REPUBLIC OF RWANDA

MINISTRY OF INFRASTRUCTURE

NATIONAL GUIDELINES FOR SUSTAINABLE RURAL WATER SUPPLY SERVICES

May 2019

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National Guidelines
for Sustainable Rural Water Supply Services

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Preface

Access to safe drinking water is crucial, not only for people's health and wellbeing, but also for poverty reduction and economic development; Improving the access, quality, availability and sustainability of water supply services in RWANDA is the top priority in the Sector; Rwanda has committed to reach SDGs targets by 2030 through the different programs such as the NST1 and 7 Years Government Program with the aim of achieving universal access to basic water and sanitation services by 2024. In order to achieve this target, an appropriate institutional system has to be in place.

The development of the National guidelines for Sustainable Rural Water Supply Services and all its supporting documents (Manuals, Training Modules, etc.) is part of the mechanism to develop the Operation and Maintenance in the Rural Water Supply, and make an important guidelines to Districts, Private Operators, User communities and all the stakeholders in the Rural Water Supply Services sub-sector.

I want to extend my appreciation to the stakeholders, especially JICA/RWANDA through the RWASOM Project, for the effort to have these important documents in place.

We look forward to positive impact of the developed documents through the O&M framework in the rural water services, sustainability of existing water infrastructures and overall, an improved and sustainable clean water supply service toward the communities in RWANDA.

Patricie UWASE

PERMANENT SECRETARY

Table of Contents

List of Acronyms

AIDR	Association Internationale Pour le Developpement Rurale
CBM	Community Based Management
CD	Capacity Development
CSO	Civil Society Organization
DWB	District Water Board
EDPRS	Economic Development and Poverty Reduction Strategy
EICV	Integrated Household Living Conditions Survey
EWSA	Energy, Water and Sanitation Authority
FBI	Fond du Bien être indigene, Belgian NGO
FED	Financial and Economical Development
FEPEAR	Forum des Exploitants Prives pour l'Eau et l'Assainissement en milieu Rural
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
JADF	Joint Action Development Forum
JICA	Japan International Cooperation Agency
JMP	Joint Monitoring Programme
KCC	Kigali City Council
LODA	Local Administrative Entities Development Agency
M&E	Monitoring and Evaluation
MINALOC	Ministry of Local Government, Good Governance, Community Development and Social Affaires
MINECOFIN	Ministry of Finance and Economic Planning
MININFRA	Ministry of Infrastructure
MIS	Management Information System
MoH	Ministry of Health
O&M	Operation and Maintenance
PO	Private Operator
PPP	Public–Private Partnership
RSB	Rwanda Standards Board
RURA	Rwanda Utilities Regulatory Authority
RWS	Rural Water Services
SPIU	Single Project Implementation Unit
SWG	Sector Working Group
WASAC	Water and Sanitation Corporation
WSP	Water and Sanitation Program
WSP	Water Service Provider

1 Introduction

1.1 Water Sector Historical Background

Before the independence, implementation and management of rural water infrastructure were initiated by Fond du Bien être indigene (FBI, Belgian NGO).

From 1964, rural water supply sector started to be managed at national scale through the state subsidize convention giving to Association Internationale Pour le Developpement Rurale (AIDR) a nationwide delegation to construct, operate and maintain all rural water infrastructures while the water service was free of charge for beneficiaries. Due to increased rural water supply infrastructures and irresponsibility of the beneficiaries, in 1984, recommendation to transfer rural water supply management to the communes (actual districts) with beneficiaries' participation has been taken.

In 1987, a decree (Presidential law no 291/11 of 15th May 1987) transferred ownership of water infrastructures supply management to the districts, well before the Government enacted a comprehensive decentralization policy.

In 1994, after the genocide, long period of emergency programs neglected maintenance and did low investment in the sector. During that period, the reconstruction characterized by rehabilitations didn't increase the water access rate and unfortunately the users did not pay the fees for water consumed and some fees collected were mismanaged. For water supply management, the government has adopted three models as follow: Regie Associative characterized by community management, Regie Administrative where the management is done by the districts staff and Regie professional the private operators play a big role. Initially the community based management (CBM) has been encouraged and water committees formed and trained to ensure water infrastructures management (technical and financial) but the basic principle was voluntary works. As result, more than 50% of rural water schemes were not well functional for many reasons like lack of knowledge and motivation for technicians, and funds for operation and maintenance.

A new water supply and sanitation policy including the demand driven and participatory approach adopted in 1997 didn't change much the existing situation due community based management still ensured management.

As professionalization involving private operators were mentioned in the above decree and some Districts tried that way.

In 2004, the Ministry in charge of water supply and sanitation conducted a water supply management assessment and found that the schemes managed by private function well while those under community or administrative management failed. Taking into account of the assessment result, the new water policy adopted in 2004 reinforces participatory approach and also private management through Public Private Partnership (PPP).

In 2010, Water supply and Sanitation policy stipulated Districts as owners of water and sanitation infrastructures, and reinforced the PPP promotion as the standard way to operate piped water supply schemes in rural areas and that the revenue collection must be based on metered consumption.

Then, PPP became the basis for water supply infrastructures management in order to ensure their sustainability. The revenue collected constitutes the main source of funds for O&M.

The rate of access to safe water is estimated at 84.8% as of 2013/14 (The fourth Integrated Household Living Conditions Survey (EICV4) 2013/14) although it is considered that the actual rate is much less than the statistical data. One of the reasons why the rate of functioning is very low is the weakness of framework for the O&M. And also, the skill level of Water Service Providers (hereinafter referred to as "WSPs") is mostly very poor and water fee collection is not practiced properly. Then once the water supply systems are broken, they are abandoned due to the lack of budget and expertise for maintenance.

To address above challenges, the Government of Rwanda established the Water and Sanitation Corporation (WASAC) in 2014 which is a national utility for water and sanitation services with the mandate to deliver on key sector milestones under Rwanda's EDPRS 2 (Economic Development and Poverty Reduction Strategy). And also WASAC has the Rural Water Services Directorate to empower Districts and to ensure that the sustainability of water and sanitation infrastructures is effective. by supporting Districts in: planning, designing, and implementation of new infrastructure projects, rehabilitation of existing WATSAN infrastructures, improvement of O&M of water facilities, capacity development and training, recruitment process for effective management of rural water supply and sanitation, monitoring and evaluation.

The full water supply service coverage can only be reached if the existing infrastructure continues to function sustainably and then the available resources can be used for extending the coverage to the unserved population rather than for rehabilitating the existing infrastructure.

This Guideline has been prepared, primarily, to guide the implementation of the sustainable rural water supply service management. This Guideline shall be used alongside other water and sanitation sector policies, strategy documents such as below.

- National Water Supply Policy and Implementation Strategy, 2016
- National Sanitation Policy and Implementation Strategy, 2016
- Water and Sanitation Sector Strategic Plan 2018 – 2024, 2017

1.2 Purpose of the Guidelines

These guidelines are intended to assist stakeholders at Central, Districts, Community and Private sector levels in rural water supply sub-sector to ensure sustainability of the water supply management services through effective operation and maintenance (O&M).

1.3 Intended Users

The targets for these guidelines are policy makers, administrators, planners, communities and private sectors in rural water supply sub-sector, and other stakeholders at all levels.

1.4 Requirements for Sustainable O&M

In this Guidelines PPP arrangement shall widely endorse as the essential components of a sustainable O&M approach with the following being in place.

- Clear institutional responsibilities;
- Adequate management capacities and technical maintenance skills;
- Financial viability and affordability of the chosen service level;
- Tariffs allowing for cost recovery;
- Effective fee collection based on consumption;
- Accumulation of funds for major repairs and the replacement of equipment;
- Availability of funds for the replacement of key assets after the end of design life.

1.5 Principles

In ensuring the sustainability of rural water supply services, the following principles should be applied.

Key Principles	Outline
a. Priority to basic services	• Each person and community has equal right to access basic water services.
b. WASH services delivered as an integrated package to ensure maximum health outcomes	• The provision of accessible and safe drinking water infrastructure by itself does not necessarily result in the health and poverty reduction outcomes for the communities being served unless it is also fully integrated with improved sanitation and hygiene behaviour change. These three crucial elements “Water – Sanitation – Hygiene” are equally important for achieving an overall balance and sustainability.
c. Decentralization	• The water and sanitation sector is committed to building and strengthening decentralized planning, implementation and management capacities.
d. Community participation	• The beneficiaries of water supply and sanitation services shall be actively involved in planning, decision making and oversight throughout the project implementation cycle. • They will choose the service level that responds to their needs and capacities.
e. Cost recovery and financial sustainability	• O&M costs of water supply and sanitation infrastructure shall be borne by the users, in order to ensure sustainable service delivery.

Key Principles	Outline
	• Affordability shall be addressed by the choice of appropriate technologies and by enhancing efficiency, not usually by granting subsidies.
f. Private sector participation	• The sector will continue to promote delegated management through private operators, which is the key strategy to enhance the sustainability of rural water infrastructure. • The private sector will also be encouraged and supported in developing capacities for investment, construction and service delivery in water supply.
g. Operational efficiency and strengthening of accountability	• It is a priorities in both urban and rural infrastructure development and management, in order to improve financial viability, minimize fiduciary risk (checks and balances) and optimize the use of the available resources.
h. Interests of women and children	• The crucial roles and the particular interests of women and children are fully acknowledged. • All sector activities shall be designed and implemented in a way to ensure equal participation and representation of men and women, and to pay due attention to the viewpoints, needs and priorities of women.
i. Grouped settlements	• The water and sanitation sector gives preferential consideration to service delivery in grouped settlements, taking into account the changing habitat structure.
j. Environment and water resources protection	• Water supply will be developed in close coordination with water resources management, based on an integrated approach. Water use should be rational and sustainable and shall abide with environmental regulations and safeguards.
k. Inclusive programme approach	• The water supply sector aims to develop a consistent, national approach, to harmonize financing and implementation modalities and to optimize stakeholder coordination. • The Sector-Wide Approach (SWAp) as well as the sector's capacity building efforts will consider all sector stakeholders, including NGOs and the private sector
l. Results-based management	• Monitoring and evaluation systems will be developed in conjunction with planning and budgeting procedures, involving decentralized actors (in particular the districts), in order to ensure that the activities and investments are in line with the defined sector objectives and priorities. • Latest ICT technologies will be used for real time monitoring to allow for evidence based decision making

Source: National Water Supply Policy, December 2016

1.6 Relevant Documents for Sustainable Rural Water Supply Services

This Guidelines shall be used alongside the other manuals and training modules which are structured as comprehensive package tools for the ensuring the sustainable rural water supply

services. List of relevant documents for sustainable rural water supply services can be found in the **Appendix 1.**

Reference

- Water and Sanitation Sector Strategic Plan 2018 – 2024, 2017
- National Water Supply Policy, December 2016

2 Policy and Legal Framework

The sector polices, legislation and regulations provide the foundation for the overall governance of the water and sanitation sector. The key polices and regulations that lay foundation for the management and development of the water sector.

2.1 Policy Framework

2.1.1 National Water Supply Policy and Implementation Strategy, 2016

The Government of Rwanda formulated National Policy and Strategy for Water Supply and Sanitation Services in 2010 to present the sector's approach on how to achieve the Vision 2020, MDGs and EDPRS 1 objectives and breaks them down into concrete principles, objectives and statements through effective coordination among all the key players including, in particular, the Districts, the MINISANTE, MINALOC, MINEDUC, MINIRENA, WASAC, RURA, Private Sector, Civil Society and Development Partners. However, a number of emerging issues were identified and the Government of Rwanda decided to update the Policy and Strategy in 2016 so as to align it with EDPRS 2 with due consideration of the following points.

- Decentralization of Water and Sanitation Services
- Sector financing mechanisms and access to funding for decentralized actors (District, Communities, Private Operators)
- Performance of Public Private Partnership arrangements
- Further sector harmonization towards Sector Wide Approach

2.1.2 National Sanitation Policy and Implementation Strategy, 2016

The National Sanitation Policy formulated in 2016 aims promoting hygiene behaviour change of people and attaining 100% sanitary service coverage by 2017/18. The sanitation sector recognizes the critical importance of hygiene behaviour change for the achievement of sustainable health benefits to people of Rwanda. While sustainable health has a close relationship with sustainable operation and maintenance (O&M) of water supply facilities, such as improving hygienic environment around water points and incentive for paying water fee through raising hygiene awareness. Mastering appropriate hygiene behaviour is one of important factors for people to sustain access to safe drinking water through improving daily O&M of water supply facilities.

2.1.3 Water and Sanitation Sector Strategic Plan 2018 – 2024, 2017

This sector strategic plan guides the sector during 2017 to 2024 and is very consistent with the sector policy of 2016 which clearly set out the approach of the sector to reach the NST 1 and SDGs. This strategic plan formulates the specific objectives/priorities to ensure 100% sustainable functionality of rural water supply infrastructure by rehabilitating non-functional system and ensure

sustainable operation and maintenance by 2024 while implementing effective management structures and well-regulated public-private partnership (PPP) arrangements.

2.1.4 National Policy for Water Resources Management, 2011

The National Policy for Water Resources Management was formulated in 2011 to aim at conserving finite water resources for people of Rwanda. In order to conserve water resources, it is subject to following objectives, 1) to strengthen Government's ability to conserve and protect Rwanda's water resources, 2) to provide a legal and institutional framework for water resources conservation and management.

The water resources management is also governed by the water and sanitation policy developed in 2004. The water resources management and water and sanitation sector are mutually connected. There is no doubt that in order to attain 100 % of access to safe drinking water, appropriate water resources management is an essential factor as well as improvement of O&M of water supply facilities.

The policy statements are presented to guide the implementation and strategic actions that formulated to facilitate the achievement of the national goals. It stresses that best practices in the management of water resources shall be achieved where decisions regarding water resources managements are made with the involvement and participation of water users and other stakeholders. Further involvement of much more actors in lower-level structure is as crucial matter as case of O&M of rural water supply facilities.

2.1.5 Water Resources Management Sub-Sector Strategic Plan (2011-2015), 2011

This strategic plan was developed to operationalize a National Policy for Water Resources Management formulated in 2011. In order to meet the increasing multiple water demand for internal use and trans-boundary needs, with limited capacity and in the face of declining water availability, Rwanda restores the productivity of its watershed and it also has to strengthen the synergy among the different sectors dependent on water resources. The strategic plan is to indicate the right directions in managing water sources to the concerned actors in five years.
In the strategic plan, it is alerted that pollution of water sources and water losses significantly affect increase of O&M costs of water supply facilities. The systemic losses are partly driven by inadequate regulation of water supply and use. Public-Private Partnership on O&M of rural water supply facilities is expected to improve system maintenance, operational efficiency and reduce losses.

2.1.6 Rwanda National Water Resources Master Plan (2014)

The National Water Resources Master Plan is summarized to develop the master plan for sustainable water resources development should not just be limited to the assessment of national

water resources and national water resources needs and uses over time. The Masterplan shall be a blueprint for a process of sustainable water, land and related resources development and management with the aim to maximize economic and social welfare in an equitable manner while safeguarding the environment.

2.2 Legal Framework

2.2.1 Water Law No.62/2008, 2008

The water Law defines the applicable rules to the use, conservation, protection and management of water resources. This also covers publics works related to water and sanitation such as conferring water public service to private operators (POs), pricing, standards on drinking water and penal provisions.

2.2.2 Governing Water Supply Services in Rwanda, Regulations No.002/RB/WAT-EWS/RURA/015, 2015

The purpose of these regulations is to establish a legal framework to ensure effective and efficient water supply services and provide an open, transparent and non-discriminatory process for the review and decision-making on modalities of licensing of Water Services in Rwanda.
These Regulations shall have the following Objectives:

- To ensure that water supplied is always of good quality and fits human consumption;
- To ensure that adequate supply with enough pressure is received by customers;
- To set up conditions enabling water supply investment;
- To ensure proper and timely customer billing;
- To protect customers against any misconduct from licensees and continually promote their interests;
- To ensure that basic human needs for water supply are met;
- To promote sustainable, efficient and beneficial use of water;
- To promote fair and loyal competition; and
- To promote equitable access to water services.

2.2.3 Regulations on Minimum Required Service Level for Water Service Provision, Issued by the Regulatory Board, RURA, 2013

The purpose of these regulations is to determine the minimum required service level for water service provision.
These Regulations shall have the following Objectives:

- To ensure that water supplied is always of good quality and fit for human consumption and that adequate supply with enough pressure is received by customer;

- To improve reliability through minimizing and managing interruptions and allow customer to plan accordingly;
- To ensure proper and timely customer billing;
- To protect consumers against any misconduct from water service providers and continually promote their interests.

2.2.4 Water Quality Standards, 2014

This Water Quality standard is to set minimum requirements for physical, chemicals and microbiological characteristics that affect safety and quality of drinking water. The use of this standard is expected to ensure provision of safe and quality drinking water for human consumption.

Reference

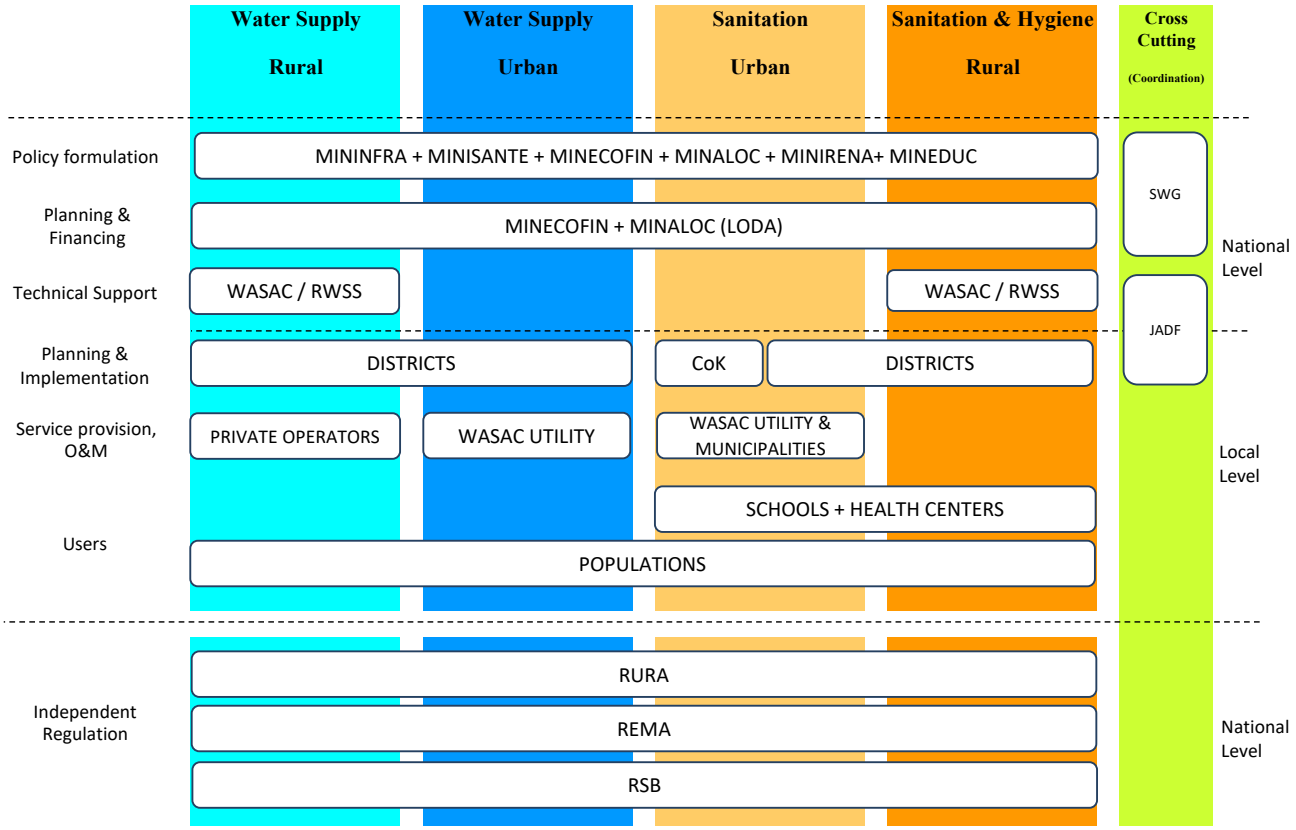
- National Water Supply Policy, December 2016
- National Water Supple Policy Implementation Strategy, December 2016
- National Sanitation Policy, December 2016
- National Sanitation Policy Implementation Strategy, December 2016
- Water and Sanitation Sector Strategic Plan 2018 – 2024, 2017
- Water Law No.62/2008, 2008
- Governing Water Supply Services in Rwanda, Regulations No.002/RB/WAT-EWS/RURA/015, 2015
- Regulations on Minimum Required Service Level for Water Service Provision, Issued by the Regulatory Board, RURA, 2013
- Rwanda Standard (RS EAS 12: 2014), Potable water – Specification, RSB 2014

3 Institutional Framework for Water and Sanitation Sector

Implementation of the Policy and the Strategic Plan will be a joint responsibility of various government institutions - several Ministries and national autonomous entities as well as local governments – under the overall oversight of MININFRA. Government bodies, development partners and non-government stakeholders will cooperate in a SWAp framework.

MININFRA will lead the institutional reform consolidation process and will host a permanent Sector Working Group (SWG) that ensures coordination and monitoring of the sector programme, including dialogue and communication with other sector stakeholders.

The schematic below provides an overview of the key roles and responsibilities of the institutions involved in the Water and Sanitation sector.



Referenced document: National Water supply Policy Implementation Strategy, December 2016

Figure 3-1: Overview of the key roles and responsibilities of the public institutions involved in the Water and Sanitation sector

3.1 Sector-Wide Approach (SWAp)

A Sector Wide Approach (SWAp) for the Water and Sanitation Sector was adopted in 2009. The SWAp is a partnership forum between the Government of Rwanda (GoR) and development partners (DPs) that aims to strengthen inter/intra sectoral coordination and rationalization of DPs initiatives to avoid duplication of efforts.

To coordinate the activities of the Water and Sanitation Sector, the GoR and its DPs maintain regular dialogue through Sector Working Group (SWG).

SWG is the key coordination platform for water sector stakeholders to discuss results and feed priority issues to the national level. These fora have been very effective in opening technical dialogue at the sector level while keeping higher-level forums for more strategic discussions. With technical discussions on performance carried out at the sector level, there is greater specialist debate to identify challenges and solutions at this level.

3.2 Institutional Roles and Responsibilities

3.2.1 National Level

Key roles and responsibilities of the public institutions involved in the WSS sector at National level are shown below.

Table 3-1: Key roles and responsibilities of the public institutions involved in the WSS sector at National level

Institution	Roles and responsibilities
MININFRA (Ministry of Infrastructure)	MININFRA formulates national policies and strategies; sector oversight, budgeting and resource mobilization; overall sector performance monitoring.
MINISANTE (Ministry of Health)	MINISANTE has the lead in household sanitation and hygiene promotion. It has launched "Community-Based Environmental Health Promotion Programme (CBEHPP)" to improve the household sanitation and hygiene. It works to ensure that health centers have the required sanitation facilities (Refer to Box 1).
MINECOFIN (Ministry of Finance and Economic Planning)	MINECOFIN coordinates the national planning, budgeting and financing framework, with a strong role in related aspects of the Water and Sanitation Sector.
MINALOC (Ministry of Local Government)	MINALOC has responsible for decentralization and matters related to local government finance and administration.
MINIRENA (Ministry of National Resources of Rwanda)	MINIRENA has responsible for environment, climate change and natural resources management at the local and national levels. The goal of MINIRENA is to provide solutions to the environmental and resource challenges faced, including the imbalance between population and natural resources that has serious impacts on sectors such as

Institution	Roles and responsibilities
	agriculture, energy, infrastructure, land, water resources and forestry, in achieving national long-term sustainable development.
MINEDUC (Ministry of Education)	MINEDUC has responsible for hygiene and sanitation in the schools. It works to ensure that schools have the required sanitation facilities and provide hygiene education to the students through the HAMS {School Hygiene and Sanitation (Hygiène et. Assainissement en Milieu Scolaire) } Programme (Refer to Box 2).
WASAC (Water and Sanitation Corporation)	WASAC was created to improve service efficiency and effectiveness in the water and sanitation sector. Indeed, these two mandates of WASAC are quite different: ➢ **WASAC as a Water Supply Utility Operator**, established as a public corporation, is supposed to operate based on commercial principles. Specific pro-poor measures may require subsidies, but in general the focus is on efficient, operational service delivery and financial viability. ➢ **WASAC Directorate of Rural Water and Sanitation Services (RWSS)** supports the implementation and management of rural water supply infrastructure, in particular by providing technical support and capacity building to districts and scheme operators – for project development and implementation as well as O&M – and by monitoring performance as well as sector achievements. It also channels grant funding and monitors/supports the use of earmarked sector funding to the districts. In the future, it should increasingly focus on developing the enabling framework for sanitation.
RURA (Rwanda Utility Regulatory Authority)	RURA will ensure regulation in two respects: vis-à-vis the public, by ensuring adequate and affordable services and protecting the interest of the consumers; and vis-à-vis the service providers, by establishment of water tariff, monitoring contract management, financial viability and accountability and ensuring effective competition. RURA thus covers four complementary aspects of regulation: (i) technical; (ii) economic; (iii) legal; and (iv) consumer relations.
REMA (Rwanda Environmental Management Agency)	REMA monitors and facilitates fundamental right to live in a healthy and balanced environment.
RSB (Rwanda Standard Board)	RSB is to undertake all activities pertaining to the development of Standards, Conformity Assessment and Metrology services in the country. It is the only body with powers to define and possess national standards. Public services and public or private firms must present their standards to RSB for adoption at national level. RSB is governed by the Board of Directors composed of major stakeholders from government, industry and academic institutions, as well as consumer associations.
LODA (Local Administrative Entities Development Agency)	LODA is a Government Fund under the supervision of MINALOC. LODA focuses on Local Economic & Community Development, Social Protection, and capacity building of local administrative entities within the scope of its mission. Moreover, LODA does monitoring and evaluation on the implementation process of development programs in

Institution	Roles and responsibilities
	Local Governments with the view of contributing to the capacity building of population and decentralized entities as well as reducing extreme poverty in the country.
DPs and NGOs (Development partners)	DPs and NGOs support sector development in accordance with the principles agreed for the SWAp; contribute to financing sector projects through a variety of aid modalities.

3.2.2 Local Level

Key roles and responsibilities of the public institutions involved in the WSS sector at Local level are shown below.

Table 3-2: Key roles and responsibilities of the public institutions involved in the WSS sector at Local level

Institution	Roles and responsibilities
Local Governments (Districts and City of Kigali: CoK)	LGs have responsible for the provision and management of water supply services. Local Governments undertake planning, budgeting, resource allocation, community mobilization. They ensure effective participation involvement of populations, follow up implementation by the private sector and support the operation and maintenance of water supply services. They undertake monitoring and reporting to WASAC and MINALOC.
Joint Action Development Forum (JADF)	JADF was established in 2007 by the Ministerial Instructions No. 04/07 of 15/07/2007 to serve as a consultative forum for District Development Stakeholders (CSOs, NGOs, Development Partners, Private and Public Sectors and Local Government). JADF operates in all the 30 Districts. The ultimate goal of JADF program is to improve and create sustainable economic development; service delivery and domestic accountability in local communities.
Private Sector	Private sector participates in the execution of the projects by consulting firms and contractors as well as in infrastructure operation and maintenance by private operators through delegated contract with the district. Rwanda Private Sector Federation (PSF) has an important role in technical and vocational training and business development support.
Populations	Populations are responsible for planning improved water and sanitation services.

Box 1: CBHPP: Community-Based Environmental Health Promotion Programme

Community-Based Environmental Health Promotion Programme (CBEHPP) is a programme created on 17th December 2009 under MoH, MINEDUC, MININFRA, MINALOC & MINECOFIN to contribute to the elimination of malnutrition, diarrhoeal diseases and intestinal worms through good hygiene practices by the year 2020 and in so doing contribute significantly to poverty reduction and sustainable development.

CBEHPP use strategically Community Hygiene Clubs (CHC) that are being established at the village level where the community will identify the existing hygiene and sanitation related problems, set priorities and take collective action to solve them. The approach is expected to empower the communities through dialogue and building common unity on which other developmental projects should be established. The social and organisational structure coupled with increased community awareness will provide a vehicle for sustainable development.

While safe water can reduce diarrhoea by 15%, health promotion can reduce diarrhoea by 35% and frequent hand-washing with soap is estimated to reduce diarrhoea by 47% (Curtis & Cairncross, 2003). It is for this reason that hygiene behaviour change is now considered an indispensible aspect of every water and sanitation programme. Without this vital component of hygiene behav-iour change, W&S programmes inevitably fail in their enormous potential to improve the health and welfare of the nation and opportunities and resources are unnecessarily wasted. CBEHPP is adopting the CHC approach that is well proven to empower communities, especially the women, to take responsibility for village-level operation, maintenance and management (VLOMM) of rural water facilities like hand-pumps, protected springs and piped supplies, thus ensuring their long-term sustainability. CBEHPP thus complements the efforts of MININFRA to provide safe drinking water and sanitation.

Source: “Roadmap for CBEHPP” Community-Based Environmental Health Promotion Programme, Republic of Rwanda – Ministry of Health, January 2010

Box 2: HAMS: Hygiène et. Assainissement en Milieu Scolaire (School Hygiene and Sanitation)

HAMS (Hygiène et Assainissement en Milieu Scolaire) program should be utilized in schools and communities to ensure active participation and ownership of programs by the communities as well as behavior change and entrenchment of sustainable good practices.

The Schools partly determine children's health and well-being by providing a healthy or unhealthy environment. Although water and sanitation facilities in schools are increasingly recognized as fundamental for promoting good hygiene behavior and children's well-being, many schools have very poor facilities. Conditions vary from inappropriate and inadequate sanitary facilities to the outright lack of latrines and safe water for drinking and hygiene. This situation contributes to absenteeism and the high drop-out rates of girls.

Schools can also be a key factor for initiating change by helping to develop useful life skills on health and hygiene. Children are often eager to learn and willing to absorb new ideas. New hygiene behavior learned at school can lead to life-long positive habits. Teachers can function as role models new hygiene behavior learned at school can lead to life-long positive habits, not only for the children but also within the community. School children can influence the behavior of family members - both adults and younger siblings - and thereby positively influence the community as a whole. It is also more cost-effective to work with children in school-based programmes than with adults.

Source: Approved Environmental Health Policy, July 2008 and Website UNICEF & IRC

Reference

- National Water Supply Policy and Strategy (NWSPS), Draft Version, December 2015
- Rwanda Governance Board Web-page: http://www.rgb.rw/index.php?id=28
- Rwanda Standard Board Web-page: http://www.rsb.gov.rw/~rbs/main-nav/about-us.html
- Inclusive Dialogue on the post 2015 Development Agenda – Helping to strengthen Capacities and Building effective institutions, Rwanda Country Report, October 2014, Unitised Nations
- An AMCOW Country Status Overview, Water Supply and Sanitation in Rwanda, Turning Finance into Services for 2015 and Beyond, 2011, Water and Sanitation Program
- LODA Web-page: http://www.loda.gov.rw
- Web-page: http://www.greenclimate.fund/-/ministry-of-natural-resources

4 O&M Framework for Rural Water Supply

4.1 O&M Framework for Water Supply Systems

Rwanda started implementing the delegated management for O&M of rural water supply systems in 2004. As of 2016, more than 60% of the water supply systems are being managed through PPP. Under this mechanism, contracts have been signed between the Private Operators and District. As per these contracts, the Private Operators are responsible for operation and maintenance with minor repair while the district is responsible for repair of major breakdowns. The draft O&M framework for piped water supply system is described in the diagram below.

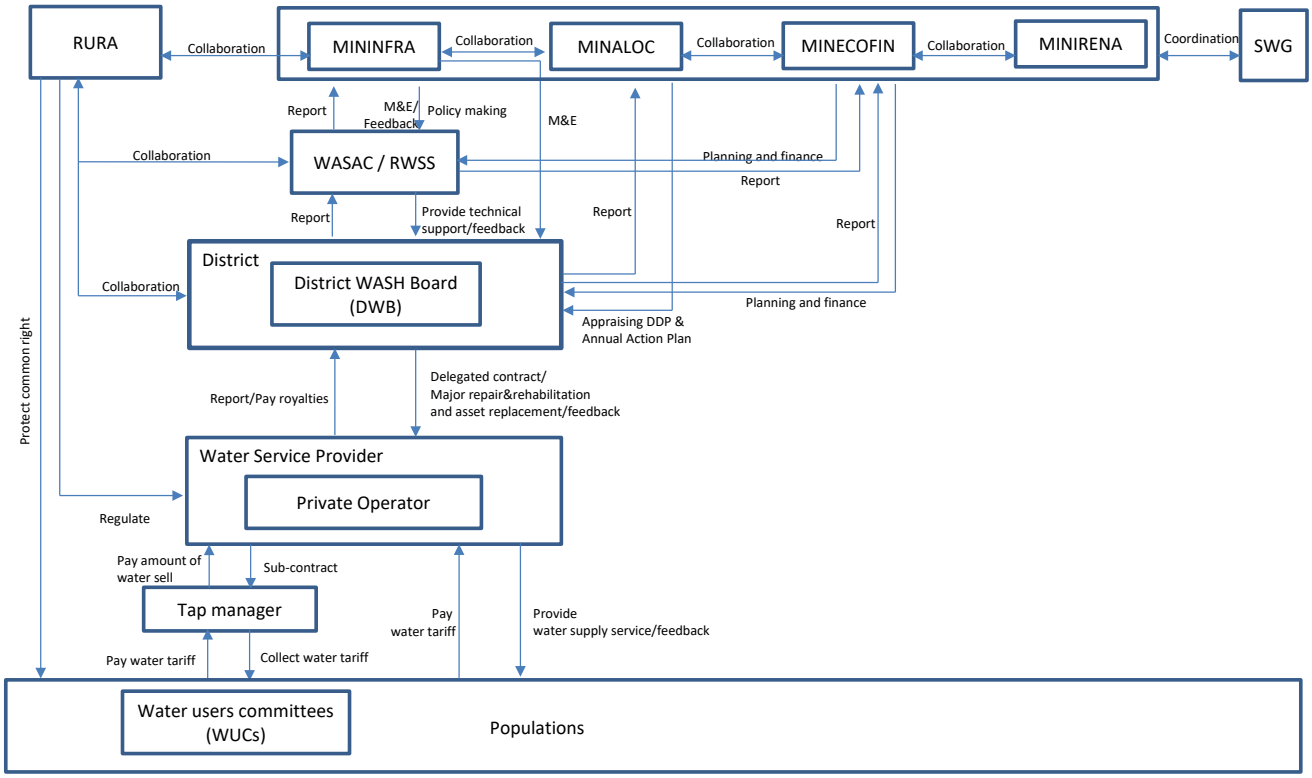


Figure 4-1: Structure of O&M Framework for Water Supply Systems

4.1.1 Roles of key Actors for Water Supply Systems

a. National Level

(1) MININFRA

- Providing policy, guidance and national strategic plans.
- Preparing national investment plans and resource mobilization.
- Monitoring and evaluation for the Water and Sanitation sector.
- Hosting and maintaining national Management Information System (MIS) for planning, monitoring and evaluation and feedback.

(2) MINALOC

- Receiving, approving and responding to financial and monitoring reports.
- Establishing and circulating criteria for resource allocations to the districts.
- Appraising District Development Plan for Water and Sanitation sector.
- Contribute on policy and strategy formulation.

(3) WASAC RWSS

WASAC RWSS Directorate is to ensure sustainable functionality of Rural WATSAN infrastructures by assisting Districts through planning, design, project implementation and putting in place effective management systems.

The main objectives for the RWSS Directorate are

- Assist the Districts to plan for rehabilitation of existing water infrastructures
- Assist the Districts to the Operations and maintenance (O&M) of water facilities
- Assist Districts in capacity building and training.
- Assist Districts in procurement process for management of RWSS (harmonized tender document and contract model)
- Assist Private Operators to plan for operation and maintenance
- Assist Private Operators to improve the management system through capacity building and trainings.
- Develop Water quality management framework for Rural Water Supply Services.
- Provide strategic and technical leadership to ensure provision of high quality services to customers in rural areas
- Develop priority programs for universe access (Water and Sanitation)
- Develop and motivate funding
- Establish a tracking mechanism for potential and available funds
- Ensure resource Mobilization
- Ensure sustainability of sanitary infrastructures
- Ensure monitoring and Evaluation

(4) RURA

- Making rules and regulations guiding the water fixing tariff.
- Regulating water utilities as an independent agency or authority guided by the law, in order to ensure compliance to standards and guidelines. (Law no N°09/2013 of 01/03/2013 in Rwanda)
- Protecting consumers.
- Providing advice in contract preparation and execution, monitoring of reporting quality through feedback on reports, visits.
- Verifying data produced in the reports, asking for justifications, visiting on site.
- Verifying conformity of operators' activities with laws, statutes, regulations, reality of expenses and declared situations.
- Licensing the qualified private operators.

b. District Level

There are a number of structures in the district as shown **Figure 4-2** which are a key to effective implementation of rural water supply services. The District is responsible for providing access to safe water to the population and makes the following activities:

- Development of water supply infrastructures.
- Planning of proper O&M for rural water supply infrastructures through professional management (delegated management).
- Preparation of asset inventory and control at least once a year.
- Protection and preservation of any assets funded by other stakeholders.
- Monitoring and evaluation of service delivery, operation and maintenance.

The overall coordination at the District level will be ensured by the District Water, Sanitation and Hygiene Boards (DWB). Specific roles and responsibilities of the concerned units under the district are as follows:

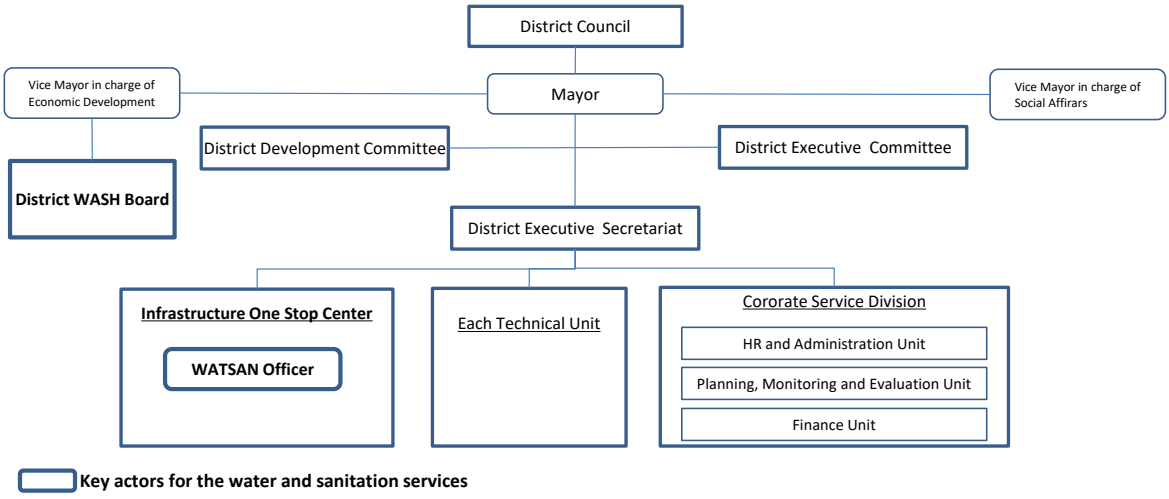


Figure 4-2: District Organization Structure related to the WSS

(1) District WASH Board

District WASH Board (DWB) is a group of Individuals representing the water stakeholders at District level. DWB is meant to reinforce the monitoring of drinking water systems management and sanitation activities.

Reports to:	Provides Technical support to:	Collaborates with:
District Council through the District	- POs - Water User Committees	- Sector office - Cell office - Development partners - NGOs

Mission:
Overseeing water activities contributing to the sustainability of water service provision through effective management of water supply in the District.

Objectives:

- To reinforce the monitoring of drinking water systems management
- To manage private operators' contracts regularly
- To make a technical and financial audit of operations
- To decide on the use of the water royalties' account.
- To negotiate capacity building funds
- To customer Satisfaction and Water Quality Motoring
- To plan Water supply and Sanitation
- To sensitize the population before the installation of Water Supply Infrastructure and the Delegation management.

Activities

(1) Planning

- To identify key priorities in water and sanitation sector
- To ensure that budget allocation takes into consideration the key priorities in WATSAN
- To ensure that the targets set by the District are in line with VISION 2020, EDPRS II, SDGs, National WATSAN Policy, etc.
- To play a coordination role of WATSAN stakeholders' interventions
- To participation in planning for capacity development

(2) Management of the water supply facilities

- To ensure that WATSAN infrastructure are assessed for functionality and advise the district accordingly
- To participate in visits to WATSAN infrastructure on regular basis
- To organize meetings with all involved in WATSAN infrastructure including private operators, water users, etc.
- To review and analyse various reports on WATSAN infrastructure and advise the district
- To review and analysis of operating reports from private operators
- To advise on O&M of WATSAN infrastructures

(3) Effective services of water and sanitation

a. <u>Equity and capacity to pay for WATSAN service provision</u>

- To have information on purchasing power of the population to pay water and sanitation services.

Reports to:	Provides Technical support to:	Collaborates with:
• To advocate to the authority in charge, in such way, all citizens should have access to drinking water and sanitation services. • To be involved in tariff setting of water and sanitation services. • To have an assessment by looking if the price set in water and sanitation services has been used by private operators. **b. <u>Contract award</u>** • To be involved in tendering of implementation and management of water and sanitation service provision. • To ensure that the private operator follows the agreements that have been set in the contract. **c. <u>Continuity of the service</u>** • To ensure that all problems in water and sanitation service provision are solved at convenient time. • To be involved in water and sanitation management activities • To work with local authorities to sensitize the population to pay water and sanitation services. • To ensure that if the royalties fees are well managed • To ensure that water and sanitation users are satisfied by the services from private operators. **d. <u>Quality assurance</u>** • To follow up on the water and sanitation services works and make sure that it's implemented with standards. • To follow up and ensure that private operators deliver quality water and quality service to the beneficially. • To work with local leaders to sensitize the population on the proper use of water and sanitation services. **e. <u>Reporting</u>** • To ensure the regularity reporting from Private Operators. • To analyse the reports from Private Operators and Advise accordingly. • To evaluate the impact of Water and Sanitation services on the development of the District.		
Membership: 1. Vice-Mayor FED as chairperson of the Board 2. WATSAN Officer as Secretary of the Board 3. Representative of water users:2 persons 4. Private Operators:1 person 5. Representative of Schools:1 person 6. Representative of health centers:1 person 7. Representative of district council:1 person 8. WASAC RWS representative:1person 9. JADF representative:1 person 10. Any other relevant people will be invited as needed.		

(2) District One Stop Centers

District and Kigali City One Stop Center consist of the staff in charge of infrastructure including the Water and Sanitation (WATSAN) Officer. He/she is especially responsible for:

- Participating in the establishment of mechanisms for the mobilization of the population for the construction and maintenance of water supply works;
- Promoting the rational use of water;
- Developing an action plan for managing used, water and waste water in the District;
- Monitoring water and waste water management including hospital and industrial wastes;
- Monitoring the water, waste water and the rain water management;
- Inspecting water and waste water management activities in the District;
- Working on the recovery of organic waste;
- Developing investment plans and mobilize the private sector and other stakeholders to invest in water and sanitation activities;
- Developing project proposals to mobilize additional resources meant for improving the District's capacity in water management and sanitation.
- MIS data entry and reporting.
- Assessment of functionality and planning of rehabilitation of water supply systems.
- Procurement and contract management of construction and operation and management of water supply systems.
- Community mobilization for water infrastructure sustainability

(3) District Council

A council is a body of elected representatives of the population in a given geographically defined area.

The District Council shall also be responsible for:

- Approving the development plan
- Coordinating activities of Sectors accomplishing their respective missions
- Monitoring the management of the District property at least once every term
- Examining the report of finance audit
- Establishing a District tender committee
- Making a follow up and to take decisions on any other activities conducted in the District which are not included in the responsibilities of the Central Administration.

In collaboration with other concerned organizational structures, it is responsible for taking decisions and issuing instructions on the following:

- Maintenance of roads, bridges and water system
- Treatment of water and protection of the environment
- Construction of sanitation facilities in public places, schools, health institutions; construction of drainage systems and solid waste management.
- Rehabilitation of abandoned and non-functional water supply systems.
- Mobilization of funds.

(4) District Executive Committee

The Executive Committee of the District is especially responsible for:

- Respecting and implementing the decisions of the District Council
- Coordinating the elaboration of the District strategic plan and to submit it to the District Council for approval
- Implementing the budget of the District
- Elaborating quarterly and annual reports of the District and forward them to the District Council, Governor of the Province and to the Minister in charge of Local Government
- Implementing cooperation agreements between the District Council and other organs

(5) District Executive Secretariat

The Executive Secretariat of District consists of the Executive Secretary and other staff members recruited in accordance with relevant laws.

The Executive Secretary is responsible for:

- Supervising the District staff activities
- Preparing instruction proposal, coordinate and control activities at District level on the basis of the decisions taken by the District Council on political and administrative matters
- Examining all documents to be approved or signed by the Mayor of the District
- Supervising the District's technical activities
- Controlling the use of District assets and prepare reports to the Mayor of the District;
- Close follow-up of the functioning of projects operating in the District
- Promoting the staff skills in terms of Information and Communication, Technologies and organize the training meant for developing the staff capacities
- Close follow-up of the elaboration of the plan of action and the preparation of reports in the District
- Chairing meetings of District Directors of Units
- Signing the contract with contractors and monitor the implementation
- Engaging the budget (budgeting manger)

(6) District Development Committee

The District Development Committee is mainly responsible for:

- Preparing the District's development action plan;
- Monitoring and control activities and projects at the District level;
- Supervising the administration and finance at the District level;
- Preparing a project proposal of the development budget at the District level;
- Organizing training of the population with regard to development activities.

c. Community Level

(1) Tap manager

A Water Service Provider (or PO) subcontracts the management of the public tap to a tap manager. The tap manager is responsible for the following:

- Regulating use and care of public tap and distribution of water
- Collection of the water fees
- Keeping records of financial status, consumption of water and meetings with users
- Reporting problems and concerns to WSP and the district
- Developing links with Village council, WSP and the district
- Monitoring and evaluate activities
- Respecting water tap hours (opening and closing hours)
- Ensuring cleanness and protection of water points
- Customer services

(2) Water Users Committee at each public tap

Water Users Committee (WUC) is a group of individuals representing the water users in a certain area (water point). They are elected by water users (Community) to undertake activities related to the management of water points (borehole with hand pump, protected spring, Public tap) for the mutual benefit of the community, operator and local authorities.

Item	Public Tap / Kiosk for water supply system
Composition	1. President 2. Vice president 3. Secretary
Role and responsibility	• Monitor service delivery, functionality and cleanness of public tap or Kiosk • Report problems and complaints to committees at village, cell and sector level, DWB and water service provider once they happen • Represent the WP users' interests in the WUC at system level • Sensitize users to pay for water services

(3) Populations (Users)

- Payment of water bills on time
- Allowing access to water point & infrastructure
- Reporting unauthorized usage or interference with water supply
- Reporting damages or suspicious activities around water infrastructure to water service providers
- Payment for repairs or maintenance resulting from negligence
- Provision of feedback on the quality and quantity of services received
- Protection of infrastructure and the source from damage and contamination

d. Private Level

A private operator has a contract with the District to manage water supply in specific areas and facilities.

(1) Private Operator

1) Contract management

- Develop and update the O&M plan and ensure its implementation
- Ensuring proper service delivery to users
- Collection of water fees
- Ensuring minimum safety stock of water equipment
- Making repair facilities on time
- Responding timely on user's complaints and give feedback
- Producing financial and technical reports timely
- Taking corrective measures according to feedback of the districts
- Paying regular royalty fees
- Ensuring regular water quality tests
- Ensuring qualified human resources
- Provision of technical advice to the District
- Participation in asset inventory survey
- implementing the preventive maintenance
- Satisfy the customer satisfaction

2) Company management

- Ensuring good relationship with stakeholders such as RURA, REMA, RSB, spare parts suppliers, WASAC central Laboratory, etc.
- Getting registered with license
- Ensuring financial and administrative soundness
- Commercial administration such as billing and recovery efficiency, paying taxes

4.2 O&M Framework for Point Water Sources

Although the Government of Rwanda has prompted a water supply system as safe water in rural areas, over the 50 % of populations in rural area still depend on point water sources such as boreholes with hand-pumps and improved springs based on the EICV 4 published by National Institute of Statics of Rwanda in August 2015. Most of point water sources are scattered in remote areas and they are in great number, it may be difficult for POs to physically implement daily O&M for each point water source through the delegated management contract.

So combining the management of point water sources with the management of water supply systems is not recommended from updated the "National Water Supply Policy Implementation Strategy, December 2016". Delegated managed contracts are at the limit of financial viability and should not be burdened by additional tasks.

Point water sources will therefore be managed either through **specific contract with POs**, or **by strengthening the community-based maintenance system**, to be supervised by the district. **Districts shall choose their preferred approach**.

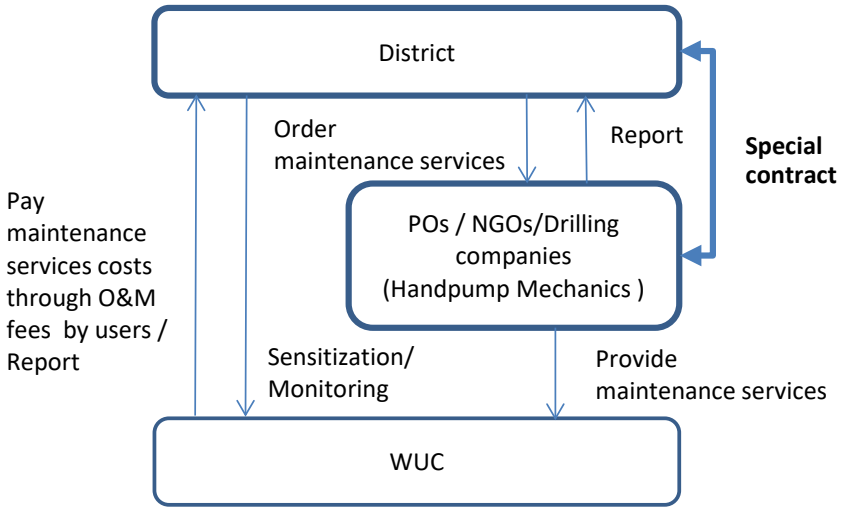


Figure 4-3: **Approach-1**: Maintenance services for Point Water Sources thorough special contract with POs

Table 4-1: Key responsibilities matrix for **Approach-1** (by special contract with POs)

Key Actors / Functions	District	Water Users Committee (WUC)	Users	Private Sector (POs/NGOs/Drilling companies)	WASAC RWSS
Asset owner	x				
Ownership		x	x		
Operation		x			
Special contract (maintenance services contract)	x			x	
Lending maintenance equipment for handpumps	x				
Setting O&M fees	x				
Collecting O&M fees		x			
Managing O&M fees / financial management	x				
Payment of O&M fees			x		
Reporting		x			
Setting WUC	x				
Sensitizing populations	x				
Monitoring	x	x			
Protecting and cleaning of point water sources			x		
Technical support					x

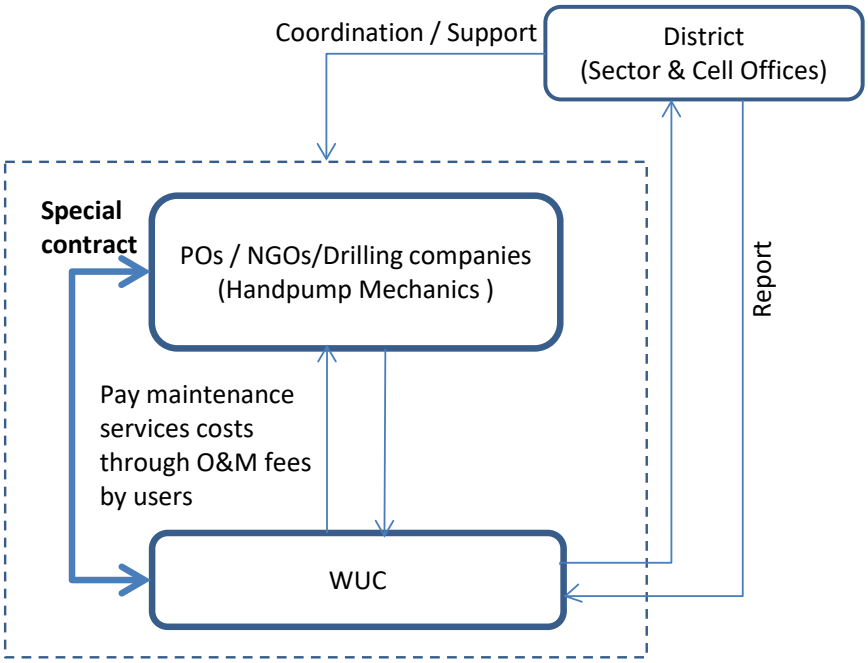


Figure 4-4: **Approach-2**: Maintenance services for Point Water Sources by strengthening the community-based maintenance system

Table 4-2: Key responsibilities matrix for **Approach-2** (by strengthening the community-based maintenance system)

Functions \ Key Actors	District	Water Users Committee (WUC)	Users	Private Sector (POs/NGOs/Drilling companies)	WASAC RWSS
Asset owner	x				
Ownership		x	x		
Operation		x			
Special contract (maintenance services contract)		x		x	
Lending maintenance equipment for handpumps	x				
Setting O&M fees	x				
Collecting O&M fees		x			
Managing O&M fees / financial management		x			
Payment of O&M fees			x		
Reporting		x			
Setting WUC	x				
Sensitizing populations	x				
Monitoring	x	x			
Protecting and cleaning of point water sources			x		
Technical support					x

(1) Type of special contract

There are two types of special contract, a maintenance contract and a repair contract. Details of these two types of contract are as follows.

Type of contract	Descriptions
Maintenance contract (Preventive contract)	➢ This type of contract is for one year and the handpump mechanics from POs/NGOs/Drilling companies should visit the point water source at least 4 times in a year for maintenance of the hand pump. ➢ The fee for the contract is determined by the District for approach-1 and by the WUC for approach-2 respectively. ➢ The contract fee should be revised from time to time based on the current rate of inflation.
Repair contract (Breakdown contract)	➢ This type of contract is signed whenever there is a breakdown of the hand pump and the District has not signed a maintenance contract with the handpump mechanics. ➢ The fee for this contract should be set and agreed with the District for approach-1 and the WUC for approach-2 respectively according to the type of repair.

4.2.1 Roles of key Actors for the O&M of Point Water Sources

a. National Level

Most roles of key actors for maintenance of point water sources are as same as O&M framework for water supply systems described in **Clause 4.1.1** except interventions by RURA who is a regulator for water supply services by the water supply systems managed by PO.

b. District Level

The District is asset owner of the point water sources and takes the lead in the implementation of all the water and sanitation activities at district level.

The main roles for **Approach-1** and **Approach-2** respectively performed include:

Approach-1: Maintenance thorough special contract with POs	**Approach-2**: Maintenance services by strengthening the community-based maintenance system
• Planning and budgeting including asset replacement • Setting O&M fees (contributions) • Setting up of WUCs • Sensitizing populations • Initiation and following up of capacity building for WUCs • Ensuring operation and maintenance (O&M) of point water sources by WUCs • Initiate and carry out monitoring, together with other stakeholders • Ensure that reports are submitted to the appropriate authorities in time • Lending and managing maintenance equipment for handpumps	
• Initiation and follow up of procurements	• Coordination and support of the special maintenance contract between WUC and

Approach-1: Maintenance thorough special contract with POs	**Approach-2**: Maintenance services by strengthening the community-based maintenance system
• Sign of the special maintenance contract with private sector (POs/NGOs/drilling companies) • Contract management • Managing O&M fees / financial management	private sector (POs/NGOs/drilling companies)

c. Community Level

(1) Water Users Committee for borehole with handpumps

Item	**Approach-1**: Maintenance thorough special contract with POs	**Approach-2**: Maintenance services by strengthening the community-based maintenance system
Role and responsibility	• Monitor service delivery, functionality and cleanness of BH • Report problems and complaints to committees at village, cell and sector level, DWB and water service provider once they happen • Sensitize users to pay for water services and ensure O&M • Carry out regular O&M where necessary • Open bank account and collect water fee	
	• Report problems for the maintenance services to district	• Sign of the special maintenance contract with private sector (POs/NGOs/drilling companies) • Contract management • Managing O&M fees / financial management
Composition	Six members (President, Vice president, Secretary/Treasurer, Two Councillors, Technician)	

(2) Water Users Committee for protected / improved spring

Item	Description
Role and responsibility	• Ensure cleanness of protected spring • Report problems and complaints to committees at village, cell and sector level, DWB and water service provider once they happen • Sensitize users to pay for water services and ensure O&M • Open bank account and collect water fee
Composition	Five members (President, Vice president, Secretary/Treasurer, Two Councillors)

d. Private Sector

The private sector such as POs /NGOs/ Drilling companies is responsible for direct implementation of maintenance services for point water sources especially as handpump mechanics through special contracts by either from the district or WUC. The main roles performed include:

- Providing technical service at a fee based on assigned special contract
- Procurement of the required spare parts
- Maintaining necessary skills by either self-study and trainings organized by district/WASAC/DPs
- Reporting their activities to District and/or WUC
- Communicating information of their activities to District and/or WUC

Reference

- Law No.08/2006 of 24/02/2006 Determining the Organisation and Functioning of the District
- District Water Board Establishment, WASAC RWS, 2015 (internal document)
- Draft Strategy Note for the RWS – Rwanda, December 2015
- Rwanda Utilities Regulatory authority Web-page, http://www.rura.rw/index.php?id=6
- Guidelines for Rural Water Users Committees in Rwanda (Version 2012), WASH Project in Rubavu, Nyabihu, burera and Musanze, EWSA/Government of Rwanda/UNICEF/SNV
- FEPEAR Strategic Plan for Five Years 2016 – 2021, Kigali, September, 2015
- Annual report July 2015 – June 2016, Rural Water Supply and Sanitation Services Directorate, WASAC

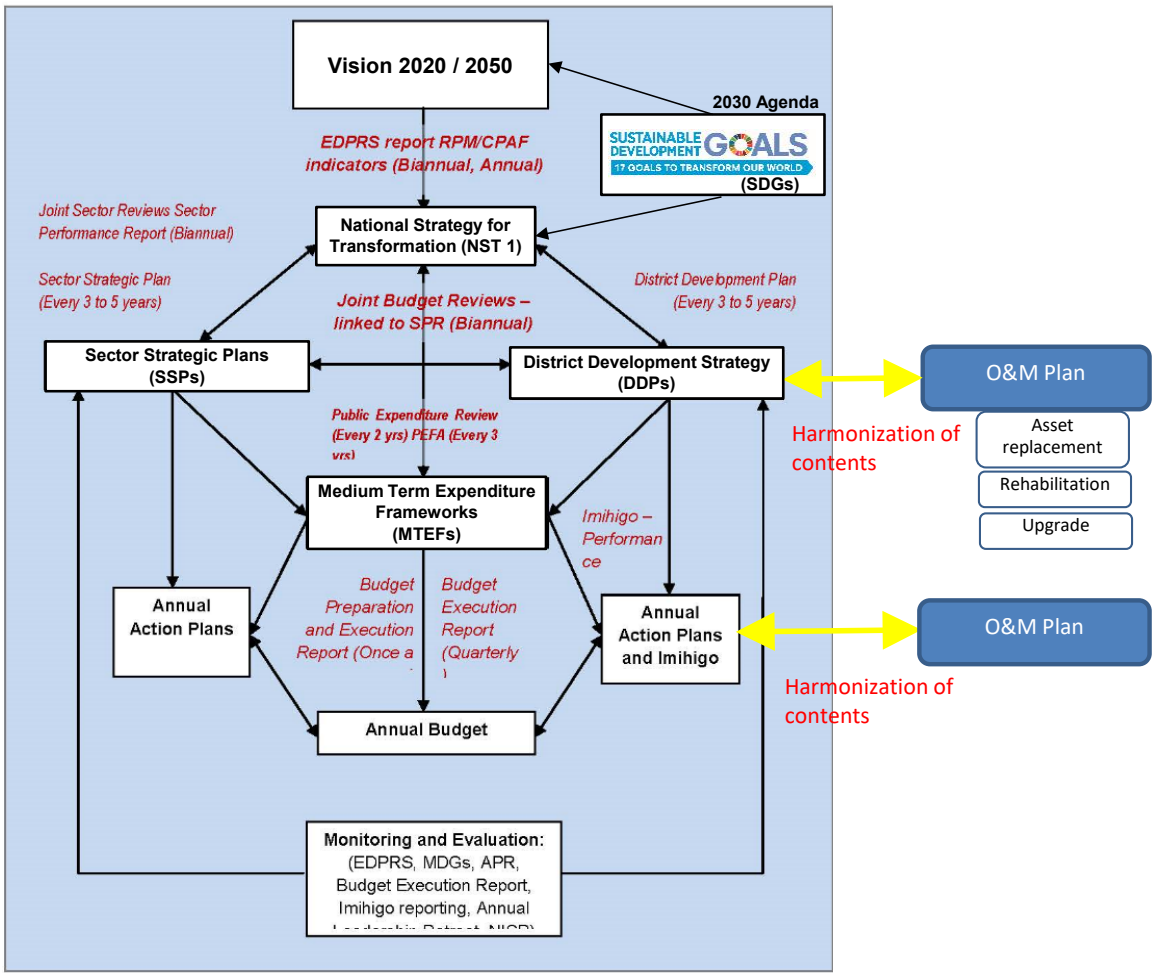
5 Planning for O&M

Inadequate planning can affect the success of an effective O&M of water supply facilities significantly. In order to ensure that O&M of water supply facilities is streamlined in all stages of operation, it is important to involve the key aspects not only in the Sector Strategic Plan (SSP) but also in various plans at district level such as District Development Strategy (DDS) and Annual action plan.

Formulation of the effective O&M plan is one of the strategies to be considered in ensuring district support to POs and also communities. The additional advantage to planning for O&M is that through sharing a detailed O&M plan with central government or donors, districts can also foster a greater understanding of the need and rationale for financial assistance.

5.1 National Planning Framework

Rwandan planning framework and strategies' implementation mechanism has been established by the government as shown in the figure below in which the relationship between planning, budgeting, monitoring and implementation mechanisms is clearly shown.



Reference Book: INCLUSIVE DIALOGUE ON THE POST 2015 DEVELOPMENT, October 2014

Figure 5-1: Rwandan planning framework and strategies' implementation mechanism

a. Vision 2020 / Vision 2050

The Vision presents a framework and key priorities for Rwanda's development and a guiding tool for the future. In 2000 the Government of Rwanda adopted the Vision 2020. Its objective is to transform Rwanda into a middle-income country by the year 2020. Vision 2020 was implemented through the first Poverty Reduction Strategic Plan (PRSP I), followed by the Economic Development and Poverty Reduction Strategy (EDPRS) 1 and EDPRS 2 which is ending in June 2018. Currently, Vision 2050 is drafted with the target for Rwanda to become an upper middle income country by 2035 and a high income country by 2050.

b. National Strategy for Transformation (NST)

In above sprit the new Economic Development and Poverty Reduction Strategy (EDPRS 3) is going to be elaborated. In September 2017 the Cabinet approved the name of "National Strategy for Transformation" (NST) as the new name to replace EDPRS 3. The decision was made to merge the new 7 Year Government Program (7YGP), which is required for the government mandate of 7 years (2017-2024), with NST. NST will be built on several strategies mainly thematic, Sector and District Development Strategies. That means the new District Development Strategies 2018 – 2024 shall be elaborated to feed into NST 1 and Vision 2050, aligned with the Sector strategy plans (SSP) and thematic strategies.

Source: A Citizen's Guide for DDS 2018-2024, LODA, October 2017

c. Water and Sanitation Sector Strategic Plan (SSP)

One of the most important functions of the Central government is to formulate policies and overall planning for the country. The roles of MININFRA are focused on formulation of polices as well as follow-up, oversight and evaluation of the water and sanitation sector.

Strategic Plan is a management tool which articulates the long-term direction of the organization. The plan stipulates goals, objectives and strategies which will provide guidance to implementation of the water supply and sanitation programme.

d. District Development Strategy (DDS)

The District Development Strategy (DDS) is a key element of the District's development. It sets the goals of the District in a 6-years local development strategy and reflects the district's priorities. The elaboration of the DDS involves the central and local government entities as well as the citizens and the civil society organizations at different levels.

e. Annual Action Plan

Annual action plan is drawn from the District Development Plan and stipulates activities to be done during the year. It incorporates with many sectors including water and sanitation. Operation and maintenance plan should be a part of annual action plan.

f. Performance Contract (imihigo)

The performance contracts (imihigo) actually stimulate a competitive environment within local government, as they are signed between district mayors and the President and at the end of the year performance evaluation reports are presented to the President in a ceremony, which is a day open to the public for mayors to show accountability and hold national dialogue over key issues. This also opens up local authorities' activities to scrutiny by the public and central government.

Imihigo attracted attention and were used to accelerate the implementation of key programs for poverty reduction at district level. The Imihigo forms the best choice for effective monitoring of performance. As a result, Imihigo indicators have become more comprehensive in capturing the NST1, the SDGs and sector- and district-specific priorities. This has been achieved via the central government's active involvement in the districts' setting of targets and deliverables, and close monitoring of the implementation of programs through the Imihigo.

g. Sustainable Development Goals (SDGs)

In September 2015, countries adopted the 2030 Agenda for Sustainable Development to end poverty and promote prosperity for all while protecting the environment and addressing climate change. The SDGs are a comprehensive development plan **to leave no person behind**.
The SDGs has water and sanitation at its core, with a dedicated SDG 6 on water and sanitation. Reaching the ambitious objectives of the SDGs demands that we address universal and equitable access to drinking water and sanitation along with issues of quality and supply, in tandem with improved water management to protect ecosystems and build resiliency. They include two main goals:

- **Goal 6**: **Ensure availability and sustainable management of water and sanitation for all**
- **Goal 17**: **Strengthen the means of implementation and revitalize the global partnership for sustainable development**

5.2 Key Principles for the Planning of the O&M

The key principles for the planning for O&M include:

- **Participatory planning:** Participatory planning can enable the government agencies responsible for water supply planning to understand the populations' real needs and willingness to participate. This provides a sound bottom-up feedback system for the planning process. Participatory planning requires project proponents to provide information about the project to all the stakeholders making the process open and transparent. Participatory

planning also requires project proponents to provide opportunities for all the stakeholders to express their concerns and opinions, and make sure that they are taken into fair consideration.

- **Realism:** The formulation of plans at all levels must take into account the resource (human, financial or otherwise) that are or will be available for their execution so that they are achievable within the period set for their implementation. However, this should not limit the ambition to achieve more.

5.3 Operation and Maintenance Plan

5.3.1 District

The O&M Plan should include at least the following components:

- Asset inventory of functionality of facilities
- Preventive and curative operation and maintenance plan
- Rehabilitation plan for existing water supply facilities
- Asset replacement plan
- Capacity development plan of the POs
- Water safety plan (water quality control)
- Monitoring and evaluation plan of all the activities
- Community mobilization and sensitization plan
- Budgeting plan (at least asset management, training communities, monitoring inclining the water quality)

5.3.2 Private Operator (PO)

The PPP contract for rural water supply systems obliges PO to develop their own O&M plan. This plan should be submitted to the District for approval. The District monitors and evaluates the implementation of O&M activities of PO based on the O&M plan. The O&M plan should be updated at least once a year.

The O&M Plan should include at least the following components:

- General information of the contract
- Information of the water supply facilities using asset management sheet
- Water service quality such as:
  - Water pressure
  - Water connection
  - Water metering
  - Resolution of complaints
  - Disconnection and reconnection
  - water quality
- Operational procedures, common operational problems and operational recodes

- Maintenance tools, spare parts inventory and preventive maintenance program
- Analysis of non-revenue water (NRW) and NRW reduction plan
- Cost calculation and annual indexation of the PO remuneration
- Budgeting plan
- Reporting plan
- Humane resource capacity development plan for O&M
- Health insurance and safety policy for the staff
- Protection plan for the water resources

5.4 Budgeting Plan

Budgeting is a financial planning process to achieve planned recurrent and development objectives. It is an important tool in the proper allocation of scarce resources necessary in the implementation of prioritized projects and activities. Budgeting is also an important instrument in controlling the implementation process and in evaluation exercises where budgets are utilized in comparing the actual and estimated cost of projects and activities.

5.4.1 Key Principles for the Financing of the O&M

The key principles for the financing for O&M include:

- **O&M costs** of rural water supply infrastructure **shall be covered by user fees**. Tariffs will be set by RURA to ensure the financial viability and sustainability of scheme operations, at a level of cost recovery that **includes major repairs and replacement of electro-mechanical equipment but not asset depreciation**. Targeted subsidy schemes or cross-subsidy arrangements will be considered in exceptional cases where the local conditions do not allow for cost recovery with affordable tariffs.
- The Districts will keep **monthly royalty** paid by the PO by the escrow accounts. This will be essential to finance major repairs, such as replacing electro-mechanical equipment, but **will not be sufficient to cover other capital maintenance and rehabilitation costs.**
- The bulk of **new infrastructure and major rehabilitation works will continue to be funded by the Government of Rwanda and its development partners**. Community contributions are important to foster commitment and ownership but will not exceed a percentage of the total upfront investment. NGOs will continue to contribute to infrastructure development.

5.4.2 Fund Sources and Usage

a. Renewal and Extension Funds

The District manages the renewal and extension funds for water supply systems which are generally supposed to be earmarked from District royalties paid by PO. These funds are intended to cover the cost for:

- Infrastructure renewal;
- Reinforcements or large scale extensions of water infrastructures to improve the service and/or to expand access to new users (construction of new water taps, network upgrade, installation of more powerful pumping equipment, etc.);
- Bank charges.
- Operating costs of the District water, sanitation and hygiene services "District WASH Board''

b. Central and Local Government Transfers

Rural water supply tariffs regulated by RURA have to be balanced to reconcile the interests of (1) cost recovery, (2) affordability for the rural poor, and (3) attractiveness for private operators.

In terms cost recovery, following levels shall be distinguished

Levels of Cost Recovery
Level 1: Running costs for operating the water system (staff, energy, consumables)
Level 2: Running costs + all repairs (including replacement of electro-mechanical equipment)
Level 3: Running costs + all repairs + depreciation of assets

Source: National Water Supply Policy Implementation Strategy, GoR, December 2016

Rural water supply shall aim cost recovery at Level 2. Level 1 would not ensure the sustainability of operations, while Level 3 would not be affordable in terms of tariffs.

Under the current delegated management contracts, usually the PO is in charge of running costs (Level 1) while the district is supposed to pay for major repairs (Level 2) and system extensions. In certain cases, subsidies or cross-subsidies through earmarked budget allocations or through Local Administrative Entities Development Agency (LODA) may be needed if the district royalties are not sufficient to cover all the Level 2 and Level 3 costs.

c. Donor Funds

Development partners (DPs) such as donors and NGOs are the largest provider of grants in the country. The distribution of donor funds among the Districts depend on the agreement entered into between Central Governments and the DPs. Fund distribution may be based on a formula and specific district basis.

5.4.3 Cost Estimation for O&M

Cost estimation is important because cost information helps the relevant stakeholders to understand the financial impact of the decisions for the O&M projects and/or activities to be funded. Cost estimation can provide answers to a wide range of questions, including the following:

- What are the financial assumptions made to realize a project and activities for O&M.
- What is the unit O&M costs considered in the Sector Strategic Plan, District Development Strategy, and Annual Action Plan.

So cost estimation shall be conducted carefully and reflected the present cost environment.

a. Cost estimation for Annual maintenance cost

The minimum calculatory annual maintenance cost are presented in the table below according to the ***"Guidelines for financing and costing of DDSs, GoR, May 2017".***

Table 5-1: Minimum calculatory annual maintenance costs by type of infrastructure in percent of total investment costs

Category	Percentage
Water supply systems	2%
Storage tanks	2%
Water pump stations	2%

Source: Draft Guidelines for financing and costing of DDSs, GoR, May 2017

b. Cost estimation for Asset Management

As owner of the assets, the District is also responsible for replacement. In order to plan for replacement, the District should have knowledge about the condition of the assets.

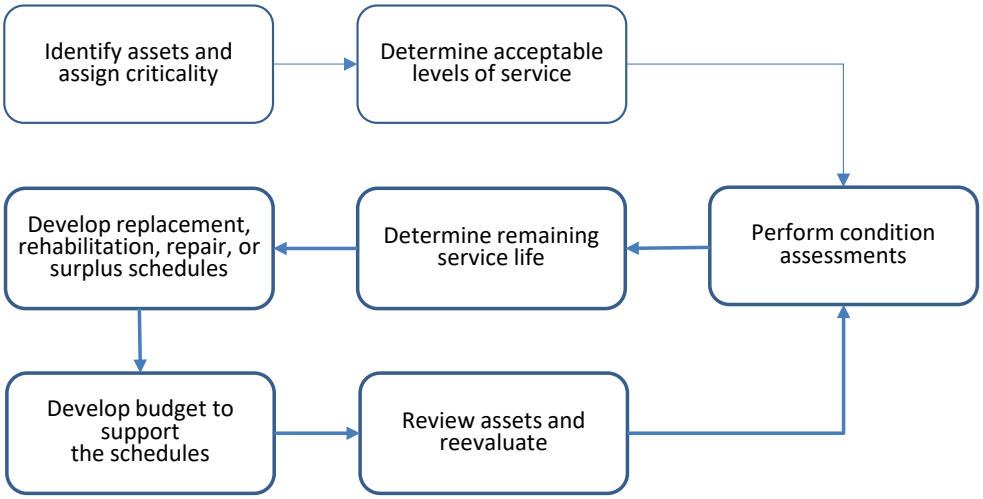
（1） Asset management process

The Asset Management process is composed of numerous steps that include the identification of assets, their criticality, and the acceptable levels of service. Condition assessments are performed and a remaining service life is determined for each asset. With this information, the District in collaboration with PO develops replacement, rehabilitation, repair, or surplus schedules and develops budgets to support the schedules. This is a reiterative process due to changing conditions and circumstances and the addition of new facilities, and equipment. The Asset Management process is shown in the next page.

（2） Prioritized assets

The priority to replace the assets can be defined by taking into account:

- The year of replacement;
- The importance of the asset for water supply;
- The possible damage caused to its surroundings in case of rupture of the asset (for example main transmission pipeline).



Source: 2011 ASSET MANAGEMENT PLAN, 2009, San Diego County Water Authority

Figure 5-2: Asset Management Process

(3) Estimation of the total financial reserve required in the current year

The District should – if necessary in cooperation with the PO- estimate the costs of activity.

The following table serves as an example and can be adapted according to the District's needs. For each asset, calculate the reserve required by dividing the cost by the years until the action will be needed. This is the estimated amount of money that water supply system(s) needs to set aside per year ("Reserve required current year" on the below sheet) for that asset. Add the reserves required per year for each item to calculate the total reserve required in the current year. This is the estimated amount of money that your system needs to set aside, starting this current year, in order to pay for all of the rehabilitation and replacement.

The District can then use this information to determine whether a potential rate increase, customer surcharge, state or federal grant or loan, or other source of funding will be required.

The detailed steps can be found in the "***District and Private Operator's Manual for Operation and Maintenance of Rural Water Supply System in Rwanda, 2019***".

Table 5-2: Sample asset budget sheet

Completed/updated: *date*					
Priority	**Asset (list from highest to lowest priority)**	**Activity**	**Years until action needed**	**Costs expected**	**Reserve required current year**
	Name asset	*Replacement*	*= year in which replacement is needed*	*To be determined for example by discussion with contractors,*	*Costs divided by the years until action is needed*

			minus the present year	*operators or other Districts*	
1	*Submersible pump*	*replacement*	*2 (2020)*	*5,000,000 Rwf*	*2,500,000 Rwf*
2	*PVC DN 75, PN16 (2,066m)*	*reconstruction*	*4 (2022)*	*8,000,0000 Rwf*	*2,000,000 Rwf*
3	*HDPE DN50, PN10 (1,500m)*	*reconstruction*	*10 (2028)*	*3,000,000 Rwf*	*300,000 Rwf*
Total reserve required in current year					*4,800,000 Rwf* *= Total of reserve required for all assets*

Source: District and Private Operator's Manual for Operation and Maintenance of Rural Water Supply System

Reference

- Inclusive Dialogue on the post 2015 Development Agenda – Helping to strengthen Capacities and Building effective institutions, Rwanda Country Report, October 2014, Unitised Nations
- Participatory planning guidelines for water services projects in Jiangsu, China, 2009, USAID
- Result based performance management (RBM) policy for Rwanda Public service, 2015, Ministry of public service and labour and Ministry of finance and economic planning
- Draft Guidelines for financing and costing of DDSs, GoR, May 2017
- District and Private Operator's Manual for Operation and Maintenance of Rural Water Supply System, GoR, 2019
- A Citizen's Guide for DDS 2018-2024, LODA, October 2017
- 2011 ASSET MANAGEMENT PLAN, 2009, San Diego County Water Authority
- Managing Small Public Water Systems: Asset Management, 2016, TCEQ publication RG-501a

6 Public-Private Partnership (PPP) Approach in Water Services

6.1 Introduction

Rwanda enacted a PPP law (**Law Nº14/2016**) in May 2016, in line with the National Development Program (Vision 2020) and the Second Economic Development and Poverty Reduction Strategy (EDPRS II). Vision 2020 also includes infrastructure development as one of the five pillars to support growth.

A PPP is a contractual arrangement between a contracting authority of the government and a private partner where both share the risks of finance, design, construction, rehabilitation, operation and/or maintenance of an infrastructure facility, other asset, or a public service. The private partner receives financial remuneration either from government contributions, charges or user fees, or a combination of both.

The Rwanda Development Board (RDB) is currently the leading agency in PPP promotion and reports directly to the President. In legal terms, Rwanda's PPP arrangements are organized on a contract-by-contract basis, whereas some definitions of the legal framework have been developed.

In general, there are different forms of private sector participation in water services: from the minimum involvement, the service contract, to full divestiture. The table below shows major types of private involvement.

Table 6-1: Typical characteristics of contract reviewed

Type / Item	Management / O&M Contracts	Affermage Contracts	Lease Contracts	Design-Build-Operate / Design-Build-Lease
Share of private operator responsibility	Public responsibility ←			→ Private responsibility
Description	Public party delegates management of system to operator	Public party delegates service provision to operator	Public party leases asset to operator to operate the service	Operator agrees to design build and operate a system
New / Existing Asset	Existing asset	Existing asset	Existing asset + new build/ rehabilitation	New build or rehabilitation
Scope of Operator	Manage the system (limited repair) (takes risk of cost of operation)	Operate and maintain the system (limited repair/renewal)	Operate and maintain the system (limited repair)(takes risk of cost of operation)	Design build and operate (+ repair/renew)
Ownership	Public party	Public party	Public party	Operator until paid for capital investment, then public party

Type / Item	Management / O&M Contracts	Affermage Contracts	Lease Contracts	Design-Build-Operate / Design-Build-Lease
Fee	Public party pays fee to operator	Operator pays public party % of revenues towards capital expenditure/operator retains fee (linked to revenue generated) and pays rest to public party	Operator pays to pubic party a fixed fee	Public party pays a fee on completion of the asset and then an operating fee
Revenue Source	Tariffs or public budget	Tariffs	Tariffs	Tariffs or public budget
Revenue Risk	Public party	Shared between parties	Operator	Operator
Duration	1 – 10 years	2-10 years	5-10 years	7-20 years

Source: Structuring Private-Sector Participation (PSP) Contracts for Small Scale Water Projects, International Bank for Reconstruction and Development / World Bank, 2014

6.2 Water Investments through PPP

In water sector, Rwanda, the history of the development of infrastructure asset through a PPP began in 2015 with a 27-year concession to develop, operate and maintain a 40,000 m^3/day bulk water supply scheme in Kigali City. The Government of Rwanda (GoR) has encouraged and supported private-sector investments not only urban water supply but also rural water supply. The GoR shall consider options to leverage private capital investments by providing low-interest loans, through output-based aid or co-financing.

The importance of this type of model is expected to grow in the future, once the sector develops beyond basic service delivery.

Among the types of non-government investments to be encouraged and co-financed are:

- Investments by private operators (in particular, system extensions, rehabilitations and service-level upgrades);
- Investments by religious communities that are in the public interest;
- Community self-help initiatives (e.g., to install rainwater harvesting facilities, self-supply, scheme expansions), to be financed through 'Ubudehe' programme and
- Participatory approach (in kind contribution through community activities ('Umuganda'), where water material expertise is to be financed by a third party).

Private investments will be subject to the same standards and regulations as public investments with respect to service standards, design principles, tariffs (affordability) and customer protection.

6.3 Delegated Water Service Management

6.3.1 Introduction

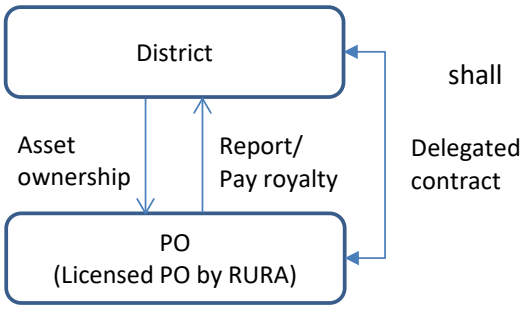
The delegated water service management is a process that Government delegates the Operation and Maintenance of the safe drinking water supply system to a national private operator.

As specified in "**Article 71 of the Law N°62/2008 of 10/09/2008 (Water Law), putting in place the use, conservation, protection and management of water resources regulations, the public water service"** is provided by Sectors, Districts, City and groups thereof.

Districts and City can manage the service or delegate it to public or private operators of their choice. This is actually the establishment of a Public Private Partnership (PPP).

Specifically, the PPP based on the following actors:

- **The District** is owner of the infrastructure and guarantor of the public interest and in particular ensure that measures are taken to ensure continuous operation of the service. The District provides all functions of user representation and control service.



- **The PO** is responsible for the technical, commercial, financial and administrative operation of the service. It is selected by competition to manage clustered water supply facilities to ensure effective management.

Both actors are linked by a delegated management contract which clarifies the responsibilities and obligations of each party. District represents the interests of water users and must monitor the performance of the private operator.

6.3.2 Water Service Delegation

a. Objective of Water Service Delegation

The following principles of water service delegation should be applied.

Objective	Statement
General objective	To establish an effective management of drinking water supply systems, ensure continuous and regular supply of drinking water to the population in sufficient quality and quantity and ensuring the maintenance of hydraulic infrastructures in operation and sustainability of water service
Specific objectives of PPP	• To ensure effective water service delivery • To ensure continuous water service in sufficient quantity and quality consistent with standards • To ensure operation, maintenance and rehabilitation of water supply facilities • To ensure technical, financial and administrative management

Objective	Statement
	performance for the sustainability of the water supply facilities • To ensure enabling environment for investors of rural water supply facilities

6.3.3 Condition of Delegated Water Service Management Contract

Terms of contract	Condition
The signatories of the Contract	• District and Private Operator • WASAC (witness)
Duration of the Contract	A period of 5 year is a minimum as seen the PPP
Level of service	Contract will provide the definition level of service with respect to the quality, quantity, pressure and continuity of service in conformity with the laws **N0 01 / RURA / 2013** suggesting the minimum service level required for the provision of water services and **No. 002 / RB / WAT-EWS / RURA / 015 23/09/2015** governing water distribution services in Rwanda developed by RURA and any other law of the Republic of Rwanda in relation to water and the environment
Responsibilities with respect to service delivery by POs	• O&M of intakes, springs, treatment plant, pumping station, distribution network and operating equipment. • Sale water to consumers from stand pipes and private connections. • Renewal of operating equipment and other facilities depending the contract duration. • Production and distribution of potable water • Fees collection • O&M of delegated infrastructures • Company's internal management • Commercial administration • Reporting • Advising district for service development and sustainability
Responsibilities of the District	• Represent and protect the interests of users of water services; • Educate users to pay for water services as defined in the Contract and have good relationships with the PO; • Ensure water infrastructure security by fighting against the depredations, theft and other vandalism activities; • Request explanation to the PO if there is a malfunction of a non-informed water service exceeding 2 days; • Manage renewal and extension funds in accordance with its purpose and procedures in the interest of the population. In particular, account for the royalties should be opened in the national bank of Rwanda. • Make feasibility studies for extension of potable water supply systems with the support from WASAC. • Mobilize the necessary funds for water supply system extensions to other unserved areas • Organize a quarterly visit as part of the PO inspection and keep the related reports in accordance with the format • Review and analyses the monthly, quarterly and annual reports submitted by the PO and give the feedback in a period not exceeding ten, fifteen and thirty days from the date of receipt of the reports for each monthly, quarterly and annual reports.

Terms of contract	Condition
	• Make available to the PO a list of vulnerable who receives free water services.
Responsibilities of the WASAC RWSS	WASAC is committed to support the District through the following obligations: • Assist the District to plan, develop and implement new water supply projects • Assist the District to make a water infrastructure rehabilitation plan • Support the District in the recruitment process of PO of the water supply system • Support the POs to improve the management system through capacity building and training • Monitor and evaluate the implementation of the contract
Relations between the PO and the Users	To ensure the greatest possible transparency with water users, the PO must follow certain instructions and obligations including: • Opening an office to the public in the trading centre, with reasonable opening hours (minimum 9 hours per day or 45 hours per week unless otherwise agreed with the users) and having phone numbers that users can call in case of need. The conditions of access to public service (connection fees and water tariff) must be displayed in the office by the PO, possibly translated into local language. • The PO shall collect claims (oral, written and electronic) of users on service quality (kept and registered for this purpose) and is required to respond within a period not exceeding five (5) days for daily problems and seven (7) days for problems related to billing. • The PO shall have a simple device to check the functionality of water meters for the consumers. If it turns out that a meter error caused over payment by the consumer, the PO is required to change the water meter within a period of two (2) days and must make an adjustment in the billing periods for subjects of complaints. If the meter error is due to the consumer, the consumer has to pay the bill and the costs of acquisition and replacement of the meter.
Obligations of the Operator regarding the keeping of records	The PO should have the following information: • **Regarding the distribution points** a) The sales details of water per public tap (meter reading at the closing time of the water tap); b) The sums collected by public tap; c) Any water loss and against their value in FRW per tap; d) The details of sales of water to individual connections e) The register of individual consumers; f) The register of other consumers (institutions, industries, water trough owners). • **Regarding maintenance** a) A document of the statement of the water meter at the source and the statement of operation time of pumping station; b) A technical document summarizing the maintenance and repairs made (on the reservoir, the distribution network and sale points). • **Regarding expenditure / revenue** a) A ledger of expenditure / revenue including date, objects of cash flow, expenses incurred, receipts and bank statements); b) Bank book and cash book;

Terms of contract	Condition
	c) A workbook containing all the supporting documents of financial flows (daily expenses, daily revenue, received cash collected at distribution points, bank transactions, receipts for any charges).
Water tariff	• To regulate the water tariff by RURA
Royalty fees	• To respect the tariff fixed by RURA Note: As of January 2017, royalties is defined by RURA 10% of revenues generated by PO
Renewal and Extension Fund	The Renewal and Extension Fund shall be part of the Royalty of the District and monthly paid by the PO into a bank opened to this effect. This amount shall be managed by the District through DWB. The raison of this Fund is to cover the following provisions: • The Renewal of Infrastructure. • The reinforcement or Extensions of Infrastructure intended to improve the Service and/or extend its access to new Users (construction of new public taps, network extension, putting in place more powerful means of production, etc.
Revision of the Royalty of the District	The Royalty of the District may be revised by RURA in consideration of the various factors such as price escalation, estimated cost and etc.
Revision of water tariff	• Any change in water tariff will be requested jointly by the PO and the District to RURA • All revision of the price of the Operator or the royalty of the District shall be applied on the water tariff.
Regime for private connections	Any natural person or legal entity may apply for a private connection. The application shall be made to the management of the Operator. Any application for connection shall be subjected to a subscription the conditions of which shall be stipulated in the Delivery Conditions.
Payment of consumptions	The meter shall be read at least once a month and the Operator shall establish an invoice in accordance with the defined tariffs. The User shall pay his or her invoice in ten (10) days at the latest after its receipt. In case of delay in the payment, the Operator shall be entitled to suspend the supply of water
Termination of the Contract	A Preliminary Termination Notice to the other Party shall specify in reasonable detail (90 days) the circumstances giving rise to the Preliminary Termination Notice. This is valuable if any of the following events occur. **<u>Termination by the District:</u>** • Durable interruption to provide water service due lack of serious insufficiency of maintenance of infrastructure; • Delay of more than three months by the Operator in the payment of the District's Royalties due • Repeated and duly noticed non-respect of tariffs by Operators of Public Taps; • The passing of a resolution by the shareholders of the Operator for the winding up of the Operator or the appointment of a liquidator in a proceeding for the winding up of the Operator by a court of competent jurisdiction, which appointment has not been set aside or stayed within 60 days • Lack of or serious insufficiency of Maintenance of Infrastructure duly noticed by an external audit;

Terms of contract	Condition
	• Serious irregularities noticed by an external audit in the provision of the Service • Impossibility to produce an annual report or rejection of accounts by auditors on grounds of fraud, serious anomalies or serious breach of the provisions of this Contract, or • An event or circumstance of Force Majeure as provided **Termination by the Operator:** • Refusal by the District to ensure sufficient protection of infrastructure, Operators of Public Taps as well as any other staff mobilized by the Operator; • District's refusal or impossibility to proceed with contractual Renewals of Infrastructure; or • An event or circumstance of Force Majeure as provided

6.3.4 Step to Initiate a Delegate Water Service Management

a. Assets Inventory

The District should have detailed inventory of all assets including point water sources on its territory and define what is suitable for delegation and what need the rehabilitation. When determining what can be delegated the need for rehabilitation or extension of parts of the system will be identified and will have to be carried out before assets are delegated. Those not functional should first be rehabilitated or included in the management contract under a specific addendum defining investments conditions.

Following information are needed in assets inventory.

- Type of facilities (piped water supply system, borehole, protected spring)
- Water supply system maps (as-built drawing)
- Location of the facilities
- Specifications of the facilities
- Condition of the facilities

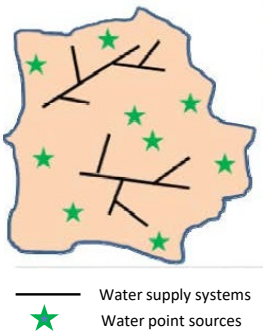
Table 6-2: Asset management sheet

Asset	Year of construction	Theoretical technical lifespan	Condition	Service history	Functional lifespan	Year of replacement	Priority
Name of asset	*(Estimated) year in which the asset was constructed*	*See list of theoretical technical lifespan*	*Good, reasonable, poor*	*Maintenance activities, rehabilitation*	*Theoretical Technical Lifespan adjusted for condition and service history*	*Year of Construction + Functional Lifespan*	*The priority to replace the asset (1 is highest)*
Pump, located in place X	2006	10	Good	Rehab. 2009	10	2016	2
Reservoir, location X	1993	40	Average		35	2028	3
PVC main	1995	30	Poor	3 repairs in 2012, 2 repairs in 2011	17	2012	1

Source: District and Private Operator's Guideline for Operation and Maintenance of Rural Water Supply System in Rwanda, SusWAS Project, 2016

b. Defining Clusters Allowing Attractive Contract

The District should define the cluster service areas of rural infrastructures for the delegated management in consideration of following points in order to allow for economy of scale and create commercially viable unites that are attractive for professional service providers.



- Served population of the water supply facilities
- Location of the water supply facilities
- Number of the water supply facilities
- Estimation cost for the water supply facilities

c. Procurement Process

The procurement process is defined as following steps based on the "**Public procurement user guide (2010)**" by Rwanda Public Procurement Agency (RPPA).

- Procurement Planning;
- Preparation of bidding documents;
- Publication and distribution of invitations to bid;
  - Either expression of interest, driving to a short list
  - Either direct and open consultation
- Receipt and safe keeping of bids;
- Offers analyse by competent officers, possibly supported by experienced resources;
- Submit award recommendation to competent authority

- Final awarding decision;
- Notification, contract finalization with selected operator;
- Contract signature process
- Information about procurement result: competitors, public, RPPA, RURA

6.3.5 Model PPP Tender Document and Contract

Model PPP tender document and contract can be obtained from the WASAC respectively.

Reference

- Training module “Delegated management of rural water supply services under public private partnership”
- Training module “PPP Contract Tendering for Rural Water Supply”
- GUIDELINES FOR PERFORMANCE-BASED CONTRACTS BETWEEN WATER UTILITIES AND MUNICIPALITIES, OECD, 2011
- Structuring Private-Sector Participation (PSP) Contracts for Small Scale Water Projects, International Bank for Reconstruction and Development / World Bank, 2014
- https://pppknowledgelab.org/countries/rwanda
- https://policy-perspectives.org/2017/05/26/public-private-partnerships-in-rwanda/

7 Water Quality Management

7.1 Introduction

The main objective of National Water Policy is to ensure safe drinking water to population. It is equally important for human health to have quality drinking water.

Water quality monitoring is carried out to ensure the conformity of the water quality with the national standards for piped water supply systems and water points.

7.2 Water Quality Monitoring Framework

The district in collaboration with PO shall make sure that all drinking water delivered to the population will comply with Rwanda Standard regarding water quality. The failure to provide adequate protection and effective treatment of water exposes the community to the health risks. Thus, it is important to establish an assurance system for water quality monitoring. In this regard, funds for conducting water quality tests by the authorized water laboratories for rural water supply facilities are required to secure the reliability of test results.

In consideration on this context, the following diagram for water quality monitoring framework for rural water supply facilities will be established. Summary of the framework will be described below, and details can be found the "***Rural Drinking Water Quality Management Framework, 2019***" as separated volume.

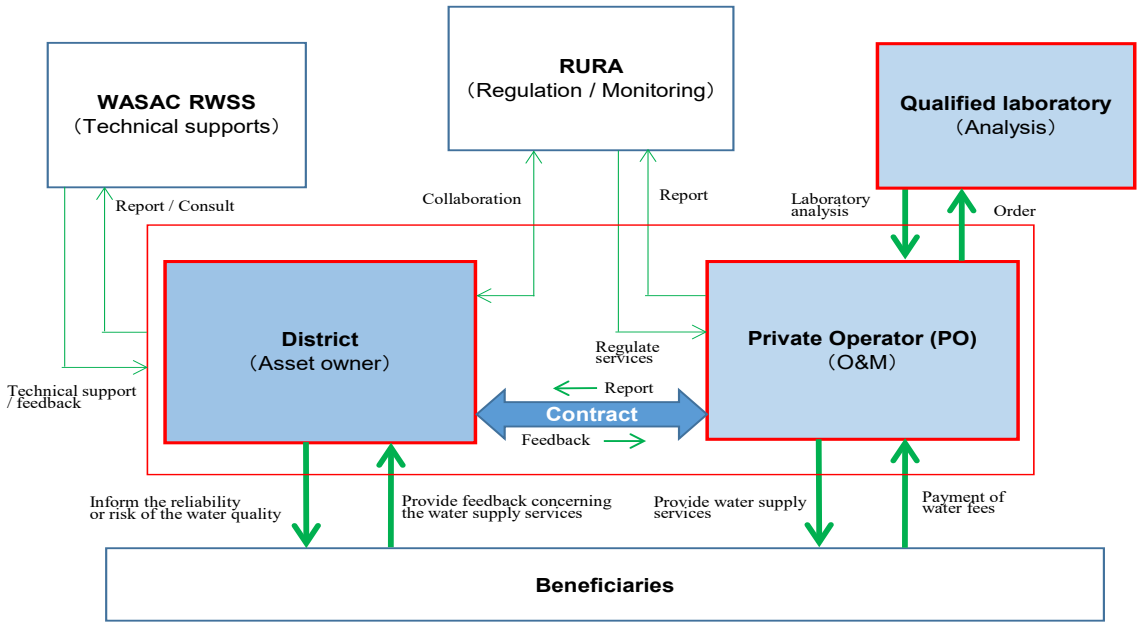


Figure 7-1: Key actors for the rural drinking water quality management

7.2.1 Role and Responsibility for Water Quality Monitoring

The role and responsibility for water quality monitoring of rural water supply facilities are as follows:

Table 7-7-1: Role and responsibility for water quality monitoring

Stakeholders	Role and Responsibility
District	• To develop the annual water safety plan for all rural water supply facilities including budget plan and implementation schedule. • To supervise water quality monitoring for all rural water supply facilities. • To keep water quality monitoring report. • To enter water quality data to National MIS. • To assess water quality of both raw water and distributed water. • To ensure protection of the water source from contamination. • To inform results of the water quality for all rural water supply facilities to the community. • To provide community sensitization for proper water use including implementation plan and budget plan.
PO	• To disinfect water regardless of whether the source is surface or ground water. • To protect water sources and watersheds. • To submit reports of water quality tests to the District, WASAC and RURA. • To operate and maintain the water treatment facilities through certified or trained operators. • To disinfect water networks after repair. • To request an authorized water laboratory to conduct water quality test. • To ensure water disinfection. • To ensure the quality of the chemicals used in water treatment.
WASAC RWSS	• To provide technical assistance for water quality monitoring to districts and POs. • To provide training for water quality monitoring to districts and POs. • To keep records of water quality analysis for future references.
MININFRA	• To keep and manage the water quality data in national MIS. • To coordinate the concerned stakeholders. • To advocate to raise funds for rural water quality control.
RURA	• To regulate the provision of water services including the water quality for all rural water supply facilities. • To evaluate capability of POs in the water quality management. • To monitor water quality and propose corrective measures to POs and districts. • To set water tariff including cost of water quality control
RSB	• To provide the portable water quality standard. • To provide certification to POs.
Qualified water laboratory	• To conduct water quality test (sampling, analysis and report of the result). • To be well equipped for water quality analysis and qualified staff
Community	• To protect water sources and watersheds from contamination such as livestock, animals and human activities. • To have awareness of the ownership of water supply infrastructure and their protection

Stakeholders	Role and Responsibility
	• To inform any issue-related to water quality deterioration to districts and POs.

7.3 Water Safety Plan

A water safety plan is a comprehensive risk assessment and risk management approach that takes into consideration the potential risks to the safety of the water from the supply catchment area to the consumer.

A water safety plan should consist of three key components:

- System assessment to determine whether the drinking-water supply chain (up to the point of consumption) as a whole can deliver water of a quality that meets health-based targets;
- Identifying control measures in a drinking water system that will collectively control identified risks and ensure that the health-based targets are met; and
- Management plans describing actions to be taken during normal operation or incident conditions and documenting the system assessment (including upgrade and improvement), monitoring and communication plans and supporting programs.

This tool was developed and promoted by World Health Organization. "***Rwanda Standard, portable water – specification (2014)"*** adopted this tool for assessment of water supply systems. The safety plan shall be developed according to context of rural water supply in Rwanda.

7.3.1 Routine Monitoring for Water Quality Control

Private Operator (PO) shall fulfil the following minimum requirements for securing safe water but not limited to:

The choice of frequency of sampling for water analysis will depend on:

- Type of water source (groundwater or surface water)
- Number of water sources for being inter connected to one collecting chamber.
- Procedure or method of treating raw water
- Risk of contamination in various parts of the system
- Particular type of system
- Previous history of water quality
- Size of the population supplied with water
- Length of the network

Minimum parameters to be analysed by qualified water laboratory at least twice a year.

Table 7-7-2: Parameters required for minimum monitoring of rural water supply

Parameter	Criterion measure	Method of test	Frequency (times / year)
Physicochemical			
Turbidity (NTU max)	≦5NTU	ISO 7027	2
pH value	6.5 – 8.5	ISO 10523	2
Microbiological			
Total coli-forms	Absent	ISO 9308-1	2
E. coli	Absent	ISO 9308-1	2
Chemical			
Nitrate as NO_3^-	≦45 mg/L	ISO 7890	2
Ammonia (NH_3)	≦0.5mg/L	ISO 11732	2
Iron (total) Fe	≦0.3mg/L	ISO 6332	2
Aluminium, Al^{3+}	≦0.2mg/L	ISO 12020	2
Manganese (Mn^{2+})	≦0.1mg/L	ISO 6333	2
Copper (Cu^{2+})	≦1.000mg/L	ISO 8288	2
Phosphates (PO_4^{3-})	≦2.2mg/L	ISO 15681	2
Fluoride (F^-)	≦1.5mg/L	ISO 10359	2
Arsenic (As^{2+})	≦0.01mg/L	ISO 11969	2
Residual free chlorine	≦0.2 -0.5	ISO 7393	2

Source: Rwanda standard (RS EAS 12:2-14). Potable water- Specification

NB:

- Heavy metals and Organic contaminants (pesticide) should be tested according to potential risk of contamination in various parts of the systems based on the history of the sites.
- All required water quality parameters for potable water specified in Rwanda standard (RS EAS 12:2-14) is shown in Appendix 3 and shall be considered for new water supply system.

Reference

- Rwanda Standard (RS EAS 12: 2014), Potable water – Specification, RSB 2014

8 Monitoring and Evaluation (M&E)

8.1 Monitoring

Monitoring is defined as a systematic collection, analysis and acting on information related to ongoing program activities using defined procedures and tools. It aims at comparing the actual situation going on with the expected (planned) and then taking corrective measures to address the congruence between the reality and the expectations.

Monitoring is done while you are carrying out a project and/or recurrent activities in order to:

- Assess progress – what has been done, what has not been done.
- Identify problems and their causes and find appropriate solutions.
- Check that resources are used effectively and activities are not costly.
- Check if the work is producing the required results.

These procedures have to be carried out iteratively between a project implementer and a monitoring team. Monitoring focuses on inputs and activities, in other words, the process of implementation.

8.1.1 Water and Sanitation Monitoring Framework

The following chart shows the framework of monitoring under rural water and sanitation sub sector.

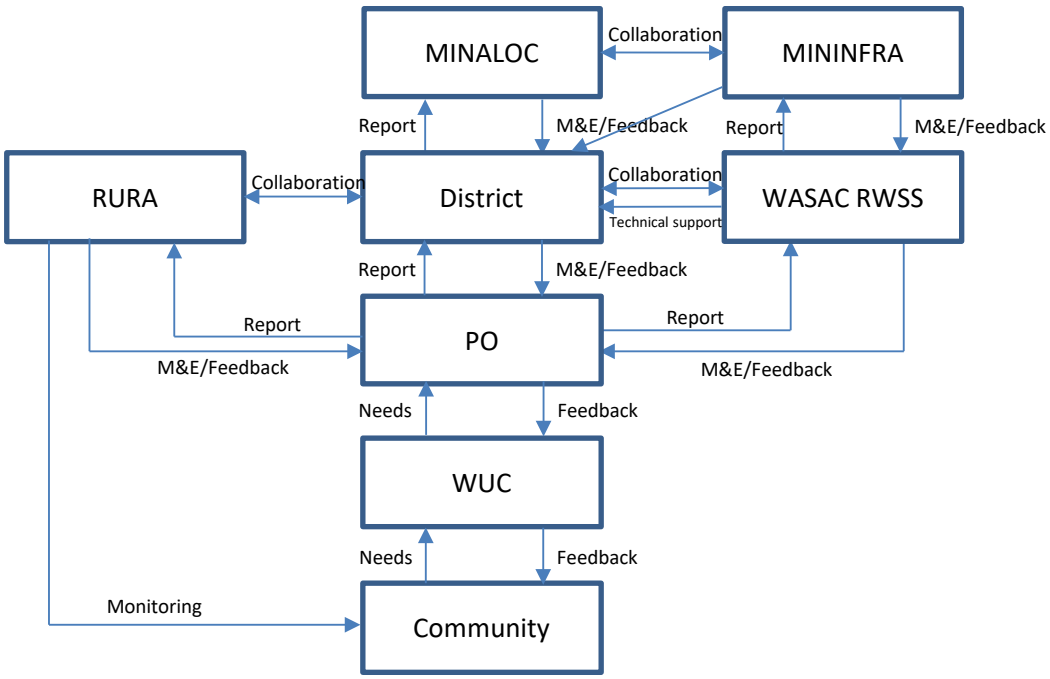


Figure 8-1: Water and Sanitation Monitoring Framework

8.1.2 Monitoring Indicators

Indicator is a variable that provides a simple and reliable means to measure achievement or reflect changes connected to an intervention.

a. Performance Indicators at National Level

"National Water Supply Policy and Implementation Strategy, 2016" has set the performance indicators for rural water supply related to O&M, in line with the following.

Category	Performance indicator
Rural water supply - coverage	
1. Raise rural water supply coverage to 100% by fast-tracking implementation of a strategic investment programme	**I-1:** % of rural households within 500 m of an improved water source
Rural water supply - functionality	
2. Ensure sustainable functionality of rural water supply infrastructure by strengthening O&M management arrangements	**I-2:** % of rural improved water sources functional at the time of spot check
	I-3: % of public rural water supply systems managed by a contracted private operator
	I-4: % cost recovery (revenue / O&M costs) for rural piped water schemes

b. National Benchmark System

National benchmarks for monitoring the service levels and performance of private operators have been drafted to ensure the monitoring of the functionality of water supply facilities.
The benchmark system is used for decision making and strategic planning at three levels.

Level	Purpose of the use
National level:	• To inform decision makers for strategic planning • To stimulate discussions for the improvement of interventions • To feed MIS and provide data for national or sector wide report • To have an overview of the progress of the sector towards partners in order to evaluate the achievements of goals and targets
District level	To Inform authorities or collectives the status of water service provision.
Local level	To compare services between users and service providers (private operators) in order to see how to improve service provision.

The private operators should provide services as per the following benchmarks:

Category	Proposed Benchmark
1. Accessibility	a. The water point should not be more than 500 meters from the household b. The time required to reach the water point, queue, collect water and return to the household should not be more than 30 minutes
2. Reliability /downtime	a. The period for which a water point is not functional should not exceed 30 days per year

Category	Proposed Benchmark
	b. 90% of the water points should be functional at the time of spot-check
3. Crowding	The number of people served by a water point should not be more than 300 per bore-hole or standpipe, or 150 per hand-dug well
4. Quantity	The quantity of drinking water used per person should not be less than 20 liters per day
5. Coverage	100% of the population in the catchment area of the water point should have access to water
6. Quality	At least 90% of the samples should meet the national water quality standards
7. Equity	All vulnerable households in the catchment area of the water point should get adequate quantity of water daily free of cost

Source: WATASN Thematic Working Group under SWG in Rwanda, 2014

And also, some examples for internationally benchmarked performance indicators have been included in **Appendix 2**.

c. Performance Indicators for Private Operators

The following 16 key indicators are set for the performance of Private Operators.

No.	Category	Performance indicator	Unite
1	Operational	Leakages repairs	No./km
		Leakage not repaired	No./km
2	Operational	Pump failures	days/pump
3	Operational	Water quality tests carried out	Percentage
4	Quality of service	Water consumption in public taps (BF)	l/day/tap
5	Quality of service	Water consumption per household connection (BP)	l/day/service connection
6	Quality of service	Water consumption per connected institution	l/day/service connection
7	Quality of service	Service complaints customers	No. complaints/1.000 customers
8	Economic & Financial	Revenues water sales per m^3 produced	RWF/m^3
9	Economic & Financial	Costs operation and maintenance	RWF/m^3
10	Economic & Financial	Energy costs	RWF/m^3
11	Economic & Financial	Collection efficiency public taps	Percentage
12	Economic & Financial	Collection efficiency household connections	Percentage
13	Economic & Financial	Collection efficiency connected institutions	Percentage
14	Economic & Financial	Collection efficiency total	Percentage
15	Economic & Financial	Non-revenue water	Percentage
16	Quality of service	Served population within 500 meter	Percentage

8.1.3 Joint Sector Review Report/ Sector Performance Report

The Joint Sector Review (JSR) Report and/or Sector Performance Report (SPR) are developed throughout the Joint Sector Review (JSR) which is an annual forum for sector performance assessment. The JSR and/or SPR provide guidance in the implementation of water and sanitation sector activities. It includes references to sector polices and strategies; provide guidance on work plan and reporting requirements; and set sector principles and procedures. So it is important to capture the O&M aspects on JSR and/or SPR so that all the stakeholders recognize the O&M situation.

8.1.4 Management Information System (MIS)

Planning for water and sanitation sector needs to be based on accurate and reliable data. This MIS allows access to all sector stakeholders. The information can be used for planning, monitoring, decision making and problem solving. Different stakeholders at the various levels have particular responsibilities and task in running the information system. The responsibilities and uses are as shown below.

Table 8-1: Responsibilities and Uses for MIS

Level and organization	Responsibilities	Use of information
1. Central level		
MININFRA	• Overall responsible for national MIS • Overall management of the MIS • Maintenance of the database • Data validation • Publishing the data	• National planning for Rural water supply and sanitation sub-sector • Developing the Sector performance report • Project preparation and targeting with development partners • Contribution to national statistics
WASAC	• Gathering information for national planning • Data entry	• National planning for water and sanitation sector • Developing the annual report for MININFRA
Development partners / NGOs	• Submission of activity and achievement reports	• Project preparation
2. District level		
District	• Consolidation of District information both piped water supply systems and improved point water • Reporting to District Council • Data entry	• Planning new infrastructure • Ensuring functionality • Monitoring of water service level
3. Community level		
Community	• Provision of information on use and functionality of water and sanitation facilities	• Immediate action to solve functionality problems

Level and organization	Responsibilities	Use of information
4. Private level		
PO	• Collection of information from WUCs and communities • Reporting to District Council • Data entry	• Ensuring functionality and use of services

8.2 Evaluation

Evaluation is defined as systematic and objective assessment of ongoing or completed projects or programs in terms of their design, implementation and results. Basically, evaluations deal with strategic issues such as program/ project efficiency, relevance, effectiveness (expected and unexpected) in light of specified objectives as well as program/ project impact and sustainability. An evaluation should provide information that is credible and useful, enabling the incorporation of lessons learned into the decision-making process of both recipients and donors.

Evaluation shall be conducted based on the following five criteria and key questions at the end of a phase or middle of a project.

Table 8-2: Evaluation criteria and key questions

Criteria	Key questions
Efficiency	• Were stocks of items available on time and in the right quantities and quality? • Were activities implemented on schedule and within budget? • Were outputs delivered economically?
Relevance	• Were the operation's objectives consistent with beneficiaries' needs and with Government policies?
Effectiveness	• Were the operation's objectives achieved? • Did the outputs lead to the intended outcomes?
Impact	• What changes did the project bring about? • Were there any unplanned or unintended changes?
Sustainability	• Are the benefits likely to be maintained for an extended period after assistance ends?

8.3 Institutional Roles and Responsibilities for M&E

There are a number of institutions involved in the implementation of M&E with various roles and responsibilities. Specific roles and responsibilities for the institutions at national, regional and district levels are provided in the table below:

Institutions	Roles and Responsibilities
MININFRA	• To monitor and evaluate the implementation of projects on water infrastructures. • To monitor and evaluate implementation of policy and strategy.
MINALOC	• To monitor and evaluate the implementation of projects on water infrastructures.

Institutions	Roles and Responsibilities
	• To monitor and evaluate the efficiency of projects towards communities. • To evaluate the outcome and the impact of water services on .beneficiaries in order to decide further planning.
WASAC	• To monitor and evaluate the activities of water supply services and do a follow up of how the contracts are being implemented. • To monitor management of delegated water services and service delivery by POs. • To monitor functionality water infrastructures. • To evaluate the outcome and the impact of water services on beneficiaries in order to decide further planning.
RURA	• To monitor the compliance regarding the roles and regulation of the water supply services • To monitor the implementation of tariff and regulations. • To monitor the service delivery by POs.
District	• To monitor the implementation of the contract for water service management by POs. • To monitor and evaluate the involvement of communities and beneficiaries in rural water services. • To evaluate the outcome and the impact of water services on beneficiaries in order to decide further planning.
PO	• To conduct self-evaluation on contract management which includes staff management and facility management such as technical, commercial and financial aspects described in Clause 8.4.2, c.

8.4 Reporting

Stakeholders at different levels should produce reports on a timely basis in order to provide information for management. After receiving reports, supervising organizations shall provide the feedback to the reporters.

8.4.1 Reporting Schedule

a. WASAC

WASAC RWSS prepares reports to the board of the directors with a copy to MININFRA.

Report	Frequency / Deadline	Reported by	Submitted to
Quarterly report	15th of the following month	WASAC	Board of Directors CC: MININFRA
Annual report	30th September		

b. Districts

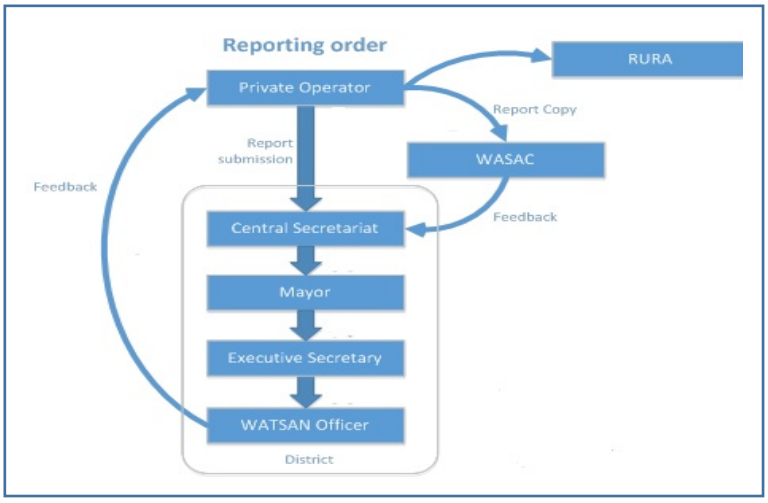
The District prepares reports to the District Council with a copy to District WASH Board, MINALOC and WASAC.

Report	Frequency / Deadline	Reported by	Submitted to
Monthly report	15th of the following month	District	-DC -CC: District WASH Board -CC: MINALOC -CC: WASAC
Quarterly report			
Annual report	End of August		

c. POs

The PO prepares reports to the District with a copy to RURA and WASAC.

Overview of the reporting and feedback process can be found in the following figures.



Report	Frequency / Deadline	Reported by	Submitted to
Monthly report	5th of the following month	PO	- District - CC: RURA - CC: WASAC
Quarterly report	Each quarter before the 30th of the following month		
Annual report	Each year before the end of the first quarter of the new fiscal year		
O&M plan (action plan and budget estimate)	Before the end of the current fiscal year		

8.4.2 Contents and Format of Reports

a. WASAC

The reports should cover the following contents:

Report	Item
Monthly report	• Summary comment on monthly progress • Statistical tables • Milestone report • Financial Report
Annual report	• Summary comment on 12 months' progress • Narrative report on work plan activities – with analysis (activities, results, constraints, proposed action/solutions)

Report	Item
	• Statistical tables • Milestone report • Financial report • Annual work plan and budget for a year ahead

b. Districts

The reports should cover the following contents:

Report	Item
Monthly report	• Summary comment on monthly progress • Statistical tables • Milestone report • Financial Report including the royalties
Annual report	• Summary comment on 12 months' progress • Narrative report on work plan activities – with analysis (activities, results, constraints, proposed action/solutions) • Statistical tables • Milestone report • Financial report including the royalties • Annual work plan and budget for a year ahead • Audit report

c POs

The reports should cover the following contents in accordance with the report format which is available from the Model contract for delegated management developed by the GoR.

(1) Monthly, Quarter and Annual Report

Category	Item
List of staff	Name of staff, Position, Qualification, Place of employment
List of purchased material and equipment	Date, Name of WSS, Material/Equipment, Qty, Unit price (Frw), Amount (Frw), Used/ Stored
Technical information	Water production, Water treatment, Water distribution, Water quality, number of repairs and replacements
Commercial information	Coverage, Categories of consumers, unmetered connections, Quality of water sold, Billing and collection per category, Number of vulnerable that benefit from pro-poor service, Quantity of water paid, Amount billed, Amount collected bills, Number of customers who did not pay their bills, Amount not paid, Number of customers dis-connected, Complaints received, Complaints resolved, Staff details, Service hours
Finical information	Revenue, Expenditure, Gross profit, Net profit
Annexes	• Laboratory tests performed • Quantity for each type of laboratory equipment owned • Types and number of repairs/replacements done • List of vulnerable benefiting from pro-poor services approved by Local Authority

Category	Item
	• Complaints received (Name, date of receipt, type of complaint, resolution, date of resolution) • Challenges encountered

Reference

- Monitoring Service Delivery of Rural Water Supply Systems in Rwanda, Task Force on Benchmarking and Functionality of Rural Water Supply Systems, WATSAN Sector Working Group, Preliminary draft for discussions-17 December 2014
- Draft Guideline for Developing an Operation and Maintenance Manual for Private Operators in the Rural Water Sector in Rwanda, December 2015, SusWAS Project
- Draft Guidelines for Monitoring Operation and Maintenance of Rural Water Supply Systems under Delegated Management of Private Operator in Rwanda, December 2015, SusWAS Project
- Report format under Draft model contract for delegated management, GoR, 2017

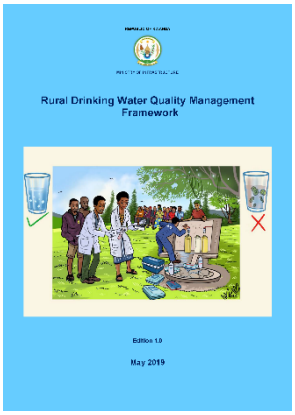
9 Appendices

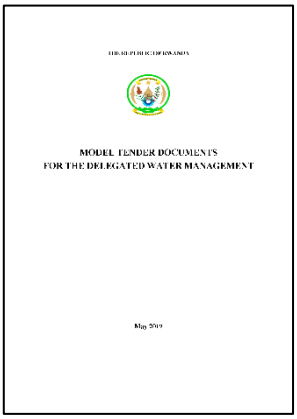
Document Tree related to O&M Framework for Rural Water Supply Facilities

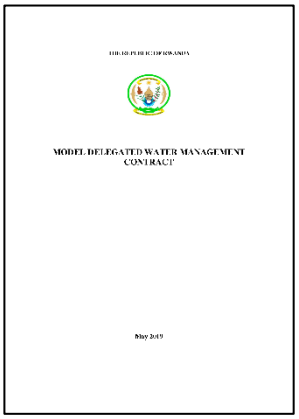
Hierarchical Order			Specific Document			
National Policies		National Water Supply Policy and Implementation Strategy, 2016				
Law / Act		Water Law, 2008 Water Supply Law (being developed)				
Regulations		Regulations on Minimum Required Service Level for Water Service Provision, 2013 WATER SERVICES LICENSING REGULATIONS, 2012 GOVERNING WATER SUPPLY SERVICES IN RWANDA, 2015				
Guidelines		National Guidelines for Sustainable Rural Water Supply Services				
Standard				Rwanda Standard RS EAS 12:2014, Second edition, Published by RSB 2-14-11-28, Potable water - Specification		Model Delegated Water Management Contract
				Monthly Report Format of Activities in Rural Water Service Provision		Model Tender Documents for the Delegated Water Management Contract
Manual	**Implementation**	Manual for Rural Water Supply Project Cycle Management		Rural Drinking Water Quality Management Framework		
				Manual for Community Mobilization on Rural Water Supply Services		District and Private Operator's Manual for Operation and Maintenance of Rural Water Supply System
	Taring Module			Training Module on Water Quality Control and Management in Rural Water Supply		Financial and Commercial Management for Rural Water Supply Systems under PPP
				Training Module on Procedure of Operation and Maintenance for Pipe Water Supply Systems		PPP Contract Tendering for Rural Water Supply Systems
				Training Module on O&M of Pumps in Rural Water Supply Systems		Social Mobilization
				Delegated Management of the Rural Water Supply Systems under PPP and PPP Environment		O&M of Rural Water Supply Systems, Distribution Network

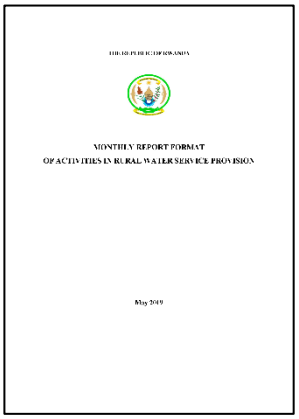
Series documents related to "National Guidelines for Sustainable Rural Water Supply Services"

◆ Summary of the Series documents related to "National Guidelines for Sustainable Rural Water Supply Services"

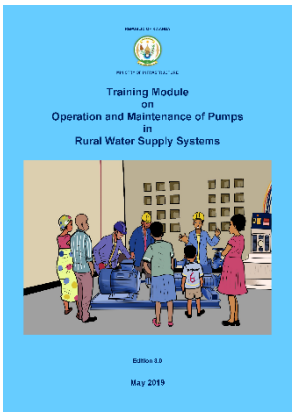
	**Title:** Rural Drinking Water Quality Management Framework (New) **Purpose:** Private operators (POs) conduct periodical water quality tests through an accredited laboratory.
Output	Reliability of water quality will be ensured.
Expected Users	Districts and Private Operators (POs), Development partners, NGOs
Contents	1. Rural drinking water quality management framework Routine Monitoring for Water Quality Control Daily Operational Monitoring 2. Installation of the disinfection facilities 3. Capacity development for the rural drinking water quality management

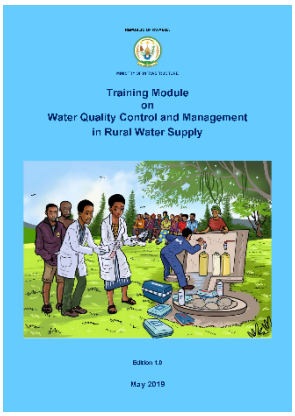
	**Title:** Model Tender Documents for the Delegated Water Management Contract (Revision) **Purpose:** To standardize the tender process and selection criteria for private operator.
Output	• Fair competition is made among private operators. • Certain level of technical and financial capacity of private operators is secured.
Expected Users	Districts, POs
Contents	Section I: Tender Notice Section II: Information Note Section III: Instructions to Bidders Section IV: Formats:

	**Title:** Model Delegated Water Management Contract (Revision) **Purpose:** To standardize the responsibilities of both districts and private operators and specify formats such as a monthly report and O&M manuals.
Output	• Common rate for water fees and royalty fees are collected. • Common formats are applied for monitoring the execution of the contract.
Expected Users	Districts, POs
Contents	Title I. Purpose of the contract and general provisions Title II. Beginning duration, amendments and termination of the contract Title III. Obligations Title IV. Obligations of the delegating authority (District) Title V. WASAC Obligations Title VI. Financial Provisions Title VII. System of particular connections Title VIII. Audit and Arbitration

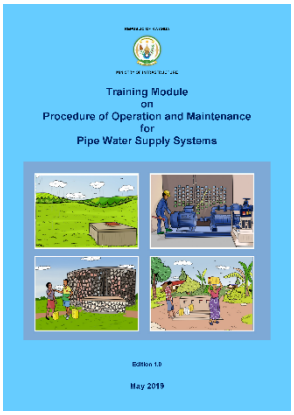
	**Title:** Monthly Report Format in Rural Water Service Provision (Revision) (First edition developed by RURA &WASAC) **Purpose:** To standardize the report format submitted by private operators.
Output	• Necessary information such as facility breakdown, number of users, collected water fees etc. is monitored. • Appropriate feedback is provided to private operators from districts and WASAC.
Expected Users	Districts, POs
Contents	• List of water supply facilities • List of staff • List of purchased material and equipment • Technical information • Commercial information • Finical information

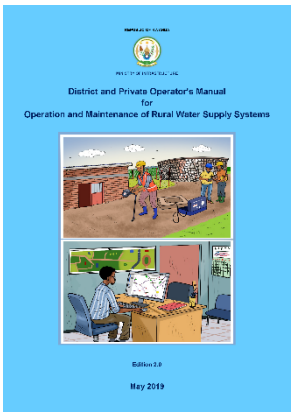
	• List of annexes

	**Title:** Training Module on Operation and Maintenance of Pumps in Rural Water Supply Systems (Revision) **Purpose:** To improve the contents of the part of handpump in the existing training module for the training WASAC staffs, WATSAN officers, POs' staffs and Water Users Committee members to build the capacity of operation and maintenance of motorized pump and borehole with handpump.
Output	• Knowledge and skills of WASAC staffs, WATSAN officers, POs' staffs and Water Users Committee members for operation, maintenance and repair of pumps will be improved. • Pump repair technicians will be established in the districts. • Functioning rate of borehole with handpump will be increased. • Operation and maintenance of pumps will be sustained in rural area.
Expected Users	POs, Districts and WASAC
Contents	Lesson 1: GENERAL INTRODUCTION Lesson 2: MANAGEMENT ASPECTS Lesson 3: Overview of Water Supply Lesson 4: PUMPING STATION GENERAL Lesson 5: PUMPS Lesson 6: POWER DRIVERS Lesson 7: SOURCES OF ENERGY

	**Title:** Training Module on Water Quality Control and Management in Rural Water Supply (New) **Purpose:** • To know the importance of water for human beings and how useful it is. • To master the necessity of maintaining the water quality and the knowledge for daily water quality management. • To identify potential solutions to address water quality challenges and water pollution. • To take knowledge of applied standards for drinking water.
Output	• District WATSAN Officers and private operator's staff will increase awareness of the quality of water supplied to residents. • Periodically measure and manage the quality of water supplied by determined methods. • To comply with Rwandan drinking water standards.
Expected Users	POs, Districts and WASAC

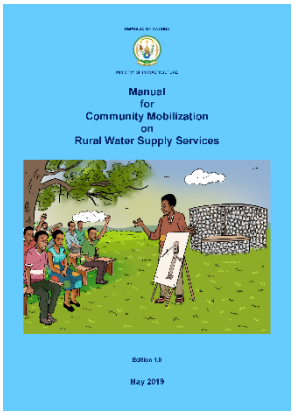
Contents	Lesson 1: General introduction Lesson 2: Water quality management Lesson 3: Definition of water principles Lesson 4: Water quality parameters and standards Lesson 5: Water quality analysis Lesson 6: Water treatment Lesson 7: Disinfection Lesson 8: Chlorination system Lesson 9: Monitoring residual free chlorine and management of chlorination facilities

	**Title:** Training Manual on Procedure of Operation and Maintenance for Pipe Water Supply Systems (New)
	Purpose: • Focusing on operation and, preventive and curative maintenance by facility of the water supply system. • Supporting the existing training modules "Training Module on O&M of Gravitational Rural Water Supply Systems" and" Training Module on Operation and Maintenance of Pumps in Rural Water Supply Systems" of FEPEAR. • Making POs easier to understand the O&M procedure. • Helping POs to develop their own O&M manual by system by themselves.
Output	Preventive and curative maintenance by facility of the water supply system will be improved.
Expected Users	POs, Districts and WASAC
Contents	1. General 2. Concept of Operation and Maintenance 3. Water Intake 4. Operation of the Pumping Cabin 5. Disinfection / Chlorination 6. Transmission Line 7. Storage 8. Distribution System 9. Customer Connection

	**Title:** District and Private Operator's Manual for Operation and Maintenance for Rural Water Supply System (Revision)
	Purpose: • To make POs' staffs easy to develop O&M manual. • To use as the training tools for the training WATSAN officers and POs' staffs to develop O&M manual by system.

Output	• O&M manual for each and every rural water supply system in Rwanda will be developed. • Districts will be able to calculate real O&M cost including depreciation cost to prepare the budget for future operation, maintenance and rehabilitation of water supply system. • Developed O&M manual will be used as the part of tender documents for the selection of PO for the delegated management contract. • POs will be able to estimate appropriate O&M cost for the financial proposal of the tender. • Appropriate water tariff will be set by RURA. • Operation and maintenance for rural water supply services will be improved.
Expected Users	POs, Districts and WASAC
Contents	1. Introduction 2. General Information 3. Description of water supply system 4. Assets 5. Service quality 6. Operations 7. Maintenance 8. Non-revenue water 9. Operating Cost 10. Reporting 11. Monitoring

	**Title:** Manual for Rural Water Supply Project Cycle Management (New)
	Purpose: All stakeholders, mainly districts and WASAC RWSS, in the water sector understand their roles and tasks at each stage of rural water supply project cycle.
Output	Rural water supply project will be implemented smoothly based on the roles and tasks of each stakeholder.
Expected Users	Districts and Private Operators (POs), Development partners, NGOs
Contents	0. Outline of Manual 1. Planning Stage 2. Implementation Stage 3. Operation and Maintenance Stage 4. Evaluation Stage

	**Title:** Manual for Community Mobilization on Rural Water Supply Services (New) **Purpose:** • To offer theory explanations and practical exercises on facilitation methods which district, sector and cell officers, as well as private operators can use to raise awareness among communities in order to motivate them to take responsibility for the daily maintenance of point water sources and public taps. • To build the capacity of operation and maintenance of point water source by community.
Output	• Facilitation skill of the staff of district, sector, cell, and private operator participants will be improved. • The staff of district, sector, cell, and private operator will be able to make community-participatory programs. • The staff of district, sector, cell, and private operator will more often meet communities to empower them. • Knowledge and skills of Water Users Committee members for operation and maintenance of point water source be improved. • Operation and maintenance of point water source will be sustained in rural area.
Expected Users	Districts (Sectors and Cells), POs, Water Users Committees, Users
Contents	1. General Introduction 2. Why does community awareness-raising require facilitation ability? 3. What is facilitation needed for community awareness-raising? 4. Monitoring and Evaluation 5. Design a Community Participation Program 6. Conclusion **【Supporting Documents】** • Attachment 8: Training Module on Social Mobilization • Attachment 9: Water Users Committees Training Manual (English version) • Attachment 10: Water Users Committees Training Manual (Kinyarwanda version)

Appendix 2: Definition of the Terms

Term	Definition of a term
Maintenance	Maintenance includes all necessary or indispensable consumables and works meant to ensure a good and reliable functioning of water production, transportation and distribution. By reliable functioning, it is meant that all the elements of the system, from the intake of raw water, its treatment, transportation, storage and distribution through public standpipes, contribute to the provision of sufficient good-quality water, at a right pressure, meeting criteria in force for drinking water. Maintenance shall be made in such a way that all elements of the system correctly function at least for a period equal to the Amortization Period. All repairing activities (major and minor) of damages caused in a way or another are considered to be maintenance. The maintenance of the Infrastructure is the responsibility of the POs.
Extension	Investments for the extension of the Infrastructure of water production, transportation and distribution comprise of all studies, designs, works and consumables necessary to extend the capacity of water production, transportation, storage and distribution (including public standpipes and private connections) or to improve the technical situation of existing installations with a view to better performance, better quality of the product or increased reliability of the functioning. The extension of any part of the production, transportation and distribution Infrastructure with the objective of meeting technical ameliorations shall be considered as necessary only where such ameliorations may be proven in technical, financial or economic terms. Any decision regarding the extension of the production, transportation and distribution infrastructure shall be introduced through a well-argued proposal. Extension investments are at the expense of the Renewal and Extension Fund;
Renewal	Investments for renewal of the Infrastructure include all studies, designs, works and supplies necessary for the renewal to equivalent characteristics for any part of the drinking water production, transportation and distribution Infrastructure. Such renewals intervene at the earliest after expiry of the Amortization Period of the concerned fixed asset and provided that convincing technical arguments justify them (for instance, the increase of breaks or leaks, compared with the situation at the beginning of the amortization period); The renewal of any part of the water production, transportation and distribution infrastructure for purposes of technical improvement or modernization, shall be deemed necessary only where the aforementioned improvement or modernization can be proven in technical, financial or economic terms. Any decision to renew any element of the water production, transportation and distribution infrastructure shall be introduced by a well-argued proposal.

<table>
<tr><th>Term</th><th>Definition of a term</th></tr>
<tr><td></td><td>Renewal investments shall be supported by the Renewal and Extension Fund;</td></tr>
<tr><td>Amortization Period</td><td>The table below shows amortization periods applied in Rwanda as well as corresponding amortization rates:
<table>
<tr><th>Categories of fixed assets</th><th>Amortization period</th><th>Amortization rate</th></tr>
<tr><td>Civil engineering</td><td>50 years</td><td>2%</td></tr>
<tr><td>Cast-iron pipes</td><td>50 years</td><td>2%</td></tr>
<tr><td>Constructions</td><td>30 years</td><td>3.33%</td></tr>
<tr><td>PVC pipes</td><td>30 years</td><td>3.33%</td></tr>
<tr><td>Connections</td><td>10 years</td><td>10%</td></tr>
<tr><td>Plumbing fixtures (taps, valves, air valves, one-way valves, etc.)</td><td>20 years</td><td>5%</td></tr>
<tr><td>Meters</td><td>10 years</td><td>10%</td></tr>
<tr><td>Electromechanical and electrical equipments</td><td>15 years</td><td>7 %</td></tr>
<tr><td>Computer Equipment</td><td>5 years</td><td>20%</td></tr>
<tr><td>Means of transport</td><td>5 years</td><td>20%</td></tr>
</table></td></tr>
<tr><td>Water Service Provider (WSP)</td><td>WSP means a public or a private person or company that supply water to consumers.</td></tr>
<tr><td>Private Operator</td><td>Any licensed operator by a private person or company who carries out activities of abstraction of water from a water source, conveyance, treatment, storage and distribution of potable water or water intended to be converted to potable water for consumption and makes delegated contract with the district.</td></tr>
</table>

Reference

- PPP Tender Document Model, January 2013, financed by Water and Sanitation Programme (WSP)
- REGULATIONS No 002/RB/WAT-EWS/RURA/015 of 23 /09/2015, GOVERNING WATER SUPPLY SERVICES IN RWANDA

Appendix 3: Examples for internationally benchmarked performance indicators

Water services international benchmarked KPIs					
	Sector KPIs		Benchmarked Best Practice [1]		
			Good	Acceptable	Not Acceptable
1	Water Coverage (population accessing safe water)		>90%	80-90%	<80%
2	Sanitation Coverage (population accessing safe services)		>90%	80-90%	<80%
3	Drinking Water Quality	No. of Tests – Residual Chlorine	≥96%	90-95%	≤89%
		Compliance – Residual Chlorine	≥96%	90-95%	≤89%
		No. of Tests – Bacteriological	≥96%	90-95%	≤89%
		Compliance – Bacteriological	≥96%	90-95%	≤89%
4	Hours of supply per day	Population > 100,000	21-24	16-20	<15
		Population < 100,000	17-24	12-16	<11
5	NRW		<20%	20-25%	>25%
6	Revenue Collection Efficiency		>90%	85-90%	<85%
7	O&M Cost Coverage		>150%	100-149%	<100
8	Staff ratio per 1000 connections	Very Large [2] – Large WSPs	≤4	5-8	≥9
		Med. & Small WSPs (< 3 towns)	≤6	7-11	≥12
		Med. & Small WSPs (≥ 3 towns)	≤8	9-14	≥15
9	Personnel Costs as %age of O&M Costs	Very Large -Large	≤19%	20-30%	> 30%
		Med. & Small WSPs (<3 towns)	≤29%	30-40%	> 40%
		Med. & Small WSPs (≥ 3 towns)	≤39%	40-45%	> 45%
10	Metering Ratio		100%	95-99%	<95%

In reference to the above table, below table presents recommended enhancement to indicators provided by RURA**.**

Recommended additional indicators for rural water in Rwanda		
	Area of Performance	**Indicators**
1.	Service Provision	i. Drinking Water Quality (number of tests carried out and %age samples that pass the test)
2.	Operational Efficiency	i. O&M Cost Coverage; ii. Staff numbers per 1,000 connections;
3.	Financial Performance	i. O&M Cost Coverage; ii. Personnel Costs as %age of O&M Costs

Reference

- Final Report on Assessment and Improvement of Performance of WSPs for Private Operators in Four Districts (BURERA, MUSANZE, NYABIHU & RUBAVU) Rwanda, August 2015, SNV

[1] To be agreed within the sector and supported by relevant **policies, laws** and **regulatory provisions**

[2] In Kenya, for example: **Very Large** WSP: Over 35,000 connections; **Large** WSP 10,000 – 34,999 connections; **Medium** WSP: 5,000-9,999 connections; **Small** WSP: less than 5,000 connections

Appendix 4: RWANDA STANDARD RS EAS 12: 2014, Second edition, Published by RSB 2014-11-28, Potable water - Specification

Requirements for potable water

1. General requirements

1.1 Potable water shall be free from organisms and chemical substances that are hazardous and injurious to human health and shall comply with requirements in Table 1, 2, 3, 4, 5, and 6.

1.2 The location, construction, operation and supervision of water supply source, its reservoirs and its distribution system shall be such that they exclude any possible pollution of the water in compliance with relevant national regulations.

1.3 Potable water shall be handled under hygienic conditions as stipulated in EAS 39.

2. Specific quality requirements

2.1 Physical characteristics

Potable water shall conform to the physical characteristics in Table 1.

Table 1— Physical requirements for potable water

Sl. No.	Characteristic	Treated potable water	Natural potable water	Method of test
i)	Colour (TCU *[a] max)	15	50	ISO 7887
ii)	Turbidity (NTU max)	5	25	ISO 7027
iii)	pH	6.5 – 8.5	5.5-9.5	ISO 10523
iv)	Taste	Not objectionable	Not objectionable	-
v)	Odour	Odourless	Odourless	-
vi)	Conductivity (µS/cm) max	1500	2500	ISO 7888
vii)	Suspended matter	Not detectable	Not detectable	ISO 11923
*[a] True colour units (TCU) mean 15 hazen units after filtration.				

2.2 Chemical characteristics

Potable water shall conform to the chemical characteristics affecting quality indicated in Table 2.

Table 2 — Quality requirements for potable water

Sl. No.	Substance or characteristic	Treated potable water (mg/L max.)	Natural potable water (mg/L max.)	Method of test
i)	Total dissolved solids	700	1500	ASTM D 5907
ii)	Total hardness, as $CaCO_3$,	300	600	ISO 6059
iii)	Aluminium, as Al^{+++},	0.2	0.2	ISO 12020
iv)	Chloride, as Cl^-	250	250	ISO 9297

v)	Total Iron as Fe	0.3	0.3	ISO 6332
vi)	Sodium, as Na^{+}	200	200	ISO 9964-1
vii)	Sulphate SO_4	400	400	ISO 22743
viii)	Zinc, as Zn^{++}	5	5	ISO 8288
ix)	Magnesium, as Mg^{++}	100	100	ISO 7980
x)	Calcium, as Ca^{++}	150	150	ISO 7980

2.3 Chemical characteristics affecting the safety of potable water

2.3.1 Inorganic contaminants

Potable water shall conform to the limits of inorganic contaminants affecting safety indicated in Table 3.

Table 3 — Limits for inorganic contaminants in natural and treated potable water

Sl. No.	Substance	Treated potable water limit of concentration mg/L, max.	Natural potable water	Method of test
i)	Arsenic, as As	0.01	0.01	ISO 11969
ii)	Cadmium, as Cd	0.003	0.003	ISO 5961
iii)	Lead, as Pb	0.01	0.01	ISO 8288
iv)	Copper, as Cu	1.000	1.000	ISO 8288
v)	Mercury (total as Hg)	0.001	0.001	ISO 12846
vi)	Manganese, as Mn	0.1	0.1	ISO 6333
vii)	Selenium, as Se	0.01	0.01	ISO 9965
viii)	Ammonia (NH_3)	0.5	0.5	ISO 11732
ix)	Chromium Total, as Cr	0.05	0.05	ISO 9174
x)	Nickel, as Ni	0.02	0.02	ISO 8288
xi)	Cyanide, as CN	0.01	0.01	ISO 6703
xii)	Barium, as Ba	0.7	0.7	ISO 14911
xiii)	Nitrate as NO^{-3}	45	45	ISO 7890
xiv)	Boron,as Boric acid	2.4	2.4	ISO 9390
xv)	Fluoride, as F	1.5	1.5	ISO 10359
xvi)	Bromate, as BrO^{-3}	0.01	0.01	ISO 15061
xvii)	Nitrite	0.003	0.003	ISO 6777
xviii)	Molybdenum	0.07	0.07	ISO 11885
xix)	Phosphates, as PO_3^{-4}	2.2	2.2	ISO 15681
xx)	Residual free Chlorine	0.2-0.5 *[a]	Absent	ISO 7393
*[a] Under conditions of epidemic diseases, it may be necessary to increase the residual chlorine temporarily				

2.3.2 Organic contaminants

Potable water shall conform to the limits of organic contaminants affecting safety indicated in Table 4.

Table 4 — Limits for organic contaminants in treated and natural potable water

Sl. No.	Substance (Arrange alphabetical order)	Limit µg/L max.	Method of test
i)	**Aromatics**		
	Benzene	10	ISO 11423
	Toluene	700	-
	Xylene	500	-
	Polynuclear aromatic hydrocarbon	0.7	ISO 13877
ii)	**Chlorinated Alkanes and Alkenes**		
	Carbon tetrachloride	2	-
	1,2-Dichloroethane	30	-
	1,1-Dichloroethylene	0.3	-
	1,1-Dichloroethene	30	-
	Tetrachloroethene	40	-
iii)	**Phenolic substances**		
	Phenols	2	ISO 8165
	2,4,6-Trichlorophenol	200	ISO 14402
iv)	**Trihalomethanes**		
	Chloroform	30	-
v)	**Pesticides**		
	Aldrin/Dieldrin	0.03	"ISO 15089
	Chlordane (total)	0.3	
	2,4- Dichlorophenoxyacetic acid	30	
	DDT (total)	1	
	Heptachlor and Heptachlor Epoxide	0.03	
	Hexachlorobenzene	1	
	Lindane BHC	2	
	Methoxychlor	20	
vi)	Surfactants (reacting with methylene Blue)	200	ISO 16265
vii)	Mineral oil	0.01	-
viii)	Organic matter	3	-

2.4 Microbiological contaminants

Potable water shall conform to the microbial limits affecting safety as indicated in Table 5.

Table 5 — Microbiological limits for potable water

Sl. No.	Type of micro-organism	Potable water	Method of test
i)	Total viable counts at 22 ºC, in mL, max. *a	100	ISO 6222
	Total viable counts at 37 ºC, in mL, max. *a	50	
ii)	Total Coliforms b) in 100 mL	Absent	ISO 4832
iii)	E. coli *b in 100 mL	Absent	ISO 9308-1
iv)	Staphylococcus aureus in 100 mL	Absent	ISO 6888-1
v)	Sulphite reducing anaerobes in100 mL	Absent	ISO 6461-2
vi)	Pseudomonas aeruginosa fluorescence in 100 mL	Absent	ISO 16266
vii)	Streptococcus faecalis in 100mL	Absent	ISO 7899-2
viii)	Shigella in 100 mL	Absent	ISO 21567
ix)	Salmonella in 100 mL	Absent	ISO 6785

*[a] This parameter is for monitoring the system at source. Total time before analysis should be not more than 6 h at 4 ºC. Determination of total viable counts shall start within 12 h after collection of the potable water sample.
*[b] During the bacteriological quality control for different types of water supply, refer to Annex A.

2.5 Radioactive characteristics

Potable water shall conform to the limits for radioactive materials stipulated in Table 6.

Table 6 — Limits for radioactive materials in treated and natural potable water

Sl. No.	Radioactive material	Limits in Bq/L	Method of test
i)	Gross alpha activity	0.5	ISO 9696
ii)	Gross beta activity	1	ISO 9697