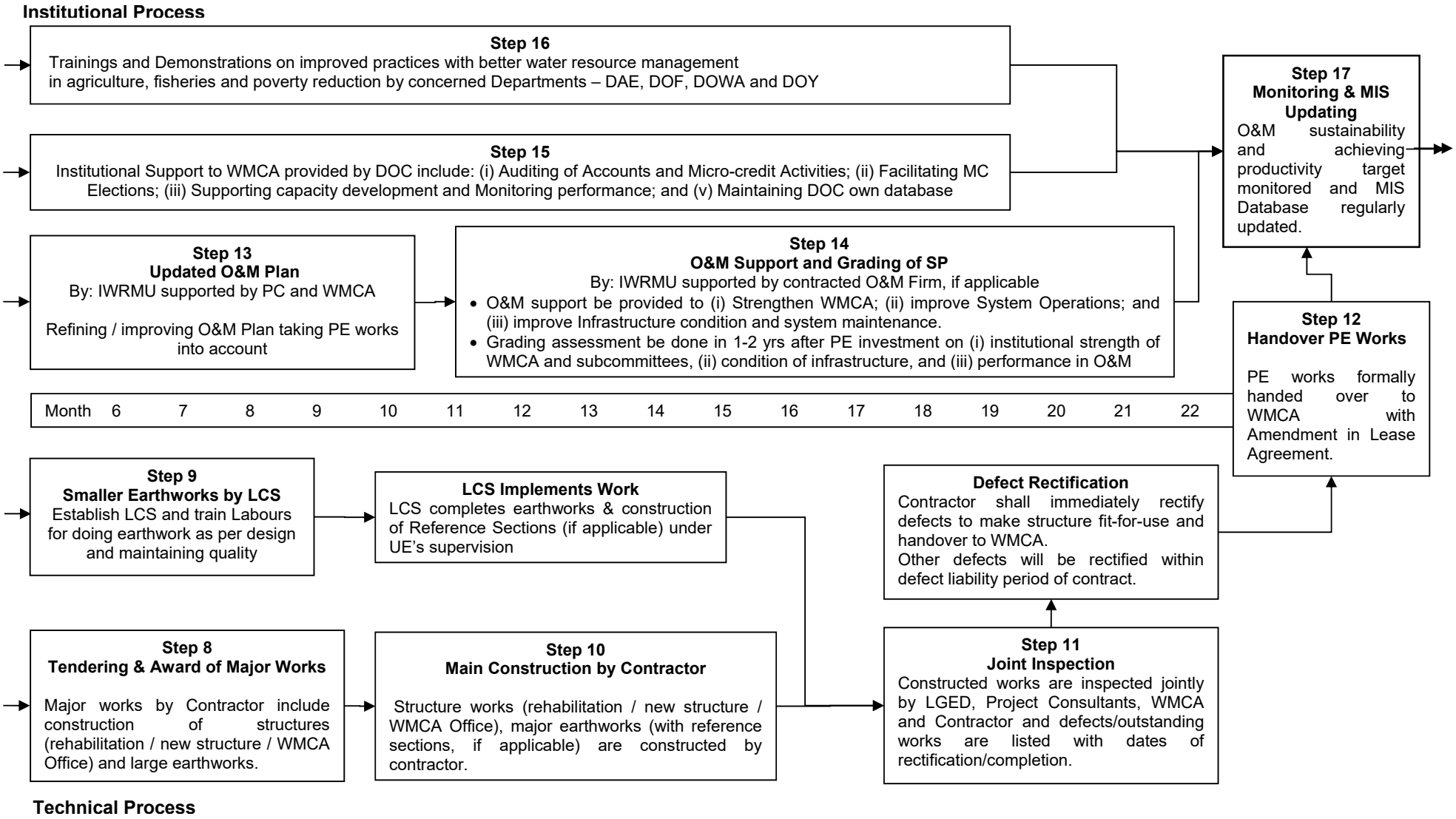


**Figure V-2 PE Stage 2 – Implementation and Sustainable O&M (12-24 months)**



# EXHIBITS

## EXHIBIT G1-A: TYPICAL KEY PROJECT IMPLEMENTATION PERSONNEL

| Level | LGED Staff (Revenue) | Project-based Professional Staff | Project Consultants |
|---|---|---|---|
| Head Quarters | IWRM Unit:<br>Addl. Chief Engineer<br>Superintg Engineer(P&D)<br>Superintg Engineer(O&M)<br>Executive Engineers<br>Others<br><br>PMO:<br>Project Director<br>Executive Engineers<br>Others | Project Management Office (accountancy support, etc)<br>IWRMU | Various Specialists |
| Greater Districts (Zones) | Executive Engineer (Training) | | Institution Dev. Specialist<br>Construction Monitoring &QC Specialists |
| District | Executive Engineer<br>Sr Assistant Engineer<br>Assistant Engineer<br>Sociologist<br>Accountant | Community Participation Officer (CPO)<br>Agriculture Facilitators<br>Fisheries Facilitators<br>General Facilitator (Institutions and O&M)<br>Const. QC Facilitator | |
| Upazila | Upazila Engineer<br>Sub-Assistant Engineer<br>Community Organizer (CO) | Construction Supervisor (CS) | |
| Subproject | | Community Assistant (CA) | |

## EXHIBIT G1-B: RESPONSIBILITY MATRIX FOR SUBPROJECT DEVELOPMENT PROCESS

The responsibility matrix assumes that subprojects are developed with support from Development Partners for Project Consultancy, Firms for Feasibility Study and Detail Design, O&M and Grading Assessment and Performance Enhancement Assessment, services of staff Facilitators for fisheries and agricultural development as well as other direct hire project staff as may be required.

The subproject development process differs for New Subprojects comprising of Category-1 (simple) and Category-2 (complex) subprojects and Performance Enhancement Subprojects comprising of Category-3 subprojects and accordingly the Responsibility Matrices also differ for New and Performance Enhancement subprojects. ***Matrix G1-B1*** and ***Matrix G1-B2*** below show stepwise activities in developing a subproject and corresponding responsible persons for New and PE subprojects respectively.

***Matrix G1-B1***

**RESPONSIBILITY MATRIX FOR DEVELOPENT OF NEW SUBPROJECTS**
(*Category 1 and Category 2 Subprojects*)

| Step | Activity | Mainly Done by | Oversight or Quality Control |
|---|---|---|---|
| **STAGE 1 – IDENTIFICATION, RECONNAISSANCE, PREFEASIBILITY & CLEARANCE** | | | |
| 1 | Subproject Identification | Local Stakeholders and UP | LGED Staff at District &Upazila |
| 2 | Site visit and technical proposal preparation | Upazila Engineer, SAE, Community Organizer | District Executive Engineer, LGED |
| 3 | Proposal presented to Upazila Parishad Meeting | Upazila Engineer | District Executive Engineer, LGED |
| 4 | Proposal reviewed at LGED District Office | District Executive Engineer, LGED | IWRMU (P&D Section) |
| 5 | Pre-screening Proposal and GIS Mapping | IWRMU/PMO - Project Consultants | IWRMU (P&D Section) |
| 6 | Intensive Reconnaissance | IWRMU/PMO - Project Consultants, District Staff (CPO), Upazila Staff (UE, SAE & CO) | IWRMU (P&D Section) |
| 7 | Participatory Rural Appraisal (PRA) | FSDD Firm (unless otherwise required specifically by any Project) | PMO – Project Consultants, IWRMU (P&D Section) |
| 8 | Pre-feasibility Study (incl Planning Meeting) | FSDD firm | PMO – Project Consultants, IWRMU (P&D Section) |
| 9 | DLIAPEC Clearance | District Executive Engineer, PMO | PMO – Project Consultants, IWRMU (P&D Section) |
| **STAGE 2 – FEASIBILITY, DESIGN AND INSTITUTIONAL ESTABLISHMENT** | | | |
| 10 | Feasibility Study (incl Envir Assessment) | FSDD firm | PMO – Project Consultants, IWRMU (P&D Section) |
| 11 | Detailed Design and Preparation of Tender Documents | FSDD firm | PMO – Project Consultants, IWRMU (P&D Section) |
| 12 | Safeguards Study (if stand-alone study required by Project) | Independent Contracted Firm/NGO | PMO – Project Consultants, IWRMU (P&D Section) |
| 13 | Land Acquisition and PAP Compensation Plan | Independent Contracted Firm/NGO | PMO – Project Consultants, IWRMU (P&D Section) |
| 14 | Formation of Organizing Committee | EE Office (Sociologist, CPO), UE, SAE, CO | Executive Engineer, LGED<br>PMO – Project Consultants |
| 15 | Information campaign and Household Inventory | CA, CO, SAE, Organizing Committee | CPO, PMO - Project Consultants |
| 16 | Prepare List of Beneficiaries | CA, CO, Organizing Committee | EE Office (Sociologist, CPO, General Facilitator) |
| 17 | Election of FMC | Organizing Committee, CPO, General Facilitator, CA, CO | Executive Engineer, LGED<br>PMO - Project Consultants |
| | Promote WMCA membership | FMC, CA, CO | Sociologist, CPO, General Facilitator |

| Step | Activity | Mainly Done by | Oversight or Quality Control |
|---|---|---|---|
| | Open Bank Account, collect O&M contribution and deposit in Bank | FMC, CA, CO | Executive Engineer, LGED<br>Sociologist, CPO, General Facilitator |
| 18 | Sign Implementation Agreement | Executive Engineer, LGED, WMCA Chairman, Union Parishad Chairman | PMO – Project Consultants<br>IWRMU (P&D Section) |
| **STAGE 3 - CONSTRUCTION AND FIRST YEAR OPERATION & MAINTENANCE** | | | |
| 19 | Tender Documents and Tendering | Executive Engineer, LGED, | PMO - Project Consultants<br>IWRMU (P&D Section) |
| 20 | Formation of LCS | Upazila Engineer, SAE, CO | CPO,<br>PMO - Project Consultants |
| | Training LCS groups | Upazila Engineer, Sociologist, CPO, AE | PMO - Project Consultants |
| 21 | Land Acquisition and PAP Compensation | Executive Engineer, LGED<br>Upazila Engineer | PMO - Project Consultants<br>IWRMU (P&D Section) |
| 22 | Infrastructure Construction and Supervision – LCS Works | LCS Groups<br>Construction Supervisor, SAE, Upazila Engineer, Executive Engineer, LGED | PMO - Project Consultants<br>IWRMU (P&D Section) |
| | Infrastructure Construction and Supervision – Structures | Contractor<br>Work Assistant, SAE, Upazila Engineer, Executive Engineer, LGED | |
| 23 | Local Stakeholder Participation during Construction | Construction Monitoring Committee,<br>WMCA | CA, CO, General Facilitator |
| 24 | Institutional Support and Training for WMCAs | DOC (Water Cell, Others). | PMO - Project Consultants<br>IWRMU (O&M Section) |
| 25 | Agricultural and Fisheries support | DAE and DOF,<br>Agriculture and Fisheries Facilitators | PMO - Project Consultants |
| 26 | Poverty Reduction Plan | CA, CO, CPO | PMO - Project Consultants |
| 27 | Establish O&M Subcommittee and prepare draft O&M Plan | WMCA, O&M Subcommittee<br>Upazila Engineer, SAE | Executive Engineer, LGED<br>PMO - Project Consultants |
| 28 | Implement Environmental Mitigation Plan | (various) | PMO – Project Consultants<br>IWRMU (Env & Social Section) |
| 29 | Joint Inspection of Works upon Completion<br>*(rectification of defects to make works fit-for- use immediately)* | Executive Engineer LGED, Upazila Engineer, WMCA, Construction Monitoring Committee, PMO – Project Consultants, and Contractor | PMO – Project Consultants<br>IWRMU (P&D, O&M Sections) |
| 30 | Handover and Lease Agreement<br>*(ceremonial with local people and invited guest)* | Executive Engineer LGED, WMCA Chairman and Union Parishad Chairman | |

| Step | Activity | Mainly Done by | Oversight or Quality Control |
|---|---|---|---|
| 31 | Joint O & M<br>*(rectification of defects and outstanding works by Contractor within liability period)* | WMCA and UE Office,<br>Contractor (defect rectification) | |
| **STAGE 4 - SUSTAINED OPERATION AND MAINTENANCE** | | | |
| 32 | Final O&M Plans and Training | PMO-Project Consultants<br>CPO, General Facilitator, AE<br>Executive Engineer (Training) | IWRMU (O&M Section) |
| 33 | O&M Support and Grading | CPO, General Facilitator, AE, Sociologist, CO, SAE<br>or<br>O&M Firm/NGO (if contracted) | PMO-Project Consultants<br>IWRMU-O&M Section<br>DOC (Water Cell) |
| 34 | Agriculture & Fisheries Support | Agriculture and Fishery Facilitators<br>DAE and DoF(Extension Staff) | |
| 35 | WMCA Monitoring, Support and MC Elections | CPO, General Facilitator, Sociologist, CO<br>DOC (Water Cell) | |
| 36 | Effects Monitoring and Evaluation | Agriculture and Fishery Facilitators, General Facilitator<br>WMCA, UE Office Staff | |
| 37 | Impact Surveys | Contracted Firm / NGO | |
| 38 | Management Information System | UE, SAE, CO<br>AE, Sociologist<br>PMO-Project Consultants | IWRMU (O&M Section) |

## *Matrix G1-B2*

**RESPONSIBILITY MATRIX FOR DEVELOPENT OF PE SUBPROJECTS**
*(Category 3 Subprojects)*

| Step | Activity | Done by | Oversight or Quality Control |
|---|---|---|---|
| **STAGE 1 – IDENTIFICATION, SCREENING AND APPRAISAL** | | | |
| 1 | Identification of PE Subproject | Upazila Engineer,<br>WMCA with local stakeholders | Executive Engineer LGED<br>IWRMU (O&M Section) |
| 2 | Completing PE Application and Forwarding | Upazila Engineer | |
| 3 | Screening of Application | PMO-Project Consultants | IWRMU (O&M Section) |
| 4 | Appraisal and Justification Report | Contracted PEA Firm<br>or<br>PMO-Project Consultants | PMO-Project Consultants<br>IWRMU (O&M Section) |
| 5 | Field Survey, Detailed Design and Tender Document | | |
| 6 | Preconditions Fulfilled by WMCA | WMCA | |
| 7 | Sign PE Agreement | Executive Engineer LGED,<br>WMCA Chairman and Union Parishad Chairman | |
| **STAGE 2 – IMPLEMENTATION AND SUSTAINABLE O&M** | | | |
| 8 | Tendering and Award of Major Works | Executive Engineer LGED | PMO-Project Consultants<br>IWRMU (P&D, O&M Sections) |
| 9 | LCS Works | LCS Groups<br>Construction Supervisor, SAE,<br>Upazila Engineer,<br>Executive Engineer LGED | |
| 10 | Construction of Major Engineering Works | Contractor,<br>Work Assistant, SAE,<br>Upazila Engineer,<br>Executive Engineer LGED | |
| 11 | Joint Inspection and Defects Rectification *(rectification of defects to make works fit-for-use immediately to Handover)* | Executive Engineer LGED,<br>WMCA, O&M Subcommittee,<br>PMO – Project Consultants,<br>Contractor | |
| 12 | Handover PE Works and Amendment of Lease Agreement *(ceremonial with local people and invited guest)* | Executive Engineer LGED,<br>WMCA Chairman and Union Parishad Chairman | |
| 13 | Updated O&M Plans | PMO-Project Consultants<br>CPO, General Facilitator, AE | PMO-Project Consultants<br>IWRMU (O&M Section) |
| 14 | O&M Support and Grading | CPO, General Facilitator, AE,<br>Sociologist, CO, SAE or<br>O&M Firm/NGO (if contracted) | PMO-Project Consultants<br>IWRMU (O&M Section)<br>DOC (Water Cell) |
| 15 | Institutions Support | CPO, General Facilitator,<br>Sociologist, CO<br>DOC Staff | PMO-Project Consultants<br>IWRMU (O&M Section)<br>DOC (Water Cell) |
| 16 | Agriculture and Fisheries Support | Agriculture and Fisheries Facilitators,<br>DAE and DoF(Extension Staff) | PMO-Project Consultants<br>IWRMU (O&M Section) |
| 17 | Monitoring and MIS | UE, SAE, CO<br>AE, Sociologist<br>PMO-Project Consultants | IWRMU (O&M Section) |

## EXHIBIT G1-C: IDENTIFICATION OF SSWRD SUBPROJECTS (FORM 1)

# FORM-1

(to be filled by Union Parishad)

## Form for Identification of SSWRD Subproject

Subproject proposal by UP to solve local water resources management problem

[**Instructions**: The Chairman will call a Meeting of all Members of the Union Parishad and (i) discuss existing problems of water resources management in the Union area with respect to agriculture, how the problems can be solved and what physical works and structures will be needed for this; and (ii) fill up this form in the Meeting with unanimous opinion of the Parishad. The Proposal will then be submitted to the Upazila Engineer along with Minutes of the UP Meeting]

1. (a) Name of the Union: .....

   (b) Upazila: ..... District: .....

2. Major Problems of Water Management in the Union and its impact:

| Problem | | Mark √ | * Give serial number as per importance | Write in short about the damage that happens to crops due to the problem |
|---|---|---|---|---|
| Flood | Early Flood (April-May) | | | |
| | Monsoon Flood (June - October) | | | |
| Water logging | During Pre-monsoon Rains (April - May) | | | |
| | During Post-monsoon (November-December) | | | |
| Drought/ No Rainfall | At start of Monsoon (June-July) | | | |
| | At end of Mnsoon (September – October)) | | | |
| Lack of Irrigation | During Rabi/Boro season | | | |
| | During Monsoon drought | | | |

* Give numbers as 1 for major problem, 2 for second problem.

3. Proposal for required subproject to solve the problem:

   (a) Name of subproject: .....

   (b) Objective and Brief Description of the subproject .....

   .....

   .....

(c) Names of Village/Mouza and Net Benefited Area (approx): .....

   .....

(d) Describe what physical infrastructure are required and where these will be located / constructed to solve the problem best:

(1) Embankment Construction (from where to where): .....

(2) Khal Re-excavation (from where to where):.....

Branch Khal-1: .....

Branch Khal-2: .....

Branch Khal-3: .....

(3) Regulator/Sluice (How many and where): a).....

b).....

c).....

(4) Water Retention Structure (How many and where)

a).....

b).....

(5) Other structures, if required: .....

4. Minutes of concerned meeting (with names and signatures of Members present) of the Union Parishad should be enclosed with the filled-up form.

| | |
|---|---|
| Signature of UP Secretary | Signature of UP Chairman |
| Name: | Name: |
| Seal: | Seal: |
| Date: | Date: |
| Phone No.: | Phone No.: |

## EXHIBIT G1-D: TECHNICAL PROPOSAL FOR SSWRD SUBPROJECTS (FORM 2)

# FORM-2

(to be filled by Upazila Engineer)

## Technical Proposal for Proposed SSWRD Subproject

[**Instruction**: Upazila Engineer will fill up this Form for each subproject identified by Union Parishad after physical inspection of the proposed subproject area and discussion with local people. During inspection of the proposed subprojects, concerned Sub-Assistant Engineer and Community Organizer of Upazila Engineer's Office and, if possible, Water Resources Engineer/Community Participation Officer from Executive Engineers Office will participate. The Sub-Assistant Agriculture Officer (SAAO) of Department of Agriculture Extension (DAE) may be requested to participate in the inspection team to provide assistance in agricultural aspects]

1. Name of the proposed sub-project: .....
2. Location of of the proposed sub-project:

   District: ..... Upazila: ..... Union: .....

   Mouza(s) .....

   Name of adjacent Union that may be influenced: .....
3. Area of the subproject:

   Name of Mouzas: ……

   Gross Area: .....ha (*)

   Possible Net Benefited Area: .....ha (*)
4. Problem identification by farmers and professional persons present at site:

| Group | Briefly describe major problem |
|---|---|
| High Land Farmers | |
| Medium High Land Farmers | |
| Low Land Farmers | |
| Fishermen | |
| Boatmen | |
| Landless | |
| Destitute Women | |

* 1 hectare=2.47 acre

5. Physical Objective of the Subproject and How that will be achieved.

| **Physical Objective of Subproject (mark with √ )** | | **How Objective will be achieved (mark with √ )** |
|---|---|---|
| **Flood Management (FM)**<br>Support improved cultivation in the land of subproject area through construction /re-construction of flood embankment and construction of regulator/sluice. | Pre-monsoon | Through reduction of duration / depth of flood / salinity control |
| | Monsoon | Through reduction of duration / depth of flood / salinity control |
| | Post-monsoon | Through reduction of duration / depth of flood / salinity control |
| **Drainage Improvement**<br>Increase agricultural / fisheries production and improve local navigation though khal re-excavation. | Pre-monsoon | Through removal of water logging / water conservation in khal for irrigation |
| | Monsoon | Though removal of water logging / water conservation in khal for irrigation |
| | Post-monsoon | Though removal of water logging / water conservation in khal for irrigation / ncrease availability of tidal water for irrigation |
| **Tidal Irrigation**<br>Increase availability of tidal water for irrigation through khal re-excavation | Later part of monsoon | Through increased availability of tidal water for irrigation |
| | Post-monsoon | Through increased availability of tidal water for irrigation |
| **Water Conservation**<br>Increase irrigation facility through conservation of water in khal/river by construction of Water Retention Structure. | Post-monsoon | Through supplementary irrigation / full irrigation / increase availability of water for household use |
| | Rabi-Dry season | Through supplementary irrigation / full irrigation / increase availability of water for household use |
| **Command Area Development (CAD)**<br>Increase of irrigation efficiency and irrigated area through development of irrigation system of existing irrigation scheme. | Rabi-Dry season | Through construction of pucca irrigation canal / installation of underground irrigation pipeline / adopting improved water distribution system / construction of aqueduct / siphon / pump-house / other structure. |
| **Other Objectives, if any**<br>(a) ……<br>(b) …… | | |

6. Possible adverse impact of the subproject

On what type of people, the subproject can impose adverse impact (Give √). Briefly write the impact.

| | | | | |
|---|---|---|---|---|
| ☐ Farmer | Outside ☐ | or Inside ☐ | of subproject | Impact: |
| ☐ Fishermen | Outside ☐ | or Inside ☐ | of subproject | Impact: |
| ☐ Medium | Outside ☐ | or Inside ☐ | of subproject | Impact: |
| ☐ Landless | Outside ☐ | or Inside ☐ | of subproject | Impact: |
| ☐ Women | Outside ☐ | or Inside ☐ | of subproject | Impact: |
| ☐ ..... | Outside ☐ | or Inside ☐ | of subproject | Impact: |
| ☐ ..... | Outside ☐ | or Inside ☐ | of subproject | Impact: |

7. Write the name of physical works of the subproject and indicate location of the work through GPS coordinate recorded at field.

| **No.** | **Name of Physical Work** | **Work location indicative GPS coordinates** | | |
|---|---|---|---|---|
| | | Start Point | One or more Points along the course | End Point |
| 1. | Khal excavation/re-excavation<br>(a)<br>(b)<br>(c) | | | |
| 2. | Embankment Construction<br>(a)<br>(b) | | | |
| 3. | Regulator / sluice / Water Retention Structure (including name of place or khal)<br>(a)<br>(b) | | | |

8. Do the subproject fall within the area of any existing Project of Bangladesh Water Development Board or related to it? .....Yes/No

if yes, then mention name of BWDB Project and present condition: ……..

.....

9. Are the people of the subproject area willing to pay contribution for O&M (1.5% for concrete work and 3% for earth work) and take full responsibility of operation & maintenance of the subproject? .....Yes/No

10. Are the people of the subproject willing to form a Water Management Cooperative Association (WMCA) for O&M activities of the subproject and socio-economic development of the area? …… Yes/No

11. Is the subproject proposal approved in Upazila Parishad Meeting? ..... Yes/No

If yes, mention the date of approval..... and enclose Minutes of the Meeting.

12. Enclose **Index Map** of the proposed subproject after preparing as below:
    - Subproject area (gross area, net benefited area, drainage/catchment area) to be shown in Upazila Base Map or Topographic Map (Scale 1: 50000)
    - All villages, rivers, khals and beels to be shown in the map
    - For showing structure and other features, use LGED's standard legends and marks.
    - Use **black ink** (pen) for showing existing structure
    - Use **red ink** (pen) for showing proposed structure and write **GPS coordinate** values beside it.
    - Use red ink for showing proposed khal re-excavation/embankment reconstruction/ construction and write GPS coordinate values of start, middle and end point at appropriate place.

13. Signature with date and seal

    Upazila Engineer
    Upazila:

14. Remark by Executive Engineer ……..
    ……

    Signature with date and seal

    Execitive Engineer
    District

## EXHIBIT G1-E: PRE-SCREENING OF SUBPROJECTS PROPOSAL (FORM 3)

## FORM-3

(to be completed in IWRMU)

# Pre-Screening of SSWRD Subproject Proposal

Name of Subproject: .....

District: ..... Upazila: ..... UP: .....

Pre-screening Date: .....

| Subproject Eligibility Criteria | | Subproject Information | Comments |
|---|---|---|---|
| **Physical** 1. Objective | Flood Management (FM) | | |
| | Drainage Improvement (DR) | | |
| | Water Conservation (WC) | | |
| | Command Area Development (CAD) | | |
| | Combination of above (please specify) | | |
| 2. Benefited Area | 50-1000 ha | | |
| 3. System Definition | Rehabilitation/Upgrading of existing system | | |
| **Planning** 4. Local Planning | Upazila Engineer inspected subproject area | Yes / No | |
| | Subproject Map with GPS Co-ordinate of works attached | Yes / No | |
| | New structures (number) | | |
| | UP Subproject Identification Form included | Yes / No | |
| | Approved by Upazila Parishad | Yes / No | |
| | Conflicting/Overlapping with BWDB Project | Yes / No | |
| 5.Regional Planning | In line with Regional Plan | Yes / No | |
| 6. National Planning | In line with National Water Policy | Yes / No | |
| **Social** 7. Resettlement | Requires displacement of people or has impact on sensitive areas | Yes / No | |
| 8.Inclusive development | More than 40% of benefited area operated by landless sharecroppers to small farmers | Yes / No | |
| | Less than 30% of subproject households depend on capture fisheries as main livelihood | Yes / No | |
| **Environmental** 9.Environmental soundness | Within environmentally sensitive area(s) | Yes / No | |
| | May have major adverse environmental impacts | Yes / No | |
| | The expected environmental impacts may be within acceptable level | Yes / No | |
| **Economic** 10. Unit Costs | Max. $ 1,500/ha for CAD subprojects | | Estimates based on recent SP cost (MIS) |
| | Max. $ 1,000/ha for other types of subprojects | | |
| **Beneficiary Participation** 11. Indication | Subproject has strong support of local community | Yes / No | |
| | Beneficiaries willing to take full responsibility for O&M and make up-front contribution of 1.5% of the cost of structures and 3% of the cost of earthworks | Yes / No | |
| **Map** 12.Index Map of SP (Google) | Preliminary Index Map of the proposed subproject will be prepared using Google Imagery based on GPS co-ordinates and other information obtained. | Yes / No | |
| *Subproject Recommended for Multidisciplinary Field Reconnaissance* | | Yes / No | Date: |
| *Name and Signature of IWRM Engineer:* | *Name and Signature of Project Consultant:* | | |

## EXHIBIT G1-F: IMPLEMENTATION AGREEMENT (FORM 4)

(Standard Format)

(To be duly registered)

**Taka *** Non-Judicial Stamp Paper**

**(Project Name)**

**SUB-PROJECT**[24]

### IMPLEMENTATION AGREEMENT

(Based on Version 1, November 1998)

This implementation agreement, together with the Appendices A, B, C and D, hereafter called the Implementation Agreement, is made on the _____ day of _____20__

**Between**

The **LOCAL GOVERNMENT ENGINEERING DEPARTMENT** (hereafter called LGED), represented by the Executive Engineer, LGED, _____district, on the one part,

**And**

The _____**WATER MANAGEMENT**

**CO-OPERATIVE ASSOCIATION** (hereafter called the WMCA), Registered on the___day of _____, 20____ under number _____, of the Cooperative Laws, represented by its Chairperson and Secretary,

_____ (Address) on the other part, defines the rights and obligations of both parties to the Implementation Agreement.

WHEREAS the Government of the People's Republic of Bangladesh through the LGED has the mandate, funds, know-how and experience to design and construct small scale infrastructure for water resource development and management, and

WHEREAS the local community, organized in the WMCA, is interested in LGED assisting it in developing the local water resource management infrastructure as per the attached design, and as explained in detail during a complete walkthrough on _____the, _____20___,

NOW THEREFORE the parties to this Implementation Agreement agree as follows:

[24] Details of the subproject concerned should be written on the underlined gaps.

**Relationship of Parties**

Clause 1 The LGED will organize, supervise and pay for the construction of the infrastructure to be developed under the sub-project (see Appendix A) and will operate and maintain it for one year after completion.

Clause 2 The WMCA will ensure the contractor's right of way, assist with land acquisition and pay ___% of the cost involved, pay the required beneficiary contribution (see Appendix B) and be fully responsible to operate and maintain the sub-project after it has been functional for one year.

Clause 3 The parties agree that this agreement will only become effective as of the date on which the full beneficiary contribution of Taka_____ (In words) has been deposited in the Bank Account of the LGED District Executive Engineer, AC. No. _____, at the _____Branch of the _____Bank.

**Rights and Responsibilities of the WMCA**

Clause 4 The WMCA accepts responsibility for collecting the full beneficiary contribution (see Appendix B) of Taka _____ (In words) from the beneficiaries (see Appendix C) and for depositing it in the above mentioned Bank Account of the LGED District Executive Engineer within 2 (two) weeks of signing the agreement.

Clause 5 The WMCA agrees to facilitate the formation and operation of Labour Contracting Societies (LCSs), which will do earthwork under this Implementation Agreement. The WMCA will ensure that destitute women (divorced, abandoned, widowed) will be given preference when forming LCSs and that more than 50% of the LCS members will be women.

Clause 6 The WMCA has the right to observe all construction activities and report to the Thana Engineer any concerns it might have about the quality of materials used and work done, as well as the quantity and progress of the work.

Clause 7 The WMCA accepts responsibility for all routine and periodic maintenance of the infrastructure rehabilitated or built under this Implementation Agreement, and will, on completion of the subproject works with fit-for-use structures, enter into a lease agreement with LGED to this effect.

Clause 8 The WMCA agrees to assist LGED during the first year's operation and maintenance.

**Rights and Responsibilities of the LGED**

Clause 9 The LGED will issue work orders only after the full beneficiary contribution has been deposited in the Bank Account of the LGED District Executive Engineer.

Clause 10 The LGED will arrange training for the Labour Contracting Societies.

Clause 11 The LGED will ensure that all construction is done in accordance with the design (see Appendix A) and standards specified in the tender documents.

Clause 12 The LGED will, at its own expense, but in active co-operation with the WMCA, operate and maintain the sub-project infrastructure for one year after completion.

Clause 13 To facilitate sustainable operation and maintenance, LGED will lease the sub-project infrastructure to the WMCA for a nominal fee after the sub-project has been operational for one year.

Clause 14 The LGED will provide technical guidance and support, such as for annual inspection, identifying maintenance needs, assistance in planning and design, use of tools/ machinery, etc. when needed.

Clause 15 The LGED will provide guidance to build up the capacity of the WMCA to operate and maintain the sub-project on a sustainable basis.

**Settlement of Disputes**

Clause 16 If the WMCA does not function as per the rules and regulations of the Co-operative Laws, then the LGED may request the District Co-operative Officer to take appropriate action in accordance with the Co-operative Laws.

Clause 17 If either of the parties to this Implementation Agreement believes the other does not live up to its obligations, then the aggrieved party will;

- first try to solve the matter through direct discussions with the other party,
- if the matter is not solved through direct discussions, then the aggrieved party will approach the Deputy Commissioner asking him to establish a small mediation committee under the Arbitration Act,
- if the matter is not solved through the mediation committee then the aggrieved party may seek redress through the judicial system.

| **Signed on behalf of LGED** | **Signed on behalf of the WMCA** |
|---|---|
| Executive Engineer: | Chairperson: |
| Date: | Date: |
| Upazila Engineer: | Secretary: |
| Date: | Date: |

*Appendix A*

SCHEDULE OF SUB-PROJECT INFRASTRUCTURE

Names and Description of Subproject Infrastructure

| No. | Name | Description |
|---|---|---|
| | Khal-1 | |
| | Khal-2 | |
| | Embankment-1 | |
| | Embankment-2 | |
| | Structure-1 | |
| | Structure-2 | |
| | Others | |
| | Etc. | |
| | | |

*Appendix B*

## CALCULATION OF BENEFICIARY CONTRIBUTION

**Earth work:**

- Estimated cost of embankment work Tk._____
- Estimated cost of khal re-excavation Tk._____

Total estimated cost of earthwork Tk._____

**Beneficiaries' upfront O&M contribution for earthwork @ 3% of total earthwork cost** (Tk._____) **Tk._____**

**Taka** _____(in words)_____.

**Structural work:**

- Estimated cost of structure 1 Tk._____
- Estimated cost of structure 2 Tk. _____
- Estimated cost of structure 3 Tk. _____
- Estimated cost of structure 4 Tk. _____

Total estimated cost of structural work Tk. _____

**Beneficiaries' upfront O&M contribution for structural works @ 1.5% of total structural cost** (Tk._____) **Tk._____**

**Taka** _____(in words)_____.

**Land Acquisition:**

- Estimated cost of plot 1 Tk._____
- Estimated cost of plot 2 Tk._____
- Estimated cost of plot 3 Tk._____
- Estimated cost of plot 4 Tk._____

Total estimated cost of procuring land Tk._____

**Beneficiaries' upfront O&M contribution for procuring land[25] @___% of total land procuring cost** (Tk._____ ) **Tk._____**

**Taka** _____(in words)_____.

**TOTAL BENEFICIARIES' UPFRONT O&M CONTRIBUTION Tk._____**

**Taka** _____(in words)

[25] 30% is suggested

***Appendix C***

## CONTRIBUTION CHARGED TO EACH BENEFICIARY

| No. | Name of beneficiary operating land | Father's name | Plot numbers (see map) | Total area operated (acres) | Individual contribution (Taka) |
|---|---|---|---|---|---|
| 1. | | | | | |
| 2. | | | | | |
| 3. | | | | | |
| 4. | | | | | |
| 5. | | | | | |
| 6. | | | | | |
| 7. | | | | | |
| 8. | | | | | |
| 9. | | | | | |
| 10. | | | | | |
| 11. | | | | | |
| 12. | | | | | |
| 13. | | | | | |
| 14. | | | | | |
| 15. | | | | | |
| etc. | | | | | |
| | | | | **Total Contribution** | |

***Note:*** *For location of plots see attached subproject map.*

***Appendix D***

**Subproject Brief with Map showing Locations and Features of Infrastructure**

(signed & attached)

## EXHIBIT G1-G: USER RIGHT (HAND OVER) AGREEMENT (FORM 5)

(Standard Format)

(To be duly registered)

# Taka *** Non-Judicial Stamp Paper

**(Project Name)**

**SUB-PROJECT**

### USER RIGHT HAND OVER (LEASE) AGREEMENT

This AGREEMENT is made on the ……. day of ……. 14…. (Bangla) / …… day of ....., 20… (Christian Era) between the following two parties:

*Local Government Engineering Department* (hereinafter referred to as "LGED"/ first party) represented in this AGREEMENT by the Executive Engineer by virtue of his office (he himself or any other officer in his place or any entrusted person or whichever when applicable) hereinafter called the person to handover of the first party

-and-

……*Water Management Cooperative Association* (hereinafter referred to as WMCA/ second party) under the district of …….. Upazila…….. Union……. represented in this AGREEMENT by the Chairperson of WMCA Management Committee by virtue of his office (he himself or any entrusted person or person in his position or whichever when applicable) hereinafter called the receiver of the second party.

Whereas, LGED is responsible for the development and management of physical infrastructure through Small Scale Water Resources Development Projects;

Whereas, LGED with its engineering skill and experiences has completed physical structures as described in Schedules 1, 2 and 3;

Whereas, local people as well as subproject beneficiaries organized under a WMCA and deposited Taka…….. in …… Bank account for the maintenance of infrastructure as constructed under the subproject and agreed for the management, operation and maintenance of the constructed infrastructure.

NOW, THEREFORE, the parties hereto, for the handover of the physical infrastructure constructed under the subproject as stated, mutually agree to sign the agreement in consideration of the clauses as follows:

**Duties and Responsibilities of LGED**

Artcle-1 The first party will handover user rights of all physical/ engineering infrastructure of the subproject to the second party as included in this deed and according to the attached Schedules 1, 2 and 3 for the use by WMCA members,

Article- 2 The first party will organize training courses for the WMCA Management Committee members and later for the operation and maintenance sub-committee for the operation and maintenance of physical infrastructure.

Article- 3 If major repair is required for flood, storm surge and other reasons the first party will arrange rehabilitation and repair of the damaged physical infrastructure.

Article- 4 The first party will provide technical guidance and support as required on annual inspection related to operation and maintenance, identification of maintenance needs, preparation of maintenance plan and design, use of different machinery.

**Duties and responsibilities of WMCA**

Article- 5 The second party will have the user right of the physical infrastructure as described in Schedule 2 on behalf of their beneficiary members and according to the agreement will be fully responsible for the operation and maintenance of subproject infrastructure for the entire period.

Article- 6 The second party will be responsible for monsoon and post-monsoon especial maintenance of physical infrastructure as described in Schedule 2.

Article- 7 For the implementation of entire maintenance works the second party will form an ‘operation and maintenance sub-committee’ including women members.

Article- 8 Operation and maintenance sub-committee will plan implement and evaluate the following activities on behalf of the second party i.e. the WMCA.

(a) Preparation of schedule for the regular inspection of infrastructure and taking of measure for preventive maintenance on the basis of inspection.

(b) Preparation of operation and maintenance plan according to the guidelines for the operation and maintenance of infrastructure, arrangement of fund for the implementation of the plan and preparation of a budget for this purpose.

(c) During the implementation of plan, control of water flow and height as required in critical times in different seasons and ensure that physical infrastructure are properly used and operated.

(d) Assessment of repair needs of infrastructure after the rainy season every year.

(e) Preparation of and implementation of detailed plan to mobilize resources for the implementation of maintenance plan with the collection of cash money and crop produces from the beneficiaries including volunteer labor and other arrangements as applicable and convenient.

Article- 9 The second party will deposit the fund collected for the operation and maintenance to the account opened jointly by WMCA and Upazila Engineer and limit use of this fund only for operation and maintenance works.

Article- 10 The second party will employ one or more **operation and maintenance** assistants/ staff for part time or fulltime for the implementation of operation and maintenance works and WMCA will provide the total expenses for the staff.

Article- 11 The second party will ensure employment of poor and destitute women in the subproject area in earthworks and in all other preventive maintenance works and plantation activities.

**Terms**

Article- 12 The unstipulated matters in this agreement including project's operation and maintenance guidelines and other documents and projects policies and rules will be considered as the party of this agreement and both first and second party will be obligated to comply those guidelines and policies and rules. No change will be made in the agreement for the changes in the second party i.e., in WMCA Management Committee or members of the committee or for the changes of Chairperson/Secretary. That is the agreement will be unchanged although if there are any changes of individual and its terms will be effective as before.

Article- 13 If any of the parties that signed this agreement considers that the other party has violated and defied any particular term or terms, then the affected or aggrieved party will initially take initiative to resolve the matter through direct dialogue and discussion among the both parties. If the matter is not resolved through the dialogue and discussion, then it will be resolved by the Local Conflict Resolution Committee as formed according to the notification no. Pro:Au:-2/Pani-5/2001/418 (2347), date: 23-04-2002 issued by the Local Government Division and provided in Annex-7. The decision of the committee will be considered as final.

IN WITNESS WHEREOFF, the parties hereto have affixed their signatures on the date first written above.

| | |
|---|---|
| For LGED | For WMCA |
| Executive Engineer | President |
| Witness | Witness |
| Upazila Engineer | Secretary |

*Schedule-1*

## Subproject Description

1. Subproject Name :

2. Subproject ID :

3. Location : Union :
   Upazila:
   District:

4. Name of WMCA :

5. WMCA Registration No. :

6. Subproject Area : Total area (hectare) :
   Benefit area (hectare):

7. Date when construction of subproject physical infrastructure started:

8. Date when construction of subproject physical infrastructure ended:

*Schedule-2*

## Detailed Description of Physical Infrastructure

| Serial No | Name of Infrastructure | Particulars of Infrastructure (Location, Length, Bed/Top Width, Side Slope, Number of Regulators/Sluices/WRS with Vent Nr and Size, etc) |
|---|---|---|
| 1. | Khal | |
| | | |
| | | |
| | | |
| 2. | Embankment | |
| | | |
| | | |
| | | |
| 3. | Gated Regulator | |
| | | |
| | | |
| | | |
| 4. | Culvert | |
| | | |
| | | |
| 5. | | |
| | | |

*Schedule-3*

**Subproject Map showing Location of Infrastructure and Important Features**