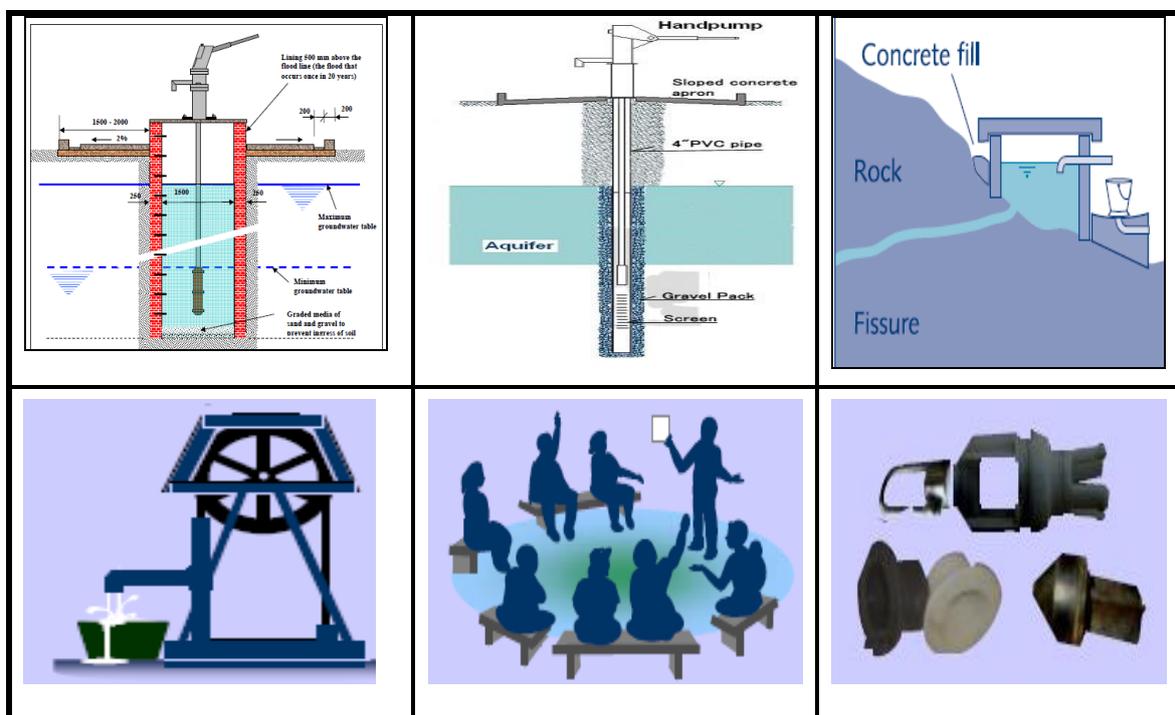




MINISTRY OF WATER AND ENERGY

SUPPORT ORGANIZATIONS BASED OPERATION AND MAINTENANCE MANAGEMENT MANUAL FOR RURAL POINT WATER SUPPLY SCHEMES



DRAFT MANUAL



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SUPPORT ORGANIZATION BASED OPERATION AND MAINTENANCE MANAGEMENT MANUAL HAS 8 PARTS

PART - A INTRODUCTION TO O&M MANAGEMENT

- PART- B DESCRIPTION OF WATER SOURCES AND TECHNOLOGIES
- PART - C TECHNICAL OPERATION AND MAINTENANCE REQUIREMENTS
- PART - D RURAL WATER SUPPLY SCHEMES MANAGEMENT
- PART - E RURAL WATER SUPPLY SPARE PARTS MANAGEMENT
- PART - F M&E AND REPORTING SYSTEM
- PART - G WATER SUPPLY SAFETY PLAN
- PART - H PREPARATION OF ACTION PLAN AND IMPLEMENTATION OF O&M ACTIVITIES

Support Organization Based Operation and Maintenance Management Manual for Rural Point Water Supply Schemes: PART – A: INTRODUCTION TO O&M

Final Manual

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Acronyms

APM	Area Pump Mechanic
CAP	Community Action Plan
CBM	Community Based Management
COWASH	Community Led Accelerated WASH in Ethiopia
CSI	Credit and saving Institute
CTs	Caretakers
HDP	Hand Pump Density Breakpoint
HDW	Hand-Dug Well
HP	Hand Pump
HRD	Human Resource Development
IMS	Information Management System
ISM	Institutional Support Mechanism
M&E	Monitoring and Evaluation
MoWE	Ministry of Water and Energy
NGOs	Non-Governmental Organizations
O&M	Operation and Maintenance
O&MM	Operation and Maintenance Management
PIs	Performance Indicators
RWB	Regional Water Bureau
RWS	Rural Water Supply
SCM	Supply Chain Management Supply Chain Management
SP	Spare Part
SW	Shallow Well
TOR	Terms of Reference
TWS	Town Water Supply
VL0M	Village Level Operation and Maintenance
VRA	Vulnerability Reduction Assessment
WASH	Water Supply, Sanitation and Hygiene
WASHCO	Water Supply, Sanitation and Hygiene Committee
WWASHPP	Woreda WASH Program Plan
WEWs	Water Extension Workers
WIF	WASH Implementation Framework
WSG	Woreda Support Group
WSP	Water Safety Plan
WWO	Woreda Water Office
WWT	Woreda WASH Team
ZWO	Zone Water Office

DEFINITIONS OF TERMS:

Accessibility	Is having a functional and reliable water supply facility without any barriers within a radius of 1500 metres for Rural Water Supply
Access Coverage	Is the percentage of people with access to safe, adequate and reliable water supply within 1500m at 15 l/c/d for rural community.
Adequate Water	Is the quantity of water required to meet the minimum demand per capita per day. The standard being 15l/capita/day by 2015 for Rural people.
Catchment	The catchment, or drainage basin, is a discrete area of land that has a common drainage system. A catchment includes both the water bodies that convey the water and the land surface from which water drains into these bodies.
Community	Refers to a group of people living in a designated area who share residential and developmental challenges and benefits. It may also refer to all people sharing such challenges and benefit regardless of geographical and social boundaries
Community Based Management	Is the process of empowering community members to assume the lead role in decision making about the levels of services they require, whilst organizing themselves to plan, implement, operate and maintain their water supply and sanitation facilities.
Community Management	Is a form of community participation in which the community takes the final decision on all aspects of planning, implementation, management, monitoring, evaluation, O&M of the water supply facility
Control measures	(also referred to as barriers or mitigation measures): Activities and processes that can be used to prevent, eliminate or significantly reduce the occurrence of a water safety hazard.
Evaluation	Is the periodic and systematic review and analysis of a practice to determine the relevance, effectiveness, efficiency and impact of programmes/projects compared to the set objectives.
Hazard	A biological, chemical, physical or radiological agent that can cause harm to public health.
Hazardous event	An incident or situation that introduces or amplifies a hazard to, or fails to remove a hazard from, the water supply
Maintenance	Refers to activities required to sustain the water supply facilities in a proper working condition. It includes preventive maintenance, corrective maintenance and crisis maintenance.
Monitoring	Is the regular and continuous checking of whether plans, activities and situations are being implemented as planned, and includes the provision of feedback to facilitate the taking of corrective measures by relevant stakeholders.
Operation	Refers to the day to day running and handling of the water supply facilities in a manner that optimizes their use and contributes to a reduction in breakdown and maintenance needs
Preventive Maintenance	Refers to an activity that includes checking the status of hand pump components at regular fixed intervals
Pocket chart	A very effective method to collect information about people's perceptions, habits, desires and will. It provides quantitatively valid information by a system of voting and further enables discussions with community members
Rehabilitation	Is the correction of major defects and the replacement of equipment to

	enable the facility to function as originally intended.
Reliable Water Supply	Is the supply of water on a continuous basis meeting the minimum demand per capita per day
Repair	Is the restoration of a defective component to return the facility to acceptable working condition. The cost of the repair should be borne by the community.
Risk	The likelihood of a hazard causing harm to exposed populations in a specific time frame and the magnitude and/ or consequences of that harm
Rural Area	“Areas of population outside urban and peri-urban using point or piped water supply system for which the community is responsible for the O&M” in addition, low population densities characterize rural areas, with small houses isolated from each other.
Safe water	Is water that is free from harmful quantities of physical, chemical and pathogenic matter and that meets the minimum Ethiopian standards (usually WHO Guidelines)
Seed Money	Is the initial sum of money disbursed to an organization in order to create/start a revolving fund for undertaking a designated programme
Scheme (Water)	The entire facility (concrete works, pipes, pumps) established to extract water from a water source, and distribute it to (close to) people’s homes
Sustainable Supply Chain	Is a system of procuring and supplying spare parts that guarantees a continuous supply of spare parts.
Source (Water)	The natural water source only, i.e. spring, groundwater, river, etc
Supply chains	Is the term used for the process that relates all activities involved with the flow and transformation of goods from the raw materials stage through to the end-user, as well as the associated information flows
WASHCO	Is a committee of representatives from a number of Water, Sanitation and Hygiene Point Committee of the same village. Sometimes WASHCO committee may refer to 2 or more village representatives benefitting from a water and sanitation point.

1 INTRODUCTION TO O&M MANAGEMENT

1.1 General

The already produced generic manual has divided to two 1) Community Based Operation and Maintenance Manual, which is simplified and easy to conduct the O&M the day to day activity by the community, 2) Support Organization Based (SOB) operation and maintenance manual, which is this manual.

This manual is prepared for support organization of the community managed water supply schemes. These support organization are: 1) Government (Federal to Woreda level), 2) Financers (Bilateral and multilateral), 3) NGOs, 4) Private sector and others.

This operation and maintenance management Manual is intended to cover all rural point water supply schemes of low technologies options such as hand dug wells fitted with handpumps, shallow wells fitted with handpumps and On-spot springs.

Prior to this and the generic Manual, the Consultant performed assessment and review of existing O&M Manuals in the MoWE, Amhara, Oromia, SNNP and Tigray Regions Water Bureaus. This generic as well as this support organization O&MM Manual is prepared based on the existing manuals collected and literatures review made.

This O&MM Manual is prepared so as to:

- Guide the support organizations in rural water supply scheme management,
- Support the community to ensure the ownership, self financing and sustainably managed the water supply schemes,
- Provide Manual for systematically monitoring and evaluation of the WASHCOs,
- Provide routine assistance until the community stands on two legs,
- Implement the water supply and sanitation policy and strategy.

This part deals with an aspect which is too often neglected in O&M, Supporting Operation and Maintenance. Indeed, the transfer of responsibilities to communities does not mean that communities will take up all activities. Effective operation and maintenance will depend on a well defined role for government support, financers support, the role of NGOs, and private sector involvement. Finally, human resources have to be developed, and information on operation and maintenance has to be made available.

In order to make easier utilizing this Manual, it has been organized according to the functional components of the O&M Management and major O&M activities.

This SOB O&M Management Manual is organized in to eight parts as follows:

Part - A	Introduction to Operation and Maintenance Management
Part - B	Description of Water Sources and Low Technologies
Part - C	Technical Operation and Maintenance Requirements
Part - D	Rural Water Supply Scheme Management

Part - E	Rural Water Supply Spare Parts Management
Part - F	Monitoring and Evaluation and Reporting System
Part - G	Introduction to Rural Water Supply Safety Plan
Part - H	O&M Implementation Strategy and Action Plan

- Part – A: Briefly describes the background information of O&M management, its objectives, principle of O&M and the mechanism, and structure of the Manual.
- Part – B: Describes different water sources and low technologies such as HDW, SW which fitted with hand pumps, and On-spot spring development for which this Manual is developed.
- Part – C: This part focuses on the technical requirements of O&M for Afridev, Indian Mark – II, Rope pump and on-spot spring development types of technologies. It describes the routine & preventive maintenances and the frequency of the repair.
- Part – D: Deals with the Community based management of the schemes through WASHCOs, Caretakers and area mechanics. It also describes the financial sources and management. The roles and responsibilities of various actors in the O&M management explained.
- Part – E: It describes the Spare Parts Management of the rural water supply schemes. The roles and responsibilities of various actors, various optional SPs outlet models and the recommended part.
- Part – F: Gives a brief descriptions of monitoring, evaluation, reporting and documentation system of the O&M management system.
- Part – G: Introduces the rural water supply system safety plan as an integral part of O&M activities like catchment protection.
- Part – H: Deals with the implementation strategy and preparation of action plan for O&M.

1.2 Aims and Objectives

The primary aims of the Manuals are:-

- To raise awareness of issues that affect rural water supply sustainability, provide options for addressing these, using examples, and describe how these options can be implemented.
- To provide basic and practical knowledge & skills on how to manage and maintain the completed water schemes which are necessary as daily water scheme management.

The overall objective of the Manual is to enable the reader to appreciate the interrelationship between different issues that affect sustainability and the importance of

adopting a holistic approach to planning and implementation, in order to achieve sustainable outcomes.

1.3 O&M and Sustainability

As per the assessment findings, there have been loose in supporting and monitoring to ensure the functionality and sustainability of rural water supply schemes.

The following key elements of sustainability are mutually supportive of effective O&M:

☞ **An enabling environment**

An environment, which encourages sustainable systems through appropriate legal provision, regulations, education, information and other similar incentives

☞ **Strong institutions**

Government and community structures with established legal status, clear responsibilities, adequate financial support, good organization and the representation of all users, including women and poorer households

☞ **Supportive attitudes**

A commitment by the water agency and community to share responsibilities, establish clear ownership and contribute to the financial support of services.

☞ **Expertise and skills**

A clear identification of O&M needs and the training of Government staff and community members in the necessary skills

☞ **Materials and equipment**

Items such as spare parts must be available to keep systems functioning.

☞ **Support services**

O&M support systems must be effective.

☞ **• Financial matters**

Factors such as capacity and willingness to pay, as well as cost sharing and community financial management, are likely to influence the financial sustainability of the systems.

Finance becomes more and more relevant, especially in a context where communities are being empowered with new financial responsibilities.

The above requirements should be satisfied to ensure the sustainability of the rural water supply schemes by the government body of at all level of execution.

1.4 Selected Technologies for the Preparation of this Manual

Rural water supply provision in Ethiopia is typified by low-cost and simple technologies which can be financed, operated, maintained and managed by rural communities. The choice of technology for improved water supplies, dependent on environmental, socio-economic and political conditions, includes:

- Hand-dug wells fitted with Hand pump,
- Shallow Well fitted with hand pumps
- On-spot protected springs;

1.5 Target Users of this Manual

The primary target users of this Manual are those responsible for planning, implementing and supporting rural water supply programmes and projects. The Manual is designed for Woreda, Zone and Regional and Federal government personnel, non-governmental organization (NGO), suppliers and private service providers. The Manual should also provide a useful overview of rural water service sustainability for policy-makers, senior technical staff within line ministries, donors and their advisors.

1.6 Principle of O&M

The Water Resources Policy stipulates that the rural water facilities should be managed using the Community Based Management (CBM) approach for O&M. The majority of such facilities are hand pumps installed on shallow wells or hand dug wells. In ensuring sustainability in O&M of these facilities, the following principles should be applied:

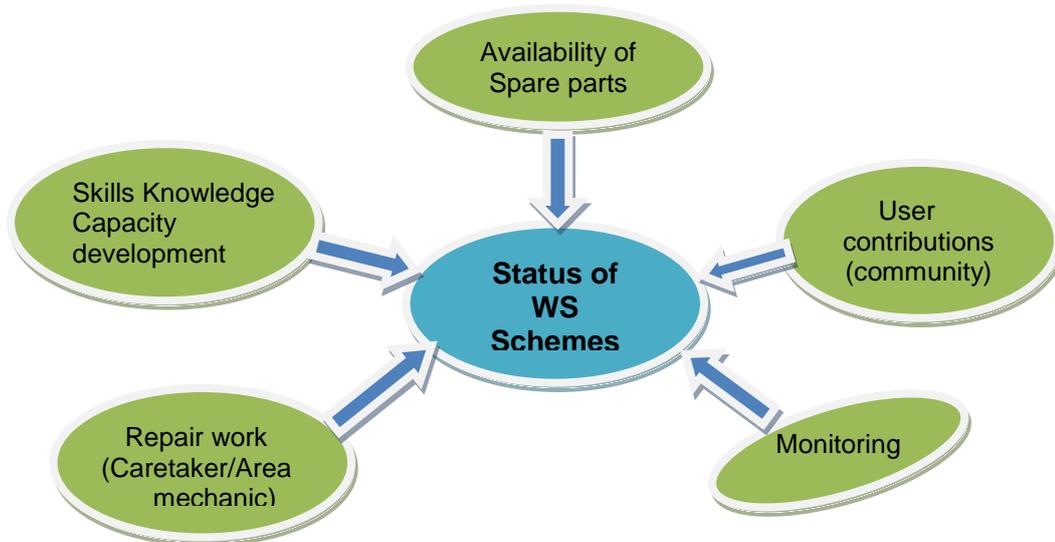
Table 1-1: Principle of Operation and Maintenance

No.	Principles	Details
1	Cost sharing by Communities	<ul style="list-style-type: none"> ▪ 100% cost for O&M ▪ Repair works beyond cost of ETB 4,000.00 should be considered as rehabilitation, and the WWO should facilitate necessary assistance required by community for hand pump to be rehabilitated
2	Sustainable supply Chains	<ul style="list-style-type: none"> ▪ Spare parts should be available at outlets at all times ▪ Spare parts should be affordable ▪ Appropriate mechanisms should be set up for a sustainable supply chain
3	O&M Mechanisms	<ul style="list-style-type: none"> ▪ Management of water facilities needs to be taken care of at the lowest appropriate level ▪ Devolved approach to RWS ▪ Involvement of stakeholders is required ▪ Striking a gender balance is essential
4	Choice of Appropriate Technology	<ul style="list-style-type: none"> ▪ Satisfying hydro-geological conditions ▪ Affordability for capital and recurrent costs is considered ▪ Durability of the facility is considered ▪ Standardization vis-à-vis research and development is applied
5	Capacity Building is the Key to Sustainability	<ul style="list-style-type: none"> ▪ Supportive policies and a regulatory framework are provided ▪ An environment for awareness raising campaigns and public participation is created ▪ Management, financial and technical skills are developed for the effective operation and management of water facilities

1.7 O&M Mechanism

Operation and Maintenance (O&M) mechanisms refers to a series of operation and maintenance structural systems that are required to be established and conducted by various stakeholders in order to maintain water supply schemes in a sustainable manner. Therefore the establishment of an O&M mechanism appropriate to sustaining hand pumps and reducing downtime is based on the recognition and understanding of factors that affect the status of hand pumps as these factors inform both the users and the person repairing (Area Mechanic/caretaker) on how much work needs to be done and how much it will cost. For the entire O&M system to be effective, the following 5(five) parameters should be considered.

Figure 1-1: O&M Mechanism to ensure sustainability



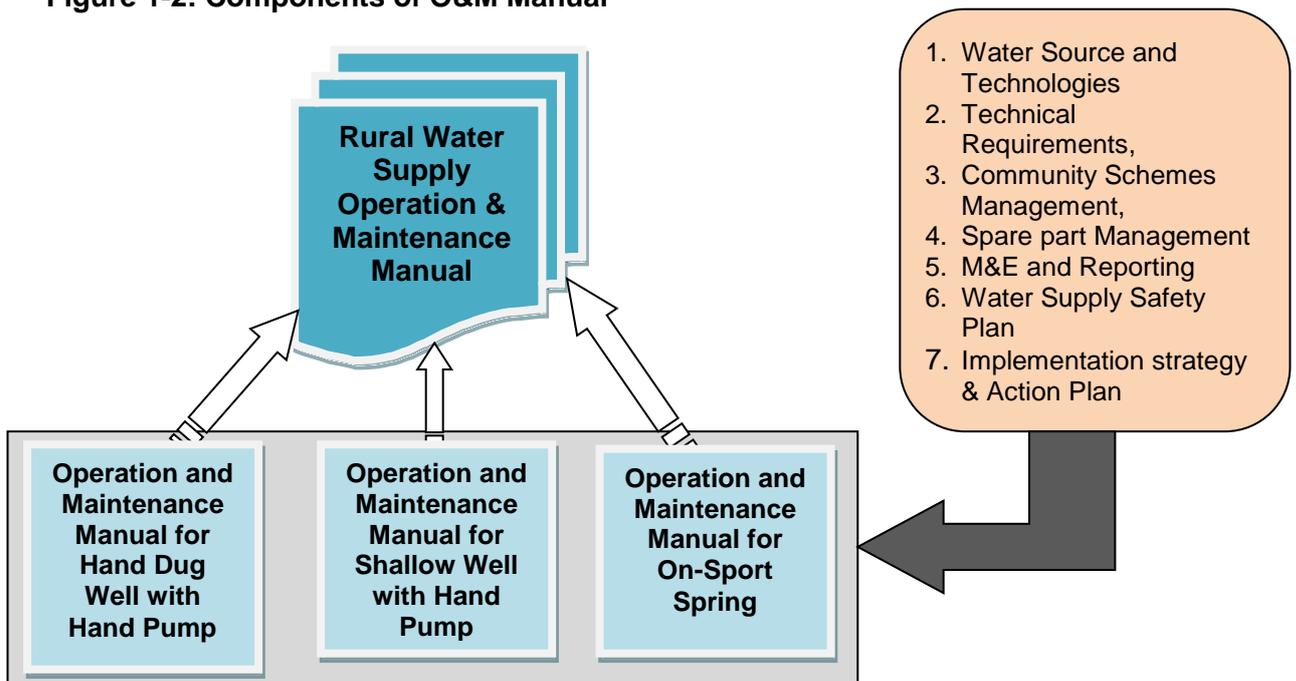
1.8 How to use the Manual

The Manual presents a total package for the O&M Management in sustainable O&M. Each parts of the Manual are to be used together as they complement each other. Each of the parts linked to one another in order to a complete Operation and maintenance management framework. This manual should be read in conjunction to the Community Based operation and maintenance manual that has been split from the generic O&MM.

1.9 Structure of the Manual

This “Community Operation and Maintenance Manual for O & M consists of 3 schemes as presented in Figure 1-2 below. Each of the three core manual covers all of the eight parts of the Manual.

Figure 1-2: Components of O&M Manual



1. Water Source and Technologies
2. Technical Requirements,
3. Community Schemes Management,
4. Spare part Management
5. M&E and Reporting
6. Water Supply Safety Plan
7. Implementation strategy & Action Plan

1.10 Preparation of this Manual

This Rural Point Water Supply Schemes operation and maintenance management manual has prepared to the Ministry of Water and Energy, which was financed by the Government of Finland with the collaboration of COWASH. COWASH offered the assignment to DEMEWOZ Consultancy. DEMEWOZ Consultancy has prepared this O&M Management Manual as per the scope of the assignment stipulated in the TOR. This manual focuses mainly on the support organization based O&M management.

1.11 Why focus on Rural Water Supply O&M Management?

According to the National WASH Inventory, the national rural water supply access was 49 per cent in 2011. Meanwhile, urban water supply access was much higher at 75 per cent in 2011. It is clear that rural areas are lagging significantly behind urban areas in water supply since about 86% of the entire population of the country live in rural area.

On top of the above, the National WaSH Inventory declared that 92,588 rural water supply schemes were inventoried in 2011, of which on average 23,610 schemes (25.5%) were non-functional. The non-functionality ranges between 20% and 35% in all regions.

These shows that significant effort is required to bring the malfunctioning schemes back into operation and ensure that existing schemes are properly maintained. Investments in new schemes are no going raise coverage further. The Government has to set a target to reduce the proportion of malfunctioned schemes to acceptable level by the planned period.

These facts, coupled with high poverty levels in many rural areas and depressed levels of service sustainability, indicates a critical need for focused attention to the operation and maintenance management of rural water supply schemes. This manual, therefore, addresses the importance of preparation of operation and maintenance management manual at National level.

The good opportunity to implement O&M management, the Growth and Transformation Plan (GTP) through the Universal Access Plan (UAP) has been planned to reach the water supply access coverage to 98.5 percent by 2015. It was also targeted to reduce the malfunctioning of the rural water supply schemes to 10%.

This manual, therefore, addresses the importance of preparation of operation and maintenance management manual at National level on the basis of the above facts.