



GOVERNMENT OF GHANA

MINISTRY OF WATER RESOURCES,
WORKS AND HOUSING

**COMMUNITY WATER AND
SANITATION AGENCY**

**SMALL COMMUNITIES
SECTOR GUIDELINES
(Operation and Maintenance Guidelines)**

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1 GENERAL PRINCIPLES

1. Small Communities Water Supply Systems shall be operated and maintained in a sustainable manner. Potable water shall be delivered at GSB water quality standards to consumers in a virtually uninterrupted manner (at least 95% of the time) over the design period in a cost effective manner. The minimum amount of water for each person shall be 20lcd.
2. Gender balanced WATSANs shall be established in each Small Community and shall have overall responsibility for the operation and maintenance of all water and sanitation facilities in the community.
3. Planned routine and periodic maintenance shall be provided for all water and sanitation infrastructure. For point sources, hand pumps and associated above – below ground components including concrete structures, shall be adequately maintained. Similarly, for piped systems, all electro mechanical equipment, civil works structures, pipe work and ancillaries, etc., shall be adequately maintained.
4. Caretakers shall be employed by WATSANs for routine operation and maintenance. Area Mechanics shall be contracted for periodic maintenance. Operational staff shall be engaged to operate and maintain small community piped systems.
5. All caretakers, Area Mechanics and other operatives engaged to operate and maintain the systems shall be provided with adequate training and shall be certified to perform their respective duties. Periodic refresher training shall be provided to such staff.
6. Beneficiary communities shall be educated on good hygiene practices, sanitation and O&M activities for the water provided.
7. Adequate records, in accordance with the CWSA O&M Tools, shall be kept on the operation and maintenance of the water supply system for analysis, reporting and informed decision-making.

2 OPERATIONAL MANAGEMENT GUIDELINES

2.1 Point Sources

- Boreholes and hand dug wells fitted with hand pumps shall be the preferred technological choice for delivery of potable water to Small Communities. To ensure sustainability, Small Communities shall carry out routine and preventive maintenance of all facilities.

- The four standardised hand pumps, notably, Ghana Modified India Mk 2 (GMIM2), Nira AF-85, Afridev and Vergnet shall be operated and maintained in accordance with the manufacturers' specifications.
- The WATSAN in a community shall exercise overall management responsibility for the water and sanitation system in the community by observing sound administrative, technical and financial management practices.
- The WATSAN shall engage a vendor who shall be responsible for the day-to-day maintenance around the hand pump and collection of tariffs. Weekly/daily accounts shall be rendered to the WATSAN.
- The WATSANs shall sign contracts with Area Mechanics to carry out preventive maintenance on hand pumps at least once yearly. Area mechanics shall also carry out periodic maintenance of hand pumps when contacted by WATSANs.
- A national hand pump spare parts distribution network shall be established with distribution outlets at the national, regional and district levels. Spare parts for hand pump maintenance and repairs shall be available at all levels at all times.
- Area mechanics shall be available in every district. Periodic refresher courses and training of new mechanics shall be carried out. Training on new technologies and strategies for pump maintenance and repairs shall also be carried out. Costs of training shall be borne by the CWSA/MMDA.
- Area Mechanics shall undertake periodic maintenance of hand pumps, which shall include general inspection, replacement of fast wearing parts and performing minor repairs. Payments shall be made to the Area Mechanic from water sales revenue.
- Major repairs or borehole rehabilitation outside the technical and financial capability of the communities shall be undertaken with the assistance of the MMDA. This shall include borehole flushing and redevelopment.
- DWSTs shall be responsible for monitoring O&M of all water and sanitation facilities in communities within areas under their jurisdiction. It shall be essential to ensure that pumps with technical problems are repaired immediately to prevent a return of the community to use of previous sources and to avoid the situation where several hand pumps are broken down simultaneously thereby requiring huge investments.
- Adequate records shall be kept on the operation and maintenance of the point sources for analysis, decision-making and reporting.

2.2 Piped Systems

- The WATSAN in a community shall exercise an overall management responsibility for the piped system in the community by observing sound administrative, technical and financial management practices.
- The WATSAN shall be supported in this capacity by all relevant public and private sector institutions, notably, the MMDAs, CWSA, NGOs and private companies.

- The WATSAN shall adopt the appropriate management system for the piped system in the community. There shall be four main options for Management of Operations and Maintenance of the Water Supply System.

Option 1: The community, through its WSDB and employees, operates and maintains the Water Supply System entirely by itself (non-mechanised systems e.g. gravity water schemes). A trained Manager, Operator, and Financial/Administrative staff shall be employed by the community to carry out daily operation and maintenance activities. They shall be supported by skilled artisans, e.g. plumbers and masons, from within the community whose services may be procured when necessary on a retainer basis.

Option 2: The community, through its WSDB engages staff for the daily operation (financial, administrative, technical) and maintenance and calls a certified/reputable firm to carry out specialised technical, financial or administrative functions as and when needed. Such functions may include the preparation of financial reports, internal auditing or some aspects of planned maintenance.

Option 3: The community, through its WSDB engages staff for the daily operation (financial, administrative, technical) and maintenance and signs a contract with a firm or firms to perform other specialised technical, financial or administrative functions on a periodic basis. Such functions may include the preparation of financial reports, internal auditing or routine/preventive maintenance.

Option 4: The community, through its WSDB contracts a firm to completely operate and maintain the Water Supply System including meter reading, billing and revenue collection, etc., for an agreed fee. This arrangement enables the WSDB to set performance standards for a set period of time.

- Due to the generally simple nature of the piped schemes to be provided for Small Communities (maximum 4No. standpipes), Options 1 and 2 shall be mostly applied.
- Other management options may be adopted where necessary. Each WATSAN, in consultation with the community it represents, and with the relevant technical support provided by the CWSA/DA must decide on the management option to be adopted.
- Water meters shall be provided for all Small Communities piped schemes for the production and distribution points. Faulty meters shall be withdrawn and replaced by the WATSAN immediately this is detected. Accordingly, the WATSAN shall maintain a stock of spare meters equivalent to at least 10% of the total number of installed meters at all times. Faulty meters may be repaired when withdrawn, either under warranty or through an arrangement with a private firm or GWCL.

2.3 Sanitation

- Institutions shall be required to put a management system in place to manage latrines.
- Provision of communal/neighbourhood latrines shall be discouraged. Where they are available, the community, through the WATSAN shall contract an operator for the management of the latrines.
- Households shall be encouraged to own and manage their own latrines.
- Training shall be provided to all household latrine owners on the maintenance of the latrine facility. Continuing health education and technical assistance shall be provided for owners/managers of all latrines to enable them function properly.
- Where necessary, desludging facilities shall be provided for latrines. However, in smaller communities, households with single pit latrines shall be encouraged to relocate their facilities to new areas when they are full, after about 2 to 3 years of use. Households shall be assisted to return to the location of the first pits after emptying. Technical assistance for relocation shall be provided by the DWD/DWST with support from the CWSA Regional Office. The material from emptied pits shall be used as soil conditioner or disposed off in a manner that is environmentally acceptable.

3 ROLES AND RESPONSIBILITIES FOR O&M

3.1 CWSA - RWST

The Regional Water and Sanitation Teams of the CWSA shall be responsible for the following functions:

- Capacity Building of DWDs/DWSTs, WATSANs, Caretakers and Area Mechanics
- Monitoring Operations & Maintenance (MOM)
- Backstopping for MMDAs

3.2 Metropolitan, Municipal and District Assemblies

Each MMDA shall be responsible for the following primary functions through the DWD/DWST:

- Provide legal backing for WATSANs and approve bye-laws proposed by WATSANs
- Monitoring Operations & Maintenance (MOM)
- Approve Tariff and Annual Budget
- Backstopping for Watsans

3.3 WATSANs

Each beneficiary community shall have a gender balanced WATSAN made up of five to nine members and shall be responsible for the following administrative functions:

- Community Meetings/Minutes of Meeting
- Community Mobilisation
- Hygiene and Sanitation Promotion
- Preparation of reports
- Correspondence
- Receipt and Dispatch of letters, reports, etc.
- Documentation Management
- Supervision of Caretakers
- Contract Management (Area mechanics, caretakers etc.)

3.4 Operating Staff

For effective operation and maintenance of the water supply system in a community, operating staff shall be engaged by the WATSAN on behalf of the community. Whichever option of management is selected, there shall be a two tier management structure, one for technical/operational aspects and the other for financial/accounting aspects. Vendors shall be engaged at each water point.

Technical/Operational Aspects

These shall include:

- Identifying faults and provide solutions to minor faults
- Keeping technical records on operations
- Analysing technical data
- Preparing technical reports

Financial/Accounting Aspects

These shall include:

- Paying of salaries and allowances
- Certification and payment of area mechanics and other technical personnel who carry out repairs.
- Keeping and preparation of financial and administrative records
- Preparing of financial reports
- Keeping cashbook
- Payments into bank account

Vendors

Vendors shall be responsible for water sales and receipt of payments at water points. Vendors shall be paid up to 20% of the revenue received at the water point.

4 PERFORMANCE MONITORING

4.1 District Monitoring and Evaluation System

CWSA has in place a comprehensive monitoring system known as the District Monitoring and Evaluation System (DiMES). DiMES has been put in place to serve as a management tool to capture, store and report information on water and sanitation activities as well as to monitor water and sanitation projects for the rural and small towns sector. DiMES evolved because of the need to have a system for the monitoring and evaluation of water and sanitation projects and their functionality directly and not through general and periodic surveys.

The DiMES provides a means for planning for investments for facilities and infrastructure for equitable development through a strategic investment planning model incorporated into the system.

4.2 Monitoring of O&M

Monitoring of operation and maintenance is essential for the sustainability of water supply in Small Communities. Staff of the MMDAs i.e. the DWD/DWSTs shall monitor the O&M of the water systems in all Small Communities in their districts.

The RWSTs shall maintain a regional database, which will be used to feed the DiMES. The RWSTs shall provide capacity building to the DWSTs to enable them obtain the required information on Small Communities in their district. DWSTs shall collect and record in the standard format all data required by the RWSTs and to be submitted every quarter to the RWST who shall prepare quarterly reports. This shall be incorporated in the DiMES at the regional level. The status of each Small Community water system shall be available at the CWSA in the DiMES which shall be updated quarterly.

The RWSTs shall pay regular visits to the DWDs/DWSTs to supervise data collection and provide the necessary on-the-job training for effective data collection. The DWDs/DWSTs shall produce up to date management information on the functionality of all small communities within the Districts so that appropriate and timely action can be taken to solve any problems arising.

4.3 Performance Indicators

Indicators for performance monitoring shall be the indicators used in the CWSA O&M tools. Communities shall be guided by the DWSTs with assistance from Consultants (POs) and RWSTs to monitor performance in accordance with CWSA O&M tools. Each beneficiary community shall be provided with the list of the indicators and monitoring forms prepared by the CWSA to enable monitoring of Small Communities projects.

5 WATER QUALITY MONITORING

The monitoring of drinking Water Quality is a requirement to ensure the safety of potable water. Water quality monitoring of Small Communities water supply systems shall be performed at least twice a year after commissioning and as described in the Water Safety Framework.

It is essential to prevent or control pollution of existing water resources through sound environmental practices to ensure effective watershed management and thereby impact positively on water quality.

Water Quality Monitoring shall consist mainly of:

- 1) Examination of Drinking Water Supplies through sampling and analysis to reveal pollution at the time when the water sample is taken and examined.
- 2) Topographical examination of the locality of the water supply system - Sanitary Surveys which may reveal potential sources of pollution, which may not be discovered by sampling and examination.

Examination of Water Supplies

The examination and analysis of Water Supplies shall cover three (3) areas of investigation, notably:

- Physico-Chemical
- Bacteriological
- Biological

To carry out these examinations, samples shall be taken and analysed according to standard procedures to meet the GSB Water Quality Standards.

Monitoring Guidelines

The following are the guidelines for monitoring water quality of Small Communities water supply systems:

- 1) Water Quality sampling and analysis should be carried out at least twice annually for each community water supply system. This shall include physico-chemical and bacteriological analysis based on the parameters outlined in the Water Safety Framework. The full list of parameters is referred to as the 'Baseline Water Quality Parameters'.
- 2) Biological analysis shall be carried out at the intake of systems based on surface waters, and at a frequency to be determined by a qualified Chemist/Bacteriologist at the time of commissioning of the Water Source. The frequency shall not be less than two times a year, or as described in the Water Safety Framework. Where sanitary surveys reveal a necessity for more frequent examination, this should be carried out.
- 3) At production plant level, bacteriological and physico-chemical analysis should be made at least once a month for groundwater supplies and once a week for surface water based supplies, or as described in the Water Safety Framework. The frequency should be related to the severity of estimated risks during monitoring.

- 4) Two people per community shall be trained to carry out sanitary surveys. These shall normally be the caretakers of the WATSAN committees. They shall record their findings in a standard format to be provided them when they are first trained, and shall send any negative reports through their WATSANs to the District Assemblies and/or CWSA regional office (where necessary) for action.
- 5) Water Quality Sampling and Analysis services shall be performed by recognised institutions, notably GWCL, WRI, SGS or KNUST laboratories and paid for by each community through tariffs.
- 6) These institutions shall send copies of reports of annual physico-chemical bacteriological and biological analyses to the District Assembly for study and action. A special report shall be made on doubtful sampling results and forwarded to the CWSA. Regional Water and Sanitation Engineers of the CWSA shall be required to take relevant action. The final responsibility for action on results of Water Quality Reports lies with the CWSA.

6 ENVIRONMENTAL AND SOCIAL SAFEGUARDS

Environmental and social safeguards shall be an integral part of all small communities water supply and sanitation projects. The key components of the safeguards to be considered in any project shall include the following:

- Identification of key stakeholders at all levels to ensure there is a clear understanding of the project and the impacts it will have on the environment, social and economic well being of the beneficiaries and other stakeholders.
- Identification of Project Affected Persons (PAPs) and communities and how they will be affected by project implementation.
- Identification of how lands will be acquired and the compensation measures/strategies that will be put in place.
- Identification of all relevant environmental and social impacts that will be encountered in project implementation and appropriate mitigation measures.
- Identification of how livelihoods (infrastructure, farms and crops etc) will be affected by the project and the types of compensation measures to be applied as well as determination of key eligibility criteria for determining entitlements for the relevant project affected persons.

7 SUPPLEMENTARY GUIDELINES

7.1 Private Sector Participation

The private sector shall be responsible for the provision of goods and services with regard to proper operation and maintenance of existing water supply and sanitation

systems. These services shall impact positively on small communities and in a sustainable manner. These services shall include among others:

- Capacity building of the WATSANs, Area Mechanics and DWDs/DWSTs;
- Supply, repair and servicing of hand pumps;
- Supply and distribution of spare parts;
- Local level maintenance and repair services;
- Specialised services such as fishing for pumps and flushing of boreholes.
- Operation and maintenance of water supply and sanitation infrastructure;
- Management of water supply schemes.

7.2 Quality Control Procedures for Hand Pump Spare Parts

Quality control measures are necessary to ensure spare parts required for O&M are of appropriate quality. The following measures shall be put in place to ensure quality control.

- Establishing of a monitoring system in which the performance, the availability, and the quality of the parts are assessed;
- Production of spare-parts catalogue in which all parts are listed;
- Establishing of procedures for independent quality control agencies for pre-delivery inspection in the country of origin;
- Setting up of consignee end inspection to assure that the quality control checks are carried out to ensure that parts are of acceptable quality.

7.3 Transport and Logistics

The WATSAN shall provide transport and other logistics for use by employees to facilitate their work.

Transport allowances shall be negotiated as part of the salaries of the operational staff.

Transport allowances shall be paid to WATSAN members to enable them carry out all relevant activities.

7.4 Record Keeping

Records shall be kept on all aspects of small communities' water and sanitation projects. Specific subject areas shall include Technical, Financial and Administrative Reports.

Records of all maintenance activities carried out shall also be kept.

7.5 Tariffs

The WATSAN shall have the responsibility for setting tariff, and shall exercise this responsibility in consultation with the community. The MMDAs shall approve all tariffs. Tariff shall be calculated using CWSA guidelines for tariff calculation. The Pay as you fetch (PAYF) method shall be the preferred method of tariff collection at standpipes.

7.6 Maintenance of Electro-Mechanical Equipment

For small communities using piped systems that depend on electricity from the national grid, solar, wind or generator source, warranty periods for mechanical/electrical equipment shall be at least one year, after which period, each community shall sign a contract preferably with an approved local agent of the manufacturers for routine and breakdown maintenance.

All suppliers of electro mechanical equipment shall have local agents capable of providing after sales services and relevant practical and theoretical training, particularly to beneficiary communities and water sector professionals.

7.7 Training

Training to be provided to relevant personnel involved in the delivery of water to Small Communities. These shall include the beneficiary community represented by the WATSAN, MMDA official, CWSA and the Private Sector. Training will be arranged by CWSA and the Agency shall determine the number of people to be trained on an annual basis.