Government of Bangladesh World Food Programme Government of the Netherlands

CHAR DEVELOPMENT AND SETTLEMENT PROJECT II

চর উন্নয়ন ও বসতি স্থাপন প্রকল্প ২

BANGLADESH

Overview of Water Management in CDSP-II

Technical Report No. 14

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May, 2004

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LIST OF ABBREVIATIONS

AEO	Assistant Extension Officer
BWDB	Bangladesh Water Development Board
CDSP	Char Development and Settlement Project
CERP	Coastal Embankment Rehabilitation Project
CBD-I	Char Baggardona-I
CBD-II	Char Baggardona-II
CM	Char Majid
CBT	Char Batirtech
DCEO	Deputy Chief Extension Officer
DTL	Deputy Team Leader
EIP	Early Implementation Projects
EO	Extension Officer
FC	Field Co-ordinator
FCD	Flood Control and Drainage
FCDI	Flood Control, Drainage and Irrigation
FFC	Female Field Co-ordinator
GOB	Government of Bangladesh
GPWM	Guidelines for Participatory Water Management
IDA	Institutional Development Advisor
KJDRP	Khulna Jessore Drainage Rehabilitation Project
LGED	Local Government Engineering Department
LGI	Local Government Institution
LPA	Local Planning Adviser
MDIP	Meghna Dhanagoda Irrigation Project
NWPo	National Water Policy
O&M	Operation and Maintenance
PD	Project Director
PWM	Participatory Water Management
RWMA	Rapid Water Management Appraisal
SDE	Sub-Divisional Engineer
SO	Section Officer
SRP	Systems Rehabilitation Project
UP	Union Parishad
WMA	Water Management Area/Association
WMC	Water Management Committee
WMF	Water Management Federation
WMG	Water Management Group
WMO	Water Management Organisation
XEN	Executive Engineer
XO	Extension Overseer

EXECUTIVE SUMMARY

Participatory water management is of utmost importance for Bangladesh, particularly in the coastal char areas. Flood Control and Drainage (FCD) Systems, developed under LRP, CDSP I and II, protect the area from floods and cyclones and are established to improve the economic conditions in the chars. The crucial importance of proper water management in these systems to achieve their potential makes it necessary to understand the prevailing water management practices and develop adequate field level institutions and management strategies.

Many studies of the water sector in Bangladesh conclude that the intended benefits from the existing Water Management (WM) systems have not materialised. This is mainly due to institutional weaknesses, resulting in the lack of maintenance and the absence of planned sluice operation (NWPo, 1999, GPWM, 2001, NWMP, 2001). One of the key approaches to overcome this institutional weakness is to ensure peoples participation and emphasise the development of local institutions in water resources management.

The Ministry of Water Resources formulated the National Water Policy (NWPo) on January the 30th, 1999. To implement the water policy, the 'Guidelines for Participatory Water Management' (GPWM) were endorsed by the Ministry of Water Resources in April 2001. Following the indication in the GPWM, the BWDB started to develop its own implementation manual. The development of the manual has been supported directly by CDSP II through technical assistance and the organisation of workshops and seminars. It is currently on-going. Regarding the application of the GPWM, the experience of CDSP has been that for FCD systems where drainage is the main water management function, a number of changes would need to be made. These are the function of the various levels of the WMO and the need for a strong role of the Local Government Institutions (LGI). For this reason, the Water Management Organisations (WMOs) established in CDSP-II are established in a slightly different manner than indicated in the GPWM.

This report deals with water management practices in the FCD systems in the CDSP-II areas. The focus lies on the specific institutional steps taken in the FCD systems. The main issues stated here are the organisation structures, steps followed to establish WMOs and strengthen linkages with Government Organisations. In addition, the management & financial strategies needed for coastal FCD systems are dealt with.

Water management in the Coastal FCD systems was first appraised by means of conducting Rapid Water Management Appraisals (RWMA) in each of the polders and WM systems. The RWMAs addressed the present water management situation, maintenance condition of the WM infrastructure, drainage problems, irrigation options, cropping practices and people's perception regarding the above-mentioned issues. The RWMA were conducted by teams from CDSP-II comprising field engineers and field coordinators. The RWMA forms the basis for intervention in the project area and establishes a baseline for future reference. In this report the results are used to compare the pre-project and the current situation with respect to water management. Also, the practices of implementing agencies are highlighted and the need for participatory water management explained. Learning from experience has been crucial in the project. As a result of this experience, a practical process for participatory water management in CDSP-II was developed. This process is also explained in the report, including the steps taken for strengthening and capacity building of the WMOs to make these organisations sustainable. Included are the definition of WM-systems and Water Management Areas (WMA), types and levels of Water Management Organisations (WMO), task and responsibilities of WMOs, O & M planning and implementation, roles of all concerned stakeholders including implementing agencies, and gender perspectives.

To move towards sustainable water management in CDSP-II, the steps taken and the fundamental institutional output are reflected here. Moreover, examples are presented of the growing number of local initiatives taken so far by the water management organisations at field level with the support of Union Parishads, and attempts to develop a sustainable source of income to finance routine O & M and office costs.

CHAPTER 1: INTRODUCTION

1.1 Background

The Char Development and Settlement Project (CDSP), as follow up to the Land Reclamation Project (LRP), started in September 1994 with the aim to develop coastal Chars in the Meghna estuary and to settle landless people on khas land. The present phase of the project (CDSP-II) commenced in October 1999 as a five years project, to be completed by the end of September 2004. The overall objective of the project is to improve the economic situation and living condition of the population of the Char areas. It is working to achieve that objective by undertaking a set of specific interventions. The most important of these is to assist to BWDB and local field level institutions (WMOs) to achieve better water management in the Char areas.

Five government agencies are involved in this implementation of CDSP-II. The Bangladesh Water Development Board (BWDB) is the lead body, responsible for construction and maintenance of all water management infrastructure in the project areas. BWDB has a long history in dealing with floods and water management and is the main organisation involved in the water sector. Experiments began with the beneficiary participation in the eighties and nineties, and subsequently the development of Guideline for Peoples Participation (GPP) in 1994 paved the way for the ongoing efforts towards participatory water management (PWM). The GPP were mainly a BWDB affair, and in the mean-time other organisations such as Local Government Engineering Department (LGED), also developed their own guidelines for participatory water management. The experience in both the BWDB and LGED resulted in the formulation of "Guidelines for Participatory Water Management (GPWM)" in April 2001. This is the first general guideline for the all concerned agencies involved in participatory water management.

A note on names of WMOs
Following the first guideline (GPP), CDSP started its activities in the PWM in three Polders in 1998 by forming Water Management Committees (WMCs), representing all the Water Management Areas or Blocks. In the final version of the guidelines (GPWM), these organisations have been designated as Water Management Associations and Water Management Groups. To be in line with the GPWM, the project decided lately to designate all newly established WMOs in accordance with the GPWM.

1.2 Definition of Water Management

Water management is more than just the operation and maintenance of water management infrastructure. In essence, it is a process through which people influence water quality and quantity in a certain area. Therefore, the defining element of water management is water control, which is the capacity to determine how much water goes or remains where and when. So, water management is the intervention by people in the manner in which surface or ground water is captured, conveyed, utilised and drained in a certain area. This takes place in a process of social interaction among different stakeholders by employing different methods, resources and strategies around the issue of water control.

Moreover, participatory water management can be defined as the control of water in a water management system, through adequate operation and maintenance of the water management infrastructure on the basis of transparent and systematic procedures for planning, budgeting, implementation, monitoring and evaluation based on the active participation of the stakeholders.

1.3 Water Management System

A WM-System includes all the land and water resources within the boundaries of the system, usually a combination of embankment, sluices and gates, khals and catchments boundaries. This includes all the water management infrastructures-temporary or permanent, constructed by the Governmental Agencies

or the stakeholders. WM-systems may distinguish Flood Control and Drainage systems, Irrigation or a combination of these. Following the categories established by the BWDB, in the coastal areas of the South-Western Hydrological Zone, FCD and FCDI systems can be found.

1.4 Control of Water

Flood Control and Drainage System (FCD-System) are all in the areas of floodplain of the rivers of Bangladesh and mostly in the coastal areas, which are characterised by a strong tidal influence. The water management infrastructure consists of embankments, khals, beels, cross bundhs, sluices etc. The infrastructure in FCD systems provides control so that the infrastructure may help to reduce early monsoon flooding and facilitate retention of water in the post monsoon within the system. Here control includes maintaining the required water level by operation of the structures, protection of salinity intrusion by regulators or cross bundhs and protection of sedimentation in the post monsoon by gate operation as well as by making cross bundhs at the outfall channel of the system. In the FCD-Systems, flood protection and proper drainage are the main objective. By retaining sweet water in the post-monsoon (irrigation), the FCD system can provide additional scope and benefit to the farmers. This depends on the following factors:

- Maintenance condition of the sluice is in excellent condition with minimal water leakage (caused e.g. by defective rubber seals)
- Sluice gates are closed properly at appropriate times so that maximum water can be retained in the canals
- Canals are re-excavated with proper designs to retain the maximum possible amount of water
- WMO is working well with proper management of retention water.

Summarised, *However irrigation is practised in FCD-systems in the coastal areas, facilitated by the proper operation of the sluices (for which adequate maintenance is a pre-requisite), and the construction of cross-bundhs by the beneficiaries' to retain water in specific parts of the polder for irrigation.*

1.5 Benefit of Agriculture and Domestic Use:

In the FCD-Systems, canal water can be used for both agriculture and domestic purposes. Particularly, for irrigation on a small scale for Rabi crops, sweet water can be retained at the end of the monsoon in a big-tide (boro katal). This water can be used for Rabi crops particularly for chilli, potato, onion, gurlic and also for boro crops in the low land where irrigation requirement is less. At the same time canal water can be used for domestic purposes in both monsoon and post monsoon
However, the main challenge is the good maintenance condition and timely operation of the sluices. Another challenge here is how to distribute water in an equitable manner during this period.

1.6 Conflicts of Interest in Water Management

A typical characteristic of water management is the multitude of interests, functions and stakeholders involved. A number of characteristics stand out:

- The conflict between the different categories of land and water users
- The complex management of water levels and quality in areas with competing and mutually exclusive demands on water levels and salinity
- The variety of functions of FCD infrastructure, such as protection of homesteads, agricultural land and drainage (their primary functions), irrigation, navigation, transport over embankments, flood shelter and housing

In other words, water management is also concerned with resolving the conflicts of interest in this field. Different types of conflicts can be observed amongst the beneficiaries:

- Conflict on opening and closing of the sluices
- Conflict between fishermen and farmers
- Conflict on cross bundhs on the drainage canals for fishing or transportation

- Conflict between the beneficiaries living on the upper and lower end of the canals or rivers
- Conflict between the beneficiaries on the high land and low land
- Conflict on the preference of sweet water or salt water

It is essential to solve the above-mentioned conflicts in the area of water management. To solve these conflicts different techniques or process are needed. One of the roles of the water management organisations (WMO) is to solve all these conflicts.

1.7 Implementing Institutions

The institutional framework in which the local stakeholders participate in water management is comprised of a structure of Water Management Groups (WMG), Water Management Associations (WMA) and Water Management Federations (WMF). These are the institutional mechanism at various levels of the local stakeholders for participatory water management. According to the GPWM and NWPo, these organisations are, each at their level within the WM-system, jointly responsible for water management together with main Government institutions. *Joint management in this context means that the WMOs participate in, and contribute to, water management activities and funding but are not yet fully responsible and have not yet been vested with the authority or provided access to resources to undertake independent management.*

The public sector agencies responsible for the implementation of the GPWM and NWPo include among others the Bangladesh Water Development Board (BWDB), the Local Government Engineering Department (LGED), and the Department of Agriculture Extension (DAE). These agencies have gradually been playing a role in the improvement of stakeholder participation in water management in the stages of project cycle. The stakeholders for participatory water management include project beneficiaries, WMOs, Local Government Institutions (LGIs), Non-Government Organisations (NGOs) and community level self-help groups. The participation of the above-mentioned stakeholders is essential for integrated water management.

According to the GPWM, the WMGs, WMAs and WMFs, representing the stakeholders, are the driving forces in water resource management. These are meant to be independent organisations with decision making power at all the stages of local water resource management. WMOs are responsible for planning, implementation, operation and maintenance of local water resource schemes in a sustainable way. The management responsibilities of schemes/projects depend on the size of the project as follows:

- Management of schemes/project over 5000 ha will be by either private management through leasing, management contract or joint management by BWDB along with LGIs and WMOs but keeping the ownership with BWDB.
- Management of schemes/project up to 5000 ha will be made over to WMOs but keeping the ownership with BWDB.
- Ownership of scheme/project up to 1000 ha will be transferred gradually to the LGIs, which are being satisfactorily managed and operated by WMOs.

1.8 Local Resource Mobilisation

In the absence of an established financing mechanism, local (public) resource mobilisation is a key factor in funding the operation and maintenance of the water management infrastructure by the field level organisations. Local WMOs can investigate the source and scope of raising a fund for O & M and office costs of the organisations itself. In this regard, support from BWDB and LGIs is important to mobilize local resources for fund raising. Likewise, the beneficiaries' contribution in kind or cash is also an important source to cover operation and maintenance costs. Prior to the fund operation by WMOs, a yearly operation and maintenance plan has to be prepared jointly by WMOs, BWDB and LGI.

2 CHAPTER 2: WATER MANAGEMENT BEFORE CDSP

2.1 Background

The Chars in the CDSP-II area are the land masses developed in the Meghna estuary by the process of accretion during the last 25-30 years. The polders were originally developed in the period 1988-1998, except for Char Bagardona-I, completed under LRP. The main water management infrastructure in the char areas consisted of embankments, sluices, drainage khals, internal roads and bridges/culverts. The main functions of these structures were protection from floods in the form of the daily tides and cyclones; drainage of rainwater and protection from salinity intrusion.

2.1.1 Typical Characteristics of Water Management

The water management condition of the above-mentioned Polders before CDSP interventions were of course varied (see Technical Report: 15 on water management appraisal). Nevertheless some general conditions can be mentioned:

- Soil salinity was the major problem in limiting the growth of Rabi crops in all the chars. Particularly, Chili, sweet potato, groundnut, linseed, onion and other winter vegetables were grown also in a limited way. Soil salinity was the main cause of low cropping.
- Storage of sweet water in the khals was not possible for irrigation.
- T. aman (mainly local variety with limited HYV) was the only main crop of the year in all the chars. Some times the pest attacks in T. aman were very serious and very few farmers could afford pesticides.
- No one took actual responsibility for operation of the sluices. In most cases, the fishermen opened and closed the sluices, as they desired for fishing. Formal operational responsibilities resided with the BWDB (by the *kalashi*).
- Maintenance conditions of the sluices were extremely bad; and there was no community responsibility to report to BWDB on the prevailing situation.
- Numerous cross dams were constructed in the drainage khals for fishing and transport without any co-ordination or control. These cross-dams were the major source of drainage congestion.
- Water management conflicts were very common. The source of the conflicts were related to fisherman under the influence of some influential persons (controlling drainage sluices), building cross bundhs on the khals, embankments cuts by outsiders to relieve drainage congestion (e.g. in Char Bagardona-II and other areas). All these conflicts led to severe damage to crops and properties.
- Flood water entering from outside through sluices, embankment cut and through the different open points of the embankment were causing damage to crops, properties, pond water and polluting the environment. Sometimes pond water had to removed by draining and replaced by fresh water for domestic uses.

2.1.2 Operation & Maintenance

Maintenance requirements in all the Polders were quite high, as CDSP did not intervene in maintenance. After completion of the infrastructure, maintenance was overlooked and a large number of drainage khals needed periodic and routine maintenance. None of the sluices were functioning properly; leakage and broken gates were common in all the systems. There was a need to remove the cross dams in almost all the drainage khals in each system. These cross dams were put across the main and secondary khals for fishing and in some cases to provide access to the homesteads with a narrow pipe. Many pipe culverts in the chars needed repair/replacement and in many cases approach roads or box/pipe culverts and bridges were damaged and had not been repaired. Earthen roads constructed by LGED were mostly mal-functioning because of lack of proper maintenance. CDSP observed and recorded all the above-

mentioned problems through conducting Rapid Water Management Appraisals (RWMA) and discussing these with the BWDB and LGED for remedy and action.

Abolishing the Khalashi System

In the past, a khalashi system was used for the operation of the sluices. The BWDB appointed khalashi for Char Bagardona-I and -II but these typically did not control sluice operation. In the BWDB the khalashi were hired on retention posts, and once these were retired, no khalashi were employed to operate t he sluices. Ultimately, operational problems existed in all the Polders under CDSP jurisdiction as well as other projects. Even the operation of very large big sluices (e.g. the 15 vent sluice at Polder 59/3C-Bamni, with a command area of around 15000 ha) no operator was hired by the BWDB. Similar problems were reported for Gangchil sluice (12 vent), with a catchment area of around 5640 ha. As BWDB has no manpower to look after the operational and maintenance aspects of these infrastructures, there were always O & M problems in all the sluices.

Mechanical Defects in the Sluices

Out of the many functions of the WM-systems, controlling water levels through the regulating structure is one of the main ones. The drainage network, water management organisation, regular O&M of the system, conflict resolution are essential tasks but without a functioning sluice, all these activities suffer. In the project area, thirteen sluices are in operation and another five medium (2-5 vents) and small (one vent) sluices are under construction. The status of these existing sluices is on the verge of collapse. None of them are in a good condition, each one has its defects since being commissioned. The major problems encountered are heavy leakage and difficult opening and closing of the lift gates. Main consequences of the defective gates are:

- Rapid drainage of sweet monsoon wastewater, a valuable source or irrigation, drinking and fisheries and storage of fresh water becomes difficult.
- Intrusions of saline water inside the polder area in the pre-monsoon, resulting in lower yields or crop failure.

The main reason lies in a defective design and construction, both structurally and mechanically, and it is above the present and future capacity of WMOs to tackle these problems. As a result, local people and water management committees (WMC) have lost confidence in their effective operation, which ultimately affects negatively the people participation in O&M and its organisation. Design and construction problems include defective placement and hinges, high resistance between the gate and walls and the complicated and mal-functioning gearboxes. Above all no attention has been paid to maintenance.

In the later part of the project, the CDSP has brought forward this issue for attention at the highest level. A pilot is expected to take place in Char Majid to address the issues of design, fabrication and implementation. In addition, CDSP, the BWDB and the WMO will, at this initial stage, address the future (long-term) management arrangements, looking into questions such as maintenance agreements, sourcing through BWDB or contractors and supervision. The basis upon which the interventions are designed is the realisation that the WMO will play the main part in O&M of the future sluice.

2.1.3 Roles and Responsibilities in O & M

The BWDB field level staff (XEN, SDE, SO) was very much aware of the poor operation and maintenance of the infrastructure. They were however themselves constrained by a wholly inadequate budget allocation for maintenance. Moreover, the outlook of the BWDB was not conducive to participation from the beneficiaries' in water management. From the side of the beneficiaries, there were no representative as water management organisations at local level in which they could participate, contribute their experience and have a voice.

3 CHAPTER 3: WATER MANAGEMENT IN CDSP-I AND CDSP-II

3.1 Background to Participatory Water Management in CDSP

CDSP started its institutional activities in water management in 1997. The approach was initially based on the 1994 Guidelines for People's Participation (GPP); except that it already assigned a role to local government bodies (in particular the Union Parishad) and that it defined a water management system as the catchments area of a sluice. After the 'final' GPWM were published in 2001, the main changes were also incorporate into CDSPs approach. The GPWM have been adapted to the conditions of the char areas, taking into account the typical FCD(I) rather than Irrigation conditions. The main differences lie in the tasks of the water management organisations at different levels; including the regular sluice operation, preventive, periodic and emergency maintenance of the WM structures and working out to a great level of detail the role of BWDB, LGED and the Union Parishad. An important distinction lies in the lowest level of the WMO. In the GPWM, these are organised into a Water Management Group (WMG) whilst in the char areas the lowest hydrological/social unit acts as the Electoral College only.

The main differences between CDSP guidelines and the GPWM are presented in the following table.

Table 1: Comparison GPWM and CDSP-approach

ISSUES	GPWM	CDSP-II
WM Group	Suggested to form WM group at the level of each smallest hydrological / social unit	No formal organisation at the smallest hydrological unit /social unit level like WMG but representation from this unit to form the WMC/WMA
WMA / WMC	GPWM term this mid tier of WMO as water management association (WMA)	In CDSP-II termed as WMC; the main organisational level. In CDSP-II, WMA means the water management area
Legal Status	GPWM suggested that WMA will be registered and WMG or WMF may or may not be registered	WMCs have not been registered yet
Women's representation in the WMO	Recommended to include at least 30% women representative in the executive committee of WMOs	50% women representation in all the WMCs in CDSP-II
WMF	Recommended to form WMF for polder /sub-polder/scheme up to 5000 ha or above 5000ha	In CDSP-II, WMF formed where appropriate and planed to form in future, possibly including areas outside the polder (upstream/downstream)

3.2 Water Management Organisations

3.2.1 Objectives

The WMOs in the project area are established with the objective to:

- Manage, operate and maintain the water management infrastructure
- Maintain the liaison with the implementing agency, Local Government Institutions (LGI) and community self help groups
- Plan and coordinate the activities of local stakeholders
- Mobilize local resources for contribution towards construction, operation and maintenance costs

3.2.2 The Water Management System, Area and Block

A Water Management System (WM-System) is defined as an independent hydrological area served by a sluice. A WM-System is divided into different Water Management Areas, being the lowest hydrological unit, often not interconnected with each other, but all draining on a main khal. In the CDSP area, the WM-System coincides with the polder in case small polders. For medium and large polders, the area has been divided into 2 to 4 WM-Systems *The delineation of each WM-System into discrete water management areas has been accomplished by conducting Rapid Water Management Appraisals (RWMA). Profiles and maps of each of the WM-Systems are provided in the Annex 1*.

3.2.3 Types and Levels of Water Management Organisations

The GPWM recommends three types of Water Management Organisations, the Water Management Group (WMG), Water Management Association (WMA) and Water Management Federation (WMF) depending on the size and complexity of the project/sub-project/scheme. It also states that the stakeholders on the basis of their preference will decide on the number and level of WMO to be formed in any project area. The following options are defined:

1. For a project/sub project/scheme up to 1000 ha, one- or two-tier WMOs may be formed; WMG at the lowest level and water management association (WMA) at the highest level.
2. For a project/sub project/scheme up to 5000 ha two or three levels of WMOs may be formed; WMG at the lowest level, WMA at the mid or apex level and WMF at the highest level.
3. For a project/sub project/scheme above 5000 ha three types of WMOs will be formed; WMG at the lowest level, WMA at the mid level and WMF at the highest level.

Although the smallest unit is the Water Management Area in CDSP-II, there is no formal organisational structure at this level. Two representatives (one male and one female) are chosen for the WMC in one or more community meetings. At this level, there is no need for regular meetings or activities except for communication activities between WMC and their members and the election of new WMCs every 2 to 3 years. A separate structure other than the existing social unit (e.g. the shomaz or mouza) is not required. This is of course different in Irrigation schemes where e.g. water distribution must be organised and paid for at this level. Up to now, the WMF as apex body only exists in Polders 59/3B and Polder 59/3C.

3.2.4 Composition of WMC/WMF

The Water Management Committee (WMC) is the functional grassroots level water management organisation in the CDSP areas. Each Water Management System has one committee, which consists of eight to twenty four members depending on the size and population of the command area of that WM-System. The Water Management Federation (WMF) where applicable is the apex body of Water Management Organisation (WMOs). In each WMC, one president, one vice-president, one secretary and one cashier together with one or two operators are in the executive position. The remaining

members are the general members of the WMC. Two operators have been nominated by WMCs in Polder-59/3C and Gangchil because of the large size of the sluices. One operator of the Gangchil sluice is a woman. The Chairman of the concerned Union Parishad (UP) is the Adviser of WMC and WMF. If the WM-system covers more than one Union, the Chairmen of all concerned Unions act as advisers of the WMC/WMF. In some of the WMCs, UP members have been selected/elected as the general member of the WMC in the mass meetings but there is no ex-officio provision for them.

Stakeholders

In a number of committees, special representatives have been selected to represent specific stakeholders. For example, initially representatives from the fishing project inside the polder area have been included in the WMC-Nabagram and Kolmi (Char Bhatirtek) because there are a considerable number of fishing projects in those two systems. The representation from the Polder outsider was included in the WMC of Char Beggar Dona II, Char Majid and Polder-59/3C (Bamni) because these systems exert an influence over the upstream/downstream areas. From the outside areas, male and female representation follows the same procedure (equal, mass meetings). One landless male and one landless female represent the landless category in all the WMCs. The adviser (UP Chairman) to the WMC selects them through consultation with the local NGOs.. The same guideline for composition of WMF has been followed.

Tenure and Reconstitution

The tenure of a water management committee is two years after which each committee is reconstituted. The re-constitution of the WMCs has been completed in the last quarter of 2001 after the completion of their first tenure in CBD I, CBD II, Char Majid, Nabagram and Kolmi. These WMCs are now running its second term.

3.2.5 Tasks of WMCs

The tasks and responsibilities of the Water Management Committees have been defined in the water management and O&M guidelines of CDSP-II (Technical report-28), which are almost similar to the tasks mentioned in the GPWM for Water Management Associations.

Water Management Tasks

The tasks of the WMCs are summarized as follows:

- Review and resolve conflicts or issues concerning the Water Management Area and System.
- Formally represent beneficiaries and project-affected persons in all issues related to water management.
- The committee is responsible for the operation of the sluice gate in pre-monsoon, monsoon, post-monsoon and dry season. The committee will decide on the water level to be maintained by closing or opening the sluice gates.
- Decide in any emergency.
- The Committee is responsible for the maintenance of the infrastructure in collaboration with the agencies concerned and with the Union Parishad, as mentioned in the Maintenance Plan (Technical Report-23).
- Generate fund by mobilizing local resources for O&M, organisational costs of the WMC and other purposes. WMC is responsible for proper financial management of those funds.
- Maintain a liaison with other institutions such as Local Government bodies (Union Parishad), NGOs and other community self help groups concerned and coordinate these activities.
- The committee is responsible for the preparation of the long-term O & M plan; it should participate in the over all activities and review and resolve conflicts and issues in the Water Management Areas/blocks.
- Prepare annual O&M plans in a participatory manner.

- Collect the contribution from the beneficiaries, preferably in the form of labour for the maintenance where applicable, collects contributions from the members of WMC for minor operational and maintenance costs as well as organisational costs of WMCs.
- Assist in arranging and receiving relevant extension, training and other services from implementing agencies, projects and NGOs for various stakeholder groups.

The office bearers of the WMC/WMFs are: the President, the Vice-President, the Secretary, the Cashier, the Operator and the Members. For each of these functionaries a detailed task description has been developed in close co-operation with the WMOs in the areas. These have been included in the Annex-2.

Supporting Tasks

Rules and Proceedings of Meetings
- The Annual General Meeting (AGM) will be held once in every two year.
- The WMC will determine the date of AGM.
- Notice of AGM will be sent to all people under the system.
- The WMC shall meet at least once in every two months.
- The secretary will decide the date, time and agenda of meeting in consultation with President and serve the notice at least three days before.
- Presence of majority of the member shall be treated as a quorum for WMC meeting.
- The secretary in consultation with President can convene emergency meetings.
- Confirmation and approval of minutes of the previous meeting.
- Present reports and accounts of the meeting.
- Proceedings of all meetings to be prepared duly and circulated to LGI (UP), BWDB and others concerned.

Record Keeping
- Every operational instruction shall be recorded in a register supplied by the BWDB and shall be made available with the Operator.
- Decision of the WMC shall also be recorded in the same register i.e. in minute book.
- A list of population under each WMC in the prescribe form shall be kept.
- Separate notice book for meeting and dissemination of other information, and any other prescribe registers or books.

Maintaining Accounts
The WMC will keep a regular account of:
- All sums of money received and expended by the WMC and of the matters in respect of which the receipt or expenditure takes place.
- All sales and purchase of goods by the WMC.
- The assets and liabilities of WMC.

3.3 Development Process of WMOs (WMG/WMA/WMF)

To enable the WMOs to become sustainable organisation that can carry out the tasks described before, a participatory process for formation and strengthening of Water Management Organizations has been developed in the project. Seven stages or steps can be distinguished. Naturally, during implementation, these steps are adapted to the local circumstances. In the sections here below, these stages are described. The sequence, and the role of training of WMOs and BWDB/UP staff, is visualised in the flow chart thereafter.

Step 1: Information Dissemination
The process starts with an information campaign (IC) in the Polder/Scheme area. The campaign includes information dissemination of GPWM/project concepts, objectives, activities related to participatory water management through individual contact of, small/large group meeting in the different locations of the WM-systems area. This was done in each water management area at community level. In most cases, the LGIs were present at these meetings. The same campaign initially was held among the officials of BWDB at division and sub-division level through workshops or meetings.

Step 2: Rapid Water Management Appraisal
The second step is the conducting of a rapid water management appraisal (RWMA) for each polder. The objectives of the appraisal are as follows:

- To delineate hydrological or social units under each water management system.
- To get baseline information on the water management conditions of the area.
- To update the existing polder map and to obtain more information on drainage problems and irrigation sources.
- To make a comprehensive plan to address the water management problems as well as to develop WMOs.

Step 3: Defining the Organisation Structure
The third step is to define the structure of water management organisations (WMOs), including the location of the Blocks (informal WMGs) within the WM-System and the number of representatives at each level. This is the initial structure as after having drafted the by-laws the WMO itself will/can adapt the organisation structure to better suit the WM-functions in the area. Included are also the detailed plan to establish WMOs. In this regard, required manpower, logistic supports, involvement of LGIs, future sustainability of WMOs etc, are addressed.

Step 4: Orientation and Election Meetings
The fourth step is to organise a series of plenary meetings (male and female separately) in each of the Water Management Systems. The objectives of these meetings are to disseminate again the concept of participatory water management, discuss the many questions that arise, orient the participants to the formation process of WMC/WMA and select/elect representative for the Executive Committee. After having a clear understanding of the WMO and its functions, the participants (s)elect one competent representative from amonstg themselves to serve voluntarily as a member of the proposed Committee. If there is any conflict in selecting or electing in the first meeting, they decide in a second or third meeting. In a critical situation, the members/chairman of the Union Parishads play a role in solving the conflict.

Step 5: Election of the Executive Committee
The fifth step is to organise an introductory/orientation session for the formation of WMOs. In this session, the selected representatives gather for the first time, and have a short orientation on their task and responsibilities for the functionaries of WMC. Also their expectations are discussed. Thereafter the participants select/elect the executive council for the WMOs and declare the organisation formally active. An appointment is made for the first regular meeting of the executive committee.

Step 6: Meetings, Annual Planning and Co-ordination

In the sixth step, the committee starts to develop the required work arrangements, both internally and with respect to co-ordination with government institutions. The committee starts to hold regular meetings, special (emergency) meetings, annual general meetings with the population and co-ordination meetings with government institutions. A series of training/orientations for strengthening and capacity building is organised in support of these activities. The committee brings together all water management related problems and suggested solutions and prepares an annual plan (including O&M) that they submit to the BWDB and LGED, with a copy to LGIs and CDSP-II. This plan is then discussed jointly with the aforementioned organisations. Support from CDSP is oriented to improving these 'normal' working arrangements. In parallel to this step, the next step takes place, the annual or seasonal cycle of operation & maintenance, conflict resolution and resource generation.

Step 7: Capacity Building and the O&M Cycle

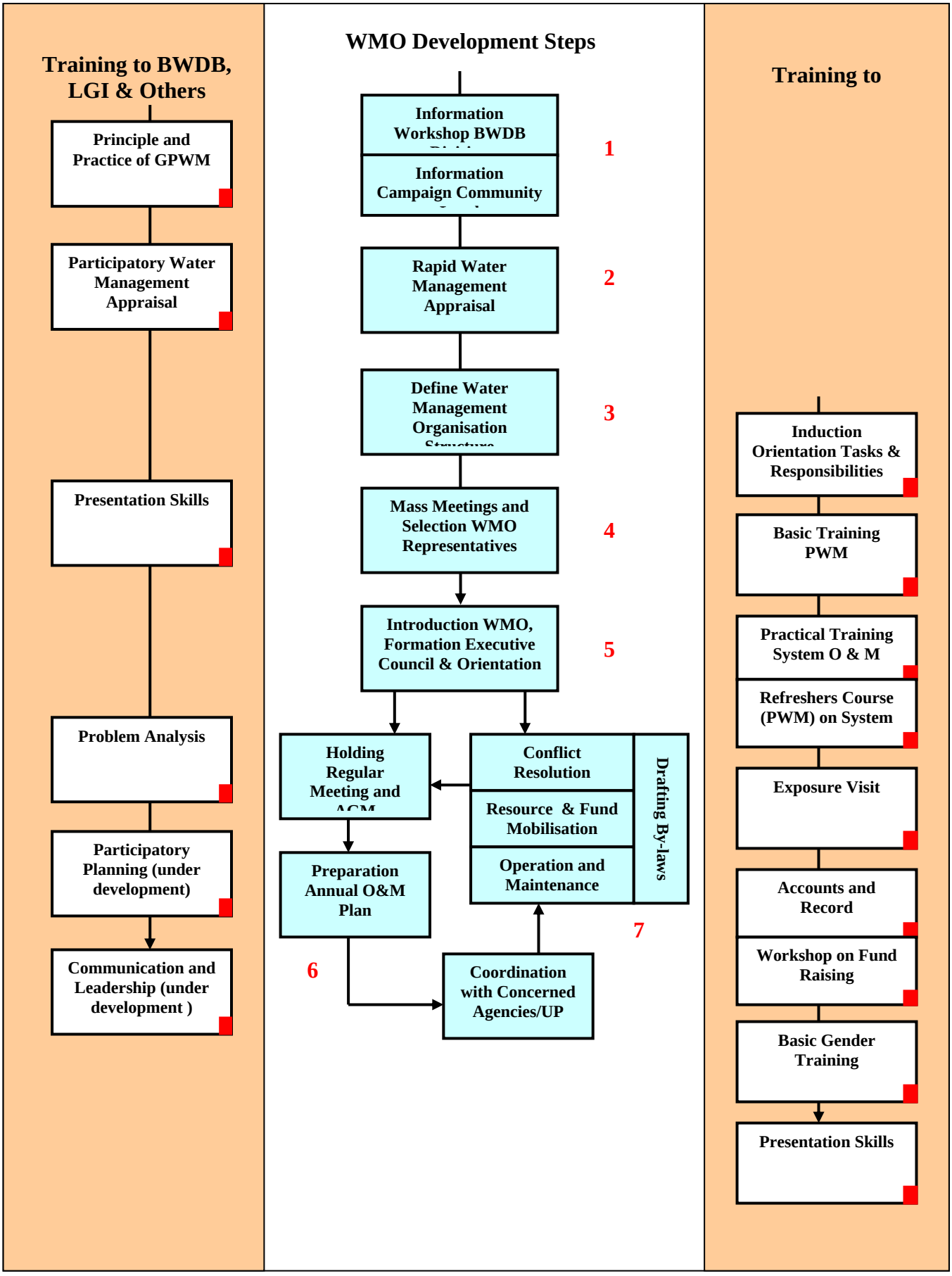
Within this cycle, the committee strengthen liaison and coordination with Union Parishads, LGED, BWDB and others concerned to solve the water management problems. The committee also take the full responsibility of the sluice operation, along with minor (routine and preventive) maintenance. For major maintenance, they always refer to the BWDB and keep regular contact with BDWB, LGED and CDSP. At this stage, the committee work for fund raising through local resource mobilization, and work together with other concerned stakeholders to solve all water related conflicts prevailing in their respective jurisdiction. The core objectives of this phase are:

- Changing the working relationship between the WMOs and the government institutions from top-down and dependent to collaborative and shared, and
- Strengthening the internal capacity of the WMO to enhance their independence and skills to the benefit of their members. Activities such as developing WMO specific by-laws, training in accounts and record keeping, practical O&M skills, conflict resolution, prioritisation, etc. are in support of this objective.

The development steps of WMOs and other related activities are shown in the flow chart.

CHAR DEVELOPMENT AND SETTLEMENT PROJECT-II

Water Management Organisation Development Process



3.4 Formation/Establishment of WMOs

At present, there are 13 WMCs, 2 WMF, 13 WMG, and 1 WMA in CDSP-II areas. In future, there will be a total of 25 WMC, five WMF on the main land, Polder 59/3C, Boyer Char, MAA and Bagardona upstream. A total of 22 WMG, 3 WMA and 1 WMF are in process of being formed in South Hatiya. Table-2 shows the existing WMCs and WMFs in different Polders with their size, member types, and attendance rate and formation date. One WMF has been established in the Polder 59/3B and another one in Polder 59/3C-Bamni having equal representation from the concerned WMCs. CDSP-II has a plan to form more WMF in Muhuri accreted Area (MAA), South Hatiya, Baggardona upstream and in Boyer Char. Federations have been formed following the GPWM. The formation of WMOs (WMG, WMA and WMF) in the South Hatiya has been going on as a pilot scheme following GPWM as per the recommendations of mid-term review mission (MTR). Basic information on the WMC/Fs in the CDSP area is provide here below, detailed information on present WMG/WMA formation is provided in the Annex-6.

Table 2: Basic information WMC/WMFs (end 2003)

Sl. No		Date of formation	Committee membership			No. Meeting held	Attendance		
			Male	Female	Total		Male	Female	Average
1	CBD-I	24/4/1998	9	8	17	26	78%	74%	76%
2	CBD-II	18/5/1998	10	10	20	28	74%	71%	73%
3	CM	12/5/1998	10	10	20	28	76%	75%	76%
4	CBT- Nabagram	1/6/1998	4	4	8	26	76%	84%	80%
5	CBT – Kolmi	7/5/1998	4	4	8	24	77%	83%	80%
6	CBT - Gangchil	1/1/2000	9	9	18	20	75%	68%	71%
7	Montaz	23/7/2001	6	5	11	10	67%	74%	71%
8	Gopal	23/7/2001	5	5	10	11	86%	69%	78%
9	Karim	23/7/2001	5	5	10	10	60%	81%	71%
10	Zillar	11/12/2001	7	7	14	12	78%	78%	78%
11	WMC-1, Bamni	16/3/2003	8	8	16	9	87%	70%	79%
12	WMC-2, Bamni	27/4/2003	12	11	23	6	71%	73%	72%
13	WMC-3	12/8/2003	12	12	24	3	72%	75%	74%
14	WMF, P-59/3C-Bamni	14/9/2003	11	4	15	2	82%	88%	85%
15	WMF, P-59/3B	9/4/2003	8	3	11	4	88%	66%	77%

3.5 Capacity Building and Strengthening of WMOs

Different steps have already been taken by CDSP-II for capacity development and strengthening of the WMCs. The steps taken are listed as follows:

- To provide the necessary training/orientation to the WMCs.
- Encouraging WMCs to raise fund and support them in this regard.
- Develop and prepare maintenance plan for each system/polder for better water management.
- Regular meeting and issue-based discussion, to enhance the linkage and coordination with concerned agencies and Union Parishads.

3.5.1 Training to the WMOs

In the project, seven modules for WMOs and three for staffs have been developed and tested. Details on the modules have been provided in Annex 4. The first training was provided in 1998, when five WMCs received training on Water Management Guidelines, and orientation on gender issues. Thereafter, all the members of five WMCs visited the Khulna Jessore Drainage Rehabilitation Project (KJDRP) as part of an exposure visit to exchange views and experiences. A one-day orientation at field level was given to newly formed/ re-constituted thirteen WMCs and two WMFs on their tasks and responsibilities. Subsequently, all the WMCs have been provided with basic training on participatory water management covering systems operation & maintenance, task and responsibilities of all stakeholders". The contents of that training are as follows:

- Water management
- Concept of participatory water management,
- WMO and their role and responsibilities,
- Role of BWDB, LGED & UP,
- Water management in agriculture,
- Role of women in water management,
- Conflict resolution,
- System operation and maintenance
- Fund raising for WMCs.

During the basic training, it was felt necessary to provide the WMCs field training on operation and maintenance, as women members particularly were not aware of the structural operation and maintenance aspects. Assessing this need and demand, it was decided to arrange one day practical training to all the WMCs to give a practical knowledge on operation and maintenance of the water management structures. Accordingly, field training (practical demonstration) on systems operation and maintenance has been provided to the 10 WMCs in the period of 26th August to 2nd October 2002. In this training, all the participants gathered at the sluice area where the sluice operation system and its maintenance aspects were demonstrated. Then the participants along with facilitators visited the embankment and observed its maintenance condition (breach, rain-cuts, slope damage etc.) and discussed the remedial measures required in that particular case. All the participants were then taken to a specific canal where more cross dams and fishing traps were found. The participants observed those cross dams/fishing traps and realized how these things obstructed water flow for drainage. At the end of canal visit, all of the participants returned to the venue where they had started their first session. At this stage, the participant's observations, knowledge and reaction were reviewed.

The major findings of the training are given below:

- Member of WMCs could identify the operational and maintenance problems prevalent in the sluice, canal and embankment.
- Participants got a practical demonstration on proper sluice operation techniques.
- They understood the importance of sluice maintenance.

- Operators of the sluice were given a personal demonstration on sluice operation and minor maintenance techniques.
- Participants realized how fishing traps or cross dams on canals could block drainage water.
- Women members of WMCs found the training very interesting and meaningful, and helpful in their understanding of their tasks and responsibilities in the area of water management.
- Integration between BWDB and WMCs was felt essential.
- It was felt necessary to provide trainings that are more practical to the operator of sluices on operation and maintenance especially on mechanical issues.

This training was found to be very useful for strengthening and capacity building of all WMCs working in CDSP-II area. The second exchange visit was organized for 37 members of 10 WMCs in Meghna Donagoda Irrigation Project (MDIP) along with a short visit to Comilla Didar Samity. The objective of this visit was to give an exposure to the WMC members on institutional development, water management, financial management and other aspects necessary for attainment of sustainability of WMOs. The training providing to the WMOs consecutively in CDSP-II are listed below:

- One-day orientation on the tasks and responsibilities of WMC in the formation day.
- Three days basic training (water management, tasks & responsibilities, operation and maintenance, water management & agriculture and fund raising issues).
- One day practical training on the operation and maintenance of the water management infrastructure.
- Refreshers courses on basic training.
- Accounts management and record keeping.
- Basic gender training.
- One day orientation on agricultural development
- Exchange visit (visit other potential FCD/I project).

A detailed overview of the training provided to each of the WMOs is provided in the following table.

Table 3: Overview of training provided

Courses	Name WMC/F	No. Of Participants	Year Provided
1.Induction orientation (one day)	All 13 WMCs and 2 WMFs in the mainland and 20 WMGs, 3 WMAs in the south Hatiya	539	2001 to 2004
2.Basic training on PWM (3 days)	All 13 WMCs and 2 WMFs in the mainland	199	2002 to 2003
3.Practical training on O & M (one day)	10 WMCs in the mainland	136	2002
4.Refresher course on PWM (one day)	10 WMCs in the mainland	136	2002 to 2003
5.Account and record management (3 days)	President, secretary and cashier of 7 WMCs in the mainland	18	2003
6.Exposure visit (3 days)	37 members from 10 WMCs in the mainland	37	2003
7.Basic gender training (5days)	3 WMCs in the mainland	57	2003
8. Orientation on Agricultural issue	All the members of 10 WMCs in the mainland	136	2003
Workshop on bi-laws	Members of WMC-CM	20	2003

3.6 Assistance of CDSP-II in Formulation of Water Management Manual

The GPWM stated that each implementing agency is responsible for the development of its own implementation manual to implement the GPWM properly in the field level. The text of this manual would be based on the practical experience of beneficiary participation in ongoing projects such as CDSP-II, KJDRP, and CADP. Experiences of finished projects such as EIP and SRP would also be used, with respect to both the formation and strengthening of WMOs in all cycles of the project. This is a BWDB manual. However, CDSP-II has taken the initiative to support BWDB. A six member-working group was put together by BWDB, with a small number of advisers to produce a draft manual. The working group consisted of a cross section from the BWDB, including members from O & M, planning and water management departments with advice and support from CDSP-II team members. It is considered a vital document in the advancement of water management and it is intended to draft the manual in a comprehensible and readable form of Bangla. The first draft of the manual already was ready by the end of 2003 and final draft is expected within the first half of 2004. A short-term consultant of CDSP-II has given the outline (Mission Reports 29, 35) to develop the manual and review the first draft.

3.7 Internal Coordination Group (ICG) on WM

All the activities so far achieved and established in the field of water management are the project-based support with little involvement of BWDB local staff. In this regard, an internal coordination group has been working consisting of members of the consultant team with a focus person. ICG work is under place and prepared the M.S. project on water management together with an external consultant listing all the comprehensive activities with starting and completion timeframe. The ICG sit together as and when required and review the progress so far achieved as per plan.

CHAPTER 4: FUNCTIONING OF WMOs

4.1 Improvement of Operation and Maintenance

The beneficiaries in the CDSP areas attach a very high priority to proper operation and maintenance of their WM-System. It is also crucial to achieve project objective and goals. In this connection, CDSP-II has been drawing the attention of the implementing agencies concerned with the operation and maintenance of the WM-infrastructure. As a result of WMO establishment and capacity building a considerable improvement in O&M has been brought about. WMCs as established field level institutions have been playing a crucial role, particularly in the operation of the sluices All the WMCs have taken full responsibility and they discuss the issue of sluice operation in their regular or emergency meeting, deciding in the meeting on the date and time of sluice opening or closing and instructing the sluice operator to work accordingly. In the maintenance of the sluices, WMCs have worked in greasing the sluices, changed the nuts/bolts, and cleaned the debris from the sluice area. For major or periodic maintenance, WMCs have reported the problems to BWDB for their action. After reporting the problems in verbal or written form, WMCs have also followed up the action of BWDB. In the sections hereafter, WMO contributions and initiatives are further elaborated. For canal re-excavation, WMCs also sought the necessary support from Union Parishads. As a result, concerned UP Chairmen visited CDSP and BWDB offices frequently to accelerate the process of canal re-excavation. Summarised the main improvements are:

Operation and Maintenance

- WMOs opening and closing the sluice as per the decision of the WMCs.
- Removing cross bundhs and fishing traps from the canals for improvement of drainage.
- Maintenance of the WM-structures:
- WMCs greasing the sluices as and when required.
- WMCs de-silting the canals for quick drainage.
- WMCs removing debris from the sluice and canals for improvement of drainage.
- WMCs working for filling rain cut and public cut of embankment.
- WMCs referring major and periodic maintenance to BWDB and LGED

O&M Planning

A comprehensive maintenance plan (Technical Report-23) was prepared on May 1999 for CBD-1, CBD-2, Char Majid and Char Bhatirtek (Nabagram, Kolmi & Gangchil) together with the concerned agencies and WMCs. In that planning process, BWDB, LGED, UP, CDSP and WMCs jointly contributed. Maintenance responsibilities were divided among the parties concerned with a commitment to accomplish it in a stipulated time. CDSP-II has introduced an annual maintenance planning of activities for the WMCs for all the water management systems. The objective of this planning is to achieve integrated planning among WMC, BWDB and LGED. WMCs of the other systems are also involved in the preparation of long-term maintenance plan. However, all the WMCs prepare annual maintenance plan with priority each year, review it with concerned UP Chairman and then submit it to BWDB/LGED. After receiving the maintenance plan from the WMCs, concerned sub divisional engineer (SDE) of BWDB organizes a review session with the representatives of all WMCs. In that session, BWDB, LGED, WMCs and CDSP consultants in a threadbare discussion finalize the maintenance proposal for each financial year. This joint planning has been organized for the last two financial years. However, implementation of this plan is still uncertain due to funding constraints and typically no more than 10-15% of the commitment is actually honoured in practice (see TR-11). This is a major source of dissatisfaction to the newly established WMOs. Involvement of Union Parishad with theses maintenance programs will need to be ensured in future.

4.2 Institutional development

4.2.1 Summary of Main Results

Before going into detail, first the main results are summarised here below:

- Established WMOs for each WM-system.
- WMOs are raising fund for O & M.
- WMOs are identifying the WM-problems prevailing in the field.
- WMOs resolving the WM-conflicts prevailing in the field.
- WMOs taking local initiatives to directly improve water management
- Participation of women ensured in all the levels and tiers of WMOs.
- BWDB working to develop a water management manual.
- WMOs prepare yearly maintenance plan and review these with the BWDB and LGED.
- Extension Overseer of BWDB working to monitor the activities of WMOs.
- WMOs are maintaining regular coordination with UP, LGED and BWDB.
- WMOs deciding the way and time for operation of the sluices.
- WMO disseminating all information related to water management to the local beneficiaries.
- WMOs maintaining all required books and records.

4.2.2 Local Resource Mobilization and Fund Raising

The need for local resources

Cost recovery for O & M in the Flood Control and Drainage (FCD) projects is not envisaged in the GPWM. In case of Flood Control Drainage and Irrigation (FCDI) projects, water rates will be charged for O & M as per Government rules. However, it has been felt necessary by the WMCs and WMFs in CDSP-II to raise a fund to maintain the official costs of WMOs as well as to perform the minor maintenance work. For this purpose, WMCs have been collecting fees of Tk10 per month from the members represented in those WMCs as a contribution to running the WMCs and to pay for minor maintenance costs. The rationale of this fund is the following:

- To meet the running cost of the WMCs itself, such as stationary, costs of meetings, maintenance of WMC shed.
- A toolkit, minor maintenance of sluices, khals and embankment
- Conveyance of office bearers to visit BWDB, LGED UP and project office.

Cashier of the respective WMC is responsible of collection and record keeping of these fees. The respective WMC deposit the total collection in a bank account in the name of the WMC. Moreover, all the WMCs have been exploring other sources to raise their funds through local resource mobilization with the support from BWDB, LGED and UP. Concerned UP Chairmen have also been supportive of the requirement for fund raising by WMCs in a workshop. In anticipation of the debate on users /beneficiaries contribution in O & M in the FCD project, it was discussed with the WMCs to have the WMCs manage a (modest) fund, not generated from systematic fees from all water beneficiaries, but from other sources. Possibilities for generating funds are as follows:

- Contribution of WMC members
- Collection of money from fisherman
- Leasing out of a water body or side of embankment to the individuals
- Obtain grant from UP and
- Collection of irrigation charges from the beneficiaries using retention water.

Accordingly, all the WMCs in CDSP-II area have been collecting monthly contributions from the members and raised a small fund. Beside the contribution of WMC members, the WMC-CM and WMC-1, Bamni have been collecting fees from the fisherman catching fish in the sluice area. An overview of funds collected and usage is presented in the table on the next page.

Table 4: Fund collection and usage (Tk)

Name WMC	Sources of fund	Total fund raised	Total fund used	Purpose of the used fund
WMC-CM	-Own contribution, -Fishermen contribution -Local donation	7000	1000	-Road repairing -Cross bundhs removal -For logistic & office expenditure
WMC-CBD-I	-Own contribution, -Local donation	4000	1200	-Small maintenance -Transport cost -Logistic/office costs
WMC-CBD-II	-Own contribution, -Local donation	5000	500	-Road maintenance -Logistic/office costs
WMC-Nabagram	-Own contribution -Fisherman contribution	700	650	-Greasing of sluice -Embankment maintenance -Logistics for WMC shed
WMC-Kolmi	-Own contribution -Fisherman contribution -Beneficiaries contribution	18200	17700	Road maintenance -Greasing of sluice
WMC-Gangchil	-Own contribution -Fisherman contribution -Beneficiaries contribution	6120	4720	-Cross dam removal -Canal re-excavation -Fishing trap removal -Greasing of sluice and cleaning debris
WMC Zillar	-Own contribution -Beneficiaries contribution -UP contribution	6650	5150	-Cross dam removal -Canal re-excavation -Fishing trap removal -Road maintenance
WMC-Karim	-Own contribution -UP contribution -Beneficiaries contribution	7870	7130	-Canal re-excavation -Greasing of sluice
WMC-Montaz	-Own contribution -Beneficiaries contribution	3500	3000	-Construction of cross dam for water retention
WMC-Gopal	-Own contribution -UP contribution -Beneficiaries contribution	10150	8550	-Cross dam removal -Canal re-excavation -Greasing of sluice -Road maintenance
WMC-1, Bamni	-Own contribution -Fisherman contribution	24500	23965	-Cross dam removal & Canal re-excavation -Transport allowances of office executives. -Remuneration to sluice operator -Entertainment and others
WMC-2, Bamni	-Own contribution -Donation of local people -Fishermen contribution	14785	13785	-Cross dam removal & Canal re-excavation -Transport allowances Remuneration to sluice operator -Entertainment and others. -Transport allowances
WMC-3, Bamni	-Own contribution	2000	1450	-Entertainment in monthly meeting -Expenditure for office stationeries

The issue of fund raising by the WMCs was discussed in the basic training on PWM provided to the WMCs. During the group discussion, two specific issues were focused on:

Number-1, why was a fund necessary? And Number-2, how could they raise it? The participant's opinion on number-1 is summarised as follows:

- Remuneration to the sluice operator
- Fund for lubricating the sluices
- Fund for small repair/maintenance
- Fund for road/embankment maintenance
- Fund for re-excavation of connecting/tertiary canals
- Office expenditure of WMCs: stationeries, conveyance allowances and meeting organising costs.
- Removals of cross bundhs from the canals.
- Fund for construction of cross bundhs on the canals/sluice area for retention of sweet water for irrigation.
- Furniture's for WMC office and equipments for sluice operation and maintenance.

Participant's opinion on raising funds on number-2 is summarised as follows:

- Fund can be raised through leasing/renting the Khas land acquired by BWDB.
- Monthly contribution from the members of the WMC.
- A lump grant by the members of WMCs.
- Fish culture in the local canals by the WMCs.
- Collection of canal leased money in cooperation with BWDB and concerned Union Parishad.
- From the profit of work assigned by BWDB, Noakhali and LGED.
- Grant from Union Parishads.
- Grant from CDSP-II.
- Grant/donation from other organisations.
- Profit from tree plantation in the road/embankment.
- Contribution/token money collection from the beneficiaries.
- Private/personal donation.
- Subscription from the users of BWDBs acquired land.

4.2.3 Local initiatives

Local initiatives are defined here as spontaneous individual or collective actions for improvement of the drainage situation and routine or periodic maintenance of water management infrastructures. These initiatives are related to traditional indigenous water management practices, or aim at enhancing the benefits or reducing the negative impacts of public water management infrastructure. These initiatives have benefited the community as a whole as well as a certain category of stakeholder. The initiatives so far taken by the WMCs are as follows:

- Removal of cross dams.
- Re-excavation of branch/link canals.
- Putting pipe on the rural roads.
- Minor maintenance of embankment, sluice area and rural road.
- Removal of fishing traps from the canals and
- Plantation of trees in the sluice area.

WMCs have been working for the removal of cross bundhs from the canals for the improvement of drainage congestion. This initiative has been documented in all the systems in CDSP area. This success has been made partly by the volunteer contribution of the members of WMCs, and in some cases, WMCs have used their own funds to hire labour to remove the bundhs. In the Bagardona area, WMC members together with UP Chairman and Members removed cross bundhs and fishing traps in the full monsoon, and this was supported by the local administration. Pipe laying on rural roads for drainage and communication has been reported in Char Majid and Polder 59/3C-Bamni. WMCs of that area have taken assistance from the local Union Parishads in this regard. Re-excavation or de-siltation of the branch or link canals by the WMCs have been reported in Polder 59/3C-Bamni, Gangchil, Zillar, and Karim systems. In this work, some WMCs were given support from by BWDB and in Polder 59/3C-Bamni WMC-1 and BWDB jointly re-excavated the khal. (see Table –6)

C-7 branch khal is a link canal of C-7 khal located at Gangchil Mouza under Char-Elahi Union lying in the catchments area of 12 vents Gangchil sluice. About 20-25 acres of crop area submerge each year caused by severe drainage congestion close to the C-7 khal. The issue was raised and discussed in a regular meeting of WMC-Gangchil and all the members agreed and decided to re-excavate the link canal by their own initiative and contributions. The WMC members discussed the issue with all the beneficiaries of that area and sought their cooperation and support. They decided to make a link canal of approximately 450 feet in length, which will be linked directly to C-7 khal. They estimated that 30-man days labour were needed to re-excavate the khal with cost of Tk 2400. WMC decided to collect TK 2000 from the direct beneficiaries and to contribute Tk 400 from WMC-fund. Accordingly, WMC arranged funds, started the work on 10th July, and completed the work on 13th July 2002. Due to this initiative, the drainage congestion problem in the area was solved and the local community became happy with the WMC initiative.

Box 1: Re-excavation of C-7 Branch Khal

WMC-1 at Polder 59/3C-Bamni planted approximately 1100 seedlings in the sluice area in the last monsoon, re-excavated some small canals in their jurisdiction, and removed debris from the sluice area. This committee has spent about Tk 17265 for this purpose. Another local initiative that has been performed by the WMC-Char Majid is mentioned in the Box No-2

Char Majid Polder is an important area of CDSP-II. The embankments to its southeast encircle the polder and by roads to its west and northern boundary. The embankment is mainly used to protect the polder from flooding. A sluice was constructed on the northern road boundary on the upper Banskhali during Coastal Embankment Project (CEP), which now serves the purpose of a bridge. A culvert was also constructed adjacent to this old sluice to pass vast amounts of rainwater from that locality. It is reported that the outside area of the polder (upstream of Banskhali khal) normally affected by the heavy rainfall especially in the full monsoon.

A twenty member WMC has been working to improve the water management of this area. In mid August of 2002, severe drainage congestion occurred in the upstream i.e. northern side of the polder. This congestion caused damage to crops, lives and properties in the outside polder area. But inside the polder was quiet normal. The CEP constructed sluice alone was not sufficient to pass the huge amount of water. As a result, once local people tried to open another passing point adjacent to the Totar Bazar to save their homestead and cropland. However the WMC members opposed it first time, but on the 2nd day many people of the locality gathered at the target point and cut the embankment. The WMC members or people living inside the polder did not come to oppose the attempt to avoid a big confrontation.

Although some water passed through the cut point, but the whole problem was not resolved and road communication became disrupted. Some days after the incident, WMC members filled up the cut point to renew the communication. This was a unique example of joint initiative of the members of WMC to oppose illegal interference, and also to repair the road cut by their own initiative.

Box 2: Road cut in Char Majid and WMC Action

Table 5: Overview of local initiatives

Name of WMC	Type of Initiative														Total labour days	Total financial costs
	Removal of Cross dams		Branch /link canal re-excavation		Road/Embankment Maintenance		Putting pipe on the Road		Removal of fishing traps		Cleaning of Jungles /debris		Others (specify)			
	Labour	Cash	Labour	Cash	Labour	Cash	Labour	Cash	Labour	Cash	Labour	Cash	Labour	Cash		
WMC-CM	223	1950	5	-	112	14000	10	300	6	-	104	875	25	*10000	485	27125
WMC-CBD-I	176	900	9	-	76	800	12	-	15	-	95	200	16	*4125	399	6025
WMC-CBD-II	255	500	4	-	138	3500	-	-	35	-	97	250	18	100	547	4350
WMC-Gangchil	95	1500		2500	12				9	300	5	200		220	121	4720
WMC-Nabagram	42	-	-	-	8	300	9	-	10	-	8	-	-	350	67	650
WMC-Kolmi	14	-	30	-	-	17500	-	-	6	-	3	-	-	200	53	17700
WMC Zillar	30	1000	-	2000	15	1500	-	-	10	500	4	-	-	150	59	5150
WMC-Karim	37	-	-	7000	9	-	-	-	14	-	3	-	-	130	63	7130
WMC-Montaz	18	-	-	-	6	-	-	-	8	-	2	-	-	3000	34	3000
WMC-Gopal	45	2000	-	4500	5	1800	-	-	5	-	2	-	-	250	57	8550
WMC-1, Bamni	60	-	-	1100	-	1800	6	600	20		30	500	30	19965	146	23965
WMC-2, Bamni	80	-	10	-	10	-	-	-	15	-	60	10800	-	2985	175	13785
WMC-3, Bamni	10	-	-	-	20	-	-	-	5	-	6	-	-	1450	41	1450

4.2.4 Gender Perspective

Due to cultural and class reasons, rural women in Bangladesh are more vulnerable than men to disasters created by flooding. In many ways they have more to win or lose from the changes in the water regime than men. The different impact of water regimes on women and men and the important role women play in domestic water supply and use was recognised during the development of water management appraisal by different water resources projects. However, in CDSP-II, it was decided to consider women as a separate category of water management stakeholders. Women in general do not share a common, collective interest in water management, but rather have their own interests or shared interests with their male relatives in the same household/community. Thus within the category " women" there are many different water management stakes, depending on the economic and social factors (such as class, age, religion, ethnicity, etc.), ranging from landless women and fishermen to women in poor farm households and rich farm households.

To ensure women's participation in water management in CDSP-II, it was decided to include 50% women representatives in the WMOs with at least 30% in the executive body of the committee. The objectives of this decision are listed below:

- Women are a separate category of water management stakeholders, thus their requirement in water management is recognised.
- Women are better at providing correct information on the drainages/uses of water and water management than men.
- In the field, a best gender differentiated approach has been followed.

The term gender refers to the relations between women and men. These are revealed in a range of practices and ideas, including the division of labour, roles and resources between men and women. A focus on gender looks at the roles and needs of both women and men and at how they are interrelated. It enhances the participation of both women and men in such a manner that both sexes contribute and equitably benefit from improvements. The women member of WMCs is very much enthusiastic about their responsibility as they see that their opinion is given serious consideration by the other male members and project. Moreover, more female than male members are present in the regular meeting, training and workshops. The female members are free to speak up at meetings. For more, see the Chapter 2.4 in Technical Report-17

4.2.5 4.2.5 Strengthening the Linkages between **BWDB and WMOs**

If there is to be any lasting success in the operation and maintenance of sluices and khal systems by the WMCs in the CDSP area, the efforts to strengthen the WMCs though the involvement of O & M and water management staff of BWDB should be increased. The staff working on WMCs should not become the 'managers' of the WMCs but should assist WMCs to take control of the water management in that area and help them to grow into the authority to make them sustainable.

The water management extension wing of the BWDB is responsible for the formation and mobilization of WMOs. An effort has been made for the continuation of BWDB staff support for WMCs/WMFs and to increase the number of staff doing so. In the meantime, Water Management Directorate has fielded four-extension overseers (XO) and one assistant extension officer (AEO) in the CDSP area. To monitor this activity closely one Deputy Chief Extension Officer (DCEO) should be posted (vacant post) at Feni as soon as possible, as this is a long pending issue. To give a lead of all the activities to BWDB, CDSP organized a special meeting in September 2002 at the BWDB conference room, Noakhali. The meeting was presided over by the Project Director, CDSP-II, BWDB, Dhaka. The participants of that meeting were the Principal Extension Officer (PEO), DCEO, XEN-concerned, SDEs, SOs, AEO, XOs and concerned CDSP-II TA team members. One of the major decisions of that meeting was to hold monthly review meeting on water management by the convening of concerned Executive Engineer. Accordingly, review meeting on water management has been holding with the Chairmanship of XEN and all concerned SDE, AEO, SO, XO, representative of LGED, DAE, DPHE and consultants participating the meeting. The meeting, review all the water management related plans, progress and problems and

necessary action taken as per decision of the meeting. *The minutes of that September meeting can be seen as Annex 5.*

From the beginning of establishing WMCs in CDSP-II area, BWDB and LGED have been considering the proposals or decisions of the WMCs. During the preparation of the annual development plan, BWDB and LGED take into account the proposals or maintenance plan so far submitted by WMCs. However, due to fund constraints or other reasons the implementing agencies are not actually accomplished. Despite the negative effect this has on WMO morale, the WMCs have continued their association and coordination with BWDB, LGED and CDSP-II and continue to put forward their priorities and propose solutions to the agencies.

4.2.6 Water Management Conflicts

One of the main objectives of PWM is the reduction of the sometimes violent conflicts between individuals and groups and the establishment of a more 'balanced' water management, taking into account the diversity of interests. A number of major water management conflicts were reported in all the systems. The most common conflict was between fishermen and WMCs over the control of sluice operation. Some fishermen who catch fish in the sluice area try to influence the sluice operation without consideration of the impacts. This conflict is severe in the CBD-II area. This illegal influence of fishermen has always negatively affected the farmers living inside the Polder area. After establishment of WMCs, the problems have been solved remarkably well in all the systems of CDSP-II. Other conflicts were building cross bundhs and fishing traps on the canals. For these traps drainage congestion have been reported in the locality. WMCs have been working very intensively to address this problem from the beginning and made very commendable success. One of the successes to solve these local conflicts is given as case study in the following box.

An eight-member WMC was reconstituted in December 2001 to look into the water management activities in the Nabagram area. This committee has been serving well with the cooperation of local people and Union Parishad. Once in the month of August 2002, a local fisherman Nurul Islam made a cross bundh for fishing purpose on the D1 Canal at Nabagram. This bundh had been created drainage congestion in the particular area of D1 canal. The affected people of that area urged Nurul Islam to remove the bundh from canal but he did not agree. As a result, tension was created between Nurul Islam and others, and at one stage, Nurul Islam physically assaulted a local person. Thereafter, the local people raised the issue with the President of WMC and appealed him to solve the problem. The President-WMC called an emergency meeting soon after receiving this complaint. The WMC members discussed the issue thoroughly in their meeting and decided to visit the complaint area. The following day, all the members of WMC along with some local people gathered at the spot and gave a clear understanding to Nurul Islam and others the bad affect of cross bundh on the canal. In this situation, Nurul Islam realised that he had done a bad deed and he apologised to the assaulted person as well as to the members of WMC. He removed the cross bundh in presence of everyone.

Box 3: Conflict resolution on cross-bundh removal

4.3 Sustainability of WMOs (Weak Lessons)

4.3.1 Financial Sustainability of WMOs

Cost recovery from the beneficiaries for flood control and drainage (FCD) projects is not envisaged in the national water policy. However, recovery of O & M cost will as far as possible be made through private collection means, such as, leasing and other financial options. Beneficiaries and other target groups will be given preference for such contracts (source: national water policy). But there is no clear indication in the NWPo or in the GPWM for having a fund to the WMOs for O & M as well as for maintaining the organisational costs of the WMOs. *It is experienced from the field that non-organisation can sustain or work more for O & M without having a minimum fund for the organisations own.*

4.3.2 Legal Status of WMOs

It is stated in the GPWM that WMG or WMF may or may not be registered but WMA will be registered following the Cooperative Societies Ordinance, 1984 and the Cooperative Societies Rules, 1987. Registration makes the WMCs/WMFs more accessible and acceptable to the BWDB, UP and other agencies. The registration could develop more confidence among the members of WMOs. The system mentioned in the GPWM is to prevail until the government frames separate rules for registration of the Water Management Organisations. However, the issue of the separate rule for registration of WMOs is not addressed in the 'Bangladesh Water Act' nor any attempt been made to acknowledge the unregistered WMOs.

From field experience in the FCD systems, the cooperative rules turn out to be inappropriate for WMOs. For the registration of the WMOs, each group has to maintain a reasonable amount of share and savings collected for a certain period before approaching to the registration authority (Upazila and District Cooperative Office) for registration. The practice includes maintaining important documents such as cash book, ledger book, resolution book, notice book, share register, and savings register etc. The group has also to maintain accounts in the bank to operate their fund. When all these practices run for a reasonable period, the group then can apply for registration to the cooperative department.

However, all these practices are found to be difficult with the prevailing bureaucratic co-operative procedures. Moreover, all these activities are focused on the entrepreneurship groups, which is different to the WMCs in CDSP-II. As a result, no initiative has been taken to register all the WMCs/ WMFs, in CDSP-II. Another difficulty relates to the need for comprehensive membership of all persons farming in the area, not just the relatively few members of the co-operative. One could work around this by registering all the people with the cooperative, even at the Block level. In FCD systems however, the rationale for regular contributions at Block level is not clearly perceived by individuals although they are motivated to contribute to concrete activities as shown in the sections above. There is simply no need to act as a full fledged organisation with accounts, books and meetings at the Block level when their function is that of a communication and election unit, with no concrete O&M tasks. It is therefore proposed that the project/BWDB engages in a MOU with the cooperative department to agree on a specific set of by-laws for the WMCs/WMA in the FCD systems. The WMA/WMC would then be registered with a clear reference to their role as representative of the whole community. The WMCs in the CDSP areas have already started working on the detailed by-laws in which these principles have been elaborated. Initial discussions have already taken place between the BWDB/CDSP and the Cooperative department. The issue has also been discussed and shared with all of the WMCs/ WMFs and they proposed to obtain registration by separate rules of registration or at least expect to have recognition from BWDB, Noakhali to run their activities legally. In addition, CDSP planned to pilot the GPWM in South Hatiya by forming three tier WMOs. Accordingly, Water Management Associations will be registered there through cooperative departments.

4.3.3 Recognition of the WMOs by the BWDB , LGED and LGI

Since the beginning of establishment of WMCs in CDSP-II, WMCs have been preparing annual maintenance plans, review jointly with BWDB, LGED and CDSP-II concerned and submit the same to BWDB, and LGED for implementation. However, BWDB and LGED have not been implementing the full plan due to shortage of funds. WMCs have been regularly asking BWDB, LGED and CDSP concerned about the progress of implementation of the maintenance plan, but without any proper response. This situation has created frustration among the members of the organisations and they have been loosing their commitment towards involvement in the water management activities.

4.3.4 Resource Sharing from LGIs and Field Practices

It is stated in the GPWM that the Local Government Institutions (LGIs) will provide supporting, facilitating and coordinating assistance to the concerned WMOs in respect of participatory water management at the local level. LGIs will provide such assistance through their representation as advisers to the concerned WMOs and also through their respective standing committees. Particularly the Union Parishad by its 'agriculture and other development works standing committee' will provide such functions.

According to GPWM, Chairman of the concerned Union Parishad has been included as adviser of the WMCs/WMFs in CDSP-II. In addition, all the WMCs and WMFs have been doing everything to get cooperation from the concerned Union Parishad. But practically, no such standing committee for agriculture and other development works exists or is functioning at Union level. Moreover, it is felt necessary to have assistance of Union Parishad with fund raising for the WMCs/WMFs. The local resource mobilization by Union Parishads is not very encouraging. Most of the Chairman of union Parishads perceives that they will loose their popularity if they take steps to mobilizing local resource or if they try to increase revenue income through taxes of the Union Parishads. However, no means is indicated in the GPWM or NWPo about how to establish a fund for the WMOs particularly in the FCD projects.

4.3.5 Role of the staff of Water Management Directorate

In CDSP-II, WMCs/WMFs have been established with the direct input from the technical assistance team of the project. Initially, no BWDB staffs were involved in establishing these field level institutions. At the beginning of 2002, CDSP-II focused on the sustainability of theses organisations and brought this issue to the notice of BWDB at field and policy level. Thereafter, BWDB both at field and central level felt the necessity and gradually started to transfer staff from the water management directorate to the CDSP-II project area. As a result, four-extension overseers and one assistant extension officer (AEO) in-charge have been posted in the CDSP-II jurisdiction. These staffs have been working with the consultant's team for formation, mobilization and strengthening of the WMCs/WMFs and to help them to build up their authority. Although it is the responsibility of BWDB to take this stand and pay attention to strengthening its water management directorate, it is proving to be less active in implement the GPWM. Deputy Chief Extension Officer (DCEO), Feni was supposed to ensure the supervision and monitoring of the field activities in CDSP-II area in consultation with the Executive Engineer and Team Leader CDSP-II. However, the position is still vacant and is responsible to monitor by another DCEO stationed at Moulavi Bazar, which is not practically workable. The immediate attention from BWDB, Noakhali should be to take the full responsibility of these field institutions so that they could be sustained in the post project situation.

4.3.6 Concluding Remarks

Water Management Impact:
Water management in FCD systems is complex and fundamentally different from water management in the irrigation projects. The institutional arrangement with the beneficiaries participation currently used in the CDSP area is new to the char peoples. However the impact of CDSP intervention in the areas of water management can be summarized as follows:

- Char people and concerned stakeholders become aware on the importance of PWM
- Char people become able to understand their responsibilities in the O& M of WM infrastructures.
- Field level institutions on PWM are established in the working areas.
- WMCs operating the sluices according to their decisions
- WMCs preparing maintenance plan and working to implement the same with BWDB.

- Overall drainage condition improved in all the systems due to the participation of WMCs..
- Due to drainage improvement agricultural production increased in the areas. Particularly cultivation of rabi crops and use of high yielding varieties in paddy cultivation has increased.
- Mass people have been showing their willingness to participate in WM, which will contribute for a future sustainable water management.
- WMCs have taken interest to retain water in the dry season for irrigation in a limited scale.
- BWDB, LGED and LGIs have recognized the existence of WMOs at field level.
- Numerous local initiatives by WMCs and local people haves created an atmosphere to owning the WM infrastructures.
- Women are equally contributing in PWM and their willingness in participation has been increasing.
- Solving the WM related conflicts are now the responsibilities of WMOs and LGIs.
- WMCs have contributed for rural roads, culverts and bridges and its maintenance through LGED BWDB, and by their own.

Lessons Learnt:

The project has been reached to a success in PWM by establishing WMOs in all the systems of the areas. There are number of external factors hampering of the further development of WMCs. However, it is clear that there is scope for improvements in current water management practices. The lessons so far learnt on PWM during the project period are summarized as follows:

- Lack of resources of the institutions to keep up the maintenance standards in the water management systems/polder.
- No legislation of WMCs with a separate and appropriate legal framework. Furthermore, there is no satisfactory solution within the existing cooperative societies rules.
- GPWM provides a broad outline for the stakeholder's participation. BWDB is supposed to develop its own procedures, Manual and formats as required on how to implement the GPWM. CDSP-II is contributing to BWDB for development of an appropriate water management manual, which is in progress. This manual considered to be vital document in the advancement of water management and it is drafted in readable form of Bangla.
- WMCs prepare yearly maintenance plan, review the same with BWDB and LGED but implementation of these plan are pending due to fund constraints and other reasons.
- Lack of appropriate plan and activities from BWDB to establish new WMOs as well as strengthening the existing WMOs.
- Lack of required fund and manpower from BWDB hampering the activities related to PWM. In this regard, project could consider to utilize budget support from other sources for providing earmarked funds for the operation and maintenance of CDSP construction works.
- Support from BWDB, LGED and UP is needed to generate a fund by the WMCs to run them as an independent local organization. Otherwise, any subsidy fund could be arranged from project to the existing and proposed WMOs with appropriate operation modalities.

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