

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 INSTITUTIONAL SUPPORT REQUIREMENTS FOR
OPERATION AND MAINTENANCE OF RWS

PART – D	SUPPORT ORGANIZATIONS BASED RURAL WATER SUPPLY SCHEMES MANAGEMENT
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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

Support Organizations Based Operation and Maintenance Management Manual for Rural Point Water Supply Schemes: Part - D: Rural Water Supply Scheme Management Manual

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4. RURAL WATER SUPPLY SCHEME MANAGEMENT

4.1 Introduction

The sustainable Operation and Maintenance (O & M) and management of water scheme primarily depend upon the capacity of the beneficiary (or users') communities accompanied with discharging their responsibilities and confidence. The realization of these conditions requires considerable time and efforts to be made through continued interactions among all stakeholders concerned, particularly the target users' communities and Woreda officials.

(WWO) are expected to perform their tasks through which those users' communities are expected to be encouraged and empowered into self-organization for sustained operation and management of water scheme.

In the past, in many cases, constructed water schemes had considerable problems; there was poor usage and maintenance of water schemes, eventually broken down, because the user communities did not feel that they owned the water scheme, they did not take responsibility of management and O & M, the water schemes were installed without their involvement. Recent experiences have shown that water schemes are effective management system much depends on regular management and monitoring and close communication between the administration (WWO) and the beneficiaries.

It was indicated in the assessment report that about 25% of the existing water supply schemes were non-functional, as reported in the WaSH Inventory of the 2011. Some of the core causes for non-functionality is that the lack of functional community managing the schemes, reluctant by community for the contribution for O&M and poor spare part management.

This part deals with the factors affecting O&M and what is required for a water supply to function in the long term. An overview is given of the roles and responsibilities of a wide range of organizations involved in O&M. A procedure for the analysis of O&M management requirements is described.

Sustainable financing mechanisms need to consider O&M and longer-term rehabilitation needs. This is essential if systems are to remain operational indefinitely. Implementers should strive to instil in users a sense of the need to pay for a water service. Financial issues discussed in this part include costing operation and maintenance, community financing, institutional financing, and subsidy.

This part of the manual emphasizes the key importance of institutional support for the community management option and the importance of capacity building. It also outlines a number of different partnership models that can be applied.

The O&M manual has been prepared to be used as a basis for bridging the gaps which have been indicated in the assessment report.

4.2 Objectives

The objective of this part is to identify the potential support organization in operation and maintenance and to assign task to support the community in managing their schemes. It is also to show the links of the responsibilities to avoid overlapping of activities among various actors.

Box 1: Specific Objective of the Manual

[Specific Objectives of the Guideline]

- ☞ To identify various support organization in O&M management,
- ☞ To define the roles and responsibility of the MoWIE, Regional Water Bureau, Zone and Woreda Water Offices, Financers, NGOs and private sectors,
- ☞ To show the links among various actors involves in O&MM,
- ☞ To show fund raising and utilization financial system to be set,

4.3 Conceiving of One WASH Program Approach

The traditional approach to rural water supply has been that of a project with a finite life span. This is convenient for Government, external donors and NGOs but conflicts with the very principle of sustainability. A water supply is a service, and any service requires ongoing management.

The Government and some donors have now recognized the limitations of the project model and are moving towards a programmatic approach, such as that promoted by “One WASH.”

Thus, the Government of Ethiopia promoted a “One WASH” Program. WASH Implementation Framework (WIF) guideline has developed by MoWIE. This guideline has a feature of 1) Integration, 2) harmonization, 3) Alignment and 4) partnership. The idea of this one WASH is that one plan, one budget and one report system.

The new WaSH recognizes that each of these partners has an essential part to play in successfully scaling-up WaSH, improving performance and ensuring the sustainability of program results.

The National WASH programme approach can contribute to sustainability in a number of ways that touch upon all the sustainability factors. This includes sustained management, financing and regulation, as well as appropriate policy change, technology choice, maintenance, and long-term rehabilitation strategies.

4.4 Support Community Managed WASH Systems

Community management refers to the capacities and willingness of users to change and determine the nature of development affecting them. However, community management can only work if WASCHO receives support when they require it. But usually external support agencies, such as Bi-lateral donors, multi-lateral organizations and development banks, assist governments in the provision of water supply systems to communities. Community members are asked to participate in construction and trained to operate and maintain the system.

Once construction is done, government and the support organizations "hand over" the system to the community and go off, saying that the community should from now on manage the system. We assume that they can and will. Often too little thought is given to

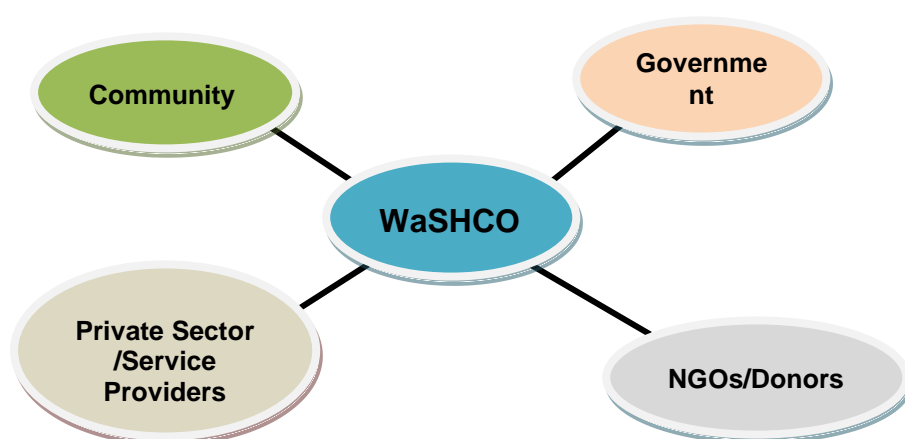
putting in place the conditions for sustained community management. Thus, in WASH system community management refers to the level at which the community exercise responsibility for decision making and control over subsequent education of these decision during project development and a capability of a community control and strongly influence the development of its water supply and sanitation schemes.

'Sustainability chain' for community water supply is consisting of motivation, maintenance, cost recovery and continuing support. Even stronger institutions than at present are needed to promote and support community management, and adequate funding is still required for Woredas to be able to perform their essential supportive role. This is backed up by new strategies developed by MoWIE that recognize the need for institutional support and the need to budget for this accordingly. Such support is not a stop-gap or short-term measure, but should be ongoing.

4.4.1 Partners in Community Management

Community management puts water users in charge of their own water system. The most effective community management is an evolving partnership, in which a community – centred organization typically a WASHCO draws on resources from within the community, from other communities, and from a variety of other outside agencies. Potential partners of WASHCO are presented in Figure 4.1.

Figure 4-1: WaSHCO's Stakeholders



The lists of the potential stakeholders are:

- ☞ Government (MoWIE, Regional Water Bureaus, Zone and Woreda Water offices and line government offices)
- ☞ External Support Agencies (World Bank, AfDB, DFID, Finnida, , UNICEF etc);
- ☞ Non-governmental Organizations (WaterAid, Water Action, Plan Ethiopia etc);
- ☞ Communities and community-based organizations (CBOs);
- ☞ Private sector companies and individuals (consultants, contractors, suppliers, artesian, micro enterprises, micro finance etc)

Active and continuous stakeholder's participation and engagement for water supply and sanitation systems O&M is indispensable and without this it is quite difficult to realize sustainable condition. In fact it is very natural for a given community to participate in different activities that could generate benefit for them. The existing arrangement of Rural WASH in Ethiopia is community based on community management and ownership. The

Rural WASH O&M shall be carried by the WASHCO with technical support and backup from the Woreda, Zonal and Regional Water Office/ Bureau establishments.

The immediate government body who shall give technical support and backup to WASHCO is the Woreda Water Office (WWO). In general, with a due consideration to the participatory O&M issue right and obligation of the beneficiary community, duties and responsibilities of the committee and decision area and the point of punishment up on the role and responsibility that will be violated by every stakeholders has to be call the attention of every development partners.

4.4.2 Conceiving and sustaining partnerships

Institutional partnerships for rural water services can involve any of the above stakeholders, and the number and nature of partners will depend on the local context. In order to form sustainable partnerships the following features are critical:

- ☞ A shared vision and mission to provide a framework to guide future actions;
- ☞ Common goals that are mutually beneficial to all partners and that can be measured;
- ☞ Clear roles and responsibilities that best use the expertise of each partner;
- ☞ Shared responsibility and authority for attaining partnership goals;
- ☞ Shared decision-making using a process on which all partners agree;
- ☞ A joint plan that outlines goals, objectives, outcomes, strategies and measurable indicators (for monitoring); and
- ☞ Shared resources committed by all partners.

4.4.3 Building institutional capacity

Without sufficient capacity at government and Woreda level, services will not be sustainable.

Capacity building comprises:

- human resource development;
- institutional reform and restructuring;
- development of an appropriate operating environment;
- provision of physical and financial resources; and
- impact assessment and follow-up training

4.5 Partnership models for service delivery

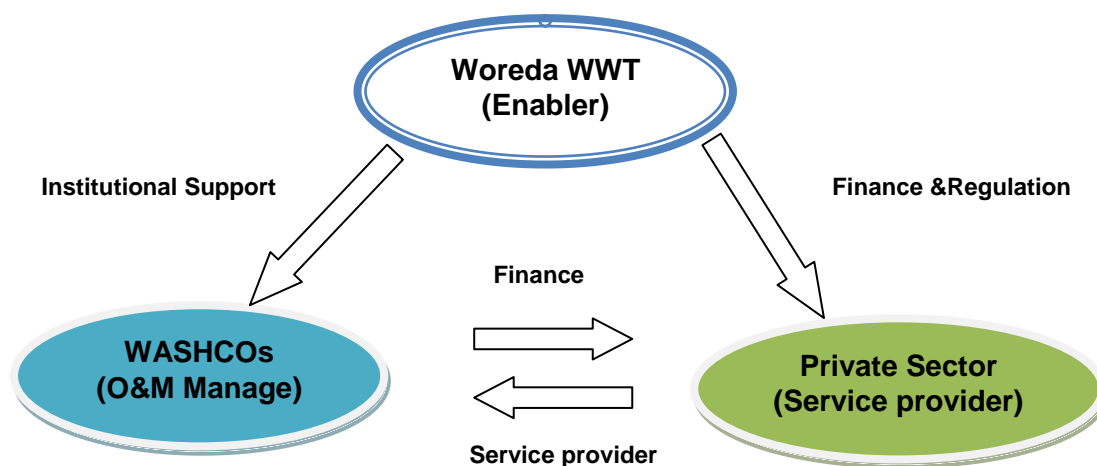
Various partnership models exist, but the community management model selected to ensure the sustainability of the rural water supply system and to fulfil the water supply and sanitation policy.

In the model depicted in Figure 4.2 Woreda's acts as enabler and is responsible for regulation, facilitation and monitoring of sector stakeholders. The term 'facilitation' as used here does not refer to the payment of allowances but to providing an environment in which stakeholders are able to operate with minimal constraints. This may involve information provision, follow-up training and technical support. The private sector is responsible for implementation, and WASHCOs are responsible for the management and financing of O&M. Actual O&M activities may be conducted by the private sector, such as Area Pump

Mechanics (APMs), or community volunteers. Where Woredas are especially weak the role of enabler is sometimes fulfilled by an NGO or External support agencies.

It is important that government recognizes the need for effective facilitation and ongoing support to WASHCOs.

Figure 4-2: Community Management Model



4.6 What comprises 'support'?

The first step is to recognize that support is required if community management is to deliver sustainable solutions. The second is to determine what that support should entail. Appropriate institutional support comprises the following components:

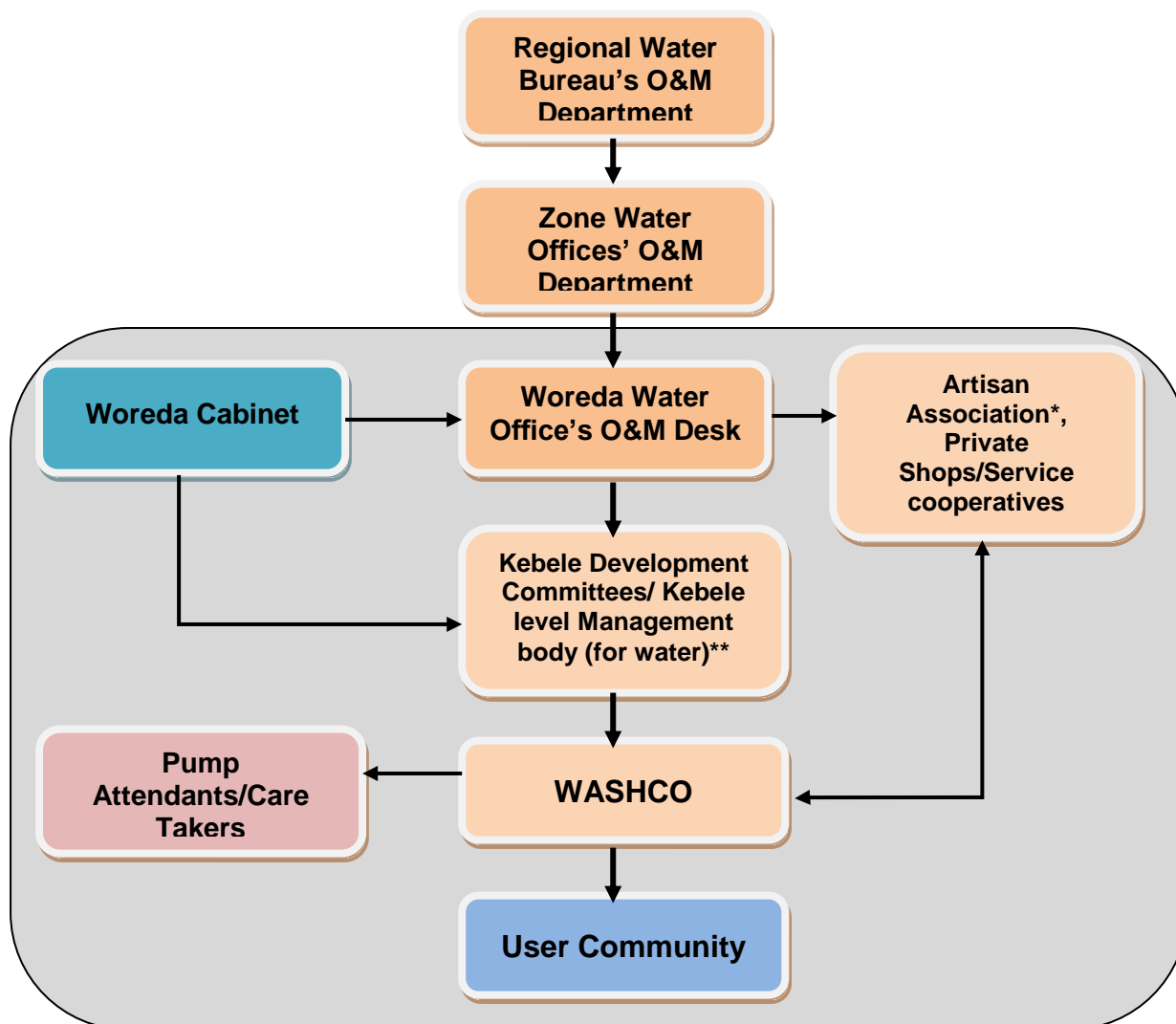
- ☞ Encouragement and motivation;
- ☞ Monitoring and evaluation;
- ☞ Participatory O&M planning;
- ☞ Capacity building; and
- ☞ Specialist technical assistance (including financial support where required).

Institutional support is best provided by a Woredas, although where this is not possible an NGO or stakeholder group can fulfil this role. One way in which appropriate institutional support can be provided is by means of a Woreda Water, Sanitation and Hygiene Team (WWT).

It is important that external support agencies (ESAs) work in partnership with government institutions from the onset of programmes. The capacity of institutions must be considered if they are to be able to fulfil the necessary support role effectively, and appropriate institutional strengthening may be required at various stages.

4.7 Organizational Structure for O&M Management

Figure 4-3 below shows the organizational structure of the operation and maintenance management of rural water supply embrace the regional water bureau to the user community.

Figure 4-3: Organizational structure for O&M Management-1

4.7.1 Roles and Responsibilities of Stakeholders in O&M Management

Implementation and operation and maintenance (O&M) of rural water supply (RWS) activities shall be carried out through a partnership of various key actors. The WASH strategy formally brings together active stakeholders at Woreda level to support the community in planning and coordination of the implementation of RWS throughout the Woreda. This section identifies and recognizes the stakeholders involved at different levels, their roles and responsibilities, and how they relate to one another for implementation and O&M of RWS activities.

The various key players in RWS are located at various levels from the national level down to the community. The table below summarizes the key players and their strategic functions.

Table 4- 1: Key Stakeholders in O&M Management of RWS

Level	Players	Focusing on	Roles
Federal Government	MoWIE/	Regional Gov Council	Providing policy direction and sourcing funds for capacity building, strategy formulation, Supporting Regions in Programming (new / rehabilitation of water supply and sanitation facilities)
Regional Government	Regional WB	Council	Backstopping in the supply of spares (spare parts), especially for hand dug wells. Technical Support and Monitor ZWO/WWO
Zone	Zone Water Office	Woreda Council	Backstopping in the supply of spares (spare parts), especially for hand dug wells. Technical Support and Monitor to Woreda
Woreda	Council	WWO	Backstopping in the supply of spare parts; Accounting, Planning, Storing of spares
	Woreda Water Office	WASHCO	Implementing Training, Monitoring, Supervision, Reporting & Recommending
	WASHCO	Caretaker	Community Sensitization, Repairing & Monitoring
Community	WASHCO	Water point And individual households	Owners of the water points. Managing & Budgeting of various activities at the water point including organizing meeting, training of community members, arranging for repairs, and scheduling for preventive maintenance

4.7.1.1 Federal MoWIE

Box-2 described the roles and responsibilities of the Ministry of Water, Irrigation and Electricity in the operation and maintenance management of rural water supply schemes.

Box 2: Roles and Responsibilities of Ministry of Water, Irrigation and Electricity

- ☞ Is responsible for formulating national water policy, strategy and action plans, and for establishing national standards pertaining to spare parts, water quality, water infrastructure and other relevant standards.
- ☞ is responsible for supervising and following up on the implementation of O&M policy and strategy instruments as well as overall sector standards. In addition to its regulatory function,
- ☞ Provide technical support to Regional Water Bureaus
- ☞ Arrange and facilitate the involvement of private sectors in O&M management, and raise the awareness of the private sector on the business opportunities of spare part.
- ☞ Facilitates and develops the local production of spare parts.
- ☞ In collaboration with the programme prepares training programmes to Regional Water Bureau experts.

4.7.1.2 Regional Water Bureaus

The Regional Water Bureaus monitors the implementation of the operation and maintenance management procedure. The Bureaus also updates the procedure when required. In addition to this, the Regional Water Bureaus R&R are:

Box 3: Roles and Responsibilities of Regional Water Bureau

- ☞ Provide technical support to WASHCO/WUB in the preparation of O&M action plan, budget and identification of spare part supply requirement for maintenance within the Woreda.
- ☞ Provide technical support to WASHCO/WUB and make all efforts to assure water supply for the community is reliable, adequate and safe for drinking.
- ☞ Arrange and facilitate the availability of spare parts for O & M activities
- ☞ Based on the selected and approved spare parts management option, the Bureaus facilitates the establishment and strengthens spare part shops at Woreda level
- ☞ Again, based on the approved option (if it is through the WWO), sets guideline on the prices of spare parts and bill collection tickets for sell at Woreda level.
- ☞ Procures and distributes spare parts and bill collection tickets when requests and delegation comes from Woredas.
- ☞ Raise the awareness of the private sector on the business opportunities of spare part.
- ☞ Facilitates and develops the local production of spare parts.
- ☞ Prepares payment guideline for maintenance services to be provided by artisans or their association
- ☞ Provide tools to the WWO and facilitates the availability of necessary documents at Woreda level.
- ☞ Facilitate the legal environment for community management (e.g. WaSHCOs' legal entity and others)
- ☞ -Develop regional performance indicators for O&M and monitor their implementation.
- ☞ In collaboration with the programme prepares training programmes to Zonal & Woreda experts.

4.7.1.3 Zone Water Offices

Box 4: Roles and Responsibilities of Zone Water Department

- ☞ Provide technical support to Woreda Water Office in the preparation of O&M action plan, budget and identification of spare part supply requirement for maintenance,
- ☞ are the supporting arms of the Water Bureaus and are mandated to provide technical support to Woreda Water Offices
- ☞ are responsible for coordinating activities, consolidating plans and reports of woredas and relaying requests from regional water bureaus and/or Woreda water offices,
- ☞ Zonal Water Offices are the links between Regional Bureaus and Woreda Water Offices

4.7.1.4 Woreda Cabinet

The Woreda Cabinet effectively functions as the Woreda WaSH steering committee. Its main function is oversight and guidance of the Woreda WaSH program. In this specific O&M framework, its responsibilities include but not limited to:

Box 5: Roles and Responsibilities of Woreda Cabinet

- ☞ defining O&M priorities and objectives for the Woreda
- ☞ establishing the Woreda O&M Team
- ☞ approving O&M annual plans and budgets
- ☞ confirming community contribution transfer arrangements with Woreda Finance Office or local Micro Finance Institution
- ☞ receiving, approving and forwarding O&M monitoring reports
- ☞ conducts regular performance review of the WWT and its member offices and the O&M implementation in the Woreda
- ☞ advocates the O&M finance requirements to sustain utilization of the schemes
- ☞ ensures that the O&M annual plan and budget is approved by the Woreda Council

4.7.1.5 Woreda Water Offices

Box 6: Roles and Responsibilities of Woreda Water Office

- ☞ The Office shall prepare the O&M annual action plan, budget and identification of spare part supply requirement for maintenance within the Woreda and submit to the Zone Water Office.
- ☞ The office shall facilitate the implementation the O&MM procedure
- ☞ The office shall support the establishment of tariff collection pattern and follow up the tariff collection and the saving.
- ☞ The office shall ensure that WASHCOs have all the necessary tools and documents for O&M.
- ☞ The office shall provide new and refresher trainings to pump attendants and care takers in collaboration with the Region and Zone.
- ☞ The office shall ensure that trained artisans exist in the Woredas for the maintenance of rural water supply schemes.
- ☞ The office shall ensure the availability of the most needed spare parts in the Woreda for sell to the user communities.
- ☞ The office shall facilitate the maintenance of water points through pump attendants/caretakers/artisans.
- ☞ The office shall be responsible for the development of technical capacity in the maintenance of schemes at Woreda level. It will also periodically provide training to concerned people at Woreda, kebele and WASHCO level as their regular task.
- ☞ The office shall maintain defects, which are beyond the capacity of pump attendants, care takers and artisans.
- ☞ The office shall take data on the number of users of each scheme.
- ☞ The office categorizes water user communities as category 1 and 2 to facilitate the proposed demonstration in the implementation strategy of the procedure.
- ☞ The office will keep records of O&M status of all water supply schemes in the Woreda and updated annually.
- ☞ The office monitors and ensures the regional performance indicators for O&M are implemented.
- ☞ Monitors the water quality status of rural water supply schemes at least twice a year and undertakes disinfection.
- ☞ The office shall report to the Zone Water Office and to the Regional water Bureau's on monthly basis.
- ☞ The office shall prepare the annual spare parts and associated items needs, calculate the budget required and presents it to the Zone Water Office for budget allocation.

4.7.1.6 Development Partners

Development partners support the government in improving the safe water and sanitation coverage. They provide funding and technical assistance directly to government programmes and through other agencies, and also offer support in studies to assess performance of different aspects of the sector, with a view to improvement. All support should be co-ordinated with government, and CBMS approaches promoted.

4.7.1.7 NGO's

Several NGOs are involved in the water and sanitation sector. They have useful roles to play as partners in mobilisation, training, planning, follow-up support and other activities, being already established in communities.

4.7.1.8 Private Sector

The role of the private sector is to support the communities in carrying out any activities beyond their capability. HPMs, masons and plumbers carry out maintenance and repair work, and are paid by the communities. Private firms manufacture, supply and distribute inputs and spares, and undertake major repairs. PSOs can also undertake community mobilisation and training. They can also manage point or small piped water supplies on behalf of the users.

See the concurrent community managed O&M management manual for the rest of the stakeholders.

4.8 Sources of Fund and Financial Management of Water Scheme

4.8.1 General

This section looks at financial aspects of water scheme management, which is an essential part of sustainable O & M and management of water scheme with regardless of type of water scheme.

In the community-based water scheme management, **Cost Sharing for O & M of a water scheme** is an important government policy. The community needs to pay for maintenance & repair of the water schemes and save the replacement of the equipment.

Sustainable financing mechanisms need to consider O&M and longer-term rehabilitation needs. This is essential if systems are to remain operational indefinitely. Implementers should strive to instill in users a sense of the need to pay for a water service. The emphasis must be shifted from paying for maintenance of a facility to paying for the provision of safe, adequate and accessible water. This concept of paying for water may be difficult to instil in water users in poor rural communities, but has the potential to remove many barriers to sustainable community financing. Financial issues discussed in this section include costing operation and maintenance, community financing, institutional financing, and subsidy.

4.8.2 Budgetary responsibilities

The first step in ensuring sustained financing is to determine stakeholder responsibilities for different costs associated with rural water services.

4.8.2.1 Cost allocation

Associated costs for rural water supply can be divided into the following categories:

- ☞ Needs assessment and community mobilization;
- ☞ Technical services for facility provision;
- ☞ Technical services for O&M;
- ☞ Institutional support for O&M;
- ☞ National and regional planning, co-ordination, monitoring and evaluation; and
- ☞ Upgrading, rehabilitation and expansion.

Where community saving or investment schemes are used there is also a need to consider inflation and currency depreciation. There are stakeholders who can finance these activities and also those who can implement them. The commonest options are summarized in Table 4.1.

Table 4-1: Budgetary Responsibilities

Activity	Financer	Implementer
Needs assessment and community mobilization	Woredas, NGOs and ESA	Woredas or, NGOs or Private Sectors
Technical services for facility provision	Woredas, or NGOs, Community and ESA	WASHCOs, NGOs or private sectors
Technical services for O&M	Community and Woredas or NGOs	WASHCOs or Private sector
Institutional support for O&M	Woredas or NGOs	NGOs, Woredas or Private sector
National and regional planning and co-ordination	MoWIE and Regional Water Bureaus	MoWIE and Regional Water Bureaus
Upgrading, rehabilitation and expansion	NGO, Woreda (and ideally Community, though this rarely occurs at present)	NGO or Private sector

Technical services for facility provision are usually implemented by the private sector and include system design and construction, borehole drilling, and pump installation. This can also be financed by ESA, NGO or government.

It is now the norm for the technical services for O&M to be financed by users, usually through the collection of maintenance fees. These services are conducted by either the private sector (including individual artisans or mechanics) or community volunteers. This cost covers routine maintenance and repair; more complex needs may be beyond the financial capacity of the community.

Another important cost is that of institutional support for O&M. Monitoring, regulation and facilitation requires adequate human and financial resources. It is likely to be unrealistic to expect communities to finance this, in which case Woredas requires adequate funding to fulfill this role. Where government institutions are particularly weak NGOs can take on the responsibility, although this is not ideal.

Most WASH programmes lack financing strategies for rehabilitation and replacement costs. Ideally, these costs should be met by the users with minimal assistance from Woredas. This can only be achieved, however, if strategies are developed early on and financing mechanisms are clear and transparent. This procedure is clearly seen in the community based O&M management, a concurrent manual to this one.

4.8.3 Cost Recovery

Cost recovery refers to the practice of charging users the full (or nearly full) cost of providing services. Full cost recovery means reimbursement to service providers of both recurring and non-recurring costs associated with construction, operation and maintenance of a water service. Costs include, but are not limited to, the costs of community mobilization, planning, design, administration, construction, equipment, and O&M expenses.

Cost recovery for rural water services is to cover O&M costs only as stipulated in the Water Resources policy.

Cost recovery for construction and installation of new water systems and facilities is, in practice, negligible. Communities are often requested to contribute 5 to 15 per cent of initial capital costs, which does not even cover the cost of the facility itself (e.g. handpump, apron and borehole). The costs of mobilization, administration, management and transportation generally remain hidden. Even where communities make a financial contribution this may sit in a fund for future maintenance or institutional support, and is intended to demonstrate ownership rather than to recover actual implementation costs.

Cost recovery for ongoing service delivery and recurrent O&M costs is a much more achievable target, although this rarely reaches 100 per cent, due to hidden costs such as subsidy of spare parts provision, supply chains and institutional support. Rather than using the term 'cost recovery' this can be summarized as 'paying for water', i.e. the cost of ongoing provision of water from an existing system.

Expecting users to pay all direct O&M costs is a realistic target which implementers should strive to meet. Direct O&M costs comprise those for maintenance, repair and replacement.

Ideally, water tariffs should cater for future system upgrade, rehabilitation and expansion costs as well as ongoing O&M costs. Currently, this occurs very rarely. One of the main constraints to this is the need for a transparent, secure and sustainable method of storing and investing money for future use. Community managed financing mechanisms are rarely able to fulfill these requirements. Private sector service providers could potentially do this but require sufficient incentive and regulation. The second key constraint is insufficient ability and willingness to pay for these costs among users. In many cases it may be unrealistic to expect communities to finance these costs and this highlights the need for a supporting institution to provide backstopping. This also applies to emergency needs such as the results of sabotage or natural disasters.

In order to make functional of this operation and maintenance manual, it is required to link with the water resources management policy and strategy formulated by the Government of Ethiopia.

4.8.3.1 What tells the Water Resources Policy on Cost Recovery

The following key cost and financial management related statements have been addressed in the water supply and sanitation policy under the water resources policy:

- Recognize water is a natural resource with an economic value and ensure that fees are paid for services rendered. This implies that provision of water supply has a cost, thus, any water users should pay for it, and no water provided freely, however, a cross subsidy mechanism applies to address the equity principle.

- Ensure that the price for water should be neither too high (and discourage water use) nor too low (and encourage abuses and over use of water). This associated with the setting of tariff and the proper utilization of the water resources at optimal situation.
- Promote that tariff setting shall be site specific, depending on the particulars of the project, location, the users, the cost and other characteristics of the schemes. Tariff setting should not be identical; it mainly depends on the technological options of the water sources and water supply system.
- Ensure that the basic human needs of water for disadvantaged rural communities, who cannot afford to pay for development of water systems, shall be borne by the government, as appropriate, and in so far as the communities are able and willing to cover the operation and maintenance costs on their own.
- Provide subsidies to communities who cannot afford to pay for basic services on capital costs only; based on established criteria and phase out subsidy gradually.
- Ensure that all water supply undertakings will adequately address costs associated with operation and maintenance and be based on "cost-recovery" principles.
- Ensure that rural tariff settings are based on the objective of recovering operation and maintenance costs while urban tariff structures are based on the basis of full cost recovery.
- Establish a **"Social Tariff"** that enables poor communities to cover operation and maintenance costs.
- Develop **flat rate tariffs** for communal services like hand pumps and public stand posts.

4.8.3.2 Water Supply and Sanitation Strategy

The following key issued related to rural water supply have been addressed in the water supply and sanitation strategy, focusing on O&M cost and financial management.

- Establish financial management rules and feasible arrangements for resource allocation, cost-sharing and accessing funds for demand driven WSS systems. These rules and arrangements should define the roles and obligations of various partners (government, communities, private sector etc.) in the management of funds to improve transparency and accountability.
- Ensure self-reliance, through the promotion of local self-financing of programs and projects, based on the overall socio-economic development conditions of local communities, and through appropriate incentive mechanisms. To this end, engage the participation of banks, private operators, micro financing institutions, national water fund, and rural credit services, etc.
- Subsidise the capital costs only for communities that are unable to cover the cost of the basic services so as to ensure social equity;
- Establish and implement cost-sharing arrangements to share the capital, O&M and capacity building costs between government, local communities, consumers, external support agencies and non-governmental organisations.
- Provide incentives to local stakeholders such as community groups, manufacturers, and consulting firms etc. in terms of concessions in import duties, tax rebates, subsidies, credit facilities and through other similar economic instruments to

encourage their participation in the planning, design, implementation and management of WSS systems.

4.8.4 The cost of Sustainability

If rural water services are to be sustainable the following three categories of cost must be (a) calculated, and (b) funded:

- ☞ Direct O&M costs;
- ☞ Institutional O&M costs (including monitoring and evaluation); and
- ☞ Rehabilitation and expansion costs.

4.8.4.1 Costing O&M

It is a direct O&M costs that incorporate recurrent repair costs and future replacement costs. Without considering the need for saving specific sums of money to replace major component parts, the sustainability of most water systems is undermined. These amounts can form part of the O&M tariffs charged.

A four-stage process can be used to determine appropriate tariffs.

- 1) The first step is to calculate **recurrent O&M costs**, which include replacement of minor components such as seals and bearings, routine preventive maintenance such as greasing or tightening parts, and any wages associated with O&M.

The annual maintenance cost may vary considerably, even for the same technology, and depends on the local environment and chosen maintenance system. For example, handpumps operating in areas of deep, aggressive groundwater may have much higher O&M costs than those operating in shallow, neutral conditions. Also, private sector maintenance systems may produce slightly higher costs than community-based systems, to allow for adequate profit for the service provider. The only reliable way to obtain guidance for costs in specific local conditions is through appropriate monitoring

Annual maintenance cost (M) = Cost of minor components + Labor costs + Profits

Example for calculation of annual maintenance cost is presented in the community based O&M management manual.

- 2) The second step is to calculate the **current replacement costs** and the projected life-span of major components which are likely to need to be replaced. Depending on the technology and environment this may be based on the replacement of the entire facility (e.g. handpump) or specific components of that facility.

Once calculated, the estimated replacement cost should be compared to the total current cost of a complete handpump. In some cases the cost of a complete handpump may be lower than or similar to that of the component parts, particularly where pumps are ordered in bulk. If this is the case the entire handpump could be replaced after five years rather than the major components listed.

Current replacement cost, R = Current cost of complete facility or major components

n = Estimated number of years before replacement

The value of **n** may be greater than 5 and will depend on the particular technology, model, manufacturer and conditions under which it is operating.

- 3) The next step is to calculate the annual amount or annuity which needs to be put aside each year to meet future replacement costs. This is based on an Annuity Factor (AF), which is a function of the expected life-span of the equipment in years (**n**) and the interest rate (**r**) in the local economy. This does not consider inflation but allows for devaluation, which is especially important for imported components and overrides inflation effects. The following equation can be used:

$$\text{Annuity, } A = \frac{\text{Current, replacement, Cost, } R}{\text{Annuity factor (AF}_{r,n})}$$

Annuity factors are based on number of years and interest rates and can be read directly off financial cost tables. In order to adjust for inflation the annuity can be multiplied by the cumulative inflation rate.

- 4) The final step is to calculate the **average annual cost of O&M per household**. Ideally, the annual amount paid each year (or saved in a communal/private fund) should be slightly higher than the calculated annuity to allow for unforeseen events and inflation. A contingency factor of 20 per cent can be used to compensate for this and will ensure that the users have saved enough to compensate for future price changes for the required component. The household tariff per year, **H**, can be estimated using the following equation, where **N** is the number of households in the community:

$$\text{Annual - HH - Tariff, } H = 1.2X \left[\frac{M + A}{N} \right]$$

This is based simply on the total number of households using the facility. To ensure equity, household tariffs can be modified by three factors: the distance to the source, the number of people in the household and 'special' factors such as poverty or disability Box 5.2 gives a worked example for a handpump water supply.

Box 7: Setting household tariffs for a handpump water supply

Using the example for the India Mark II handpump above:

Total annual maintenance cost, M = 450 Birr

Current replacement cost, R = 4,000 Birr

Estimated number of years before replacement, n = 5 years

Approximate interest rate, r = 20%

Annuity factor (read from table) AF_{r,n} = 2.83

Annuity, A = R / AF_{r,n} = 4000 / 2.83 = 1413 Birr

Number of households, N = 50 (250 people)

Annual household tariff, H = $1.2X \left[\frac{M + A}{N} \right] = 1.2X \left[\frac{450 + 1413}{50} \right] = 37.26 \text{ Birr}$

This can then be divided by 12 to convert to a monthly household tariff of **3.10 Birr**.

Detail calculation with example is given in the Community Based O&M Management manual.

4.8.4.2 Costing institutional support

An ongoing issue raised in this manual is the need for institutional support for community-based management systems or for regulation of the private sector. Such support obviously has an ongoing cost associated with it and yet this has been largely not given attention in the past.

Woredas should earmark funds for monitoring and O&M and suggests that 6 per cent of investment funds for increasing access to rural water supply should be allocated to this. Experience obtained from Orimia Region Water Bureau that the allocation of budget for O&M management is below 1 per cent of the total budget allocated for water supply development.

It is essential, however, that the cost of institutional support is estimated and that appropriate budgetary allocation is made for this. Table 5.4 presents an example breakdown of costs for institutional support which shows the aspects which should be considered and estimated cost ratios for these. These costs are based on consultation with Regional Water Bureaus and NGOs.

Table 4-2: Example breakdown of costs for institutional support

Activity	Annual cost per 50 communities (Birr)
Monitoring and evaluation • quarterly monitoring visits to all communities	30,000.00
Participatory planning • liaison with problem communities to develop solutions	20,000.00
Specialist technical assistance • advice and intervention for unforeseen technical problems	20,000.00
Capacity building • training of stakeholders (staff, communities, private sector etc.)	40,000.00
Total annual cost per 50 communities	110,000.00

Note: Unit costs are likely to reduce with an increase in the number of communities to which institutions provide support; this is an example only.

The above costing example equates to 2,200.00 Birr per supported community per year. Such a cost is not excessive and for 50 communities is roughly the cost of one handpump-equipped borehole. The figure quoted could be reduced considerably further where institutions support a greater number of communities, where communities develop increased self-sufficiency, or where support from other stakeholders (e.g. non-profit organizations) is available. What is vitally important is that institutions attempt to estimate costs and budget accordingly.

Support costs need to be determined locally and appropriate long-term funding mechanisms sought. Where possible, Woredas should develop budgets which recognize the need for such expenditure on a long-term basis. Even where water supply management systems are not community-based, institutional support costs are likely to remain at similar levels. In public-private models community-based costs may be replaced with those related to regulation of the private sector. The added advantage of this model is that taxation of the private sector can contribute to funding this support.

4.8.4.3 Rehabilitation and expansion costs

The cost of long-term rehabilitation should also be assessed where possible. This does not refer to the replacement of equipment or components but to larger scale measures, such as borehole rehabilitation or upgrade of pumps and systems. For the example of a handpump-equipped borehole it is important to recognize the borehole as part of the water system as well as the pump. Eventually the borehole itself may need rehabilitation due to problems such as siltation; insufficient yield and corrosion of screens/casing. Such measures may entail considerable cost and this must be met by the supporting institution and/or the users of the system.

If communities of users are to be expected to finance rehabilitation, even in the 'long-term', appropriate financing mechanisms must be established in advance. Using the 'rehabilitation annuity' needs to be estimated in addition to that for replacement. This can be done using the same equation and the current cost of the rehabilitation measure that will eventually be required.

$$\text{Rehabilitation Annuity}, A_R = \frac{\text{Current Rehabilitation Cost}}{\text{Annuity factor}(AF_{r,n})}$$

The 'rehabilitation annuity' can then be combined with the recurrent maintenance costs and replacement annuity to calculate the household contribution needed to finance recurrent O&M, medium-term replacement and long-term rehabilitation. This is demonstrated in the following equation:

$$\text{Annual HH Tariff}, H = 1.2X \left[\frac{M + A + A_R}{N} \right]$$

Box 7 uses the previous example of the India Mark II handpump to illustrate the impact of incorporating rehabilitation costs in household water tariffs. By incorporating the need for borehole rehabilitation in twenty years' time, the monthly household tariff increases by almost two-and-a-half times from the previous value of 3.10 Birr. This may not seem a large amount but has a significant impact on planning and may affect the users' willingness to pay for the service.

Box 8: Setting household tariffs to cover rehabilitation Costs

Using the earlier example for the India Mark II handpump::Current rehabilitation cost, $R = 12,000$ BirrEstimated number of years before replacement, $n = 20$ yearsApproximate interest rate, $r = 20\%$ Annuity factor (read from table) $AF_{r,n} = 4.67$

$$A_R = R / AF_{r,n} = 12,000 / 4.67 = 2,570.00 \text{ Birr}$$

Number of households, $N = 50$ (250 people)

$$H = 1.2X \left[\frac{M + A + A_R}{N} \right] = 1.2X \left[\frac{450 + 1413 + 2,570}{50} \right] = 88.66 \text{ Birr}$$

This can then be divided by 12 to convert to a monthly household tariff of **7.40 Birr**.

Note: Example only

The biggest problem with this method is the difficulty in estimating future rehabilitation needs and when that rehabilitation will be required. There is always an element of unpredictability about any system and what the users may demand in the future. For example, in future it may be that a borehole becomes contaminated and is beyond rehabilitation, meaning a new one must be drilled, or that a community decides it wants a newly available technology. In such situations, adequately financing rehabilitation from the outset is almost impossible.

4.8.5 Community Financing

In the interests of efficiency, effectiveness, equity and replicability (i.e. sustainability) it is now generally accepted that rural communities and users should finance the cost of running their own water supplies.

4.8.5.1 Financing O&M

The community should cover the O&M costs. Some costs like cost of spare parts, distribution, storage and technical support is often subsidized. But this subsidization is for a transition period that may be necessary before the full O&M cost recovery can be achieved. It would appear that such a transition period is ongoing and little progress has been made towards its successful completion. There are a number of key measures that need to be fulfilled to ensure sustainable community financing:

- ☞ Determine ongoing costs and package this information in a way that communities can understand in order to make informed decisions.
- ☞ Convince people to pay for water through appropriate community sensitization.
- ☞ Establish transparent and efficient financial management systems.

- ☞ Sustain willingness to pay among communities through ongoing institutional support and promotion of income generation.
- ☞ Develop incremental strategies to phase out unsustainable subsidies, and/or develop mechanisms for sustainable cross-subsidy.

Costing O&M is the first step to ensure that communities are aware of ongoing costs and the financial commitment required sustaining their water systems. This allows them to select the most appropriate technology and system for them.

Whatever financing system is to be used, it is essential that users are aware of typical costs from the outset, and that those responsible for management are assisted in setting realistic and adequate water tariffs.

4.8.5.2 Revenue collection

There are many different mechanisms by which maintenance funds can be collected and stored, and locally appropriate systems should be developed through consultation with communities. The most common funding systems are:

- Pay-as-you-fetch.
- Monthly tariffs; and
- Reactive financing.

Pay-as-you-fetch systems require a caretaker to be present at the facility at all times (except when it is locked) to collect water tariffs from the community. Users pay a fixed amount per container. In some cases the caretaker operates the pump for customers and receives 20 to 30 per cent of the revenue raised as salary.

Monthly tariffs are perhaps the most widespread system whereby each household in the community is expected to contribute a given amount each month.

Reactive financing simply means that when a system fails or breaks down the community or better-off households club together to pay for repair.

The advanced collection of maintenance funds does not necessarily shorten the downtime of a given handpump, although seasonal cash flow variations may have a big impact on whether finances can be raised rapidly. Where household tariffs are paid monthly and funds are stored safely such systems can be highly successful.

The most common problem encountered, however, is that willingness to pay among households is difficult to sustain and this often reduces over time. Pay-as-you-fetch systems are undoubtedly the most successful in terms of revenue generated but are only possible where there is a year-round cash economy.

Where the pay-as-you-fetch system cannot be used household collections are the normal means of collecting water revenue. This can be conducted by WASHCOs members or private service providers. This can be a time consuming process, particularly where non-payers need to be chased up. Respected community members can play an important role in exerting pressure and deciding where exemption or subsidy is appropriate.

4.8.5.3 Storage and investment of funds

In order to ensure year-round rapid repair it is important to have an appropriate mechanism for storing funds in advance of breakdown. Options for investment and storage of funds include:

- Community bank account;
- Community co-operative;
- Advance purchase of spares; and
- Private contractor.

Where a WASHCOs is charged with the management of the water supply there is usually a treasurer to keep account of the money collected from the community and how this is spent. Some communities are encouraged to open bank accounts to store the money but this has a number of constraints. The details are found in the other manual of the Community Based O&M management Manual.

Rather than use a bank account communities can opt to run a co-operative whereby the water funds are used to purchase livestock or to support a community farm. Communal agricultural produce can then be sold when funds are required. This has the added advantage of avoiding devaluation effects.

Similarly, funds can be used to purchase 'consumable' spare parts in advance of breakdown, though large stocks may be needed to guarantee that the correct spares are always available.

4.8.5.4 Bank Account Methodology

The proposal to bank funds for O&M emanates from the challenges experienced by community members on effective management of contributed funds; such as concerns over security of funds in the community and lack of accountability by the WASHCO leadership. Once funds are misused, community members become reluctant to make more contributions in the event that the hand pump breaks down again.

Therefore, the purpose for developing a banking scheme (revolving fund system) is to create a saving mechanism that is sustainable and one which enables WASHCO to accumulate funds for O&M whilst reducing the above risks and building confidence in the community members who have contributed.

These contributions can be started as early as during the construction stage and continue after the hand pump has been installed. Availability of funds at any given time at the bank for the WASHCO that open a bank account will ensure that the hand pump is repaired within the shortest possible time.

Bank Account Management (roles & responsibilities)

The Woreda WASH Team is required to open a bank account specifically for RWS O&M on behalf of communities/WASHCOs. It is recommended that the WWT follows the laid down Woreda procedures for establishment of this account. WASHCOs are expected to submit their contributions in two ways.

- i. Direct deposit into the account: The deposit can be made by WASHCOs directly into the account whenever their accumulated funds with the WASHCO Treasurer reach a reasonable amount which is risky to keep in the house. **A copy** of the deposit slip can then be given to the Woreda Water Office for updating the ledger book,

- ii. WASHCOs can pay their contributions to the sub area committees and are issued with a receipt. The sub area committees in turn take the funds to the Woreda, and are also issued with a receipt and also obtain a deposit slip to be given to WASHCOs.
- iii. To access the spare parts the WASHCO will write a letter signed by at least 3 committee members (preferably the Chairman, Secretary and Treasurer) and the spare parts requirements. This is presented to the Woreda Water Office and the community is given the spare parts and receipts. The costs of these parts are then deducted from their ledger accounts by the WWO.

Table 4-3: Actors and their roles in this mechanism of Managing Community contributions

Actors	Roles/Action to be taken
WWT	Facilitates V-WASHE to secure their O&M funds in bank
Wored Water Office	<ul style="list-style-type: none"> ▪ Receives O&M funds from WASHCO, and facilitates banking with RWSS A/c by WWT ▪ Keep official Woreda receipt book, and issues receipt to WASHCO ▪ Provides evidence of banking (deposit slip) to WASHCO
WASHCO	<ul style="list-style-type: none"> ▪ Collects O&M funds and records details in register/cash book ▪ Keeps O&M funds safely ▪ Banks O&M funds (bank option) ▪ Takes O&M funds to WWO for delivery to bank through WWT ▪ Receives receipt from WWO
Community	<ul style="list-style-type: none"> ▪ Make O&M contributions to WASHCO

4.8.5.5 Income generation

Where water directly leads to income generation the problem of community financing may become significantly less. For this reason, opportunities for income generation should always be investigated. Possible ventures include livestock watering, irrigation for market gardens. Where communities and individuals rely on an improved water supply to generate revenue, as well as for its other benefits, they will have a much larger incentive to keep it operating and should have finances available to enable ongoing O&M. Those who benefit financially from a system may be asked to pay a higher tariff than those that do not. For example, cattle owners may be expected to pay more than other community members if they have access to water for their animals as well as their families. Experience shows, however, that there are few examples of successful income generation from systems designed primarily for the supply of drinking water.

4.8.6 Access to other sources of funding

“New strategies should aim towards increased efficiency in the use of available funds and in increased mobilization of additional funds.” It will indeed be important to plan and determine financial mechanisms which cover all costs, if these are not fully covered by user’s fees. As seen earlier, tariffs are often based on the recovery of basic operation and maintenance costs, and rarely include the cost for major repairs, rehabilitation and replacement. Communities will need to tap into alternative sources, and it is proposed that planners take this into account, and facilitate /organize access to these sources. Possible alternative financial sources are:

- ☛ existing community contributions,

- ☞ Cooperative Fund,
- ☞ subsidies and taxes,
- ☞ Credit–loan mechanisms,
- ☞ Grants,
- ☞ Specific funds.

This section gives an overview of these possible alternatives to tariffs. Government need to assess the availability, reliability and sustainability of these sources and, where they are non-existent, the possibility of developing them.

4.8.6.1 Cooperative funds

Cooperative funds result from an initiative by a group of users or individuals who get together to finance productive activities, not in the first place always related to WS&S. The initial capital comes from contributions in cash or in kind from the members of the cooperative. Once the group has sufficient revenue, members may decide to use part of their funds to finance WS&S services. However, the amount of capital available in this option depends on the results of the first stage investments. With good financial and organizational practices, this is a good way to administer WS&S services.

4.8.7 Pro-poor financing strategies

In the original definition of sustainability, one of the four success criteria identified was 'equity'. This means that all members of a community regardless of gender, age, race, religion or wealth should benefit from an improved water supply. The United Nations Committee on Economic, Cultural and Social Rights issued a statement in November 2002 declaring access to water a human right and stating that water is a social and cultural good, not merely an economic commodity. The government of Ethiopia strategies recognized this fact and aim to increase access to water for all. In order to achieve this, however, it is important to find ways in which to serve the poorest and most vulnerable, while ensuring adequate cost recovery from the users. This issue addressed in the other manual.

4.8.7.1 Subsidies

a) Direct government subsidies (Hidden)

In fact the Water resources management policy stated that the O&M cost should be recovered by the users, however, the government still provide spare parts to the community, assisted the community in provision of technical, monitoring and evaluation activities.

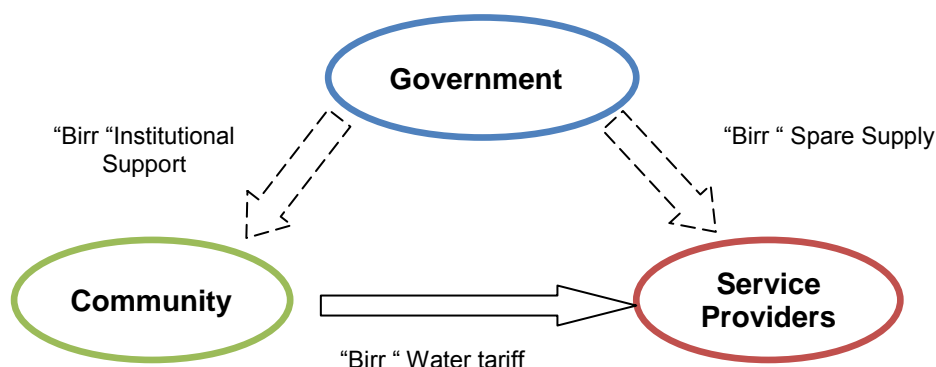
Regional Water Bureaus allocate part of their budget towards operating and maintaining of rural water supply schemes, but the allocated budget is too low compared to the construction of new schemes.

Subsidies can be used as promotion tools for a particular professional group, for instance the informal and formal private sector. They can also be used to promote access to water services by marginalized groups, with subsidies adapted to various levels of marginalization.

Some subsidies for operation and maintenance of rural water supplies are indirect or 'hidden'. These include support for spare parts supply, storage and distribution, and

monitoring, regulation and institutional support for communities. Here, the service provider may be a local mechanic who obtains spare parts from a local NGO or subsidized dealer (see Figure 4.4). It may be accepted that some level of such subsidy is needed, particularly for institutional support, but where possible, attempts should be made to phase out hidden subsidies over time and these costs should be worked into financial plans.

Figure 4-4: Hidden subsidies (dashed)

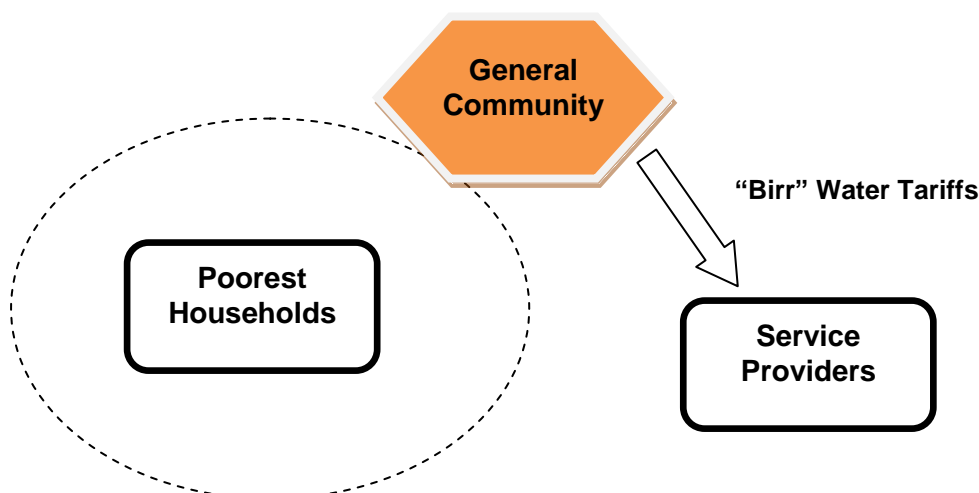


b) Cross-subsidy

One way to make the service equitable and affordable for all is to subsidize the poor and surcharge high-income consumers. However, in rural and low-income urban areas the majority of users have low-income levels, so funds raised from surcharging richer users in that area will not cover their subsidies.

Many poor rural people are currently subsidized by other more affluent members of their community. Community management systems often recognize that some households are unable to afford water tariffs or maintenance funds and therefore exempt them from payment. This is a sensitive issue since it may give rise to internal disagreement or envy and is open to abuse. It is, however, highly effective where community management is strong and allows the poorest and most vulnerable to be supported and protected by the rest of the community. The service provider in this case may be mechanics or private sector individual/ organization. Figure 4.5 presents the community subsidy.

Figure 4-5: Community cross-subsidy



4.8.7.2 Grants

NGOs and donors have used grants as a type of financing mechanism for the construction of new water supply facilities. Grants rarely pay for recurrent costs. Nowadays, this approach should be changed and the NGOs and Donors provide grant for O&M in order to use the facilities sustainably. Grant should not be for basic O&M management.

4.8.7.3 Micro-credit

Micro-credit is financing through lending mechanisms, similar to credits given by banks, except for their nature and size. Micro-credits are generally small in volume and respond directly to the specific needs of rural or low-income urban communities.

☞ Credit and Saving Institute

A micro-credit system can be used to:

- ☞ contribute to investments,
- ☞ purchase material and equipment for replacement, extension and rehabilitation,
- ☞ finance major unforeseen repairs,
- ☞ cover short-term cash-flow problems;
- ☞ Develop a stock of spares, parts and tools.

The Amhara region has already commenced to implement the CSI and became effective.

There is rules and regulation for the fund, lending conditions, interest rate, guarantee against risk, loan reimbursement, and limits of loan.

4.9 Private Sector in O&M of RWS

The private sector encompasses a range of individuals, companies and micro enterprises from the village blacksmith to international companies manufacturing pumps and diesel generators. They all have a part to play in supporting O&M.

These private sectors support the community by:

- 1) Provide O&M training.
- 2) Design and manufacture pumps and other equipment for operation and maintenance at the village level.
- 3) Supply spare parts and consumables ,
- 4) Develop community/agency managed O&M systems.
- 5) Rehabilitate and extend schemes for community O&M.
- 6) Major repair work
- 7) Local manufacture of spare parts and tools
- 8) Local skills for preventive and corrective
- 9) Operation of facilities
- 10) Billing, rate collection, auditing of accounts
- 11) Provide banking facilities for O&M funds.
- 12) Provide credit facilities for irregular high cost items and for the expansion or modification of facilities.

4.9.1 The private sector at the community level

A strengthened private sector will give communities greater freedom to decide who they involve in O&M. Even within existing centralized maintenance systems the private sector has been involved in providing a range of support services.

Large community schemes serving several communities may decide to contract operation and maintenance to individuals or private organizations. Alternatively, communities might operate a system themselves but arrange a preventive maintenance and repair contract with an external body. Small schemes are unlikely to provide enough work to employ full-time staff and may rely on local artisans for periodic maintenance.

4.10 Human Resource Management

Human Resources Development (HRD) entails the development of skills, the raising of awareness, confidence-building and the motivation of people. Training is an important and major component of HRD but it is not the only one. Improving access to information, recognizing people's endeavors' and worth, and providing monetary and non-monetary incentives, such as promotion prospects, can all contribute.

Woreda Water office, Zone Water office and regional water bureaus often have a surplus of staff in their departments but the majorities are untrained or only semi-skilled. Staff who are suitably qualified tend to be few and often overburdened. This situation is partly due to the problem of attracting and retaining skilled staff. Little professional interest in O&M, poor salaries and low esteem has been responsible for the failure to retain managers, engineers, technicians and other skilled personnel. It is not uncommon to find a skilled worker's monthly salary in the public sector to be equivalent to a day's income for an artisan in the private sector.

Incentives for skilled staff are often restricted by rigid salary structures. Incentives are more easily paid on donor-supported construction programmes but the effect then is to divert much needed O&M staff away from their important tasks of running existing water supplies. Such incentives can harm O&M and be counter-productive in the long term. On the other hand, new projects with appropriate donor support can provide valuable experience to personnel and give the opportunity and funds for the further development of skills. Women are often less mobile than men and, therefore, the training of women may have a longer-lasting benefit.

4.10.1 Restructuring and training

Human resources development complements the restructuring of organizations. Job descriptions will need to be adapted and new performance criteria established. Agency staff- professionals, managers, technicians, extension workers - will need orientation to a partnership approach and extra skills will need to be acquired. Technical field staffs, for example, are potential trainers themselves and may need to be sensitized to their expanding role as advisers rather than 'doers'. At the community level, committee officials, treasurers, operators, leaders and users will all need support to be able to participate and perform their new operation and maintenance tasks.

Training and education will vary for the different personnel in the O&M system:

- The incorporation of aspects of O&M in existing formal courses for technicians, engineers, trainers and managers.
- In-service or on-the-job training for existing and new personnel: technicians, mechanics, health and social workers, extension staff, accountants.

- Specific short courses held informally in rural communities and follow-up support for unskilled community personnel, committee members and artisans.

4.11 O&M Information Management

O&M information management is the recording, documentation and dissemination of information relevant to O&M to support the sector.

There is a need to exchange information at a localized level - within Woreda, Zone, region and Federal levels. The kind of information is broad and includes performance and technical data, skills needs and training, financing and costs, all related to O&M. The people who will use the information are professionals in the water sector involved in planning, design and management; policy makers, practitioners at the field level, community members involved in O&M management and the users of water supply facilities.

Information management system has already established at Ministry of Water, Irrigation and Electricity, and this system should be linked down with region, zone, woreda and kebele levels.