



Operations and Maintenance (O&M) Framework for rural and small-town water supply systems in the Ahafo Region

Riva Ghana

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small-town water supply systems
in the Ahafo Region

Riva Ghana

List of abbreviations and acronyms

ANAM	Asutifi North Ahonidie Mpontuo	NCWSP	National Community Water and Sanitation Programme
ARCC	Ahafo Regional Coordinating Council	NDPC	National Development Planning Commission
COM	Community Ownership and Management	NDWQMF	National Drinking Water Quality Management Framework
CWSA	Community Water and Sanitation Agency	NGO	Non-Governmental Organisation
CWSP	Community Water and Sanitation Policy	NWP	National Water Policy
DACF	District Assembly Common Fund	O&M	Operation and Maintenance
DAs	District Assemblies	PPE	Personal Protective Equipment
GHS	Ghana Health Service	PPP	Public-Private Partnership
GoG	Government of Ghana	PWSPs	Professionalised Water Service Providers
GSA	Ghana Standards Authority	PURC	Public Utility Regulatory Commission
GWASHSDP	Ghana WASH Sector Development Programme	RCC	Regional Coordinating Council
GWL	Ghana Water Limited	SDGs	Sustainable Development Goals
GWCL	Ghana Water Company Limited	SHEP	School Health Education Programme
IWRM	Integrated Water Resources Management	UNICEF	United Nations Children's Fund
JMP	Joint Monitoring Programme (WHO/UNICEF)	WASAMS	Water and Sanitation Monitoring System
LGSS	Local Government Service Secretariat	WASH	Water, Sanitation, and Hygiene
LI	Legislative Instrument	WASHPMIS	Water, Sanitation and Hygiene Project Management Information System
MLGCRA	Ministry of Local Government, Chieftaincy and Religious Affairs	WaterTRACS	Water Testing, Research, and Capacity Strengthening
MMDAs	Metropolitan, Municipal and District Assemblies	WHO	World Health Organization
MoF	Ministry of Finance	WRC	Water Resources Commission
MoGCSP	Ministry of Gender, Children and Social Protection	WSCs	Water and Sanitation Committees
MoH	Ministry of Health	WSMTs	Water and Sanitation Management Teams
NCWSS	National Community Water and Sanitation Strategy	WSSDP	Water Sector Strategic Development Plan
		WVI	World Vision International

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Executive summary

This Operations and Maintenance (O&M) Framework for the Ahafo Region has been developed to strengthen the management, reliability, and sustainability of rural and small-town water supply schemes. It responds to persistent challenges in system functionality, service reliability, and institutional coordination, and aligns with national policy directives from the Ministry of Works, Housing and Water Resources (MWHWR), the Community Water and Sanitation Agency (CWSA), and the Ghana Water Policy. The document guides District Assemblies, Water and Sanitation Management Teams (WSMTs), Area and Regional Water and Sanitation Directorates, and other stakeholders to ensure that water supply systems are effectively operated, maintained, and supported throughout their life cycle.

The Framework sets out practical operational, technical, managerial, and financial measures to deliver sustainable, equitable, climate-resilient, and functional water services across Ahafo. It promotes a shift from ad hoc maintenance to planned, adequately resourced, and accountable O&M, with a specific focus on community-managed rural and small-town schemes. It provides direction for planning, budgeting, implementation, and monitoring of O&M activities at district, sub-district, and community levels, and supports the application of national policies through standardised O&M practices, stronger institutional arrangements, improved collaboration, and enhanced technical and financial capacity.

The Framework was developed through a consultative process involving desk review, stakeholder interviews, and field consultations to ensure that it reflects both sector evidence and implementation realities. The draft was validated at a stakeholder workshop in Goaso and finalised after incorporating the comments and recommendations received.

Drawing on key sector documents, including the Ghana Water, Sanitation and Hygiene Sector Development Programme, National Water Policy, Environmental Sanitation Policy, CWSA O&M Guidelines, rural water supply standards, and relevant District Assembly mandates, the Framework supports Ghana's transition towards professionalised management and reflects recent regulatory reforms. Key priorities include preventive maintenance across the project life cycle; functional spare-parts supply chains; stronger WSMT accountability and performance; improved post-construction support from regional and district teams; capacity building at all levels; and the integration of water safety planning, climate resilience, and asset management into routine O&M. The document also outlines procedures for situational assessments, Strengths, Weaknesses, Opportunities and Threats (SWOT) analyses, asset condition assessments, risk profiling, and annual maintenance planning, and clarifies the roles of regional, district, and community actors in preparing and approving O&M Action Plans.

Following stakeholder validation, several priority issues were further emphasised as critical to the sustainability of operations and maintenance of rural and small-town water supply systems in the Ahafo Region. These include political interference in operational and governance decisions, rising electricity and power-related O&M costs, the need for strengthened quarterly reporting to Metropolitan, Municipal and District Assemblies (MMDAs) and the Regional Coordinating Council (RCC), enforcement of compliance through local byelaws, the use of digital and modern communication channels for monitoring and coordination, the establishment of platforms for sharing best practices and innovation and the formation of a technical working group to support implementation of the framework. These issues have been integrated into the Framework to strengthen its practical applicability, institutional accountability and implementation support mechanisms.

About the Framework

How to use this Framework

This Framework is structured to move from governance and management foundations to operational procedures, financial systems and performance improvement mechanisms.

Users are encouraged to:

- Apply the Framework holistically, rather than selectively;
- Use annexes and templates to support implementation; and
- Adapt procedures to local conditions without undermining minimum standards.

Intended users

The primary users of this Framework include:

- Water service providers and system managers;
- District Assembly technical and environmental health staff;
- Regional and other sector oversight institutions;
- NGOs, private operators, and social enterprises involved in service delivery; and
- Development partners supporting water sector programmes.



Chapter 1: Introduction

1.1 Background and rationale

Over the past two decades, Ghana has made significant investments in small-town and rural water supply infrastructure through public funding, development partner support, and private and non-governmental initiatives. These investments have expanded access to water services across many parts of the country. However, evidence from national assessments, sector reviews, and field experience consistently shows that a substantial proportion of these systems fail to deliver reliable services over time due to weaknesses in operation and maintenance (O&M).

A lack of technical design knowledge rarely causes non-functionality and intermittent services. Instead, they are primarily driven by systemic challenges, including inadequate revenue generation, weak preventive maintenance practices, unclear institutional roles, limited technical capacity, weak accountability mechanisms, and poor communication with users. In many cases, O&M arrangements depend heavily on individual commitment rather than institutionalised systems. As a result, systems deteriorate prematurely, service reliability declines, and public confidence in water service providers is undermined.

Operation and maintenance are therefore not peripheral activities, but the core determinants of service sustainability. Without adequate O&M arrangements, capital investments fail to translate into reliable and safe water services, and the long-term objectives of national water policy and the Sustainable Development Goals cannot be achieved.

This document addresses this challenge directly by providing a structured and practical framework to guide the day-to-day operation, routine maintenance, and preventive measures, as well as the long-term sustainability of small-town and rural water supply systems in Ghana.

In addition to the technical, financial and institutional challenges identified during the assessment, the validation process highlighted a number of operational risks that continue to affect the sustainability of water services in the Region. These include political interference in service delivery decisions, high recurrent energy (electricity) costs for mechanised and piped systems, weak enforcement of operational obligations, limited structured learning across districts and service providers and insufficient use of digital tools for routine monitoring and coordination. These issues reinforce the need for an O&M framework that is not only technically sound, but also institutionally anchored, enforceable, adaptive and responsive to the practical realities of service delivery in the Ahafo Region.

This framework is being piloted in the Ahafo Region, under the technical facilitation of Riva Ghana, MMDAs, RCC and regional partners, with the intention that lessons, evidence, and operational experience generated through implementation will inform the development of a national O&M framework or policy instrument by the Ministry of Works, Housing and Water Resources, the Community Water and Sanitation Agency, and other statutory institutions. The application in the Ahafo Region is intended as a structured, evidence-generating pilot to support future national policy and legal adoption.

1.2 Purpose of the O&M Framework

The purpose of this Framework is to guide the sustainable management of water systems and service providers across all communities in the Ahafo Region. Specifically, the Framework aims to:

- Establish minimum operational standards for the sustainable delivery of small-town and rural water services in Ghana;
- Provide clear guidance on roles, responsibilities, procedures, and performance expectations for all actors involved in O&M;
- Promote a shift from reactive, breakdown-driven maintenance to planned and preventive maintenance;

- Strengthen financial, technical, and institutional capacity for managing water services as a continuous utility function; and
- Support regulators, service authorities, and development partners in monitoring performance and enforcing accountability.

The framework is intended to serve as both:

- A practical operational guide for service providers and system managers; and
- A reference framework to support oversight institutions, District Assemblies, and partners to strengthen O&M for improved water service delivery.

1.3 Framework development process

The development of this O&M Framework followed a consultative and iterative approach to ensure that it is contextually relevant, practical, and aligned with sector needs. The process commenced with a desk study involving the review of relevant policies, guidelines, reports, and related reference materials on rural and small-town water supply. This review provided the basis for understanding the institutional and operational context, identifying key O&M challenges, and informing the structure of the Framework.

The desk review was complemented by field interviews and stakeholder consultations to obtain practical insights from key actors in the sector. Stakeholders engaged included World Vision, Safe Water Network, Saha Global, Project Maji, the District Planning Officer from Kenyasi, the Community Water and Sanitation Agency (CWSA), and the Kenyasi Chief, among others. These engagements helped to capture field-level experiences, implementation challenges, institutional perspectives, and good practices relevant to the framework.

Based on the findings from the desk study and stakeholder consultations, a draft O&M Framework was prepared and subjected to stakeholder review at a validation workshop held in Goaso. The workshop provided an opportunity to assess the clarity, relevance, and practicality of the draft Framework and to obtain comments for its improvement.

Following the validation workshop, the draft was revised to incorporate the feedback received and subsequently finalised. The resulting Framework therefore reflects both documentary evidence and stakeholder input, and is intended to provide a practical basis for strengthening the operation and maintenance of rural and small-town water supply systems.

1.4 Scope and applicability

1.4.1 Systems covered

This Framework applies to small-town and rural water supply systems, including but not limited to:

- Mechanised borehole systems with standpipes and/or limited distribution networks;
- Point sources in rural water systems;
- Small-town piped water schemes with treatment, storage, and distribution components;
- Rehabilitated or upgraded water supply systems operated under new management arrangements.

While the Framework does not focus on sanitation facilities, it recognises the importance of source protection, hygiene practices and environmental management where these directly affect water system performance and public health.

1.4.2 Management models covered

The Framework is explicitly designed to work across different management models, while recognising the operational

realities of each in Ghana. It applies to:

- Public utility–managed systems, including systems managed directly or with oversight from the Community Water and Sanitation Agency (CWSA);
- Community-based management systems, typically operated by Water and Sanitation Management Teams (WSMTs); and
- Private-, NGO-, and social enterprise–operated systems, under management contracts, concessions, or partnership arrangements;
- Point sources managed by WSMTs.

Where requirements differ by management model, the Framework explicitly identifies these differences while maintaining common minimum standards.

1.5 Institutional and regulatory context

Water service delivery in Ghana operates within a decentralised governance framework. District Assemblies hold statutory responsibility for ensuring access to water services within their jurisdictions, while national institutions provide policy direction, technical support, and regulatory oversight. This Framework is aligned with:

- Ghana’s national water policies and sector strategies;
- The decentralisation framework governing local service delivery;
- Public health and environmental protection regulations; and
- National commitments to universal access to safely managed drinking water.

This Framework is intended as a technical resource to inform and support the Ministry of Works, Housing and Water Resources, the Community Water and Sanitation Agency, and other statutory institutions in strengthening operation and maintenance practices in the Ahafo Region.



Photo credit: Riva Ghana

Chapter 2: Overview of the policy, institutional and policy framework

2.1 Policy and legal framework

The Ghana Water Policy (2024) reaffirms the expanded mandate of the Community Water and Sanitation Agency (CWSA) to include the direct management of piped water systems. This signals a shift from the traditional Community Ownership and Management (COM) approach towards a more professionalised utility model for operating and managing small-town piped water schemes. At the same time, the policy recognises that service delivery must remain context-specific, and therefore retains other management options, including community-managed systems led by Water and Sanitation Management Teams (WSMTs) and Safe Water Enterprises (SWEs) operated by private or social enterprises. Point-source facilities, particularly boreholes fitted with handpumps, are expected to remain under community ownership and management arrangements.

The policy highlights persistent constraints that undermine rural water O&M, including declining functionality of facilities, weak spare-parts supply chains, and limited uptake of technology and innovation. In response, it emphasises the need for appropriate technology selection, continuous capacity development, effective and transparent tariff setting, strengthened spare parts systems, and improved water safety management as core pillars of a sustainable O&M framework. These priorities align with the objectives of this O&M Framework, which promotes preventive maintenance, professionalised technical support, reliable financing arrangements, and strong accountability mechanisms to sustain service delivery across rural and small-town systems.

On financing, the CWSA Regulation, 2011 (L.I. 2007) requires tariffs to cover routine operational and minor maintenance costs, with an additional margin -stated as 32%-to support system extension, replacement, major repairs, and rehabilitation (CWSA, 2011). This provision reinforces the principle that cost recovery is fundamental to sustainable operations and maintenance (O&M) and must be supported by clear financial management systems and transparent reporting to build user confidence and willingness to pay.

Finally, the CWSA Guidelines (CWSA, 2010) outline roles and responsibilities for O&M among key actors, including service providers, service authorities, service recipients, and CWSA. However, these guidelines require updating to reflect evolving sector realities, including the shift towards professionalised management of piped systems, emerging private and social enterprise models, stronger requirements for performance monitoring and reporting, expanded emphasis on water safety planning and risk management, and the integration of climate resilience and asset management into routine O&M planning.

2.2 Institutional arrangements

The institutional arrangement for rural and small-town water service delivery in Ghana is defined under the CWSA Act (Act 564) and related legislative instruments.

The Ministry of Works, Housing and Water Resources provides overall sector leadership, including policy formulation, planning, coordination, collaboration, and monitoring and evaluation of programmes related to water resources management and water supply. The Water Resources Commission (WRC), established under Act 522, regulates and manages the utilisation of Ghana's water resources and coordinates relevant government policies, supporting the availability of raw water in adequate quantity and acceptable quality for water supply.

The Community Water and Sanitation Agency (CWSA), established by Act 564 of 1998, was mandated to facilitate the provision of safe drinking water and related sanitation services to rural communities and small towns. Under current reforms, CWSA's role is evolving towards a more professionalised utility function for managing small-town

piped water supply systems. Point-source facilities, such as boreholes fitted with handpumps, are expected to remain under community ownership and management arrangements, under the supervision of District Assemblies.

The Water Policy provides that tariffs for piped water systems are subject to approval by the Public Utilities Regulatory Commission (PURC). It also anticipates the implementation of recommendations on alternative management models and the definition of an appropriate organisational structure for CWSA to support the transition.

At the regional level, the Regional Coordinating Council (RCC) provides oversight for District Assemblies, coordinates district plans and programmes, and monitors implementation progress. District Assemblies (DAs) are the primary owners of rural and small-town water supply assets within their jurisdictions and are responsible for planning, implementation oversight, monitoring, and ensuring that facilities are operated and maintained in line with national guidelines. DAs supervise WSMTs and may also delegate operation of some piped schemes to private operators under agreed management arrangements.

Drinking water quality must meet the Ghana Standards Authority (GSA) standards for potable water, and water quality assurance should be integrated into routine operations, monitoring, and reporting. Development Partners, NGOs, and Civil Society Organisations (CSOs) support government through financing, technical assistance, capacity building, research, advocacy, knowledge sharing, and accountability initiatives.

Although roles are broadly defined, coordination challenges persist, particularly in harmonising responsibilities and ensuring effective collaboration among CWSA, District Assemblies, private operators, and community-level management structures. A summary of institutional mandates, O&M responsibilities, and coordination interfaces is presented in Table 2.1 to guide implementation and strengthen accountability across the service delivery chain.

Table 2.1: Summary of institutional roles for rural and small-town water O&M

Actor	Mandate	Key O&M responsibilities	Key coordination interfaces
Ministry of Works, Housing and Water Resources	Sector leadership: policy formulation, planning, coordination, monitoring and evaluation	Set sector O&M policy direction; coordinate reforms; ensure alignment of national programmes and financing priorities	CWSA, PURC, WRC, RCCs, DAs, Development Partners
Water Resources Commission (WRC)	Regulate and manage water resources; coordinate water-related policies (Act 522)	Protect/allocate raw water sources; support source sustainability and catchment protection; basin-level planning	Ministry, CWSA/GWL, DAs, Basin Boards, Environmental regulators
Community Water and Sanitation Agency (CWSA)	Facilitate safe water and sanitation services for rural/small towns (Act 564); evolving towards utility management of small-town piped systems	Technical standards and guidance; post-construction support frameworks; monitoring systems; support professionalised O&M for piped schemes; capacity building	Ministry, DAs, RCCs, WSMTs, private operators/PWSPs, Development Partners
Ghana Water Limited (GWL)	Urban water supply utility; technical standards and operational expertise where applicable	Provide technical guidance/benchmarks where relevant; interface for bulk supply or adjoining systems (as applicable)	Ministry, CWSA, PURC, WRC, DAs (where systems interface)

Public Utilities Regulatory Commission (PURC)	Regulate tariffs and service standards for piped water systems (per policy)	Approve piped-water tariffs; oversee tariff setting principles and consumer protection mechanisms	CWSA/GWL, Ministry, DAs, consumer groups
Regional Coordinating Council (RCC)	Regional oversight and coordination of District Assemblies	Coordinate district plans; monitor implementation performance; support harmonisation across districts	DAs, CWSA regional teams, Development Partners
District Assemblies (DAs)	Local governance; primary owners of rural/small-town water assets	Plan and oversee O&M; approve/oversee local tariff regimes (as applicable); supervise WSMTs; ensure compliance with national guidelines; contract and manage private operators where used	RCC, CWSA, WSMTs, private operators/PWSPs, Environmental Health Units
Water and sanitation management teams (WSMTs)	Community-level management for many rural/small-town systems	Routine operations; tariff/user-fee collection; minor maintenance; recordkeeping; security; reporting faults and downtime	DAs, area mechanics, CWSA support teams, communities/customers
Private operators / professional water service providers (PWSPs) / SWEs	Provide contracted or enterprise-based O&M/ service delivery	Operate systems under contracts; preventive maintenance; customer service; revenue collection; performance reporting; compliance with standards	DAs, CWSA, communities, spare-parts suppliers, labs/GSA (as applicable)
Area mechanics / spare-parts suppliers	Provide technical maintenance services and parts	First-line fault response; repairs; parts procurement; support preventive maintenance schedules	WSMTs, DAs, private operators, CWSA support structures
Ghana Standards Authority (GSA) / laboratories	Set/verify drinking water quality standards	Provide standards, testing services, and guidance to support compliance	CWSA, DAs, operators/WSMTs, Ministry (policy interface)
Development partners	Financial/technical support to government and sector actors	Fund infrastructure and O&M strengthening; capacity building; systems strengthening; pilots for professionalisation/monitoring	Ministry, CWSA, RCC, DAs, NGOs/CSOs
NGOs / CSOs	Implementation support, advocacy, research, accountability	Support O&M capacity building; community engagement; social accountability; innovation pilots; learning and knowledge sharing	DAs, CWSA, Development Partners, communities

2.3 Service delivery models

Service delivery for rural and small-town water supply is guided by the CWSA reform agenda, which promotes a gradual shift from a predominantly community-managed approach towards more professionalised arrangements - particularly for small-town piped systems - to improve reliability, cost recovery, and long-term sustainability.

Water supply systems in the region comprise a mix of technologies. Small-town piped schemes serve medium to large settlements (typically with populations of about 2,000–50,000) through distribution networks, standpipes, and household connections where applicable. Smaller and dispersed communities are mainly served by point sources, especially boreholes fitted with handpumps. Point-source facilities are generally managed under community-based arrangements, with routine operation and minor maintenance undertaken by trained area mechanics and local artisans, under the oversight of the District Assembly.

Small-town piped schemes may operate under one of the following management models:

- CWSA-managed small-town piped systems (professionalised utility management);
- WSMT-managed small-town piped systems (community-based management with technical backstopping);
- Safe Water Enterprises (SWEs) operated by private or social enterprises under agreed contractual or partnership arrangements.

Selection of the appropriate model should reflect the size and complexity of the scheme, operating cost requirements, availability of qualified operators, strength of revenue collection, and the capacity of local institutions to provide effective oversight. More complex schemes (e.g., those with treatment processes, larger networks, or higher energy and chemical costs) are generally better suited to professionalised management to ensure consistent technical performance and compliance. Smaller or less complex schemes may remain under WSMT management where governance and accountability are strong and post-construction support is reliable. Regardless of the model adopted, minimum O&M requirements apply across all schemes, including adherence to standard operating procedures and preventive maintenance schedules, transparent tariff setting and financial reporting, timely access to spare parts and repair services, routine water quality monitoring, accurate recordkeeping, and regular performance reporting to the District Assembly and relevant regional/national institutions.

Chapter 3: Situational analysis of operation and maintenance practices in Ahafo Region

3.1 Overview of water supply systems

The Ahafo Region was created in 2019 from the former Brong-Ahafo Region. It includes densely populated towns, and widely dispersed rural communities, resulting in a mixed water-service landscape. Water supply systems in the region include piped water schemes serving district capitals and larger towns, small-town piped schemes, mechanised boreholes (including submersible-pump systems) and handpump boreholes in smaller settlements. The Community Water and Sanitation Agency (CWSA) and Ghana Water Limited (GWL) are the principal national agencies supporting implementation and regulation, working alongside District Assemblies, development partners, and community management structures.

Technically, the region's systems can be grouped into: (a) medium-scale piped systems with treatment and distribution networks serving municipal areas and larger small towns; (b) smaller piped schemes with simpler designs but frequent management and operational constraints, and (c) rural point sources, including handpumps and mechanised boreholes supplying standpipes or limited reticulation networks. In several communities, solar-powered submersible pumps are increasingly used to improve reliability and reduce dependence on diesel generation and grid fluctuations.

Despite improvements and recent investments, including major works targeting Goaso and other towns, coverage and functionality remain uneven across districts. Pockets of good service exist alongside areas where systems experience frequent breakdowns due to mechanical failures, weak revenue collection and limited spare-parts availability. Seasonal variability also affects system performance: dry periods can reduce yields of shallow sources and stress groundwater-dependent mechanised systems, while heavy rains and flooding can damage infrastructure and increase contamination risks where protection measures are inadequate. Several systems, initially financed through projects or donor support, have been handed over to community management structures without sustained technical backstopping or financing arrangements, contributing to premature asset failure and prolonged downtime.

3.2 Current O&M arrangements

O&M in Ahafo is carried out through a mix of actors and arrangements, including national agencies, District Assemblies, community-based management structures (notably WSMTs), contracted private providers and informal local mechanics and spare-parts vendors. This arrangement reflects Ghana's post-construction support approach and recent policy directions towards professionalised service delivery. At the national level, CWSA provides guidance for rural and small-town services, including post-construction support, monitoring expectations and management arrangements. District Assemblies hold statutory oversight responsibilities, including coordination, support for service delivery and resource mobilisation. GWL generally manages urban piped supplies where applicable and contributes broader operational standards and technical guidance.

At community level, many systems, particularly rural facilities and smaller schemes remain under community-based management. WSMTs typically oversee day-to-day operations, tariff collection, minor repairs and basic facility security. While WSMTs can handle routine tasks, they often lack the technical capacity, spare parts, and financing needed for timely major repairs. To address these gaps, earlier support models have included training of mechanics, creation of maintenance centres and guidance on spare-parts arrangements, but consistency and sustainability vary across districts.

A growing trend in Ahafo is the gradual introduction of professionalised O&M arrangements, supported through projects and partner programmes. Under these models, private or NGO service providers operate systems under service agreements, with responsibilities for preventive maintenance, revenue collection, reporting and customer care,

supported by performance monitoring. Although promising, these models remain limited in scale and depend on realistic tariffs, effective contract management and local institutional capacity for oversight.

3.3 Key challenges and gaps

O&M challenges in Ahafo are multi-dimensional, leading to frequent breakdowns, prolonged downtime and inequitable access, particularly in smaller and remote communities. Key challenges include:

- **Technical and logistical constraints:** Limited preventive maintenance practices, weak diagnostic capacity at local level, and delayed repairs due to poor access to spare parts and specialised support.
- **Financing constraints:** Insufficient and unpredictable O&M revenues, low tariff, low collection efficiency, low capacity to fund major repairs and reliance on external support that reinforces reactive repair cultures.
- **Weak monitoring and information systems:** Incomplete or inconsistent asset registers, downtime records and performance reporting, reducing the ability to identify and prioritise interventions and plan maintenance effectively.
- **Governance and transparency challenges:** Variable capacity of WSMTs, weak accountability and limited transparency in revenue management, often affecting trust and willingness to pay.
- **Environmental and climate-related pressures:** Seasonal droughts, flooding and source vulnerability increase operational risks and maintenance demands, especially for poorly protected systems.
- **Inadequate integration with environmental sanitation risks:** Poor sanitation practices and uncontrolled waste or sludge disposal near catchments increase contamination risks, adding water quality burdens that exceed local O&M capacity.

Summary: Key findings from the Ahafo O&M situation analysis

- Ahafo's water supply systems range from medium-scale piped schemes to small-town networks and rural point sources, with uneven functionality across districts.
- O&M remains largely community-based, with emerging professionalised service arrangements in selected areas.
- Core constraints include weak preventive maintenance, limited spare parts access, inadequate and unpredictable revenue to cover O&M expenses, and inconsistent performance monitoring.
- Governance and transparency gaps reduce trust and weaken tariff compliance, affecting cost recovery and repair readiness.
- Climate variability increases operational risks through drought-related source stress and flood-related damage and contamination.
- Good practices show that preventive maintenance, professional support, ring-fenced funds, strong post-construction support, and local capacity development significantly improve outcomes.

Chapter 4: The Framework

4.1 Guiding principles for O&M

The following guiding principles underpin the entire Framework. They must be used to interpret, apply and enforce all subsequent chapters.

- **Service Sustainability over Infrastructure Delivery:** The primary objective of O&M is the continuous provision of reliable and safe water services, not merely the construction or rehabilitation of infrastructure. Decisions at all levels must prioritise long-term functionality and service continuity over short-term project completion.
- **Preventive Maintenance First: Risk-based** preventive maintenance is mandatory and takes precedence over corrective maintenance. Systems must be inspected, serviced and maintained according to defined schedules to prevent avoidable failures and reduce life-cycle costs.
- **Cost Recovery with Affordability Safeguards:** Water services must generate sufficient revenue to cover routine operation and maintenance costs, as well as contribute to capital maintenance and replacement. At the same time, tariff-setting processes must incorporate affordability considerations and transparent engagement with users, particularly vulnerable households, to address the needs of all customers.
- **Professionalism and Accountability:** Regardless of ownership or management model, water services must be operated as a professional utility function. Clear responsibilities, documented procedures, performance monitoring, and consequences for non-performance are essential to effective operations and maintenance (O&M).
- **Transparency and Community Trust:** Trust between service providers and users is crucial to the sustainability of services. Transparent communication, accessible grievance redress mechanisms, and clear financial and operational reporting are integral components of O&M, not optional add-ons.
- **Regulatory Compliance and Public Health Protection:** Compliance with water quality standards, public health regulations, and environmental safeguards is non-negotiable. O&M systems must prioritise the protection of consumers from waterborne health risks.
- **Climate Resilience and Risk-Informed Planning:** Water supply systems must be operated and maintained with an understanding of climate variability, energy risks, and environmental stressors. O&M planning must anticipate droughts, floods, power disruptions, and source degradation.
- **Participation with Clear Roles and Limits:** Community participation strengthens O&M only when roles, authority, and limits are clearly defined. Participation must complement, not substitute for, technical competence, financial discipline, and professional management.

4.1.1 Structure of the O&M Framework

This Framework is organised into thematic chapters covering governance, service delivery models, standard operating procedures, preventive maintenance, financial management, human resources, water quality management, supply chains, customer relations, risk management, monitoring and implementation.

Each chapter:

- Translates the guiding principles into operational requirements;
- Defines minimum standards applicable across management models; and
- Provides practical guidance to support consistent implementation.

Annexes provide model-specific tools, templates and checklists to support day-to-day use.

4.2 Institutional roles and responsibilities

4.2.1 Core governance principles for O&M

The following principles shall guide governance arrangements for O&M:

1. **Clarity of roles:** Each function: asset ownership, service provision, oversight and regulation must be clearly defined and non-duplicative.
2. **Separation of functions:** Oversight bodies shall not directly perform routine operations and maintenance (O&M), and service providers shall not be allowed to self-regulate.
3. **Accountability with consequences:** Performance expectations must be linked to incentives, support and sanctions.
4. **Professional neutrality:** O&M decisions shall be insulated from partisan political interference.
5. **Subsidiarity with support:** Responsibilities should be exercised at the lowest appropriate level, with adequate technical and institutional backing.
6. **Ownership-differentiated arrangement:** Governance, reporting, and asset-planning responsibilities shall reflect the ownership, investment responsibility, and operational risk borne by the entity managing the system.

Operations and maintenance decisions shall be guided by the principles of technical integrity, transparency, accountability and service continuity. O&M functions shall be protected from undue political, partisan, or irregular external influence that may compromise system performance, financial discipline, regulatory compliance or equitable service delivery. All institutions and actors involved in water service delivery shall support implementation of the O&M Framework in a manner consistent with approved procedures, contracts, byelaws and reporting obligations.

4.2.2 Governance architecture for small-town and rural water supply

To ensure effective O&M, the following functions shall be institutionally defined:

- **Asset ownership:** Legal custodianship of water infrastructure and associated assets.
- **Service provision:** Day-to-day operation, maintenance, customer service and revenue management.
- **Oversight and monitoring:** Performance monitoring, contract supervision and compliance checks.
- **Regulation and public health oversight:** Enforcement of water quality, safety and service standards.

Where one institution performs multiple roles, safeguards must be in place to prevent conflicts of interest and ensure independent oversight and/or accountability.

4.2.3 Roles and responsibilities of key actors

Service providers

The service provider, regardless of management model, shall be responsible for the day-to-day operation and maintenance of the water supply system in accordance with the provisions of this O&M Framework, approved operating procedures, and any applicable contractual or regulatory requirements. In this role, the service provider shall ensure that water services are delivered safely, reliably, efficiently and in a manner consistent with agreed service standards.

Specifically, the service provider shall:

- Ensure the continuous and safe operation of the water supply system in accordance with approved standard operating procedures (SOPs);
- Implement risk-based preventive and corrective maintenance of system assets and components;
- Undertake billing, revenue collection, and financial management in accordance with approved tariffs and established financial procedures;
- Carry out water quality monitoring and ensure compliance with applicable regulatory and public health standards;
- Provide customer service, communication, and grievance handling in accordance with approved service protocols; and
- Prepare and maintain accurate operational, technical, and financial records, and submit routine reports, including financial reports, as

required under this Framework.

Within the evolving rural water service delivery environment, service providers are increasingly undertaking a range of roles, including construction and operation of water infrastructure.

All service providers, including contracted operators, WSMTs, and other approved management entities, can use this framework as a guide, as appropriate to their service model and system type. This framework provides technical reference to service providers on O&M procedures, maintenance schedules, reporting requirements, water quality obligations, and customer service protocols. This framework provides guidance on how service providers can strive to meet performance standards, service obligations and reporting requirements, particularly in relation to the District Assemblies, which have overall responsibility for water service delivery to citizens.

District Assemblies

District Assemblies, as the local service authority under Ghana's decentralised framework, shall serve as the primary institutional custodians of implementation of this O&M Framework within their respective jurisdictions. In this role, the DAs shall use the Framework as a guide for coordinating the activities of service providers and management entities, ensuring that their operations are aligned with district planning, budgeting, monitoring, and local governance systems.

Specifically, District Assemblies shall:

- Ensure that every water supply system operates under a legally recognised management arrangement;
- Provide technical oversight and supervisory functions over all water service providers within their jurisdiction, either directly or through delegated institutions;
- Approve and periodically review tariffs in accordance with established procedures;
- Monitor service performance against regulatory standards, agreed KPIs, and other requirements of this Framework;
- Review routine and quarterly operational and financial reports submitted by service providers;
- Facilitate coordination among service providers,

traditional authorities, regulatory agencies, and other relevant stakeholders;

- Support capacity development and, where justified, co-finance major rehabilitation works;
- Ensure that all water systems prepare and maintain Water Safety Plans and Asset Management Plans;
- Enforce applicable byelaws, corrective actions, and other compliance measures where service providers fail to meet minimum standards;
- Ensure that all stakeholders, including service providers, regulators, and users, play their respective roles in sustaining water service delivery.

District Assemblies shall also take steps to incorporate the requirements of this Framework into district-level service agreements, monitoring systems, planning and budgeting processes, and other relevant local governance instruments. However, District Assemblies shall not routinely substitute for service providers in financing or carrying out O&M, except under clearly defined emergency or transitional arrangements

National and Regional-Level Institutions

National and regional institutions shall provide the policy, technical, coordination, and system-strengthening support required for effective implementation of this O&M Framework. Their role shall be to create an enabling environment for sustainable service delivery by supporting District Assemblies and service providers with standards, capacity development, technical backstopping, performance analysis, and sector learning.

Specifically, national and regional institutions shall:

- Provide policy direction, regulatory guidance, and technical standards for O&M;
- Support the capacity development of service providers, District Assemblies, and other relevant actors;
- Provide technical backstopping for complex operational, managerial, and institutional challenges;
- Receive, consolidate, and analyse performance data across systems and districts;
- Facilitate learning, benchmarking, peer exchange, and sector-wide improvement; and
- Support periodic review and strengthening of the

Framework based on implementation experience and emerging sector needs.

These institutions shall avoid direct operational control of local water systems except where formally mandated by law, policy, or approved transitional arrangements.

Within this broader institutional arrangement, the Regional Coordinating Council (RCC), or any designated regional coordinating body, shall provide regional coordination, oversight, and harmonisation support for implementation of the O&M Framework across the Ahafo Region. In this role, the RCC shall support District Assemblies in applying the Framework consistently, promote regional learning and accountability, and facilitate periodic review and improvement of the Framework based on implementation experience.

Specifically, the RCC shall:

- Provide regional oversight and coordination for implementation of the O&M Framework across all Metropolitan, Municipal and District Assemblies (MMDAs) in the Region;
- Consolidate, review, and analyse district-level reports, including quarterly submissions from MMDAs;
- Monitor regional trends in service performance, compliance, operational risks, and implementation challenges;
- Coordinate regional learning, review meetings, and cross-district experience sharing;
- Facilitate harmonisation of implementation approaches, reporting practices, and performance review processes across districts;
- Coordinate the work of the Regional O&M Technical Working Group or any similar platform established to support implementation follow-up, problem-solving, and institutional learning;
- Support periodic revision and strengthening of the Framework based on lessons from implementation; and
- Refer critical policy, regulatory, or resource issues requiring national-level attention to the appropriate institutions.

The RCC shall not assume the routine operational responsibilities of service providers or the direct local oversight responsibilities of District Assemblies. Rather, its role shall be to provide the regional oversight,

convening, coordination, and learning support necessary to ensure effective and consistent implementation of the Framework across the Region.

Traditional authorities and community leadership

Traditional authorities and community structures shall play an important supporting role in promoting accountability, legitimacy, and community ownership in the implementation of this O&M Framework. In this role, they shall help strengthen public understanding of safe water service delivery, reinforce community cooperation, and support the protection and sustainability of water supply systems.

Specifically, traditional authorities and community structures shall:

- Advocate for the importance of safe, reliable, and sustainable water services;
- Support the social legitimacy and local acceptance of approved service delivery arrangements;
- Facilitate community engagement, dialogue, and conflict resolution where necessary;
- Promote protection of water supply assets, facilities, and water sources; and
- Reinforce compliance with agreed rules, responsibilities, and good practices relating to water service delivery.

Traditional authorities and community structures shall not interfere in technical operations, staffing decisions, tariff administration, or revenue management. However, they may exercise their moral and social authority to support accountability, encourage compliance, and promote continuity of service delivery

4.2.4 Accountability and performance management

Performance expectations

Every service provider shall operate under clearly defined performance expectations, including but not limited to:

- Service continuity and reliability
- Preventive maintenance compliance
- Financial management and revenue performance
- Water quality compliance
- Responsiveness to customer complaints

These expectations shall be documented through performance agreements, service contracts, or approved management plans.

Reporting and transparency

Service providers shall submit routine reports to the District Assemblies on a monthly and annual basis, covering:

- Operational performance
- Financial statements
- Water quality monitoring results
- Major incidents and corrective actions

Summarised performance information shall be made accessible to users in a clear and concise format. The reports shall be analysed and consolidated into district-level performance reporting, and ultimately fed into national-level reporting. Feedback aimed at improving service delivery shall be provided to the service providers.

Sanctions and corrective action

Where service providers fail to meet minimum standards, the oversight authority, such as the District Assembly, shall apply graduated corrective measures, which may include:

- Written warnings and corrective action plans
- Targeted technical or managerial support
- Financial or contractual penalties, where applicable
- Contract review, management transition, or termination of management arrangements

Sanctions shall be applied consistently and transparently.

4.2.5 Governance arrangements by management model

Community-managed systems (WSMTs)

For community-managed systems:

- WSMTs shall operate under formally approved constitutions or byelaws and management plans
- Clear limits of authority shall be defined, particularly regarding financial decisions and technical interventions
- External technical support by DAs shall be mandatory for systems exceeding defined complexity thresholds

- Volunteer staff shall be complemented by paid or professional support where system complexity demands it
- Persistent underperformance shall trigger a structured transition to a public utility or any other model described in this document

4.2.6 Public utility–managed systems

For public utility–managed systems:

- Governance shall be anchored in performance contracts between CWSA and DAs with defined targets
- Reporting lines between system operators, regional offices, and head offices shall be clear
- Emergency funds and capital maintenance provisions shall be formally managed
- Coordination with District Assemblies shall be documented

4.2.7 Private and social enterprise–operated systems

For privately or NGO-operated systems:

- Formal contracts or Memorandums of Understanding (MoUs) with the District Assembly shall govern management arrangements
- Service obligations, tariff policies, and reporting requirements shall be explicit
- Consumer protection and grievance redress mechanisms shall be mandatory
- Oversight authorities shall retain the right to audit performance and finances
- Profit or cost-recovery objectives shall not compromise water quality or service reliability

4.2.8 Managing political and social interference

Political and social influence shall not undermine operational decision-making. To safeguard O&M:

- The appointment of water system operators and managers, as well as operational decisions, shall be insulated from partisan political influence
- Tariff decisions shall be in line with tariff policy and shall follow documented procedures and be subject to stakeholder consultation



- Oversight responsibility by the DA shall be insulated from partisan influence
- Emergency or politically motivated interventions shall be time-bound and documented.

Traditional and political leaders shall support, rather than substitute for, formal governance arrangements.

Political and social interference shall be recognised as a governance risk affecting the sustainability of water services. Interference may arise in relation to operator appointments, tariff decisions, procurement, staffing, enforcement actions, water revenue use, shutdown and restoration decisions, or other matters that ought to be determined through established technical, financial, and governance processes. Such interference undermines accountability, weakens service discipline, and may contribute to operational inefficiency or financial distress.

All instances of significant interference affecting O&M performance shall be documented and reported through the appropriate institutional channels. MMDAs and the RCC shall review such cases and, where necessary, institute corrective measures to protect the integrity of service delivery arrangements. Political and traditional leadership should support implementation of the Framework by reinforcing transparency, compliance, and continuity of service, rather than overriding approved operational procedures.

4.2.9 Transition and failure management

Where existing governance or management arrangements are no longer adequate to ensure reliable, safe, and financially viable service delivery, formal transition processes shall be initiated. Transitions shall be planned, documented, and led by the service authority, rather than triggered by system collapse. A review or transition of the management model shall be initiated when one or more of the following conditions persist despite corrective support:

- Recurrent system downtime beyond acceptable thresholds
- Chronic financial deficits or failure to recover routine O&M costs
- Repeated non-compliance with water quality standards
- Breakdown of accountability structures, including inactive or ineffective management bodies

These criteria shall be assessed using performance evidence and monitoring reports, not ad hoc judgments.

During any transition:

- All physical assets shall be inventoried, inspected, and secured
- Operational, financial, and maintenance records shall be formally handed over
- Bank accounts, cash balances, and outstanding liabilities shall be reconciled and safeguarded

- No transition shall proceed without documented verification of asset and financial status

Continuity of service during transition:

Service continuity shall be treated as a non-negotiable priority during transition periods. Interim arrangements, such as temporary technical support, or short-term management contracts, shall be put in place to:

- Prevent prolonged service interruptions
- Maintain minimum water quality and safety standards
- Preserve user confidence during institutional change

The District Assembly shall act as the lead coordinating authority during transition processes by:

- Formally initiating and overseeing the transition
- Convening relevant stakeholders, including outgoing and incoming managers
- Approving interim arrangements and timelines
- Ensuring protection of public assets and financial resources
- Monitoring service continuity and compliance throughout the transition period

District Assemblies shall ensure that transitions are proactive, transparent, and time-bound, with clear accountability at each stage.

4.3 Service delivery models and management options

This section establishes a structured framework for recognising, assessing, and applying service delivery and management models for water supply systems. It clarifies the conditions under which each model is viable, the minimum requirements for effective operation, and the criteria for transitioning between models when performance deteriorates or system complexity increases.

The objective is not to prescribe a single preferred model, but to ensure that management arrangements are fit for purpose, professionally accountable, and aligned with service sustainability objectives.

4.3.1 Overview of recognised service delivery models in Ghana

For this Framework, three broad service delivery and

management models are recognised:

1. **Community-managed systems**, typically overseen by Water and Sanitation Management Teams (WSMTs);
2. **Public utility–managed systems**, operated by public or quasi-public utilities with professional staff; and
3. **Private, NGO, or social enterprise–operated systems**, operating under contractual or partnership arrangements.

Each model presents distinct strengths, risks, and operational implications. The suitability of a model depends on factors such as system size, technical complexity, revenue potential, local capacity, and oversight arrangements.

Minimum service standards

- Each person served shall have access to at least 20 litres of safe water per day
- No user should travel more than 500 metres to a water point
- Water supply systems shall function at least 95% of the time (cumulative service disruption: not more than 18 days per year)*
- Each point source (e.g., borehole or standpipe) should ideally serve no more than ~300 persons.
- Supplied water must consistently meet national drinking water quality standards (microbiological, chemical, and heavy metals).

* The uptime of the water system shall be determined through the annual service monitoring undertaken by the District Assembly under the guidance of the Regional Coordinating Council. Service providers shall submit records of the cumulative number of days of service downtime during the assessment period, which shall be used by the District Assembly to calculate and verify the system's annual uptime.

4.3.2 Community-managed systems (WSMT model)

Community-managed water supply systems are typically operated by Water and Sanitation Management Teams (WSMTs) or similar community-based structures. Management and oversight functions under this model are usually carried out on a voluntary or semi-voluntary basis, meaning that WSMT members are not formally employed and do not receive regular salaries. In fully voluntary arrangements, members perform their roles without guaranteed financial compensation, often alongside other livelihood activities. In semi-voluntary arrangements, certain operational roles—such as system operators or revenue collectors—may receive modest allowances or irregular payments from water revenues, but these positions are rarely governed by formal contracts or professional employment terms. This management model is most commonly applied in smaller settlements with limited infrastructure complexity and modest water demand, where revenues are insufficient to support full professional staffing and where community oversight remains feasible.

Strengths of the community-managed model

- Strong local presence and familiarity with community dynamics;
- Potential for rapid response to minor issues when leadership is committed;
- Lower immediate staffing costs;
- Alignment with participatory development principles.

Structural limitations and risks

Evidence consistently shows that community-managed systems face inherent challenges, including:

- Dependence on unpaid or underpaid volunteers, leading to fatigue and turnover;
- Limited technical and financial management capacity;
- Weak enforcement of rules and tariffs due to social pressure;
- High vulnerability to political interference; and
- Difficulty sustaining preventive maintenance and record-keeping.

These limitations are **structural**, not individual, and must be acknowledged explicitly in O&M planning.

Minimum conditions for viability

Community-managed systems shall only be considered viable where all the following conditions are met:

- System size and complexity remain within clearly defined thresholds;
- Tariffs are formally approved and regularly reviewed at least annually;
- External technical backstopping arrangements are in place;
- Preventive maintenance schedules are in place, implemented and documented;
- Clear and active oversight by the District Assembly is in place.

Where these conditions cannot be met, continued reliance on community management is not recommended.

4.3.3 Public utility–managed systems

The CWSA utility–managed systems are operated by professional staff with structured performance management frameworks in place. These systems typically serve larger populations or more technically complex infrastructure.

Strengths of the public utility model

- Professional staffing and technical depth;
- Greater capacity for preventive maintenance and asset management;
- More robust financial systems and revenue controls;
- Formal performance monitoring and reporting mechanisms.

Challenges and constraints

- Bureaucratic delays in procurement and decision-making;
- Limited flexibility in tariff adjustments;
- Potential for centralised decision-making that is distant from users; and
- Exposure to political pressures affecting operational autonomy.

Minimum requirements for effective utility management

Public utility–managed systems shall operate under:



- Clearly defined performance contracts;
- Documented SOPs and preventive maintenance plans;
- Transparent financial reporting and auditing at all levels;
- Defined emergency response and escalation procedures; and
- Structured engagement with District Assemblies and communities.

4.3.4 Private, NGO, and social enterprise–operated systems

Private and non-state operators manage water systems under formal contractual or partnership arrangements with DAs or the Community. Often, they incorporate innovations such as digital payments, prepaid meters, solar energy, and remote monitoring.

Strengths of the private and social enterprise model

- Strong incentives for efficiency and revenue optimisation;
- Ability to professionalise operations and staffing;
- Flexibility in adopting technology and management innovations;
- Improved responsiveness to service disruptions.

Risks and safeguards

Key risks include:

- Prioritisation of cost recovery over service equity;
- Limited transparency if contracts are weak; and
- Dependence on proprietary technologies or

suppliers.

These risks shall be mitigated through clear contractual obligations, regulatory oversight, and consumer protection measures.

Minimum contractual and operational requirements

Private and NGO-operated systems shall be governed by formal agreements that specify:

- Service standards and performance indicators;
- Tariff-setting and revision procedures;
- Reporting and audit requirements;
- Grievance redress and customer protection mechanisms; and
- Conditions for contract renewal or termination.

4.3.5 Hybrid and transitional management models

In many contexts, neither complete community management nor complete professional management is immediately feasible. Hybrid models combine elements of community oversight with professional, technical or financial management.

Common hybrid arrangements

Examples include:

- Community ownership with outsourced technical operations;
- Circuit rider or area-based technician support;
- Performance-based contracts with private operators under public oversight.

Conditions for success

Hybrid models require:

- Clear division of roles and authority;
- Formal agreements defining responsibilities;
- Strong oversight and monitoring; and
- Clear pathways for transition in case of performance decline.

4.3.6 Institutionally managed systems

Institutionally managed water supply systems, including those serving schools, health care facilities, and other public institutions, shall have clearly defined

arrangements for ownership, operation, maintenance, financing, and oversight. The institution responsible shall designate a focal person or management team to coordinate routine operation and maintenance, monitor water quality and service performance, maintain operational records, and ensure timely reporting and corrective action.

District-level education, health, environmental health, and works authorities shall provide appropriate coordination, technical oversight, monitoring, and support in accordance with their respective mandates. School and health facility management structures shall support routine maintenance, budgeting, and the provision of essential O&M inputs, while community structures, where applicable, shall support the protection and accountability of institutional water facilities.

Institutional water systems shall be operated and maintained in accordance with approved O&M procedures and applicable standards. Routine activities shall include inspection and prompt repair of water supply infrastructure and leakages; maintenance of drainage, taps, and water points; regular cleaning and disinfection of storage tanks and handwashing facilities; monitoring of water quality and water use; and maintenance of the surrounding environment.

Responsibilities for routine O&M, utility costs, consumables, minor repairs, major repairs, rehabilitation, and asset replacement shall be clearly defined among the institution, asset owner, service provider, District Assembly, and other relevant stakeholders. Where the institution lacks the technical capacity to undertake required O&M activities, appropriately qualified service providers shall be engaged.

These responsibilities shall be documented at the time of commissioning or handover and reviewed periodically to ensure continuity of O&M, particularly where there are changes in institutional management or staffing.

4.3.7 Criteria for selecting or transitioning between management models

A formal review of the management model shall be initiated where one or more of the following occur:

- Persistent system downtime or declining service reliability;

- Chronic financial deficits or low revenue collection efficiency;
- Repeated water quality non-compliance;
- Breakdown of governance or accountability structures; or
- Significant system expansion or technological upgrading.

4.3.8 Transition principles

Transitions between management models shall:

- Prioritise service continuity and asset protection;
- Be guided by documented performance evidence;
- Include stakeholder consultation and clear communication; and
- Be formally approved by the relevant service authority.

4.4 Standard operating procedures for routine operation

4.4.1 Scope of standard operating procedures (SOPs)

The SOPs in this section apply to all routine technical and commercial operational activities, including:

- Water abstraction, treatment, storage and distribution;
- Meter reading and production monitoring;
- Customer interface and service continuity management;
- Billing, revenue collection, and basic financial controls;
- Operational and commercial record-keeping.

Compliance with these procedures is mandatory for all service providers, regardless of management model.

4.4.2 Roles and responsibilities for daily operations

Operators (technical operations)

Operators are responsible for the **technical functioning** of the water system. Their duties include:

- Operating abstraction, pumping, and treatment facilities;
- Conducting routine inspections and minor preventive actions;

- Recording technical operational data accurately and on time;
- Reporting faults, leakages, or abnormal conditions immediately.

Operators shall not collect revenue unless formally designated and trained to do so.

Accounts/commercial team

The accounts (or commercial) team is responsible for **revenue assurance and customer billing functions**, which are integral to daily operations. Their responsibilities include:

- Reading customer meters (where applicable) and verifying meter functionality;
- Preparing and issuing bills to household, commercial, and institutional customers;
- Collecting payments through approved mechanisms (cash, mobile money, prepaid systems);
- Issuing receipts and maintaining daily cash or digital transaction records;
- Reconciling billed amounts with collected revenue on a daily or weekly basis;
- Depositing collected revenue into designated bank accounts in accordance with financial controls; and
- Reporting arrears, defaults, and anomalies to system management.

The Accounts Team shall not interfere with technical operations but shall work closely with operators to ensure consistency between **water produced, water sold and revenue collected**.

System managers or supervisors

System managers or supervisors shall:

- Coordinate the activities of operators and accounts staff;
- Ensure compliance with both technical and revenue-related SOPs;
- Review operational and financial records regularly;
- Authorise corrective actions and escalation where required; and
- Liaise with oversight authorities and technical support providers.

Oversight authorities

District Assemblies and other oversight authorities shall verify compliance with SOPs through:

- Periodic inspections and audits of technical and financial records;
- Spot checks on billing, collection, and deposit practices; and
- Follow-up on reported incidents, deviations, or revenue shortfalls.

4.4.3 Daily operational procedures – technical functions

Water abstraction and production

Operators shall, on each operational day:

- Verify the condition of abstraction sources (borehole, intake, well);
- Check pump operation, power supply, and control systems;
- Record pump runtime, production volume, and energy use (where applicable);
- Observe for unusual noises, vibrations, leaks, or overheating.

Any abnormal observation shall be reported immediately.

Water treatment and disinfection

Operators shall:

- Prepare and apply disinfectants according to approved dosing instructions;
- Confirm availability of treatment chemicals;
- Check dosing equipment for proper functioning;
- Record treatment activities and quantities used.

Disinfection shall not be suspended without authorisation, except during documented emergencies.

Storage and distribution

Operators shall:

- Inspect storage tanks daily for leaks, overflows, or contamination risks;
- Check pipelines, valves, and standpipes for damage or illegal connections;
- Ensure service availability during designated supply hours.

4.4.4 Daily and routine operational procedures – revenue and customer management

Meter reading and sales monitoring

The Accounts Team shall:

- Read customer meters according to the approved billing cycle;
- Record standpipe sales (pay-as-you-fetch) daily where applicable;
- Cross-check bulk production figures with sales data to identify discrepancies.

Billing and revenue collection

The Accounts Team shall:

- Prepare and issue bills promptly and accurately;
- Collect payments using approved methods only;
- Issue receipts for all payments;
- Maintain a daily revenue collection log.

No water shall be supplied on credit unless explicitly authorised under documented arrangements.

Revenue reconciliation

On a daily or weekly basis (depending on system size), the Accounts Team shall:

- Reconcile billed amounts with collected revenue;
- Identify arrears, underpayments, or leakages;
- Submit reconciliation summaries to the system manager.

4.4.5 Weekly operational procedures

Weekly activities shall include:

- Joint review by operators and accounts staff of production, sales, and revenue data;
- Verification of chemical stock, spare parts, and consumables;
- Review of customer complaints and payment disputes;
- Submission of weekly summaries to system management.

4.4.6 Monthly operational procedures

Monthly procedures shall include:

- Comparison of total water produced versus total

water billed and collected;

- Identification of non-revenue water trends;
- Review of outstanding arrears and enforcement actions;
- Submission of consolidated technical and financial reports to oversight authorities.

4.4.7 Operational record-keeping requirements

Mandatory records

Each system shall maintain, at a minimum:

- Daily production and operation log;
- Treatment and disinfection register;
- Breakdown and incident register;
- Meter reading and billing register;
- Revenue collection and deposit records;
- Customer complaint and arrears register.

Data integrity and controls

- Records shall be accurate, timely, and verifiable;
- Cash handling shall follow approved internal controls;
- Falsification or concealment of records constitutes serious non-compliance.

4.4.8 Deviation management and escalation

Where SOPs cannot be followed due to technical, financial, or security constraints:

- The deviation shall be recorded;
- The system manager shall be informed immediately;



- Temporary mitigation measures shall be applied where possible; and
- Unresolved issues shall be referred according to approved protocols.

4.4.9 Health, safety, and environmental considerations

Operators shall comply with basic occupational health and safety requirements, including:

- Use of protective equipment where required;
- Safe handling and storage of chemicals;
- Safe operation of electrical and mechanical equipment.

Environmental risks, including source contamination or chemical spills, shall be reported immediately.

4.4.10 Compliance and enforcement

Compliance with SOPs shall be verified by DAs through:

- Routine supervision;
- Periodic audits by oversight authorities; and
- Performance reviews.

Persistent non-compliance shall trigger corrective measures, including retraining, restructuring of responsibilities, or management transition.

4.5 Asset management

4.5.1 Asset management principles

The following principles shall guide asset management under this Framework:

1. **Life-cycle thinking:** All assets deteriorate and must be managed from installation to retirement.
2. **Prevention before failure:** Planned maintenance shall take precedence over breakdown repair.
3. **Risk-based prioritisation:** Critical assets shall receive priority attention.
4. **Documentation and traceability:** All assets and interventions shall be recorded.
5. **Financial linkage:** Asset management decisions

shall inform tariffs, budgets, and reserves.

6. All systems should have an asset management plan.

Asset management shall include consideration of the operating efficiency of energy-consuming assets such as pumps, motors, control systems, generators, and related power infrastructure. Preventive maintenance shall therefore include checks on energy performance, operating condition, and efficiency of major components. Where equipment inefficiency results in persistently high electricity or fuel costs, this shall be reflected in maintenance planning, rehabilitation priorities, and capital replacement decisions. Where infrastructure has been financed by NGOs, social enterprises, or private investors, life-cycle asset management decisions shall take account of the investment risks and responsibilities of the asset owner. The asset owner and relevant stakeholders shall agree on an Asset Management Plan that clearly defines ownership, responsibilities for maintenance and rehabilitation, asset replacement arrangements, and other investment decisions relating to the infrastructure.

4.5.2 Asset inventory and asset register

Mandatory asset register

Every water supply system shall maintain an up-to-date **asset register**, covering all critical components, including:

- Water sources (boreholes, intakes);
- Pumps, motors, and control units;
- Power systems (solar arrays, inverters, generators, grid connections);
- Treatment units and chemical dosing systems;
- Storage tanks and towers;
- Distribution networks (pipes, valves, meters);
- Standpipes and household connection infrastructure.

Minimum asset register information

For each asset, the register shall record at minimum:

- Asset name and unique identifier;
- Location;
- Installation date and expected service life;
- Technical specifications;
- Current condition rating (good/fair/poor);

- Maintenance history;
- Estimated replacement cost.

Asset registers shall be reviewed and updated at least annually.

4.5.3 Preventive maintenance planning

Preventive maintenance schedule

Each system shall have a documented preventive maintenance schedule, specifying:

- Maintenance tasks;
- Frequency (daily, weekly, monthly, quarterly, annually);
- Responsible personnel; and
- Required tools and materials.

Schedules shall be system-specific but shall meet or exceed the minimum frequencies prescribed in this Framework.

Minimum preventive maintenance frequencies

At minimum, the following frequencies shall apply:

- **Pumps and motors:** inspection weekly; servicing quarterly; major service annually.
- **Solar systems:** visual inspection weekly; electrical checks quarterly; performance review annually.
- **Treatment systems:** daily operational checks; monthly cleaning; annual calibration.
- **Storage tanks:** visual inspection monthly; cleaning and disinfection at least twice per year.
- **Distribution networks:** walk-through inspection monthly; pressure testing annually.
- **Meters and valves:** functionality check monthly; calibration annually.

Failure to adhere to these minimum frequencies constitutes non-compliance.

4.5.4 Condition assessment and risk classification

Asset condition assessment

Supervisors shall conduct formal asset condition assessments at least once per year to:

- Identify deterioration trends;
- Estimate remaining useful life; and

- Prioritise maintenance or replacement actions.

Critical asset identification

Assets shall be classified according to their impact on service continuity and public health:

- **Critical assets:** failure causes immediate service outage or health risk;
- **Important assets:** failure reduces service quality or efficiency;
- **Non-critical assets:** failure has limited immediate impact.

Critical assets shall receive priority in maintenance planning and spare parts stocking.

4.5.5 Corrective maintenance and escalation

Classification of faults

Faults shall be classified as:

- **Minor faults:** can be resolved by on-site operators without service interruption;
- **Major faults:** require specialised skills or cause partial/full service interruption;
- **Critical failures:** pose safety or public health risks.

Escalation procedures

- Minor faults shall be addressed immediately by operators;
- Major faults shall be reported to supervisors within 24 hours;
- Critical failures shall trigger immediate shutdown and notification of oversight authorities.

Escalation pathways shall be clearly displayed at each system site.

4.5.6 Capital maintenance and replacement planning

Distinction between routine and capital maintenance

- **Routine maintenance:** regular servicing and minor repairs covered by operating budgets.
- **Capital maintenance:** major rehabilitation or replacement of assets nearing end of life.

Failure to plan for capital maintenance leads to system collapse.

Capital maintenance plans

Each system shall prepare a capital maintenance plan (CMP) that:

- Identifies assets approaching end of service life;
- Estimates replacement or rehabilitation costs;
- Prioritises investments based on risk and service impact; and
- Links capital needs to financial planning and tariffs.

4.5.7 Financing preventive and capital maintenance

Maintenance financing requirements

Tariffs and financial systems shall:

- Cover full routine preventive maintenance costs; and
- Contribute to a capital maintenance reserve where feasible.

External support and co-financing

Where capital maintenance exceeds system capacity:

- District Assemblies or development partners may co-finance interventions;
- Support shall be conditional on evidence of proper routine maintenance and record-keeping.

4.5.8 Monitoring compliance and performance

Compliance with preventive maintenance requirements shall be assessed through:

- Review of asset registers and maintenance logs;
- Physical inspection of assets;
- Tracking of downtime and failure frequency; and
- Verification of maintenance schedules.

Persistent non-compliance shall trigger corrective action as outlined earlier.

4.6 Financial management, tariff setting and revenue systems

4.6.1 Principles of financial anagement for O&M

The following principles shall guide financial management under this Framework:

- Full recovery of routine O&M costs as a minimum condition for sustainability;
- Transparency and traceability of all revenues and expenditures;
- Ring-fencing of water revenues for water service purposes only;
- Affordability with explicit safeguards, not implicit underpricing; and
- Professional financial discipline, regardless of



Photo credit: Riva Ghana

management model.

4.6.2 Cost structure of small-town and rural water systems

Operating costs

Operating costs typically include:

- Energy (electricity, fuel, solar system servicing);
- Treatment chemicals and consumables;
- Routine labour and supervision;
- Minor repairs and maintenance materials; and
- Administrative expenses directly related to service delivery.

These costs shall be identified, quantified, and reviewed annually.

Electricity and power costs shall be recognised as a major and potentially volatile component of O&M expenditure, particularly for mechanised boreholes, solar-assisted systems with backup power, and piped schemes. Annual and periodic O&M budgeting shall explicitly identify electricity and power-related costs as a distinct cost category, and service providers shall monitor trends in power consumption and expenditure as part of routine financial management.

Maintenance and capital maintenance costs

Maintenance costs include:

- Preventive maintenance activities;
- Corrective maintenance and repairs;
- Spare parts replacement.

Capital maintenance costs include:

- Major component replacement (pumps, motors, control units);
- Rehabilitation of storage and distribution infrastructure.

Failure to account for capital maintenance leads to predictable system collapse.

4.6.3 Tariff setting and review

Principles of tariff setting

Tariffs shall be designed to:

- Recover full routine O&M costs;

- Contribute to capital maintenance reserves where feasible;
- Incentivise efficient water use; and
- Maintain affordability for low-income users.

Cost-based tariff determination

Tariff setting shall be based on:

- Annual operating, preventive and maintenance costs;
- Asset replacement costs;
- Financing costs;
- Forecasted water production and sales;
- Allowance for non-revenue water;
- Provision for contingency and reserves;
- Future system expansion costs.

For professionally managed systems—including private, NGO, and social enterprise-operated systems where the service provider is responsible for financing capital maintenance, asset replacement, or service expansion—tariff determination shall be based on transparent cost-recovery principles that reflect the full life-cycle cost of service delivery. This shall include operating expenditure, preventive maintenance, capital maintenance, asset replacement, financing costs, operational reserves, and provision for future system expansion, in addition to the routine O&M costs identified elsewhere in this Framework.

Tariff approval and revision

All tariffs shall:

- Be formally approved by the relevant service authority;
- Be communicated clearly to users;
- Be reviewed at least every two to three years, or when costs change materially.

Consultation shall focus on **explaining costs and service commitments**, not negotiating away financial viability.

Tariff setting and periodic tariff review shall take into account the actual cost of routine O&M, including labour, consumables, water quality monitoring, spare parts, and energy or electricity costs. Where electricity tariffs or power-related operating costs increase significantly, tariff reviews shall assess the implications for service sustainability, while also considering affordability safeguards and the need to protect access for vulnerable

users. Tariff adjustments should be accompanied by efforts to improve operational efficiency and reduce avoidable costs.

Affordability safeguards

Affordability shall be addressed through:

- Lifeline tariffs or cross-subsidies where feasible;
- Transparent subsidy mechanisms;
- Targeted support for vulnerable households.

Underpricing that undermines service sustainability is not an acceptable affordability strategy.

The Framework adopts a blended financing approach in which routine O&M should, as far as practicable, be financed through tariffs and improved revenue management, while capital maintenance, emergency repairs, and selected equity gaps may require targeted public or partner support. Such support shall be transparent, rules-based, and designed to strengthen service sustainability without undermining accountability, financial discipline, or willingness to pay.

4.6.4 Billing and revenue collection systems

Billing arrangements

Billing systems shall:

- Be simple, understandable, and auditable;
- Apply consistently across all users;
- Reflect actual water usage where metering is in place.

Collection mechanisms

Acceptable collection mechanisms include:

- Cash-based systems with strict controls;
- Mobile money and digital payments;
- Prepaid or pay-as-you-fetch systems.

Collection systems shall minimise handling risks and revenue leakage.

Collection efficiency standards

Service providers shall:

- Monitor collection efficiency regularly;
- Investigate persistent shortfalls;
- Apply corrective measures promptly.

Chronic low collection efficiency shall trigger management review.

4.6.5 Non-revenue water (NRW) management

Sources of NRW

NRW may arise from:

- Physical losses (leaks, overflows);
- Commercial losses (illegal connections, billing errors);
- Unbilled authorised consumption.

NRW control measures

Minimum NRW management actions include:

- Routine leak detection and repair;
- Meter inspection and calibration;
- Enforcement against illegal connections;
- Reconciliation of production and sales data.

4.6.6 Financial controls and internal accountability

Revenue safeguards

All water revenues shall:

- Be deposited into designated accounts;
- Be recorded accurately and promptly;
- Be protected from diversion.

Cash handling procedures shall be documented and enforced.

Budgeting and financial reporting

Service providers shall:

- Prepare annual budgets linked to O&M plans;
- Produce regular financial statements;
- Submit reports to oversight authorities as required.

Auditing and oversight

Periodic internal and external audits shall be conducted by the service authority (DA):

- Verify financial integrity;
- Identify control weaknesses;
- Reinforce accountability.

4.6.7 Affordability and pro-poor measures

Affordability considerations

Affordability shall be addressed through:

- Transparent tariff setting processes;
- Targeted support mechanisms, where justified; and
- Service level differentiation (e.g., standpipes vs household connection) and targeted affordability measures (e.g., lifeline volumes, community-supported access) rather than uniformly low tariff for all users.

Revolving funds and risk-sharing mechanisms

Where appropriate, mechanisms such as:

- Revolving maintenance funds;
- Insurance schemes; or
- Performance-based financing may be used to manage financial risks, subject to clear governance controls.

4.6.8 Financial management by service delivery model

Community-managed systems

- Simple, standardised accounting formats shall be used;
- Separation of financial duties shall be enforced;
- External support may be required for audits and tariff reviews.

Public utility–managed systems

- Corporate financial systems and controls shall apply;
- Cross-subsidisation shall be transparent and documented.

Private and social enterprise systems

- Financial obligations shall be defined contractually;
- Profit or cost-recovery objectives shall not undermine service standards;
- Transparent reporting to oversight authorities shall be mandatory.

4.6.9 Compliance, monitoring, and enforcement

Compliance with this chapter shall be assessed through:

- Review of financial records and reports;
- Monitoring of collection efficiency and NRW indicators; and
- Audit findings.

Persistent financial mismanagement shall trigger corrective actions outlined

4.6.10 Commercial Sustainability

Sustainable rural water services depend not only on technical maintenance but also on strong commercial performance. Service providers shall give explicit attention to customer acquisition and retention, expansion of household connections, demand creation, revenue optimisation, efficient billing and collection practices, energy efficiency, and proactive customer service, as core components of financial sustainability alongside the cost-recovery and tariff provisions.

4.7 Human resources, skills and professional capacity

4.7.1 Human resource management principles

Human resource management under this Framework shall be guided by the following principles:

- **Professionalisation of service delivery:** Water supply O&M is a technical service, not a voluntary activity.
- **Fitness for purpose:** Staffing levels and skills shall match system complexity and risk profile.
- **Clear roles and accountability:** Job responsibilities shall be clearly defined and enforceable.
- **Continuous capacity development:** Training shall be ongoing, practical, and needs-based.
- **Retention and motivation:** Incentives, recognition, and fair remuneration support performance and continuity.

4.7.2 Staffing structure and minimum requirements

Core roles in water supply O&M

All systems shall ensure coverage of the following core functions, whether through direct employment, contracting, or shared arrangements:

- **System Operator:** Responsible for daily operation and basic maintenance.
- **Technical Supervisor / System Manager:** Oversees operations, maintenance planning, and compliance.
- **Financial / Administrative Officer:** Manages billing, revenue, and financial records.
- **Customer Service and Liaison Function:** Handles communication and complaints (may be combined with other roles in small systems).

Staffing by system size and complexity

Staffing requirements shall scale with:

- Population served;
- System complexity (e.g. treatment processes, network size);
- Revenue volume; and
- Risk profile (e.g. reliance on complex energy systems).

Small systems may combine roles, but separation of critical functions (e.g. revenue collection and expenditure approval) must be maintained.

4.7.3 Roles, responsibilities, and competency profiles

System operators

Operators shall:

- Execute daily SOPs and preventive maintenance tasks;
- Monitor production, treatment, and distribution;
- Identify and report faults and risks promptly; and
- Maintain accurate operational records.

Minimum competencies:

- Basic mechanical and electrical knowledge;
- Ability to follow SOPs and safety procedures;
- Basic water quality awareness.

Technical supervisors / System managers

System managers shall:

- Plan and supervise preventive maintenance;
- Manage asset registers and maintenance schedules;
- Authorise technical interventions and escalation;
- Ensure regulatory compliance; and
- Report performance to oversight authorities.

Minimum competencies:

- Technical training relevant to water systems;
- Supervisory and planning skills;
- Understanding of asset management principles.

Financial and administrative Staff

Financial staff shall:

- Implement billing and revenue collection systems;
- Maintain financial records and reports;
- Support tariff reviews and budgeting; and
- Ensure financial controls and transparency.

Minimum competencies:

- Basic accounting and bookkeeping;
- Familiarity with billing systems and data management;
- Integrity and accountability.

Customer service and community liaison staff

These staff shall:

- Manage communication with customers and communities;
- Receive, document, and track complaints;
- Support transparency and trust-building activities.

Minimum competencies:

- Communication and interpersonal skills;
- Basic understanding of service standards and grievance procedures.

4.7.4 Training and capacity development

Induction training

All personnel shall receive induction training covering:

- System overview and SOPs;

- Safety and risk management;
- Water quality and public health responsibilities;
- Financial and accountability procedures.

Continuous training and refresher programmes

Service providers shall implement periodic training to:

- Update technical skills;
- Introduce new technologies or procedures;
- Address performance gaps identified through monitoring.

Training shall prioritise practical, hands-on learning over theoretical instruction.

Access to external technical support

Where in-house capacity is limited:

- Formal arrangements shall be established for external technical support;
- Escalation pathways shall be clearly documented; and
- Costs shall be planned within financial management systems.

4.7.5 Performance management and accountability

Performance expectations

Performance expectations shall be clearly defined for each role and linked to:

- SOP compliance;
- Preventive maintenance execution;
- Service reliability;
- Financial discipline; and
- Customer responsiveness.

Monitoring and evaluation

Supervisors shall:

- Conduct regular performance reviews;
- Use operational and financial data to assess performance;
- Provide feedback and corrective guidance.

Incentives and sanctions

Performance management systems shall include:

- Recognition and incentives for good performance;

- Corrective training or supervision for underperformance;
- Disciplinary measures where negligence or misconduct occurs.

4.7.6 Volunteer engagement and transition

Role of volunteers

Volunteers may support:

- Community engagement and oversight;
- Minor non-technical activities; and
- Social mobilisation.

Volunteers shall **not** be relied upon for critical technical or financial functions.

Transition to professionalised staffing

Where volunteer-based arrangements are in place:

- Clear transition plans shall be developed.
- Responsibilities shall shift progressively to trained, remunerated staff; and
- Stakeholders shall be informed and engaged throughout the transition.

4.7.7 Occupational health, safety, and welfare

Service providers shall:

- Ensure safe working conditions;
- Provide basic protective equipment;
- Train staff in safety procedures; and
- Address occupational risks associated with water system operations.

4.8 Water quality management and regulatory compliance

4.8.1 Principles of water quality management

Water quality management under this Framework shall be guided by the following principles:

- Prevention over detection: Risks shall be controlled before contamination occurs.
- Routine assurance, not crisis response: Monitoring shall be systematic and scheduled.
- Clear responsibility: Water quality is an operational responsibility, not an external add-on.

- **Transparency:** Water quality information shall be accessible and credible.
- **Rapid response:** Non-compliance shall trigger immediate corrective action.

4.8.2 Water safety planning

Requirement for Water Safety Plans

All water supply systems covered by this Framework shall develop and implement a **Water Safety Plan (WSP)** appropriate to system size and complexity.

The WSP shall:

- Identify hazards from source to point of delivery;
- Assess risks to water quality;
- Define control measures and monitoring requirements; and
- Establish corrective actions for identified risks.

Hazard identification and risk assessment

Hazards to be assessed include:

- Source contamination (surface water runoff, latrine proximity, flooding);
- Treatment failures (inadequate disinfection, dosing errors);
- Distribution risks (leaks, low pressure, illegal connections);
- Storage contamination (tank hygiene, animal access);
- Handling risks at standpipes and household connections.

4.8.3 Routine water quality monitoring

Monitoring responsibilities

Service providers are responsible for routine water quality monitoring at system level. Monitoring shall not depend solely on external agencies.

Minimum monitoring parameters

At minimum, routine monitoring shall include:

- **Operational parameters:** turbidity, residual chlorine (where disinfection is applied);
- **Microbiological indicators:** E. coli or thermotolerant coliforms (periodic);
- **Aesthetic parameters:** colour, taste, odour (continuous observation).

In addition to routine operational and microbiological parameters, water supply systems shall undertake initial baseline testing for chemical parameters of public health concern that may be associated with the characteristics of the water source or treatment process, including parameters such as arsenic and lead where relevant.

The results of the initial assessment shall inform the water quality monitoring programme and the frequency of subsequent testing. Where initial testing identifies a parameter of health concern above the applicable standard, periodic monitoring shall be undertaken at a frequency determined by the relevant regulatory or water quality authority, and appropriate corrective measures shall be implemented.

Monitoring frequency

Minimum frequencies shall be as follows:

- Operational checks: daily (where applicable);
- Field microbiological screening: monthly or quarterly, depending on system size;
- Laboratory confirmation: as required by regulatory authorities.

Failure to conduct routine monitoring constitutes non-compliance.



Photo credit: Riva Ghana

4.8.4 Water quality record-keeping and reporting

Mandatory records

Service providers shall maintain:

- Water quality monitoring logs;
- Treatment chemical usage records;
- Incident and corrective action records.

Records shall be dated, signed, and retained for inspection.

Reporting obligations

Water quality results shall be:

- Submitted to oversight and public health authorities as required;
- Used internally to inform operational decisions; and
- Communicated to users in simplified formats where appropriate.

4.8.5 Response to water quality incidents

Incident classification

Incidents shall be classified as:

- **Minor deviations:** short-term operational parameter deviations;
- **Major non-compliance:** confirmed microbiological contamination or chemical overdosing.

Immediate response actions

In the event of major non-compliance, service providers shall:

- Suspend supply or issue precautionary advisories where necessary;
- Investigate the source of contamination.
- Implement corrective actions (e.g. tank cleaning, flushing, shock chlorination);
- Document all actions taken.

Communication with users and authorities

Clear and timely communication shall be made to:

- Users (through notices, community leaders, or media);
- District Assemblies and public health authorities;

- Regulatory bodies, where required.

4.8.6 Treatment and disinfection management

Chemical handling and storage

Operators shall:

- Store chemicals securely and clearly labelled;
- Follow approved dosing procedures;
- Use personal protective equipment where required.

Dosing control and verification

Disinfection dosing shall:

- Be calibrated and verified regularly;
- Be adjusted based on raw water quality and demand;
- Be recorded daily.

Improvised dosing is prohibited.

4.8.7 Regulatory compliance

Compliance requirements

Service providers shall comply with:

- National drinking water quality standards;
- Public health regulations;
- Environmental protection requirements.

Inspections and audits

Regulatory authorities may:

- Conduct inspections and audits;
- Review water quality records.
- Issue compliance directives.

Service providers shall cooperate fully with such processes.

Building public confidence in water quality

Service providers shall:

- Display basic water quality information at standpipes or offices;
- Engage community leaders in water safety messaging;
- Link tariffs explicitly to service assurance and safety.

Trust is reinforced when water quality management is visible and credible.

4.8.8 Compliance, monitoring, and enforcement

Compliance with this chapter shall be assessed through:

- Review of water safety plans and monitoring records;
- Inspection reports; and
- Incident response documentation.

Persistent non-compliance shall trigger corrective actions under Chapter 3

Chapter 5: Spare parts, supply chains and logistics management

5.1 Identification of critical spare parts

5.1.1 Critical spare parts lists

Each system shall develop and maintain a critical spare parts list, aligned with:

- System technology and configuration;
- Asset criticality classification; and
- Historical failure patterns.

5.1.2 Typical categories of critical spares

Critical spare parts may include, but are not limited to:

- Pump components (seals, bearings, impellers);
- Electrical and control components (switches, controllers, fuses);
- Solar system components (inverters, charge controllers, connectors);
- Treatment components (dosing pumps, valves);
- Distribution fittings (valves, connectors, taps, meters).

5.2 Spare parts stocking and access strategies

5.2.1 On-site stock requirements

At minimum, each system shall maintain:

- Consumables and low-cost high-failure items on-site;
- Emergency spares for critical components where feasible.

The level of on-site stock shall reflect system size, remoteness, and failure consequences.

5.2.2 Off-site and networked access

Where on-site stocking is not feasible, service providers shall:

- Establish guaranteed access arrangements with suppliers;

- Participate in pooled or regional spare parts systems; or
- Maintain framework agreements with qualified service providers.

Reliance on informal or ad hoc sourcing is non-compliant.

5.3 Procurement procedures

5.3.1 Planned procurement

Spare parts procurement shall:

- Be based on preventive maintenance schedules and asset condition assessments;
- Be incorporated into annual budgets; and
- Follow approved procurement procedures.

5.3.2 Emergency procurement

Emergency procurement shall:

- Be limited to genuine unforeseen failures;
- Follow documented emergency procedures; and
- Be reviewed after the event to prevent recurrence.

Repeated emergency procurement indicates planning failure.

5.4 Supplier and vendor management

5.4.1 Supplier selection criteria

Suppliers shall be selected based on:

- Proven technical competence;
- Availability of parts and after-sales support;
- Geographic accessibility; and
- Compliance with quality standards.

5.4.2 Avoiding vendor lock-in

Service providers shall:

- Avoid proprietary systems without local support capacity;

- Ensure availability of compatible components from multiple suppliers;
- Document risks associated with single-supplier dependence.

Technology choices shall consider long-term serviceability.

5.5 Storage, inventory control, and security

5.5.1 Storage requirements

Spare parts shall be:

- Stored in secure, dry, and organised locations;
- Clearly labelled and protected from damage; and
- Accessible to authorised personnel only.

5.5.2 Inventory management

Service providers shall maintain:

- Spare parts inventory records;
- Stock level thresholds; and
- Reorder triggers.

Inventory records shall be reviewed regularly and reconciled with physical stock.

5.6 Logistics and response time standards

5.6.1 Downtime targets

Each system shall define maximum acceptable downtime for critical failures, informed by:

- Public health risk;
- Population served; and
- Availability of alternative water sources.

5.6.2 Response and repair timelines

Service providers shall establish:

- Target response times for fault detection;
- Repair timelines based on failure severity; and
- Escalation thresholds when timelines are exceeded.

5.7 Roles and responsibilities

5.7.1 Operators

Operators shall:

- Identify and report spare parts needs promptly;
- Maintain basic stock records; and
- Protect spare parts from misuse or loss.

5.7.2 System managers

System managers shall:

- Approve procurement and replenishment;
- Monitor supplier performance; and
- Ensure compliance with logistics standards.

5.7.3 Oversight authorities

Oversight authorities shall:

- Review spare parts plans and inventories during monitoring visits;
- Support regional or pooled procurement where appropriate; and
- Enforce corrective action for persistent downtime.

5.8 Compliance, monitoring, and continuous improvement

Compliance with this chapter shall be assessed through:

- Review of spare parts inventories and procurement records;
- Analysis of downtime and response times; and
- Inspection of storage facilities.

Lessons from failures and delays shall be documented and used to improve planning.

Chapter 6: Customer service, communication, and grievance redress

6.1 Customer information and engagement

6.1.1 Mandatory customer information

Service providers shall ensure that users have access to clear information on:

- Tariffs and payment methods;
- Hours of service and supply schedules (where applicable);
- Rules for water use and connections;
- Contact details for reporting faults or complaints.

Information shall be displayed at standpipes, service offices, or other prominent locations.

6.1.2 Community engagement mechanisms

Service providers shall engage users through:

- Periodic community meetings or forums;
- Use of community leaders as communication channels; and
- Targeted outreach during tariff reviews or major system changes.

Engagement shall be structured and documented, not ad hoc.

6.2 Communication during service interruptions

6.2.1 Planned interruptions

For planned maintenance or system upgrades, service providers shall:

- Provide advance notice to users;
- Communicate expected duration and alternative arrangements; and
- Update users if schedules change.

6.2.2 Unplanned interruptions

For unplanned breakdowns, service providers shall:

- Notify users as soon as practicable;

- Explain the nature of the problem in simple terms;
- Provide estimated restoration times; and
- Update users regularly during extended outages.

Silence during outages is non-compliant.

6.3 Grievance redress mechanisms

6.3.1 Establishment of grievance channels

Each system shall establish at least one accessible grievance channel, which may include:

- A designated phone number;
- A service desk or office;
- A written complaint register.

Grievance channels shall not depend solely on a single individual.

Accessible grievance and communication channels may include approved digital and modern communication platforms such as WhatsApp, SMS, mobile phone lines, email, and other context-appropriate tools, provided that complaints and key service communications are documented in the official complaint and reporting records. Such channels shall be used to improve responsiveness, escalation, and user access, but shall complement rather than replace formal record-keeping requirements.

6.3.2 Complaint registration and tracking

All complaints shall be:

- Logged in a complaint register;
- Assigned a reference number or date; and
- Categorised by type (billing, quality, access, behaviour).

Verbal complaints shall be recorded by staff.

6.3.3 Response time standards

Service providers shall define and communicate:

- Target response times for different complaint types;
- Escalation procedures where complaints are not resolved promptly.

Failure to respond within stated timelines constitutes non-compliance.

6.4 Resolution and escalation

6.4.1 Complaint resolution

Service providers shall:

- Investigate complaints objectively;
- Provide explanations or corrective action; and
- Communicate outcomes to complainants.

6.4.2 Escalation pathways

Where complaints are not resolved, escalation pathways shall include:

- Supervisor or system manager review;
- Referral to oversight authorities;
- Independent mediation where applicable.

Escalation procedures shall be documented and accessible.

6.5 Customer protection and fair treatment

Service providers shall:

- Apply tariffs and service rules consistently;
- Avoid punitive or arbitrary disconnections;
- Respect vulnerable users and public health considerations.

Customer protection measures shall be balanced with financial discipline.

6.6 Roles and responsibilities

6.6.1 Operators and frontline staff

Operators shall:

- Receive and log complaints;
- Communicate respectfully with users;
- Refer issues beyond their authority promptly.

6.6.2 System managers

System managers shall:

- Oversee grievance handling;
- Review complaint trends;
- Ensure corrective actions are implemented.

6.6.3 Oversight authorities

Oversight authorities shall:

- Monitor grievance handling performance;
- Intervene where systemic issues are identified;
- Ensure compliance with customer service standards.

6.7 Monitoring and performance improvement

Service providers shall:

- Analyse complaint data periodically;
- Identify recurring issues;
- Use findings to improve operations and communication.

Complaint trends are performance indicators, not inconveniences.

6.8 Compliance and enforcement

Compliance with this chapter shall be assessed through:

- Review of complaint registers and response records;
- Feedback from users during monitoring visits; and
- Performance indicators related to responsiveness and resolution.

Persistent failure to manage customer relations shall trigger corrective action under Chapter 3.

Chapter 7: Risk management, climate resilience and emergency response

7.1 Risk identification and classification

7.1.1 Categories of risk

Service providers shall identify and document risks under the following categories:

- **Technical risks:** pump failure, pipe bursts, treatment breakdowns;
- **Climate and environmental risks:** droughts, floods, source contamination, seasonal variability;
- **Energy risks:** grid outages, fuel shortages, solar system failure;
- **Financial risks:** revenue shortfalls, cost escalation, delayed payments;
- **Institutional and governance risks:** leadership changes, political interference, staff turnover;
- **Public health risks:** water quality incidents, disease outbreaks.

The risk management framework shall explicitly recognise political interference, rising electricity tariffs, unreliable power supply, and high energy intensity of water systems as risks that may significantly affect service continuity and O&M sustainability. Mitigation measures may include improved governance and reporting arrangements, documentation and escalation of interference, energy efficiency improvements, pump and operational optimisation, backup power planning, and where feasible, assessment of solar or hybrid energy options. These risks shall be reviewed periodically as part of system-level and district-level O&M planning.

7.1.2 Risk assessment

For each identified risk, service providers shall assess:

- Likelihood of occurrence (low, medium, high);
- Severity of impact on service and public health; and
- Existing control measures.

Risks shall be prioritised based on combined likelihood and impact.

7.2 Climate resilience planning

7.2.1 Climate risk considerations

Climate-related risks shall be explicitly incorporated into O&M planning, including:

- Reduced water availability during dry seasons;
- Flood-related damage to infrastructure;
- Increased turbidity and contamination during rainfall events; and
- Heat-related impacts on equipment and storage.

7.2.2 Resilience measures

Service providers shall implement feasible resilience measures, such as:

- Source protection and catchment management;
- Diversification of water sources where possible;
- Elevated or flood-protected infrastructure;
- Solar or hybrid energy systems with backup options;
- Demand management during scarcity periods.

7.2.3 Integration with asset and financial planning

Climate resilience measures shall:

- Be reflected in asset management plans (Chapter 5);
- Inform spare parts and logistics planning (Chapter 9); and
- Be considered during tariff reviews and budgeting (Chapter 6).

7.3 Emergency preparedness

7.3.1 Emergency response plans

Each system shall develop and maintain a basic Emergency Response Plan (ERP) covering:

- Common emergency scenarios;
- Roles and responsibilities during emergencies;
- Communication protocols; and
- Resource mobilisation procedures.

7.3.2 Emergency response teams

Service providers shall designate:

- Responsible personnel for emergency coordination;
- Backup contacts where primary personnel are unavailable; and
- Liaison officers for coordination with District Assemblies and public health authorities.

- Supply shall be suspended or restricted where necessary;
- Precautionary advisories shall be issued promptly;
- Corrective actions shall be implemented without delay.

Public health protection takes precedence over service continuity.

7.4 Emergency response procedures

7.4.1 Technical emergencies

In the event of major technical failure:

- Immediate steps shall be taken to isolate damaged components;
- Temporary service arrangements shall be explored;
- Repair timelines shall be communicated to users.

7.4.3 Climate and natural hazard events

During floods, droughts, or storms:

- Staff safety shall be prioritised;
- Infrastructure shall be secured where possible;
- Emergency water supply options shall be activated if required.

7.4.2 Water quality and public health emergencies

In the event of water quality incidents:

7.5 Communication during emergencies

Service providers shall:

- Communicate clearly and regularly with users;
- Use multiple communication channels;
- Coordinate messaging with local authorities and traditional leaders.



Photo credit: Riva Ghana

Silence or misinformation during emergencies is unacceptable.

7.6 Financial provisions for emergencies

Service providers shall:

- Maintain contingency provisions where feasible;
- Define emergency expenditure authorisation procedures;
- Document and review all emergency-related expenditures.

Emergency spending shall not bypass accountability.

7.7 Post-incident review and learning

Following major incidents, service providers shall:

- Conduct post-incident reviews;
- Document causes, responses, and outcomes; and
- Update risk assessments and plans accordingly.

Learning from failure is a requirement, not an option.

7.8 Compliance, monitoring, and enforcement

Compliance with this chapter shall be assessed through:

- Review of risk registers and emergency plans;
- Evaluation of emergency responses during incidents; and
- Follow-up on post-incident corrective actions.

Failure to prepare for foreseeable risks constitutes non-compliance.

Chapter 8: Monitoring, reporting and performance improvement

8.1 Key performance indicators (KPIs)

8.1.1 Core KPI categories

All service providers shall monitor indicators under the following categories:

- Service reliability and continuity;
- Water quality and safety;
- Financial performance and viability;
- Operational efficiency and maintenance;
- Customer service and responsiveness.

8.1.2 Minimum core KPIs

At minimum, service providers shall monitor:

- Percentage of days with uninterrupted service;
- Average downtime per incident;
- Compliance with water quality standards;
- Revenue collection efficiency;
- Preventive maintenance compliance rate;
- Number and resolution time of customer complaints.

Oversight authorities may define additional indicators.

8.2 Performance rating bands and triggers

Service providers and oversight authorities shall use KPI results to classify performance and trigger proportionate corrective actions.

Suggested performance bands (adaptable by the Region/District):

- **GREEN** (meets or exceeds minimum standard)
- **AMBER** (minor underperformance requiring corrective actions within 30 days)
- **RED** (serious underperformance requiring immediate escalation and structured support/sanctions).

Corrective triggers include: uptime below 95% for two consecutive months; repeated water quality non-

compliance; revenue collection efficiency below 80% for two consecutive billing cycles; preventive maintenance compliance below 80% for a quarter; and unresolved complaints above 10% at month-end.

Minimum service standards (performance targets)

- **Service Reliability:** At least 95% uptime (cumulative service disruption: not more than 18 days per year)*
- **Water Quality:** 100% of water quality tests meet national standards for physio-chemical, microbiological, and heavy metal parameters
- **Accessibility:** All users within 500 m of a water point; no community served by a system should be without water for more than 3 consecutive days
- **Quantity:** Minimum 20 litres per capita per day provided to all households under normal operations
- **Customer service:** 100% of complaints recorded, and at least 90% resolved within the stipulated response time frame
- **Financial sustainability:** Annual revenue covers 100% of routine O&M costs and contributes to capital maintenance fund as planned

*The uptime of the water system shall be determined through the annual service monitoring undertaken by the District Assembly under the guidance of the Regional Coordinating Council. Service providers shall submit records of the cumulative number of days of service downtime during the assessment period, which shall be used by the District Assembly to calculate and verify the system's annual uptime.

8.3 Data collection and management

8.3.1 Data sources

Data shall be collected from:

- Operational logs;
- Maintenance records;
- Financial reports;
- Water quality monitoring;
- Complaint registers.

8.3.2 Data quality and integrity

Service providers shall ensure:

- Accuracy and completeness of records;
- Timely data entry;
- Secure storage of records.

Deliberate falsification of data constitutes serious non-compliance.

Monitoring and coordination systems may utilise approved digital and modern communication channels, including WhatsApp groups, mobile reporting tools, spreadsheets, dashboards, SMS, email, and other suitable platforms for rapid communication and operational follow-up. However, all official reporting shall be captured in approved formats and archived appropriately to ensure traceability, consistency, and institutional record-keeping. Digital channels may be used for alerts, coordination, escalation, and field communication, but they shall complement rather than replace formal reporting requirements.

8.4 Reporting requirements

8.4.1 Routine reporting

Service providers shall prepare:

- Monthly operational and financial summaries;
- Quarterly performance reports;
- Annual performance reviews.

8.4.2 Reporting to oversight authorities

Reports shall be:

- Submitted within defined timelines;
- Reviewed by oversight authorities; and

- Used to guide supervision and support.

Service providers shall provide quarterly operational and financial performance information to the relevant MMDA using the approved reporting format or an equivalent reporting system agreed with the MMDA. The information shall cover key performance indicators, major maintenance activities undertaken, service interruptions, customer complaints, water quality status, revenue performance, major operational risks, and issues requiring district-level support or escalation. Where service providers maintain established operational records, digital dashboards, financial management systems, or asset management information that capture the required information, these may be used to meet the reporting requirements, subject to agreement with the relevant MMDA. MMDAs shall review the information received and consolidate key performance information for regional monitoring, follow-up, and learning. Oversight authorities may also undertake periodic review visits to service providers to verify operational, financial, asset management, and customer service information directly.

8.5 Performance review and corrective action

8.5.1 Internal performance reviews

Service providers shall:

- Conduct regular internal reviews of performance data;
- Identify causes of underperformance;
- Develop corrective action plans.

8.5.2 External performance reviews

Oversight authorities may:

- Conduct periodic performance assessments;
- Benchmark systems;
- Recommend or enforce corrective measures.

8.6 Performance incentives and sanctions

8.6.1 Incentives

Good performance may be recognised through:

- Public acknowledgement;
- Access to additional support or funding;
- Contract renewal or extension.

8.6.2 Sanctions

Persistent underperformance shall trigger:

- Formal warnings;
- Increased supervision;
- Management restructuring or transition (Chapter 3).

8.7 Learning and continuous improvement

Service providers shall:

- Document lessons learned;
- Share experiences across systems;
- Update practices and plans accordingly.

Continuous improvement is a core O&M function.

To support continuous improvement, the Region shall establish structured mechanisms for sharing best practices, operational innovations, and lessons learned from implementation of the O&M Framework. This may include periodic regional learning sessions, peer exchange among districts and service providers, innovation showcases, and documentation of successful practices that can be adapted elsewhere. The objective shall be to promote cross-learning, accelerate uptake of workable innovations, and reduce duplication of effort across the Region.

8.8 Compliance and enforcement

Compliance with this chapter shall be assessed through:

- Review of monitoring systems and reports;
- Verification during inspections;
- Follow up on corrective actions.

Quarterly reporting and performance monitoring shall serve not only as compliance requirements, but also as mechanisms for continuous performance improvement.

Service providers shall use available operational records, digital utility management systems, dashboards, and other appropriate management tools to monitor performance and identify recurring failures, governance

risks, financial stress points, maintenance backlogs, and opportunities for support or corrective action. Digital utility management systems may be used to support remote monitoring, predictive and preventive maintenance, customer management, operational analytics, water quality monitoring, financial management, and asset life-cycle planning, and may serve as acceptable mechanisms for demonstrating compliance where they capture the information required under this Framework.

Persistent non-compliance or repeated poor performance shall trigger structured follow-up, including, where appropriate, technical support, management review, enforcement action, or contractual remedies.

Chapter 9: Implementation and action plan

9.1 Implementation approach

The implementation and action plan for strengthening O&M of water supply systems in Ahafo is grounded in the prevailing conditions: dispersed rural settlements, rapidly expanding small-town systems, high reliance on mechanised boreholes, intermittent functionality challenges due to power fluctuations, limited spare parts availability, and weak community management structures in many communities. The plan aims to transition communities from a reactive maintenance culture to a proactive, well-supported, and financially sustainable operations and maintenance (O&M) system. Implementation follows four key principles:

- **Strengthening community ownership and governance** – Empower communities through formalised Water and Sanitation Management Teams (WSMTs) and clear local oversight mechanisms.
- **Ensuring availability of technical support and spare parts within the region** – Establish dedicated O&M support units at the district level and improve supply chain access.
- **Integrating preventive maintenance and water safety planning into daily operations** – Make

routine maintenance and water quality checks part of standard practice rather than emergency responses.

- **Embedding O&M responsibilities within district planning, budgeting, and byelaw enforcement** – O&M activities must be incorporated into District Assemblies' annual plans and budgets, with local regulations supporting enforcement (e.g., byelaws requiring communities to allocate user fees for maintenance).

To strengthen compliance, institutional accountability, and practical application of the Framework at district level, MMDAs shall align relevant local governance and enforcement mechanisms with the provisions of this O&M Framework. MMDAs shall take steps to align existing byelaws, service delivery arrangements, and enforcement procedures with the provisions of this O&M Framework. Where necessary, byelaws shall be enacted or revised to require all authorised service providers and management entities to comply with approved O&M procedures, reporting obligations, maintenance requirements, customer service standards, and performance monitoring arrangements. Enforcement shall be undertaken through a combination of formal



Photo credit: Riva Ghana

notices, supervision, corrective directives, contractual remedies, and any other lawful mechanisms available to the MMDA. This will help ensure that implementation of the Framework is not only advisory in nature, but is supported by enforceable district-level arrangements that promote consistency, compliance, and sustained service delivery performance.

To operationalise these principles, the following coordinated initiatives are proposed:

Community-led O&M strengthening:

- Reconstitute and train all WSMTs and WATSAN committees in the region to improve their governance and management capacity.
- Provide standardised training modules on financial management, tariff setting, minor repairs, and Water Safety Plan implementation to community-level teams.
- Introduce routine performance audits of WSMTs by District Assemblies (e.g., semi-annually) to hold them accountable and identify areas needing support.

District-level technical support system:

- Establish District O&M Support Units consisting of key technicians (pump mechanics, electricians), revenue officers, and water quality officers based at the District Assembly or relevant agency.
- Create a rapid-response maintenance team capable of attending to critical breakdowns within a target of 72 hours for all high-priority systems.
- Develop district spare parts banks or storage facilities stocked with fast-moving components (pump seals, circuit boards, etc.), so common repairs are not delayed due to parts shortages.

Standardised preventive maintenance regime:

- Introduce a structured maintenance schedule for all water supply systems:
 - Monthly basic inspections (e.g., checking for leaks, verifying pump performance, inspecting storage levels and tank cleanliness).
 - Quarterly technical inspections by district technicians (more thorough, including electrical checks, generator servicing, etc.).
 - Annual comprehensive servicing of mechanised systems (pulling pumps for

inspection, etc.).

- Biannual water-quality monitoring and an annual review/update of each system's Water Safety Plan.
- Require each WSMT or operator to submit simple maintenance reports to the District Assembly after each scheduled activity, to track compliance.

Multi-stakeholder engagement:

- District Assemblies will lead enforcement, planning, and oversight, ensuring that O&M is featured in District development plans and budgets.
- Community structures (WSMTs and traditional leaders) will handle daily O&M and local governance of water points.
- Private sector partners (area mechanics, local suppliers, drilling firms) will be engaged through MoUs or simple contracts to provide specialized services (deep repairs, spare part supply).
- The Ahafo Regional Coordinating Council (ARCC) will coordinate among districts, harmonise approaches, and aggregate regional performance data for reporting purposes.
- Development partners/NGOs will align capacity-building and financing support with this framework (for example, funding training programmes or co-financing capital maintenance needs).

A Regional O&M Technical Working Group shall be established to support implementation of the Framework. The Working Group shall serve as a technical and coordination platform for reviewing progress, identifying implementation bottlenecks, harmonising approaches across districts, advising on technical and institutional issues, and supporting the RCC in preparing for periodic review and learning sessions. Membership may include representatives of the RCC, MMDAs, CWSA, selected service providers, and relevant development and technical partners. The Working Group shall, at minimum: (a) review quarterly implementation and performance reports; (b) identify priority technical, financial, or institutional issues requiring follow-up; (c) promote cross-district learning and sharing of innovations; (d) support harmonisation of implementation approaches and reporting practices; and (e) advise on future revisions or strengthening of the Framework.

9.2 Action plan

The Action Plan provides practical steps to implement the strategic directions outlined in this Framework. It guides districts and communities to translate identified O&M challenges into actionable activities, timelines, and budgets. The Action Plan covers preventive and corrective maintenance, institutional strengthening, supply chain development, financing, capacity building, and monitoring arrangements. It is structured to ensure coherent coordination across district and regional levels while enabling community management structures to fulfil their statutory responsibilities. The Action Plan aligns with the annual planning and budgeting cycle of the sector, and approval by each District Assembly will give it official status within district development programmes.

9.3 Stages for preparing the O&M action plan

- **Stage 1: Adoption of guidelines** – Key district stakeholders (Assembly members, WSMT representatives, local NGOs) convene to review and formally adopt relevant O&M principles, national guidelines, and regional directives. This stage ensures a shared understanding of roles, water safety concepts, spare parts supply principles, and financial management requirements across all actors in the district.
- **Stage 2: Situational analysis** – Each District conducts a detailed assessment of the current conditions of water schemes, gathering baseline data on functionality, existing O&M practices, revenue flows, spare parts availability, and capacity gaps. A SWOT analysis is used to identify governance weaknesses, technical gaps, financing shortfalls, and climate/environmental vulnerabilities. This stage concludes with stakeholders agreeing on the ideal O&M system model and the targets the district aims to achieve.
- **Stage 3: Development of the O&M action plan** – Using findings from Stage 2, the District Water and Sanitation Team, together with WSMTs and partners, formulates a structured Action Plan consisting of:
 - Objectives and outputs: Clear objectives (e.g., “Improve preventive maintenance compliance”) with specific outputs (e.g.,

“Maintenance schedule implemented for all systems”).

- Activities: Detailed activities under each output (e.g., “Train 20 area mechanics”, “Conduct quarterly water quality tests in 50 communities”).
- Indicators and targets: Define how progress will be measured (e.g., “% of systems with updated asset registers” or “number of systems meeting uptime standard”).
- Responsibilities: Assign lead actors for each activity (WSMT, District Engineer, CWSA, NGO support, etc.).
- Timeline: Schedule activities across Year 1, Year 2, and subsequent years, prioritising urgent fixes over medium-term improvements.
- Budget: Estimate costs and funding sources for each major activity (tariff revenues, district funds, donor support).

The Action Plan prioritises urgent interventions (such as fixing non-functional high-priority systems), medium-term improvements (including capacity building and procedural changes), and longer-term sustainability measures (such as establishing asset replacement funds).

- **Stage 4: Approval and Submission** – Once drafted, the O&M Action Plan is reviewed and approved by the District Assembly (through its Water and Sanitation sub-committee and full Assembly as needed). Upon approval, it is submitted to the Regional Water and Sanitation Directorate (or ARCC) for technical review and incorporation into the region's consolidated plans. Official approval ensures the plan is recognised within the district's development agenda.

(Note: Detailed Regional and District Action Plan Matrices with objectives, activities, indicators, verification means, actors, timelines, and risks are prepared as separate tables – see Annexes.)

9.4 Resource mobilisation

Implementing the Action Plan will require mobilising resources from multiple sources. District Assemblies shall integrate key O&M activities into their Composite Budgets to leverage the District Assembly Common Fund and other government transfers. Where gaps

exist, proposals will be developed for support from development partners, NGOs, and the private sector (for instance, public-private partnerships for spare parts supply or financing arrangements for capital maintenance). The Region (ARCC/CWSA) will coordinate resource mobilisation efforts, ensuring that external funding is aligned with the O&M framework priorities and distributed to areas of greatest need.

9.5 Implementation road map

To put the Framework into operation across the region, the following steps will be taken:

- **Validation and official adoption:** All stakeholders, including the Regional Coordinating Council, CWSA, District Assemblies, and major NGOs, will validate the Framework and formally adopt it as the guiding document for O&M by end of Year 1. This includes passing any required resolutions and disseminating the Framework to all parties.
- **Integration into byelaws and planning:** Districts will update or enact byelaws to enforce O&M standards and require all authorised service providers and management entities to comply with approved O&M procedures, reporting obligations, maintenance requirements, customer service standards, and performance monitoring arrangements. O&M activities and targets will be explicitly included in District Annual Plans and monitored as part of the Assembly's performance. These byelaws should require all authorised service providers and management entities to comply with approved O&M procedures, reporting obligations, customer service standards, and performance monitoring arrangements.
- **Capacity mobilisation:** Identify and assign key personnel for the District O&M Support Units and provide training by specialised agencies (CWSA, etc.) by mid-Year 1. Mobilise technical assistance to build local capacity (training of area mechanics, accountants, etc.) continuously from Year 1–Year 3.
- **Roll-out of SOPs and tools:** By Year 2, distribute standard SOPs, record-keeping templates, and maintenance checklists (Annexes) to every WSMT and operator in the region. Conduct hands-on training on using these tools; and subsequently, ensure that every system is operating according to

the standard procedures by Year 3.

- **Monitoring systems:** Strengthen the monitoring and MIS (e.g., WASHPMIS or other) by having service providers report quarterly to MMDAs, and Districts submit quarterly consolidated O&M indicators to the Region. Introduce simple digital reporting (via mobile where possible), including approved communication channels such as WhatsApp and other modern tools, to track functionality and issues in near-real-time by Year 2.
- **Ongoing review:** Establish an annual O&M review workshop at the regional level where Districts present their progress, challenges, and lessons (starting end of Year 1). Use this forum to update the Action Plans, share innovations, and agree on any modifications to the Framework or support needed for subsequent years.

Immediate and medium-term implementation actions shall also include formal adoption and institutional anchoring of the Framework; review and enactment or strengthening of MMDA byelaws to support compliance and enforcement; rollout of quarterly reporting systems to MMDAs and the RCC; deployment of digital monitoring and coordination channels; establishment of the Regional O&M Technical Working Group; organisation of periodic learning and innovation-sharing forums; and strengthening of district and operator capacity to apply the Framework in practice.

The Implementation and Action Plan as outlined will be monitored continuously. Roles and responsibilities for each activity are clearly assigned, as shown in the templates listed in the Annexes. Progress will be reported quarterly at District level and quarterly in consolidated form at Regional level. Adaptive management will be employed if certain strategies are not yielding results, stakeholders will collaboratively adjust the approach. This dynamic implementation process ensures that the Framework remains a living tool, driving tangible improvements in water service operations and maintenance across the Ahafo Region.

Chapter 10: Annex

Annex 1: Standard operating procedure (SOP) templates and checklists

Use these templates as the minimum standard for documenting routine operations, maintenance, incidents, and customer interactions. Service providers may digitise these forms, but the fields must be retained in their original format.

Annex 1A: Daily operations checklist

Complete for each operational day (or each shift where applicable).

[illegible]

Annex 1B: Breakdown / incident report form

Use for all major faults, critical failures, water quality incidents, or security events.

[illegible]

Annex 1C: Customer complaint / grievance register

Log all complaints, track actions and closure. This register supports KPI reporting on complaint resolution.

[illegible]

Annex 2: Preventive maintenance schedule template

Customise by system type (handpump, mechanised borehole, small-town piped scheme). The schedule must reflect the minimum frequencies specified in the Framework and be approved by the Supervisor.

[illegible]

Annex 3: Asset register and condition assessment template

Maintain a complete inventory of all assets. Update at least annually and after any major repair/rehabilitation. The condition rating may be 1-5 (1=Excellent, 2=good, 3=moderate, 4=poor and 5=very poor)

[illegible]

Annex 4: Water safety plan (WSP) template

This template supports a simplified Water Safety Plan for rural and small-town systems. Complete and review at least annually, and after any significant change or incident.

Annex 4A: WSP team and system description

WSP team members (name - role - contact):

Name	Role	Organisation/unit	Contact

System description (source, treatment, storage, distribution, service area):

Describe briefly here (attach schematic/map if available).

Annex 4B: Hazard identification and risk assessment table

[illegible]

Annex 4C: Verification and review

Verification activities (e.g., independent testing, sanitary inspections, audits):

[illegible]

Annex 5: Financial management templates

These templates support transparency, cost recovery, and audit readiness. All revenue must be ring-fenced for water services and deposited in accordance with the Framework.

Annex 5A: Daily cash / mobile money collection sheet

[illegible]

Annex 5B: Monthly income and expenditure statement

[illegible]

Annex 5C: O&M annual budget template

[illegible]

Annex 6: Performance monitoring and reporting formats

Use these formats for monthly and quarterly reporting to the District Assembly/Regional team. Where feasible, replicate these forms in a simple digital tool (mobile form or spreadsheet).

The quarterly reporting template shall include, in addition to routine performance data, fields for reporting significant governance or interference issues, major electricity or power-related cost pressures, use of digital monitoring channels, customer complaints, major operational risks, and any matters requiring district or regional support. Reporting formats shall be standardised across districts to enable consolidation, benchmarking, and regional learning.

Annex 6A: Monthly performance summary (systems-level)

[illegible]

Annex 6B: Quarterly performance review checklist

Review area	Evidence reviewed	Findings	Corrective actions	Responsible	Deadline

Annex 7: Regional O&M action plan matrix

Populate this matrix at the Regional level (ARCC/CWSA/Partners) to coordinate support to districts and track region-wide implementation.

Regional action planning should include, at minimum, activities to establish and operationalise the Regional O&M Technical Working Group, coordinate quarterly review of district O&M reports, organise periodic regional O&M learning and innovation-sharing sessions, support harmonised adoption of digital monitoring and coordination channels, and review recurrent governance and political interference issues affecting service delivery.

[illegible]

Annex 8: District O&M action plan matrix

Each District Assembly should complete this matrix annually, aligning it with the district's planning and budgeting cycle. The plan should reference specific systems/communities and include costed activities.

District action planning should include, at minimum, activities to ensure quarterly reporting by all service providers to the MMDA, review local byelaws and service agreements for alignment with this Framework, monitor electricity and power-related operating costs and identify mitigation options, establish district-level digital coordination channels for routine monitoring and escalation, and document and communicate significant cases of political or irregular interference affecting service delivery.

[illegible]

Annex 9: Guidelines for Institutional WASH facility management

These guidelines developed by the Ghana Education Services and Ghana Health Services are intended to improve the management and the operations and maintenance of WASH facilities in Schools and Health Care facilities.

WASH IN SCHOOLS

O&M guidelines

School toilets (KVIP)

- It is very important that the number of users does not exceed the toilet's design capacity. Excessive use can disrupt the intended alternation between pits and prevent the toilet from functioning as designed.
- Doors must always remain shut, even when the toilet is not in use.
- The drop hole currently in use must never be covered, as this restricts the airflow to the pit and would cause odours to build up inside the toilet. The drop hole not in use must be sealed to prevent its use, but should be easy to unseal when it is time to alternate.
- Only soft anal cleansing materials must be used. All anal cleansing materials should be put into the pit.
- Anal cleansing material must NOT be kept in a basket or box intended for waste paper inside the toilet cubicle. This will attract flies and other insects.
- The immediate surroundings of the toilet must be kept clean and should be weeded regularly. This will prevent rodents from entering the toilet.
- Urinals must be checked regularly to ensure water flows through properly to avoid smells.
- Hand washing facilities, taps and plumbing work must be checked regularly to ensure they are operating as designed and there are no leakages.
- Defective vent pipes must be replaced immediately.
- A little water must be poured down the vent pipe at the end of each month to remove cobwebs.
- Toilet cubicles must be swept daily to keep them clean.
- Toilet cubicles must be scrubbed to remove remains of faeces and urine. Disinfectants must be diluted before use.
- Tree branches overhanging the toilet must be cut back, as they impede the flow of light down the vent pipe.
- Cracks that appear in the structure must be professionally assessed and repaired immediately.
- Fly screens must be inspected and changed half yearly. If a fly screen is found to be torn during inspections, it must be replaced immediately.
- Repair any locks that get damaged immediately.
- Pits must be alternated when faecal matter rises up to 500mm below the squat slab.
- School compounds must be swept regularly (at least once a week)
- Weeding of school compounds must be done at least once a term. During the rainy season weeding must be done monthly.

Water Supply Facilities

- Ensure water is collected in a suitable container when the tap is opened, except during hand washing.
- Repair all leakages immediately upon detection, whether in storage tanks, pipelines or taps.
- Ensure that drains and/or soak aways are clean and functional.
- Clean area around tap/fetching point daily.
- Ensure storage tanks are cleaned at least once a year.

Hand Washing Facilities

- Hand washing containers must be cleaned daily.
- Hand washing containers must be disinfected weekly.
- Taps must be repaired immediately when leakages appear.
- Ensure drains and/or soak aways are clean and functional.

WASH IN HEALTH CARE FACILITIES

O&M of Water Supply Facilities

- Ensure water is collected in a suitable container when the tap is opened, except during hand washing.
- Repair all leakages immediately upon detection in storage tanks, pipelines or taps.
- Ensure drains and/or soak aways are clean and functional.
- Inspect and clean standpipe drains.
- Keep the surroundings of the yard tap clean.
- Keep the tap closed when you are not using it.
- Do not use the platform of the yard tap for washing clothes.
- Make sure that wastewater is led away from the yard tap.
- Check water meter readings and record water production.
- Check water quality in storage tanks.
- Wash and disinfect storage tanks.
- Ensure storage tanks are cleaned at least once a year.

O&M of Sanitation Facilities

- Clean squatting seats, basins, urinals and floors.
- Unblock U-trap when blocked.
- Empty septic tanks at regular intervals.

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